

PRODUCT

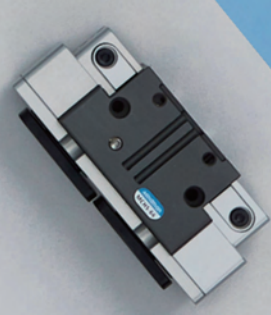
2020

2021

C A T A L O G U E

3

AIR CYLINDER
GRIPPER
ELECTRIC ACTUATOR
HYDRAULIC CYLINDER



 Mindman

MINDMAN. SMART AUTOMATION

<p>Core Business : Manufacture and sale for varieties of high quality automation components.</p>	 <p>QUALITY POLICY Quality advancement & Exceeding customers' demands</p>	<p>No.1 Quantity supplied of pneumatic components in Taiwan.</p>	 <p>SALES NETWORK 97 Countries</p>
 <p>PRESIDENT CHING-CHENG HUANG</p>	<p>1979 FOUNDED</p>	<p>MANUFACTURE BASE IN TAINAN CITY, TAIWAN</p>	<p>HEADQUARTERS IN TAIPEI CITY, TAIWAN</p>
 <p>CAPITAL USD 12,558,000</p>	 <p>EMPLOYEES 750 People</p>	 <p>PLANT SIZE 90,000 m²</p>	

Mindman Industrial Co., Ltd. was established in 1979 with a destination to provide high quality automation components for a wide variety of industries.

During the past 40 years, Mindman has devoted to the expansion of our product range. Thanks to our R&D department, we are proud to possess the diversified product lineup includes solenoid valves, air treatment units, pneumatic cylinders, electric actuators and all different types of fluid power accessories.

We always believe that fast delivery of automation components is the key of success in the market. Through the complete vertical integration of all manufacturing processes and automated warehouse, we are confident to achieve on time delivery.

To keep quality high during the whole production process, we implement the strict quality control standard. We thoroughly control the process via standard operation procedure (SOP), statistical process control system (SPC) and total productive management (TPM). Most important of all, Mindman commits to providing the products with 100% inspection after assembly.

Currently, Mindman products are exported to more than 90 countries around the world. We devoted ourselves to building the relationship with customers worldwide and provide them with the strong support, such as online 3D drawing, inventory check and promotional program... etc. In the vast automation market, Mindman will spare no effort in establishing a brand – a world-class premium automation components supplier.



<p>ISO 9001 Quality </p>
<p>ISO 14001 Environmental protection </p>
<p>OHSAS 18001 Health and safety </p>







TA PHONE trading co., Ltd.

- Authorized distributor of NITTO, VESSEL and AIRMAN.
- Founded in 1968
- Capital: USD 1,000,000
- Employees: 8 people



www.taphone.com.tw



WAY FU industrial co., Ltd.

- The first time recorder manufacturer in Taiwan.
- Founded in 1980
- Capital: USD 780,000
- Employees: 40 people



www.wayfu.com.tw



ATAM Taiwan

- An Italian world-class manufacturer in the field of electrical coil
- Founded in 2013
- Capital: USD 1,660,000
- Employees: 12 people



www.atam.tw



PISCO Taiwan

- A Japanese world leader of high quality pneumatic components manufacturer.
- Founded in 1992
- Capital: USD 3,000,000
- Employees: 41 people



www.pisco.co.jp



UNIMECH hydro-pneumatic co., Ltd.

- A hydraulic - pneumatic actuators manufacturer based in Taiwan Kaohsiung.
- Founded in 1993
- Capital: USD 1,300,000
- Employees: 30 people



www.unimec.com.tw

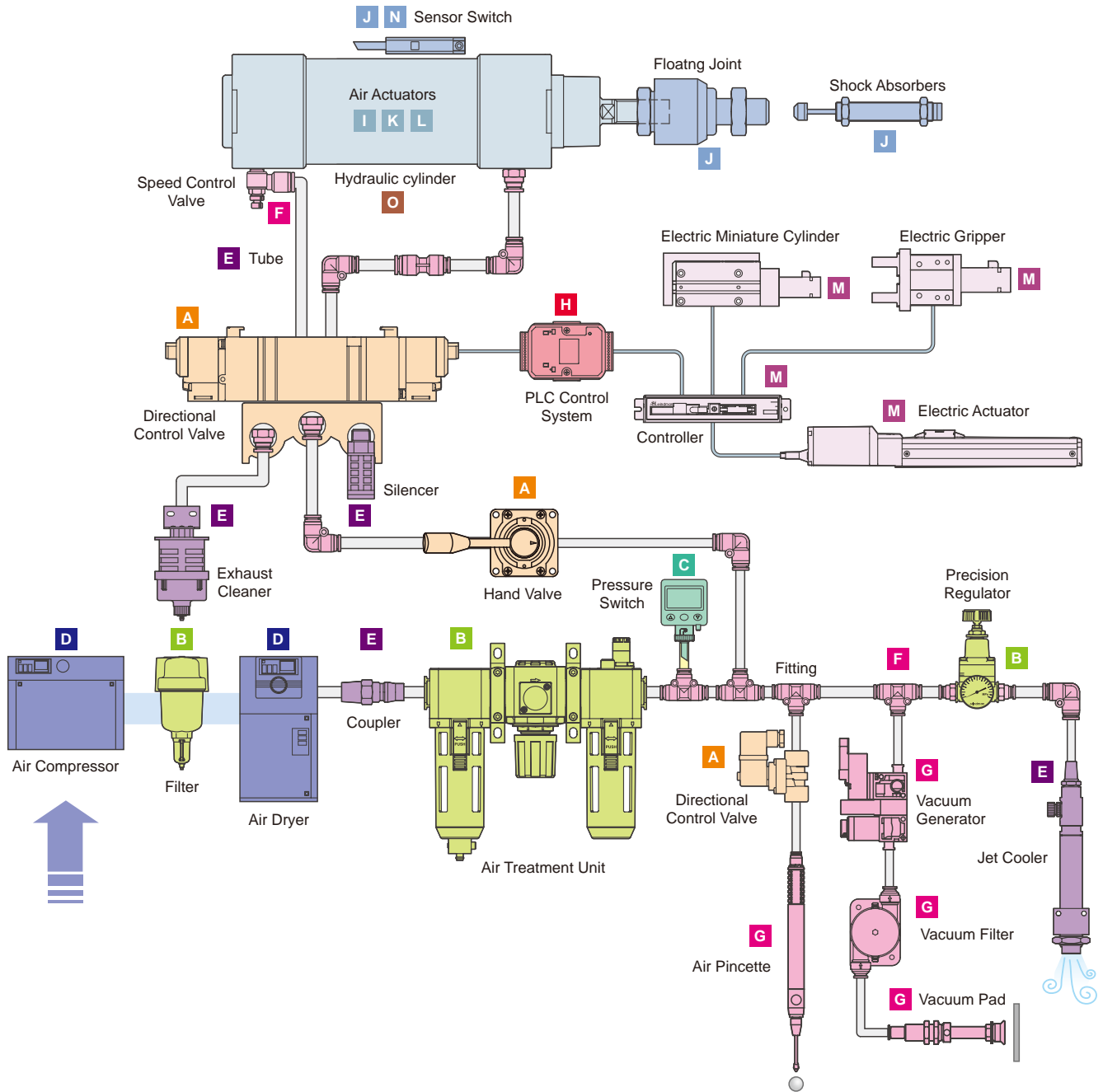


MEDAN GmbH

- A German professional manufacturer in the field of pneumatic and electric linear technology.
- Founded in 1990
- Capital: EUR 26,000
- Employees: 12 people



www.medan-gmbh.com



Vol. 1

Vol. 2

Vol. 3

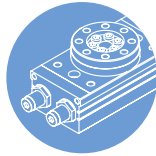
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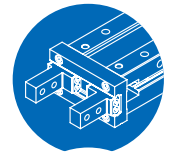
1 ROTARY ACTUATOR



Rotary Actuator

1-2

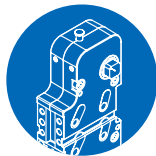
3 GRIPPER



Paraller Gripper
Angular Gripper

3-2
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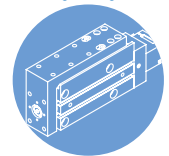
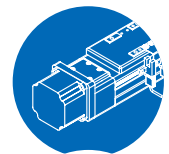
2 CLAMP CYLINDER



Clamp Cylinder

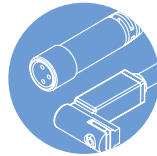
2-2

4 ELECTRIC ACTUATOR



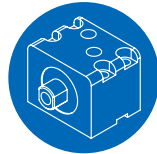
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5 OTHER AUXILIARY EQUIPMENT



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Double Acting Cylinder	6-2
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INNOVATION

Department of R&D

Mindman R&D team develops the product through the concept of mechatronics and IoT with the higher level of precision improvement. We apply PLM system to facilitate the sorting and analysis of complicated 3D drawings and product data. Furthermore, we implement multiple testing to insure the product lifespan, load capacity, flow rate, and response time consist with our product catalog.



Advanced Process

Mindman built an independent team to conquer the process obstacle and design the optimized process. Our department of advanced process provides a continuous improvement of manufacturing via the analysis of daily data collection which helps to minimize the waste of time and maximize the productivity of machines.



Automation

Mindman founded the department to design and provide the solution of automation. Besides, the team designs our own automated machine which enhances our productivity and increases liability of quality.





1 ROTARY ACTUATOR

MCRA	1-4
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MCRQ F	1-14
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2 CLAMP CYLINDER

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3 GRIPPER

Paraller Gripper		
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4 ELECTRIC ACTUATOR

Slider Electric Cylinder – Belt Driven	
MEAT	4-2
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Slider Electric Cylinder – Ball Screw Drive	
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Rod Type Electric Actuator	
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Miniature Electric Cylinder	
MESS2 New	4-96
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Electric Gripper	
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F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set.
For more information, please go to our MINDMAN website (www.mindman.com.tw) and click on the “Component Set Inventory” button.



5 OTHER AUXILIARY EQUIPMENT

Sensor Switch

RC*		5-2
RD*	New	5-10
LN*	New	5-15

Cable With Connector

M8*	New	5-20
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6 HYDRAULIC CYLINDER

Double Acting Cylinder

MDHB/MDHD/MDHN	6-2
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Compact Hydraulic Cylinder

MHCB/MHCQ	6-15
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Hydraulic With Piston Sensing Cylinder

MDOA/C/D/N	6-44
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Hydraulic Rotary Actuator

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Hydraulic Lever – Type Cylinder

MHCK	6-54
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Hydraulic – Swing Clamp Cylinder

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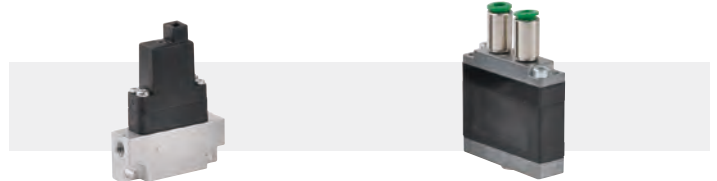
Hydraulic Work Support

MSP-**A/B	6-70
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F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set. For more information, please go to our MINDMAN website (www.mindman.com.tw) and click on the “Component Set Inventory” button.

Solenoid Valve

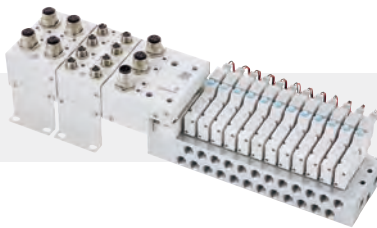


MVDA-80 series
Direct acting type

P. 1-84

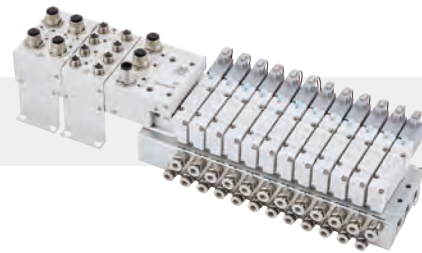
MVDA-120 series
Direct acting type

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MVE-100 series
Fieldbus system

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MVE-156 series
Fieldbus system

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Auxiliary Equipment



M83C-M
series

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M124C-MA
series

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M124C-MD
series

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- ◀ Connector
- ▼ Cable with Connector



M83R-F
series

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M125R-WB
series

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M124R-FA
series

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M124R-RJD
series

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M124R-MD
series

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Air Treatment Unit



MAHR200 series

High pressure regulator

P. 4-78



MAER series

Electro pneumatic regulator

P. 4-80



MAIR300 series

Precision regulator

P. 4-94



MAM*-25 series

Precision filter / Water separator

P. 4-112

Flow & Pressure Sensor



MF01 series

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MFP01 series

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MSBE series

P. 7-4

- ◀ Stopper Cylinder
- ▼ Standard Cylinder



MCQV3 series

P. 1-48



MCQI3 series

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Compact Cylinder



MCJU series

Add: 21,22 double rod

P. 2-62

Miniature Cylinder



MCMIS series

Stainless steel

P. 3-52

High Speed Cylinder



MCCH series

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MCKD series

Powerful clamp

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◀ Clamp Cylinder

Rotary ▶ Actuator



MCRC series

Vane type

P. 1-11

Sensor Switch ▼



RDP8 series

Proximity sensor

P. 5-13



RNKD series

for MCKD series

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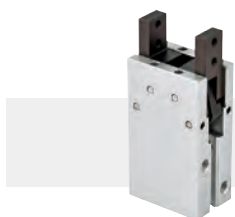


LN65 series

for MRT* series

P. 5-19

Parallel Gripper



MCHB series

Add: Single acting N.O.

P. 3-3



MCHC series

Add: ø6, long stroke & flat type

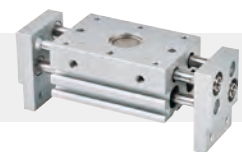
P. 3-8



MCHD series

Add: medium & long stroke

P. 3-22



MCHX series

Add: ø40

P. 3-47

Electric Actuator

▶ Slider Electric Cylinder (Without motor)



METFB-25 series

P. 4-5

METFB-32 series

P. 4-11

METFB-40 series

P. 4-17



METG-8 series

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METS2-10 series

P. 4-54

METS2-14 series

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METS2-17 series

P. 4-63

▶ Rod Type Electric Actuator (Without motor)



MEQG-5 series

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MEQG-8 series

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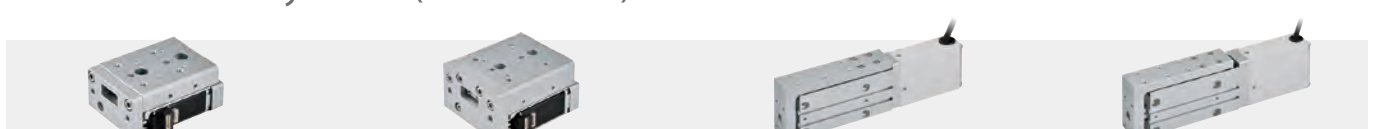
MEQI-50 series

P. 4-86

MEQI-63 series

P. 4-86

▶ Mini. Electric Cylinder (With motor)



MESS2-16 series

P. 4-96

MESS2-25 series

P. 4-96

MESH2-16 series

P. 4-99

MESH2-20 series

P. 4-99

▶ Electric Gripper (With motor)



MEHC2-16 series

P. 4-102

MEHC2-25 series

P. 4-102

▼ Controller



MECQ1 series

P. 4-106

▼ Driver



MECP series

P. 4-108



Mindman Website



www.mindman.com.tw

Mobile Phone / Tablet or iPad / Computer

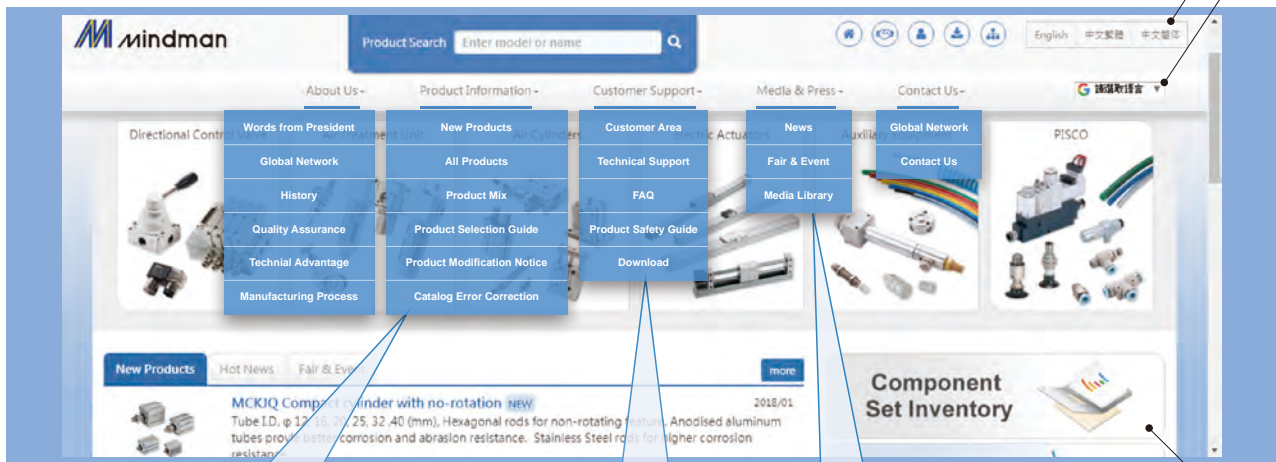
New Features

Google Translate

Plug-in provides a simple way to translate

Language option

English / Chinese (Traditional) / Chinese (Simplified)



Product Information

Product Mix

An automation circuit chart that could easily lead to your interested product.



Product Selection Guide

A simple software selector to guide you to find the suitable product.

Product Modification Notice

Offering the update specification changes.

Customer Support

Technical Support

CV, Flow coefficient, Effective orifice, Cylinder theoretic force, Compressed air consumption, etc...

Download

- 2D / 3D download - Anonymous login - No registration required to download the drawings with your own specifications, like preferred stroke, thread, brackets, sensors, etc...
- Catalog download - E-book.



Media & Press

Fair & Event

Media Library



Component Set Inventory

Fast delivery items with up to date stock status.

Exclusive feature for distributors

If you wish to access these exclusive features, please create a new account and contact your sales representatives to activate your account.



Customer Area

About Us

Technical Advantage

Manufacturing Process

Customer Support

Customer Area

- ▶ Stock check
- ▶ Training
- ▶ Promotion Activity



Cylinders' theoretic force



Unit: N

Bore (mm)		12	16	20	25	32	40	50	63	80	100	125	150	200	
Rod (mm)		6	6	8	10	12	16	20	20	25	25	35	40	50	
Area (mm ²)	A	113	201	314	491	804	1257	1963	3117	5027	7854	12272	17671	31416	
	B	85	173	264	412	691	1056	1649	2803	4536	7363	11310	16414	29453	
Operating pressure (MPa)	0.1	A	11	20	31	49	80	126	196	312	503	785	1227	1767	3142
		B	9	17	26	41	69	106	165	280	454	736	1131	1641	2945
	0.2	A	23	40	63	98	161	251	393	623	1005	1571	2454	3534	6283
		B	17	35	53	82	138	211	330	561	907	1473	2262	3283	5891
	0.3	A	34	60	94	147	241	377	589	935	1508	2356	3682	5301	9425
		B	26	52	79	124	207	317	495	841	1361	2209	3393	4924	8836
	0.4	A	45	80	126	196	322	503	785	1247	2011	3142	4909	7068	12566
		B	34	69	106	165	276	422	660	1121	1814	2945	4524	6566	11781
	0.5	A	57	101	157	246	402	629	982	1559	2514	3927	6136	8836	15708
		B	43	87	132	206	346	528	825	1402	2268	3682	5655	8207	14727
	0.6	A	68	121	188	295	482	754	1178	1870	3016	4712	7363	10603	18850
		B	51	104	158	247	415	634	989	1682	2722	4418	6786	9848	17672
	0.7	A	79	141	220	344	563	880	1374	2182	3519	5498	8590	12370	21991
		B	59	121	185	288	484	739	1154	1962	3175	5154	7917	11490	20617
	0.8	A	90	161	251	393	643	1006	1570	2494	4022	6283	9818	14137	25133
		B	68	138	211	330	553	845	1319	2242	3629	5890	9048	13131	23562
	0.9	A	102	181	283	442	724	1131	1767	2805	4524	7069	11045	15904	28274
		B	77	156	238	371	622	950	1484	2523	4082	6627	10179	14773	26508
	1.0	A	113	201	314	491	804	1257	1963	3117	5027	7854	12272	17671	31416
		B	85	173	264	412	691	1056	1649	2803	4536	7363	11310	16414	29453

The method of calculation (Cylinders' force)

$$F = P \times A - f$$

F: Cylinder's force (N)

P: Air pressure (MPa)

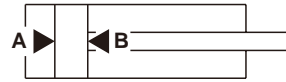
A: Piston area (mm²)

f: Friction drag (N)

Pressure conversion chart

Pa	kPa	MPa	bar	mbar	kgf/cm ²	cmH ₂ O	mmH ₂ O	mmHg	p.s.i.
1	0.001	0.000001	0.00001	0.01	0.0000102	0.0102	0.10197	0.0075	0.000145
1000	1	0.001	0.01	10	0.0102	10.2	101.97	7.5	0.145
1000000	1000	1	10	10000	10.2	10200	101970	7500	145
100000	100	0.1	1	1000	1.02	1020	10200	750.06	14.5
100	0.1	0.0001	0.001	1	0.00102	1.02	10.2	0.75	0.0145
98066.5	98.07	0.09807	0.98	980.67	1	1000	10000	735.56	14.22
98.0665	0.9807	0.0009807	0.00098	0.98	0.001	1	10	0.74	0.01422
9.80665	0.09807	0.00009807	0.00009807	0.09807	0.0001	0.1	1	0.07356	0.00142
133.32	0.13332	0.00013332	0.00133	1.33	0.00136	1.36	13.6	1	0.01934
6895	6.895	0.006895	0.06895	68.95	0.07031	70.31	703.07	51.71	1

Compressed air consumption



Unit: ℓ/min

Bore (mm)	12	16	20	25	32	40	50	63	80	100	125	150	200	
Rod (mm)	6	6	8	10	12	16	20	20	25	25	35	40	50	
Area (mm ²)	A	113	201	314	491	804	1257	1963	3117	5027	7854	12272	17671	31416
	B	85	173	264	412	691	1056	1649	2803	4536	7363	11310	16414	29453
Operating pressure (MPa)	0.1	0.039	0.074	0.115	0.180	0.298	0.460	0.719	1.178	1.903	3.028	4.693	6.783	12.114
	0.2	0.059	0.111	0.172	0.269	0.446	0.689	1.076	1.764	2.850	4.535	7.028	10.158	18.140
	0.3	0.079	0.148	0.229	0.359	0.594	0.918	1.434	2.350	3.797	6.042	9.363	13.533	24.167
	0.4	0.098	0.186	0.287	0.448	0.742	1.147	1.792	2.937	4.744	7.548	11.698	16.908	30.193
	0.5	0.118	0.223	0.344	0.537	0.890	1.376	2.149	3.523	5.690	9.055	14.032	20.282	36.220
	0.6	0.137	0.260	0.401	0.627	1.038	1.605	2.507	4.109	6.637	10.562	16.367	23.657	42.247
	0.7	0.157	0.297	0.458	0.716	1.186	1.834	2.865	4.695	7.584	12.068	18.702	27.032	48.273
	0.8	0.177	0.334	0.516	0.806	1.334	2.063	3.222	5.281	8.531	13.575	21.037	30.407	54.300
	0.9	0.196	0.371	0.573	0.895	1.482	2.292	3.580	5.867	9.478	15.081	23.372	33.781	60.327
	1.0	0.216	0.408	0.630	0.984	1.630	2.521	3.937	6.453	10.425	16.588	25.707	37.156	66.353

• The table is for a complete cycle 100mm stroke in one minute.

The method of calculation (Compressed air consumption)

$$Q_n = (A_a + A_b) \times L \times \frac{P + 0.101}{0.101} \times n \times 10^{-6}$$

Qn:	Compressed air consumption	(ℓ/min)
Aa:	Piston area of A	(mm ²)
Ab:	Piston area of B	(mm ²)
L:	Stroke of cylinder	(mm)
P:	Air pressure	(MPa)
n:	Cycle of operation	(cycle/min)

Flow rate conversion chart

m ³ /s	l/s	cm ³ /s	m ³ /h	m ³ /min	l/h	l/min	ft ³ /min (scfm)	gallon min UK	gallon min USA
1	1000	1000000	3600000	60	3600000	60000	2120	13200	15850
0.001	1	1000	3.6	0.06	3600	60	2.12	13.2	15.85
0.000001	0.001	1	0.0036	0.00006	3.6	0.06	0.0212	0.0132	0.01585
0.00028	0.28	280	1	0.01667	1000	16.67	0.59	3.67	4.4
0.01667	16.67	16670	60	1	60000	1000	35.31	219.97	264.17
0.00000028	0.00028	0.28	0.001	0.00001667	1	0.01667	0.00059	0.00367	0.0044
0.00001667	0.01667	16.67	0.06	0.001	60	1	0.03531	0.21997	0.264
0.00047	0.47	470	1.699	0.02832	1699	28.32	1	6.23	7.48
0.00007579	0.07577	75.77	0.273	0.00455	273	4.55	0.16	1	1.2
0.00006309	0.06309	63.09	0.227	0.00379	227	3.79	0.13	0.83	1

Order example

ROTARY / CLAMP CYLINDER



Order example of rotary cylinder * Please refer to the product page for complete model number.

MCRA - 63 R - 90 - LB - G

Model	Tube I.D.	Angle adjuster	Rotary angle	Mounting type	Port thread
MCRA	6-63		90 90°	—	— Rc thread
MCRC		A Adjusting bolt	180 180°	LB	G G thread
MCRJ-S		R Shock absorber	Connecting port position and rotation		NPT NPT thread
MCRQ			* Only for MCRA		
MCRQ-S			Shaft	End rod type	
MRT*			W Double shaft	D Double end rod type	
				* Only for MRTH	
			Vane		
				S Single vane	
				* Only for MCRC	

* Code 1) M: Mindman
 Code 2) C: Cylinder
 Code 3) R: Rotary
 Code 4) A: Series

Order example of clamp cylinder * Please refer to the product page for complete model number.

(Continued)

MCKC A - 20 M - 10 - CW - 40 x 90 - LN - B - G

Model	Tube I.D.	Magnet	Stroke	Rotating direction	Piston (ø)	Rotating angle (°)	Rotating direction	Arm	Clamping arm type	Port thread
MCKC	16-63	M Magnet	10~	CCW Counter clockwise	25	0 90	L Left	— With arm	— Standard	— Rc/M thread
MTA*				CW Clockwise	32	15 105	R Right		B Extention	G G thread
MAS*					40	30 120		N Without	* Only for MTA*	NPT NPT thread
MATS*					50	45 135			Lever type	
MCKD					63	60 180			— Without lever	
MCKB						75			L Left side lever	
									R Right side lever	* Only for MCKD
										* Only for MTA*
										* Only for MTA*

* Code 1) M: Mindman
 Code 2) C: Cylinder
 Code 3) K: Clamp
 Code 4) A: Series

Order example

GRIPPER



Order example of gripper * Please refer to the product page for complete model number.

MCHD — 20 R — 50 M — N

Model	Tube I.D.	Piping type	Stroke	Style	Type	
MCHB	6~125	— Axial piping	— Short	— Double acting	— Standard	
MCHC	Body spec.	R Side piping	1 Medium	S Single acting N.O.	1 Side tapped mounting	
MCHD		Finger option		C Single acting N.C.	2 Standard (Through hole)	
MCHH	50~300	— Standart tap mounting	* Only for MCHD 20~200	Magnet		
MCHU		1 Opening / closing direction through hole.	* Only for MCHX	M Magnet	3 Flat	
MCHS					N Narrow	
MCHX					N1 Narrow type side tapped mounting	
MCHG2					N1 Narrow (Through hole)	
MCHJ		* Only for MCHY			Port thread	
MCHA					— Rc/M thread	
MCHY					G G thread	
					NPT NPT thread	

* Code 1) M: Mindman
 Code 2) C: Cylinder
 Code 3) H: Gripper
 Code 4) A: Series

Order example

HYDRAULIC CYLINDER



Order example of hydraulic cylinder

* Please refer to the product page for complete model number.

1 - MDHB L - 50 - CW - 23A × 90 M - N (Continued)

Seal material		Model	Clamping stroke		Tube I.D.	Rotating direction		Piston (∅)	Rotating		Magnet	Cushion	
1	NBR	MDH*	-	Standard type	20~150	CCW	Counter clockwise	20A, 25B 32A, 32B 40A, 40B	0	0°	M Magnet	R	Rod end with cushion
2	PU	MDM*	L	Lengthened		CW	Clockwise		45	45°		H	End end with cushion
3	VITON	MHC*	* Only for MTH*			R	Clockwise		60	60°		B	Both end with cushion
		MHCB-M				L	Counter clockwise	90	90°			N	No cushion
		MHCB*				P	Non-swing	180	180°			* Only for MDH*, MDM*	
		MDO*				* Only for MHS*, MHTS*		* Only for MRPH, MTH*, MHS*, MHTS*, MF*, MD*					
		MRPH											
		MHCK											
		MTH*											
		MHS*											
		MHTS*											
		MF*											
		MD*											
		MTC*											
		MSP*											

* Code 1) M: Mindman
Code 2) H: Hydraulic
Code 3) Series
* Please refer to the product page for complete model number.

- 100 - BC - FC - Z D A - LB - Y

Stroke	Port & cushion adj. location	Manifold type	Rod end type	Rod type	Adjustable stroke	Mounting type
50~500	Standard (A) (B) (AB) 	FC MF F	- Female thread Z Male thread R,L One male and one female thread	D Double rod type	- Standard type A Adjustable 25mm B Adjustable 50mm	FA FB LA LB CA CB TC Y I
	ex. BC 1st code: Port location 2nd code: Cushion adjustment location	* Only for MTH*	* Only for MHC*	* Only for MHC*	* Only for MDO*, MHC*	
	* Change port & cushion adj. location. * Only for MDH*, MDM*.		Manifold type			
			- Standard type F Manifold type			
			* Only for MHCK			
			Clamping arm type			
			- Standard type B Extension type			
			* Only for MTH*			

Order example

ELECTRIC ACTUATOR



Order example of Electric actuator

* Please refer to the product page for complete model number.

METS2 – **5** **N** – **L02** – **100** **BC** – **CQ1** (Continued)

Model	Size	Guide installation	Ball screw lead	Stroke	Motor position	Controller
MEAT	16	N Without guide	L02 2 mm	30~6000	M Built-in	CQ1 MECQ1
METFB	25	GR Guide right side	L05 5 mm		BA Turned	Cable length
METB	32	GL Guide left side	L06 6 mm	BC Exp3osed	01 1.5 m	
METG	40	* Only for METFB		L08 8 mm	BM Bottom side	03 3 m
METS2	42	Spec. and type		L10 10 mm	BW Top side	05 5 m
METS	50	– Standard	L12 12 mm	L20 20 mm	BR On right side	
MEQG	55	1 Standard type with side tapped			BL On left side	
MEQI	63	N Narrow				
MESS2	80	N1 Narrow type with side tapped				
MESH2	Spec.	Motor cable entry				
MEHC2	4	– Parallel				
	5	F Perpendicular				
	8					
	10					
	14					
	17					
	22					

* Code 1) **M**: Mindman
Code 2) **E**: Electric
Code 3) Series

Controller / Driver

MECQ1 – **20L**

Controller	Motor size
MECQ1	20L <input type="checkbox"/> 20
Driver	28L <input type="checkbox"/> 28
	35L <input type="checkbox"/> 35
	42L <input type="checkbox"/> 42
	56L <input type="checkbox"/> 56
MECP	

Accessoires

MECQ1 – **S03**

Controller	Cable length
MECQ1	I/O signalcable
Driver	S015 1.5 m
	S03 3 m
MECP	Actuator cable
	M015 1.5 m
	M03 3 m
	M05 5 m
	Power connection
	P

Order example

ELECTRIC ACTUATOR



— **M10** **B** — **A3** **D** — **XA00**

Motor band		Power output	
M	Mitsubishi	Servo	
P	Panasonic	05	50W
Y	Yaskawa	10	100W
D	Delta	20	200W
E	Else	40	400W
S	Mindman	75	750W
		Step	
		35	<input type="checkbox"/> 35
		42	<input type="checkbox"/> 42
		56	<input type="checkbox"/> 56

Shaft versions			
Size	Type	∅	Part No.
42	Female shaft	8	F08
	Male shaft	12	M12
	Double male shaft	12	D12
55	Female shaft	8	F08
	Male shaft	16	M16
	Double male shaft	16	D16
80	Female shaft	19	F19
	Male shaft	19	M19
	Double male shaft	19	D19

* Only for METB

Brakes	
—	No brake
B	With brake
Male shaft	
L	Left shaft
R	Right shaft

Limit sensor	
—	No sensor
A1	1 pc
A2	2 pcs
A3	3 pcs

Accessory	
E	End cap mounting
M <input type="checkbox"/>	Mid section mounting
	— 1 set (2 pcs)
	2 2 set (4 pcs)
	n n set (n*2 pcs)
A <input type="checkbox"/>	Limit switch adapters
	— 1 pc
	2 2 pcs
	n n pcs

* Only for METB.

Sensor	
E5	No sensor
In side	
A <input type="checkbox"/>	Motor side
	1 1 pc
	2 2 pcs
B <input type="checkbox"/>	Opposite motor side
	1 1 pc
	2 2 pcs
Out side	
C <input type="checkbox"/>	Motor side
	3 1 pc
	4 2 pcs
D <input type="checkbox"/>	Opposite motor side
	3 1 pc
	4 2 pcs

Sensor type	
D	2 wire
N	NPN
P	PNP

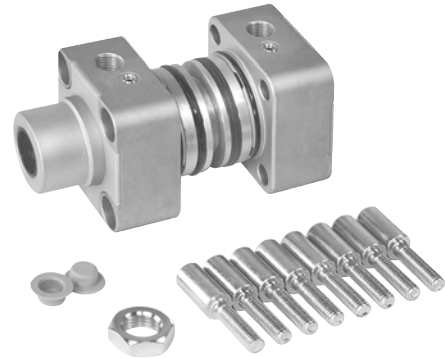
I/O cable length	
01	1.5 m
03	3 m

Special order no.	
I/O card	
—	Standard
1	With I/O card

* Only for MEAT

Cylinders kits

- We can supply your company with full cylinder assembly kits which meet NFPA, ISO-VDMA and JIS internationally recognizable standards.
- Assembly kits include all necessary components to enable rapid assembly and despatch in order that you can meet your customers delivery schedules.
- Piston rod, tie rod and tubes are also available.



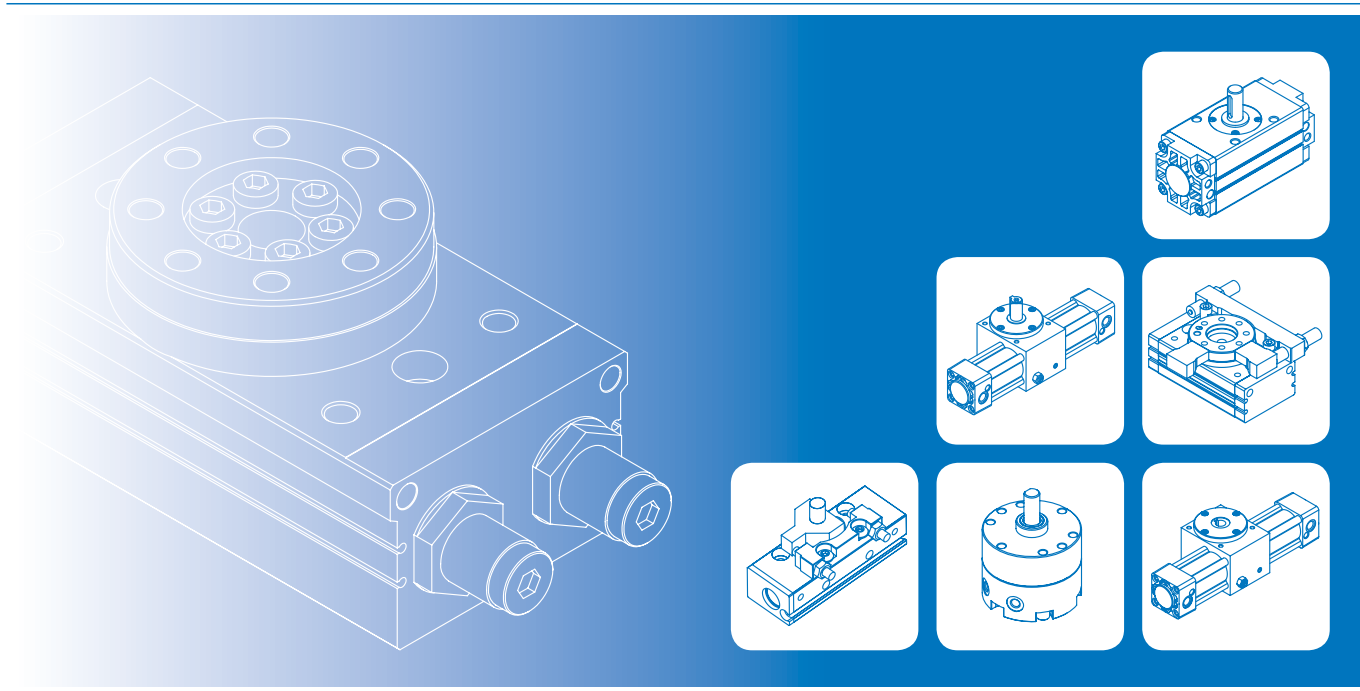
Model	Tube I.D. (mm)	Type	Description
CP - MCQA - <input type="checkbox"/>	ø6~ø200	Component parts	Air cylinder
PS - MCQA - <input type="checkbox"/>		Repair kits	
MDO SK <input type="checkbox"/>	ø20~ø150	Repair kits	Rotary actuator / Hydraulic cylinder

Model	Component parts	Repair kits
(Vol.2) Standard cylinder		
MCQA	●	●
MCQN	●	●
(Vol.2) ISO-VDMA Standard profile cylinder		
MCQV	●	●
MCQV2	●	●
MCQV3	●	●
MCQI2	●	●
MCQI3	●	●
MCKQI2	●	●
(Vol.2) Compact cylinder		
MCJA	●	●
MCJQ	●	●
MCJQ2	●	●
MCKJQ	●	●
MCJI	●	●
MCJU		●
MCJI	●	●
MCFB	●	●
(Vol.2) Miniature cylinder		
MCMA	●	●
MCMB	●	●
MCKMB	●	
MCMBRA	●	●
MCMBRB	●	●
(Vol.2) ISO-6432 / Non-pivot type mini. cylinder		
MCKMI	●	●
MCMIS	●	
MCKMI	●	
(Vol.2) Pen cylinder		
MCMJ	●	
MCMJP		●

Model	Component parts	Repair kits
(Vol.2) Round cylinder		
MCCG	●	●
MCCN	●	●
(Vol.2) High speed cylinder		
MCCH	●	●
(Vol.2) Guide cylinder		
MCGA		●
MCGS		●
MCGI	●	●
MCGJ		●
MGTB / K / U / X	●	●
MCGD		●
MCG3		●
MCDA		●
MCDJ		●
Rotary actuator		
MCRA		●
MCRQ		●
MRTF / H		●
Clamp cylinder		
MCKB		●
Gripper		
MCHB		●
MCHC		●
MCHD		●
MCHH		●
MCHU		●
MCHS		●
MCHX		●
MCHG2		●
MCHJ		●
MCHA		●

Model	Component parts	Repair kits
Gripper		
MCHY		●
Hydraulic cylinder		
MDHB / D / N		●
MDMB / D / N		●
MHCB / Q		●
MHCB-M		●
MDOA / C / D / N		●
MRPH		●

ROTARY ACTUATOR




	Moment of inertia	1-2
MCRA	ø63	1-4
MCRJ-S	ø6, ø8	1-8
MCRC	30 New	1-11
F MCRQ	ø12~ø40	1-14
MCRQ-S	ø16~ø25	1-21
MRT*	ø40~ø80 MRTH / MRTF	1-25

F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set. For more information, please go to our [MINDMAN website \(www.mindman.com.tw\)](http://www.mindman.com.tw) and click on the "Component Set Inventory" button.

- The load will create inertial forces (kinetic energy) when moving the load with Rotary Actuator. In order to stop the moving load, it is necessary to use stopper or Shock Absorbers to absorb the kinetic energy of load.
- The moving load with actuator can be distinguished as following
 1. Linear motion (air cylinder), Fig.(1)
 2. Rotation motion (rotary actuator), Fig.(2)
- Calculate the kinetic energy by using the formula in FIG.

Linear motion

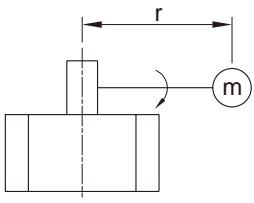


E : Kinetic energy
 m : Load mass
 V : Speed

$$E = \frac{1}{2} \cdot m \cdot V^2 \dots (1)$$

Fig. (1) Linear motion

Rotation motion



E : Kinetic energy
 I : Moment of inertia(= $m \cdot r^2$)
 ω : Speed
 m : Mass
 r : Radius of rotation

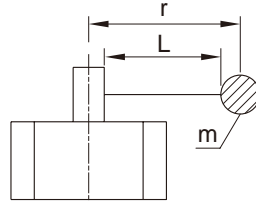
$$E = \frac{1}{2} \cdot I \cdot \omega^2 = \frac{1}{2} \cdot m \cdot r^2 \cdot \omega^2 \dots (2)$$

Fig. (2) Rotation motion

- For linear motion, if the velocity V of formula (1) is constant, the kinetic energy E and mass m is proportional; The rotation motion, formula (2) shows even the angular velocity ω and mass m is constant, kinetic energy E will also proportional with r^2 . Therefore, even the mass is small but the rotation radius r is large, when the moment of Inertia $I = m \cdot r^2$ is large, kinetic energy E will become larger, it will cause bearing damage or other accidents.
- Therefore when there is a rotation motion, the product selection should be based on moment of inertia instead of mass.

Moment of inertia

- Moment of inertia shows, it is not easy to rotate the stationary object; the same which means it is difficult to stop the rotating object.
- Rotary Actuators in the allowable kinetic energy has its limitations, it can be calculated moment of inertia to calculate minimum rotation of moment of inertia described as following.

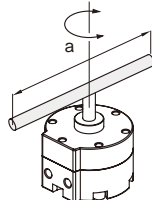


$I = m \cdot r^2$
 m : Mass
 r : Radius of rotation

Above figure represents the moment of inertia for the distance r from rotary shaft to mass m of the object. The formula for moment of Inertia is not the same if the shapes of the object are different. The following examples are calculated on the basis of specific moment of inertia.

1. Thin shaft

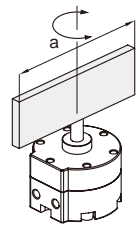
Position of rotational axis: Perpendicular to the shaft through the shaft through the center of gravity.



$I = m \cdot \frac{a^2}{12}$

2. Thin rectangular plate

Position of rotational axis: Parallel to side b and through the center of gravity.



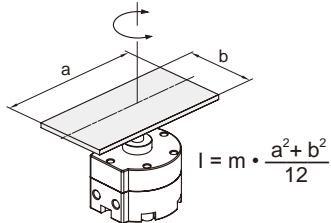
$I = m \cdot \frac{a^2}{12}$

Moment of inertia

ROTARY ACTUATOR

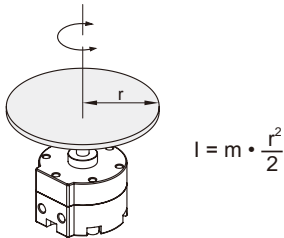
3. Thin rectangular plate (Including rectangular parallelepiped)

Position of rotational axis: Perpendicular to the plate through the center of gravity.



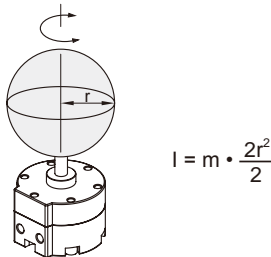
4. Round plate (Including column)

Position of rotational axis: Through the center axis.



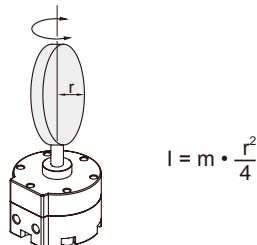
5. Solid sphere

Position of rotational axis: Through the center of diameter.

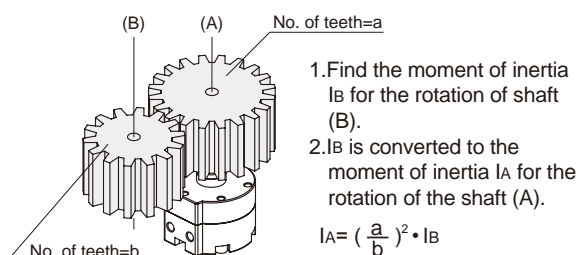


6. Thin round plate

Position of rotational axis: Through the center of diameter.



7. Gear transmission



Use the following formula to calculate the rotation time

$$t \geq \sqrt{\frac{2 \cdot I \cdot \theta^2}{E}}$$

t : Rotation time (s)
 E : Kinetic energy (J)
 I : Moment of inertia ($\text{kg} \cdot \text{m}^2$)
 θ : Rotation angle (rad)

The meaning of this formula is the critical rotation time for not cause damage of the cylinder. Therefore the rotation time must be set on or over the t seconds calculated in above formula.

After calculated the moment of inertia by load shape, use the following formula to calculate the kinetic energy of the load.

$$E = 1/2 \cdot I \cdot \omega^2$$

E : Kinetic energy (J)
 I : Moment of inertia ($\text{kg} \cdot \text{m}^2$)
 ω : Angle speed (rad/s)

Angle speed

$$\omega = 2\theta / t \dots (1)$$

$$\omega = \theta / t \dots (2)$$

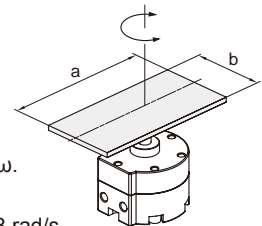
t : Rotation time (s)
 I : Moment of inertia ($\text{kg} \cdot \text{m}^2$)
 θ : Rotation angle (rad)

However, when the rotation time for 90° becomes longer than 2 seconds, use formula (2).

Calculation example

Load form: Cuboid
 Rotation angle θ : 180°
 Rotation time t : $1 \text{ s}/180^\circ$
 Length of a part: 0.12 m
 Length of b part: 0.06 m
 Mass (m) : 0.1 kg

$$I = m \cdot \frac{a^2 + b^2}{12}$$



(Step 1) Find the angle speed ω .

$$\omega = \frac{2\theta}{t} = \frac{2}{1} \times \pi = 6.28 \text{ rad/s}$$

(Step 2) Find the moment of inertia I .

$$I = m \cdot \frac{a^2 + b^2}{12}$$

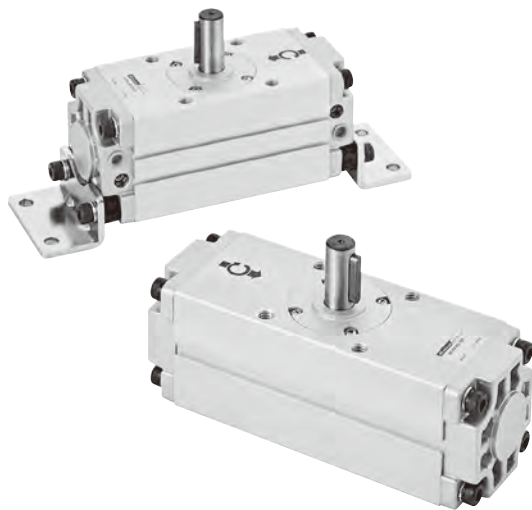
$$= 0.1 \times \frac{144 \times 10^{-4} + 36 \times 10^{-4}}{12}$$

$$= 1.5 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

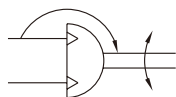
(Step 3) Find the kinetic energy E .

$$E = \frac{1}{2} \cdot I \cdot \omega^2 = \frac{1}{2} \times 1.5 \times 10^{-4} \times 6.28^2$$

$$= 0.002958 \text{ J}$$



Symbol



Features

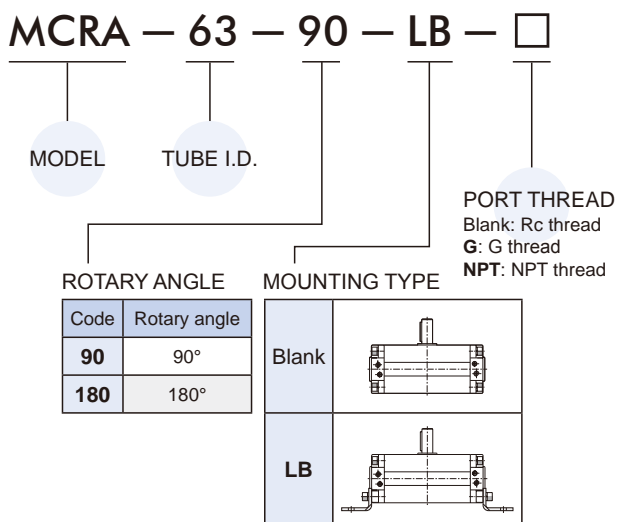
- Compact body.
- Functional design with clean appearance.
- Simple mounting of sensors.
- Magnetic as standard.

Specification

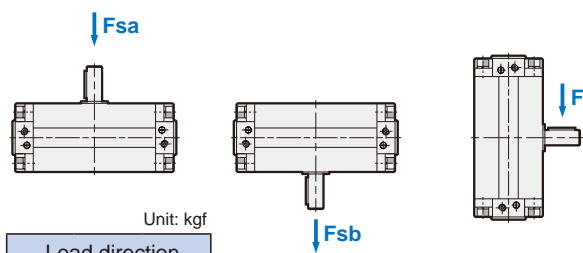
Model	MCRA		
Acting type	Double acting		
Tube I.D. (mm)	ø63		
Port size	Rc1/8		
Medium	Air		
Operating pressure range	0.1~1 MPa		
Proof pressure	1.5 MPa		
Ambient temperature	-5~+60°C (No freezing)		
Acting angle tolerance	0~+4°		
Lubrication	Not required		
Cushion	Air cushion		
Allowable kinetic energy	1.5J (Air cushion)		
Sensor switch (*)	RCB, RCE, RCE1, RDEP		
Weight (kg)	90°	180°	LB
	2.7	3.1	0.4

* RCB, RCE, RCE1, RDEP specification, please refer to page 5-4, 6, 7, 10.

Order example



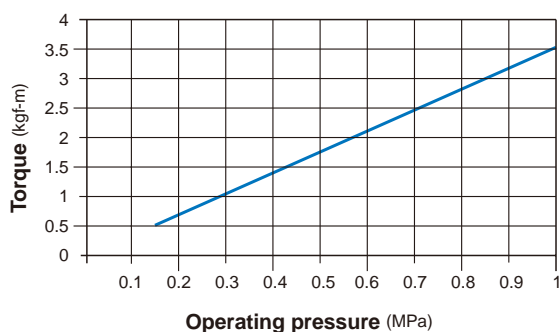
Shaft loading

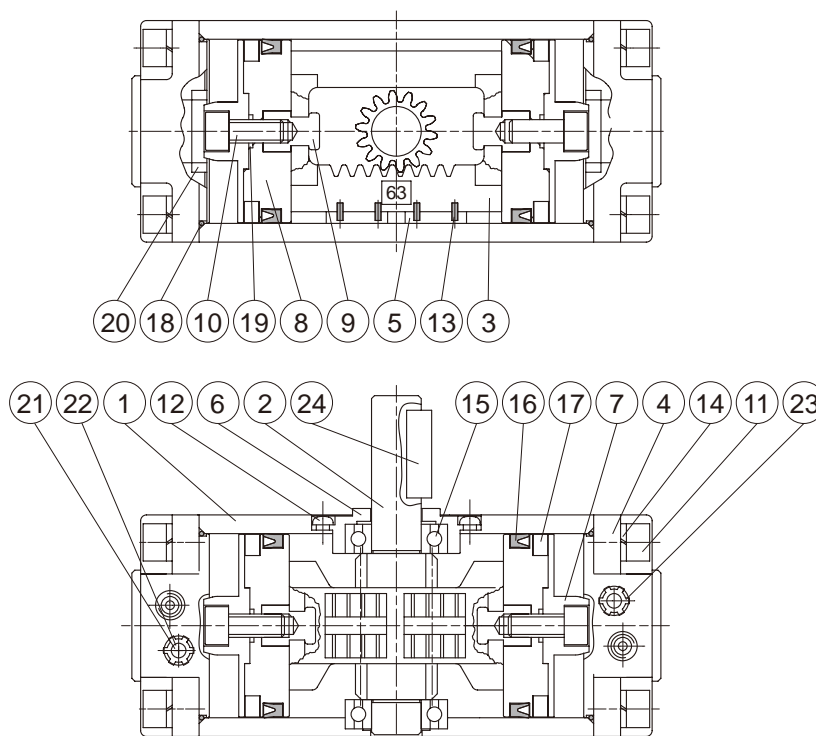


Unit: kgf

Load direction		
Fsa	Fsb	Fr
60	20	30

Torque diagram





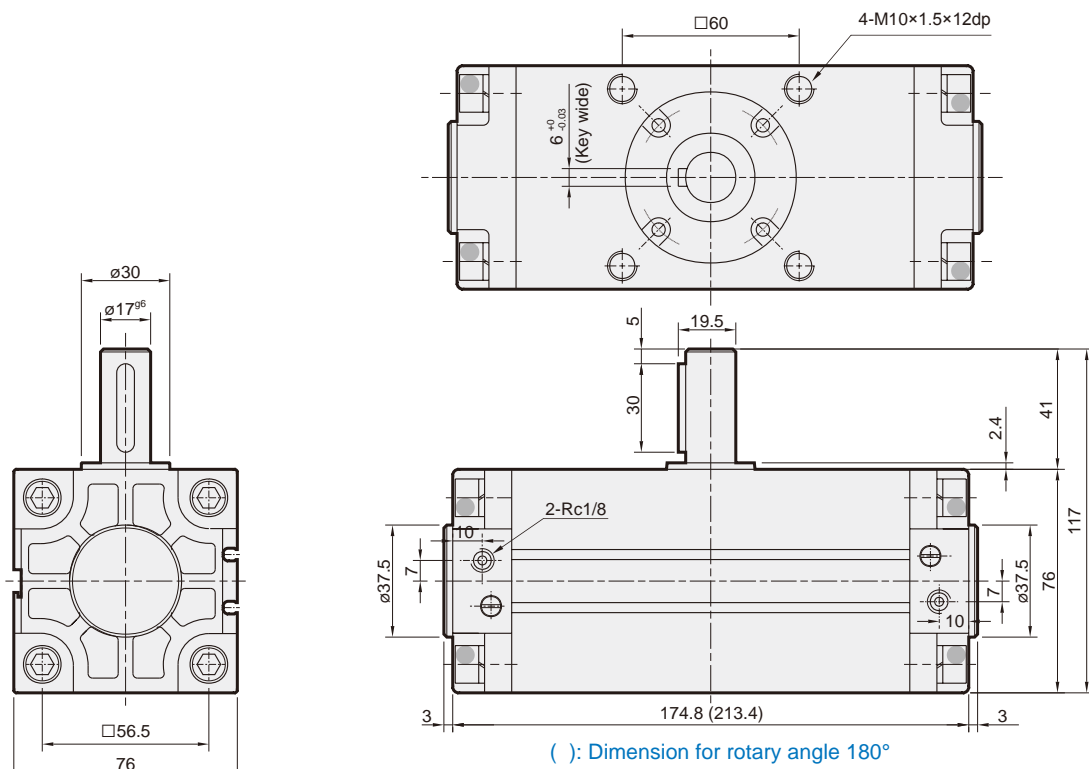
Material

No.	Part name	Material	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy	1	
2	Shaft	Carbon steel	1	
3	Rack	Carbon steel	1	
4	Cover	Aluminum alloy	2	
5	Slider	Plastic	2	
6	Bearing retainer	Aluminum alloy	1	
7	Piston #1	Aluminum alloy	2	
8	Piston #2	Aluminum alloy	2	
9	Screw #1	Carbon steel	2	
10	Screw #2	SCM	2	
11	Bolt	SCM	8	
12	Screw	SCM	4	
13	Spring pin	Spring steel	4	
14	Spring washer	SCM	8	
15	Bearing	Bearing steel	2	
16	Piston packing	NBR	2	●

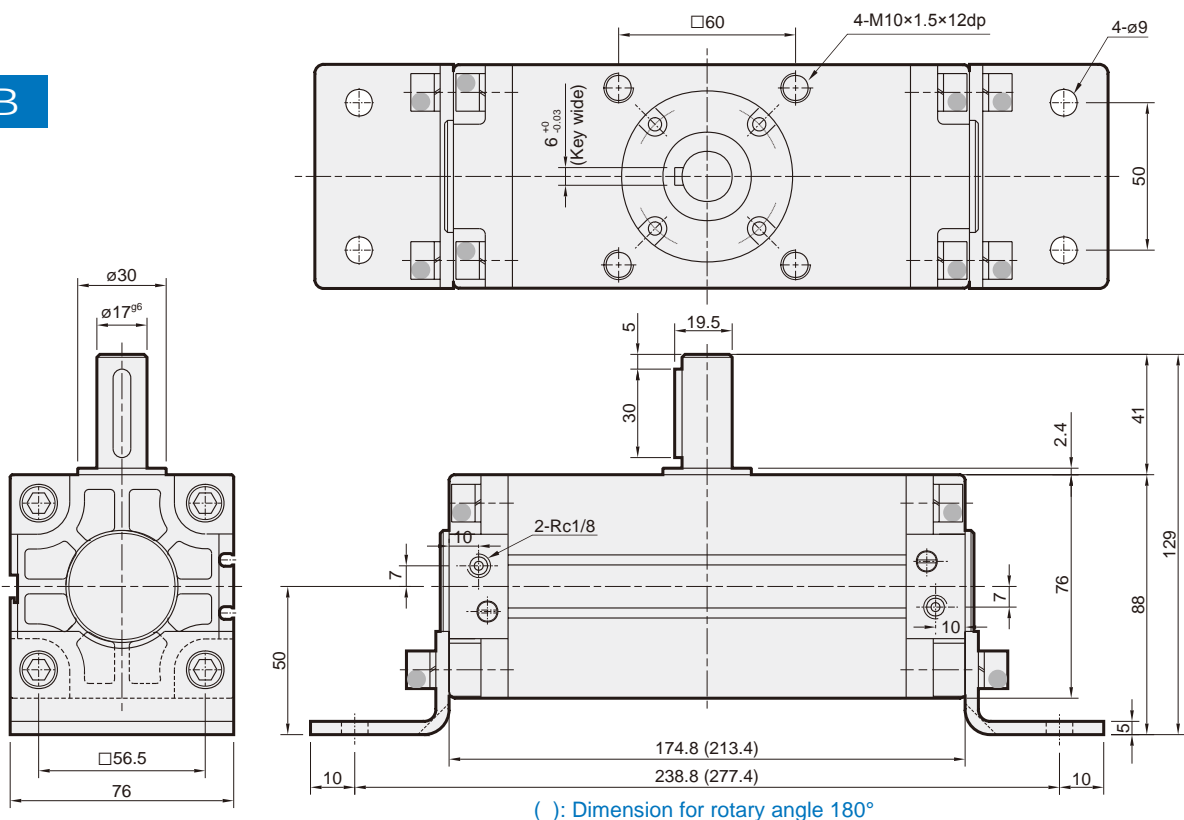
No.	Part name	Material	Q'y	Repair kits (inclusion)
17	Magnet ring	Magnet material	2	
18	Gasket	NBR	2	●
19	O-ring	NBR	2	●
20	Cushion packing	NBR	2	
21	Needle valve	Copper	2	
22	Needle valve gasket	NBR	2	●
23	Needle valve washer	Aluminum alloy	2	
24	Parallel key	Carbor steel	1	

Order example of repair kits

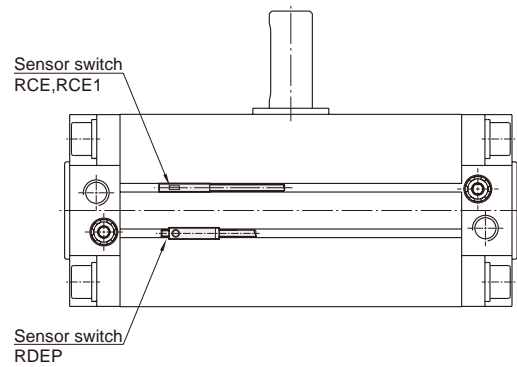
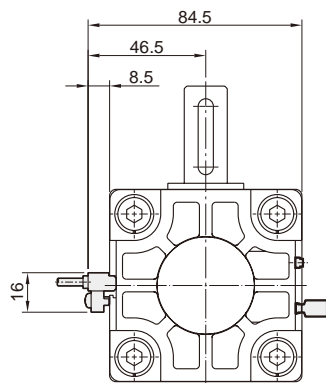
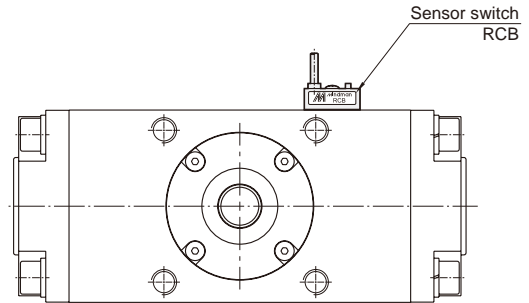
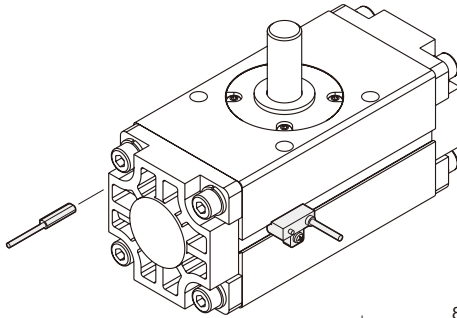
Tube I.D.	Repair kits
ø63	PS-MCRA-63

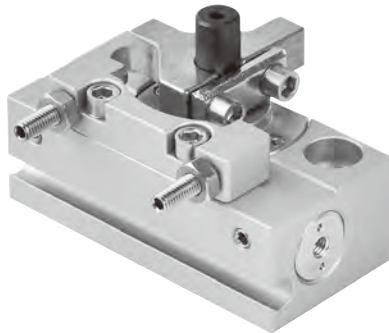


LB

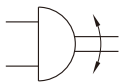


Installation of sensor switch



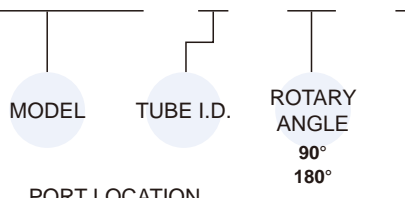


Symbol

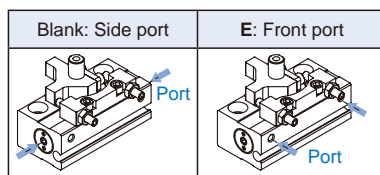


Order example

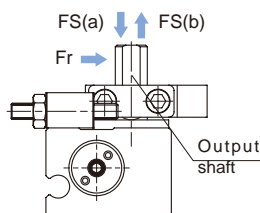
MCRJ – S – 6 – 90 – E



PORT LOCATION



Allowable load



Tube I.D. (mm)	Allowable load (N)			Output shaft size (mm)
	Fr	FS (a)	FS (b)	
6	25	20	20	ø5
8	30	25	25	ø6

Features

- Rack and pinion type with external stoppers.
- Rotary angle 90°, 180°.
- Compact and lightweight, mounting from 3 directions.
- Standard with magnet.

Specification

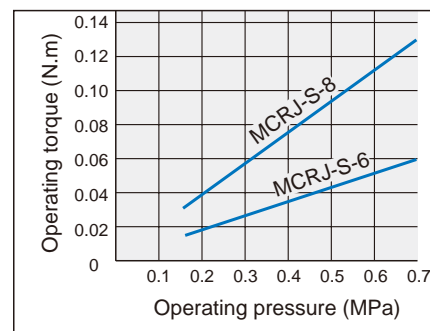
Model	MCRJ-S		
Tube I.D. (mm)	6	8	
Port size	M3 × 0.5		
Rotation	90°, 180°		
Medium	Air (Non-lube)		
Operating pressure range	0.15~0.7 MPa		
Ambient temperature	0~+60°C (No freezing)		
Angle adjustment range	Each rotation end ±5°		
Sensor switch (*)	2 wire	RDVE(V): Non-contact	
	3 wire	RNFE(V): NPN, RPFE(V): PNP	
Weight (g)	90°	47.2	70.9
	180°	53.4	81.6

* R*FE(V) specification, please refer to page 5-11.

Operating torque

Tube I.D. (mm)	Operating pressure (MPa)						
	0.15	0.2	0.3	0.4	0.5	0.6	0.7
6	0.013	0.017	0.026	0.034	0.042	0.05	0.059
8	0.029	0.038	0.057	0.076	0.095	0.11	0.13

Note. Effective torque values are representative values. They are not guaranteed values. Use them only as a guide.

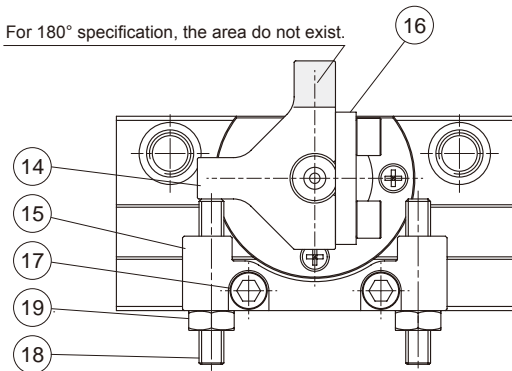
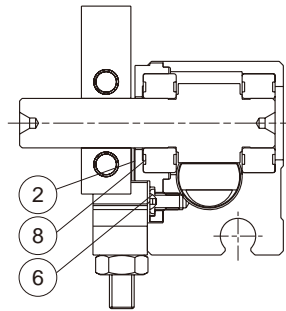
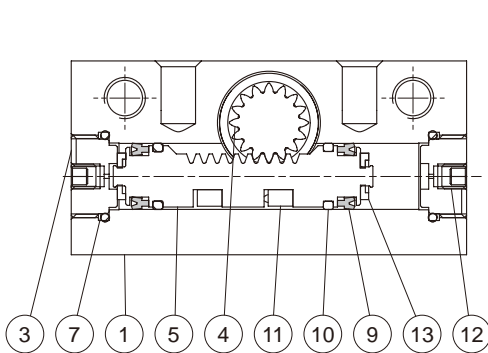


Allowable kinetic energy / Rotation time adjustment range

Tube I.D. (mm)	Allowable kinetic energy (J)	Rotation time adjustment range for stable operation (s/90°)
6	0.001	0.1~0.5
8	0.002	

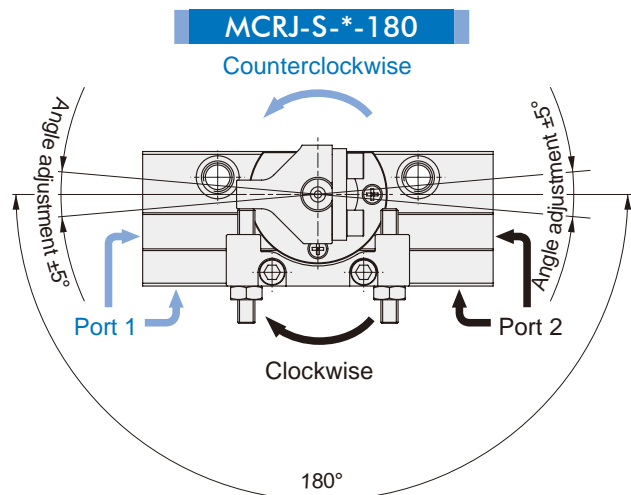
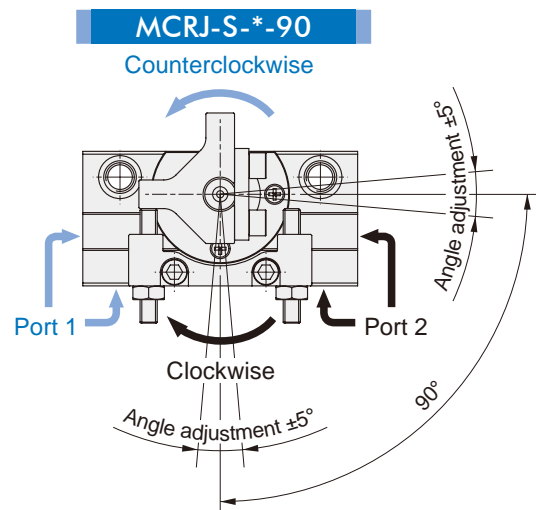
MCRJ-S Inside structure & Parts list

MINI-ROTARY ACTUATOR



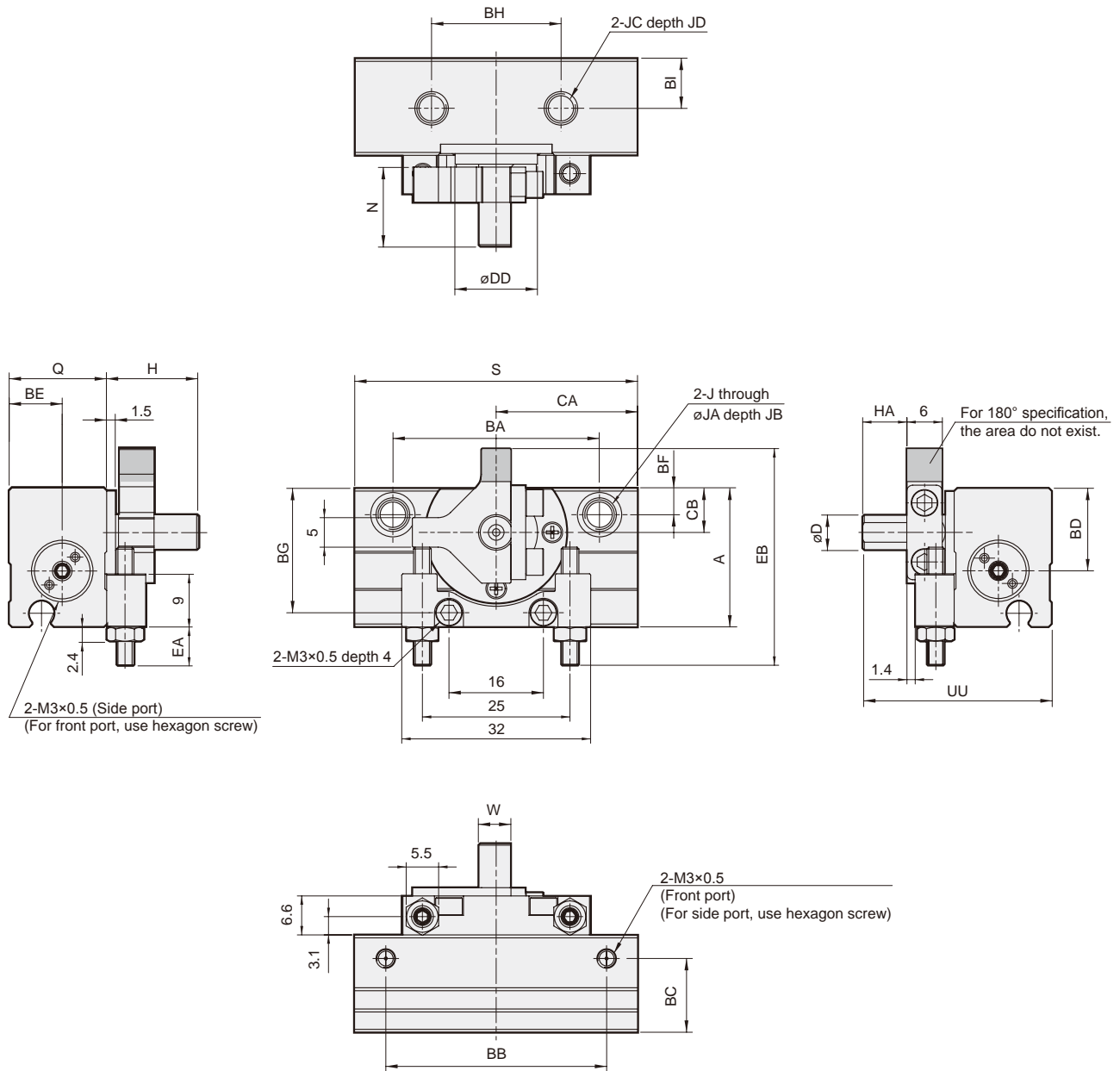
Rotating direction and angle

- The shaft rotates counterclockwise when the input air is from port 1. The shaft rotates clockwise when the input air is from port 2.
- The rotation range can be adjusted by adjustment screws.



Material

No.	Tube I.D. Part name	6	8	Qty
1	Body	Aluminum alloy		1
2	Bearing holder	Aluminum alloy		1
3	Cover	Aluminum alloy		2
4	Pinion	Stainless steel		1
5	Piston	Stainless steel		1
6	Screw	Stainless steel		3
7	O ring	NBR		2
8	Ball bearing	Bearing steel		2
9	Piston seal	NBR		2
10	Wearing ring	POM	Teflon	2
11	Magnet	Magnet material		2
12	Screw	Steel		2
13	Gasket	NBR		2
14	Stopper	Alloy steel		1
15	Holder	Aluminum alloy		1
16	Stopper retainer	Low carbon steel		1
17	Hexagon screw	Stainless steel		4
18	Hexagon screw	Stainless steel		2
19	Hexagon nut	Low carbon steel		2



Code Tubr I.D.	A	BA	BB	BC	BD	BE	BF	BG	BH	BI	CA	CB	D	DD	EA	EB	HA	J	JA	JB	JC	JD	H	N	Q	S	UU	W
6	19.5	30	32.4 (43.4)	9.5	11	6.5	3.5	17.1	20	7	21.5(27)	5.5	5g6	10h9	4.5	32.7	6.5	M4 \times 0.7	5.8	3.5	M4 \times 0.7	5	14.5	12.5	13.5	43(54)	28	4.5
8	23.5	35	37.4 (50.4)	12.5	14	9	4.5	21.1	22	8.5	24(30.5)	7.5	6g6	14h9	6.5	36.7	7.5	M5 \times 0.8	7.5	4.5	M5 \times 0.8	6	15.5	13.5	16.5	48(61)	32	5.5

* () for 180° specification.



Features

- Compact and lightweight, mounting from 3 directions.
- Rotary angle 90°, 180°, 270°.
- Both rods have locating plane.
- Spin the rod with built-in vane mechanism.

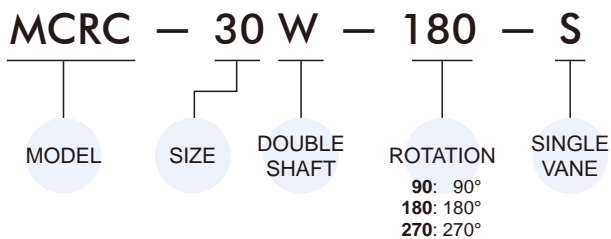
Specification

Model	MCRC		
Acting type	Double acting		
Size	30		
Port size	M5×0.8		
Rotation	90°	180°	270°
Acting angle tolerance	0~+4°		
Medium	Air (Non-lube)		
Max. operating pressure	1 MPa		
Min. operating pressure	0.15 MPa		
Proof pressure	1.5 MPa		
Ambient temperature	+5~+60°C		
Allowable kinetic energy (J)	0.02		
Load (N)	Radial	30	
	Axial	25	
Rotation time adjustment range (s/90°)	0.04~0.3 (*)		
Weight (g)	200	195	190

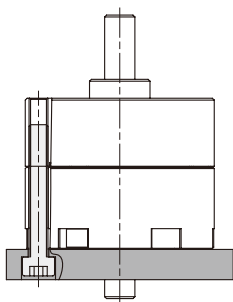
* When the operation speed is lower than the lower speed limit, the rod may jitter or stop.

Please use the product in the range as table shown.

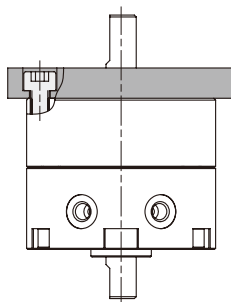
Order example



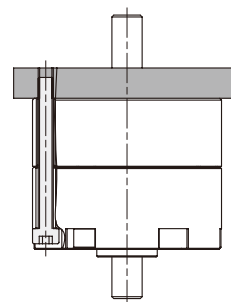
Mounting methods



Body tapped

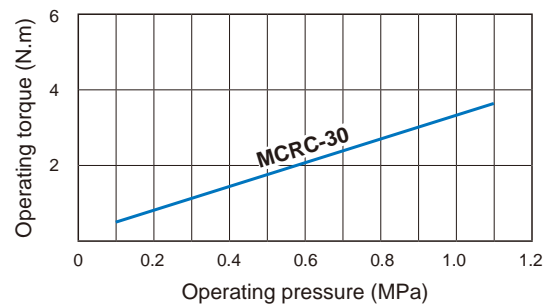


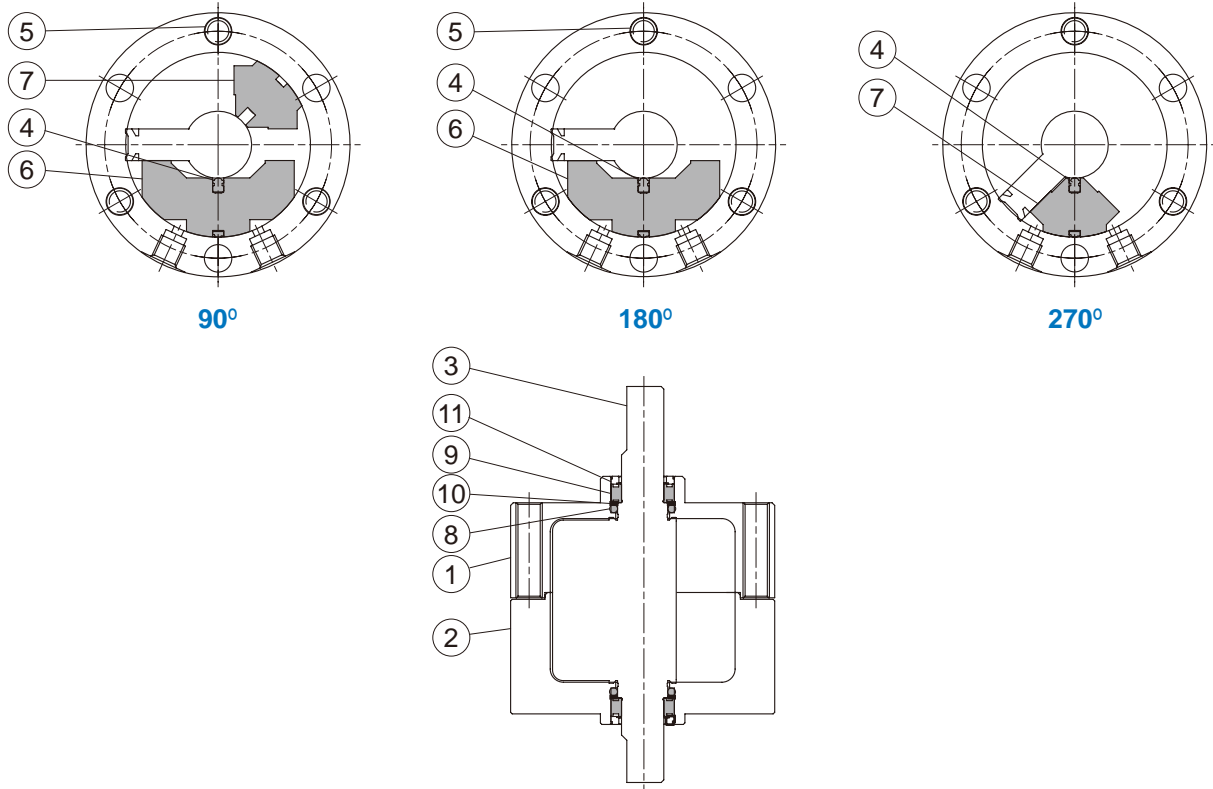
Body tapped



Body through-hole
(Fixed with the customer's plate)

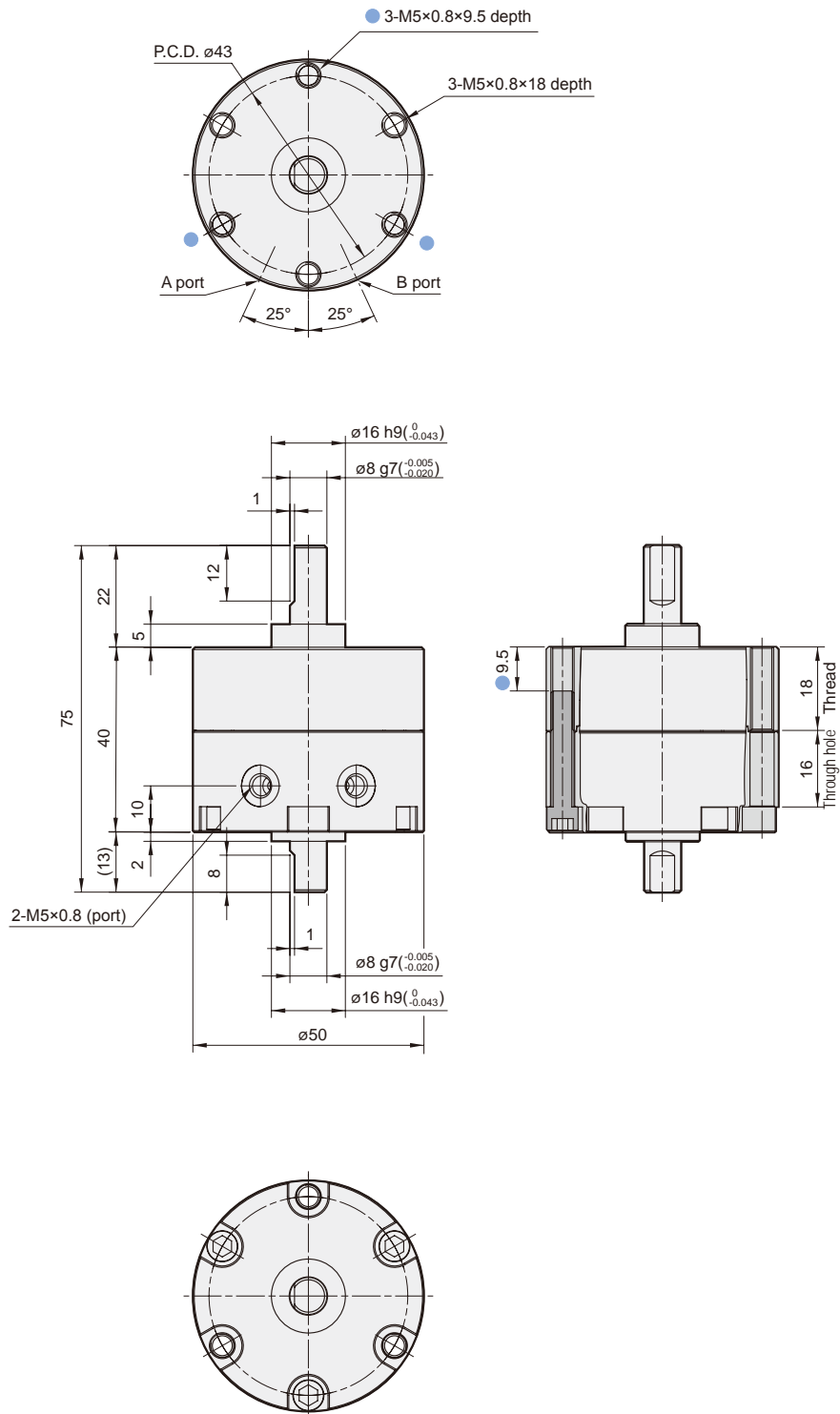
Torque diagram

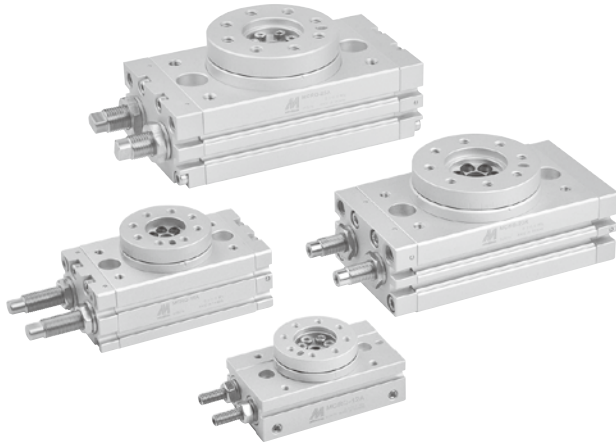




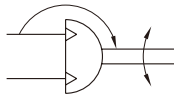
Material

No.	Part name	Material	Q'y		
			90°	180°	270°
1	Upper body	Aluminum	1		
2	Lower body	Aluminum	1		
3	Shaft	Carbon	1		
4	Packing	NBR	1		
5	Bolt	Stainless steel	3		
6	Adjusting block	Plastic	1	1	0
7	Adjusting block	Plastic	1	0	1
8	O-ring	NBR	2		
9	Ball bearing	Bearing steel	2		
10	Gasket	Stainless steel	2		
11	Retaining ring	Stainless steel	2		





Symbol



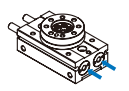
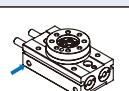
Order example

MCRQ - 20R - [] - []

MODEL TUBE I.D.

ANGLE ADJUSTER
A: With adjusting bolt
R: With shock absorber
 * $\phi 12$ without shock absorber.

PORT LOCATION (*)

Blank: End port

E: Front port


PORT THREAD

Blank: M5×0.8 (for $\phi 12, \phi 16$)
 Blank: Rc thread
G: G thread
NPT: NPT thread (for $\phi 20 \sim \phi 40$)

* $\phi 12$ only option.
 * Port location cannot be changed after delivery.

Features

- Centering boss and locating hole for accurate positioning.
- Operating range of table is 0°~190° by angle adjusting screw.
- Compact design using double rack and single pinion.
- Hollow shaft standard for wiring and piping.
- Possible to fit shock absorbers as stops.
- Ease of mounting with integral table.
- Magnetic as standard.

Specification

Model	MCRQ						
Acting type	Double acting						
Tube I.D. (mm)	12	16	20	25	32	40	
Port size	M5×0.8		Rc1/8				
Medium	Air						
Max. operating pressure	adjusting bolt	0.7MPa	1 MPa				
	shock absorber	—	0.6 MPa (*1)				
Min. operating pressure	0.1 MPa (*2)						
Ambient temperature	0~+60°C (No freezing)						
Cushion	adjusting bolt	Rubber bumper					
	shock absorber	—	Shock absorber				
Angle adjustment range	0° to 190°(max.) (*3)						
Sensor switch (*4)	2 wire	RDVE(V): Non-contact					
	3 wire	RNFE(V): NPN, RPFE(V): PNP					
Weight (kg)	adjusting bolt	0.25	0.60	1.24	2.10	4.18	7.67
	shock absorber	—	0.61	1.31	2.12	4.19	7.72
Minimum rotation that will not allow decrease of energy absorption ability	—	72°	58°	69°	77°	82°	

*1. The maximum operating pressure of the actuator is restricted by the maximum allowable thrust of the shock absorber.

*2. No-load conditions.

*3. Be careful if the rotation angle of a type with internal shock absorber is set below the value in the table below, the piston stroke will be smaller than the shock absorber's effective stroke, resulting in decreased energy absorption ability.

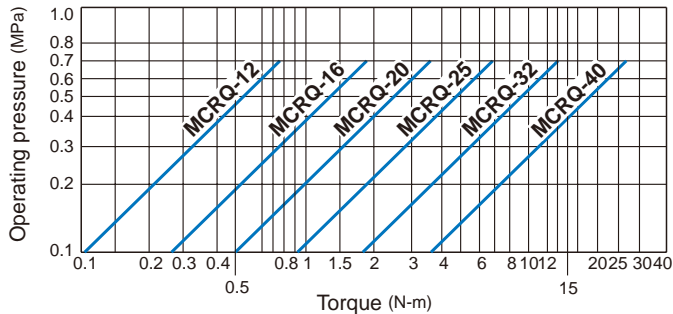
*4. R*FE(V) specification, please refer to page 5-11.

Allowable kinetic energy and rotation time adjustment range

Model	Allowable kinetic energy (J)		Rotation time adjustment range for stable operation(s/90°)	
	Adjustment bolt	Internal shock adsorber	Adjustment bolt	Internal shock adsorber
MCRQ-12	0.006	—	0.2 to 1.0	—
MCRQ-16	0.007	0.039		0.2 to 0.7
MCRQ-20	0.048	0.116		
MCRQ-25	0.081	0.294	0.2 to 2.0	0.2 to 1.0
MCRQ-32	0.32	1.6		
MCRQ-40	0.53	2.9		

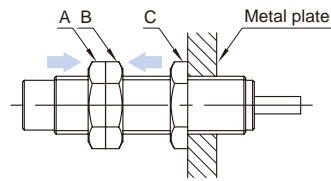
* Be careful if a type with internal absorber is used below the minimum speed, the energy absorption ability will decrease drastically.

Torque diagram



Installation guide of shock absorber

- ❶ Install 3 nuts on the shock absorber as the picture shown.
- ❷ Bind the A nut and B nut together via tightening them with different rotating direction.
- ❸ Hold B nut and rotate C nut to bind the plate and C nut together.
- ❹ Unbind the A nut and B nut. The installation is complete.



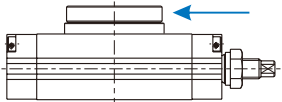
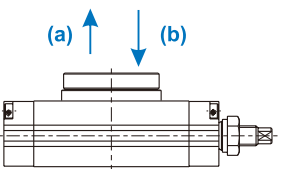
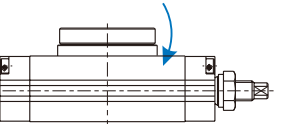
Theoretic force

Unit: N-m

Type		MCRQ					
Tube I.D.		12	16	20	25	32	40
Operating pressure (MPa)	0.1	0.1	0.26	0.5	0.91	1.88	3.78
	0.2	0.21	0.52	1	1.81	3.78	7.53
	0.3	0.31	0.78	1.5	2.72	5.66	11.31
	0.4	0.41	1.04	2.01	3.62	7.56	15.09
	0.5	0.52	1.31	2.51	4.55	9.44	18.87
	0.6	0.63	1.57	3	5.45	11.32	22.62
	0.7	0.73	1.83	3.5	6.36	13.23	26.4

Allowable load

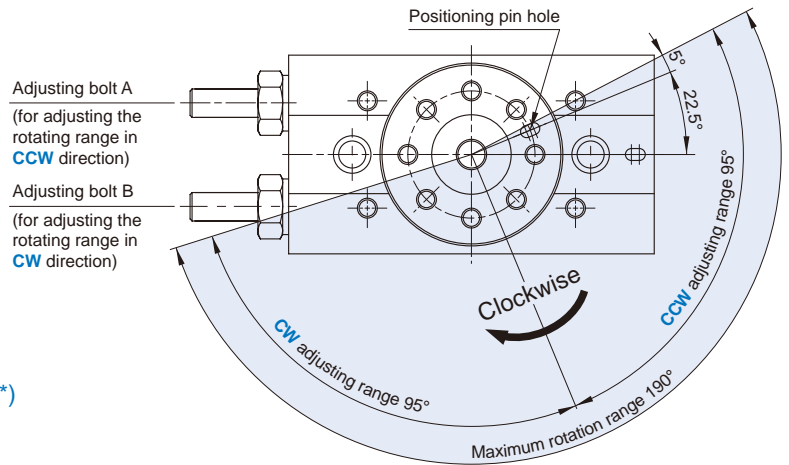
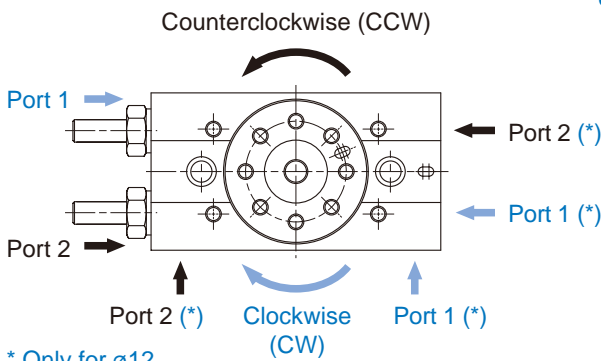
Set the load and moment to be applied to the table within the allowable values shown in the table below. (Values outside of limitations will cause excessive play, deteriorate accuracy, and shorten service life.)

Pictures						
	Tube I.D.	Allowable radial load (N)	Allowable thrust load (N)			Allowable moment (N.m)
			(a)	(b)		
	12	54	71	71	1.5	
	16	78	74	78	2.4	
	20	196	197	363	5.3	
	25	314	296	451	9.7	
	32	390	493	708	18	
	40	543	740	1009	25	

Rotating direction and angle

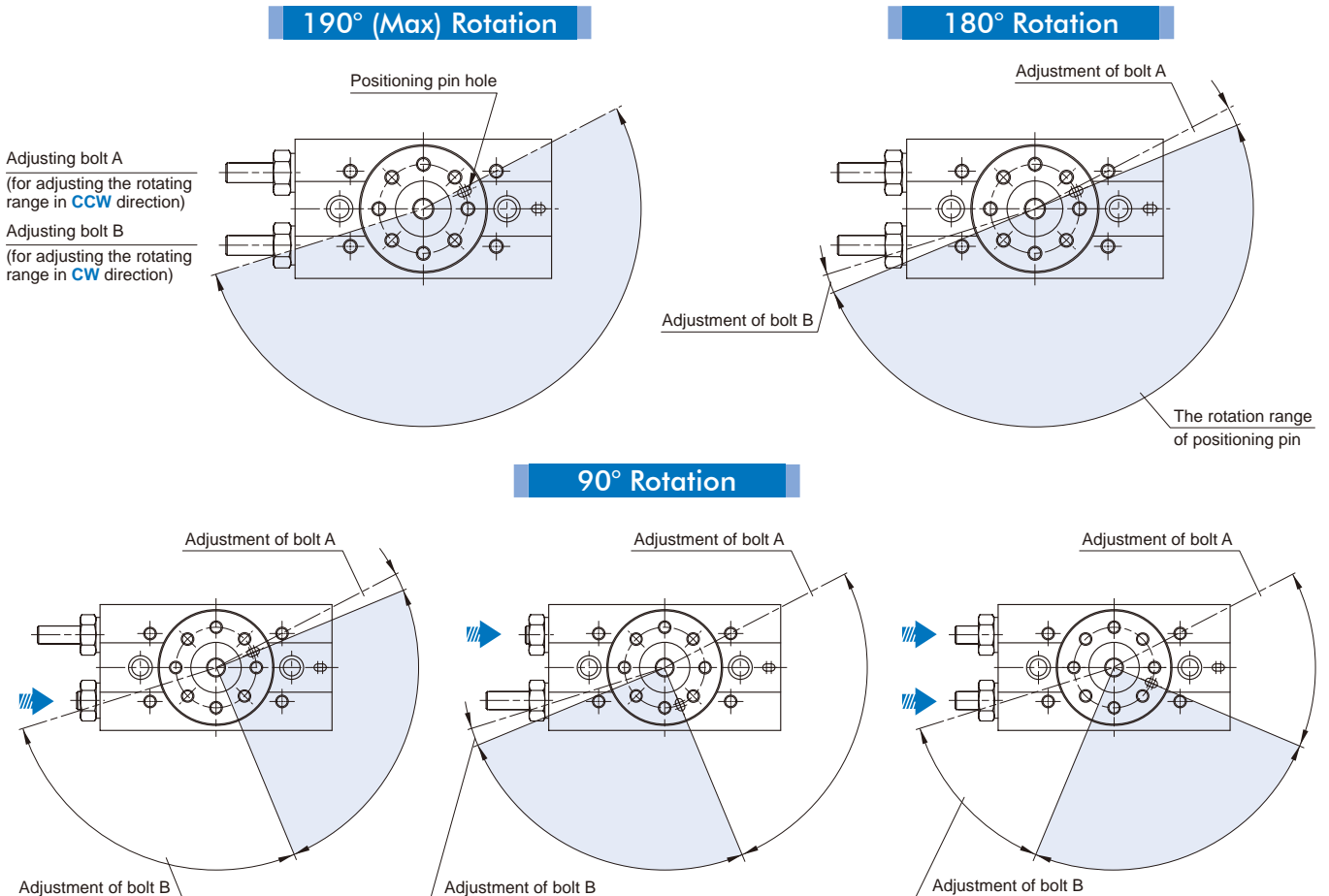
- When the port 1 is pressurized, the flange rotates in clockwise (CW) direction.
- When the port 2 is pressurized, the flange rotates in counter-clockwise (CCW) direction.

The rotating angle range can be adjust by the method shown as right figure.



Rotating range adjusting example

- The followed figures show the rotating range of different adjustment via bolt A and B. (The drawings also show the rotation ranges of the positioning pin hole.)

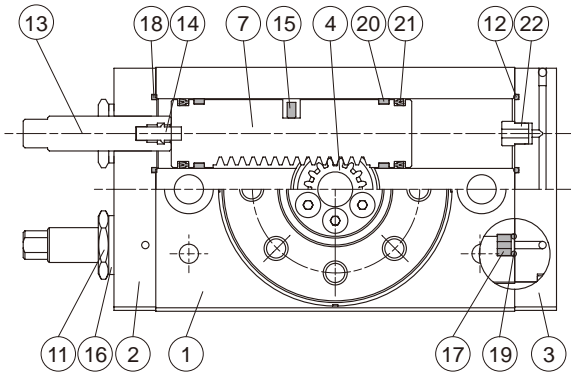


MCRQ Inside structure & Parts list

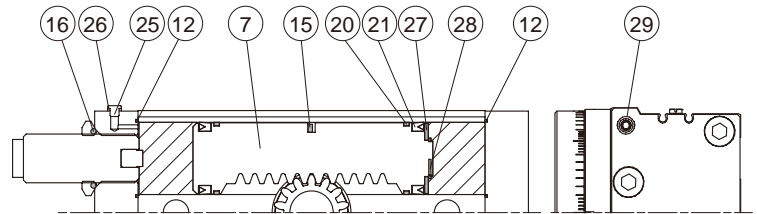
ROTARY ACTUATOR



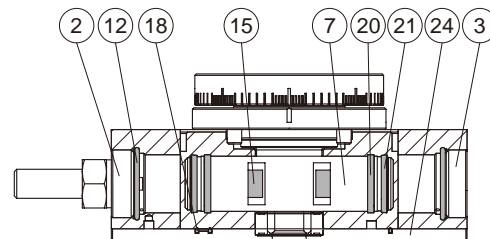
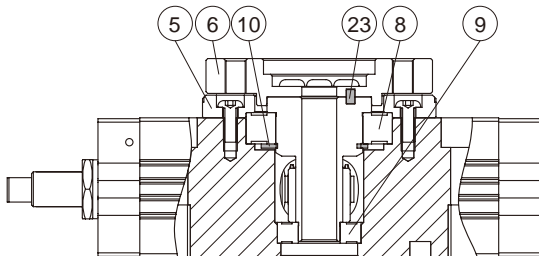
ø16~ø32



ø40



ø12



Material

No.	Part name	Material	Tube I.D. & Q'y			Repair kits (inclusion)
			12	16	20-32	
1	Body	Aluminum alloy	1			
2	Cover	Aluminum alloy	2		1	
3	End cover	Aluminum alloy	2		1	
4	Pinion	SCM	1			
5	Bearing retainer	Aluminum alloy	1			
6	Table	Aluminum alloy	1			
7	Piston	Stainless steel	2			
8	Rolling bearing	Bearing steel	1			
9	Rolling bearing	Bearing steel	1			
10	Snap ring	Spring steel		1	-	
11	Seal nut	Carbon steel	2			
12	O-ring	NBR	4	2	4	●
13	Adjusting bolt *1	Stainless steel *2	2			
	Shock absorber	-	-	2		
14	Cushion pad *1	NBR	2			
15	Magnet	Magnet material	4		2	
16	Seal washer	*3	2			●
17	Fixed	Copper	-	4	2	-
18	Piston packing	NBR	1	-	2	-
19	O-ring	NBR	-	4	2	-

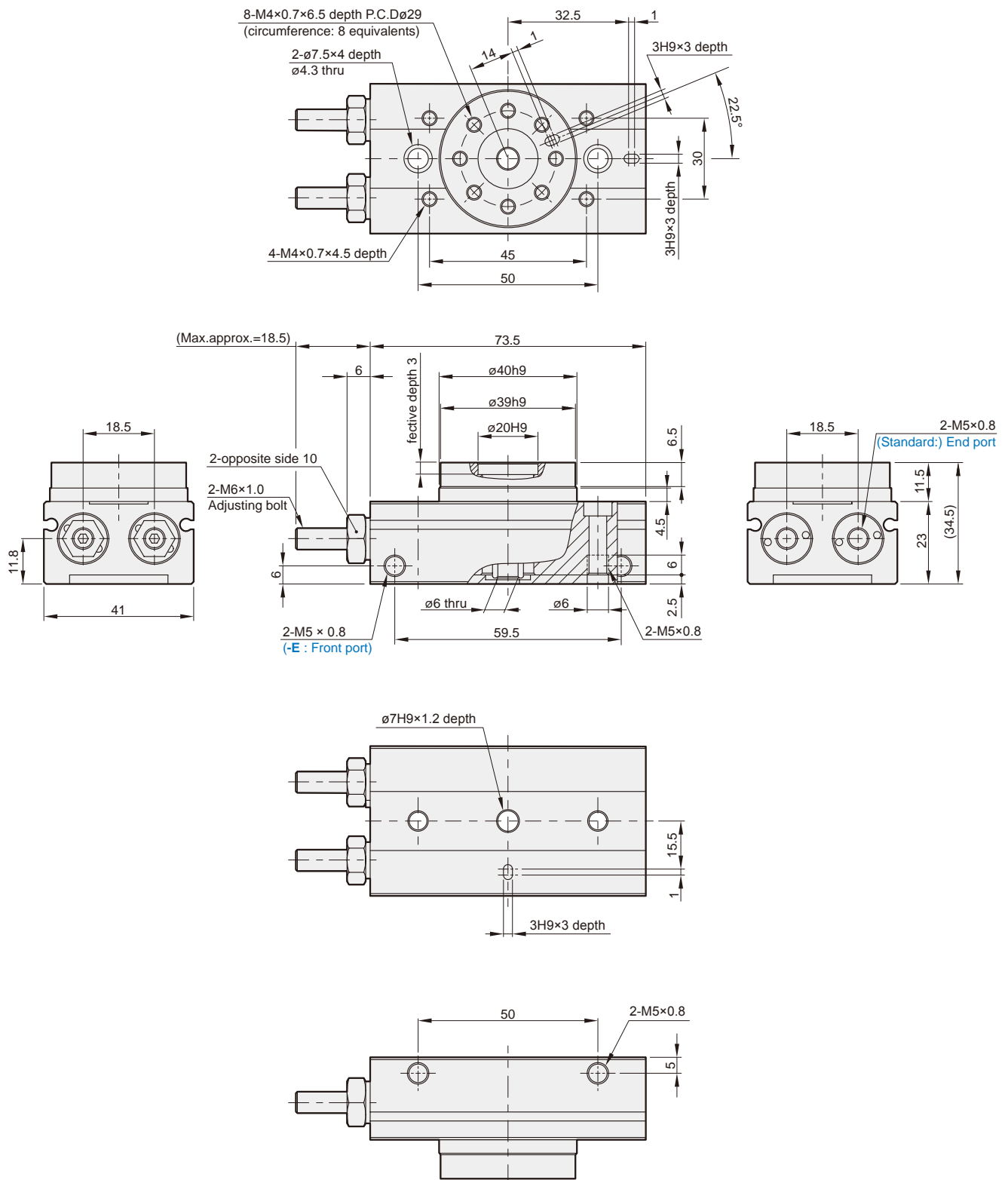
No.	Part name	Material	Tube I.D. & Q'y				Repair kits (inclusion)
			12	16	20-32	40	
20	Wear ring	Complex resin	4				
21	Piston Seal	NBR	4				●
22	Stop chunk	Aluminum alloy	-	2	-		
23	Pin *4	SCM	1				
24	Plate	Aluminum alloy	1	-			
25	Plug	Copper	-	-	1		
26	Plug washer	PET	-	-	1		
27	Piston retainer	Aluminum alloy	-	-	2		
28	Piston snap ring	Spring steel	-	-	2		
29	Plug	Carbon steel	-	-	2		

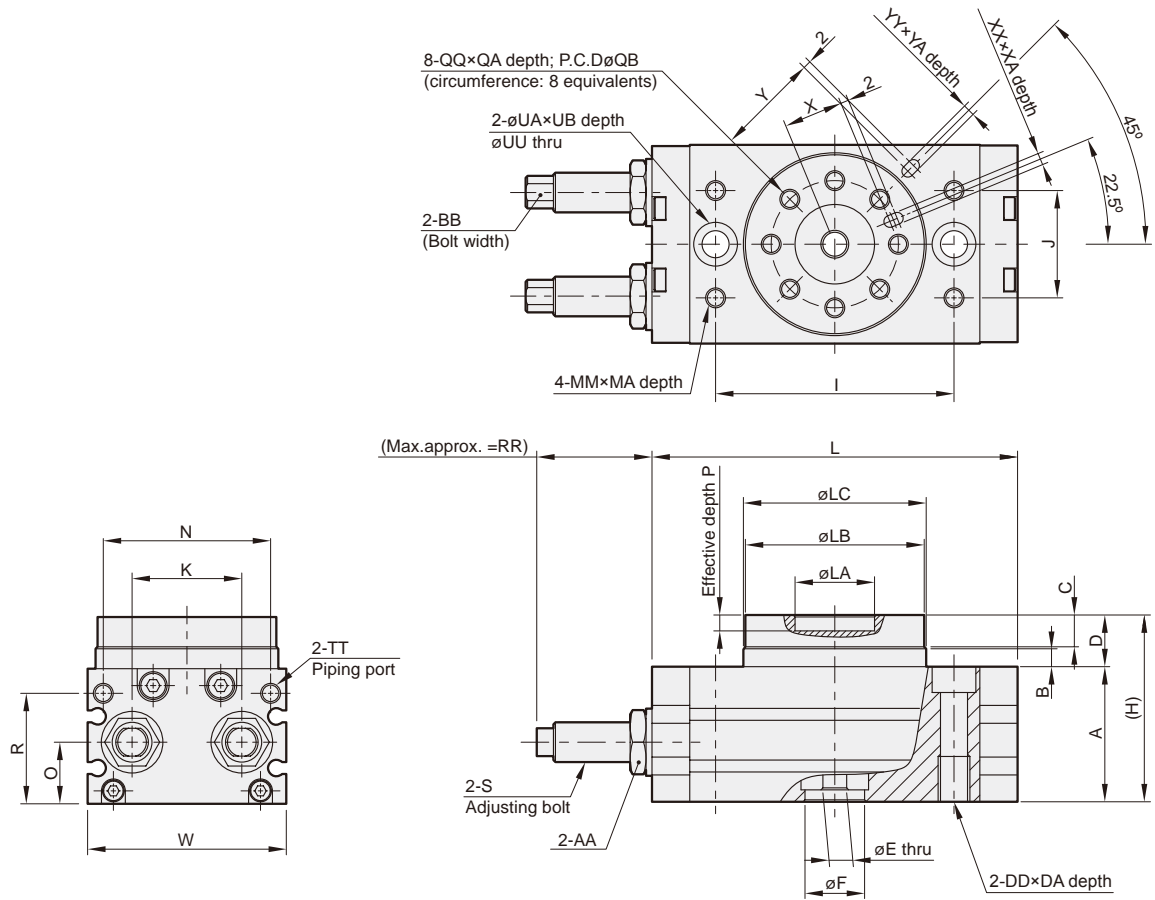
*4. ø20~ø40: Key

Order example of repair kits

Tube I.D.	Repair kits
ø12	PS-MCRQ-12
ø16	PS-MCRQ-16
ø20	PS-MCRQ-20
ø25	PS-MCRQ-25
ø32	PS-MCRQ-32
ø40	PS-MCRQ-40

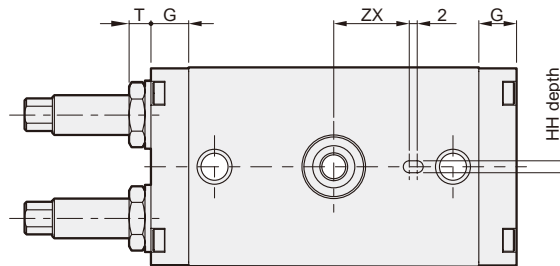
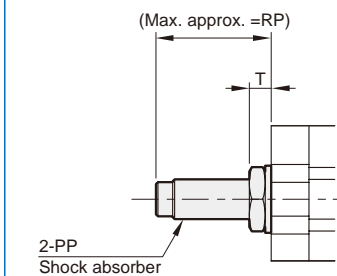
*1. Only for (A) with adjusting bolt. *2. ø40: Carbon steel
 *3. ø12~ø32: NBR+Carbon steel; ø40: NBR





MCRQ-16~25R

With shock absorber



Unit: mm

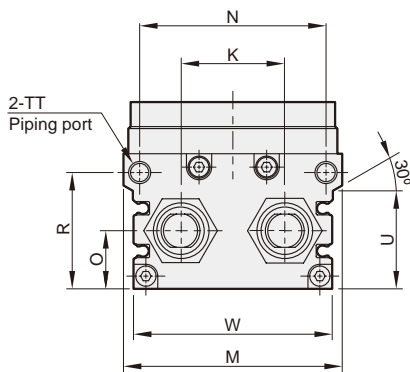
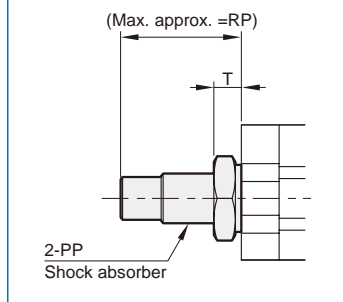
Code Tubr I.D.	A	AA	B	BB	C	D	DA	DD	E	F	G	H	HH	I	J	K	L	LA	LB	LC	MA	MM	N
16	34	14	4.5	7	8	13	12	M8×1.25	6	15H9	9.5	47	3H9×3.5	60	27	26	92	20H9	45h9	46h9	8	M5×0.8	37
20	40	17	6.5	7	10	17	15	M10×1.5	10	22H9	12	57	4H9×4.5	84	37	32	127	32H9	65h9	67h9	8	M6×1	54
25	46	22	7.5	8	12	20	18	M12×1.75	13	26H9	15.5	66	5H9×5.5	100	50	37	152	35H9	75h9	77h9	8	M8×1.25	63

Code Tubr I.D.	O	P	PP	QA	QB	QQ	R	RP	RR	S	T	TT	UA	UB	UU	W	X	XA	XX	Y	YA	YY	ZX
16	15.5	4	FK-1008L-S	8	32	M5×0.8	29	29	31	M10×1.0	5.5	M5×0.8	11	6.5	6.8	50	15	3.5	3H9	27	3.5	3H9	19
20	19.5	4.5	FK-1008L-S	10	48	M6×1.0	33	23.5	26	M10×1.0	4.5	Rc1/8	14	8.5	8.6	70	23	4.5	4H9	39	4.5	4H9	28
25	22	5	FK-1412L-S	12	55	M8×1.25	37.5	33	31.2	M14×1.5	7.5	Rc1/8	18	10.5	10.5	80	26.5	5.5	5H9	45	5.5	5H9	33

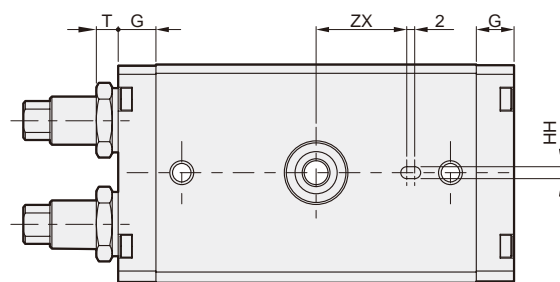
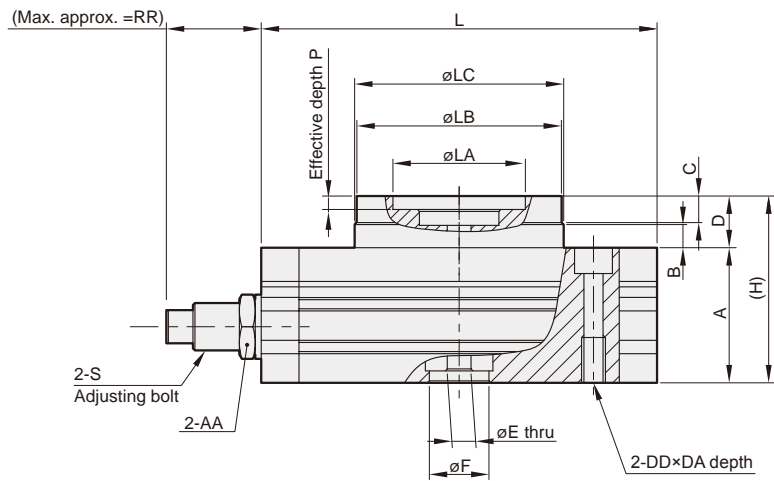
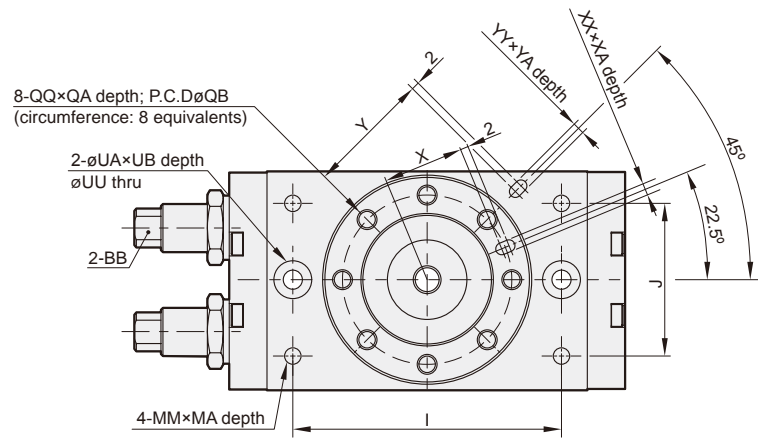
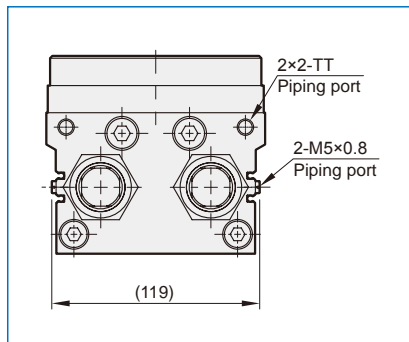
ROTARY ACTUATOR

MCRQ-32R, 40R

With shock absorber



MCRQ-40

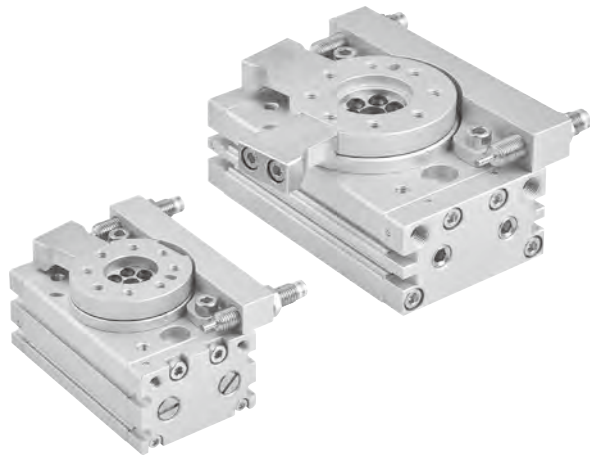


Unit: mm

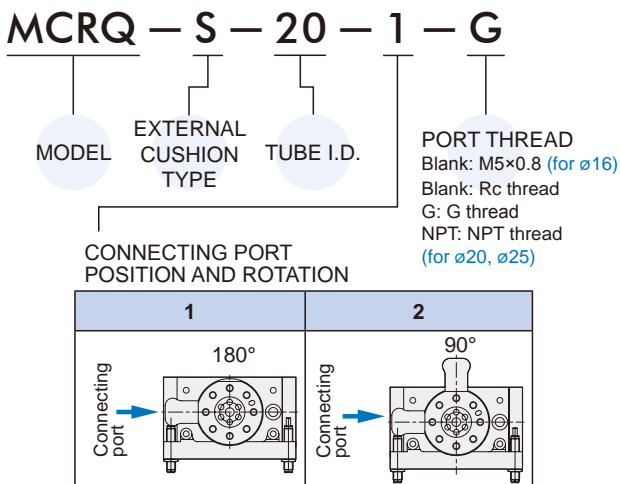
Code Tubr I.D.	A	AA	B	BB	C	D	DA	DD	E	F	G	H	HH	I	J	K	L	LA	LB	LC	M	MA
32	59	30	12	Bolt width 12	14.5	27	18	M12×1.75	13	24H9	17	86	6H9×4.5 dp	130	66	47	189	56H9	98h9	100h9	102	10
40	74	36	15	Bolt width 21	16.5	32	25	M16×2.0	24	32H9	24	106	8H9×6.5 dp	150	80	60	240	64H9	116h9	118h9	120	13

Code Tubr I.D.	MM	N	O	P	PP	QA	QB	QQ	R	RP	RR	S	T	TT	U	UA	UB	UU	W	X	XA
32	M8×1.25	85	27.5	6	FK-2016L-S	14.5	77	M10×1.5	50.5	46	38.1	M20×1.5	10.5	Rc1/8	42	18	10.5	10.5	95	37.5	6.5
40	M12×1.75	100	37	9	FK-2725L-S	16.5	90	M12×1.75	65.5	68	45	M27×1.5	7	Rc1/8	57	20	12.5	14.2	113	44	8.5

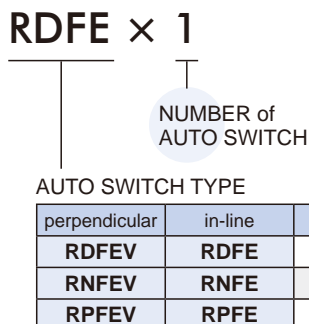
Code Tubr I.D.	XX	Y	YA	YY	ZX
32	6H9	59	4.5	6H9	49
40	8H9	69	4.5	8H9	54



Order example



Auto switch type



Notice for shock absorber

- The threaded orifices shown below are not connecting ports. Never remove the plugs as this will cause malfunction.
- Never rotate the bottom screw of the shock absorber. (It is not an adjustment screw.) This may cause oil leakage.

Features

- **4 to 10 times more allowable kinetic energy** (compared with internal shock absorber type)
- **Total length shortened**
Longitudinal mounting space is reduced because there is no protrusion from adjustment bolts or internal shock absorbers.

Specification

Model	MCRQ-S		
Acting type	Double acting		
Tube I.D. (mm)	16	20	25
Port size	M5×0.8	Rc1/8	
Rotation	90°, 180°		
Medium	Air (Non-lube)		
Max. operating pressure	1 MPa (*1)		
Min. operating pressure	0.2 MPa		
Ambient temperature	0~+60°C (No freezing)		
Allowable kinetic energy (J)	0.231	1.21	1.82
Rotation time adjustment range (s/90°)	0.2~1.0 (*2)		
Cushion	Shock absorber		
Shock absorber type	MDSC-0806-3N	MDSC-1008-3N	MDSC-1412-3N
Angle adjustment range	Each rotation end ± 3°		
Weight (kg)	90°	0.67	1.55
	180°	0.64	1.48
Sensor switch (*3)	2 wire	RDFE(V): Non-contact	
	3 wire	RNFE(V): NPN, RPFE(V): PNP	

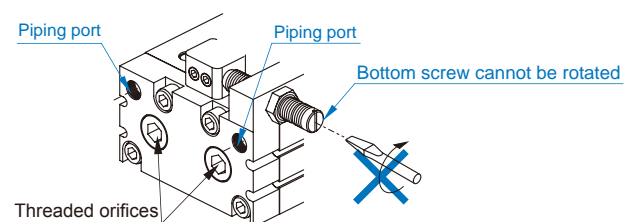
*1. The maximum operating pressure of the actuator is restricted by the maximum allowable thrust of the shock absorber.

*2. For stable operation the time required for the rotary table to reach the rotation end after deceleration differs depending on the operating conditions (inertial moment of the load, rotation speed, and operating pressure), however, approximately 0.2 to 2 seconds are required.

*3. R*FE(V) specification, please refer to page 5-11.

Range of shock absorber operates

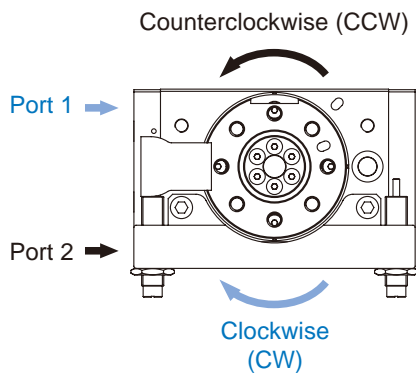
Model	Adjustment angle per rotation of angle adjustment screw	Range of angle the shock absorber operates (single side)
MCRQ-S-16	1.5°	12°
MCRQ-S-20	1.1°	9°
MCRQ-S-25	1.3°	11°



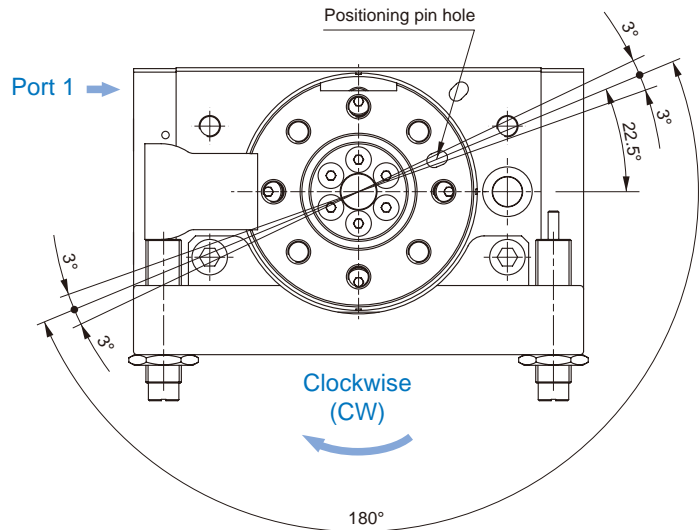
Rotating direction and angle

- When the port 1 is pressurized, the flange rotates in clockwise (CW) direction.
- When the port 2 is pressurized, the flange rotates in counter-clockwise (CCW) direction.

The rotating angle range can be adjust by the method shown as right figure.

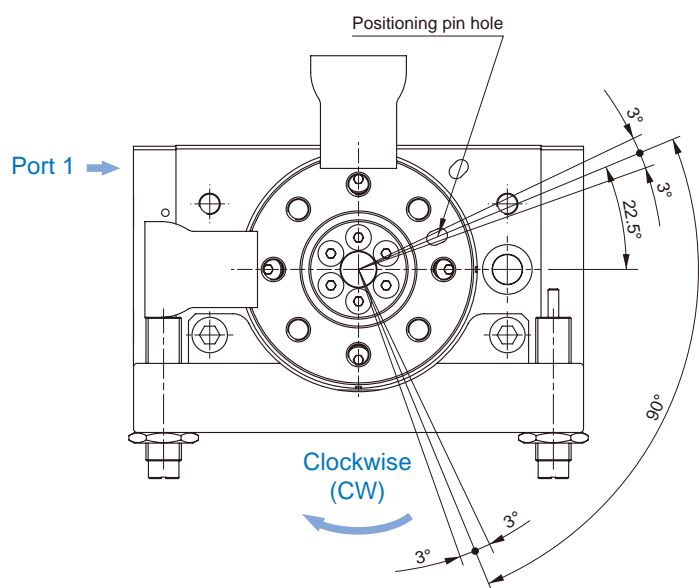


MCRQ-S-*-1 180°

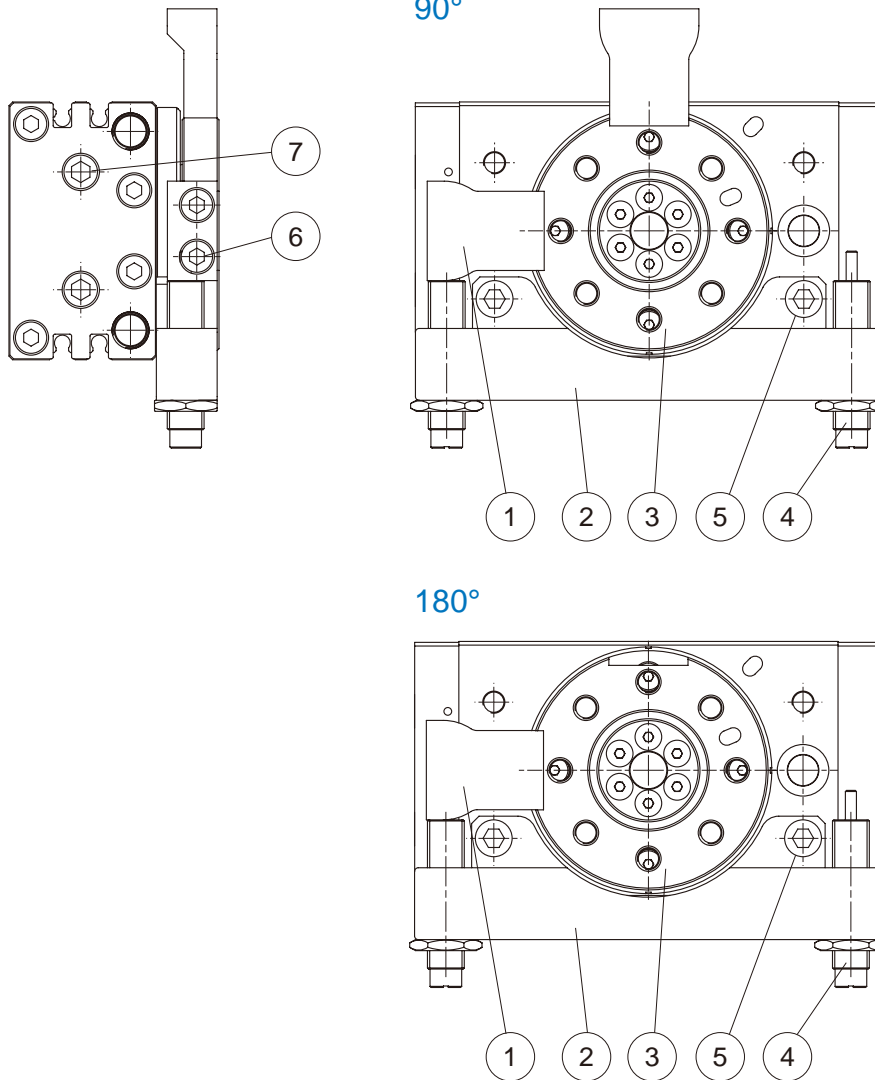


Minimum rotating range 174°
Maximum rotating range 186°

MCRQ-S-*-2 90°



Minimum rotating range 84°
Maximum rotating range 96°



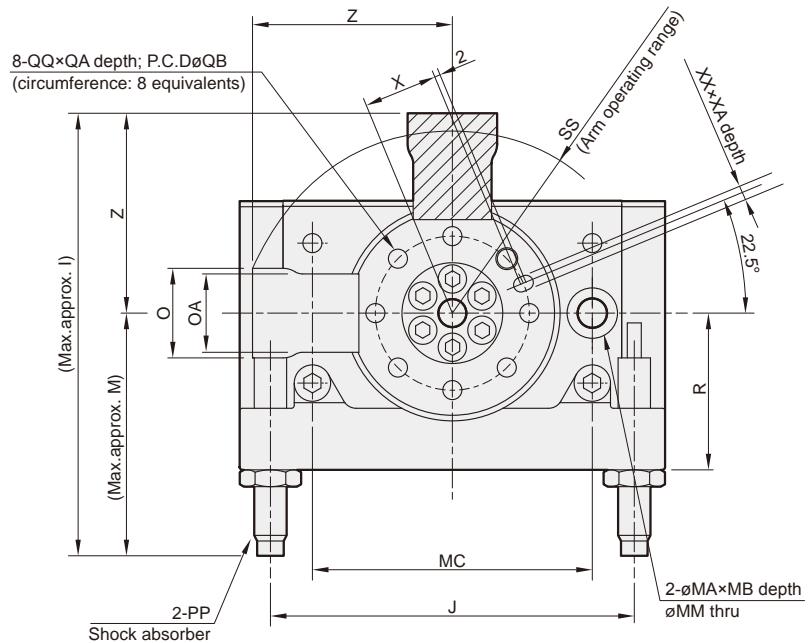
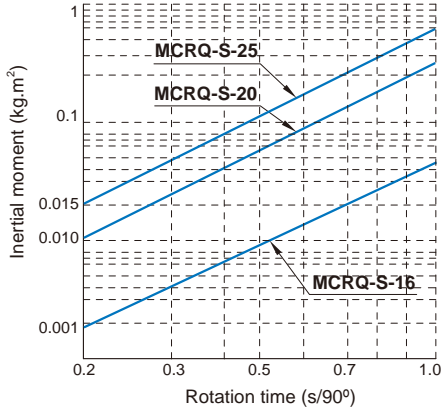
Material

No.	Part name	Material	Rotation & Q'y	
			90°	180°
1	Fixing plate	Carbon steel	2	1
2	Cushion mount	Aluminum alloy	1	1
3	Flange table	Aluminum alloy	1	1
4	Shock absorber	—	2	2
5	Bolt	Stainless steel	2	2
6	Bolt	Stainless steel	4	2
7	Plug	Stainless steel	2	2

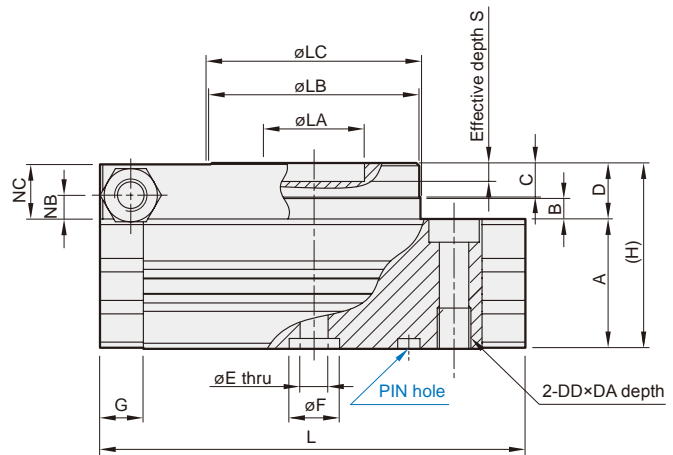
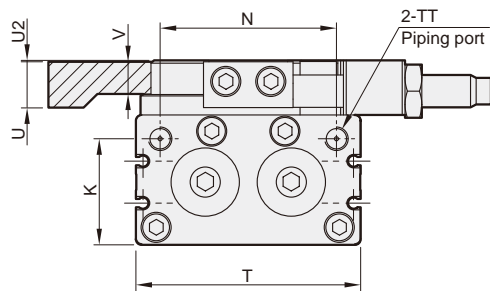
ROTARY ACTUATOR

mindman

In the inertial moment and rotation time



Code Tubr I.D.	PP
16	MDSC-0806-3N
20	MDSC-1008-3N
25	MDSC-1412-3N



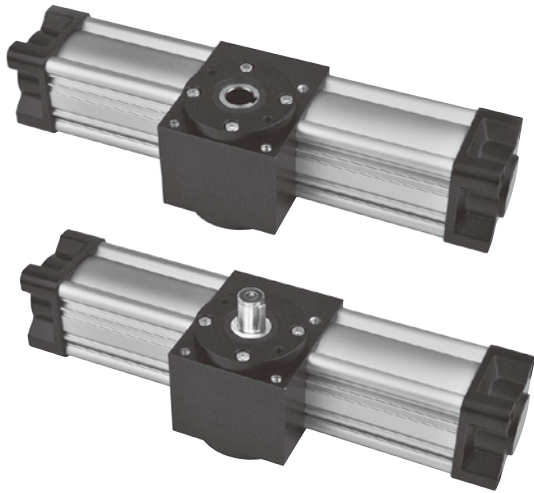
PIN hole size

Code Tubr I.D.	HH	ZX
16	3H9×3.5	19
20	4H9×4.5	28
25	5H9×5.5	33

Unit: mm

Code Tubr I.D.	A	B	C	D	DA	DD	E	F	G	H	I	J	K	L	LA	LB	LC	M	MA	MB	MC
16	34	4.5	8	13	12	M8×1.25	6	15H9	9.5	47	92.8	80.6	29	92	20H9	45h9	46h9	48.5	11	6.5	60
20	40	6.5	10	17	15	M10×1.5	10	22H9	12	57	119.3	110	33	127	32H9	65h9	67h9	59	14	8.5	84
25	46	7.5	12	20	18	M12×1.75	13	26H9	15.5	66	154.8	130	37.5	152	35H9	75h9	77h9	83.3	18	10.5	100

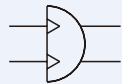
Code Tubr I.D.	MM	N	NB	NC	O	OA	QA	QB	QQ	R	S	SS	T	TT	U	U2	V	X	XA	XX	Z
16	6.8	37	5.5	12.5	20	15.6	8	32	M5×0.8	33	4	45.4	50	M5×0.8	11.5	0.3	7.5	15	3.5	3H9	44.3
20	8.6	54	8	16.5	27	21.5	10	48	M6×1	46	4.5	61.8	70	Rc1/8	13.5	0.5	9	23	4.5	4H9	60.3
25	10.5	63	8.5	19.5	32	28	12	55	M8×1.25	54.5	5	73.3	80	Rc1/8	18	0.5	11	26.5	5.5	5H9	71.5



MRTH Male pivot gear (standard type)

MRTH-D Male pivot gear (double end rod type)

MRTF Female pivot gear



Features

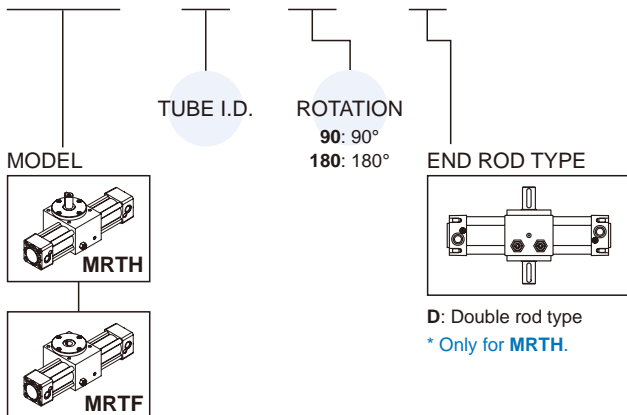
- The body is manufactured in anodized aluminium alloy, and has been designed looking at the harmonious aesthetic development.
- Pinion and rock produced from carbon steel reduces backlash within the mechanism.
- Rotation adjustment screw.
- Magnetic as standard.

Specification

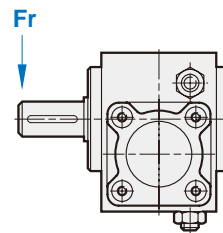
Model	MRTF, MRTH, MRTH-D			
Tube I.D. (mm)	40	63	80	
Standard rotation	90±5°, 180±5°			
Rotating shaft dia. (mm)	16	24	28	
Initial position of slot (mm)	See dimensional feature			
Medium	Filtered air with or without lubrication			
Operating pressure range	0.13~0.7 MPa			
Ambient temperature	-5~+60°C (No freezing)			
Max. allowable axial thrust (kg)	10	12	20	
Cushion angle	74°	75°	80°	
Max. allowable kinetic energy	90°	0.266J	0.675J	1.34J
	180°	0.58J	1.54J	3.03J
Max. allowable radial trust (Fr)	514.5 N	725.2 N	896.7 N	
Sensor switch	LN65 (Please refer to page 5-19)			

Order example

MRTH - 40 - 90 - D



Max. allowable radial trust

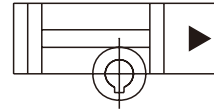


Cylinder weight

Unit: kg

Tube I.D.	MRTH		MRTH-D		MRTF		LN65 Sensor switch 0.03
	90°	180°	90°	180°	90°	180°	
40	3.30	3.40	3.35	3.45	3.14	3.24	0.03
63	5.80	6.20	5.95	6.35	5.47	5.87	
80	10.25	10.80	10.49	11.00	9.69	10.24	

ROTARY ACTUATOR



Compressed air consumption for a complete cycle

Unit: L/cycle

Model	Rotation	Operating pressure (MPa)									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
MRTH40 MRTF40	90°	0.1571	0.2352	0.3133	0.3915	0.4696	0.5477	0.6259	0.7040	0.7821	0.8603
	180°	0.3141	0.4704	0.6267	0.7829	0.9392	1.0955	1.2517	1.4080	1.5643	1.7205
MRTH63 MRTF63	90°	0.4383	0.6564	0.8744	1.0925	1.3105	1.5286	1.7466	1.9647	2.1828	2.4008
	180°	0.8766	1.3127	1.7488	2.1850	2.6211	3.0572	3.4933	3.9294	4.3655	4.8016
MRTH80 MRTF80	90°	0.8480	1.2698	1.6917	2.1135	2.5354	2.9572	3.3791	3.8009	4.2228	4.6447
	180°	1.6959	2.5396	3.3834	4.2271	5.0708	5.9145	6.7582	7.6019	8.4456	9.2893

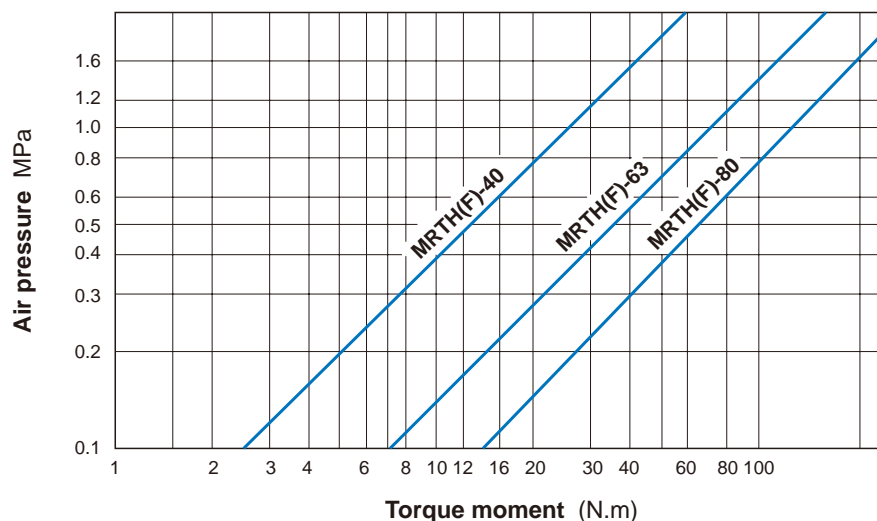
Model	MRTH, MRTF		
Tube I.D.(mm)	40	63	80
Constant K	0.3491	0.3927	0.4712

The method of calculation (Compressed air consumption)

$$Q = 2 \times K \times A \times n \times Dg \times \frac{P+0.101}{0.101} \times 10^{-6}$$

Q:	Compressed air consumption (L/cycle)
A:	Piston area (mm ²)
Dg:	Rotation
P:	Air pressure (MPa)
K:	Constant
n:	Cycle of operation (cycle/min)

Output torque table



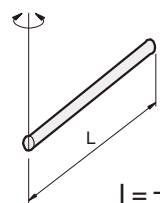
Kinetic energy of rotation motion

$$E = \frac{1}{2} \times I \omega^2$$

E:	Kinetic energy	(J)
I:	Moment of inertia	(Kg·m ²)
ω:	Angle speed	(rad/s)

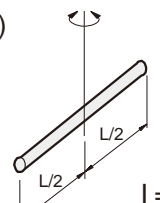
Equation table moment of inertia

(1)



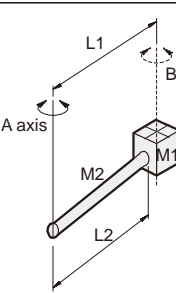
$I = \frac{ML^2}{3}$

(2)



$I = \frac{ML^2}{12}$

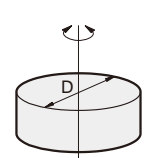
(5)



$I = I_1 + M_1 L_1^2 + \frac{M_2 L_2^2}{3}$

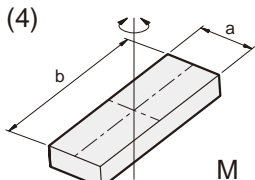
I₁ = Obtain the center of gravity of the load (M₁) as I₁, a provisional shaft (B).

(3)



$I = \frac{MD^2}{8}$

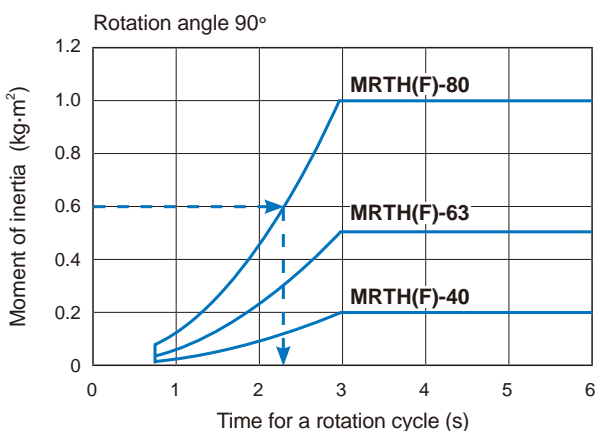
(4)



$I = \frac{M}{12} (a^2 + b^2)$

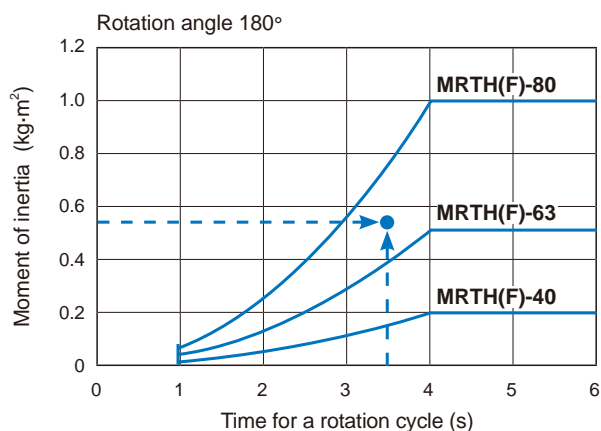
I (I₁):	Moment of inertia	(Kg·m ²)
M (M₁, M₂):	Load mass	(Kg)
L, a, b:	Side length	(m)
D:	Diameter	(m)

Moment of inertia



Example 1

When there are constraints for the moment of inertia of load, but not for rotation time. From "rotation angle = 90°", MRTH(F)-80, to operate at the load moment of inertia 0.6 kg·m²: MRTH(F)-80 will be 2.3 seconds or higher.



Example 2

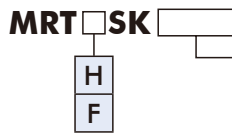
When there are constraints for the moment of inertia of load, but not for rotation time. From "rotation angle = 180°", to operate at the load moment of inertia 0.5 kg·m² and at the rotation time setting of 3.5 seconds: The model will be MRTH(F)-80.

MRTH / MRTF Inside structure & Parts list



ROTARY ACTUATOR

How to order the seal kit

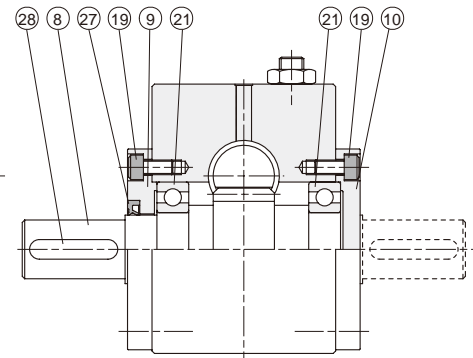
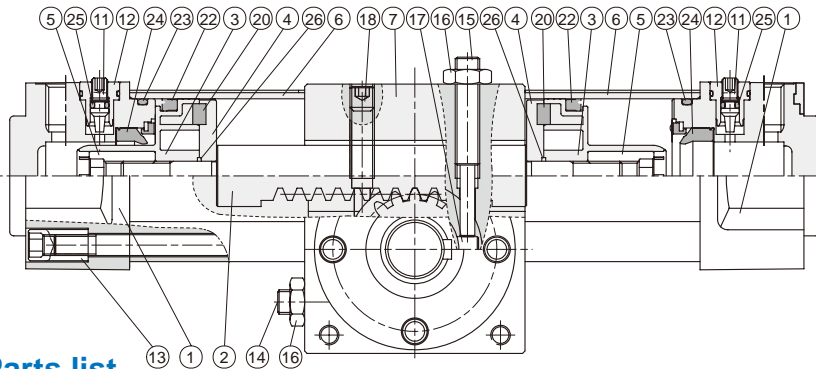


Tube I.D.	Seal kit
40	MRTHSK40 - Including No.22,23,24,25,26,27
63	MRTHSK63 - Including No.22,23,24,25,26,27
80	MRTHSK80 - Including No.22,23,24,25,26,27

Tube I.D.	Seal kit
40	MRTFSK40 - Including No.22,23,24,26,27
63	MRTFSK63 - Including No.22,23,24,26,27
80	MRTFSK80 - Including No.22,23,24,26,27

MRTH

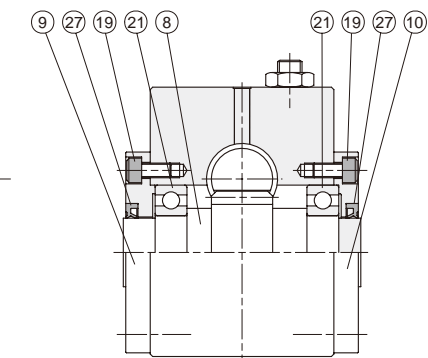
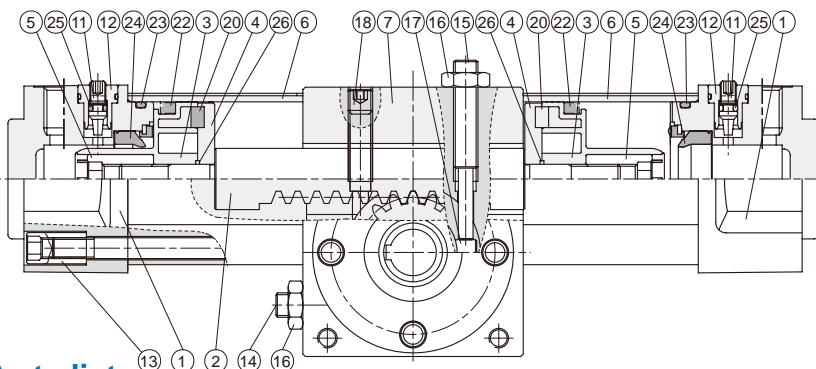
MRTH-D



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	End cap	2	11	Cushion needle	2	21	Ball bearing	2
2	Rack	1	12	Washer	2	22	Piston packing	2
3	Piston	2	13	Tie bolt	8	23	Cylinder gasket	2
4	Magnet holder	2	14	Adjusting screw	1	24	Cushion packing	2
5	Piston nut	2	15	Adjusting screw	1	25	O-ring	2
6	Cylinder tube	2	16	Lock nut	2	26	Piston gasket	2
7	Housing	1	17	Stopper pin	1	27	Rod packing	1
8	Pinion shaft	1	18	Set screw	1	28	Key (MRTH-D=2)	1
9	End cover	1	19	Hexagon socket head screw	8			
10	End cover	1	20	Magnet	2			

MRTF

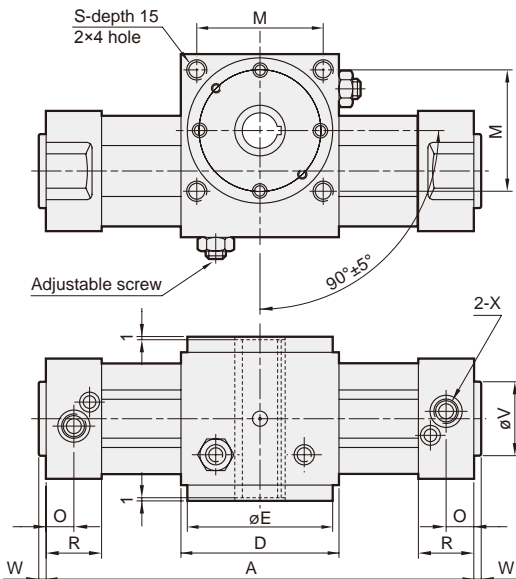


Parts list

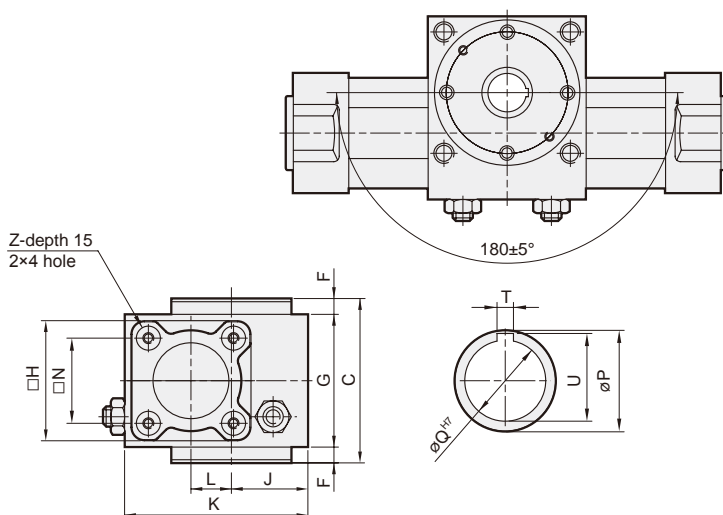
No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	End cap	2	10	End cover	1	19	Hexagon socket head screw	8
2	Rack	1	11	Cushion needle	2	20	Magnet	2
3	Piston	2	12	Cushion plug	2	21	Ball bearing	2
4	Magnet holder	2	13	Tie bolt	8	22	Piston packing	2
5	Piston nut	2	14	Adjusting screw	1	23	Cylinder gasket	2
6	Cylinder tube	2	15	Adjusting screw	1	24	Cushion packing	2
7	Housing	1	16	Lock nut	2	25	O-ring	2
8	Pinion shaft	1	17	Stopper pin	1	26	Piston gasket	2
9	End cover	1	18	Set screw	1	27	Rod packing	2

MRTF

Angle of rotation 90°



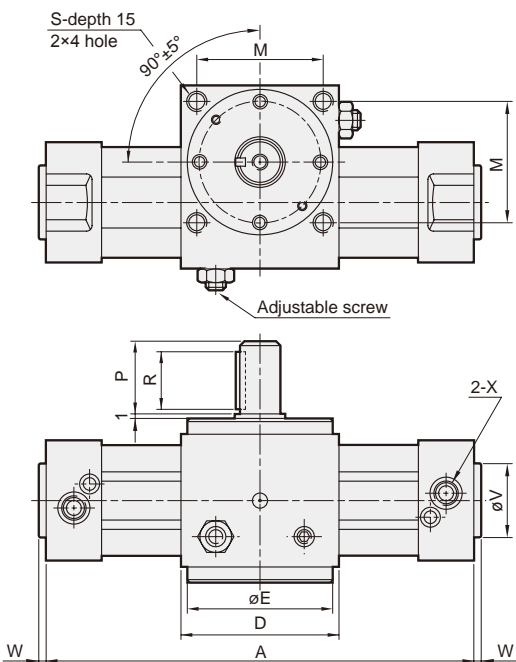
Angle of rotation 180°



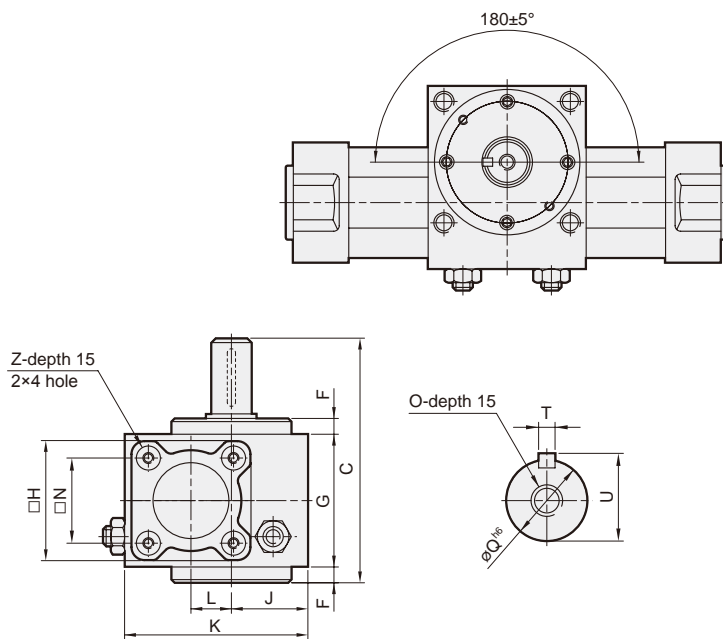
Model	A		C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Z
	90°	180°																						
MRTF-40	263	326	81	75	72	8	65	53	37.5	93	27.5	60	38	15	25	14	30	M6	5	16.5	35	5	G1/4	M6
MRTF-63	306	377	95	90	82	10	75	75	42.5	110	30	70	56.5	16	30	19	32	M8	6	22	45	4	G3/8	M8
MRTF-80	343	428	119	105	96	12	95	95	51.5	135	36	82	72	19	35	24	38	M10	6	27	45	5	G3/8	M10

MRTH

Angle of rotation 90°



Angle of rotation 180°

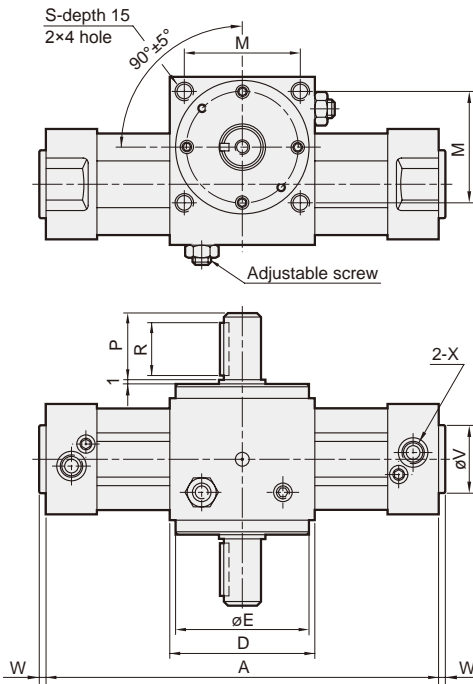


Model	A		C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Z
	90°	180°																						
MRTH-40	263	326	112	75	72	8	65	53	37.5	93	27.5	60	38	M5	30	16	25	M6	5	18	35	5	G1/4	M6
MRTH-63	306	377	138	90	82	10	75	75	42.5	110	30	70	56.5	M8	42	24	36	M8	8	27	45	4	G3/8	M8
MRTH-80	343	428	170	105	96	12	95	95	51.5	135	36	82	72	M8	50	28	45	M10	8	31	45	5	G3/8	M10

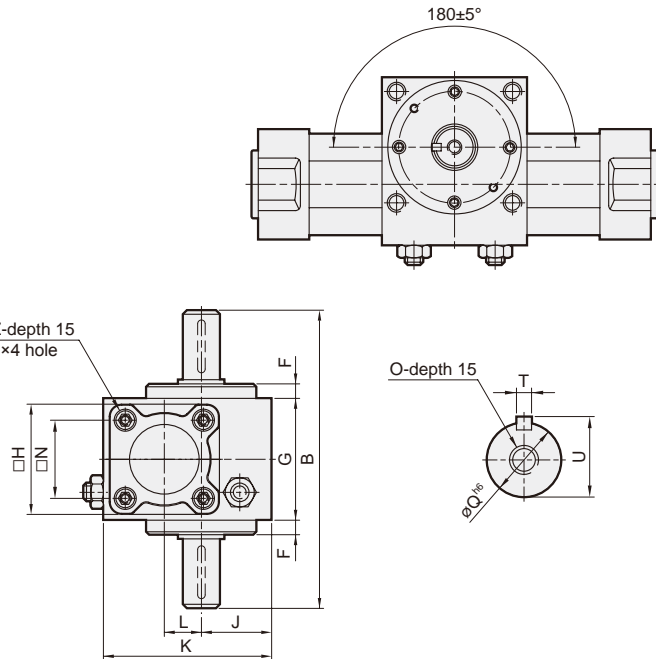
ROTARY ACTUATOR

mindman

MRTH-D Angle of rotation 90°

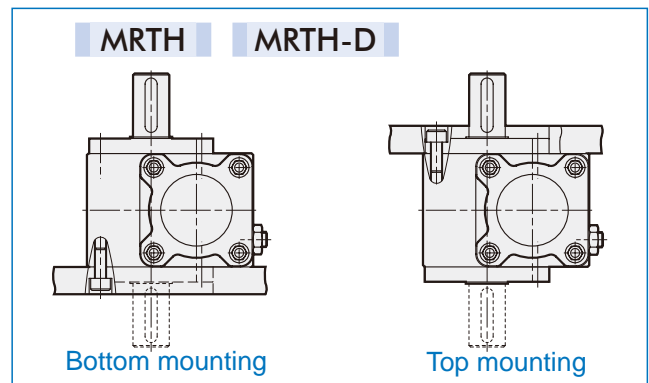
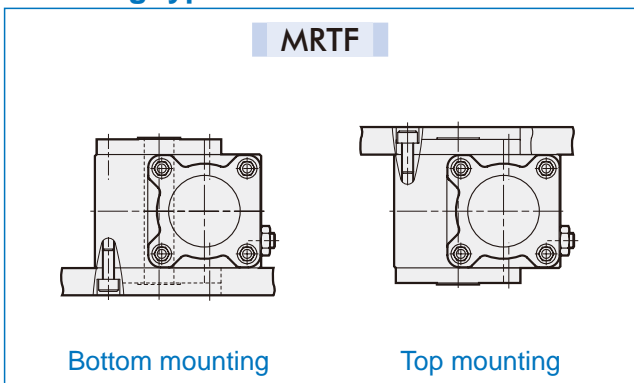


Angle of rotation 180°

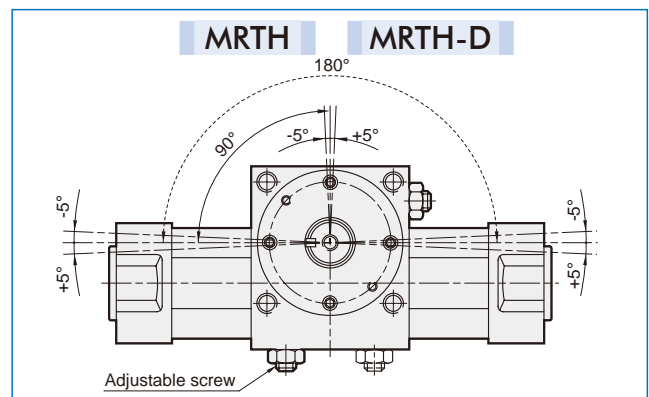
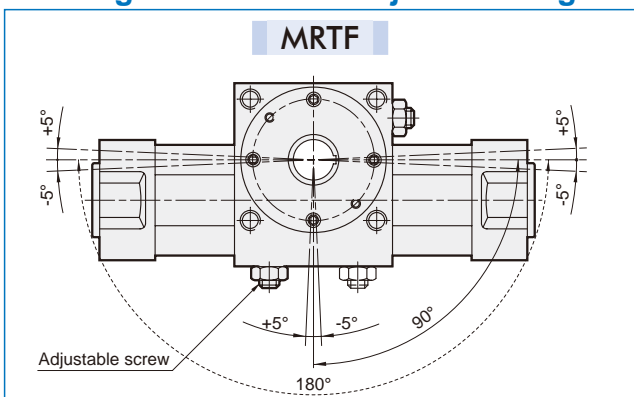


Model	A		B	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Z
	90°	180°																						
MRTH-40-D	263	326	143	75	72	8	65	53	37.5	93	27.5	60	38	M5	30	16	25	M6	5	18	35	5	G1/4	M6
MRTH-63-D	306	377	181	90	82	10	75	75	42.5	110	30	70	56.5	M8	42	24	36	M8	8	27	45	4	G3/8	M8
MRTH-80-D	343	428	221	105	96	12	95	95	51.5	135	36	82	72	M8	50	28	45	M10	8	31	45	5	G3/8	M10

Mounting type



Rotating direction and adjustable angle



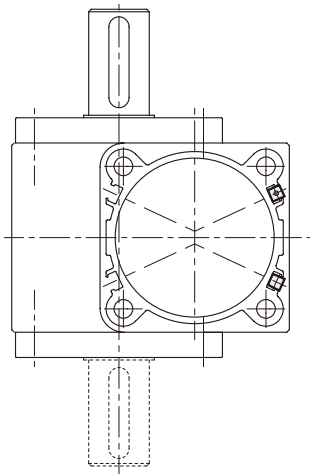
MRTH / MRTF Installation of sensor switches $\varnothing 40\sim\varnothing 80$



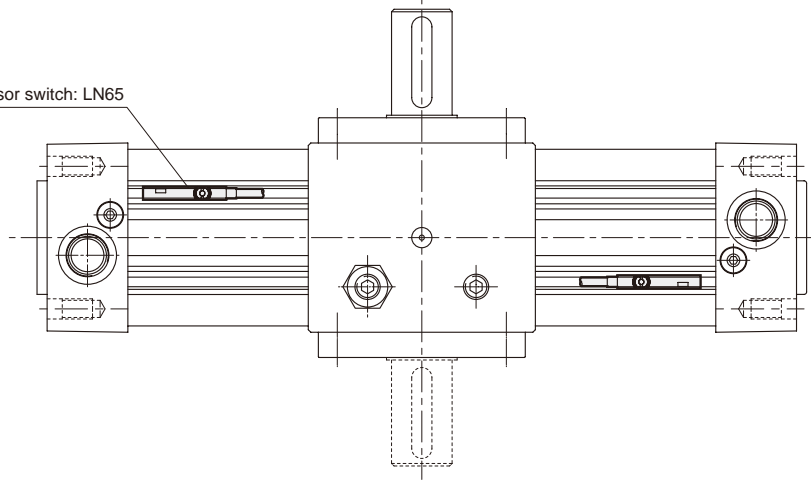
ROTARY ACTUATOR

MRTH

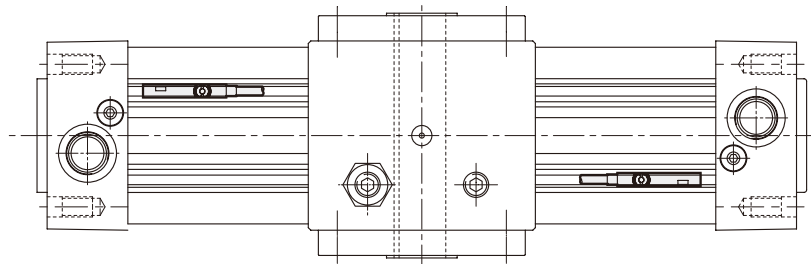
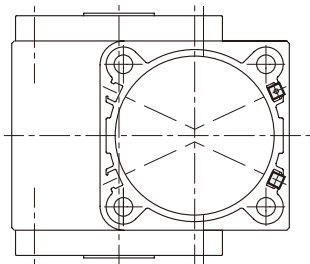
MRTH-D



Sensor switch: LN65

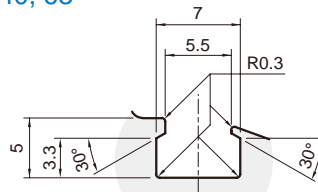


MRTF

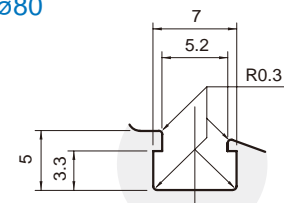


Sensor switch mounting groove

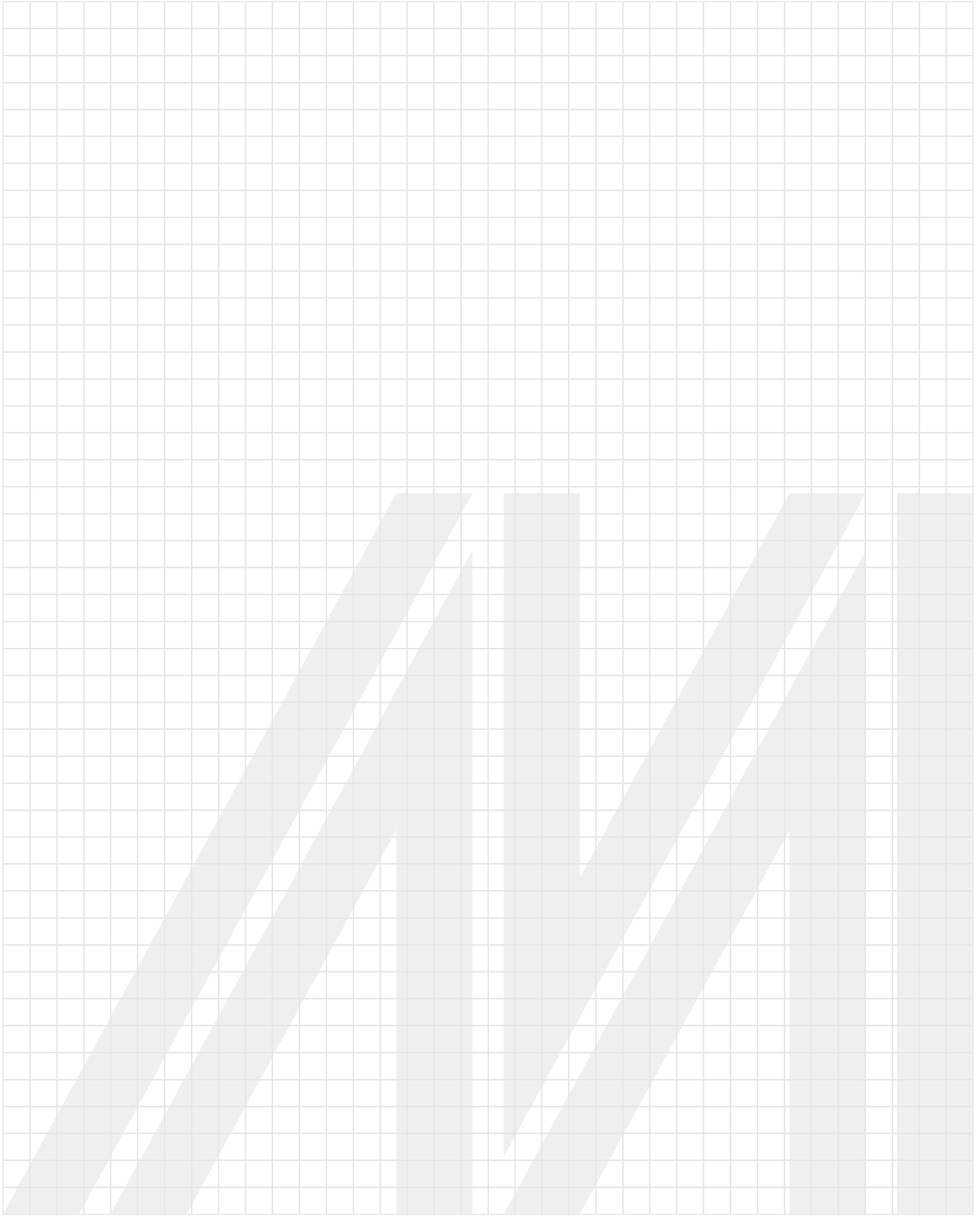
$\varnothing 40, 63$



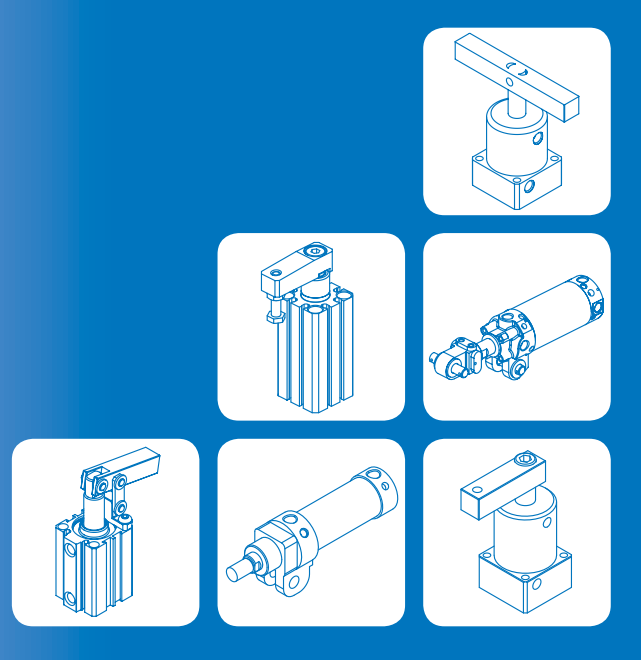
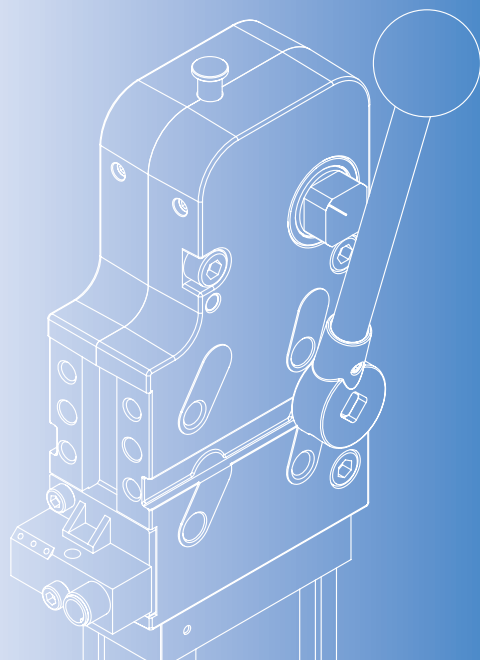
$\varnothing 80$



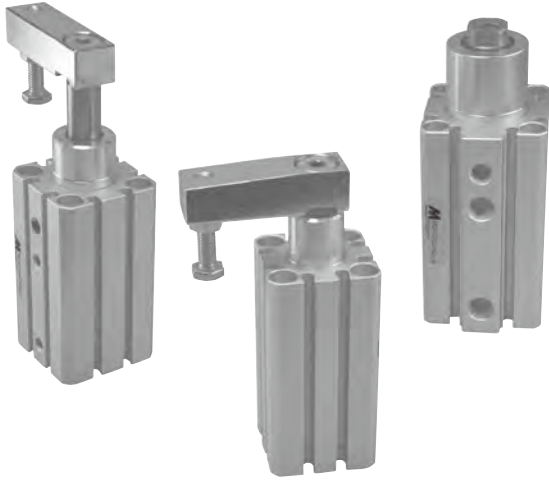
Tube I.D.	Sensor switch
40, 63, 80	LN65



CLAMP CYLINDER



MCKC	ø12~ø40	2-2
MTA*	MTAS / MTAD	2-6
MA*	MAS / MATS	2-14
	MASD / MATSD	2-14
MCKD	ø50, ø63 New	2-17
MCKB	ø32	2-23



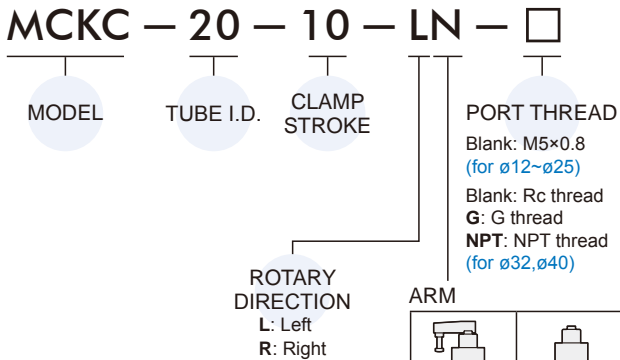
Features

- Ultra compact, light weight and space saving cylinder.
- Ideal for use in machinery where space is limited and incorporating sensor groove which enables flush fitting of sensors.
- The sensor can freely mounted the four sides.
- Magnetic as standard.

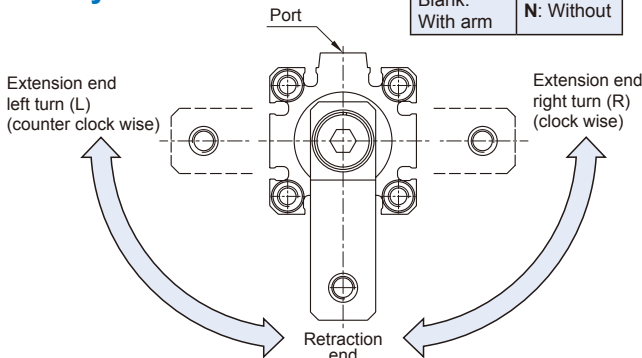
Specification

Model	MCKC					
Acting type	Double acting					
Tube I.D. (mm)	12	16	20	25	32	40
Port size	M5x0.8			Rc1/8		
Rotary angle	90°±10°					
Rotary direction	Left (L), Right (R)					
Rotary stroke (mm)	7.5		9.5		15	
Clamp stroke (mm)	10, 20		10, 20, 30			
Medium	Air					
Operating pressure range	0.1~0.9 MPa					
Ambient temperature	-5°C~+60°C (No freezing)					
Available speed range	50~200 mm/sec					
Non-rotating accuracy (*1)	±2°	±1.3°	±1.2°	±1°		
Lubrication	Not required					
Sensor switch (*2)	RDE		RCE, RCE1, RDEP			

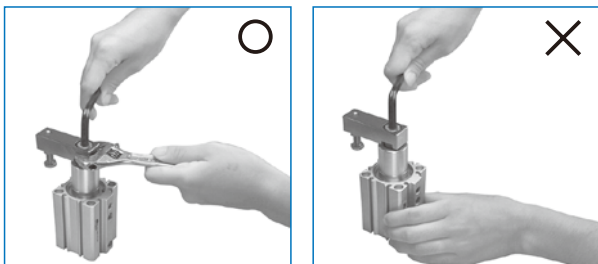
Order example



Rotary direction



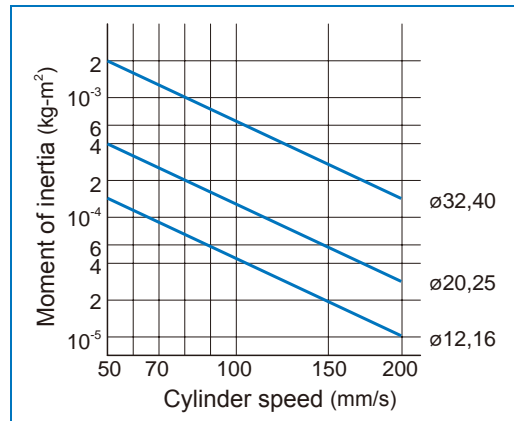
Clamping arm mounting methods



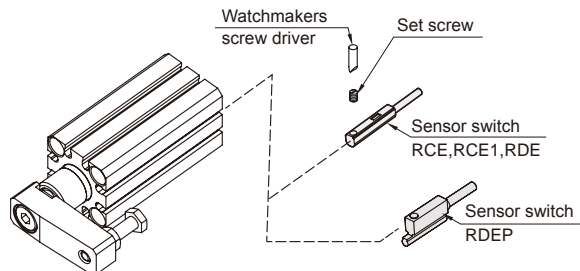
*1. Arm during clamping (Clamp part).

*2. RCE, RCE1, RDE, RDEP specifications please refer to page 5-6, 7, 10.

Moment of inertia



Installation of sensor switch



CAUTION

Do not use the cylinder under the following environments

- Areas that contain splashing cutting oil.
- Areas that contain foreign objects such as cutting chips or heavy-dust.
- Areas that environment temperature exceeds the operating range.
- Areas that expose to direct sunlight.
- Areas that contain corrosion risk.

A cylinder could malfunction or the non-rotating accuracy could be reduced if a rotational force is applied to the piston rod. Therefore, check the particular examples below before operating the cylinder.

- 1 Make sure to mount the cylinder vertically to the ground. (Fig.1)
- 2 Do not apply external rotary force on the piston rod. (Fig.2)
- 3 Make sure that the clamping surface of the workpiece is perpendicular to the axial line of cylinder. (Fig.3)
- 4 Clamping the workpiece in the straight stroke of cylinder only. Do not clamp the workpiece in the rotary stroke. (Fig.4)
- 5 Make sure that the workpiece is not moved by external force while clamping. (Fig.5)

- 1 Do not mount the cylinder horizontally.

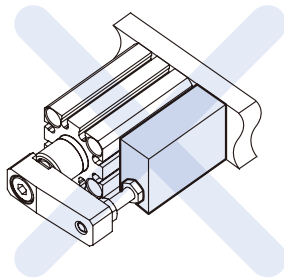


Fig.1

- 2 Do not apply external rotary force on the piston rod.

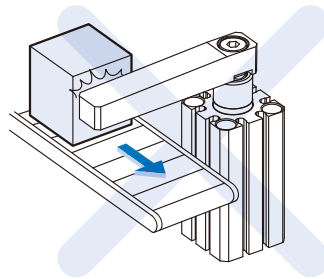


Fig.2

- 3 Do not clamp on a slope.

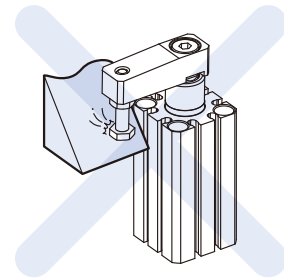


Fig.3

- 4 Do not clamp the workpiece in the rotary stroke.

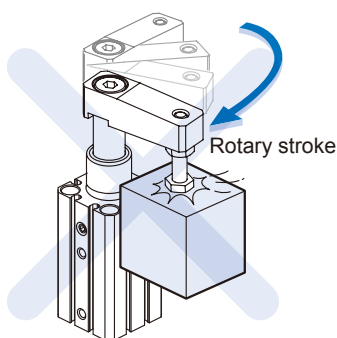
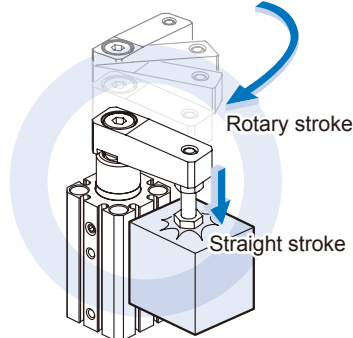


Fig.4



- 5 Make sure that the workpiece have no external force applied besides the cylinder while clamping.

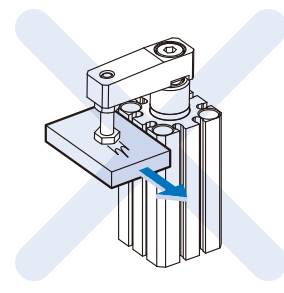
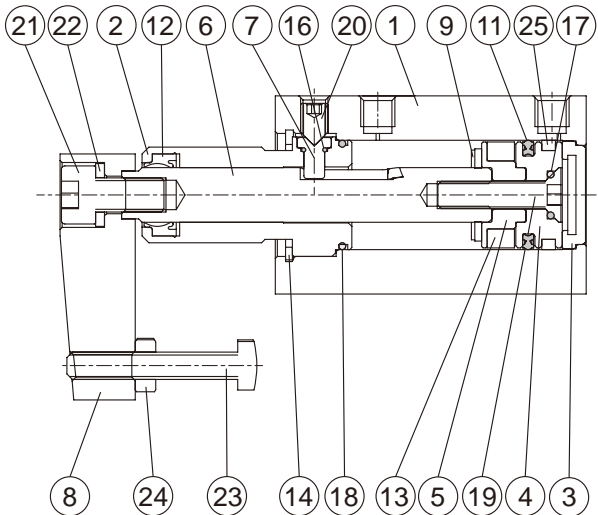
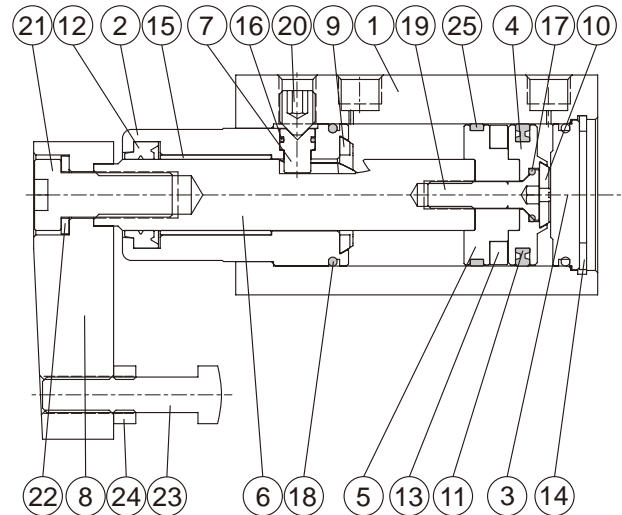


Fig.5

ø12, ø16, ø40



ø20, ø25, ø32



Material

No.	Part name	Material	Note
1	Body	Aluminum alloy	
2	Rod cover	Aluminum alloy	
3	End cover	Aluminum alloy	
4	Piston	Aluminum alloy	
5	Piston for magnet ring	Aluminum alloy	
6	Piston rod	SCM	
7	Guide pin	SCM	
8	Arm	Carbon steel	
9	Rod cushion	NBR	
10	End cushion	NBR	For ø20~ø40
11	Piston packing	NBR	
12	Rod packing	NBR	
13	Magnet ring	Magnet material	

No.	Part name	Material	Note
14	Snap ring	Stainless steel	*1
15	Bush	Copper	For ø32,ø40
16	O-ring	NBR	
17	O-ring	NBR	
18	O-ring	NBR	
19	Bolt	Stainless steel	
20	Set screw	SCM	
21	Bolt	SCM	
22	Spring washer	Spring steel	
23	Bolt	SCM	
24	Nut	Carbon steel	
25	Wear ring	Teflon	

*1. Carbon steel (for ø12,ø16)

Theoretical force



Unit: N

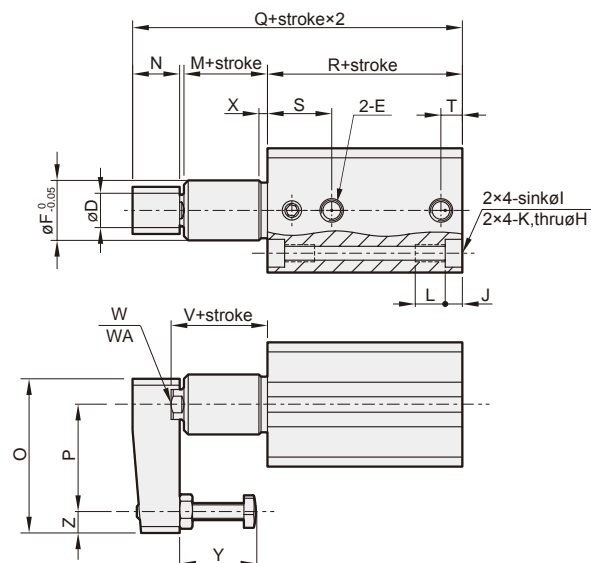
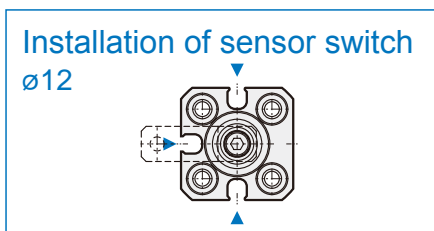
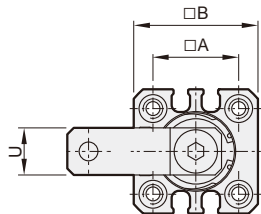
Tube I.D. (mm)	Piston rod (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)								
				0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
12	6	A	113	11.3	22.6	33.9	45.2	56.5	67.8	79.1	90.4	101.7
		B	85	8.5	17.0	25.5	34.0	42.5	51.0	59.5	68.0	76.5
16	8	A	201	20.1	40.2	60.3	80.4	100.5	120.6	140.7	160.8	181.0
		B	151	15.1	30.2	45.2	60.3	75.4	90.5	105.6	120.6	135.7
20	12	A	314	31.4	62.8	94.2	125.7	157.1	188.5	219.9	251.3	282.7
		B	201	20.1	40.2	60.3	80.4	100.5	120.6	140.7	160.8	181.0
25	12	A	491	49.1	98.2	147.3	196.4	245.4	294.5	343.6	392.7	441.8
		B	378	37.8	75.6	113.3	151.1	188.9	226.7	264.4	302.2	340.0
32	16	A	804	80.4	160.8	241.3	321.7	402.1	482.5	563.0	643.4	723.8
		B	603	60.3	120.6	181.0	241.3	301.6	361.9	422.2	482.5	542.9
40	16	A	1257	125.7	251.4	377.1	502.8	628.5	754.2	879.9	1005.6	1131.3
		B	1056	105.6	211.2	316.8	422.4	528.0	633.6	739.2	844.8	950.4

Cylinder weight

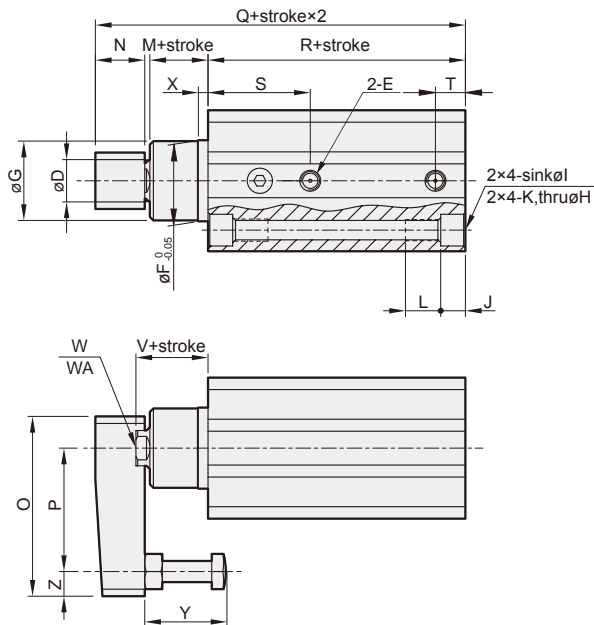
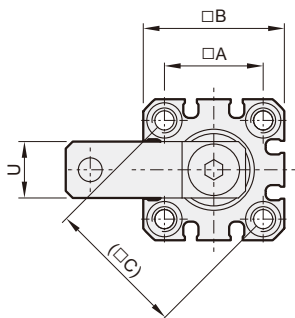
Unit: g

Model	Basic weight MCKC	Basic weight MCKC-N	Stroke 10 mm MCKC
Tube I.D.			
ø12	66	52	16
ø16	100	66	23
ø20	266	176	38
ø25	319	229	46
ø32	573	382	69
ø40	652	461	74

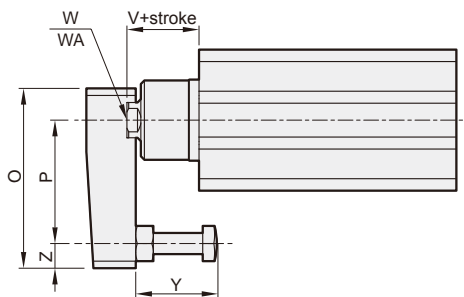
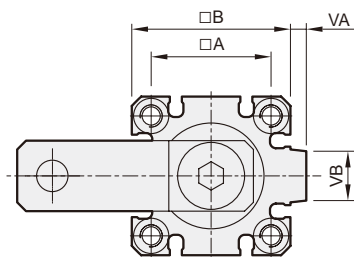
$\varnothing 12, \varnothing 16$



$\varnothing 20, \varnothing 25$

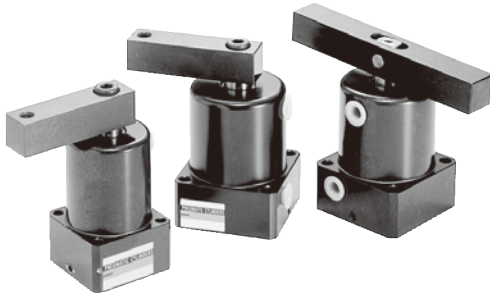


$\varnothing 32, \varnothing 40$



Code Tube I.D.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
12	15.5	25	-	6	M5x0.8	11	-	3.5	6.5	4	M4x0.7	7	9.5	8	29	20	54	35.5	15	5	8
16	20	29	-	8	M5x0.8	14	-	3.5	6.5	4	M4x0.7	7	9.5	11	36	25	57	35.5	15	5	11
20	25.5	36	36	12	M5x0.8	18	17.9	5.4	9	7	M6x1.0	10	6.5	14	51	35	84	62	28	8.7	16
25	28	40	39.6	12	M5x0.8	23	22.5	5.4	9	7	M6x1.0	10	6.5	14	51	35	85	63	29	8.5	16
32	34	45	-	16	Rc1/8	30	29.5	5.5	9	7	M6x1.0	10	15.5	18	67	45	107	71.5	28	11	20
40	40	52	-	16	Rc1/8	30	29.5	5.5	9	7	M6x1.0	10	23	18	67	45	108	65	27	8	20

Code Tube I.D.	V	VA	VB	W (ROD thread)	WA	X	Y	Z
12	12.5	-	-	M3x0.5x5.5L	Across flats 5x2.5L	2	7~18	4
16	12.5	-	-	M5x0.8x6.5L	Across flats 7x2.5L	2	7~20	5
20	10.5	-	-	M8x1.25x14L	Across flats 10x3L	3	12~25	7
25	10.5	-	-	M8x1.25x14L	Across flats 10x3L	3	12~25	7
32	22	4.5	14	M10x1.5x19L	Across flats 14x5.5L	3	12~25	10
40	29.5	5	14	M10x1.5x19L	Across flats 14x5.5L	3	12~25	10



Features

- These swing clamps are used when it is required to keep the fixture workpiece area free of straps and clamping components for unrestricted workpiece loading and un-loading.
- This pneumatic clamping element is a pull type cylinder, There are five standard sizes, and for each size two versions of standard clamping arms, mounting of these clamping arms at any angle within 360.

Note

- Please don't exceed 1.5 times of the original length, if it is necessary to increase the length of the clamping arm.
- Suggested to install a flow control valve protect cylinder barrel and internal components against fretting wear.

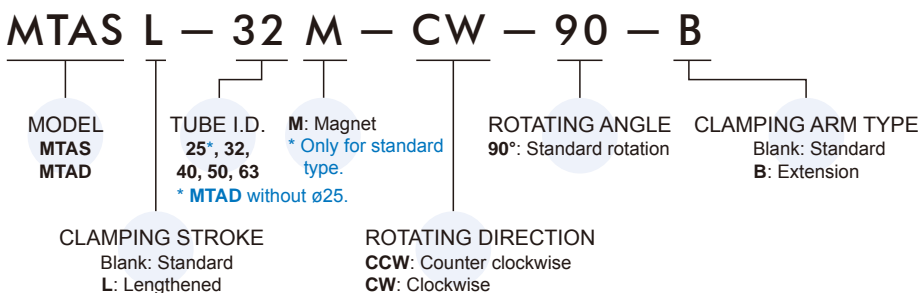
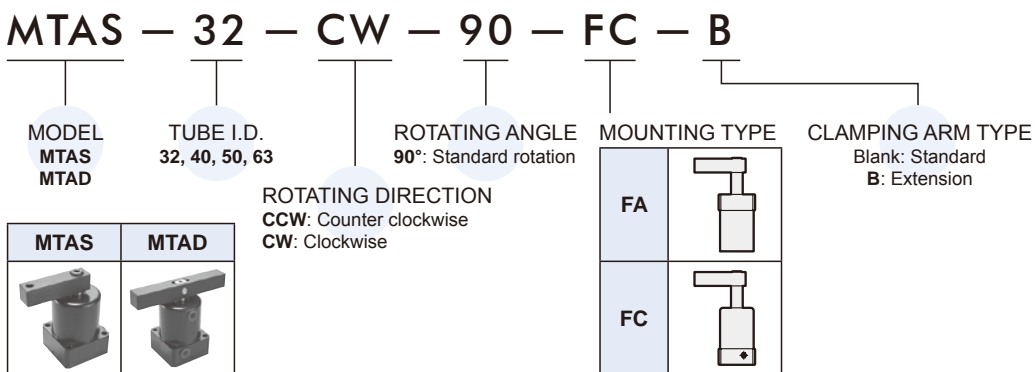
Double acting

MTAS	Single side clamping arm	
MTAD	Double sides clamping arm	
MTAS..M	Single side clamping arm (Piston with magnet)	
MTAD..M	Double sides clamping arm (Piston with magnet)	
MTAS..FC	Single side clamping arm (Manifold With flow control)	
MTAD..FC	Double sides clamping arm (Manifold With flow control)	
MTAS..FA	Single side clamping arm (Flange type)	
MTAD..FA	Double sides clamping arm (Flange type)	

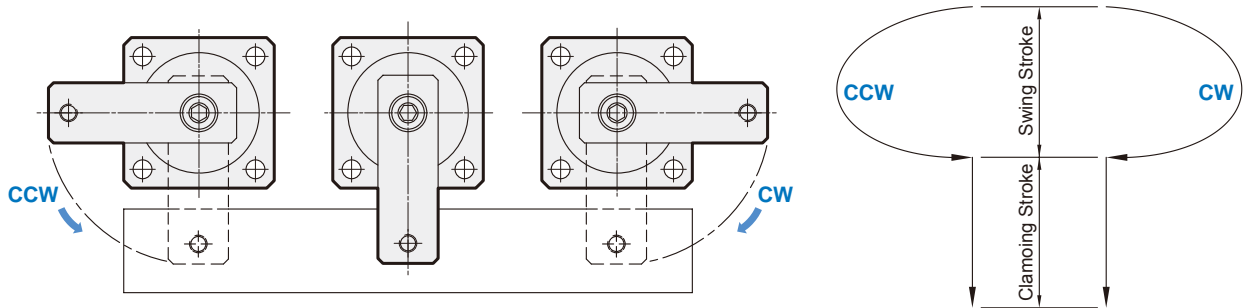
Specification

Model	MTAS	MTAD
Acting type	Double acting	
Tube I.D. (mm)	25, 32, 40, 50, 63	32, 40, 50, 63
Power fluid	Filtered air with or without lubrication	
The range of pressure	0.1~1 MPa	
Max. pressure	1.47 MPa	
Material of cylinder barrel	Anodised aluminum alloy	
Standard angle of rotation	90°±2° (Angle of 0°, 45° and 60° are optional)	
Rotating direction	Clockwise or counter clockwise	
Sensor switch	LN40R (Please refer to page 5-18)	

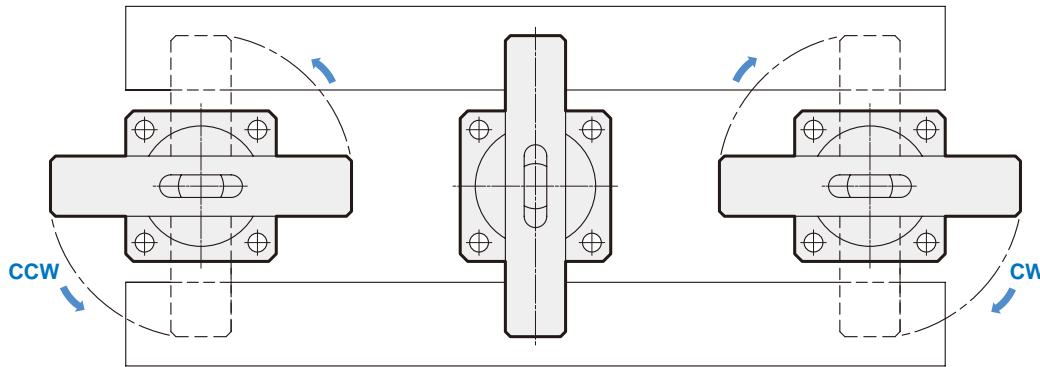
Order example



Single side swing clamp



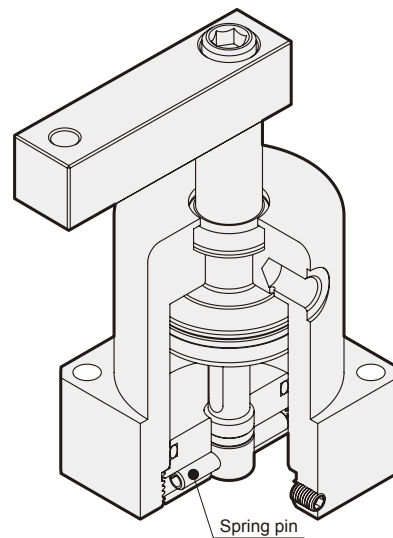
Double side swing clamp



Clamping arm mounting methods



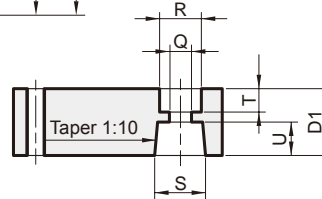
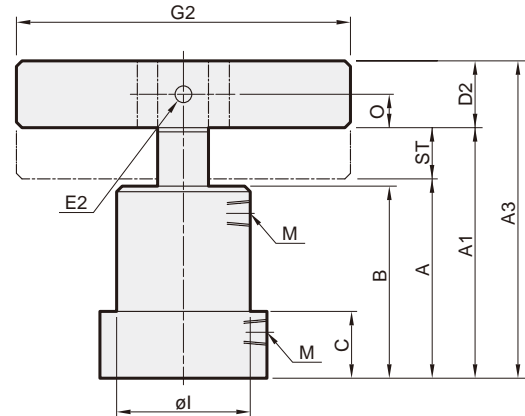
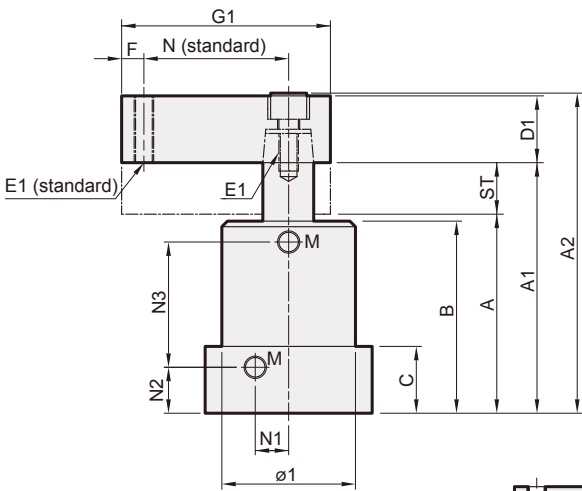
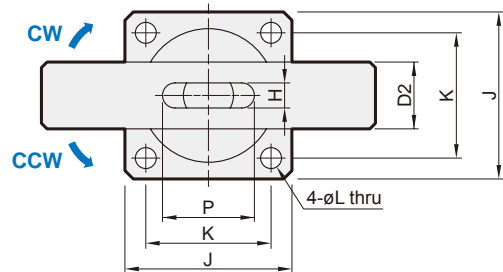
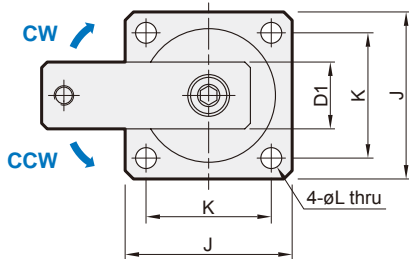
Clamping arm removing methods



Note. If the clamping arm is wrong mounting and removing, the spring pin is broken easily. Then the rotation angle is deviation or the action is not smooth when the cylinder works.

MTAS / MTASL

MTAD / MTADL



Single side clamping arm

* Clamping stroke lengthened type.

Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)		Pressure area push/pull (mm ²)	Clamping force N (0.6 MPa)	Clamping arm type				
				Standard	L type*			G1		G2		
								Standard	Extension	Standard	Extension	
MTAS-25	—	$\varnothing 25$	$\varnothing 14$	9	13	—	491 / 337	200	50	70	—	—
MTAS-32	MTAD-32	$\varnothing 32$	$\varnothing 16$	11	15	30	804 / 603	360	70	100	140	200
MTAS-40	MTAD-40	$\varnothing 40$	$\varnothing 16$	11	15	30	1257 / 1056	630	75	100	140	200
MTAS-50	MTAD-50	$\varnothing 50$	$\varnothing 20$	13	17	34	1963 / 1649	980	85	130	160	230
MTAS-63	MTAD-63	$\varnothing 63$	$\varnothing 20$	13	17	34	3117 / 2803	1680	95	130	160	230

Code Model	Standard type						Clamping stroke lengthened type						C	D1	D2	E1	E2	F	
	A	A1	A2	A3	B	ST	A	A1	A2	A3	B	ST							
MTAS-25	—	67	89	(105.9)	—	65	22	—	—	—	—	—	—	23	$\square 15.9$	—	M6x1.0	—	6
MTAS-32	MTAD-32	82	108	(128)	127	78	26	97	138	(158)	157	93	41	28	$\square 19$	$\square 19$	M8x1.25	$\varnothing 8$	8
MTAS-40	MTAD-40	82	108	(128)	127	78	26	97	138	(158)	157	93	41	28	$\square 19$	$\square 19$	M8x1.25	$\varnothing 8$	8
MTAS-50	MTAD-50	94	124	(150.4)	146.2	90	30	111	158	(184.4)	180.2	107	47	31	$\square 25.4$	$\square 22.2$	M10x1.5	$\varnothing 8$	10
MTAS-63	MTAD-63	94	124	(150.4)	146.2	90	30	111	158	(184.4)	180.2	107	47	31	$\square 25.4$	$\square 22.2$	M10x1.5	$\varnothing 8$	10

Code Model	H	I	J	K	L	M	N	N1	N2	N3		O	P	Q	R	S	T	U	
										Standard	L type*								
MTAS-25	—	—	$\varnothing 35$	38	30	$\varnothing 4.6$	M5x0.8	35	8	16.5	Standard	—	—	—	$\varnothing 6.8$	$\varnothing 11$	$\varnothing 14$	5	8.5
MTAS-32	MTAD-32	9	$\varnothing 46$	50	40	$\varnothing 5.6$	Rc1/8	50	11.5	19	45	60	9.5	25	$\varnothing 9$	$\varnothing 14$	$\varnothing 16$	7	9.5
MTAS-40	MTAD-40	9	$\varnothing 55$	60	48	$\varnothing 6.8$	Rc1/8	55	14	19	45	60	9.5	25	$\varnothing 9$	$\varnothing 14$	$\varnothing 16$	7	9.5
MTAS-50	MTAD-50	10	$\varnothing 65$	70	57	$\varnothing 6.8$	Rc1/8	60	17	21	54	71	11.1	29	$\varnothing 11$	$\varnothing 17$	$\varnothing 20$	9	12.5
MTAS-63	MTAD-63	10	$\varnothing 78$	83	67	$\varnothing 9$	Rc1/8	70	20	21	54	71	11.1	29	$\varnothing 11$	$\varnothing 17$	$\varnothing 20$	9	12.5

MTAS-25M With magnet type $\phi 25$

PNEUMATIC - SWING CLAMP CYLINDER



Rotary Actuator

Clamp Cylinder

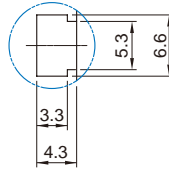
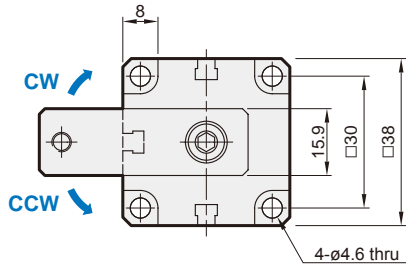
Gripper

Electric Actuator

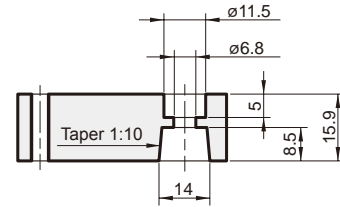
Auxiliary Equipment

Hydraulic Cylinder

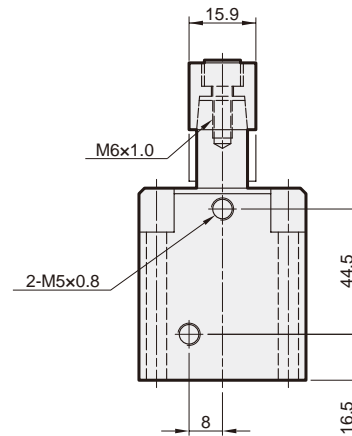
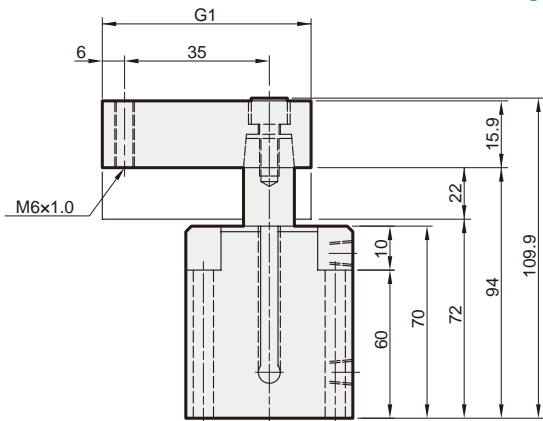
MTAS



Auto switch mounting groove position



Single side clamping arm



Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/ pull (mm ²)	Clamping force N (0.6MPa)	Clamping arm type G1	
							Standard	Extension
MTAS-25M	$\phi 25$	$\phi 14$	9	13	491 / 337	200	50	70

Cylinder weight

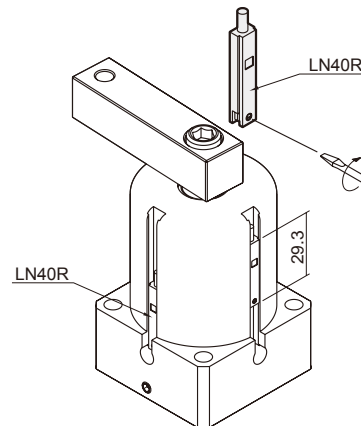
Standard type

Model	Weight (kg)
MTAS-25	0.3
MTAS-32	0.7
MTAD-32	0.9
MTAS-40	0.9
MTAD-40	1.1
MTAS-50	1.6
MTAD-50	1.8
MTAS-63	2.1
MTAD-63	2.3

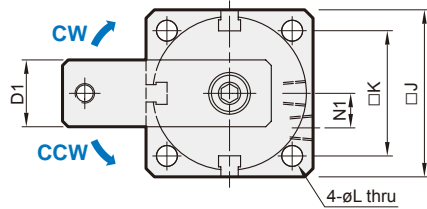
With magnet type

Model	Weight (kg)
MTAS-25M	0.4
MTAS-32M	0.73
MTAD-32M	0.93
MTAS-40M	0.95
MTAD-40M	1.15
MTAS-50M	1.65
MTAD-50M	1.85
MTAS-63M	2.22
MTAD-63M	2.42

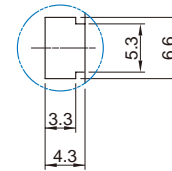
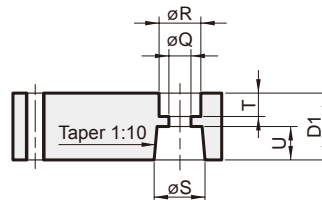
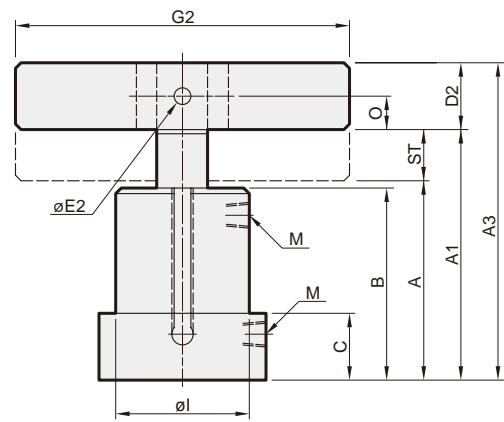
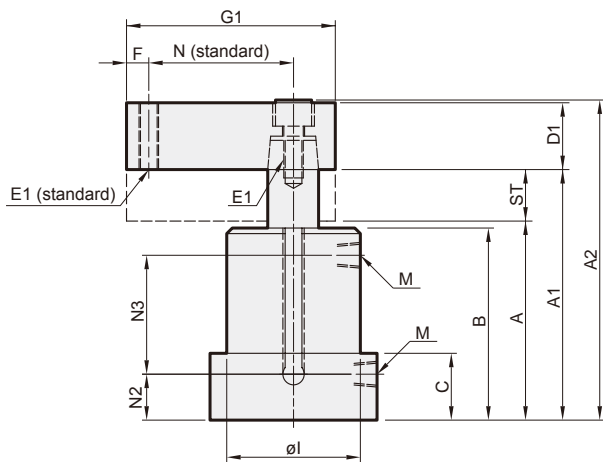
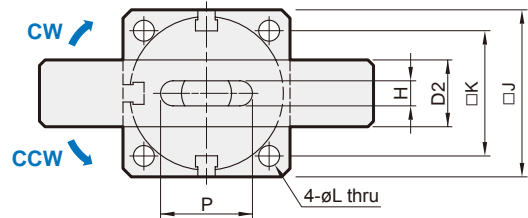
Installation of sensor switch



MTAS



MTAD



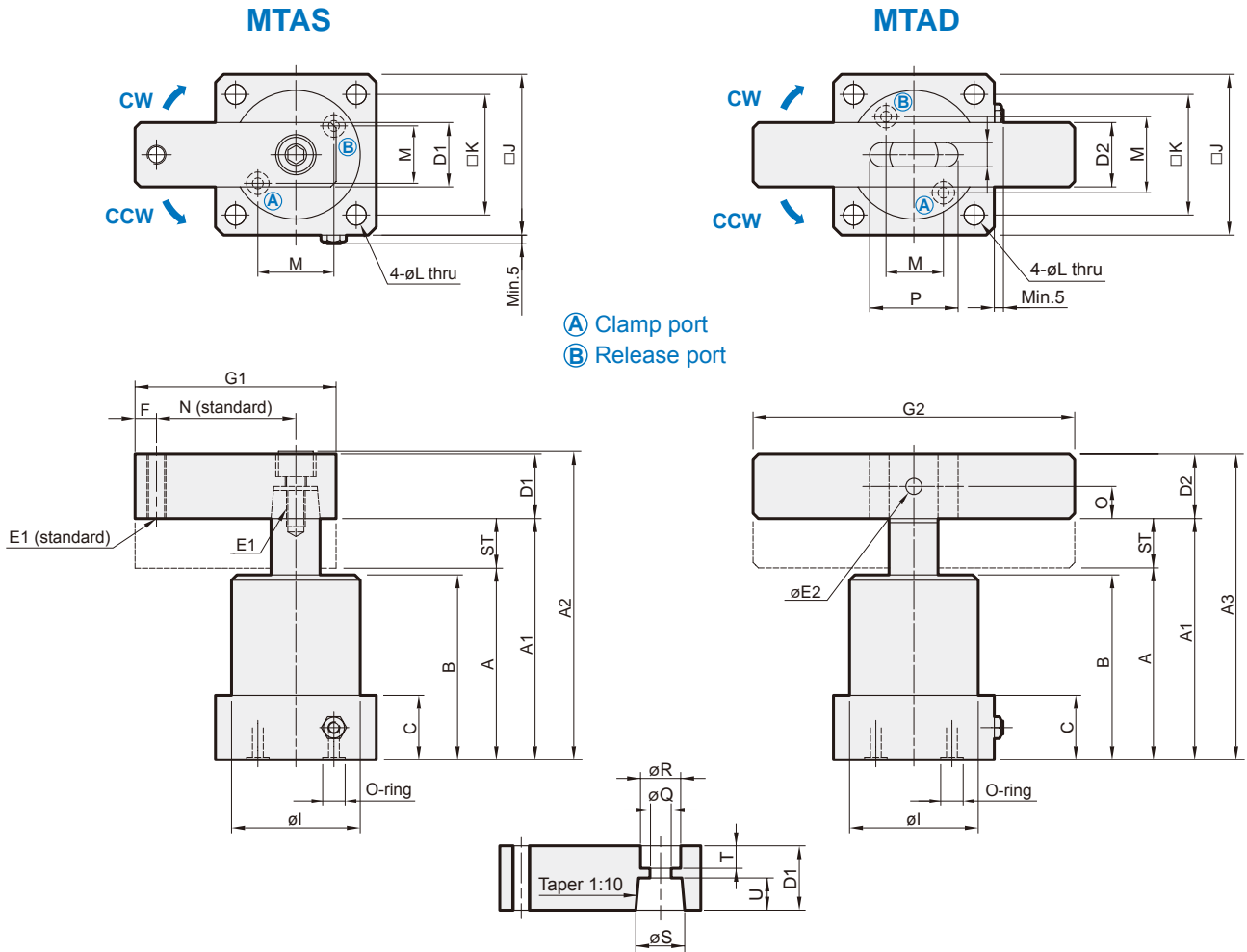
Single side clamping arm Auto switch mounting groove position

Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/pull (mm ²)	Clamping force N (0.6 MPa)	Clamping arm type				
							G1		G2		
							Standard	Extension	Standard	Extension	
MTAS-32M	MTAD-32M	$\varnothing 32$	$\varnothing 16$	11	15	804 / 603	360	70	100	140	200
MTAS-40M	MTAD-40M	$\varnothing 40$	$\varnothing 16$	11	15	1257 / 1056	630	75	100	140	200
MTAS-50M	MTAD-50M	$\varnothing 50$	$\varnothing 20$	13	17	1963 / 1649	980	85	130	160	230
MTAS-63M	MTAD-63M	$\varnothing 63$	$\varnothing 20$	13	17	3117 / 2803	1680	95	130	160	230

Code Model	A	A1	A2	A3	B	C	D1	D2	E1	E2	F	H	I	J	K	
MTAS-32M	MTAD-32M	87	113	(133)	132	83	28	$\square 19$	$\square 19$	M8x1.25	$\varnothing 8$	8	9	$\varnothing 46$	50	40
MTAS-40M	MTAD-40M	87	113	(133)	132	83	28	$\square 19$	$\square 19$	M8x1.25	$\varnothing 8$	8	9	$\varnothing 55$	60	48
MTAS-50M	MTAD-50M	99	129	(155.4)	151.2	95	31	$\square 25.4$	$\square 22.2$	M10x1.5	$\varnothing 8$	10	10	$\varnothing 65$	70	57
MTAS-63M	MTAD-63M	99	129	(155.4)	151.2	95	31	$\square 25.4$	$\square 22.2$	M10x1.5	$\varnothing 8$	10	10	$\varnothing 78$	83	67

Code Model	L	M	N	N1	N2	N3	O	P	Q	R	S	ST	T	U	
MTAS-32M	MTAD-32M	$\varnothing 5.6$	Rc1/8	50	11.5	19	50	9.5	25	$\varnothing 9$	$\varnothing 14$	$\varnothing 16$	26	7	9.5
MTAS-40M	MTAD-40M	$\varnothing 6.8$	Rc1/8	55	14	19	50	9.5	25	$\varnothing 9$	$\varnothing 14$	$\varnothing 16$	26	7	9.5
MTAS-50M	MTAD-50M	$\varnothing 6.8$	Rc1/8	60	17	21	59	11.1	29	$\varnothing 11$	$\varnothing 17$	$\varnothing 20$	30	9	12.5
MTAS-63M	MTAD-63M	$\varnothing 9$	Rc1/8	70	20	21	59	11.1	29	$\varnothing 11$	$\varnothing 17$	$\varnothing 20$	30	9	12.5

FC



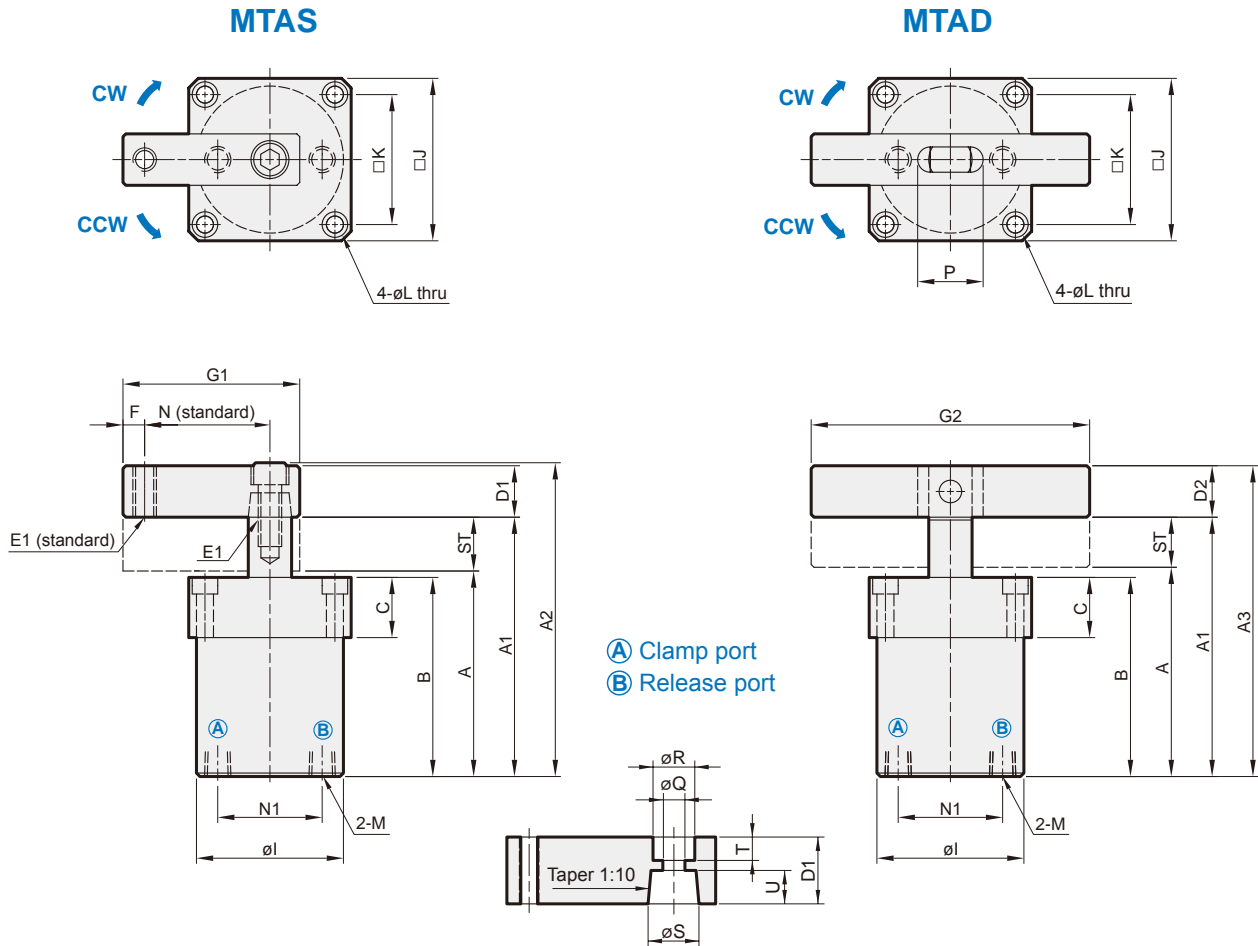
Single side clamping arm

Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/ pull (mm ²)	Clamping force N (0.6 MPa)	Clamping arm type			
							G1		G2	
							Standard	Extension	Standard	Extension
MTAS-32 FC / MTAD-32 FC	ø32	ø16	11	15	804 / 603	360	70	100	140	200
MTAS-40 FC / MTAD-40 FC	ø40	ø16	11	15	1257 / 1056	630	75	100	140	200
MTAS-50 FC / MTAD-50 FC	ø50	ø20	13	17	1963 / 1649	980	85	130	160	230
MTAS-63 FC / MTAD-63 FC	ø63	ø20	13	17	3117 / 2803	1680	95	130	160	230

Code Model	A	A1	A2	A3	B	C	D1	D2	E1	E2	F	H	I	J	K
MTAS-32 FC / MTAD-32 FC	82	108	(129.5)	127	78	22	□19	□19	M8x1.25	ø8	8	9	ø46	50	40
MTAS-40 FC / MTAD-40 FC	82	108	(129.5)	127	78	22	□19	□19	M8x1.25	ø8	8	9	ø55	60	48
MTAS-50 FC / MTAD-50 FC	94	124	(152.4)	146.2	90	25	□25.4	□22.2	M10x1.5	ø8	10	10	ø65	70	57
MTAS-63 FC / MTAD-63 FC	94	124	(152.4)	146.2	90	25	□25.4	□22.2	M10x1.5	ø8	10	10	ø78	83	67

Code Model	L	M	N	O	P	Q	R	S	ST	T	U	O-ring
MTAS-32 FC / MTAD-32 FC	ø5.6	19	50	9.5	25	ø9	ø14	ø16	26	7	9.5	P7
MTAS-40 FC / MTAD-40 FC	ø6.8	23	55	9.5	25	ø9	ø14	ø16	26	7	9.5	P7
MTAS-50 FC / MTAD-50 FC	ø6.8	28	60	11.1	29	ø11	ø17	ø20	30	9	12.5	P9
MTAS-63 FC / MTAD-63 FC	ø9	32	70	11.1	29	ø11	ø17	ø20	30	9	12.5	P9

FA



Single side clamping arm

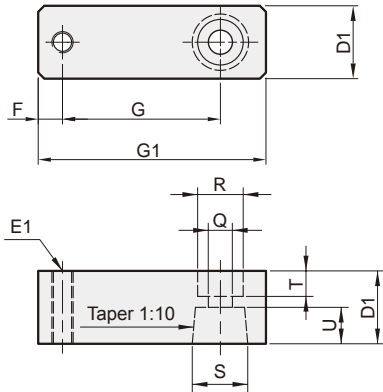
Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/pull (mm ²)	Clamping force N (0.6 MPa)	Clamping arm type				
							G1		G2		
							Standard	Extension	Standard	Extension	
MTAS-32 FA	MTAD-32 FA	$\varnothing 32$	$\varnothing 16$	11	15	804 / 603	360	70	100	140	200
MTAS-40 FA	MTAD-40 FA	$\varnothing 40$	$\varnothing 16$	11	15	1257 / 1056	630	75	100	140	200
MTAS-50 FA	MTAD-50 FA	$\varnothing 50$	$\varnothing 20$	13	17	1963 / 1649	980	85	130	160	230
MTAS-63 FA	MTAD-63 FA	$\varnothing 63$	$\varnothing 20$	13	17	3117 / 2803	1680	95	130	160	230

Code Model	A	A1	A2	A3	B	C	D1	D2	E1	E2	F	H	I	J	K	
MTAS-32 FA	MTAD-32 FA	82	108	(129.5)	127	78	22	$\square 19$	$\square 19$	M8x1.25	$\varnothing 8$	8	9	$\varnothing 46$	50	40
MTAS-40 FA	MTAD-40 FA	82	108	(129.5)	127	78	22	$\square 19$	$\square 19$	M8x1.25	$\varnothing 8$	8	9	$\varnothing 55$	60	48
MTAS-50 FA	MTAD-50 FA	94	124	(152.4)	146.2	90	25	$\square 25.4$	$\square 22.2$	M10x1.5	$\varnothing 8$	10	10	$\varnothing 65$	70	57
MTAS-63 FA	MTAD-63 FA	94	124	(152.4)	146.2	90	25	$\square 25.4$	$\square 22.2$	M10x1.5	$\varnothing 8$	10	10	$\varnothing 78$	83	67

Code Model	L	M	N	N1	O	P	Q	R	S	ST	T	U	
MTAS-32 FA	MTAD-32 FA	$\varnothing 5.6, \varnothing 9 \times 5.5dp$	Rc1/8	50	32	9.5	25	$\varnothing 9$	$\varnothing 14$	$\varnothing 16$	26	7	9.5
MTAS-40 FA	MTAD-40 FA	$\varnothing 6.8, \varnothing 10.5 \times 6.5dp$	Rc1/8	55	40	9.5	25	$\varnothing 9$	$\varnothing 14$	$\varnothing 16$	26	7	9.5
MTAS-50 FA	MTAD-50 FA	$\varnothing 6.8, \varnothing 10.5 \times 6.5dp$	Rc1/8	60	50	11.1	29	$\varnothing 11$	$\varnothing 17$	$\varnothing 20$	30	9	12.5
MTAS-63 FA	MTAD-63 FA	$\varnothing 9, \varnothing 14 \times 9dp$	Rc1/8	70	63	11.1	29	$\varnothing 11$	$\varnothing 17$	$\varnothing 20$	30	9	12.5

Single side clamping arm

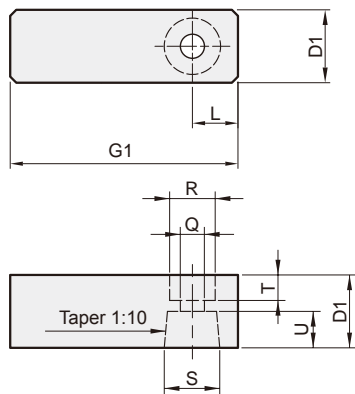
(Standard type with thread)



Code Model	D1	F	G	G1	E1	Q	R	S	T	U
MTAS-25	□15.9	6	35	50	M6×1.0	∅6.8	∅11	∅14	5	8.5
MTAS-32	□19	8	50	70	M8×1.25	∅9	∅14	∅16	7	9.5
MTAS-40	□19	8	55	75	M8×1.25	∅9	∅14	∅16	7	9.5
MTAS-50	□25.4	10	60	85	M10×1.5	∅11	∅17	∅20	9	12.5
MTAS-63	□25.4	10	70	95	M10×1.5	∅11	∅17	∅20	9	12.5

Single side clamping arm B type

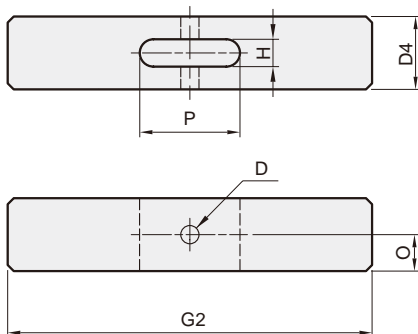
(Extension type without thread)



Code Model	D1	F	G1	L	Q	R	S	T	U
MTAS-25 B	□15.9	6	70	15	∅6.8	∅11	∅14	5	8.5
MTAS-32 B	□19	8	100	20	∅9	∅14	∅16	7	9.5
MTAS-40 B	□19	8	100	20	∅9	∅14	∅16	7	9.5
MTAS-50 B	□25.4	10	130	25	∅11	∅17	∅20	9	12.5
MTAS-63 B	□25.4	10	130	25	∅11	∅17	∅20	9	12.5

Double side clamping arm

(Standard & Extension type)



Double side clamping arm (Standard type)

Code Model	Tube I.D.	D	D4	G2	H	O	P
MTAD-32	∅32	∅8	□19	140	9	9.5	25
MTAD-40	∅40	∅8	□19	140	9	9.5	25
MTAD-50	∅50	∅8	□22.2	160	10	11.1	29
MTAD-63	∅63	∅8	□22.2	160	10	11.1	29

Double side clamping arm B type (Extension type)

Code Model	Tube I.D.	D	D4	G2	H	O	P
MTAD-32 B	∅32	∅8	□19	200	9	9.5	25
MTAD-40 B	∅40	∅8	□19	200	9	9.5	25
MTAD-50 B	∅50	∅8	□22.2	230	10	11.1	29
MTAD-63 B	∅63	∅8	□22.2	230	10	11.1	29



Features

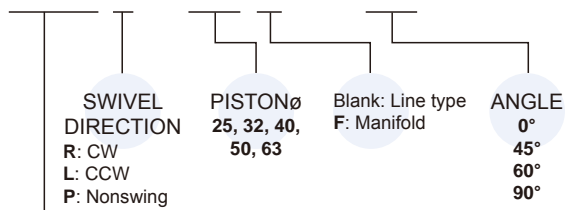
- Double clamp retracting, the piston rod rotates, causing the clamping arm to swing in either a clockwise or counterclockwise direction. Clamping then takes place as the rod continues to retract in a straight line, pulling the arm against the workpieces.
- Pull cylinder type, Available models offer angles of rotation of 0°, 45°, 60° or 90°.
- The cylinder body is made of aluminum alloy and the surface is hard membrane treated.
- Mounting methods: Square base type, threaded type, upper flange type.

Note

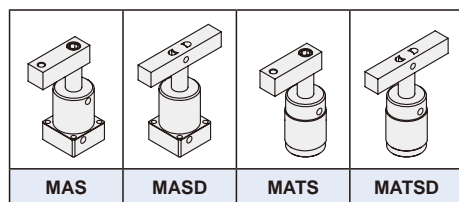
- When it is necessary to change the length of the clamping arm, it should be noted that do not exceed 1.5 times of the original G value in order to avoid the serious slanting of the piston rod.
- Suggested to add a flow control valve to the hydraulic inlet to control the motion of the swing angle in order to prevent the inertial impact.
- A workpiece should not be clamped within a swing stroke, and it should be clamped within the vertical downward clamping stroke.
- Whenever placing and taking off a workpiece, it is necessary to use an air gun to clean the piston and the seal for removing the iron slag or foreigner objects attached thereon in order to prevent the foreigner objects from entering the seal to cause oil leakage.

Order example

MAS L - 40 F - 90



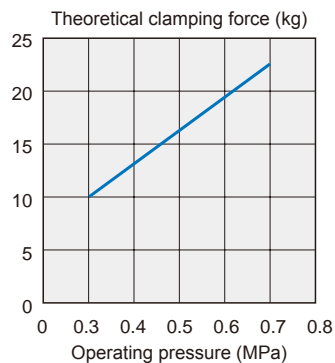
MODEL



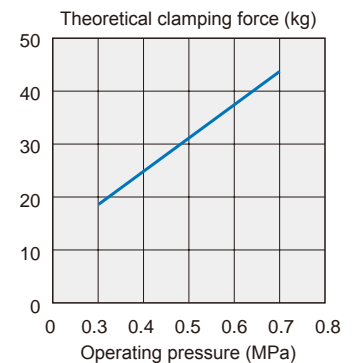
* MATS and MATSD produced by order.

Schematic view showing a theoretical clamping force under different pneumatic pressure.

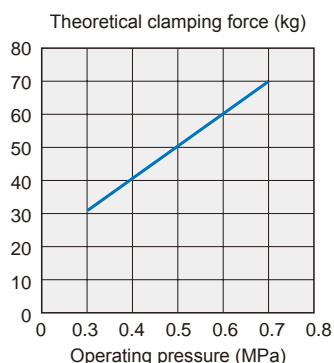
MAS-25



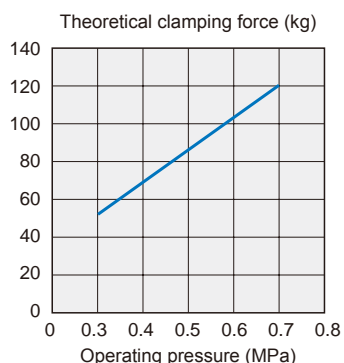
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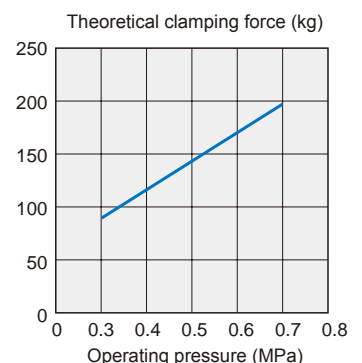
MAS-40



MAS-50

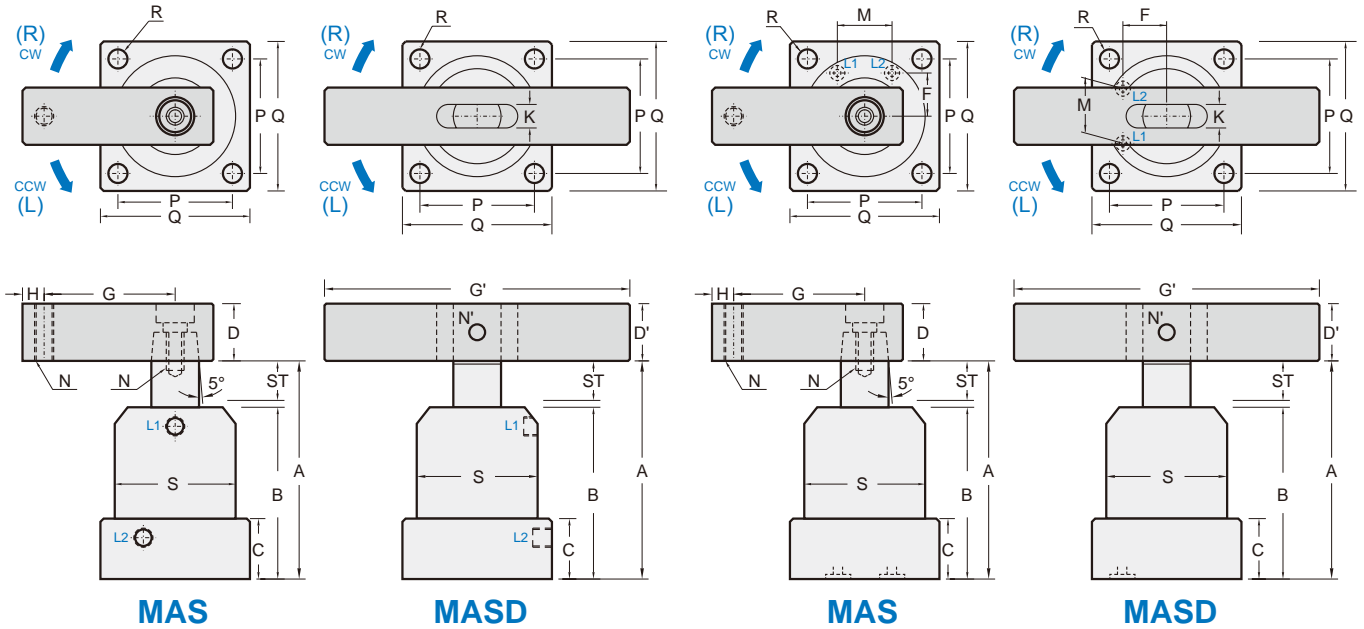


MAS-63



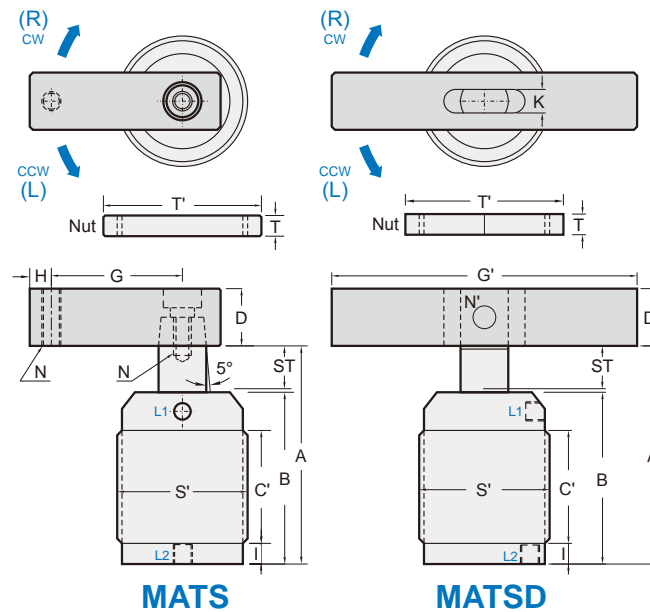
MAS*

MAS*-F


MAS
MASD
MAS
MASD

Flange type	MAS-25	MAS-32 MASD-32	MAS-40 MASD-40	MAS-50 MASD-50	MAS-63 MASD-63
Max. operating pressure	1 MPa				
Normal operating pressure	0.4~0.6 MPa				
Cylinder operating	Double acting				
Swivel angle	90°(60°,45°,0°)±2°				
Swivel stroke (mm)	12	12	12	14	14
Clamping stroke (mm)	14	14	15	15	15
Piston \varnothing (mm)	25	32	40	50	63
Piston rod \varnothing (mm)	14	16	16	20	20
Theoretical force (0.5 MPa)	16kg	30kg	50kg	85kg	140kg
A (unclamp) (mm)	95.5	102.5	106	113	119
B (mm)	65.5	71	75	80	86
C (mm)	23	23	26	26	30
D (mm)	□16	□19	□19	□25.4	□25.4
D' (mm)	—	□19	□19	□22	□22
G (mm)	30	50	50	70	70
G' (mm)	—	100	100	120	120
H (mm)	8	9	9	10	10
K (mm)	—	9	9	10	10
L1 (clamp) L2 (unclamp)	M5x0.8	Rc1/8	Rc1/8	Rc1/8	Rc1/8
O-ring manifold	S3	S4	S4	S4	S4
N (mm)	M6x1	M8x1.25	M8x1.25	M10x1.5	M10x1.5
N' (mm)	—	∅8	∅8	∅8	∅8
P (mm)	30	44	48	55	64
Q (mm)	40	54	58	68	80
R (mm)	∅4.5	∅6.5	∅6.5	∅8.5	∅8.5
S (mm)	∅35	∅50	∅55	∅65	∅75
M (mm)	18	22	26	30	40
F (mm)	12.5	17	19.5	24	29
Weight (kg)	0.4	0.7	0.85	1.3	1.8

MATS*



Threaded type (produced by order)	MATS-25	MATS-32 MATSD-32	MATS-40 MATSD-40	MATS-50 MATSD-50	MATS-63 MATSD-63
Max. operating pressure	1 MPa				
Normal operating pressure	0.4~0.6 MPa				
Cylinder operating	Double acting				
Swivel angle	90°(60°,45°,0°) $\pm 2^\circ$				
Swivel stroke (mm)	12	12	12	14	14
Clamping stroke (mm)	14	14	15	15	15
Piston \varnothing (mm)	25	32	40	50	63
Piston rod \varnothing (mm)	14	16	16	20	20
Theoretical force (0.5 MPa)	16kg	30kg	50kg	85kg	140kg
A (unclamp) (mm)	95.5	102.5	106	113	119
B (mm)	66.5	71	75	80	86
C' (mm)	35	40	45	50	56
D (mm)	$\square 16$	$\square 19$	$\square 19$	$\square 25.4$	$\square 25.4$
D' (mm)	—	$\square 19$	$\square 19$	$\square 22$	$\square 22$
G (mm)	30	50	50	70	70
G' (mm)	—	100	100	120	120
H (mm)	8	9	9	10	10
I (mm)	7	9	9	9	10
K (mm)	—	9	9	10	10
L1 (clamp) L2 (unclamp)	M5x0.8	Rc1/8	Rc1/8	Rc1/8	Rc1/8
N (mm)	M6x1	M8x1.25	M8x1.25	M10x1.5	M10x1.5
N' (mm)	—	$\varnothing 8$	$\varnothing 8$	$\varnothing 8$	$\varnothing 8$
S' (mm)	M40x1.5	M50x1.5	M55x1.5	M65x1.5	M80x1.5
T ($\times 2$ pcs nut) (mm)	9	11	11	12	12
T' (mm)	$\varnothing 58$	$\varnothing 70$	$\varnothing 75$	$\varnothing 85$	$\varnothing 100$
Weight (kg)	0.8	1.1	1.25	1.7	2



Order example of cylinder

MCKD — 50 — 120 □ — □ — RNKD

MODEL

TUBE I.D.
50
63

PORT THREAD
Blank: Rc thread
G: G thread
NPT: NPT thread

SENSOR SWITCH
Blank: Without
RNKD: NPN
RPKD: PNP

Available release angle range (*)

- 15: 15°
- 30: 30°
- 45: 45°
- 60: 60°
- 75: 75°
- 90: 90°
- 105: 105°
- 120: 120°
- 135: 135°

HANDLE

Blank: Without	L: Left side	R: Right side

- * The available clamping angle will differ from using a handle or not.
- * The available clamping angle will differ from the types of clamping arm installation.
- * Please check the latter pages for the details.

Order example of clamping arm

AM — MCKD — 50 — 15 R S

MODEL

TUBE I.D.
50
63

PORT SIZE
S: D1: ø6, D2: ø9
B: D1: ø8, D2: ø10.2

OFFSET

15	
45	

MOUNTING POSITION

C: Center	
L: Left	
R: Right	

Features

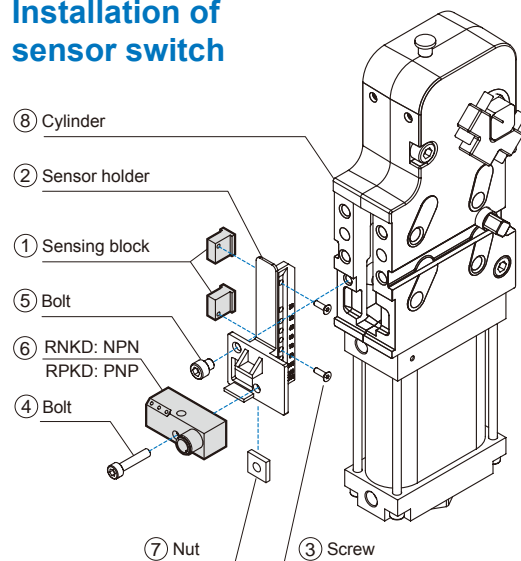
- Oval piston design for space saving.
- Clamping arm angle is adjustable via adjusting bolt with ease.
- 12 types of clamping arm for various usage.
- 15° minimum release angle for lowering clamping time.
- Welding slag and magnetic field proof sensor available.
- Cylinder remains clamping position with self-locking mechanism even if there is no air input.

Specification

Model	MCKD	
Acting type	Double acting	
Tube I.D. (mm)	50	63
Port size	Rc1/8	Rc1/4
Release angle range	15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°	
Medium	Filted air	
Operating pressure range	0.3~0.8 MPa	
Proof pressure	1.2 MPa	
Ambient temperature	-10~+60°C (No freezing)	
Cushion	Cushion pad (*)	
Min. operating time	At least 1.0 second to clamp and unclamp	
Sensor switch	RNKD (Please refer to page 5-14)	

* Need to install speed controller. Please refer to page 7-15 (Vol.1).

Installation of sensor switch



Installation step

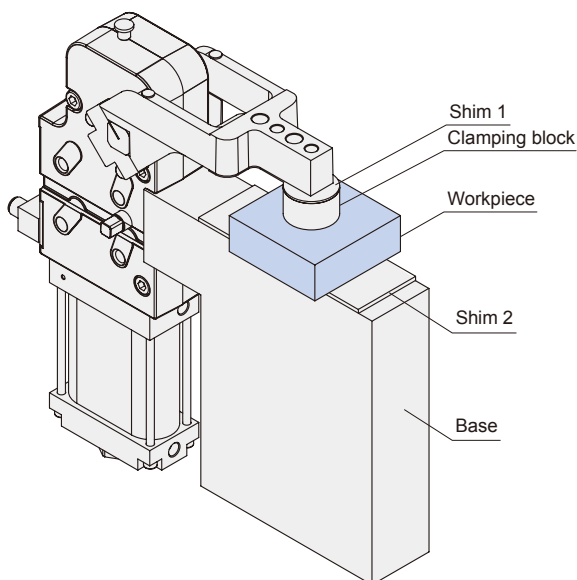
1. Use (3) to mount (1) on (2).
2. Use (4) and (7) to mount (6) on (2).
3. Use (5) to mount (2) on (8).

Common precautions

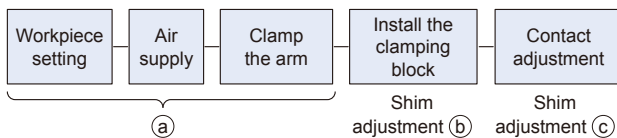
- ① Use F.R.L. unit with 5 μm element filter.
- ② Clean the power clamp cylinder with air blow before piping.
- ③ Use standard arm in Mindman catalog only.
- ④ Use two speed controller at both ports. Clamping and releasing speed both must be more than 1 second.

Mounting guide

① Basic clamping method



② Mounting sequence

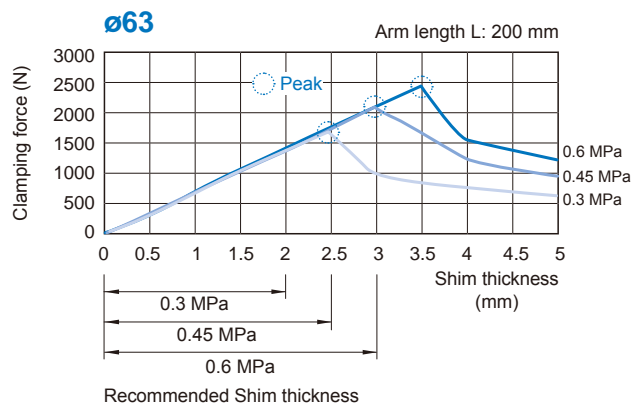
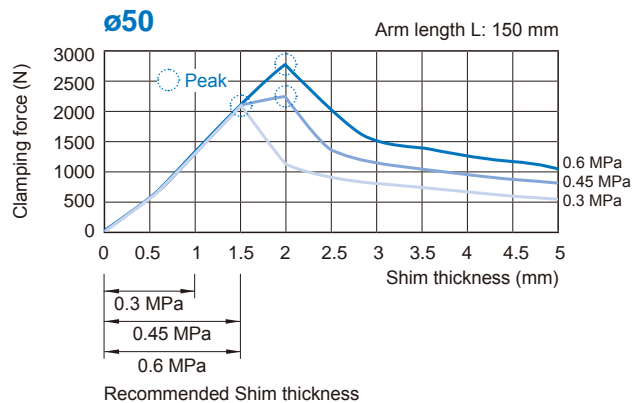
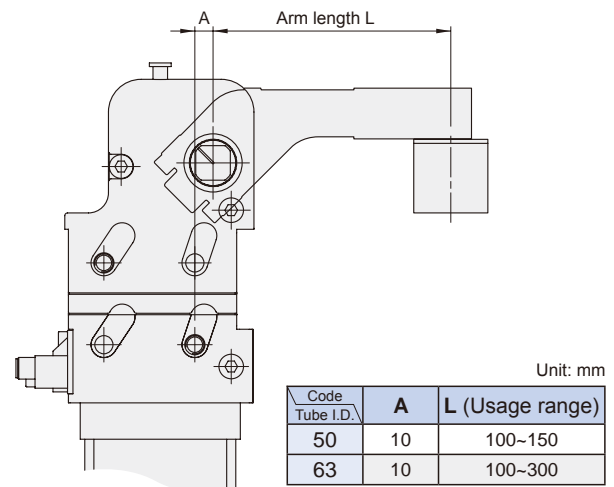


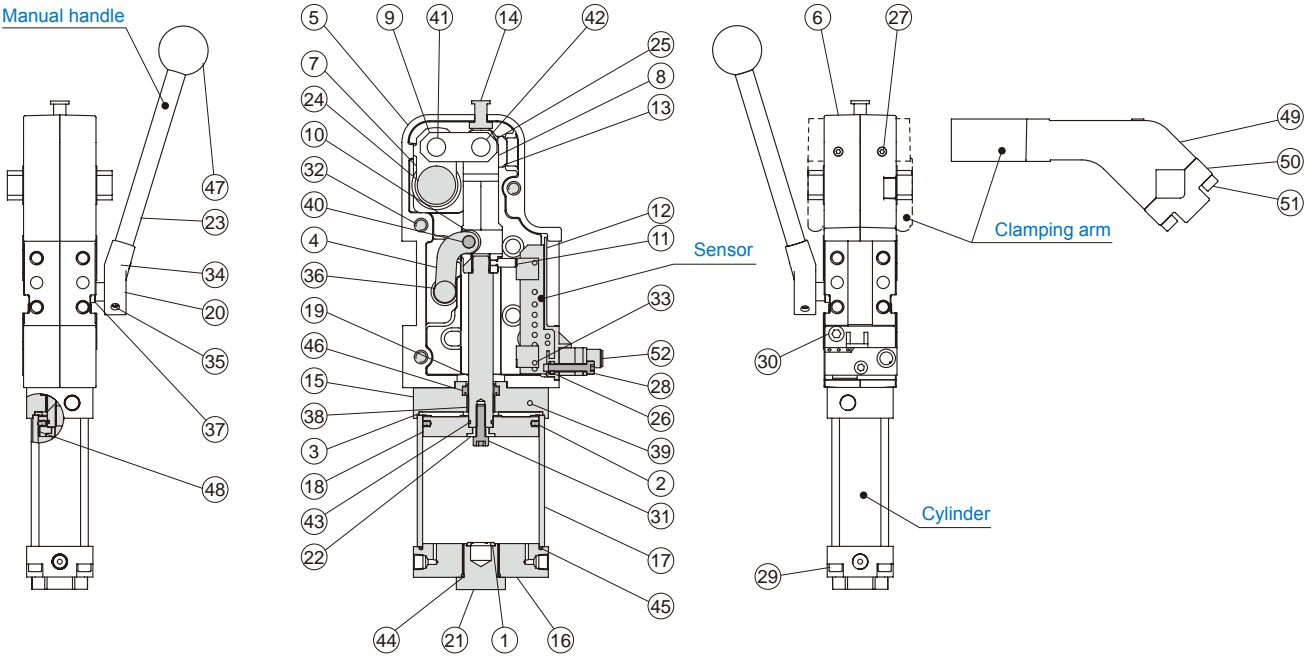
③ Details

- a) Place the workpiece on the base. Clamp the arm to the end of stroke without installing the clamping block.
- b) Place the clamping block between arm and workpiece. Find suitable shim to insert into the gap between arm and clamping block. Make the gap is nearly 0. Theoretically there is no clamping force.
- c) Check the clamping force curve and find the needed clamping force and operation pressure. Insert a second shim with corresponding thickness between workpiece and base and adjust the pressure. The setting is done. (There is a 10% tolerance in our clamping force chart due to the tolerance of each part.)

Clamping force and mounting details

- ① The pictures below show the clamping force curve. There is always a peak for highest clamping force in every curve. When the thickness of inserted second shim exceeds the peak of the force curve, the self-locking mechanism doesn't work.
- ② The arm length is defined as picture below.



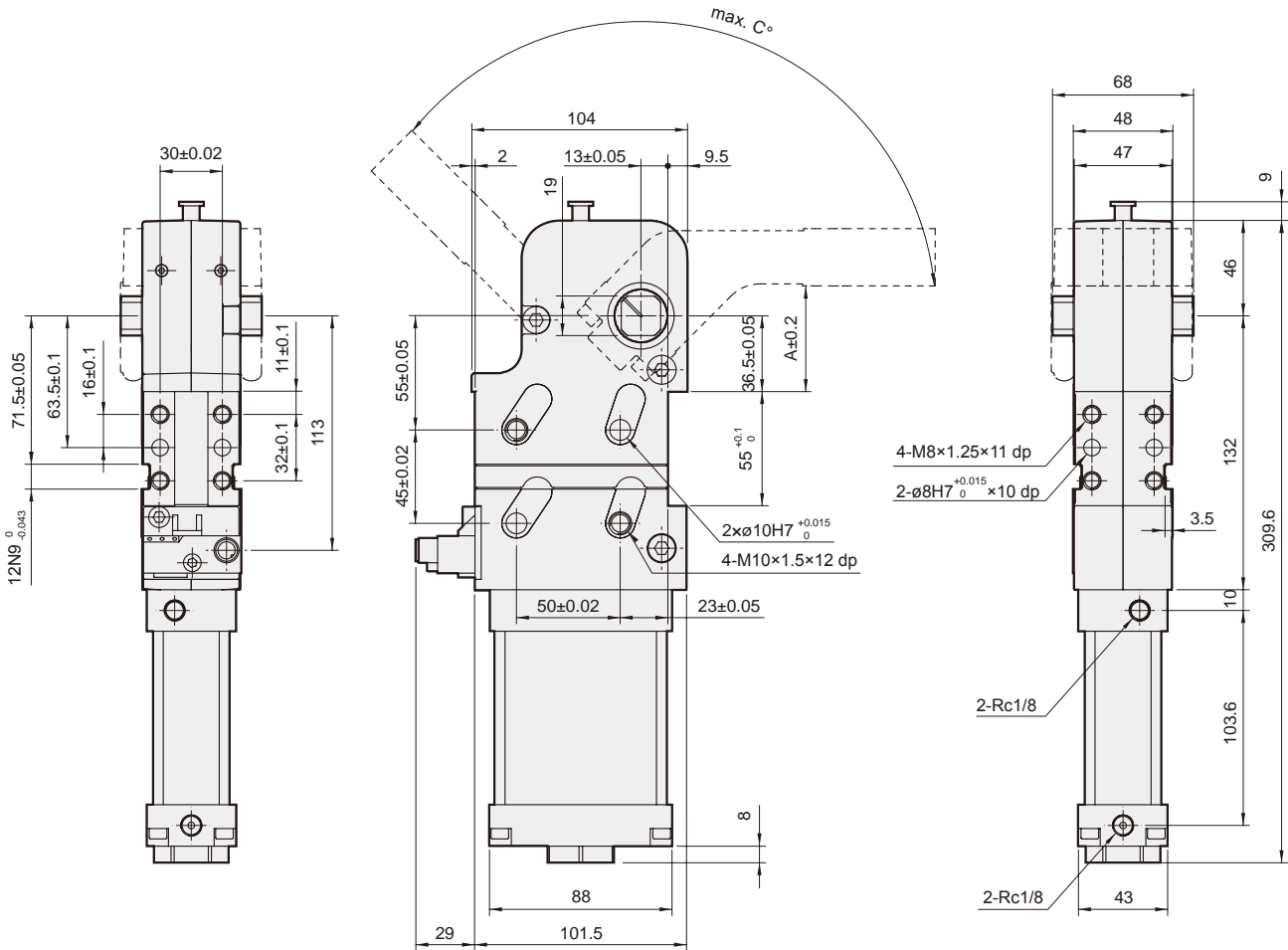


Material

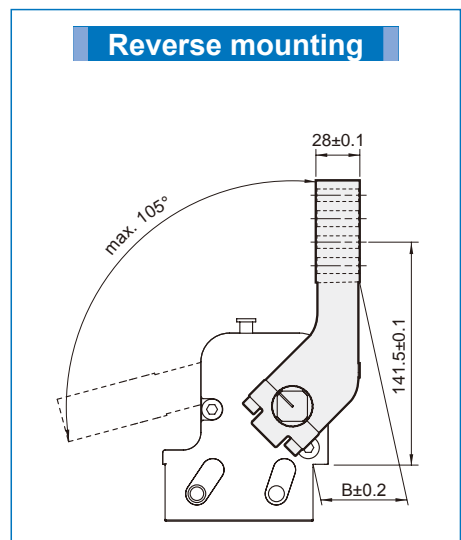
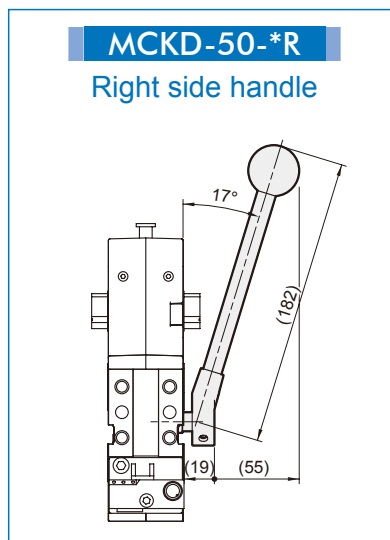
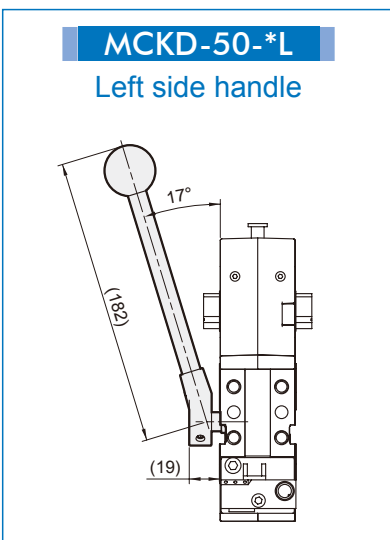
N: Without handle, L: Left side handle, R: Right side handle

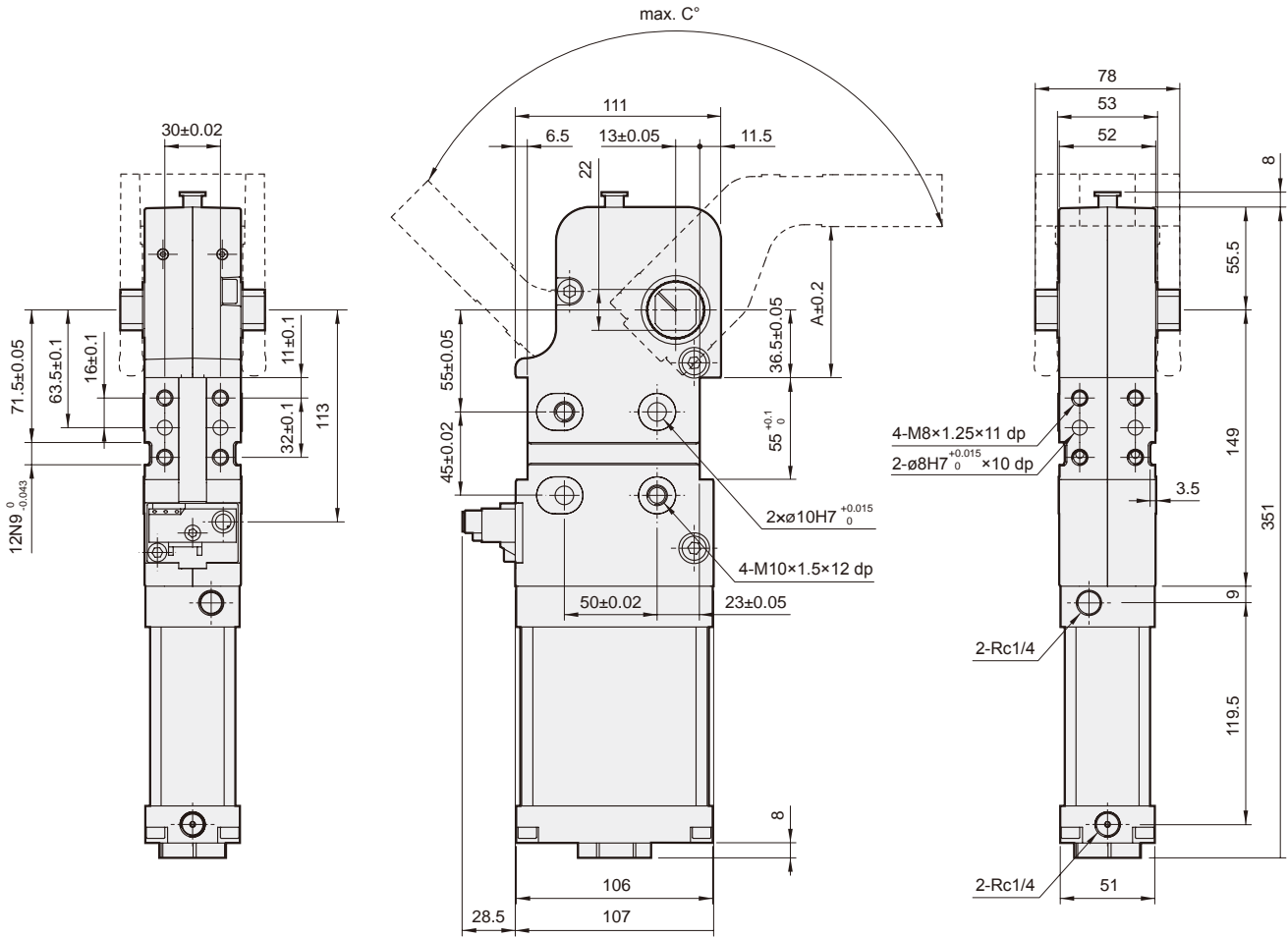
No.	Part name	Material	Q'y	
			N	L,R
1	Cushion pad	TPU	1	
2	Piston ring	HNBR	1	
3	Cushion pad	TPU	1	
4	Manual shaft	Carbon steel	0	1
5	Right side cover	Aluminum alloy	1	
6	Left side cover	Aluminum alloy	1	
7	Drive shaft	Carbon steel	1	
8	Y connector	Carbon steel	1	
9	Connecting bar	Carbon steel	1	
10	Wheel	Carbon steel	0	2
11	Sensing stick	Carbon steel	1	
12	Sensor holder	Plastic	1	
13	Stopper	Carbon steel	2	
14	Bump pin	Carbon steel	1	
15	Rod cover	Aluminum alloy	1	
16	End cover	Aluminum alloy	1	
17	Cylinder	Aluminum alloy	1	
18	Piston	Aluminum alloy	1	
19	Piston rod	Stainless steel	1	
20	Handle holder	Carbon steel	0	1
21	Adj. bolt	Iron	1	
22	Locking rod	Carbon steel	1	
23	Rod	Stainless steel	0	1
24	Needle bearing	-	2	
25	Needle bearing	-	2	
26	Square nut	Carbon steel	1	

No.	Part name	Material	Q'y	
			N	L,R
27	Bolt	Carbon steel	2	
28	Bolt	Carbon steel	1	
29	Bolt	Carbon steel	4	
30	Bolt	Carbon steel	1	
31	Bolt	Carbon steel	1	
32	Bolt	Carbon steel	3	
33	Bolt	Carbon steel	2	
34	Screw	Carbon steel	0	1
35	Screw	Carbon steel	0	2
36	Bush	Bearing alloy	0	1
37	Bush	Bearing alloy	0	1
38	Bush	Bearing alloy	1	
39	Ball	Stainless steel	1	
40	Pin	Bearing steel	0	1
41	Pin	Bearing steel	1	
42	Pin	Bearing steel	1	
43	O-ring	NBR	1	
44	O-ring	NBR	1	
45	O-ring	NBR	1	
46	Rod packing	NBR	1	
47	Ball	Bakelite	0	1
48	Wearing plate	POM	2	
49	Clamping arm	Carbon steel	1	
50	Arm holder	Carbon steel	2	
51	Bolt	Carbon steel	4	
52	Sensor switch	-	1	

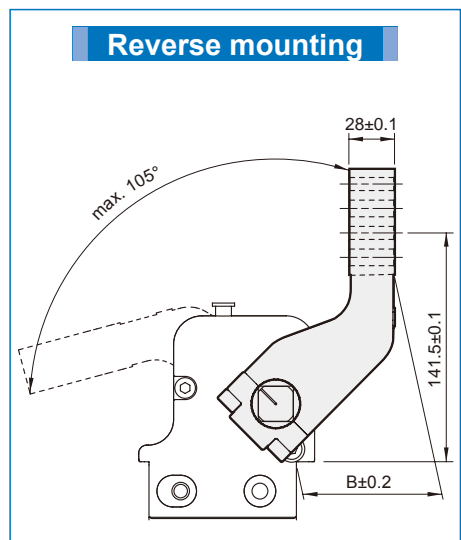
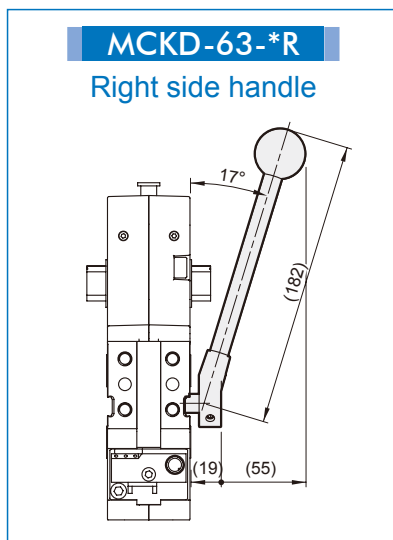
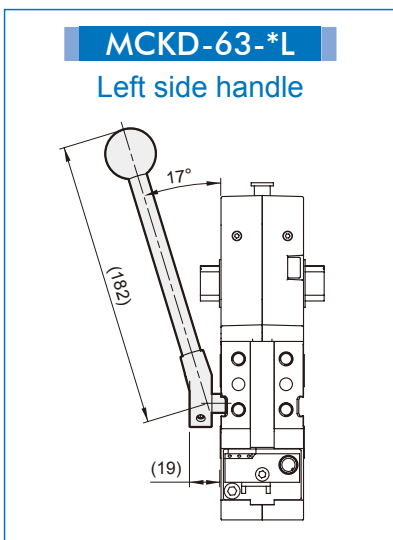


Code	Offset	A	B	C	
				Standard	Handle
50	15	51.5	30	135	120
	45	81.5	60	135	120



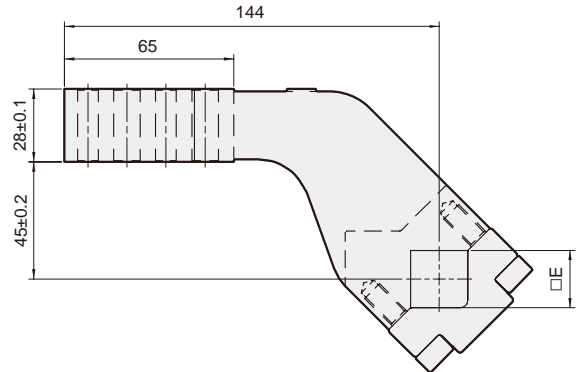
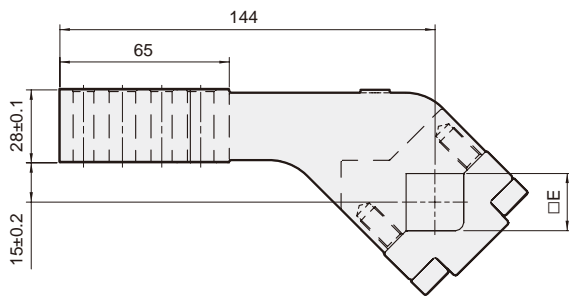
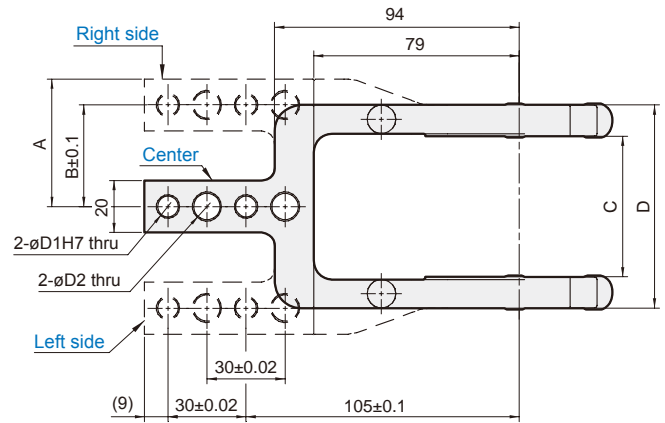
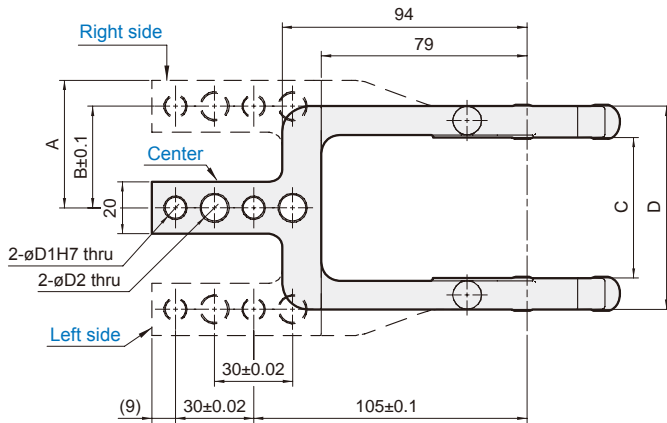


Code Tube I.D.	Offset	A	B	C	
				Standard	Handle
63	15	51.5	30	135	120
	45	81.5	60	135	120



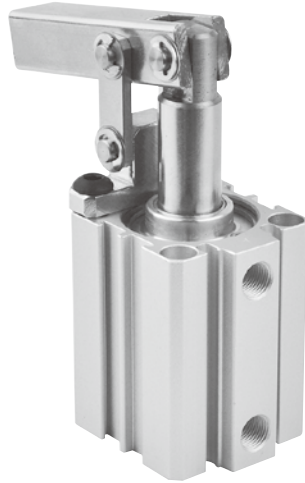
15 type

45 type



Code Tube I.D.	A	B	C	D	D1		D2		E
					S*	B*	S*	B*	
50	44	34	48	68	6	8	9	10.2	19
63	47	37	54	78	6	8	9	10.2	22

* S, B was the port size code of clamping arm.



Order example

MCKB – 32 M – □

MODEL TUBE I.D. M: Magnet PORT THREAD

Blank: Rc thread
G: G thread
NPT: NPT thread

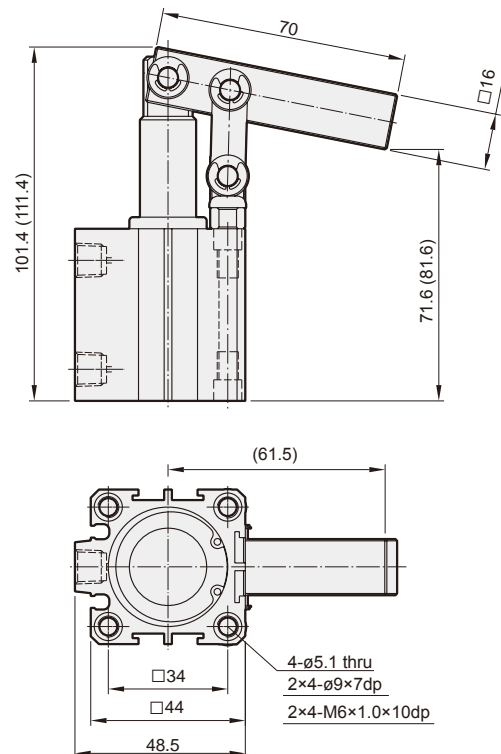
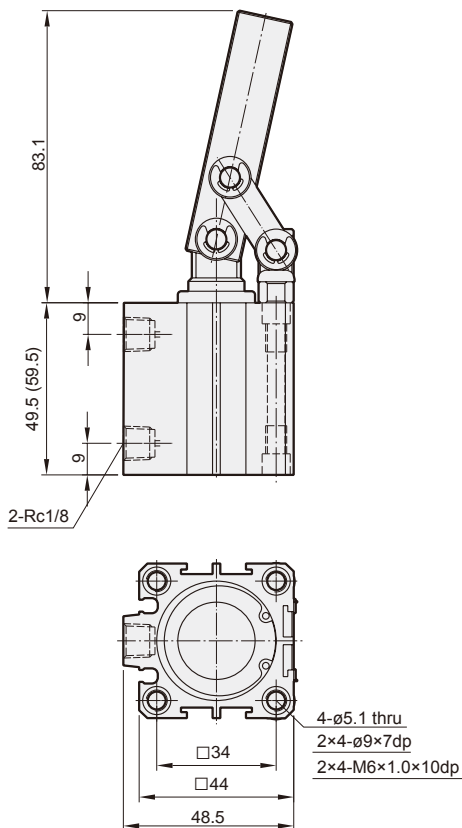
Features

- Lever type clamp cylinder gives high clamping force.
- Simple mounting of sensors on all four sides of body.
- Hard anodised body gives smooth lines and high corrosion resistance.

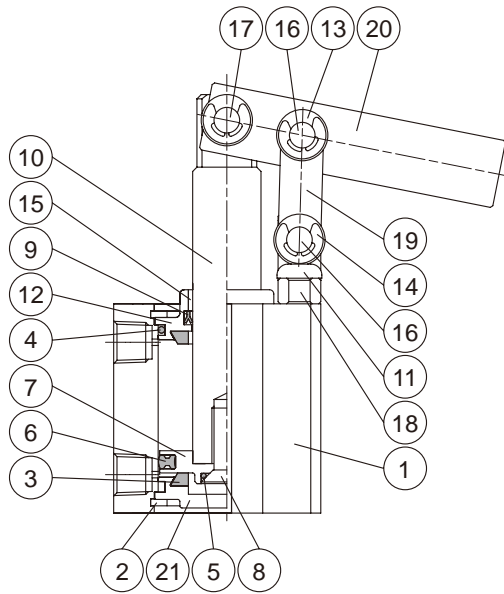
Specification

Model	MCKB
Acting type	Double acting
Tube I.D. (mm)	32
Port size	Rc1/8
Operating fluid	Air
Operating pressure range	0.1~1 MPa
Proof pressure	1.5 MPa
Ambient temperature	-5~+60°C (No freezing)
Lubrication	Cylinder: Not required Lever: Grease
Available speed range	50~500 mm/sec
Sensor switch (*)	RCB, RCE, RCE1, RDEP

* RCB, RCE, RCE1, RDEP specification, please refer to page 5-4, 6, 7, 10.



*(): Dimension for with magnet.



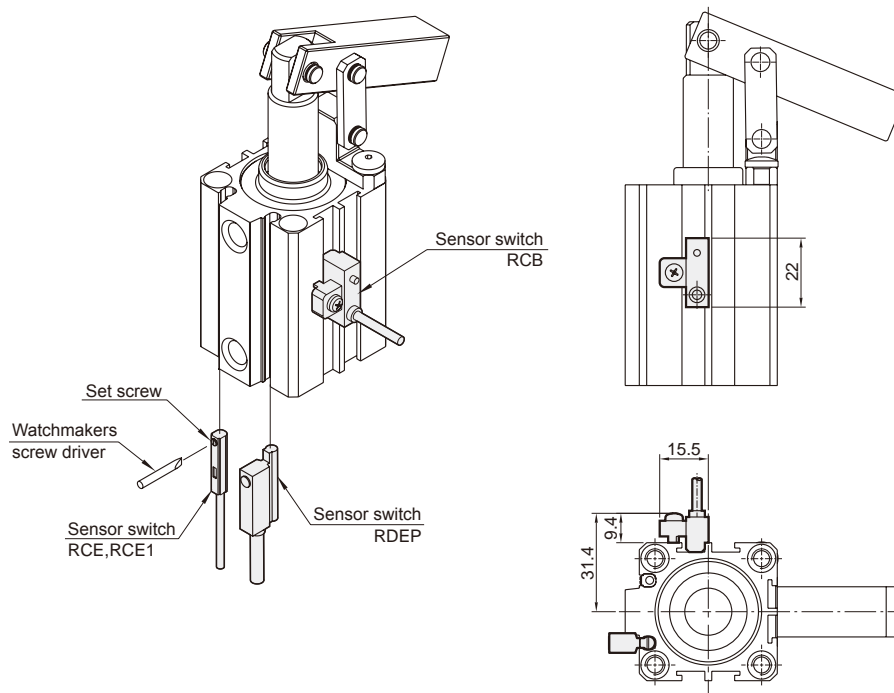
Order example of repair kits

Tube I.D.	Repair kits
ø32	PS-MCKB-32

Material

No.	Part name	Material	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy	1	
2	Snap ring	Spring steel	2	
3	Cushion	NBR	2	●
4	Cover gasket	NBR	2	●
5	Piston gasket	NBR	1	●
6	Piston packing	NBR	1	●
7	Piston	Aluminum alloy	1	
8	Piston bolt	SCM	1	
9	Rod packing	NBR	1	●
10	Piston rod	Carbon steel	1	
11	Screw	SCM	2	
12	Rod cover	Aluminum alloy	1	
13	Washer	Carbon steel	6	
14	Snap ring	Spring steel	6	
15	Rod bush	Bearing alloy	1	
16	Connecting pin	Stainless steel	2	
17	Lever pin	Stainless steel	1	
18	Holder	Carbon steel	1	
19	Connecting plate	Carbon steel	2	
20	Lever	Carbon steel	1	
21	Head cover	Aluminum alloy	1	

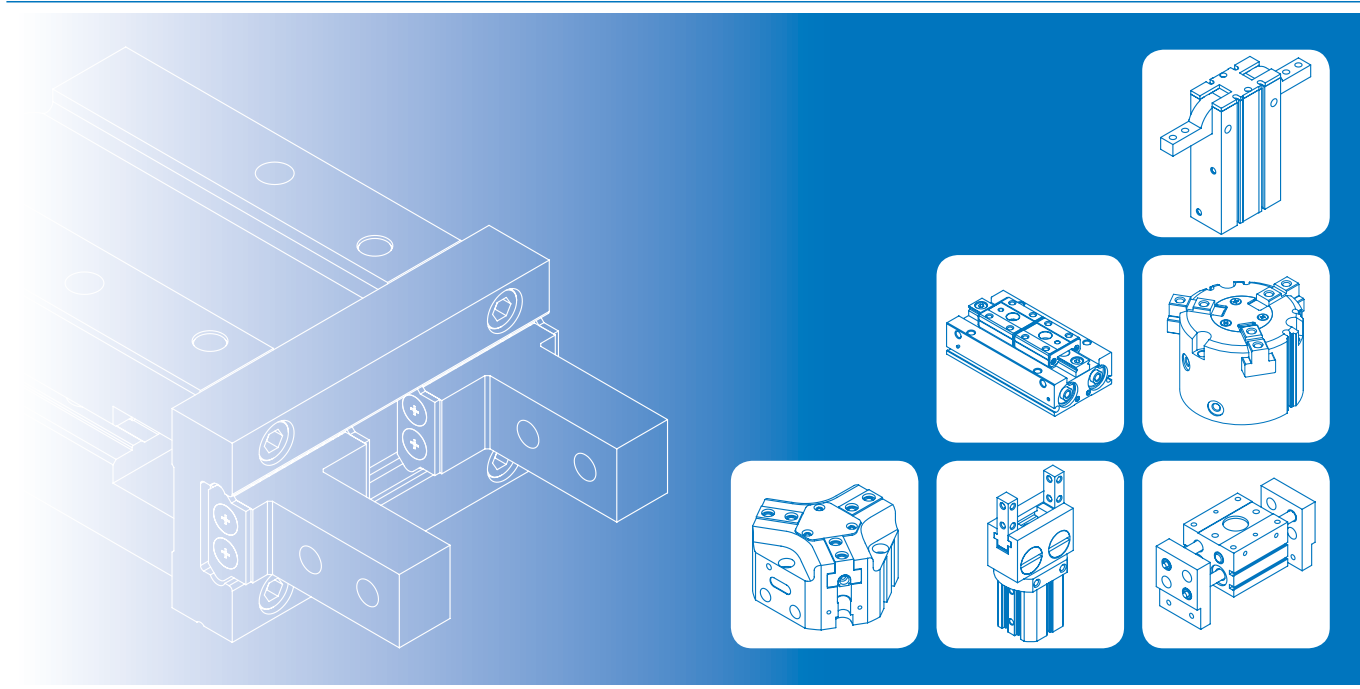
Installation of sensor switch







GRIPPER



	Model Selection.....	3-2
	PARALLEL GRIPPER (2-Finger)	
F	MCHB	ø12~ø32..... 3-3
F	MCHC	ø6~ø25..... 3-8
F	MCHD	ø8~ø20 3-22
	MCHH	ø20~ø40..... 3-31
	MCHU	ø12~ø20..... 3-35
F	MCHS	50~300 3-38
F	MCHX	ø10~ø40 (Wide type)..... 3-47
	PARALLEL GRIPPER (3-Finger)	
F	MCHG2	ø16~ø125..... 3-52
F	MCHJ	50~300 3-58
	30° ANGULAR GRIPPER	
F	MCHA	ø12~ø32..... 3-64
	180° ANGULAR GRIPPER	
	MCHY	ø10~ø25 (Cam style)..... 3-68

F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set. For more information, please go to our MINDMAN website (www.mindman.com.tw) and click on the "Component Set Inventory" button.

GRIPPER

Gripper selection

- Depends on the coefficient of friction and the gripping conditions between soft fingers and work piece.

When gripping a workpiece as in the figure as shown above:

- F**: Gripping force of single finger (N)
- n**: Number of finger
- μ : Coefficient of friction between the attachments and the workpiece
- m**: Workpiece mass (kg)
- g**: Gravitational acceleration (=9.8m/s²)
- a**: Safe factor

the conditions under which the workpiece will not drop are,

$$n \times \mu F > m \times g$$

Therefore,

$$F \geq \frac{m \times g}{n \times \mu}$$

With "a" representing the extra margin, "F" is determined by the following formula:

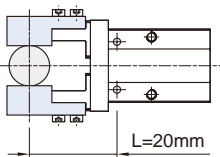
$$F \geq \frac{m \times g}{n \times \mu} \times a$$

Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

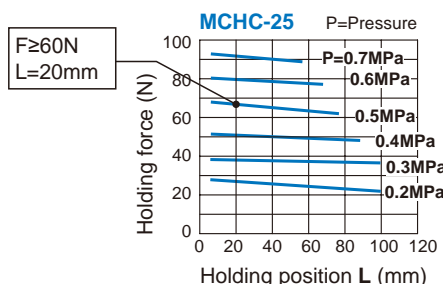
Model selection example

In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.3kg , Gripping method: External gripping, Operating pressure: 0.5 MPa, Coefficient of friction (μ): 0.1, Holding position: L=20mm (no overhang)

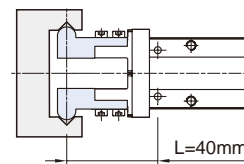


1. Based on the above formula, the required gripping force can be derived:

$$F \geq \frac{0.3 \times 9.8}{2 \times 0.1} \times 4 \geq 60(N)$$
2. From Effective Gripping Force Fig, Operating pressure: 0.5 MPa; Holding position: 20 mm Effective gripping force is greater than 60 (N) So selected **MCHC-25** grippers.

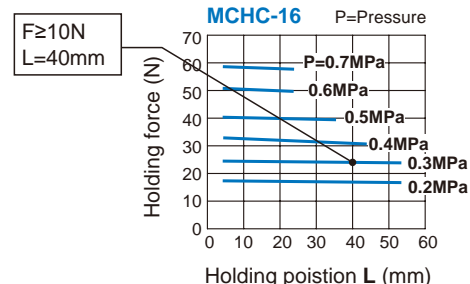


In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.05kg , Gripping method : External gripping, Operating pressure: 0.3 MPa, Coefficient of friction (μ): 0.1, Holding position: L=40mm (no overhang)



1. Based on the above formula, the required gripping force can be derived:

$$F \geq \frac{0.05 \times 9.8}{2 \times 0.1} \times 4 \geq 10(N)$$
2. From Effective Gripping Force Fig, Operating pressure: 0.3 MPa; Holding position: 40 mm Effective gripping force is greater than 10 (N) So selected **MCHC-16** grippers.





Features

- Available with comprehensive range of Tube I.D. 12 ~ 32mm.
- Highly accurate air driven device for holding work-piece.
- Magnetic as standard.

Specification

Model		MCHB				
Acting Type		Double / Single acting				
Tube I.D. (mm)		12	16	20	25	32
Port size		M3x0.5		M5x0.8		
Medium		Air				
Operating pressure range	Double acting	0.15~0.7 MPa				
	Single acting	0.2~0.7 MPa				
Ambient temperature		-5~+60°C (No freezing)				
Max. operating frequency (c.p.m)		180				
Lubrication	Cylinder	Not required				
	Lever	Grease (Actuation at)				
Max. arm length (L) (mm)		30	40	60	70	85
Lever open / close stroke		6	8	12	14	16
Sensor switch (*)		RDE, RDE-D: Non-contact				
Weight (g)	Double acting	66	144	255	419	719
	Single acting	66.5	145	257	422	722

* RDE, RDE-D specification, please refer to page 5-6.

Order example

MCHB - 16 - S

MODEL

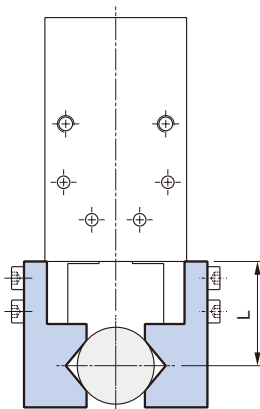
TUBE I.D.

ACTING

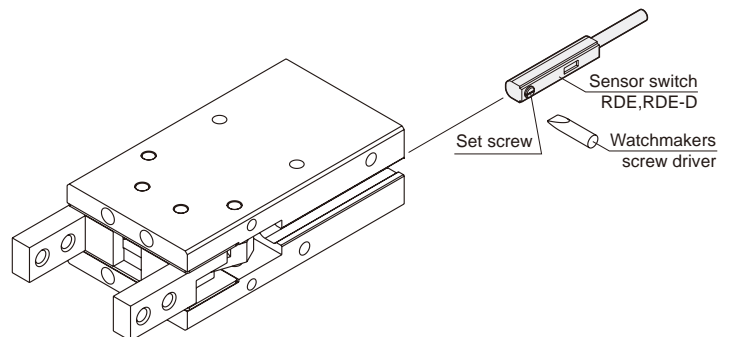
12
16
20
25
32

Blank: Double acting
S: Single acting
(Normally open)

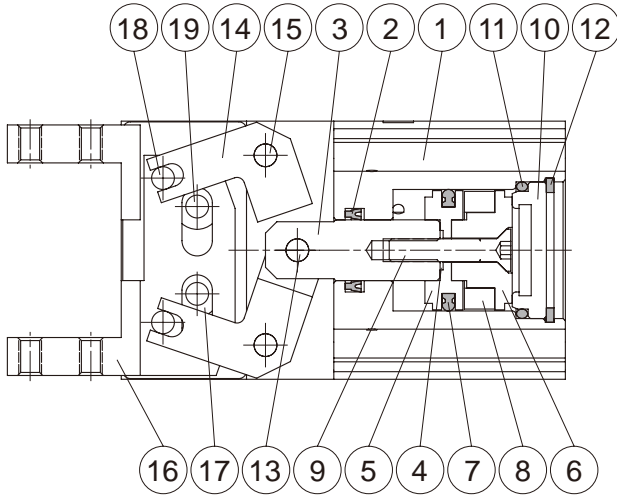
Length of gripping point



Installation of sensor switch

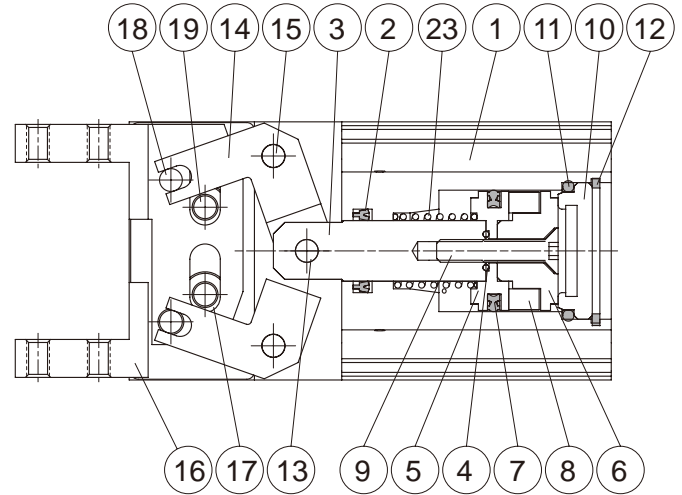


Double acting



Single acting

Normally open



Material

No.	Part name	Material	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy	1	
2	Rod packing	NBR	1	●
3	Piston rod	Stainless steel	1	
4	Gasket	NBR	1	●
5	Piston-R	Aluminum alloy	1	
6	Piston-H	Aluminum alloy	1	
7	Piston packing	NBR	1	●
8	Magnet ring	Magnet material	1	
9	Screw	Stainless steel	1	
10	Head cover	Carbon steel	1	
11	Cover ring	NBR	1	●
12	Stop ring	Spring steel	1	
13	Spindle river	Bearing steel	1	
14	Grip per	Carbon steel	2	
15	Grip rivet	Carbon steel	2	
16	Grip per	Carbon steel	2	
17	Bush	Stainless steel	4	
18	Grip rivet	Bearing steel	2	
19	Grip rivet	Carbon steel	2	
20	Screw	SCM	4	
21	Screw	SCM	4	
22	Washer for grip	Stainless steel	2	
23	Spring	Spring steel	1	

Order example of repair kits

Tube I.D.	Repair kits
ø12	PS-MCHB-12
ø16	PS-MCHB-16
ø20	PS-MCHB-20
ø25	PS-MCHB-25
ø32	PS-MCHB-32

MCHB Capacity – Double acting

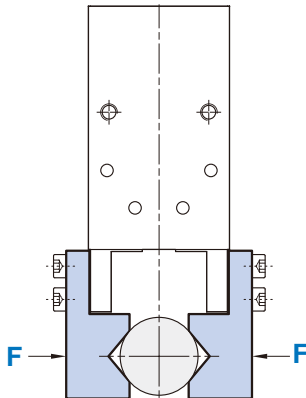
PARALLEL GRIPPER (2-Finger)



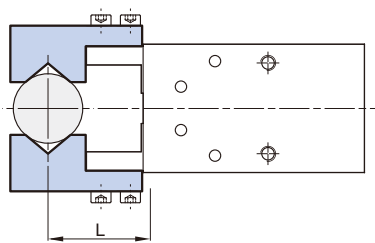
Effective gripping force (Double acting)

Indication of effective force.

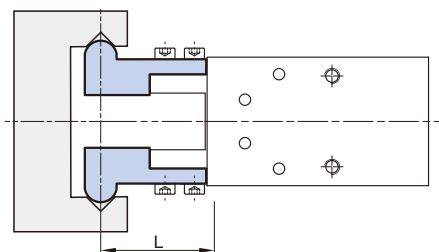
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



1N=0.102 kgf
1MPa=10.2 kgf/cm²

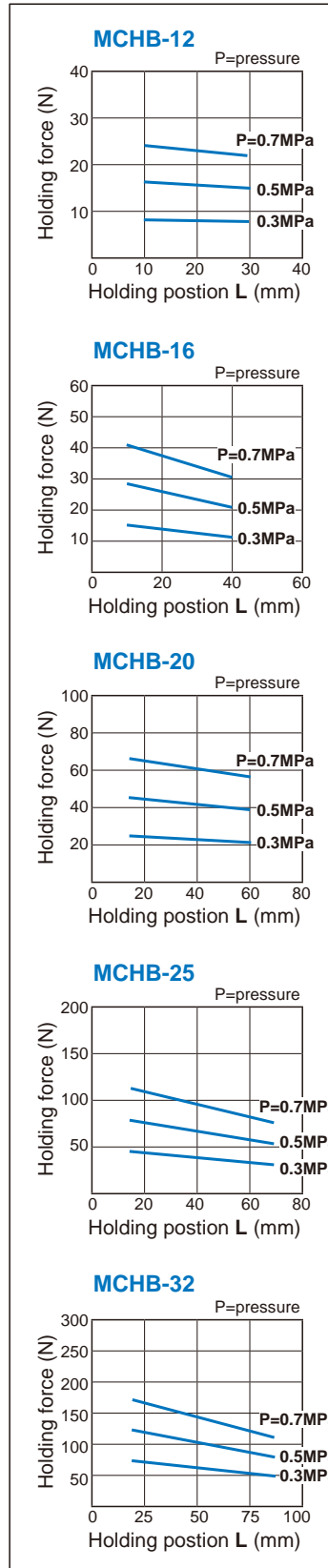


External grip

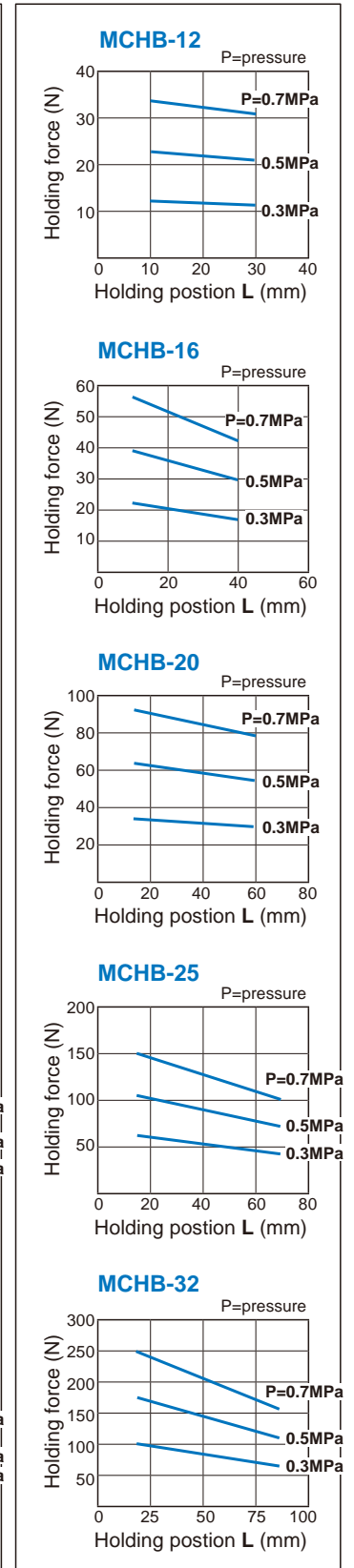


Internal grip

External gripping force Double acting



Internal gripping force Double acting

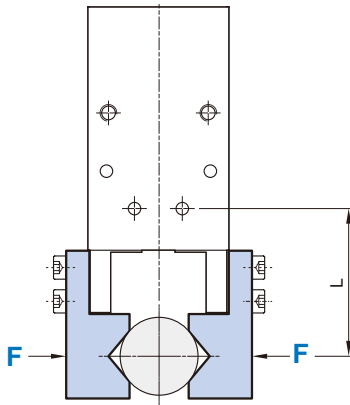


Effective gripping force (Single acting)

Indication of effective force.

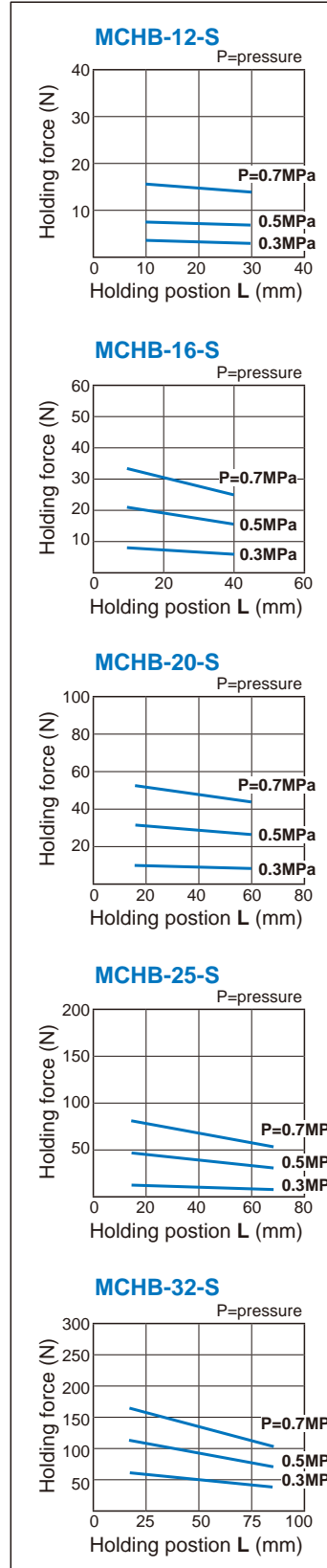
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

1N=0.102 kgf
1MPa=10.2 kgf/cm²

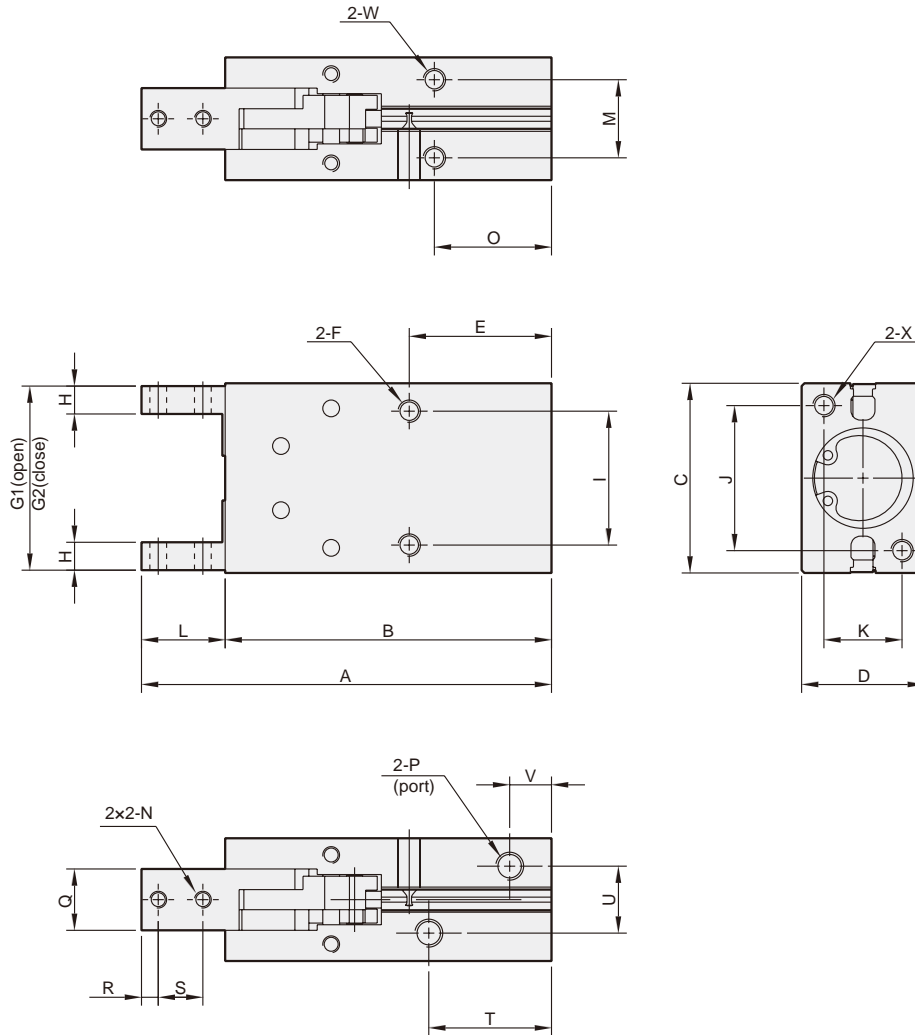


External grip
(Single acting / Normally open)

External gripping force Single acting / N.O.



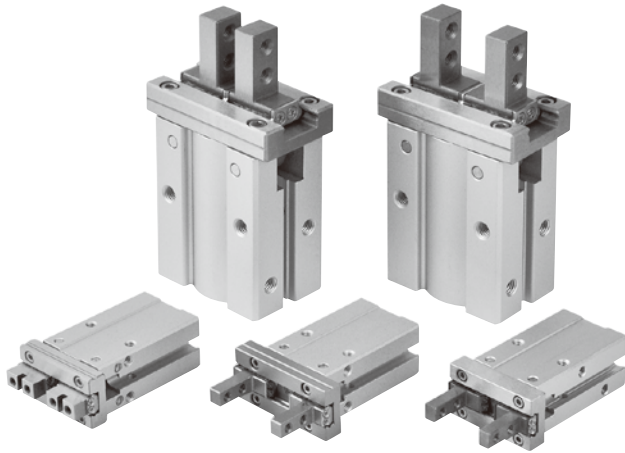
PARALLEL GRIPPER (2-Finger)



Code Tube I.D.	A	B	C	D	E	F	G1	G2	H	I	J	K	L	M	N	O
12	63.5 (68.5)	50.5 (55.5)	28	16	20 (25)	M3x0.5x5 depth	27	21	4	18	17	10	13	10	M3x0.5	16 (21)
16	73.5 (78.5)	58.5 (63.5)	34	22	25.5 (30.5)	M4x0.7x11 depth	33	25	5	24	26	14	15	14	M3x0.5	21 (26)
20	88.5 (93.5)	69.5 (74.5)	45	26	25 (30)	M5x0.8x8 depth	44	32	6	30	35	16	19	16	M4x0.7	19 (24)
25	102.5 (107.5)	78.5 (83.5)	52	32	28 (33)	M6x1.0x10 depth	51	37	8	36	40	20	24	20	M5x0.8	22 (27)
32	120.5 (125.5)	90.5 (95.5)	60	40	34 (39)	M6x1.0x10 depth	59	43	10	44	46	24	30	26	M6x1.0	26 (31)

Code Tube I.D.	P	Q	R	S	T	U	V	W	X
12	M3x0.5x5 depth	7	3	6	23	10.2	7.5	M3x0.5x5 depth	M3x0.5x5 depth
16	M5x0.8x5 depth	11	3	8	22	12	7.5	M4x0.7x7 depth	M4x0.7x7 depth
20	M5x0.8x5 depth	12	4	10	26	13	8	M5x0.8x8 depth	M5x0.8x8 depth
25	M5x0.8x5 depth	14	5	12	29	18	8.5	M6x1.0x10 depth	M6x1.0x10 depth
32	M5x0.8x5 depth	20	7	15	35	24	10.5	M6x1.0x10 depth	M6x1.0x10 depth

* Values in () are for single acting.






Order example








MCHC □ – 20 – □ N

Model	Tube ID.	Style (*1)	Type (*2)
MCHC (Standard stroke)	6	Blank: Double acting	Blank: Standard 1: Side tapped mounting 2: Standard (Through hole)
	10	Blank: Double acting S: Single acting / Normally open C: Single acting / Normally closed	Blank: Standard 1: Side tapped mounting 2: Standard (Through hole) 3: Flat N: Narrow N1: Narrow type side tapped mounting N2: Narrow (Through hole)
	16		
	20		
	25		
MCHCL (Long stroke)	10 16 20 25	Blank: Double acting	Blank: Standard 1: Side tapped mounting 2: Standard (Through hole)

*1. STYLE

Blank: Double acting	S: Single acting / Normally open	C: Single acting / Normally closed
		

*2. TYPE

Blank: Standard	1: Side tapped mounting	2: Standard (Through hole)	3: Flat
			
N: Narrow	N1: Narrow type side tapped mounting	N2: Narrow (Through hole)	
			

Features

- Integral linear guide used for high rigidity and high precision.
- The material of finger is martensitic stainless steel.
- Body thickness tolerance $\pm 0.05\text{mm}$.
- Bottom pin holes for accurate re-locating.
- Grooves on the body for sensor switch to be inserted into.
- The gripping stroke of long-stroke type is approximately double compare with standard type.
- Standard with magnet.

Specification

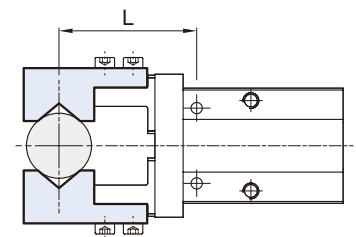
Model	MCHC						
Acting type	Double acting / Single acting						
Tube I.D. (mm)	6	10	16	20	25		
Opening / Closing stroke (mm)	4	4(8)	6(12)	10(18)	14(22)		
Port size	M3x0.5		M5x0.8				
Medium	Air						
Operating pressure range (MPa)	Double acting	0.15-0.7	0.2-0.7	0.1-0.7			
	Single acting	—	0.35-0.7	0.25-0.7			
Ambient temperature	-10~+60°C (No freezing)						
Repeatability	$\pm 0.01\text{ mm}$						
Max. operating frequency (c.p.m)	180 (120)						
Lubricator	Not required						
Sensor switch (*2)	*1	RDE, RDE-D: Non-contact					
Weight (g)	Double acting	Standard	27	55	124	250	461
		Long stroke	—	56	125	252	463
	Single acting	Flat type	—	53	124	244	450
		Standard	—	70	145	270	490

*1. Tube I.D. $\phi 6$ use RDFE(V) sensor switch.

2. RDE, RDFE(V) specification, please refer to page 5-6, 11.

*3. () value for long stroke.

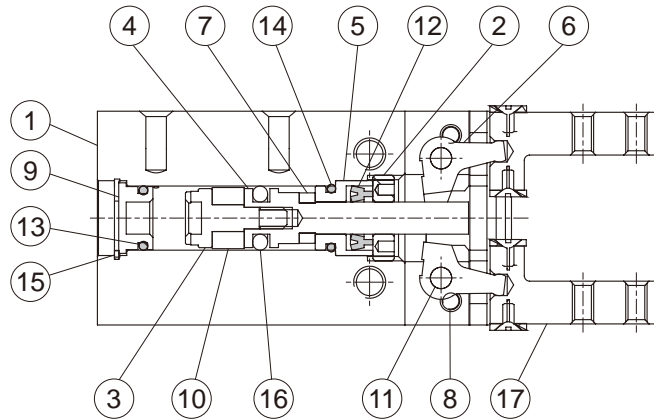
Gripping force



Tube I.D. (mm)		6	10	16	20	25
Double acting	External	3.3(0.3)	11(1.1)	34(3.5)	42(4.3)	65(6.6)
	Internal	6.1(0.6)	17(1.7)	45(4.6)	66(6.7)	104(10.6)
Single acting / Normally open	External	—	7.1(0.7)	27(2.8)	33(3.4)	45(4.6)
Single acting / Normally closed	Internal	—	13(1.3)	38(3.9)	57(5.8)	83(8.5)

* Operation pressure 0.5 MPa, gripping length 20mm, the effective gripping force for each finger is *** N(kgf).

Double acting



Material

No.	Part name	Material	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy	1	
2	Front cap	Stainless steel	1	
3	Magnet holder	Stainless steel	1	
4	Piston rod	Stainless steel	1	
5	Rod cover	Stainless steel	1	
6	Lever	Stainless steel	2	
7	Cushion pad	PU	1	●
8	Screw	Stainless steel	4	
9	Head cover	Aluminum alloy	1	
10	Magnet ring	Magnet material	1	
11	Pin	Steel	2	
12	Rod packing	NBR	1	●
13	O-ring	NBR	1	
14	O-ring	NBR	1	
15	Snap ring	Carbon steel	1	●
16	Piston packing	NBR	1	●
17	Gripping set	Stainless steel (*)	1	

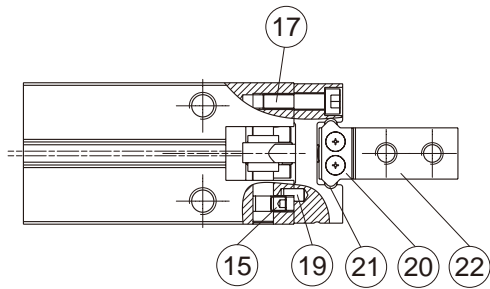
* Bearing steel balls as standard.

Order example of repair kits

Tube I.D.	Repair kits
ø6	PS-MCHC-6

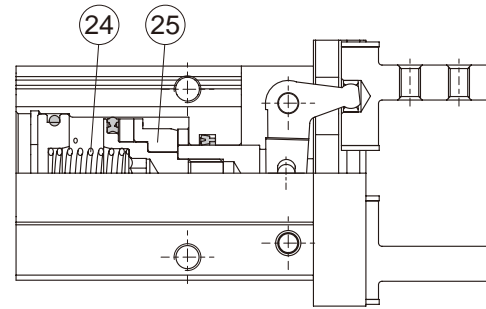
PARALLEL GRIPPER (2-Finger)

Double acting



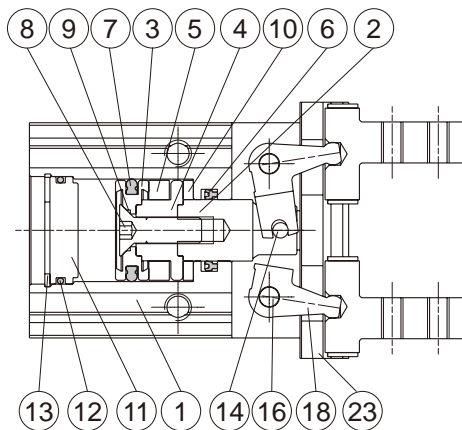
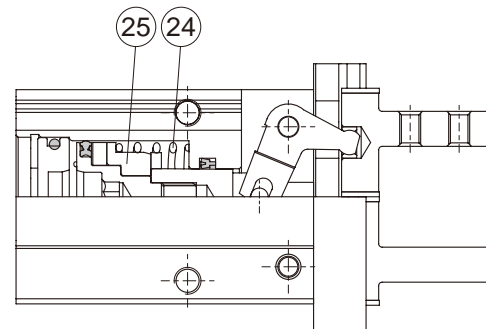
Single acting

Normally open



Single acting

Normally closed



Material

No.	Tube I.D. Part name	10	16	20	25	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy				1	
2	Piston rod	Stainless steel				1	
3	Piston	Aluminum alloy				1	
4	Piston R	*1	Aluminum alloy			1	
5	Magnet ring	Magnet material				1	
6	Rod packing	NBR				1	●
7	Piston packing	NBR				1	●
8	Screw	—	Stainless steel			1	
9	O-ring	—	NBR			1	●
10	Cushion pad	PU				1	●
11	Head cover	Aluminum alloy				1	
12	Cover ring	NBR				1	●
13	Stop ring	*2	Stainless steel			1	
14	Spindle river	Carbon steel				1	
15	Screw	Carbon steel				4	
16	Grip rivet	Carbon steel				2	
17	Bolt	Stainless steel				4	
18	Lever	Stainless steel				2	

No.	Tube I.D. Part name	10	16	20	25	Q'y	Repair kits (inclusion)
19	Pin	Carbon steel				2	
20	Roller stopper	Stainless steel				4	
21	Steel balls	Bearing steel				24	
22	Finger	Stainless steel				2	
23	Guide	Stainless steel				1	
24	Magnet holder	Stainless steel				1	
25	Stop ring	Stainless steel				1	

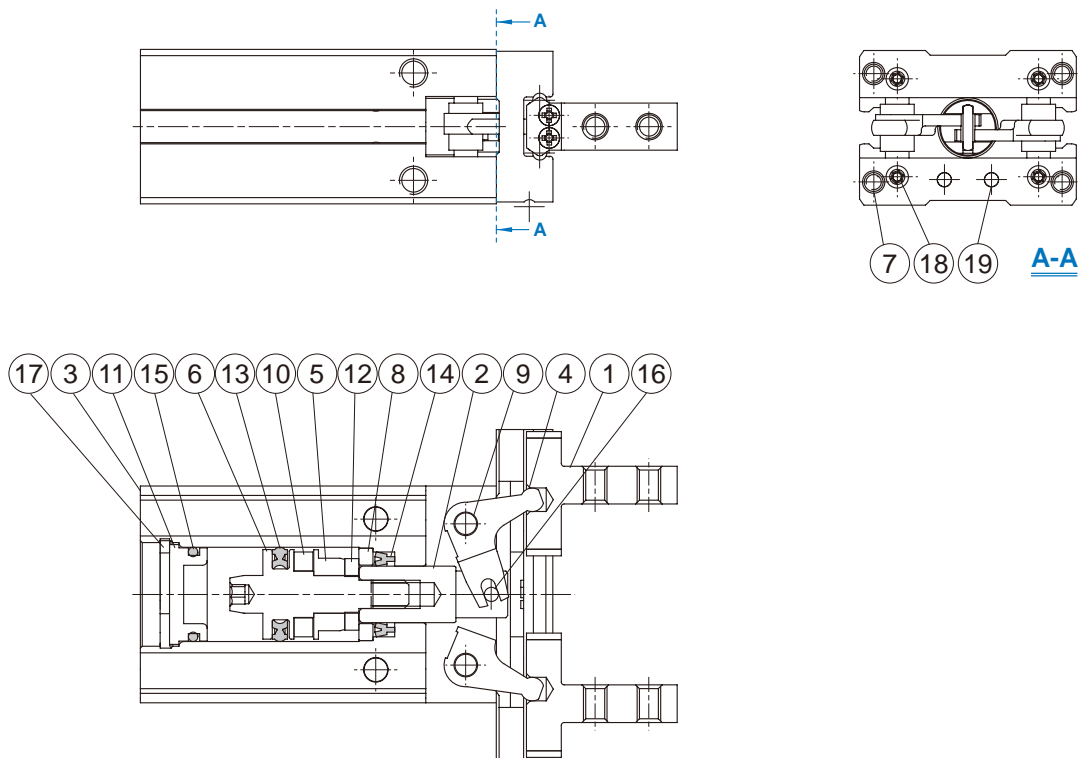
*1. Stainless steel *2. Carbon steel

Order example of repair kits

Tube I.D.	Repair kits
$\varnothing 10$	PS-MCHC-10
$\varnothing 16$	PS-MCHC-16
$\varnothing 20$	PS-MCHC-20
$\varnothing 25$	PS-MCHC-25

PARALLEL GRIPPER (2-Finger)

Double acting



Material

No.	Tube I.D. Part name	10	16	20	25	Q'y	Repair kits (inclusion)
1	Gripping set	Stainless steel (*1)				1	
2	Piston rod	Stainless steel				1	
3	Body	Aluminum alloy				1	
4	Lever	Stainless steel				2	
5	Spring holder	Stainless steel				1	
6	Piston	Stainless steel				1	
7	Bolt	Stainless steel				4	
8	Stop ring	*2		-		1	
9	Grip rivet	Mild carbon steel				2	
10	Magnet ring	Magnet material				1	
11	Head cover	Aluminum alloy				1	
12	Gasket	NBR				1	●
13	Piston packing	NBR				1	●
14	Rod packing	NBR				1	●
15	O-ring	NBR				1	●
16	Spindle river	Carbon steel				1	
17	Snap ring	*3	Stainless steel			1	
18	Hexgon screw	Stainless steel				4	
19	Pin	Carbon steel				2	

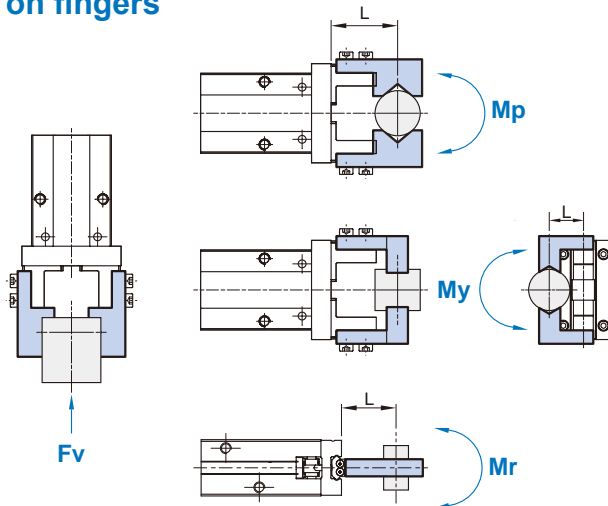
*1. Bearing steel balls as standard.

2. Stainless steel 3. Carbon steel

Order example of repair kits

Tube I.D.	Repair kits
$\varnothing 10$	PS-MCHCL-10
$\varnothing 16$	PS-MCHCL-16
$\varnothing 20$	PS-MCHCL-20
$\varnothing 25$	PS-MCHCL-25

Confirmation of external force on fingers

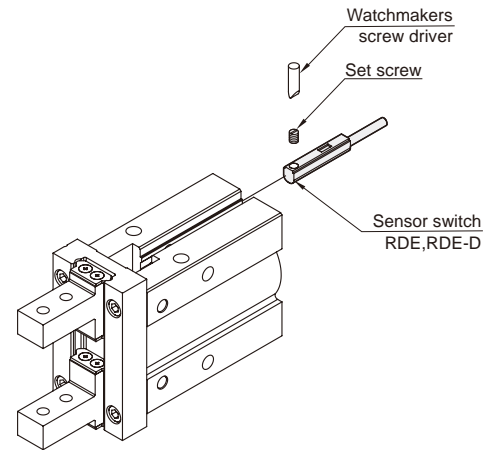


L: distance to the point at which the load is applied (mm)

Tube I.D. (mm)	Allowable vertical load Fv (N)	Maximum allowable moment		
		Pitch moment Mp (N-m)	Yaw moment My (N-m)	Roll moment Mr (N-m)
6	10	0.04	0.04	0.08
10	58	0.26	0.26	0.53
16	98	0.68	0.68	1.36
20	147	1.32	1.32	2.65
25	255	1.94	1.94	3.88

* Values for load and moment in the table indicate static values.

Installation of sensor switch



Allowable load calculation

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

Example

When a static load of $f=20N$ is operating, which applies pitch moment to point $L=25mm$ from the **MCHC-16** guide.

$$\begin{aligned} \text{Allowable load } F(N) &= \frac{0.68 (N \cdot m)}{25 \times 10^{-3} (m)} \\ &= 27.2 (N) \end{aligned}$$

Load $f=20 (N) < 27.2 (N)$, so can be used.

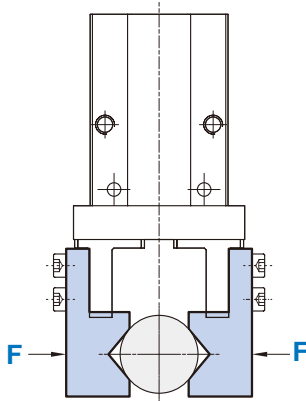
Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

Effective gripping force (Double acting)

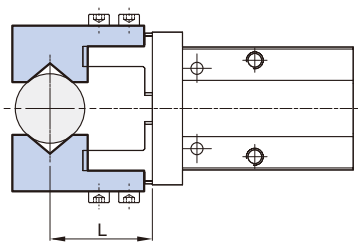
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

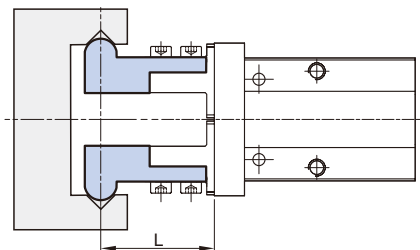


$$1\text{N} = 0.102 \text{ kgf}$$

$$1\text{MPa} = 10.2 \text{ kgf/cm}^2$$



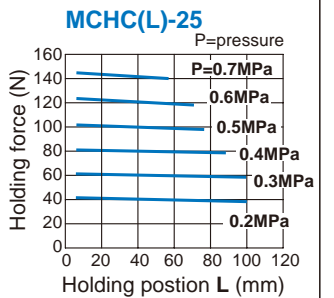
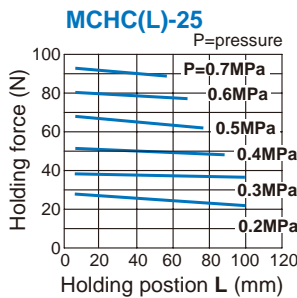
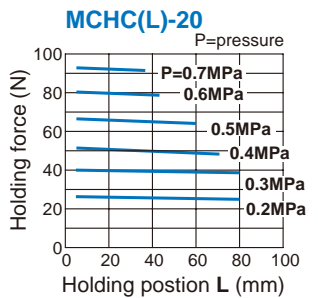
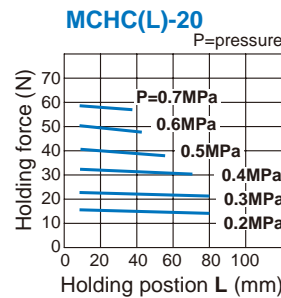
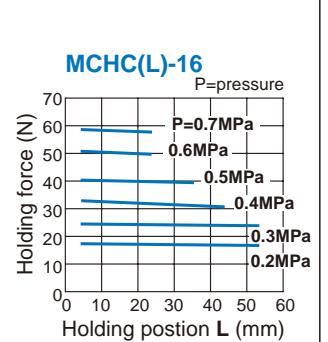
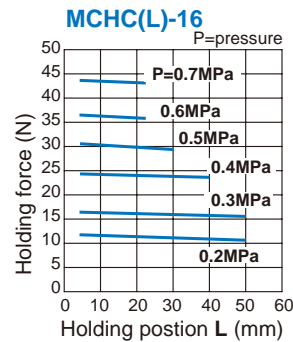
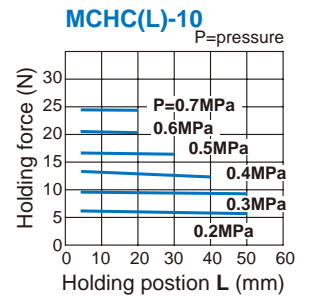
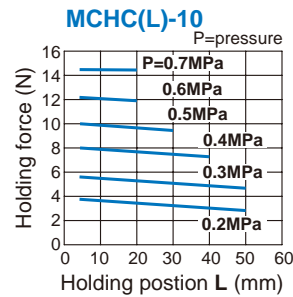
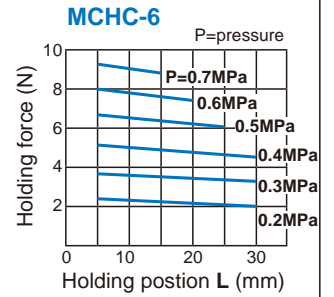
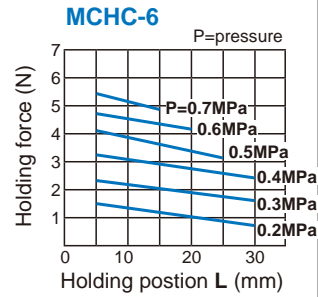
External grip



Internal grip

External gripping force

Internal gripping force

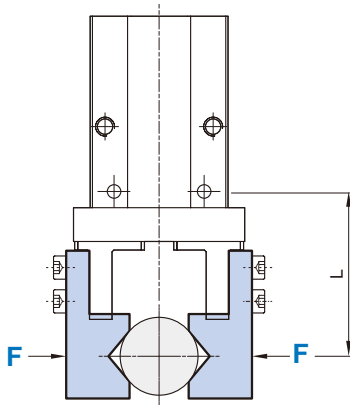


Effective gripping force (Single acting)

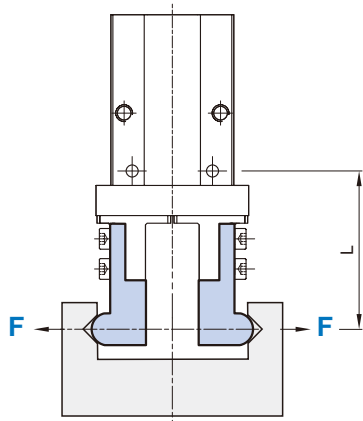
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

1N=0.102 kgf
1MPa=10.2 kgf/cm²

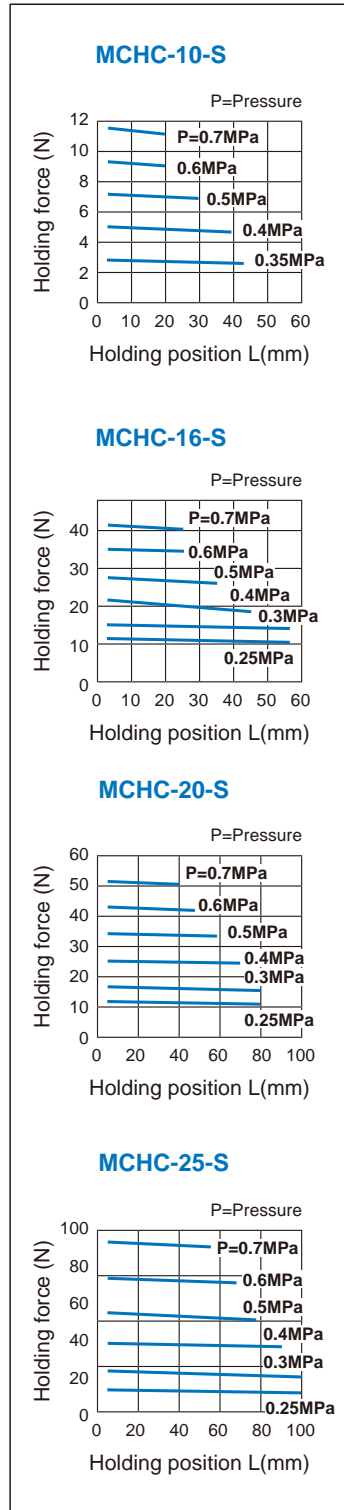


External grip
(Single acting / Normally open)

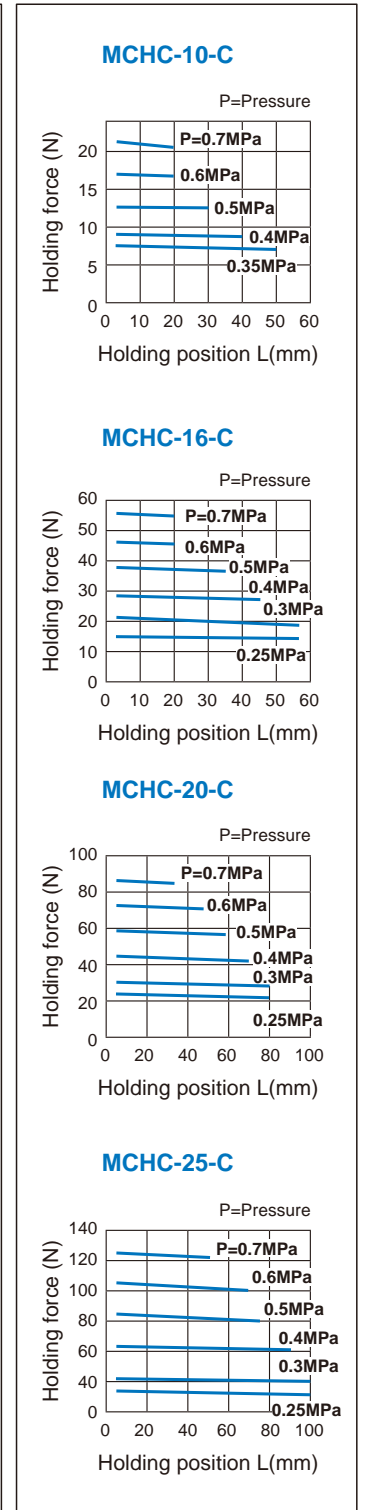


Internal grip
(Single acting / Normally closed)

External gripping force Single acting / N.O.

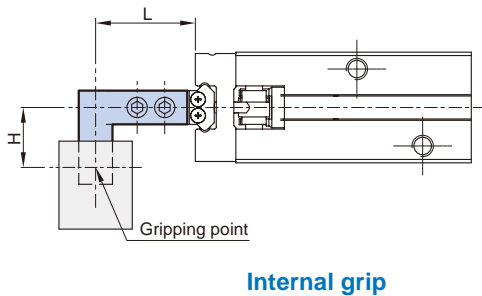
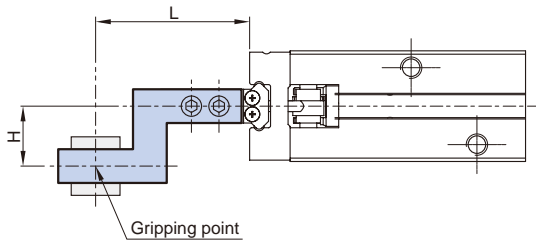


Internal gripping force Single acting / N.C.

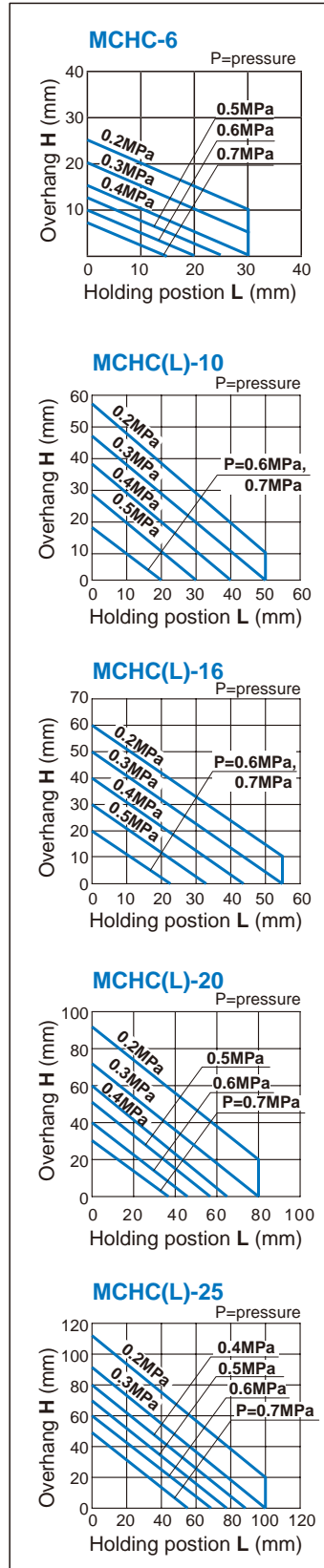


Confirmation of gripping point

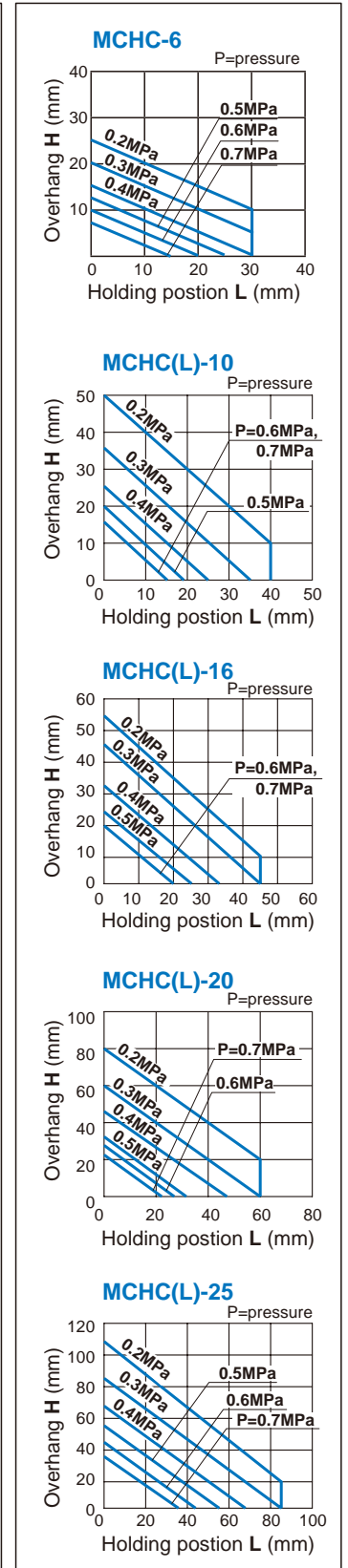
- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life the air gripper.

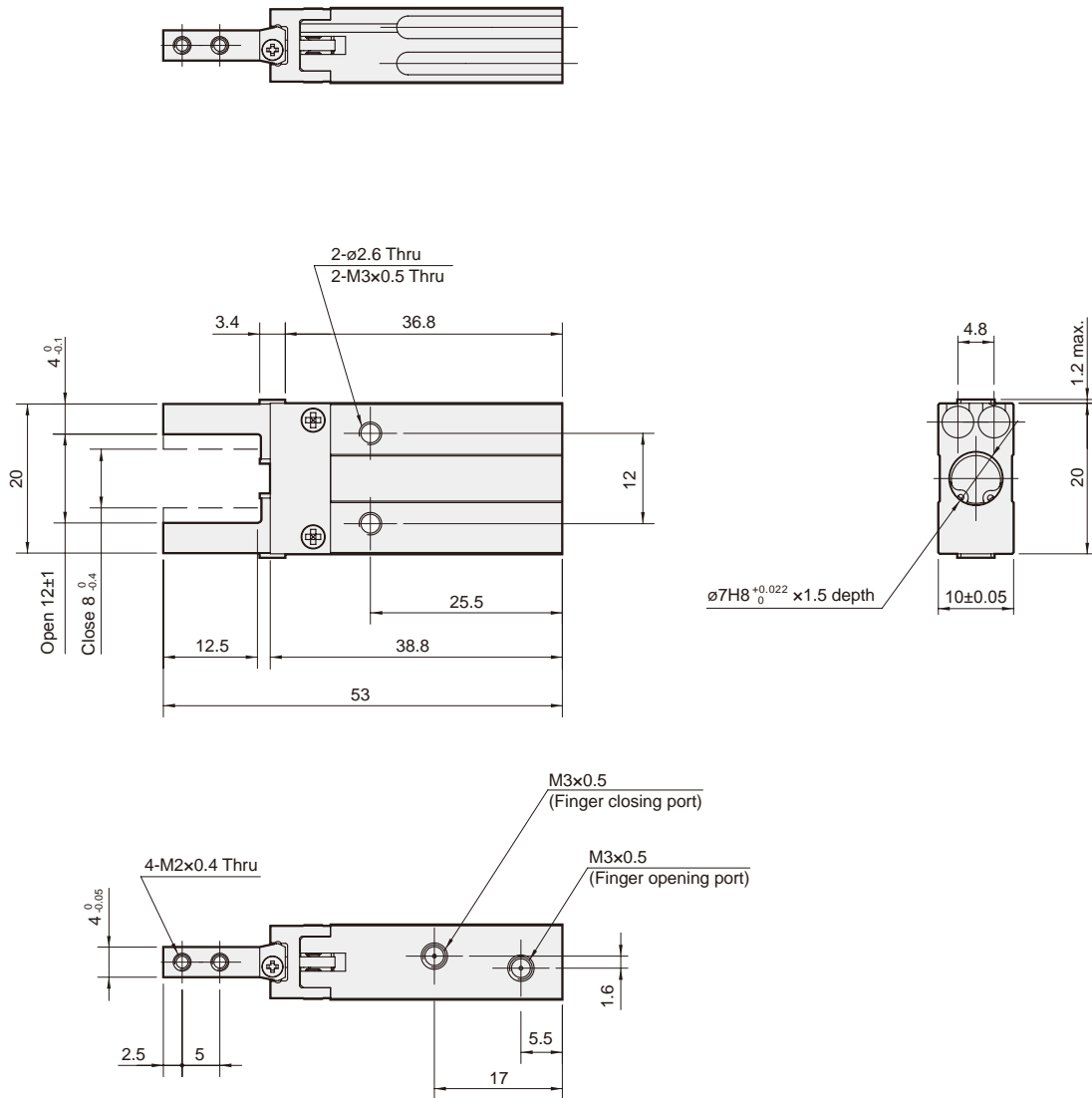


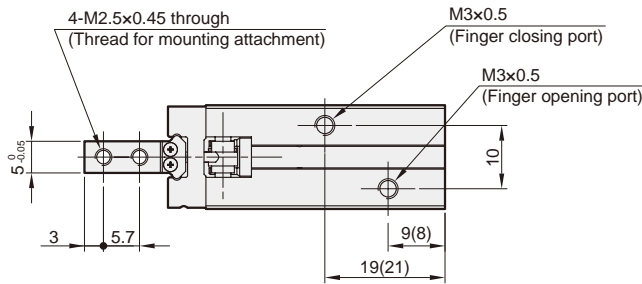
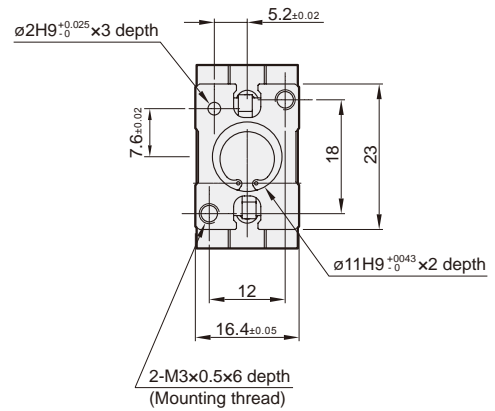
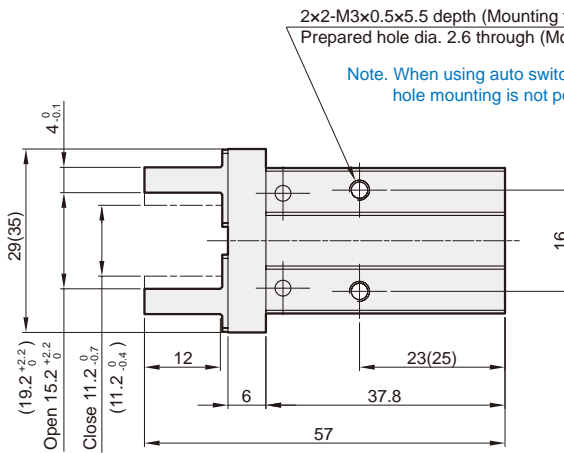
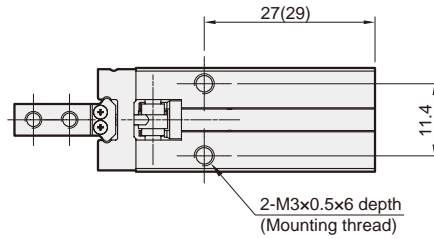
External gripping



Internal gripping

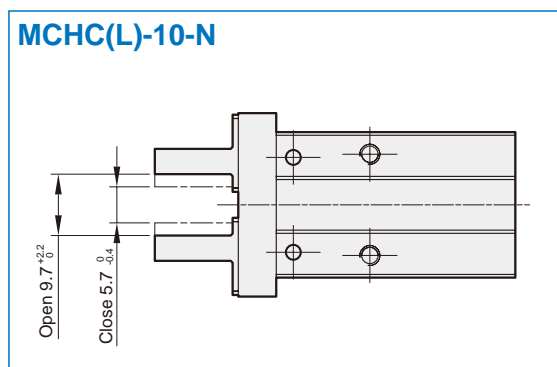


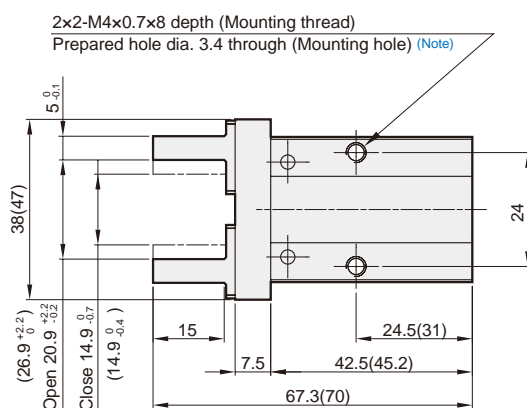
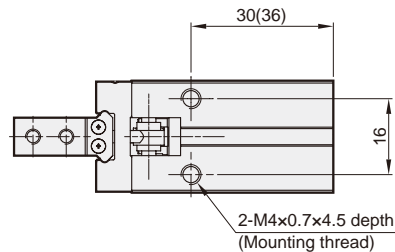




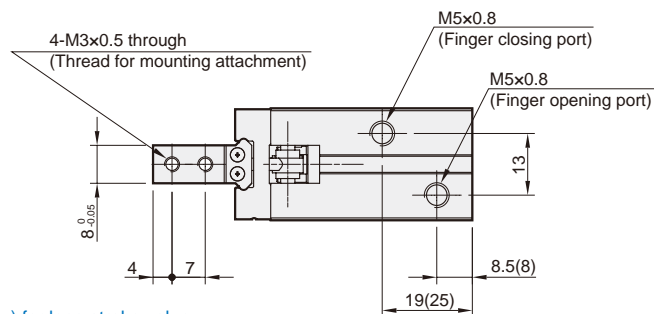
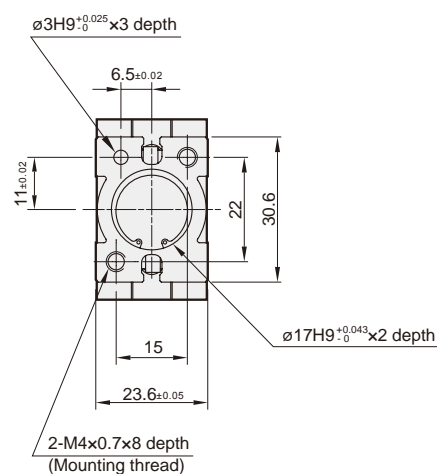
*() for long stroke value.

Finger position – Narrow type



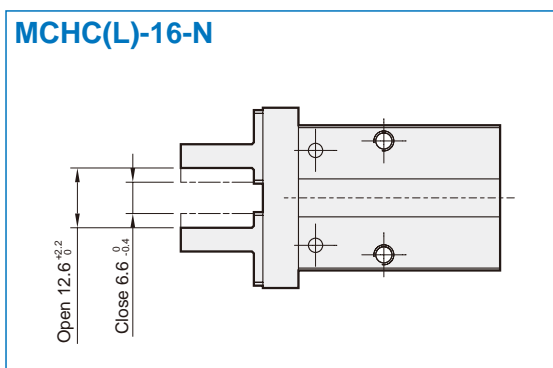


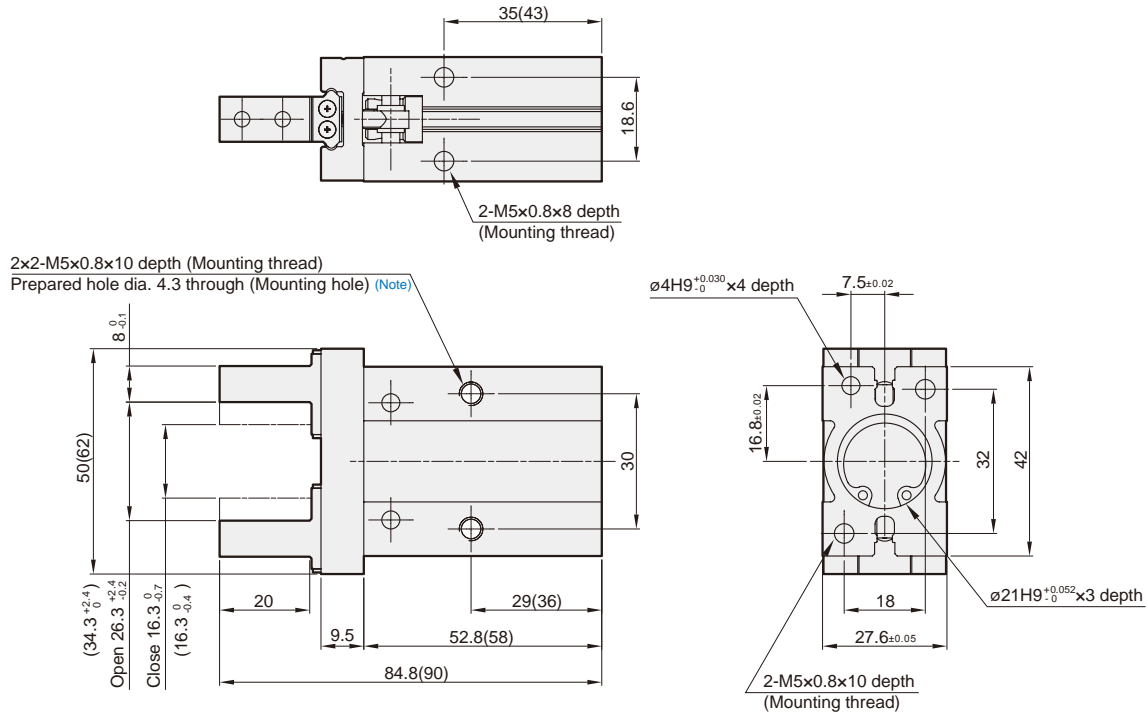
Note. Through-hole mounting is not possible when using the auto switch at the square groove.



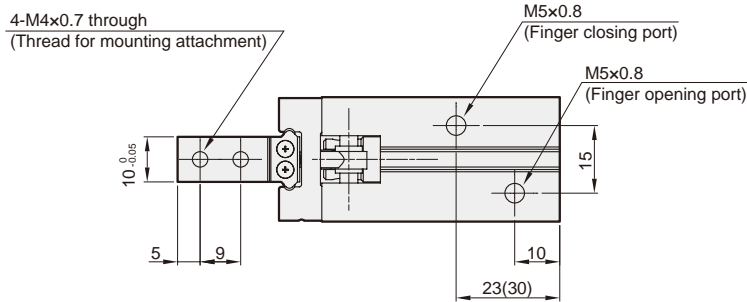
*() for long stroke value.

Finger position – Narrow type



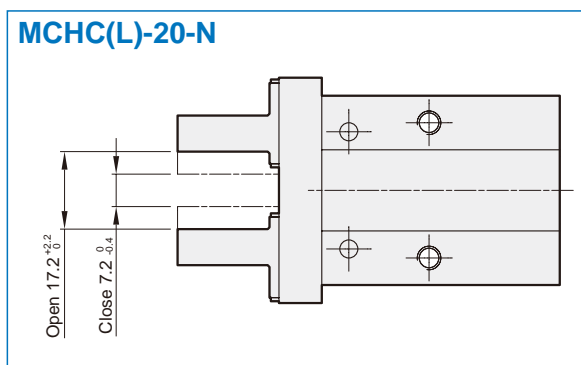


Note. Through-hole mounting is not possible when using the auto switch at the square groove.

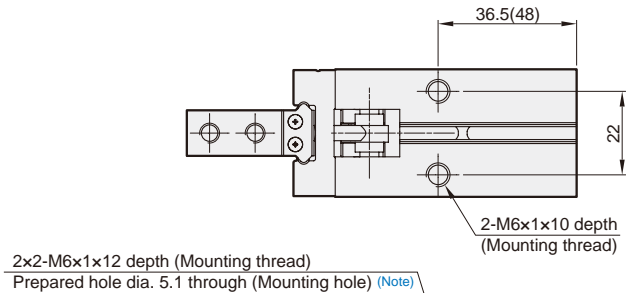


*() for long stroke value.

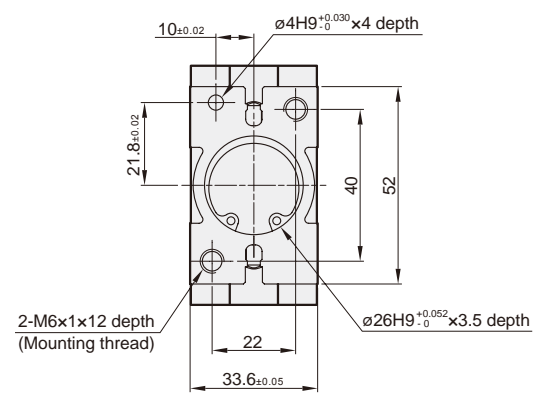
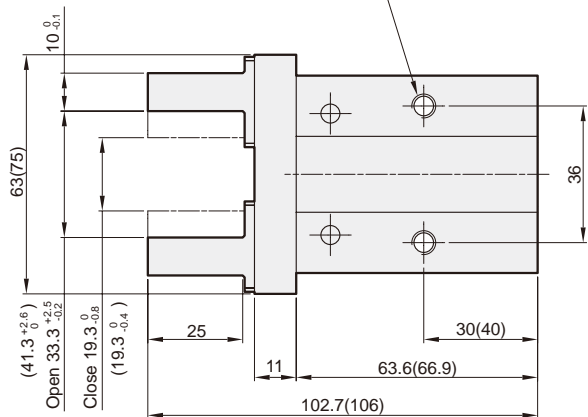
Finger position – Narrow type



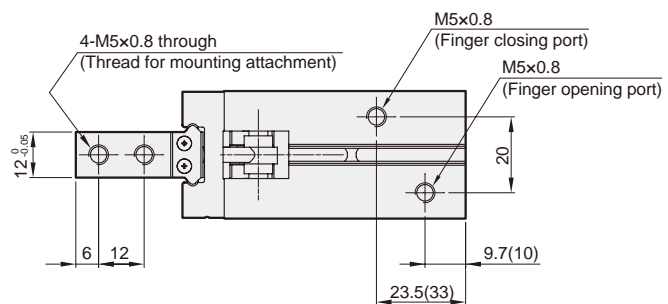
PARALLEL GRIPPER (2-Finger)



2x2-M6x1x12 depth (Mounting thread)
Prepared hole dia. 5.1 through (Mounting hole) (Note)

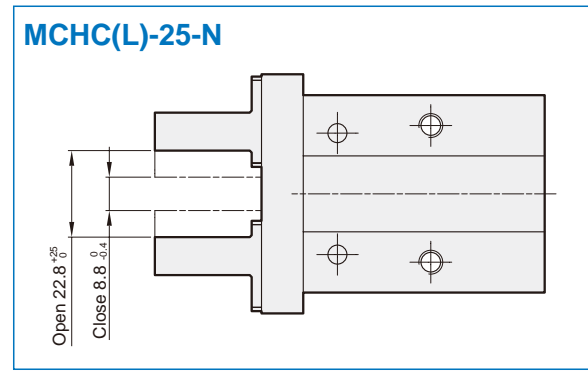


Note. Through-hole mounting is not possible when using the auto switch at the square groove.



* () for long stroke value.

Finger position – Narrow type

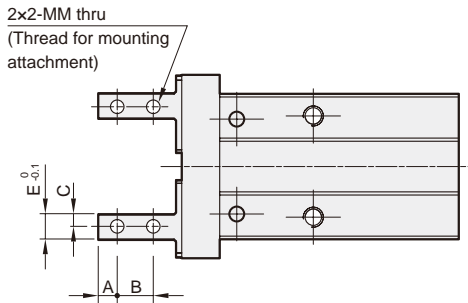


MCHC Finger option $\phi 6 \sim \phi 25$

PARALLEL GRIPPER (2-Finger)

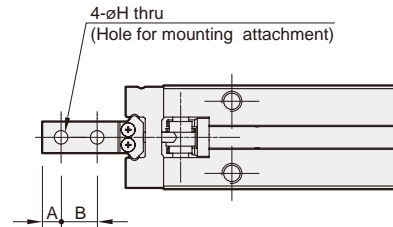


MCHC*-1, N1 Side tapped mounting



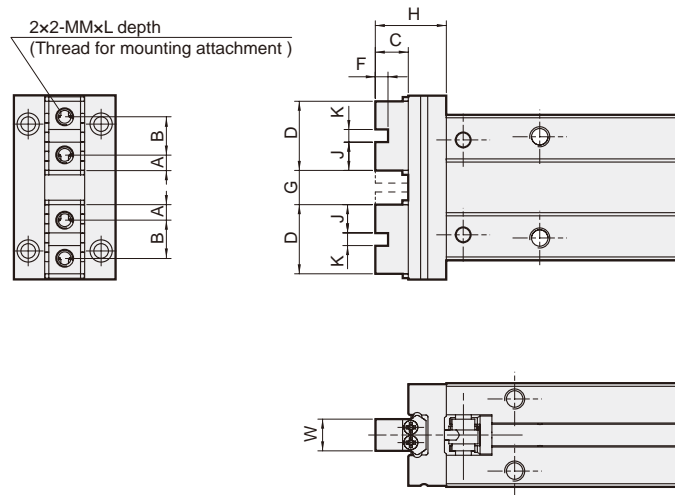
Code Tube I.D.	A	B	C	E	MM
6	2.5	5	2	4	M2x0.4
10	3	5.7	2	4	M2.5x0.45
16	4	7	2.5	5	M3x0.5
20	5	9	4	8	M4x0.7
25	6	12	5	10	M5x0.8

MCHC*-2, N2 Through hole type

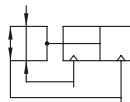
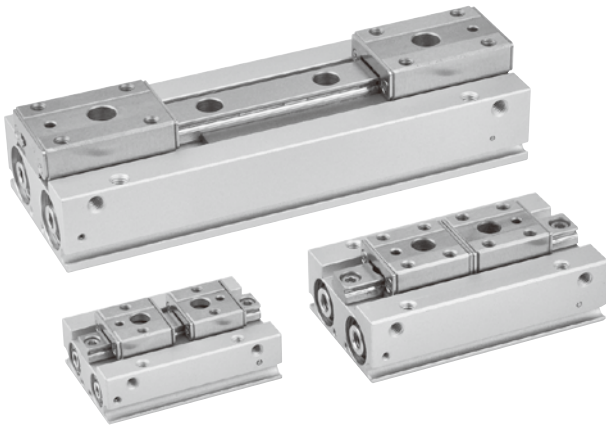


Code Tube I.D.	A	B	H
6	2.5	5	$\phi 2.4$
10	3	5.7	$\phi 2.9$
16	4	7	$\phi 3.4$
20	5	9	$\phi 4.5$
25	6	12	$\phi 5.5$

MCHC*-3 Flat type



Code Tube I.D.	A	B	C	D	F	G		H	J	K	MM	L	W
						Open	Closed						
10	2.45	6	5.2	10.9	2	5.4 ^{+2.2} ₀	1.4 ⁰ _{-0.2}	11.2	4.45	2H9 ^{+0.025} ₀	M2.5x0.45	5	5 ⁰ _{-0.05}
16	3.05	8	8.3	14.1	2.5	7.4 ^{+2.2} ₀	1.4 ⁰ _{-0.2}	15.8	5.8	2.5H9 ^{+0.025} ₀	M3x0.5	6	8 ⁰ _{-0.05}
20	3.95	10	10.5	17.9	3	11.6 ^{+2.3} ₀	1.6 ⁰ _{-0.2}	20	7.45	3H9 ^{+0.025} ₀	M4x0.7	8	10 ⁰ _{-0.05}
25	4.90	12	13.1	21.8	4	16 ^{+2.5} ₀	2 ⁰ _{-0.2}	24.1	8.9	4H9 ^{+0.03} ₀	M5x0.8	10	12 ⁰ _{-0.05}



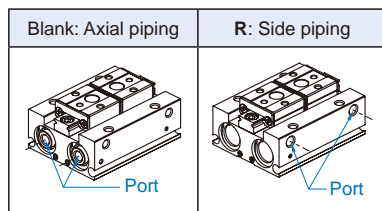
Order example

MCHD – 20R – □




MODEL TUBE I.D.
8, 12, 16, 20

STROKE *
Blank: Short
1: Medium
2: Long

PIPING TYPE



* Stroke selection

Tube I.D. Stroke (mm)	8	12	16	20
Short stroke 	8	12	16	20
Medium stroke 	16	24	32	40
Long stroke 	32	48	64	80

Features

- Low profile design saves space and reduces bending moments, improved accuracy with smooth operation.
- Improved mounting repeatability, easy positioning for mounting.
- Double piston construction achieves compact design with strong gripping force.
- High rigidity and high precision with martensitic stainless steel.
- Grooves on the body for sensor switch to be inserted into.
- Standard with magnet.

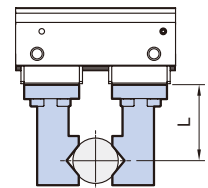
Specification

Model	MCHD			
Acting type	Double acting			
Tube I.D. (mm)	8	12	16	20
Port size	M3x0.5	M5x0.8		
Medium	Air			
Operating pressure range	0.15~0.7	0.1~0.7 MPa		
Ambient temperature	-10~+60°C (No freezing)			
Repeatability	± 0.05 mm (*1)			
Max. operating frequency (c.p.m)	Short	120		
	Medium	120		
	Long	60		
Lubricator	Not required			
Sensor switch (*2)	2 wire	RDVE(V): Non-contact		
	3 wire	RNFE(V): NPN, RPFE(V): PNP		
Attached bolt	2 pcs	—		

* 1. This is the value when no offset load is applied to the finger. When an offset load is applied to the finger, the maximum value is ±0.15mm due to the influence of backlash of the rack and pinion.

* 2. R*FE(V) specification, please refer to page 5-11.

Gripping force

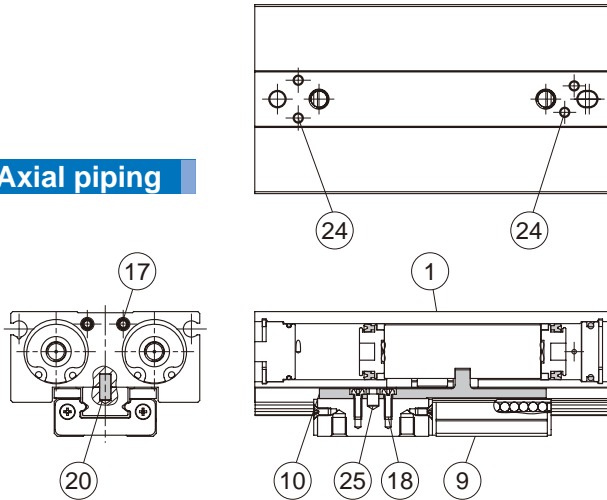


Model	Gripping force per finger effective value (N) (*)	Weight (g)
MCHD-8	19	65
MCHD-8-1		79.1
MCHD-8-2		113.3
MCHD-12	48	150
MCHD-12-1		191.3
MCHD-12-2		291.2
MCHD-16	90	350
MCHD-16-1		454.2
MCHD-16-2		678.3
MCHD-20	141	660
MCHD-20-1		869
MCHD-20-2		1310.6

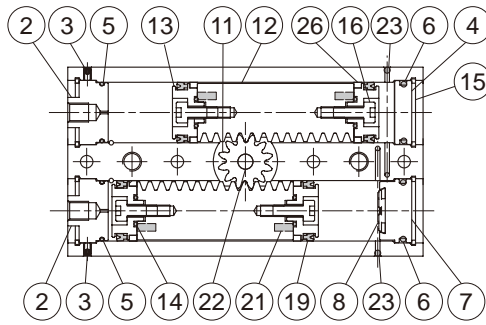
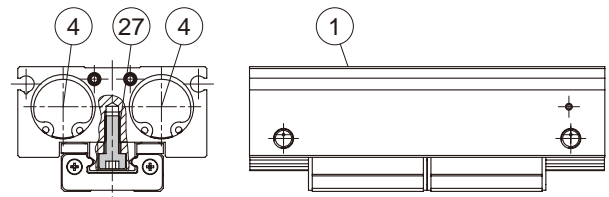
* Values based on pressure of 0.5 MPa, gripping point L=20mm, at center of stroke.

PARALLEL GRIPPER (2-Finger)

Axial piping



Side piping



Order example of repair kits

Tube I.D.	Repair kits	Tube I.D.	Repair kits
ø8	PS-MCHD-8	ø16	PS-MCHD-16
	PS-MCHD-8R		PS-MCHD-16R
ø12	PS-MCHD-12	ø20	PS-MCHD-20
	PS-MCHD-12R		PS-MCHD-20R

Material

No.	Tube I.D. Part name	Material				Q'y		Repair kits (inclusion)
		8	12	16	20	Axial	Side	
1	Body	Aluminum alloy				1	1	
2	Cover A	Aluminum alloy				2	0	
3	Hexgon screw	Stainless steel				2	0	
4	Cover B	Aluminum alloy				1	3	
5	O-ring	NBR				2	0	●
6	O-ring	NBR				2	4	●
7	Cover C	Aluminum alloy				1	1	
8	Cushion pad	TPU				1	1	●
9	Guide set	Stainless steel				1	1	
10	Lever	Stainless steel				2	2	
11	Pinion	SCM				1	1	
12	Pinion piston	Stainless steel				2	2	
13	Piston	*1	Aluminum alloy			4	2	
14	O-ring	NBR				4	4	●
15	Snap ring	Stainless steel				4	4	
16	Bolt	-	Stainless steel			4	4	
17	Screw	Stainless steel				4	4	
18	Screw	Stainless steel				4	4	

No.	Tube I.D. Part name	Material				Q'y		Repair kits (inclusion)
		8	12	16	20	Axial	Side	
19	Piston packing	NBR				4	4	●
20	Pin	Stainless steel				2	2	
21	Magnet	Magnet material				4	4	
22	Needle	Stainless steel				1	1	
23	Ball	Stainless steel				2	2	
24	Ball	Stainless steel				4	4	
25	Needle	Stainless steel				2	2	
26	Wear ring *2	Teflon				4	4	
27	Bolt *3	Stainless steel				K	K	

*1. Stainless steel

*2. Model MCHD-8(R)(-1), MCHD-12(R)(-1) without wear ring.

*3. Bolt Q'y

Model	K	Model	K
MCHD-8	2	MCHD-16	2
MCHD-8-1	2	MCHD-16-1	4
MCHD-8-2	4	MCHD-16-2	4
MCHD-12	2	MCHD-20	2
MCHD-12-1	4	MCHD-20-1	4
MCHD-12-2	4	MCHD-20-2	4

Model selection

Please select your model according to the weight of workpiece

- Although conditions differ according to the work piece shape and the coefficient of friction between the attachments and the workpiece, select a model that can provide a gripping force of 10 to 20 times the workpiece weight, or more.
- If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

When gripping a workpiece as in the figure as shown above:

F: Gripping force (N)

μ : Coefficient of friction between the attachments and the workpiece

m: Workpiece mass (kg)

g: Gravitational acceleration (=9.8m/s²)

mg: Workpiece weight (N)

the conditions under which the workpiece will not drop are,

$$2 \times \mu F > mg$$

Number of fingers

Therefore,

$$F > \frac{mg}{2 \times \mu}$$

With "a" representing the extra margin, "F" is determined by the following formula:

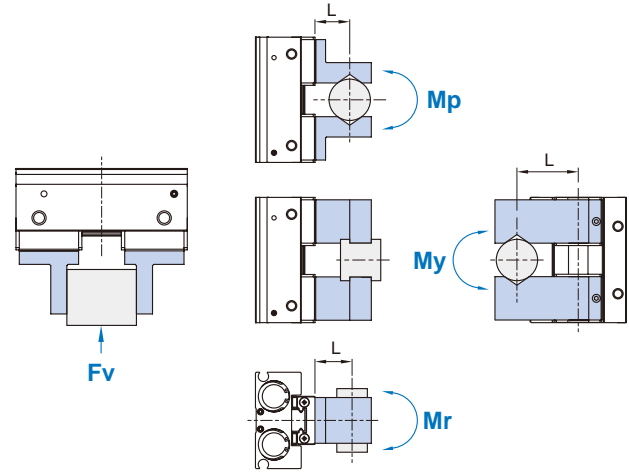
$$F = \frac{mg}{2 \times \mu} \times a$$

The "10 to 20 times or more of the workpiece weight" is calculated with a safety margin of a=4, which allows for impacts that occur during normal transportation, etc.

$\mu=0.2$	$\mu=0.1$
$F = \frac{mg}{2 \times 0.2} \times 4$	$F = \frac{mg}{2 \times 0.1} \times 4$
$= 10 \times mg$	$= 20 \times mg$
↓	↓
10×workpiece weight	20×workpiece weight

- * 1. Even in cases where the coefficient of friction is greater than $\mu=0.2$, for reasons of safety, please select a gripping force which is at least 10 to 20 times greater than the workpiece weight.
- * 2. If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

Confirmation of external force on fingers



L: Distance to the point at which the load is applied (mm)

Tube I.D. (mm)	Allowable vertical load Fv(N)	Maximum allowable moment		
		Pitch moment Mp(N·m)	Yaw moment My(N·m)	Roll moment Mr(N·m)
8	58	0.26	0.26	0.53
12	98	0.68	0.68	1.4
16	176	1.4	1.4	2.8
20	294	2	2	4

* Values for load and moment in the table indicate static values.

Allowable load calculation

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

Example

When a static load of f=20N is operating, which applies pitch moment to point L=25mm from the MCHD-16 guide.

$$\begin{aligned} \text{Allowable load } F(N) &= \frac{1.4 (N \cdot m)}{25 \times 10^{-3} (m)} \\ &= 56 (N) \end{aligned}$$

Load f=20 (N) < 56 (N), so can be used.

Model selection example

In the motion process did not produce high acceleration, deceleration or impact forces,
 Workpiece mass: 300g, Gripping method: External gripping,
 Operating pressure: 0.5 MPa, Coefficient of friction (μ): 0.1,
 Holding position: 20mm (no overhang)

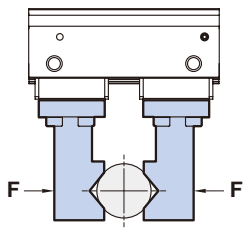
1. The conditions under which the workpiece will not drop are,

$$F = \frac{0.3}{2 \times 0.1} \times 4 = 6 (\text{kgf}) \approx 60 (N)$$

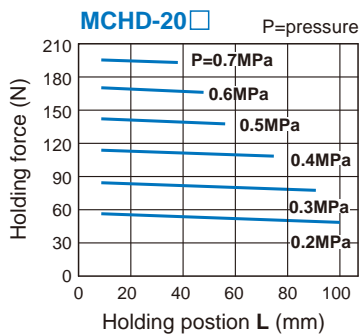
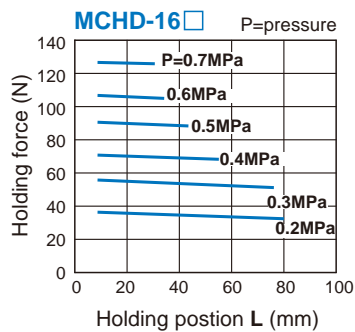
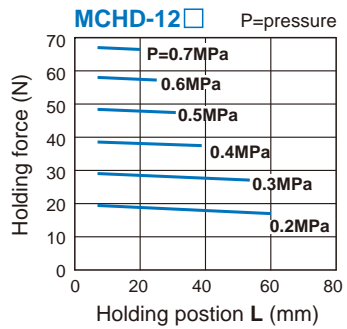
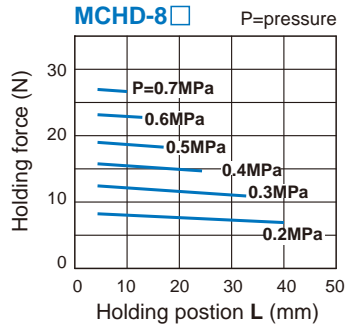
2. From Effective Gripping Force Fig,
 Operating pressure: 0.5 MPa; Holding position: 20 mm
 Effective gripping force is greater than 60 (N)
 So selected **MCHD-16** grippers.

Effective gripping force (Double acting)

Indication of effective force.
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

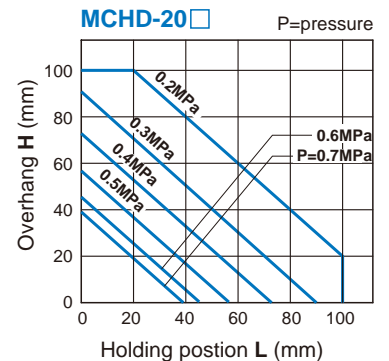
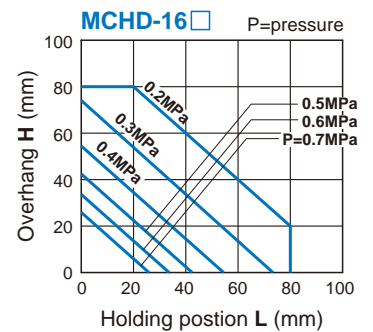
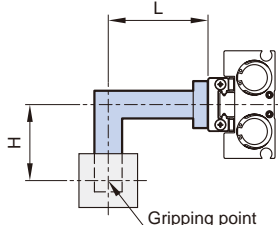
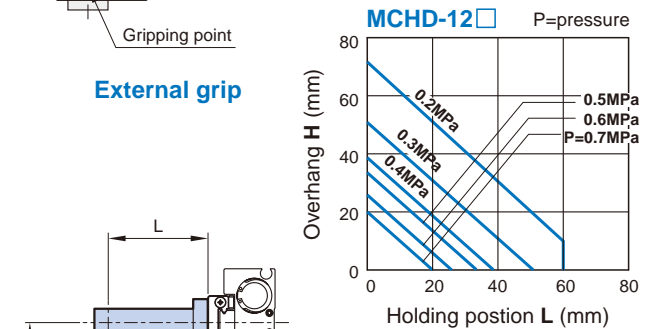
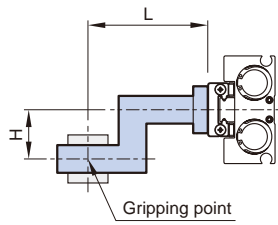
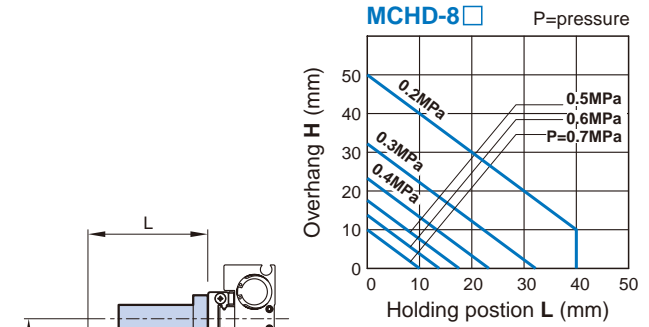


1N=0.102 kgf
1MPa=10.2 kgf/cm²



Confirmation of gripping point

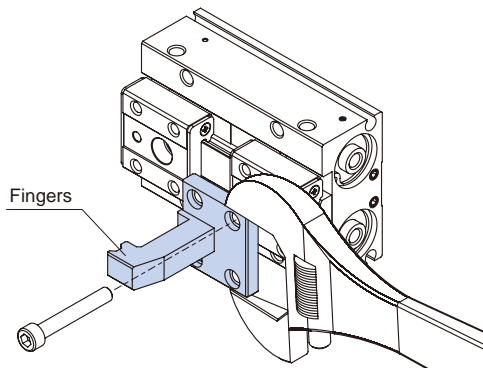
- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life the air gripper.



Product precautions

Before mount the fingers, sure be refer the tightening torque values in the table below.

Tube I.D. (mm)	Bolt	Max. tightening torque (N.m)
8	M2.5x0.45	0.36
12	M3x0.5	0.63
16	M4x0.7	1.5
20	M4x0.7	1.5



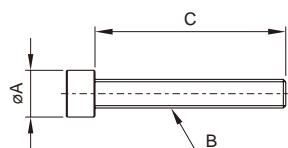
Order example of attached bolt

* One set includes 2 pcs, long stroke type need two sets (4 pcs).

BOLT — MCHD — 8

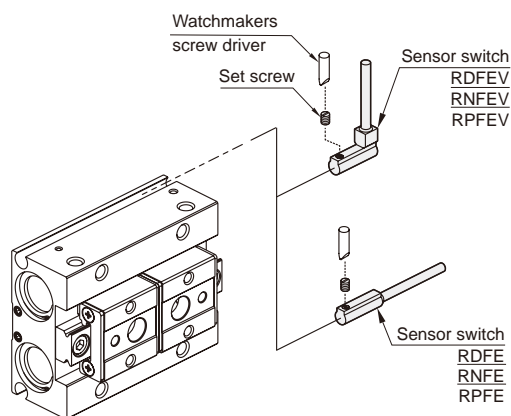
ATTACHED BOLT

TUBE I.D.
8
12



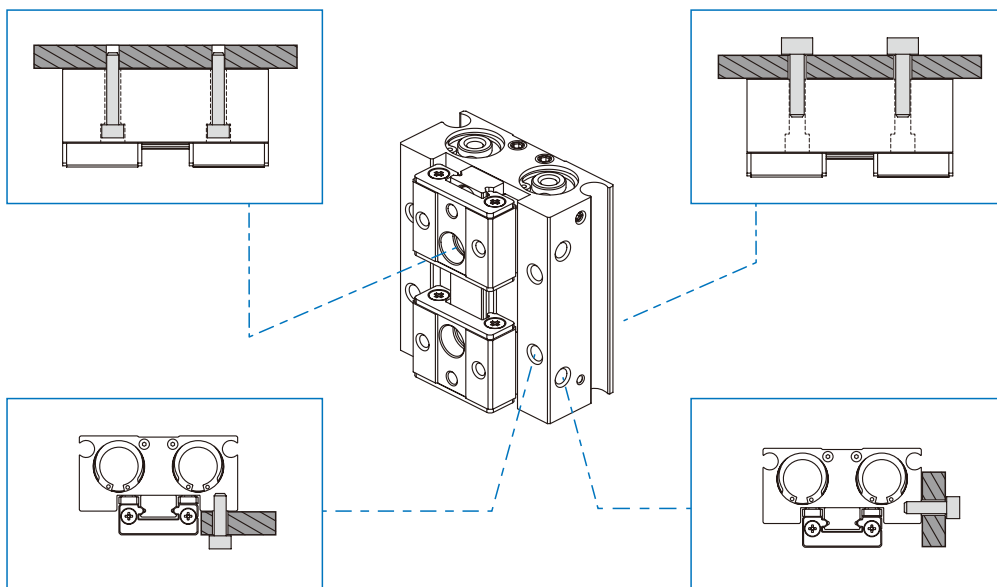
Code Tube I.D.	A	B	C
8	3.8	M2.5x0.45	15
12	4.9	M3x0.5	20

Installation of sensor switch

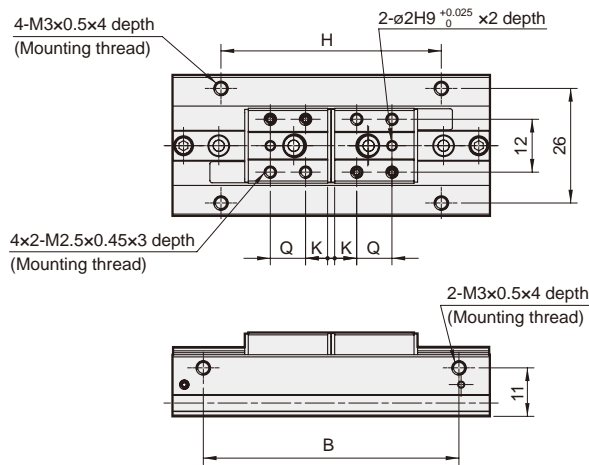
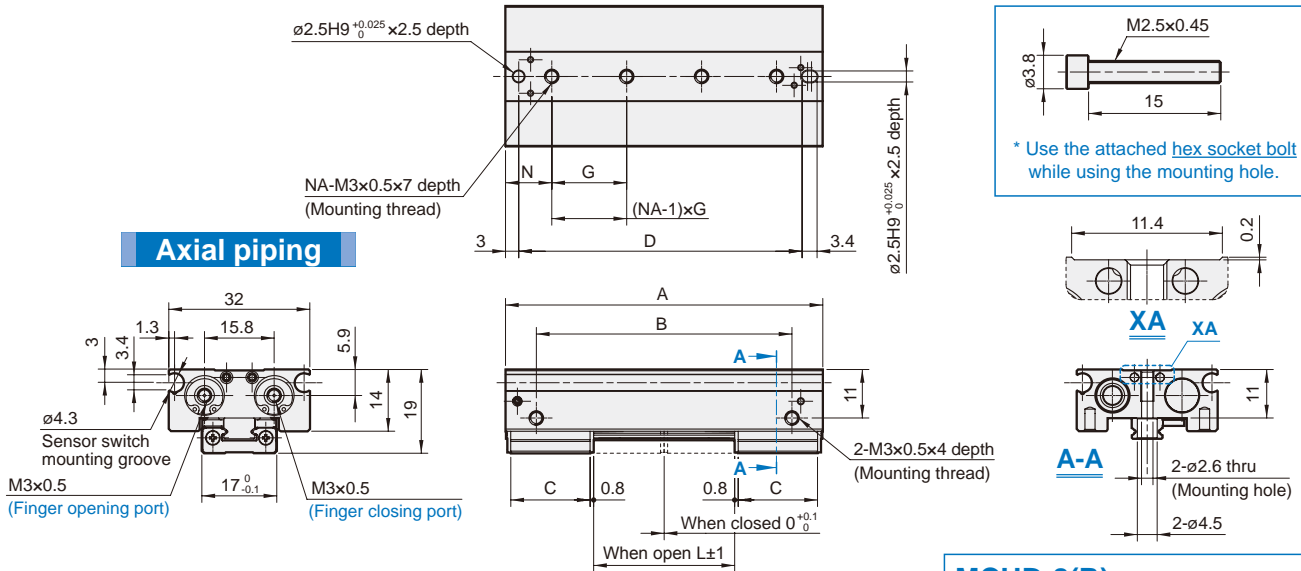


High degree of mounting flexibility

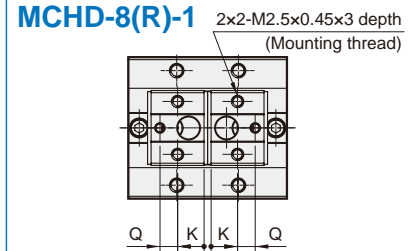
* Use the attached bolt for mounting in tube I.D. $\varnothing 8$, $\varnothing 12$.



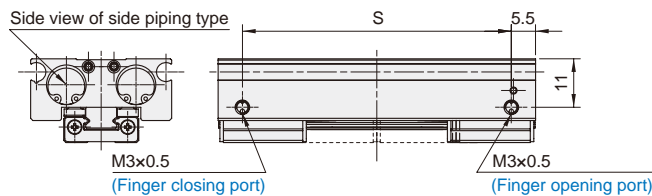
Axial piping



MCHD-8(R) MCHD-8(R)-1



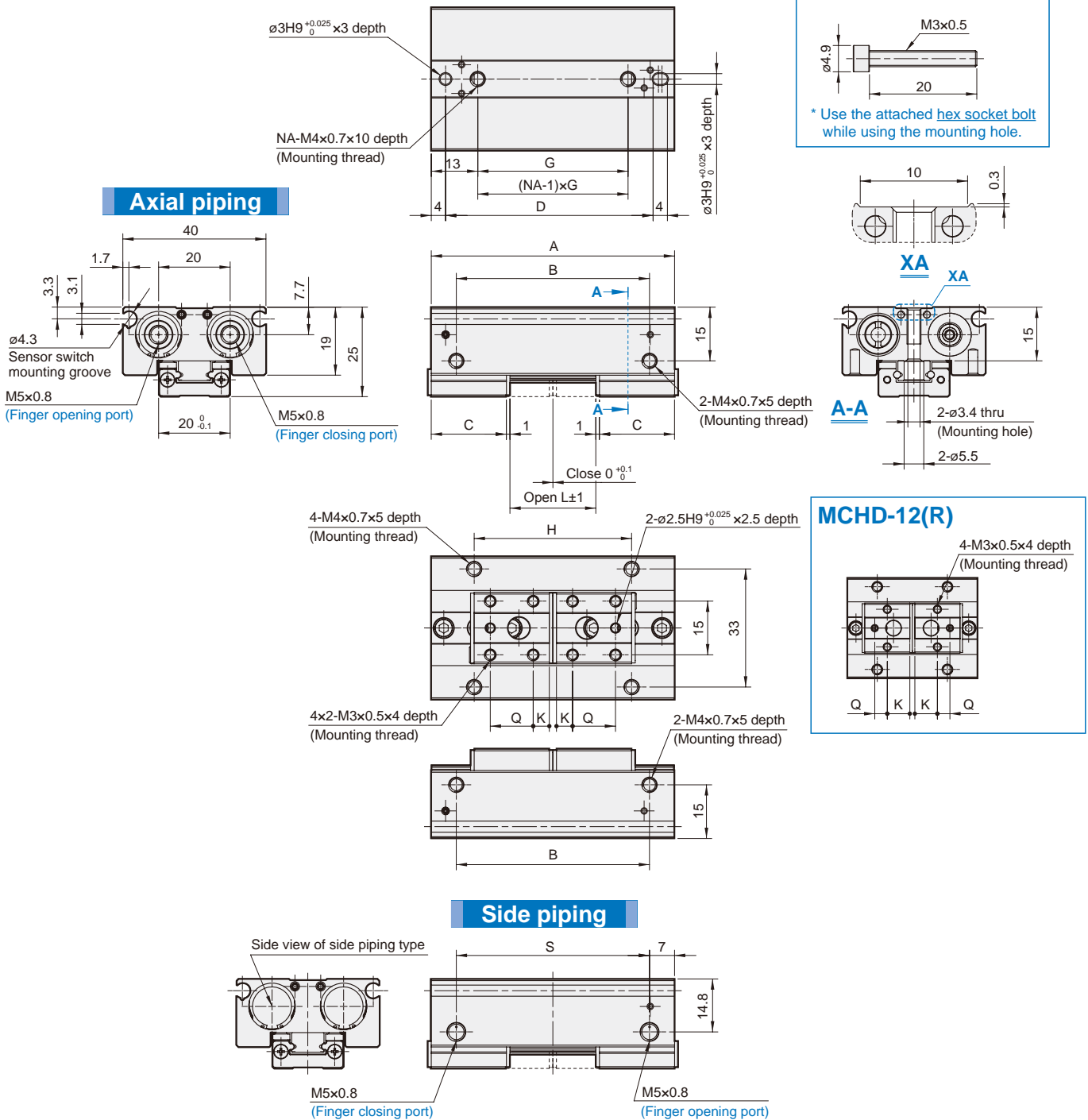
Side piping



Unit: mm

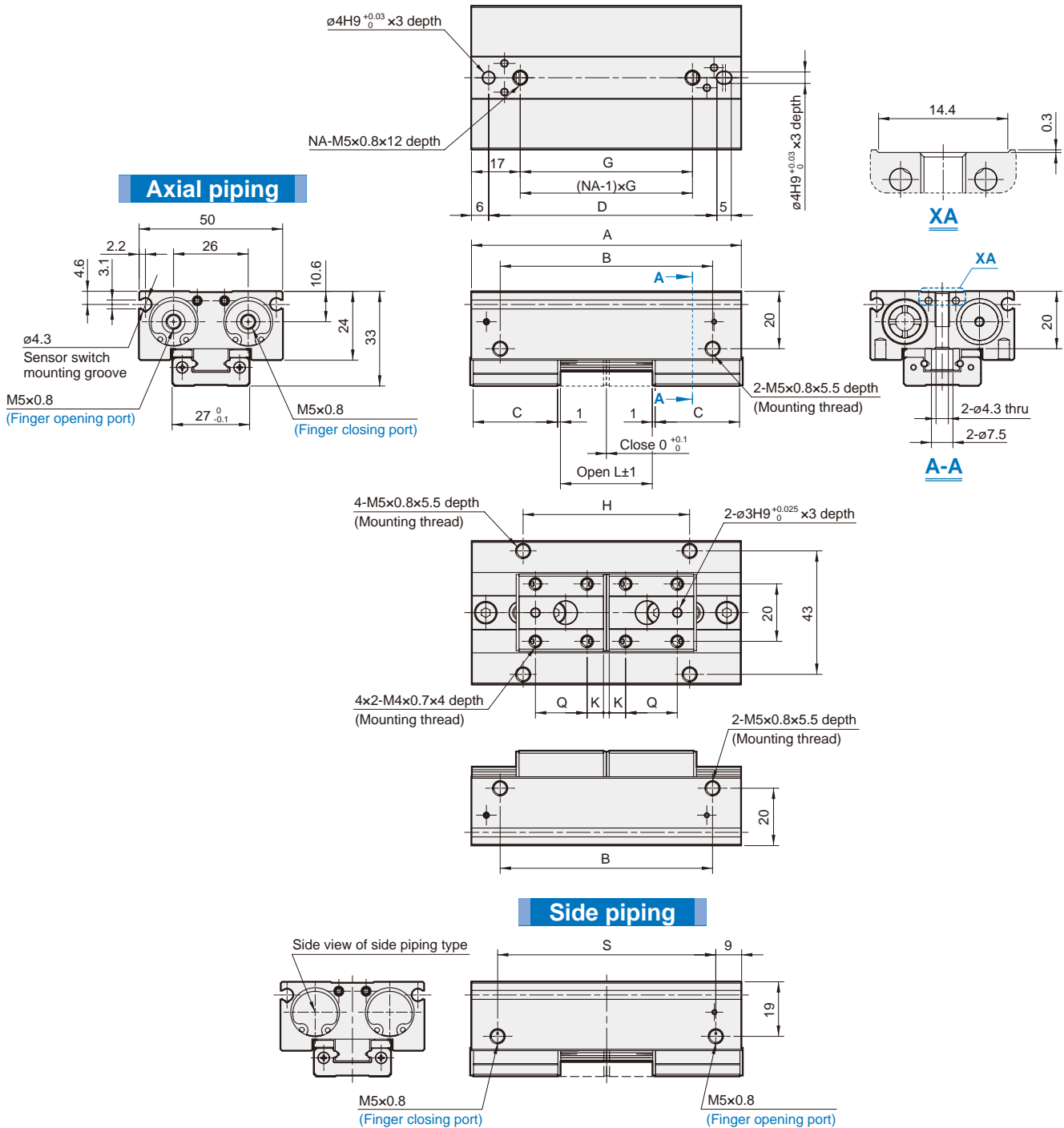
Code Model	A	B	C	D	G	H	K	L	N	NA	Q	S
MCHD-8(R)	36	22	12	28.3	16	14	6	8	10	2	4	25
MCHD-8(R)-1	48	34	14	40.3	28	26	7	16	10	2	4	37
MCHD-8(R)-2	72	58	18	64.3	17	50	5	32	10.5	4	8	61

PARALLEL GRIPPER (2-Finger)



Unit: mm

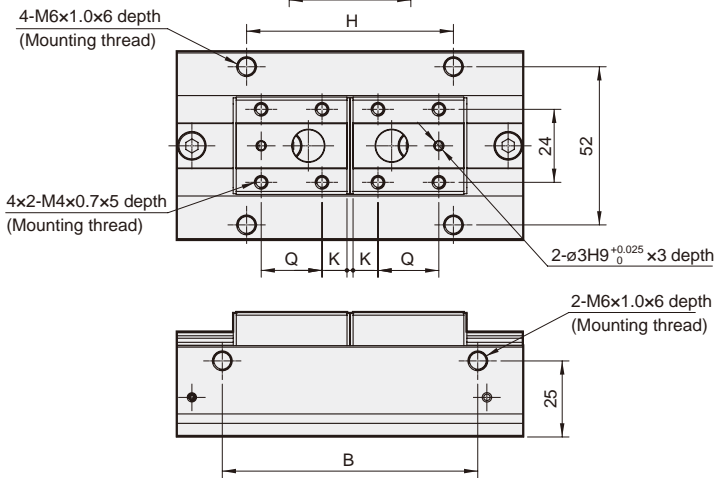
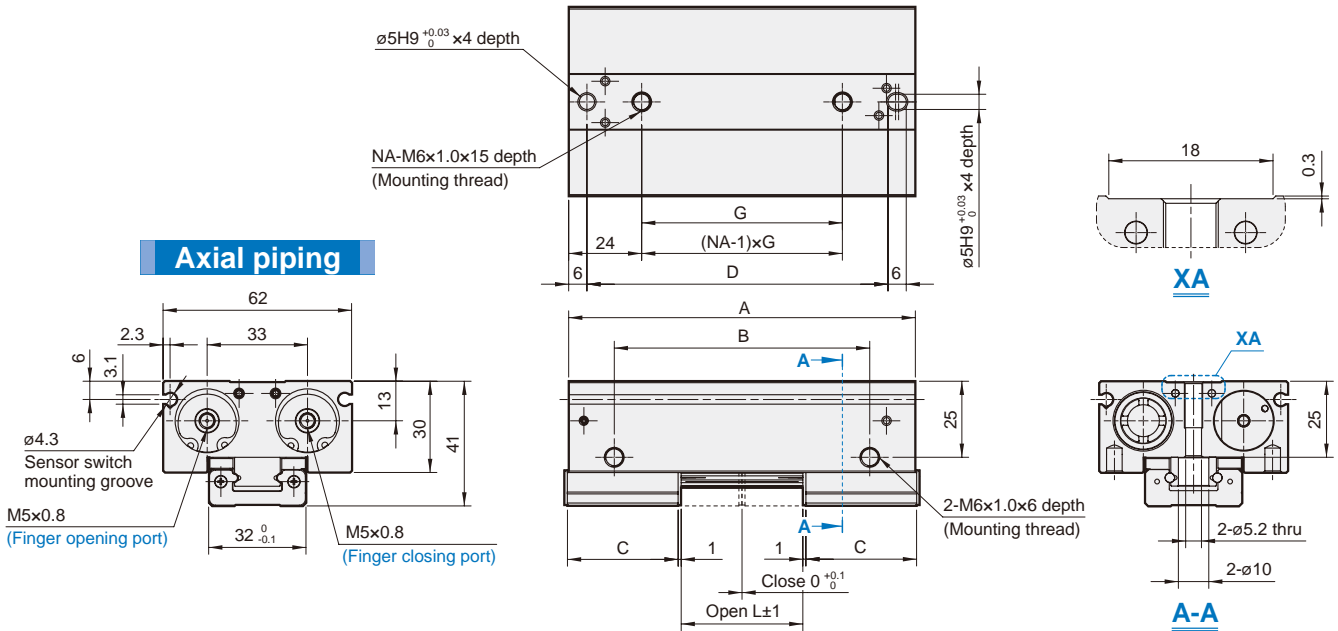
Code Model	A	B	C	D	G	H	K	L	NA	Q	S
MCHD-12(R)	52	38	18	42	26	28	9	12	2	5	38
MCHD-12(R)-1	68	54	21	58	42	44	4.5	24	2	12	54
MCHD-12(R)-2	104	90	27	94	26	80	4.5	48	4	18	90



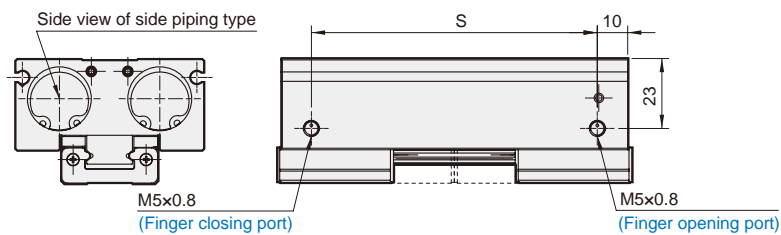
Unit: mm

Code Model	A	B	C	D	G	H	K	L	NA	Q	S
MCHD-16(R)	72	52	25.4	57.5	38	36	5.2	16	2	15	54
MCHD-16(R)-1	94	74	29.4	79.5	60	58	5.7	32	2	18	76
MCHD-16(R)-2	142	122	37.4	127.5	36	106	5.7	64	4	26	124

Axial piping

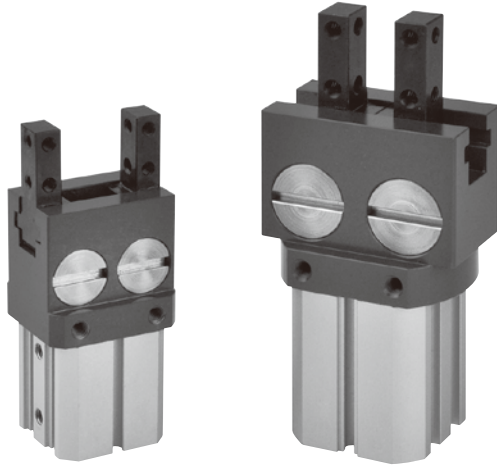


Side piping



Unit: mm

Code Model	A	B	C	D	G	H	K	L	NA	Q	S
MCHD-20(R)	86	56	31.4	71	38	40	7.7	20	2	16	66
MCHD-20(R)-1	114	84	36.4	99	66	68	8.2	40	2	20	94
MCHD-20(R)-2	174	144	46.4	159	42	128	8.2	80	4	30	154



Order example

MCHH – 25 M

MODEL

TUBE I.D.

20
25
40

M: Magnet

* Magnetic as standard.

Features

- With the same tube I.D., the gripping stroke is longer compare with other grippers.
- The plain bearing parts are hardened for longer effective life time.
- Three mounting directions are available.
- Magnetic as standard.

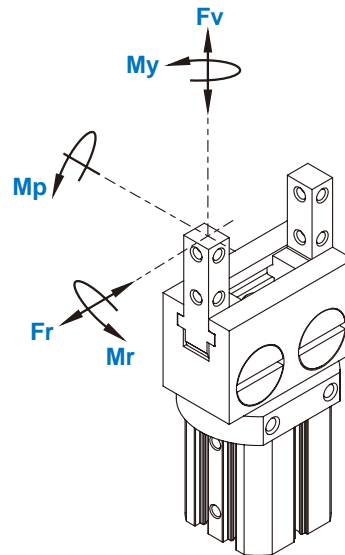
Specification

Model	MCHH		
Acting type	Double acting		
Tube I.D. (mm)	20	25	40
Stroke	16	26	41
Medium	Air		
Operating pressure range	0.3~0.7 MPa		
Ambient temperature	-10~+60°C (No freezing)		
Lubrication (*1)	Not required		
Repeatability	± 0.03 mm		
Sensor switch (*2)	2 wire	RDFE(V): Non-contact	
	3 wire	RNFE(V): NPN, RPF(E): PNP	
Weight (kg)	0.27	0.59	1.46

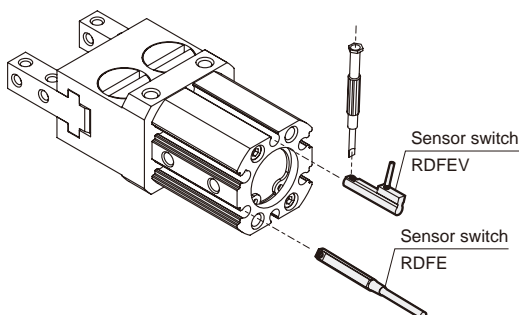
*1. Sliding area of jaws need scheduled relubrication.

*2. R*FE(V) specification, please refer to page 5-11.

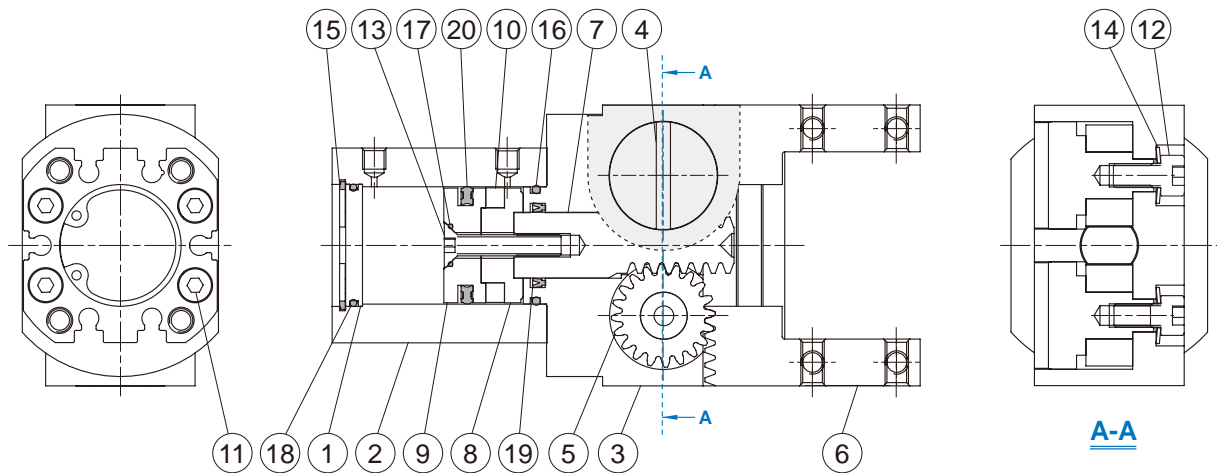
Load limit



Installation of sensor switch



Code Tube I.D.	Mr max. (Nm)	Mp max. (Nm)	My max. (Nm)	Fv max. (N)	Fr max. (N)
20	0.83	0.41	0.41	56.55	37.70
25	1.56	0.78	0.78	80.86	53.91
40	9.17	4.58	4.58	371.56	247.71



Material

No.	Part name	Material	Q'y	Repair kits (inclusion)
1	End cover	Aluminum alloy	1	
2	Body	Aluminum alloy	1	
3	Finger rail	Aluminum alloy	1	
4	Pinion holder	Carbon steel	2	
5	Pinion	Alloy steel	2	
6	Finger	Alloy steel	2	
7	Piston rod	Alloy steel	1	
8	Magnet holder	Aluminum alloy	1	
9	Piston	Aluminum alloy	1	
10	Magnet ring	Magnet material	1	
11	Hexgon bolt (*)	Steel	2 or 4	
12	Hexgon bolt	Steel	2	
13	Countersink bolt	Steel	1	
14	Washer	Spring steel	2	
15	Snap ring	Spring steel	1	
16	O-ring	NBR	1	●
17	O-ring	NBR	1	●
18	O-ring	NBR	1	●
19	Rod packing	NBR	1	●
20	Piston packing	NBR	1	●

* ø20 Q'y: 2 pcs, ø25 & ø40 Q'y: 4 pcs

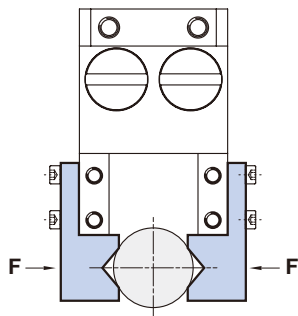
Order example of repair kits

Tube I.D.	Repair kits
ø20	PS-MCHH-20
ø25	PS-MCHH-25
ø40	PS-MCHH-40

Effective gripping force

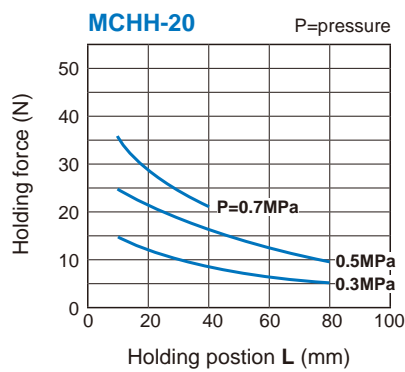
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

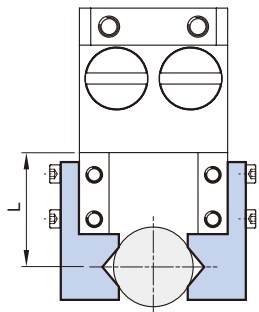
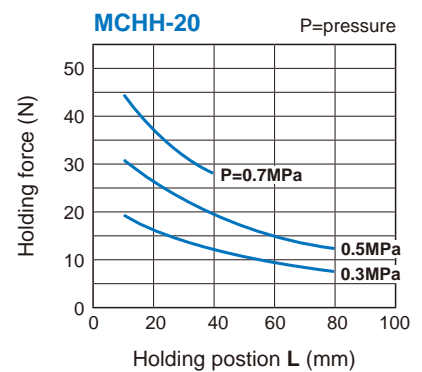


$1N=0.102\text{ kgf}$
 $1MPa=10.2\text{ kgf/cm}^2$

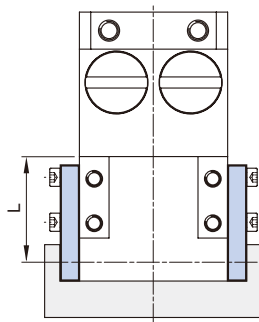
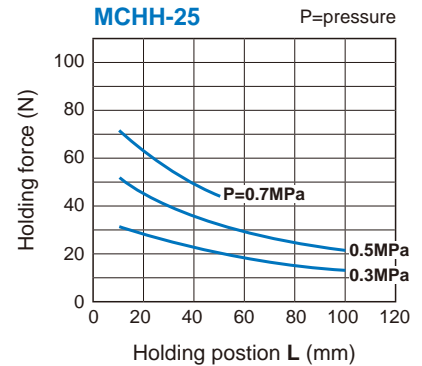
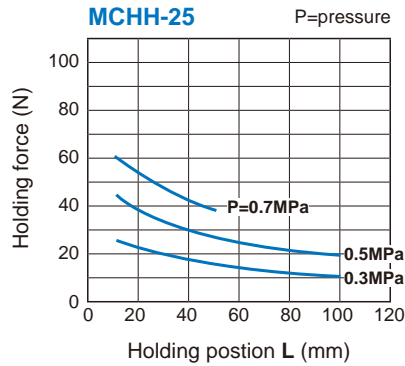
External grip



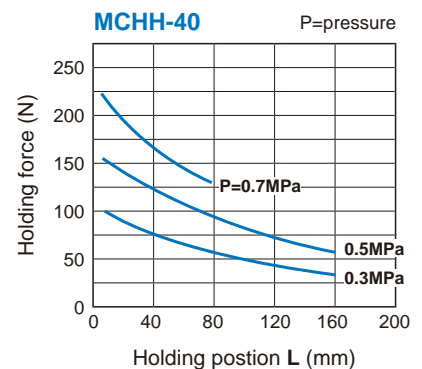
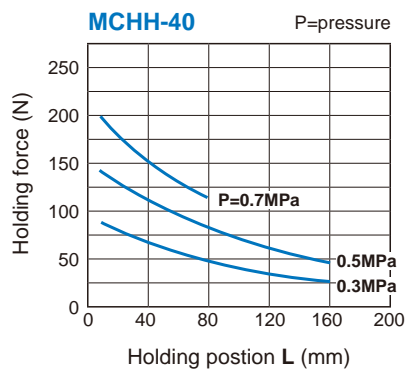
Internal grip



External grip

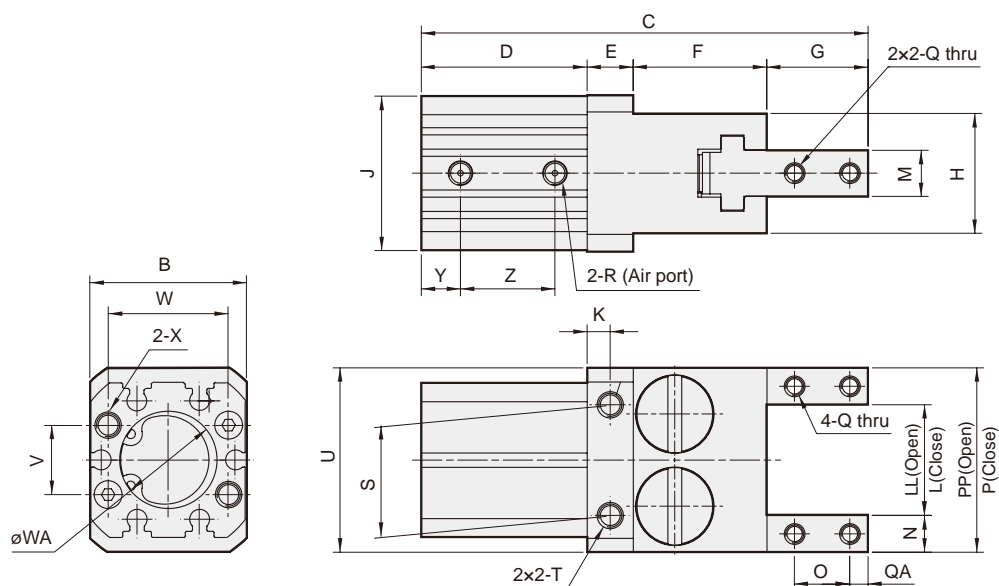


Internal grip

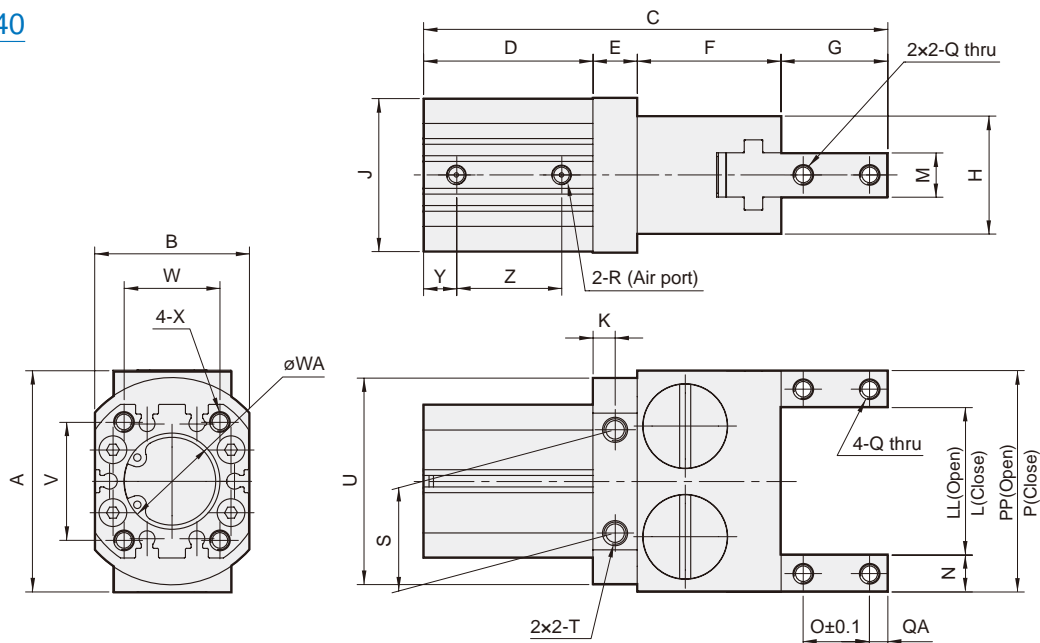


PARALLEL GRIPPER (2-Finger)

$\phi 20$

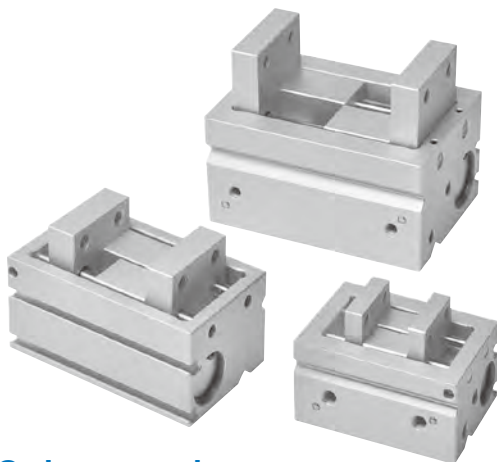


$\phi 25, \phi 40$



Code Model	A	B	C	D	E	F	G	H	J	K	L	LL	M	N	O	P	PP	Q	QA	R	S	T	U
MCHH-20	-	34	97	36	10	29	22	26	33.5	5	8	24	10 ^{-0.01/-0.06}	8	12	24	40	M4x0.7	4	M5x0.8	24	M5x0.8x12 dp	40
MCHH-25	60	42	126	46	12	39	29	32	41.5	6	14	40	12 ^{-0.01/-0.06}	10	18	34	60	M5x0.8	5	M5x0.8	28	M6x1.0x14 dp	$\phi 56$
MCHH-40	92	60	167	57	15	58	37	38	58	8	26	68	14 ^{-0.01/-0.06}	12	20	50	92	M6x1.0	7	Rc1/8	42	M8x1.25x14 dp	$\phi 82$

Code Model	V	W	WA	X	Y	Z
MCHH-20	15	26	$\phi 22^{+0.05}_0 \times 1.5$ dp	M5x0.8x10 dp	8.5	20.5
MCHH-25	32	26	$\phi 26^{+0.05}_0 \times 1.5$ dp	M5x0.8x10 dp	9	28.5
MCHH-40	44	34	$\phi 42^{+0.05}_0 \times 2$ dp	M6x1.0x12 dp	11	28.5



Features

- Compact design, low weight with rugged construction.
- Jaws mounted to wear resistant bush guides.
- Proximity and reed switches can be used with this unit.
- Magnetic as standard.

Specification

Model	MCHU		
Acting type	Double acting		
Tube I.D. (mm)	12	16	20
Stroke	15	20	25
Fluid	Air 0.2~0.7 MPa		
Ambient temperature	-10~+60°C (No freezing)		
Lubrication (*1)	Not required		
Repeatability	±0.03 mm		
Sensor switch (*2)	RDFE(V): Non-contact		
	RNFE(V): NPN, RPFE(V): PNP		
Weight (kg)	0.16	0.29	0.58

*1. Sliding area of jaws need scheduled relubrication.
 *2. R*FE(V) specification, please refer to page 5-11.

Order example

MCHU – 12 M

MODEL

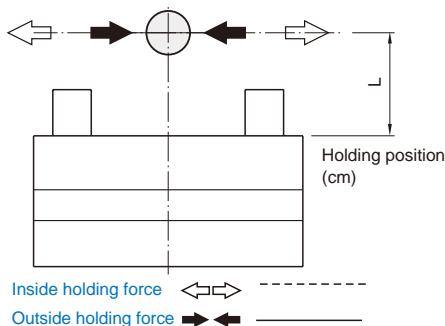
TUBE I.D.

M: Magnet

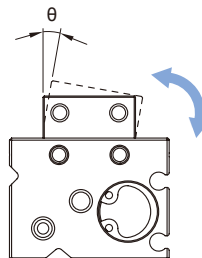
* Magnetic as standard.

12
16
20

Capacity

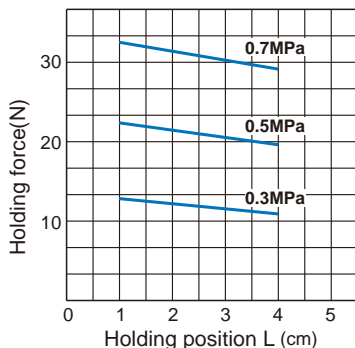


Non-rotating accuracy

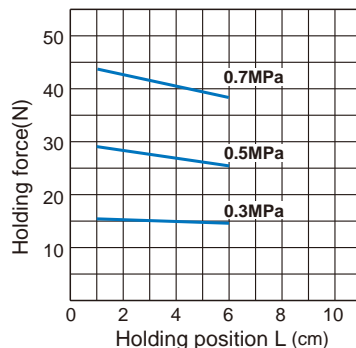


Tube I.D.	(θ)
ø12	±0.25°
ø16	±0.2°
ø20	±0.15°

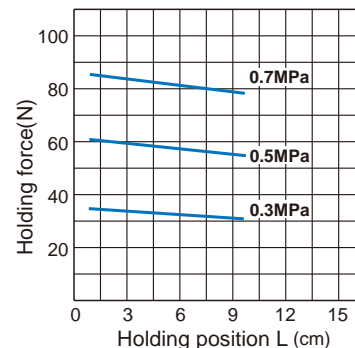
MCHU-12



MCHU-16



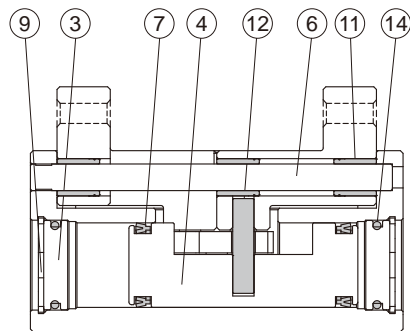
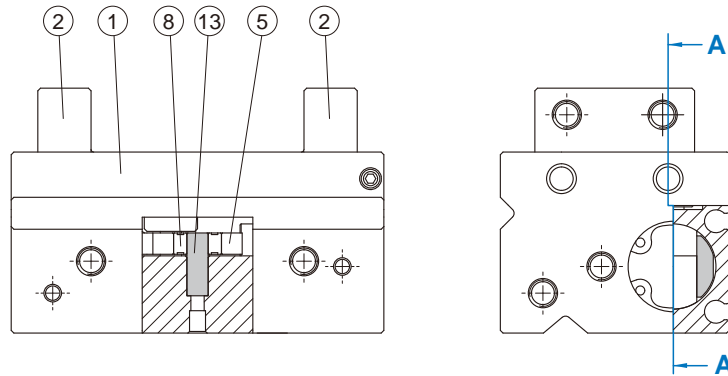
MCHU-20



Model selection suggestions

* Finger selection please refer to page 3-2.

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.



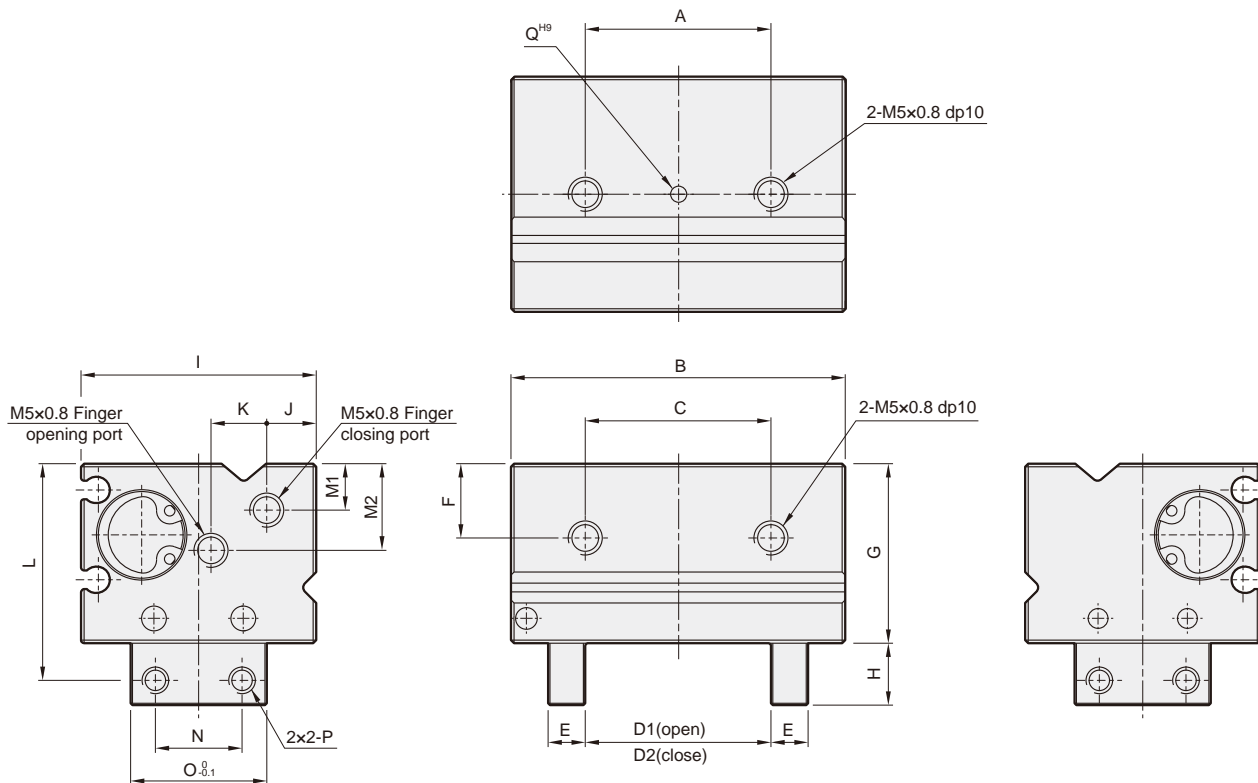
A-A

Material

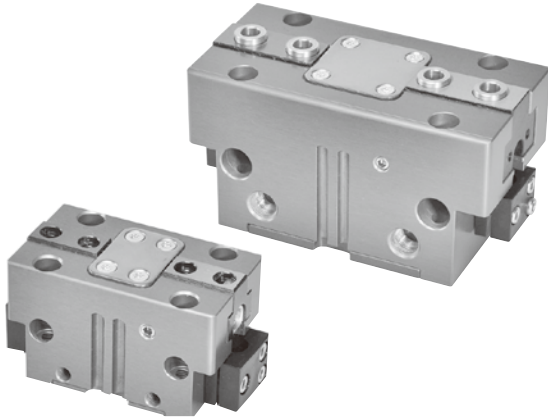
No.	Tube I.D. Part name	12	16	20	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy			1	
2	Finger	Aluminum alloy			2	
3	Cover	Aluminum alloy			2	
4	Piston	Stainless steel			1	
5	Cam	SCM			1	
6	Guide rod	Carbon steel			2	
7	Piston packing	NBR			2	●
8	Bearing	Bearing steel			1	
9	Snap ring	Spring steel			2	
10	Magnet	Magnet material			1	
11	Bush	Copper			6	
12	Pin	High carbon steel			2	
13	Pin	High carbon steel			1	
14	O-ring	NBR			2	●

Order example Repair kits

Tube I.D.	Repair kits
ø12	PS-MCHU-12
ø16	PS-MCHU-16
ø20	PS-MCHU-20



Code Tube I.D.	A	B	C	D1	D2	E	F	G	H	I	J	K	L	M1	M2	N	O	P	Q ^{H9}
12	30	54	30	30	15	6	12	29	10	38	8	9	35	7.5	14	14	22	M4x0.7	$\varnothing 2^{+0.025}_0 \times 2dp$
16	40	70	40	40	20	10	13.5	34	12	43	8	11	41	7.5	12.5	18	30	M5x0.8	$\varnothing 3^{+0.025}_0 \times 4dp$
20	60	82	60	50	25	10	15	43	22	56	10	15	59	9	20	20	35	M5x0.8	$\varnothing 3^{+0.025}_0 \times 6dp$



Order example

MCCHS – 50

MODEL

BODY SPECIFICATION
50, 66, 80, 100,
125, 160, 200, 300

Features

- Compact design to ensure minimum interference while operating; robust T rail design, ensure accurate gripping.
- Can reach maximum torque suitable for long jaws design.
- Oval piston-driven design ensure maximum gripping force.
- Hose-free direct connection: Air supply channel can connect directly without piping or through tread to assure the flexibility of supplying compressed air on any kind of automation system.

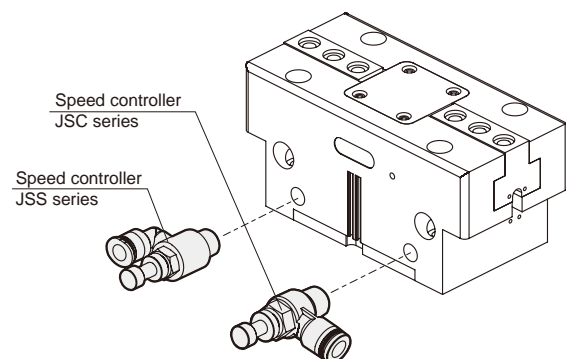
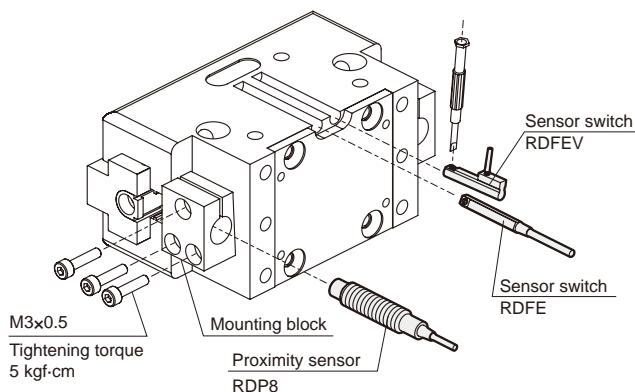
Specification

Model	MCCHS							
Acting type	Double acting							
Body specification	50	66	80	100	125	160	200	300
Stroke per-jaw(mm)	4	6	8	10	12	16	20	30
Effective external gripping force (N) (*1)	77	135	285	359	600	884	1606	3411
Close/Open time(s)	0.02	0.03	0.04	0.07	0.1	0.1	0.35	0.4
Medium	Air							
Operating pressure range	0.3~0.8 MPa							
Compressed air consumption(cm ³)	4.1	10.1	23.6	39.3	85	85	330	1000
Ambient temperature	+5°C~ +80°C							
Lubrication	Not required							
Sensor switch (*2)	2 wire	RDFE(V): Non-contact						
	3 wire	RNFE(V): NPN, RPFV(V): PNP						
Proximity sensor	-	RDP8 (Please refer to page 5-13)						
Accessories	Mounting block, Accessory kits							
Weight (kg)	0.14	0.27	0.495	0.85	1.6	3.0	5.7	14.2
Recom. workpiece weight (kg)	0.85	1.4	2.6	3.6	6.3	9.2	15	32

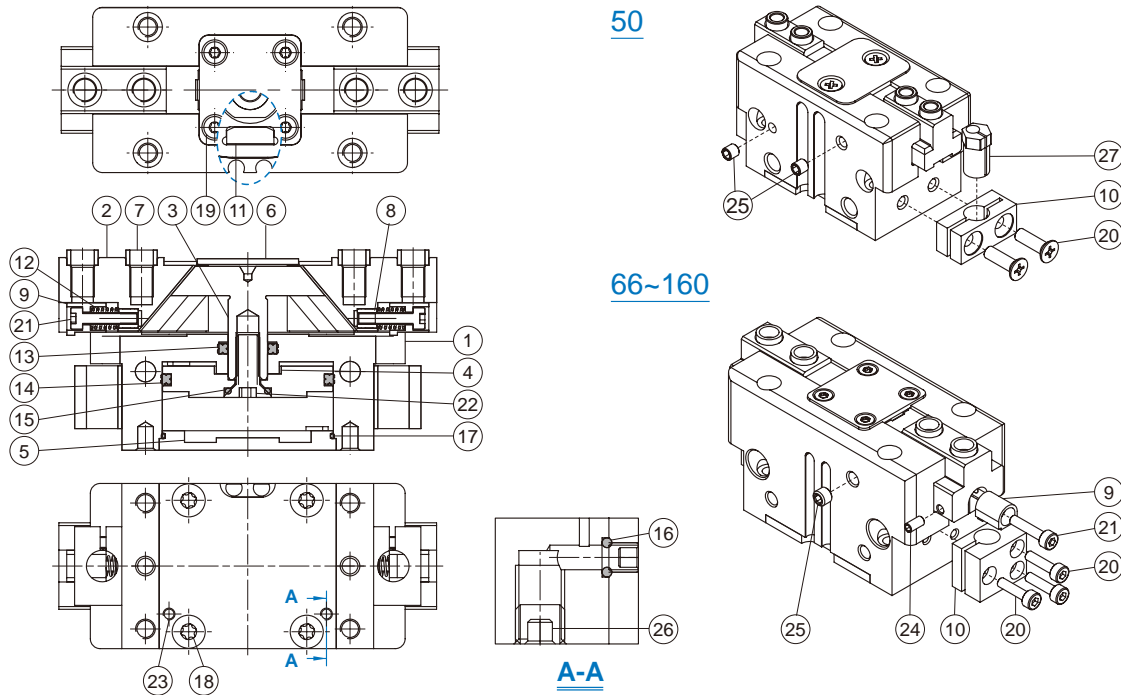
*1. Under the condition of clamping length 40mm and operation pressure 0.6 MPa.

*2. R*FE(V) specification, please refer to page 5-11.

Installation of sensor switch & speed controller



* Each gripper needs at least two speed control valves to control speed.
* Speed controller specification, please refer to page 7-15 (Vol.1).



Material





No.	Part name	Material	Body spec & Q'y						Repair kits (inclusion)
			50	66	80	100	125	160	
1	Body	Aluminum alloy	1						
2	Finger	Mid carbon steel	2						
3	Rod	Mid carbon steel	1						
4	Piston	Aluminum alloy	1						
5	End cover	Aluminum alloy	1						
6	Plate cover	Stainless steel	1						
7	Centering sleeve	Stainless steel	4						
8	Thread insert	Brass	-			2			
9	Sensor adj block	Aluminum alloy	-			2			
10	Sensor holder	PBT+30%GF	2						
11	Magnet	Magnet material	1						
12	Spring	SWP	-			2			
13	Rod packing	NBR	1						●
14	Piston packing	NBR	1						●
15	O-ring	NBR	1						●
16	O-ring	NBR	3	4	2			●	
17	O-ring	NBR	1						●
18	Screw	Carbon steel	4						
19	Screw	Carbon steel	2	4					
20	Bolt	Stainless steel	4	6					
21	Hex bolt	Stainless steel	-			2			
22	Hex bolt	Stainless steel	1						
23	Hex screw	Stainless steel	2						
24	Hex screw	Carbon steel	4						
25	Hex screw	Stainless steel	2						
26	Hex screw	Stainless steel	2						
27	Adjust socket	Stainless steel	2	-					

Order example of repair kits

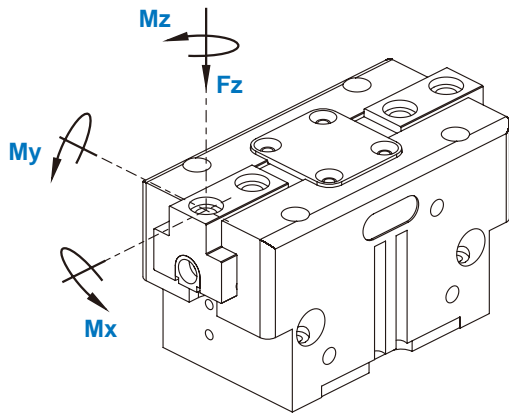
Model	Repair kits
MCHS-50	PS-MCHS-50
MCHS-66	PS-MCHS-66
MCHS-80	PS-MCHS-80
MCHS-100	PS-MCHS-100
MCHS-125	PS-MCHS-125
MCHS-160	PS-MCHS-160

Order example of accessory kits

Model	Accessory kits
MCHS-50	AK-MCHS-50
MCHS-66	AK-MCHS-66
MCHS-80	AK-MCHS-80
MCHS-100	AK-MCHS-100
MCHS-125	AK-MCHS-125
MCHS-160	AK-MCHS-160

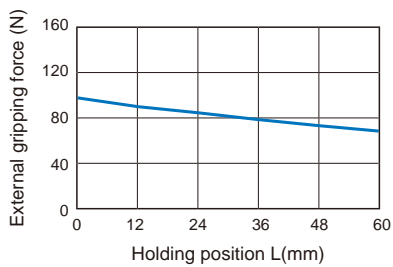
	
O-ring (x2)	Iron plug (x2)
	
PIN (x2)	Centering sleeve (x4)

Holding force

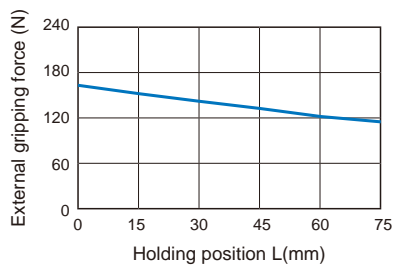


Code Model	Mx max. (Nm)	My max. (Nm)	Mz max. (Nm)	Fz max. (N)
MCHS-50	15	15	8	700
MCHS-66	50	45	35	1200
MCHS-80	80	60	50	1800
MCHS-100	100	90	75	2500
MCHS-125	120	120	100	3200
MCHS-160	160	180	140	5000
MCHS-200	180	220	170	7000
MCHS-300	275	300	200	9000

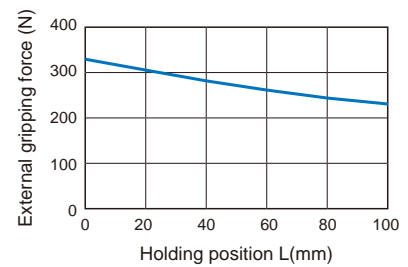
MCHS-50



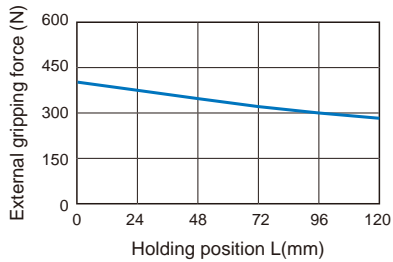
MCHS-66



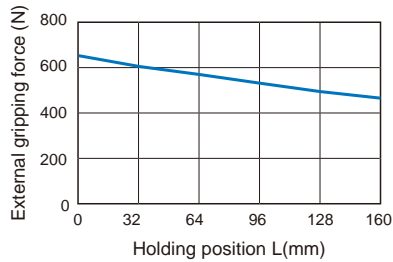
MCHS-80



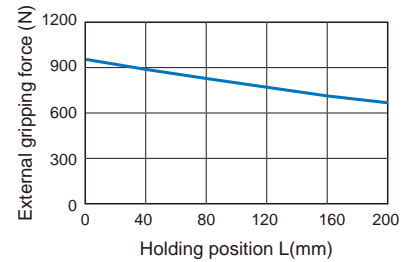
MCHS-100



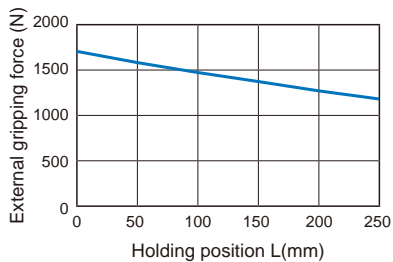
MCHS-125



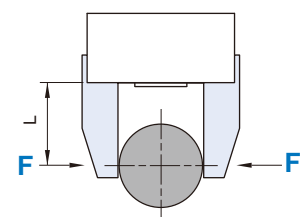
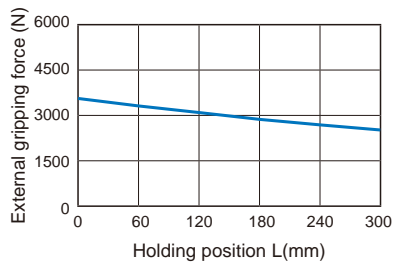
MCHS-160



MCHS-200

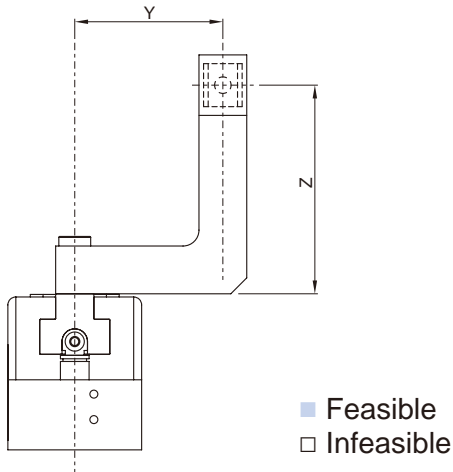
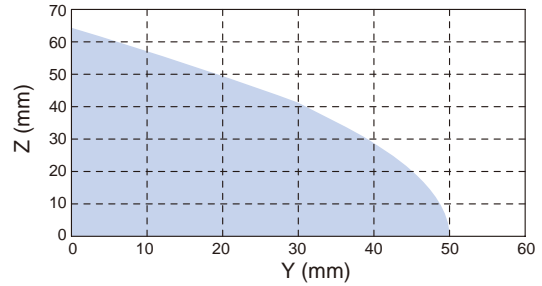
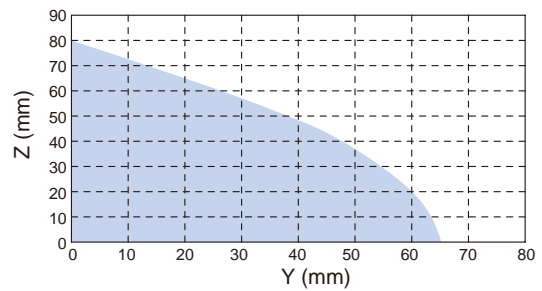
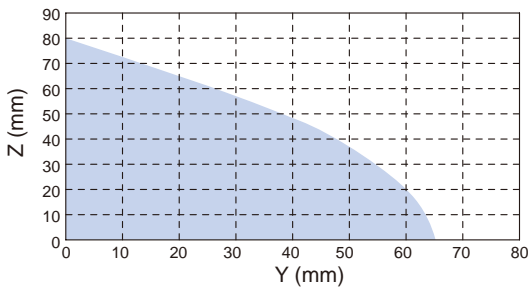
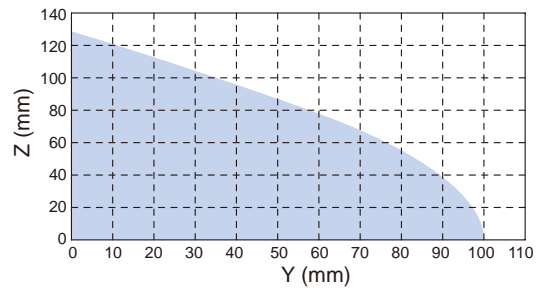
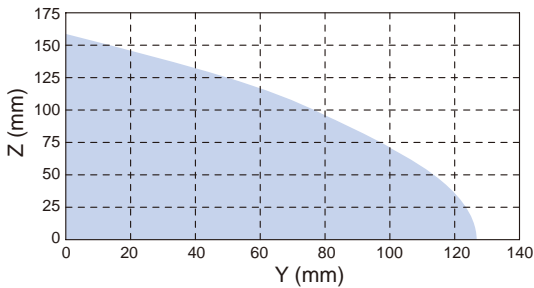
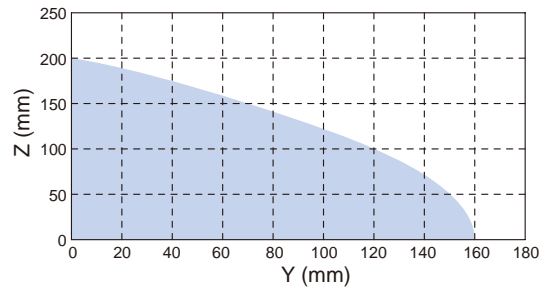
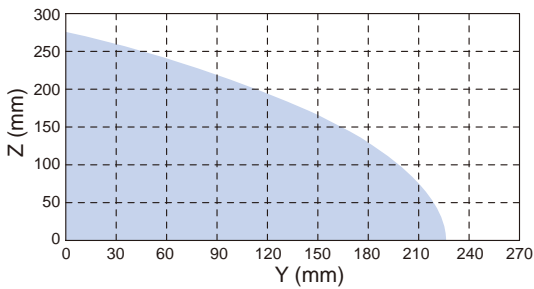
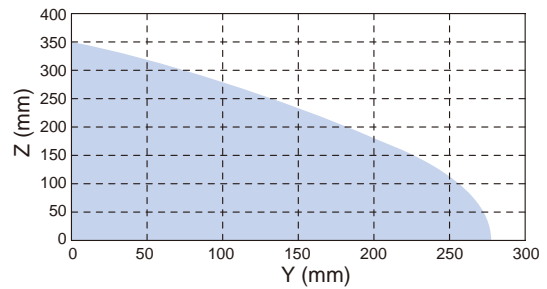


MCHS-300



* Operating pressure 0.6 MPa.

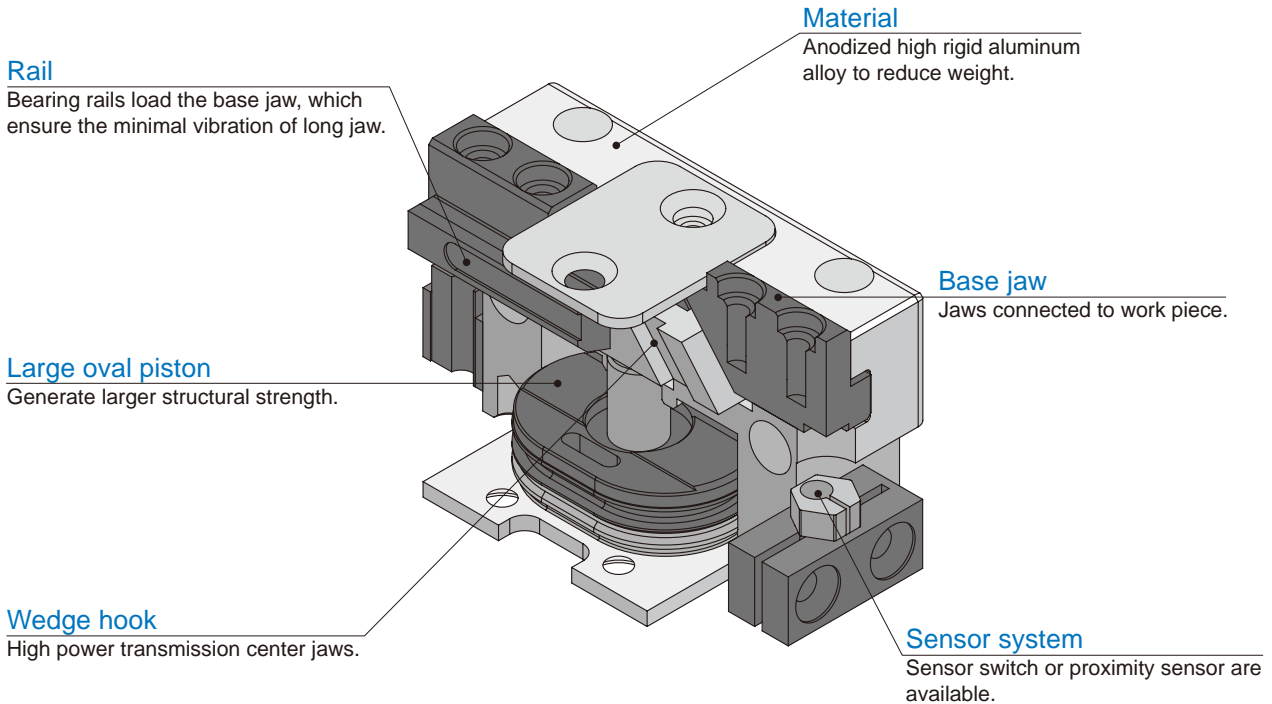
Max. feasible centrifugal degree


MCHS-50

MCHS-66

MCHS-80

MCHS-100

MCHS-125

MCHS-160

MCHS-200

MCHS-300


PARALLEL GRIPPER (2-Finger)

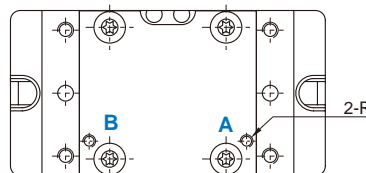
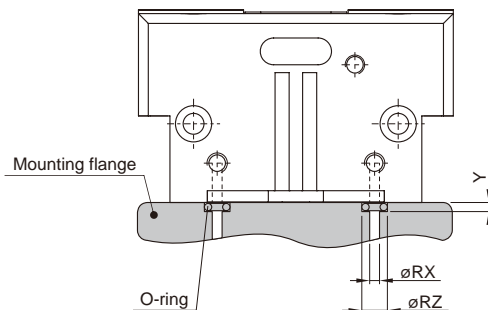
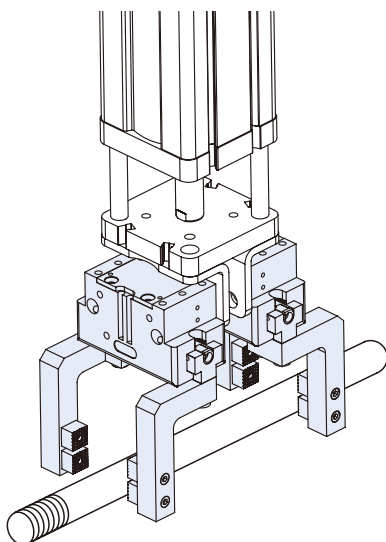
Internal structure & Movement description

Compressed air will push or press the oval piston.
By tilting the working surface, the wedge hook will transfer the movement to side movement, and initiate the action of the two base jaws simultaneously.



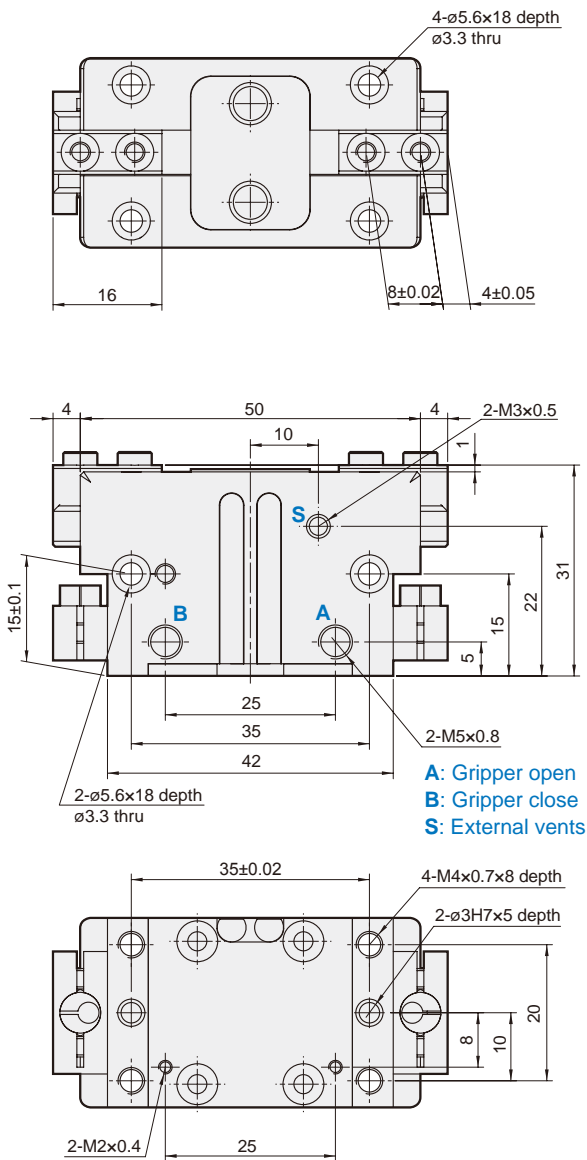
Application examples

Hose-free direct connection

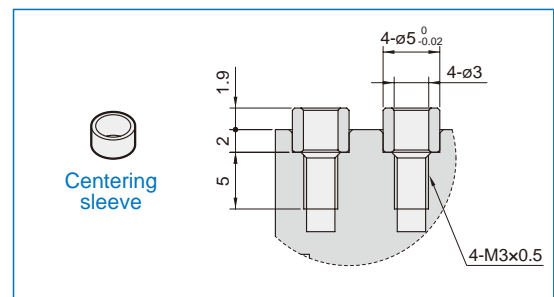


Code Model	R	RX	RZ	Y
MCHS-50	M2	2	4	0.7
MCHS-66	M3	3	5	0.7
MCHS-80	M3	3	5	0.7
MCHS-100	M5	5	8	1.1
MCHS-125	M5	5	8	1.1
MCHS-160	M5	5	8	1.1
MCHS-200	M5	5	8	1.1
MCHS-300	M5	5	8	1.1

A : Gripper open
B : Gripper close



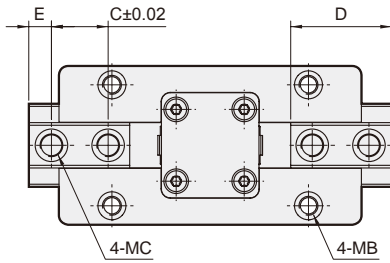
Centering sleeve



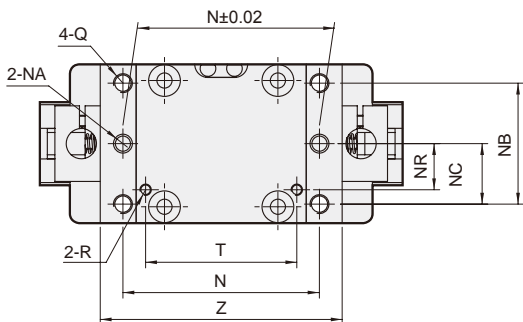
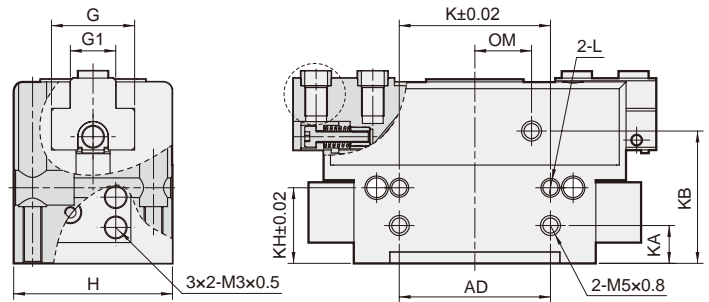
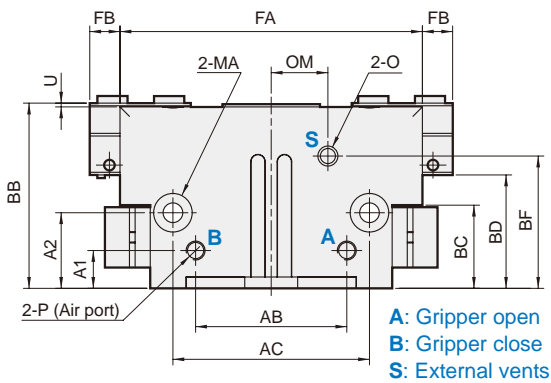
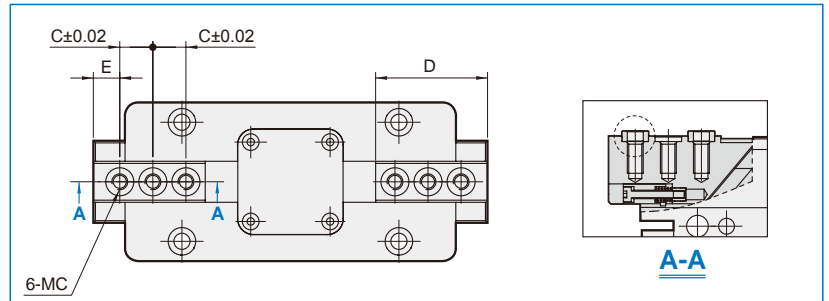
PARALLEL GRIPPER (2-Finger)

mindman

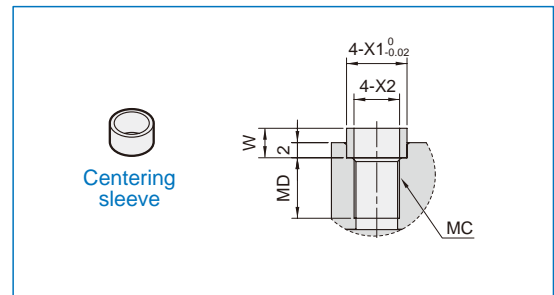
66~100



125~160

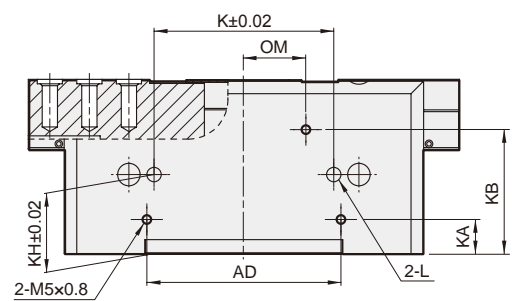
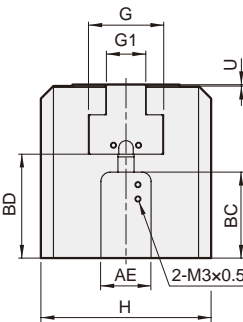
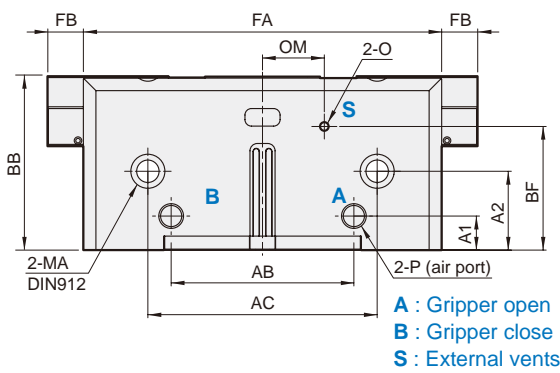
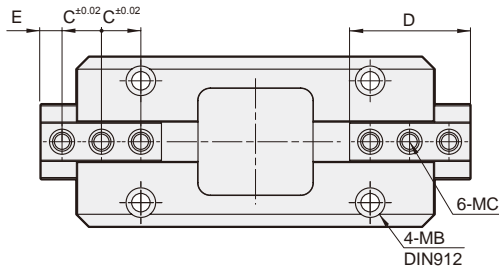


Centering sleeve

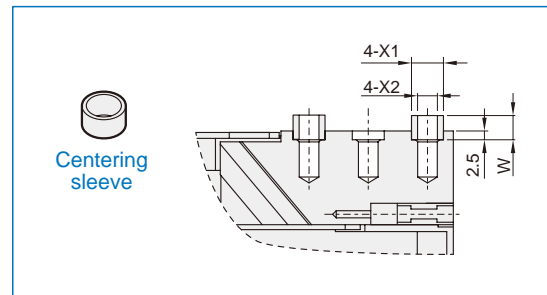
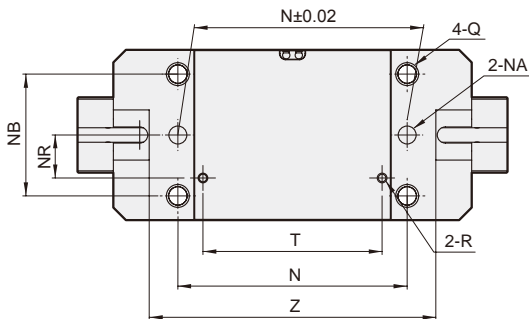


Code Spec.	A1	A2	AB	AC	AD	BB	BC	BD	BF	C	D	E	FA	FB	G	G1	H	K	KA	KB	KH	L	MA
66	5	18	28	42	28	39	18.5	23	27.5	12	22	5	64	6	17	10	36	20	5	27.5	18	ø4H7x4dp	ø7.4x13dp, ø4.2 thru
80	10	20	40	52	40	49	22	30	35	15	26.7	6	80	8	22	12	42	40	10	35	20	ø4H7x6dp	ø9.2x16dp, ø5.2 thru
100	12	25	48	66	54	55	28	33	38	18	34.2	10	100	10	26	14	50	50	12	38	25	ø5H7x7dp	ø10.4x28dp, ø6.2 thru
125	13	30	62	82	65	64	32	38.5	45	12.5	42.3	10	125	12	31	15.5	60	60	13	45	30	ø6H7x8dp	ø13.5x34dp, ø8.2 thru
160	15.5	28	78	100	82	78	39	46	53	18	54.8	10	160	16	39	20	72	76	15.5	53	28	ø6H7x10dp	ø13.5x47dp, ø8.4 thru

Code Spec.	MB	MC	MD	N	NA	NB	NC	NR	O	OM	P	Q	R	T	U	W	X1	X2	Z
66	ø7.4x24dp, ø4.2 thru	M4x0.7	6	42	ø4H7x6dp	27	13.5	11	M5x0.8	12	M5x0.8	M5x0.8x10dp	M3x0.5	28	1	3.9	ø6	ø4	52
80	ø7.4x33dp, ø4.3 thru	M6x1.0	8	52	ø4H7x6dp	32	16	12.2	M5x0.8	15	M5x0.8	M5x0.8x10dp	M3x0.5	40	1	3.9	ø8	ø6	64
100	ø9x21.5dp, ø5.1 thru	M6x1.0	10	66	ø5H7x8dp	38	19	16	M5x0.8	16	G1/8	M6x1.0x10dp	M5x0.8	48	1	3.9	ø10	ø6	80
125	ø10.4x40dp, ø6.1 thru	M6x1.0	12	82	ø6H7x8dp	45	22.5	18	M5x0.8	20	G1/8	M8x1.25x10dp	M5x0.8	60	1	3.9	ø10	ø6	100
160	ø10.4x37dp, ø6.8 thru	M8x1.25	12	100	ø6H7x8dp	56	28	22	M5x0.8	27	G1/8	M8x1.25x10dp	M5x0.8	76	1	3.9	ø12	ø8	125



Centering sleeve



Code Spec.	A1	A2	AB	AC	AD	AE	BB	BC	BD	BF	C	D	E	FA	FB	G	G1	H	K	KA	KB	KH	L
200	19	44	102	128	108	28	97	48	58	69	22	67.5	12	200	20	42	22	95	100	19	69	44	ø8H7x8 dp
300	19	66	150	180	152	30	130	67	78	92	30	91.0	15	260	30	66	32	139	140	19	92	66	ø10H7x12 dp

Code Spec.	MA	MB	MC	MD	N	NA	NB	NR	O	OM	P
200	ø19x55 dp, ø12.5 thru	ø16.5x62 dp, ø10.2 thru	M10x1.5x20 dp	20	128	ø10H7x10 dp	68	24	M5x0.8	34.5	G1/4
300	ø18.5x100 dp, ø12.4 thru	ø16.5x72 dp, ø10.2 thru	M12x1.75x20 dp	20	180	ø10H7x12 dp	100	24	M5x0.8	43	G1/4

Code Spec.	Q	R	T	U	W	X1	X2	Z
200	M12x1.75x17 dp	M5x0.8	100	0.8	4.9	ø14h7	ø11	160
300	M12x1.75x16 dp	M5x0.8	150	0.8	4.9	ø18h7	ø12.5	220

PARALLEL GRIPPER (2-Finger)

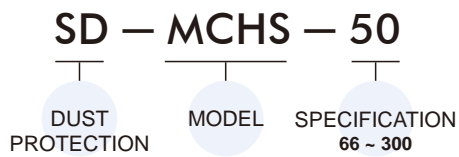
Dust protection module

Dust protection upgraded the IP class to prevent dust entering the gripper, suitable for dirty environment.

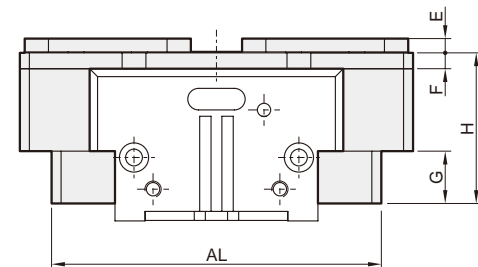
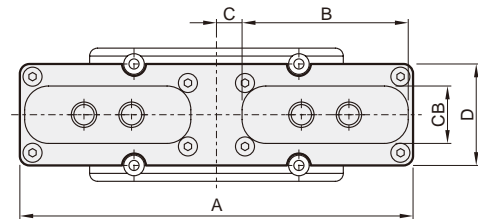
The length of fingers need to be measured from the surface of dust cover.

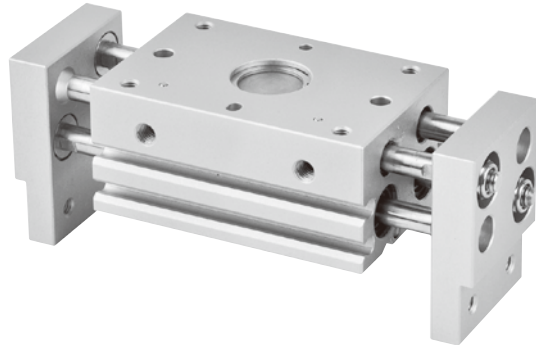
(Anti corrosion & hear-resistance are available, please contact us.)

Order example



Code Spec.	A	AL	B	C	CB	D	E	F	G	H
50	81.2	58.6	30	6	13	24	4.5	5	12	32
66	104	92	41	6.5	16.2	30	4.5	5	16.5	41
80	124	104	52.4	8.3	18.1	32	4.5	5	16.5	47.5
100	144	124	61	10.5	22	38	4.5	5	16.5	49
125	177	157	72	16	22	45	4.5	5	23	59
160	231	182	93	21.5	25	56	4.5	6	18	62
200	292	247	118	27	30	68	6.3	6	18	74
300	394	318	162	34	38	100	8.3	6	20	87





Order example

MCHX – 16 – 30 M

MODEL

TUBE I.D.	STROKE
10	20, 40, 60
16	30, 60, 80
20	40, 80, 100
25	50, 100, 120
32	70, 120, 160
40	100, 160, 200

M: Magnet

* Magnetic as standard.

Features

- Rack and pinion construction enable synchronisation of both jaws enabling smooth and consistent gripping force.
- Wide range of strokes available.
- Dust seals protect all internal parts from ingress of dirt.
- Proximity and reed switches can be used with this unit.
- Magnetic as standard.

Specification

Model	MCHX					
Acting type	Double acting					
Tube I.D. (mm)	10	16	20	25	32	40
Medium	Air					
Operating pressure range	0.2~0.6 MPa					
Ambient temperature	-5~+60°C (No freezing)					
Lubrication	Not required					
Repeatability	±0.1 mm					
Sensor switch (*)	RDVE(V): Non-contact RNFE(V): NPN, RPFE(V): PNP					

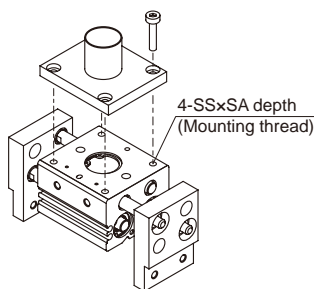
* R*FE(V) specification, please refer to page 5-11.

Weight

Model	MCHX-10			MCHX-16			MCHX-20			MCHX-25			MCHX-32			MCHX-40		
Stroke (mm)	20	40	60	30	60	80	40	80	100	50	100	120	70	120	160	100	160	200
Max. operating frequency (c.p.m)	60	40	40	60	40	40	60	40	40	60	40	40	30	20	20	30	20	20
Weight (kg)	0.28	0.35	0.44	0.56	0.8	0.94	1.0	1.5	1.68	1.69	2.8	3.0	3.15	4.36	5.02	5.3	6.8	8.6

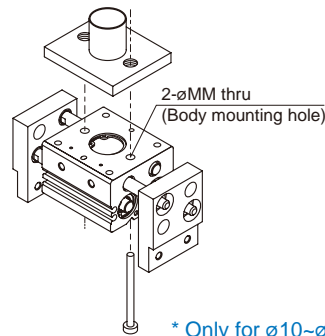
Mounting

Axial mounting



Tube I.D.	SA	SS	Max. tightening torque (N.m)
10	8	M4x0.7	2.1
16	10	M5x0.8	4.3
20	12	M6x1.0	7.3
25	16	M8x1.25	17.7
32	16	M8x1.25	18
40	20	M10x1.5	36

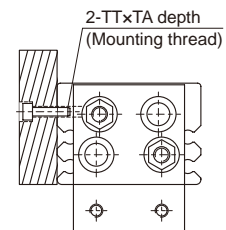
Axial mounting



* Only for ø10~ø25.

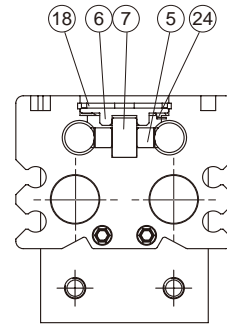
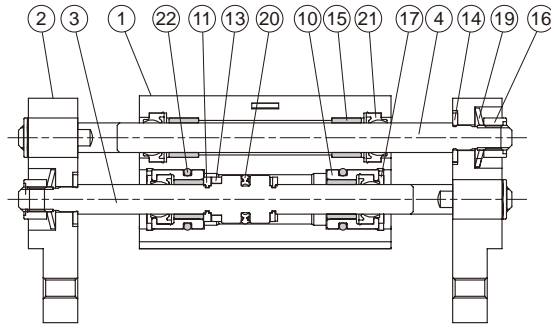
Tube I.D.	MM	Bolt	Max. tightening torque (N.m)
10	4.5	M4x0.7	2.1
16	5.5	M5x0.8	4.3
20	6.6	M6x1.0	7.3
25	9	M8x1.25	17.7
32	-	-	-
40	-	-	-

Lateral mounting

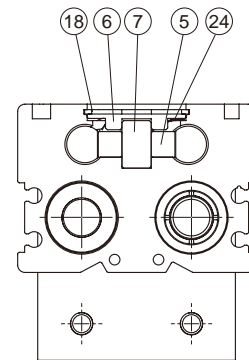
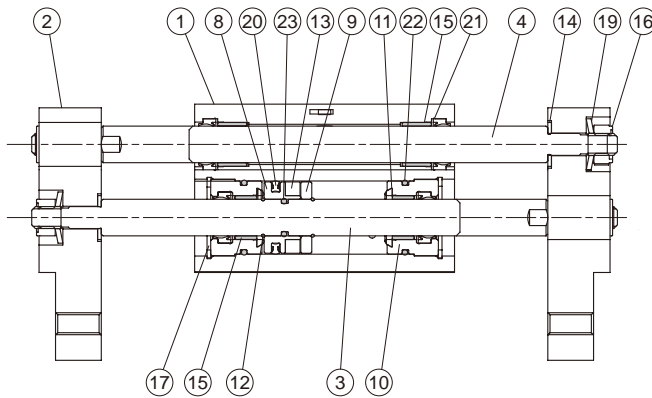


Tube I.D.	TA	TT	Max. tightening torque (N.m)
10	5	M4x0.7	1.4
16	7	M5x0.8	2.8
20	7	M6x1.0	4.8
25	7	M8x1.25	12
32	11	M8x1.25	12
40	12	M10x1.5	24

ø10



ø16-ø40



Material

No.	Tube I.D. Part name	10	16	20	25	32	40	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy						1	
2	Finger	Aluminum alloy						2	
3	Piston rod	Stainless steel						2	
4	Rack	Stainless steel						2	
5	Pinion	Carbon steel						1	
6	Pinion cover	Carbon steel						1	
7	Pinion axis	Stainless steel						1	
8	Piston	–	Brass				2		
9	Magnet holder	–	Brass				2		
10	Rod cover	Aluminum alloy						4	
11	Damper	NBR	PU	NBR			4	●	
12	Stop ring	–	Spring steel	*1	*2		4		
13	Magnet	Magnet material						2	
14	Washer	Stainless steel			Carbon steel			4	
15	Bearing	Oil containing polyacetal with back metal						8	
16	U nut	Carbon steel						4	
17	R-shape snap ring	*3	*1	Carbon steel		*1	4		
18	C-shape snap ring	Carbon steel						1	
19	Conical spring washer	Stainless steel *4						4	
20	Piston packing	NBR						2	●
21	Rod packing	NBR						8	●
22	O-ring	NBR						4	●
23	O-ring	–	NBR				2		
24	Wave washer	Carbon steel						1	

Order example of repair kits

Tube I.D.	Repair kits
ø10	PS-MCHX-10
ø16	PS-MCHX-16
ø20	PS-MCHX-20
ø25	PS-MCHX-25
ø32	PS-MCHX-32
ø40	PS-MCHX-40

*1. Stainless steel

*2. Spring steel

*3. Carbon steel

*4. ø40: Stainless steel 2 pcs + Carbon steel 2 pcs

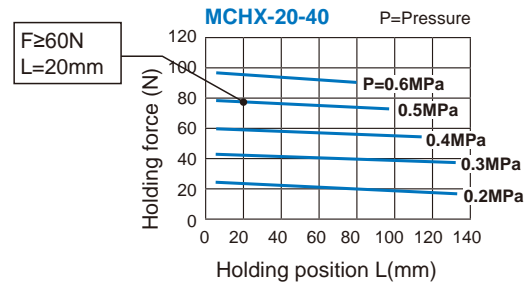
Model selection example

* Finger selection please refer to page 3-2.

In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.3kg , Gripping method: External gripping, Operating pressure: 0.5 MPa, Coefficient of friction (μ): 0.1, Holding position: L=20mm (no overhang)

- Based on the above formula, the required gripping force can be derived:

$$F \geq \frac{0.3 \times 9.8}{2 \times 0.1} \times 4 \geq 60(N)$$
- From Effective Gripping Force Fig, Operating pressure: 0.5 MPa; Holding position: 20 mm Effective gripping force is greater than 60 (N) So selected **MCHX-20-40** grippers.

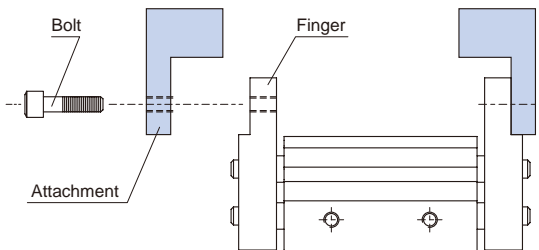


Model selection suggestions

- For normal gripping and carrying usage, the recommended safe factor (a) is 4.
- The value of gripping force of single finger can be found at the gripping force table.
- The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

Mounting precautions

- To prevent bending the piston rod, please mount the attachment when finger is closing.
- Do not scratch or dent the sliding portion of the piston rod, or it may cause air leaks or faulty operation.
- Refer to the table below for the proper tightening torque on the bolt used for securing the attachment to the finger.

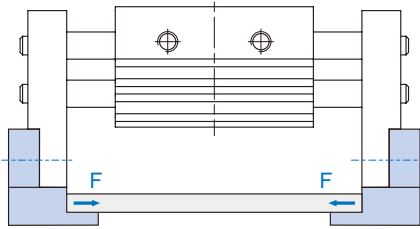


Tube I.D.	Bolt	Max. tightening torque (N.m)
10	M4x0.7	1.4
16	M5x0.8	2.8
20	M6x1.0	4.8
25	M8x1.25	12
32	M10x1.5	24
40	M12x1.75	42.2

Effective gripping force

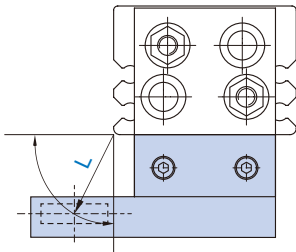
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

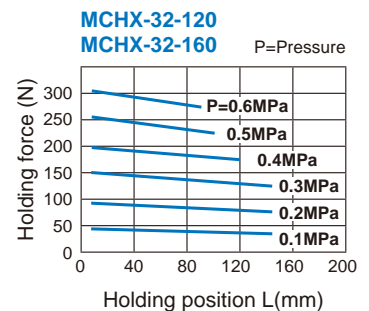
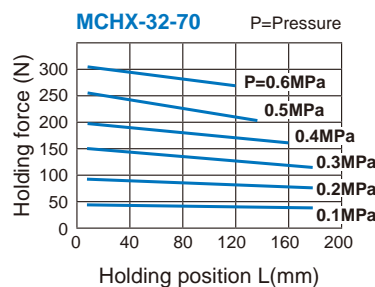
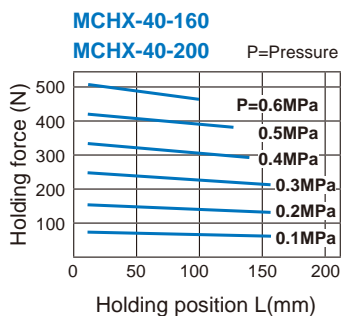
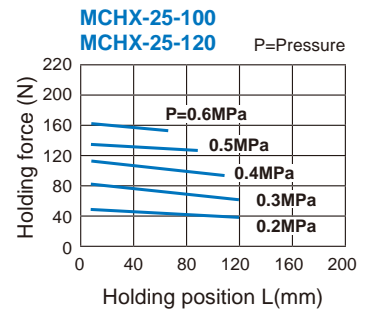
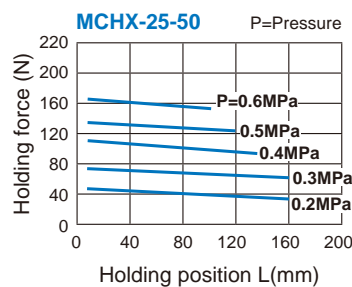
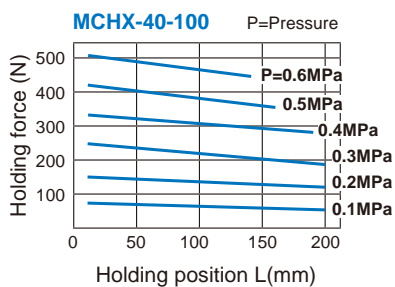
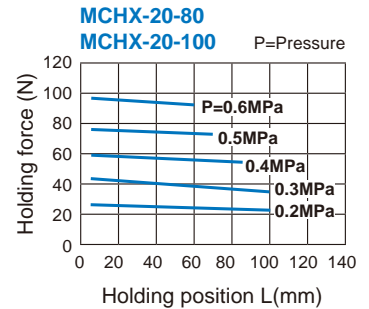
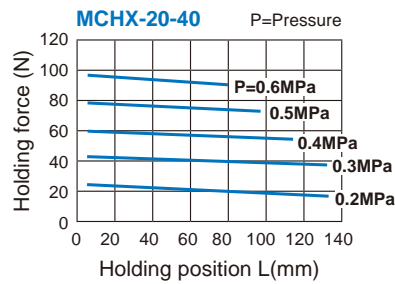
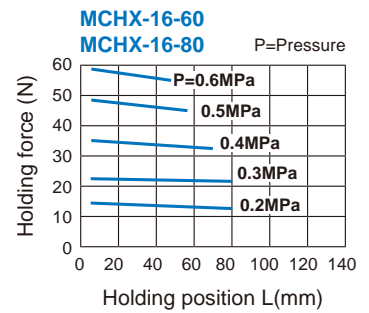
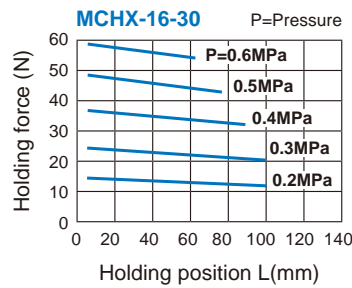
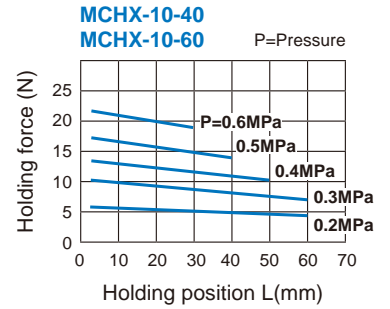
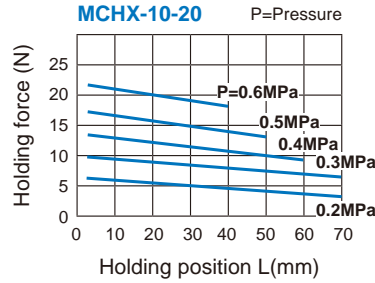


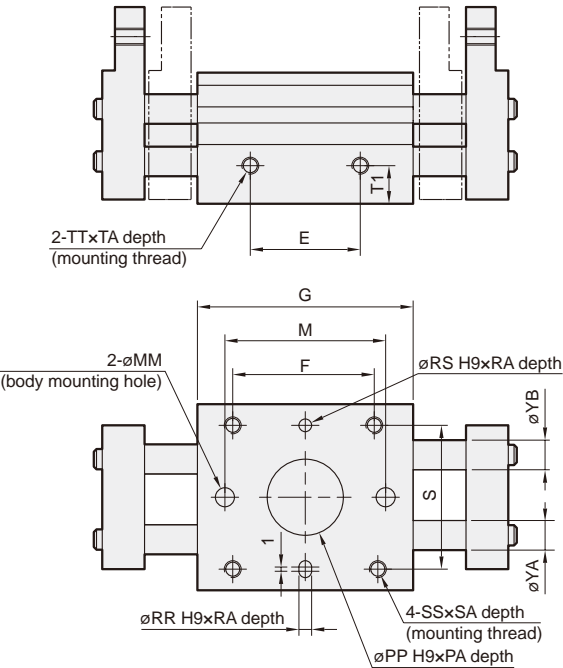
$$1\text{N} = 0.102 \text{ kgf}$$

$$1\text{MPa} = 10.2 \text{ kgf/cm}^2$$

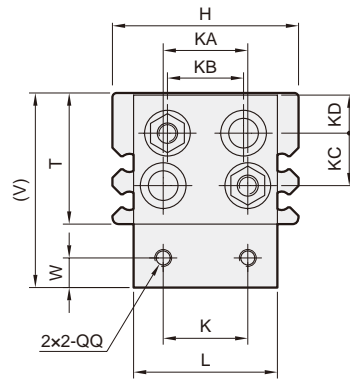
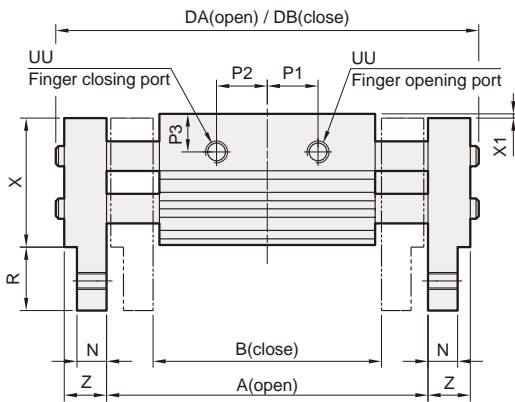


L: Holder position (mm)



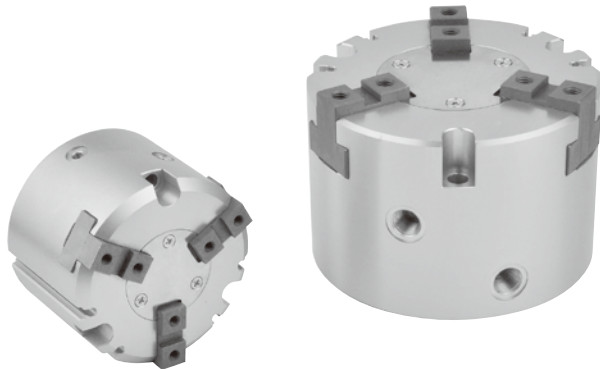


Code Tube I.D.	Stroke	A	B	DA	DB	E	F	G	M	P1	P2
10	20	76	56	100	80	26	36	51	38	11.5	11.5
	40	118	78	142	108	42	52	67	54	19.5	19.5
	60	156	96	180	146	60	70	85	72	28.5	28.5
16	30	98	68	128	98	28	45	60	40	13	13
	60	170	110	200	152	58	75	90	70	25	25
	80	210	130	240	192	78	95	110	90	35	35
20	40	122	82	160	120	38	58	71	54	16	16
	80	222	142	260	194	80	100	113	96	34	34
	100	262	162	300	234	100	120	133	116	44	44
25	50	150	100	196	146	48	70	88	66	19	19
	100	282	182	328	244	102	124	142	120	43	43
	120	320	200	366	282	120	142	160	138	52	52
32	70	220	150	272	202	60	86	110	—	28	28
	120	318	198	370	282	108	134	158	—	52	52
	160	402	242	454	366	152	178	202	—	74	74
40	100	288	188	348	252	80	116	148	—	36	36
	160	406	246	466	370	138	174	206	—	65	65
	200	486	286	546	450	178	214	246	—	85	85



Code Tube I.D.	H	K	KA	KB	KC	KD	L	N	MM	PA	PP	P3	QQ	R	RA	RR	RS	S	SA	SS
10	44	20	20	18.2	12.5	8	34	7	4.5	1.5	18	9	M4x0.7	15	3	3	3	34	8	M4x0.7
16	55	25	25	22.6	16.5	9	43	9	5.5	1.5	23	10	M5x0.8	19	3	3	3	42	10	M5x0.8
20	65	30	30	28.2	20	10	54	12.5	6.6	1.5	24	11	M6x1.0	24	4	4	4	52	12	M6x1.0
25	76	40	38	33.2	23.5	11.5	64	14	9	1.5	32	16	M8x1.25	29	4.5	4	4	62	16	M8x1.25
32	82	50	40	32.2	30	14.5	70	15	—	2.5	35	16	M10x1.5	32	8	6	6	64	16	M8x1.25
40	98	60	48	40.2	37	16	86	18	—	2.5	40	18	M12x1.75	38	8	6	6	76	20	M10x1.5

Code Tube I.D.	T	T1	TA	TT	UU	V	W	X	X1	YA	YB	Z
10	31	9	5	M4x0.7	M5x0.8	46	7	30.5	0.5	6	6	10
16	39	10	7	M5x0.8	M5x0.8	58	8	38.5	0.5	8	8	13
20	46	11	7	M6x1.0	M5x0.8	70	10	45	1	10	10	17
25	52	12.5	7	M8x1.25	M5x0.8	81	12	51	1	12	12	21
32	68	22	11	M8x1.25	Rc1/8	100	15	67	1	14	16	24
40	79	28	12	M10x1.5	Rc1/8	117	18	78	1	16	20	28



Features

- Through holes in body enable simple mounting.
- Body manufactured from high tensile, anodised aluminum giving good resistance to corrosion.
- Available with sensors.
- Magnetic as standard.

Order example

MCHG2 – 16 M – □

MODEL

TUBE I.D.
16, 20, 25, 32, 40,
50, 63, 80, 100, 125

M: Magnet
* Magnetic as
standard.

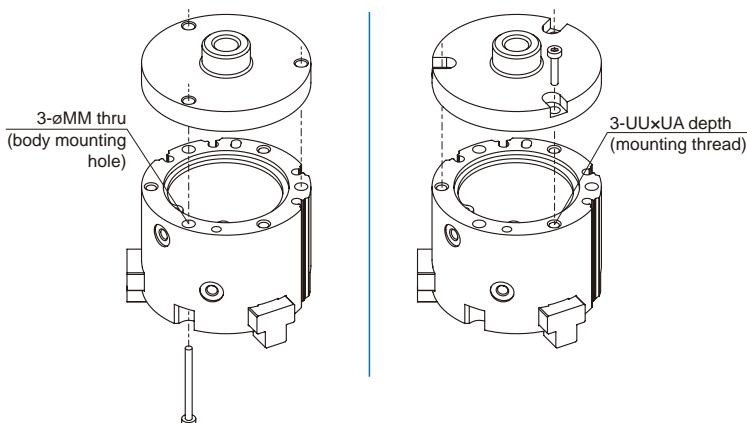
PORT THREAD
Blank: M thread
(only for ø16-ø63)
Blank: Rc thread
G: G thread
NPT: NPT thread
(only for ø80-ø125)

Specification

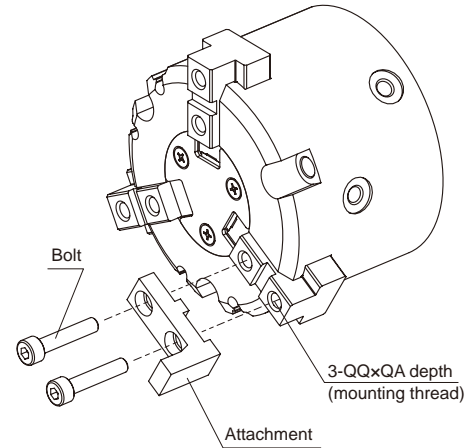
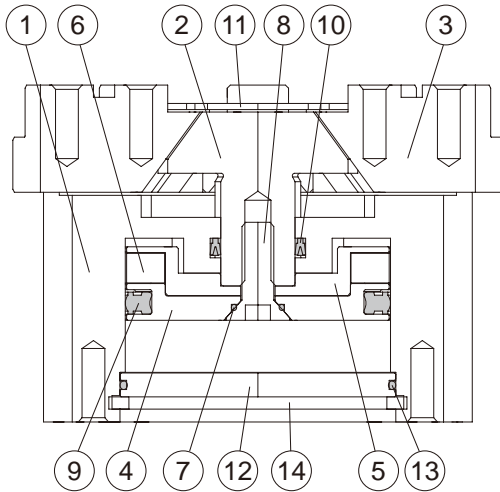
Model	MCHG2										
Acting type	Double acting										
Tube I.D. (mm)	16	20	25	32	40	50	63	80	100	125	
Stroke (mm)	4	4	6	8	8	12	16	20	24	32	
Port size	M3x0.5	M5x0.8						Rc1/8	Rc1/4	Rc3/8	
Medium	Air										
Operating pressure (MPa)	0.2~0.6					0.1~0.6					
Ambient temperature	-10~+60°C (No freezing)										
Repeatability	±0.01 mm										
Max. operating frequency (c.p.m)	120				60				30		
Lubrication	Not required										
Effective gripping force N (lbf) at (0.5 MPa) (*)	External	14(3.1)	25(5.6)	42(9.4)	74(16.6)	118(26.5)	187(42)	335(75)	500(112)	750(169)	1270(285)
	Internal	16(3.6)	28(6.3)	47(10.6)	82(18.4)	130(29)	204(46)	359(81)	525(118)	780(175)	1320(297)
Sensor switch	2 wire	RDVE(V): Non-contact (Please refer to page 5-11)									
	3 wire	RNFE(V): NPN, RPFE(V): PNP (Please refer to page 5-11)									
Weight (g)	80	110	150	240	400	540	1020	1880	3300	6200	

* Values for ø16-ø25 are with gripping length(L) = 20 mm, for ø32-ø63 with gripping length(L) = 30 mm, and for ø80-ø125 with gripping length(L) = 50 mm. Refer to "Effective Gripping Force" data for the gripping force at each gripping position.

Installation



Model	MM	UUxUA	Bolt
MCHG2-16	3.4	M3x0.5x4.5	M3x0.5
MCHG2-20	3.4	M3x0.5x6	M3x0.5
MCHG2-25	4.5	M4x0.7x6	M4x0.7
MCHG2-32	4.5	M4x0.7x6	M4x0.7
MCHG2-40	5.5	M5x0.8x7.5	M5x0.8
MCHG2-50	5.5	M5x0.8x10	M5x0.8
MCHG2-63	6.6	M6x1.0x9	M6x1.0
MCHG2-80	6.6	M6x1.0x12	M6x1.0
MCHG2-100	9	M8x1.25x16	M8x1.25
MCHG2-125	11	M10x1.5x20	M10x1.5



Material

No.	Part name	Material	Repair kits (inclusion)
1	Body	Aluminum alloy	
2	Lever	Carbon steel	
3	Slider	Carbon steel	
4	Piston	Aluminum alloy	
5	Piston-R	Aluminum alloy	
6	Magnet ring	Magnet material	
7	O-ring	NBR	●
8	Piston bolt	Carbon steel	
9	Piston packing	NBR	●
10	Rod packing	NBR	●
11	Table	Stainless steel	
12	End plate	Aluminum alloy	
13	O-ring	NBR	●
14	Snap ring	Carbon steel	

Mounting precautions

The tightening torque of slider mounting bolt, please refer to the table below.

Model	QQxQA	Bolt	Max. tightening torque (N.m)
MCHG2-16	M3x0.5x5	M3x0.5	0.59
MCHG2-20	M3x0.5x6	M3x0.5	0.59
MCHG2-25	M3x0.5x6	M3x0.5	0.59
MCHG2-32	M4x0.7x8	M4x0.7	1.4
MCHG2-40	M4x0.7x8	M4x0.7	1.4
MCHG2-50	M5x0.8x8	M5x0.8	2.8
MCHG2-63	M5x0.8x8	M5x0.8	2.8
MCHG2-80	M6x1.0x12	M6x1.0	4.8
MCHG2-100	M8x1.25x16	M8x1.25	12
MCHG2-125	M10x1.5x20	M10x1.5	24

Order example of repair kits

Tube I.D.	Repair kits	Tube I.D.	Repair kits
ø16	PS-MCHG2-16	ø63	PS-MCHG2-63
ø20	PS-MCHG2-20	ø80	PS-MCHG2-80
ø25	PS-MCHG2-25	ø100	PS-MCHG2-100
ø32	PS-MCHG2-32	ø125	PS-MCHG2-125
ø40	PS-MCHG2-40		
ø50	PS-MCHG2-50		

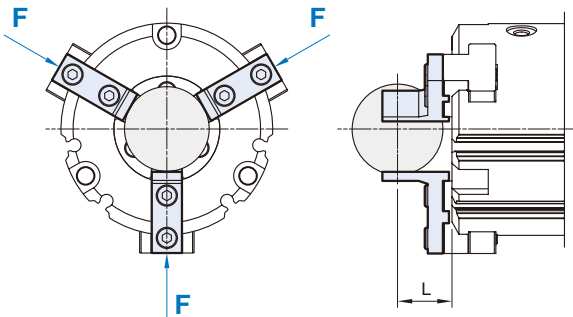
Effective gripping force

* Finger selection please refer to page 3-2.

Indication of effective gripping force.

The effective gripping force shown in the graphs to the right is expressed as F , which is the thrust of one finger, when three fingers and attachments are in full contact with the workpiece as shown in the figure below.

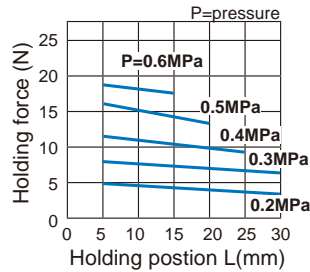
1N=0.102 kgf
1MPa=10.2 kgf/cm²



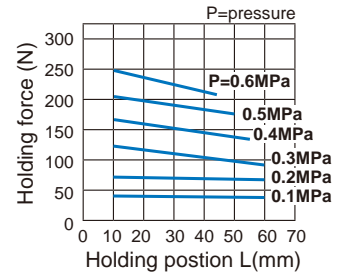
External grip

External gripping force

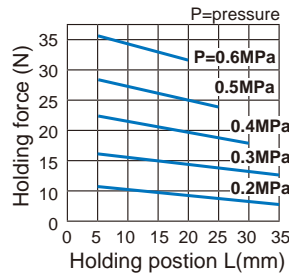
MCHG2-16



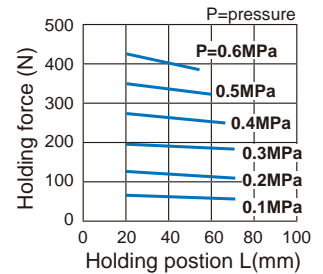
MCHG2-50



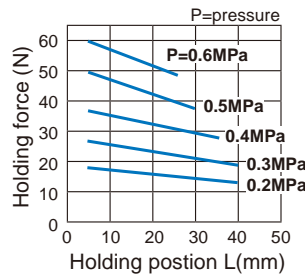
MCHG2-20



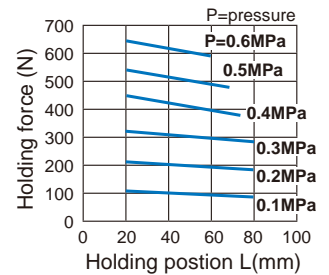
MCHG2-63



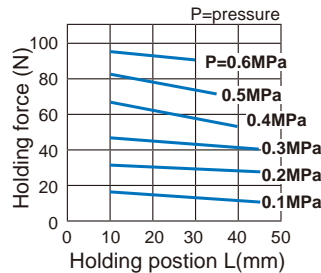
MCHG2-25



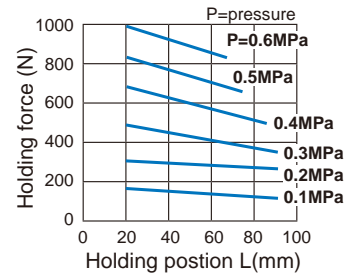
MCHG2-80



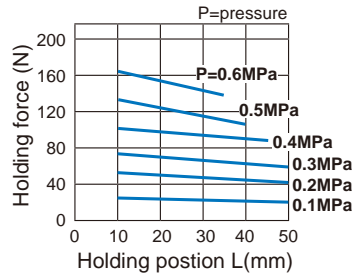
MCHG2-32



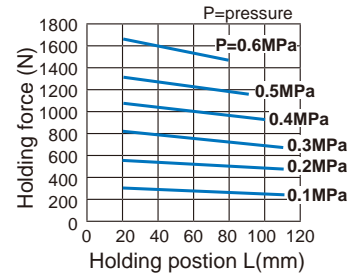
MCHG2-100



MCHG2-40



MCHG2-125



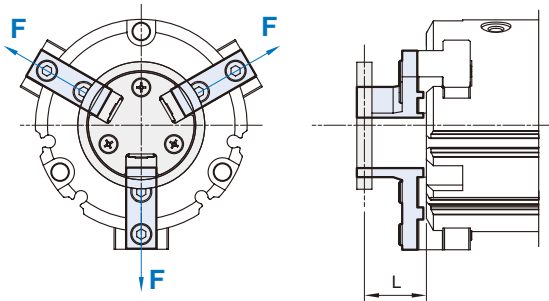
Effective gripping force

* Finger selection please refer to page 3-2.

Indication of effective gripping force.

The effective gripping force shown in the graphs to the right is expressed as F , which is the thrust of one finger, when three fingers and attachments are in full contact with the workpiece as shown in the figure below.

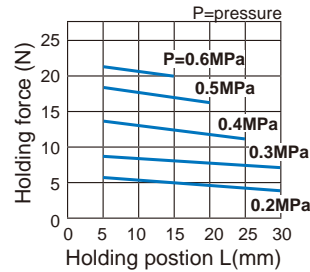
1N=0.102 kgf
1MPa=10.2 kgf/cm²



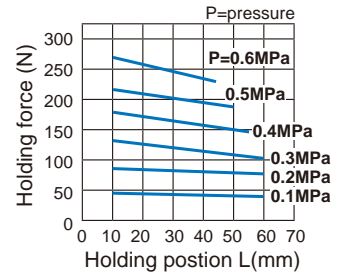
Internal grip

Internal gripping force

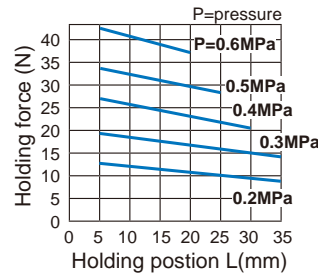
MCHG2-16



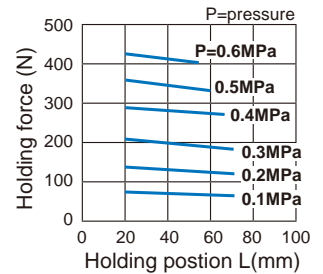
MCHG2-50



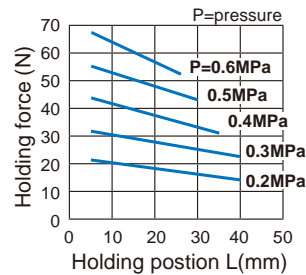
MCHG2-20



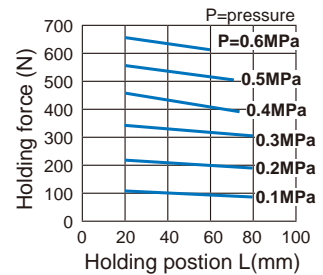
MCHG2-63



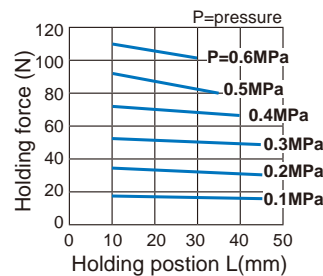
MCHG2-25



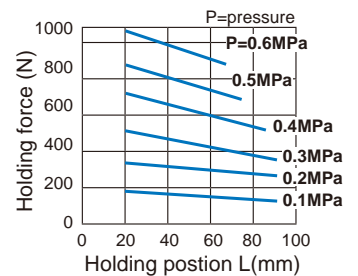
MCHG2-80



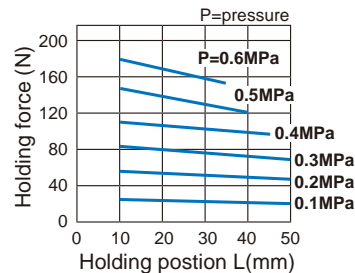
MCHG2-32



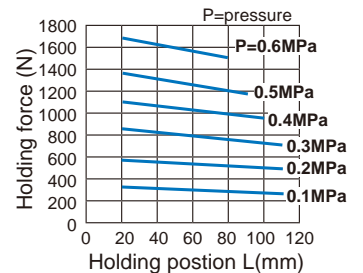
MCHG2-100



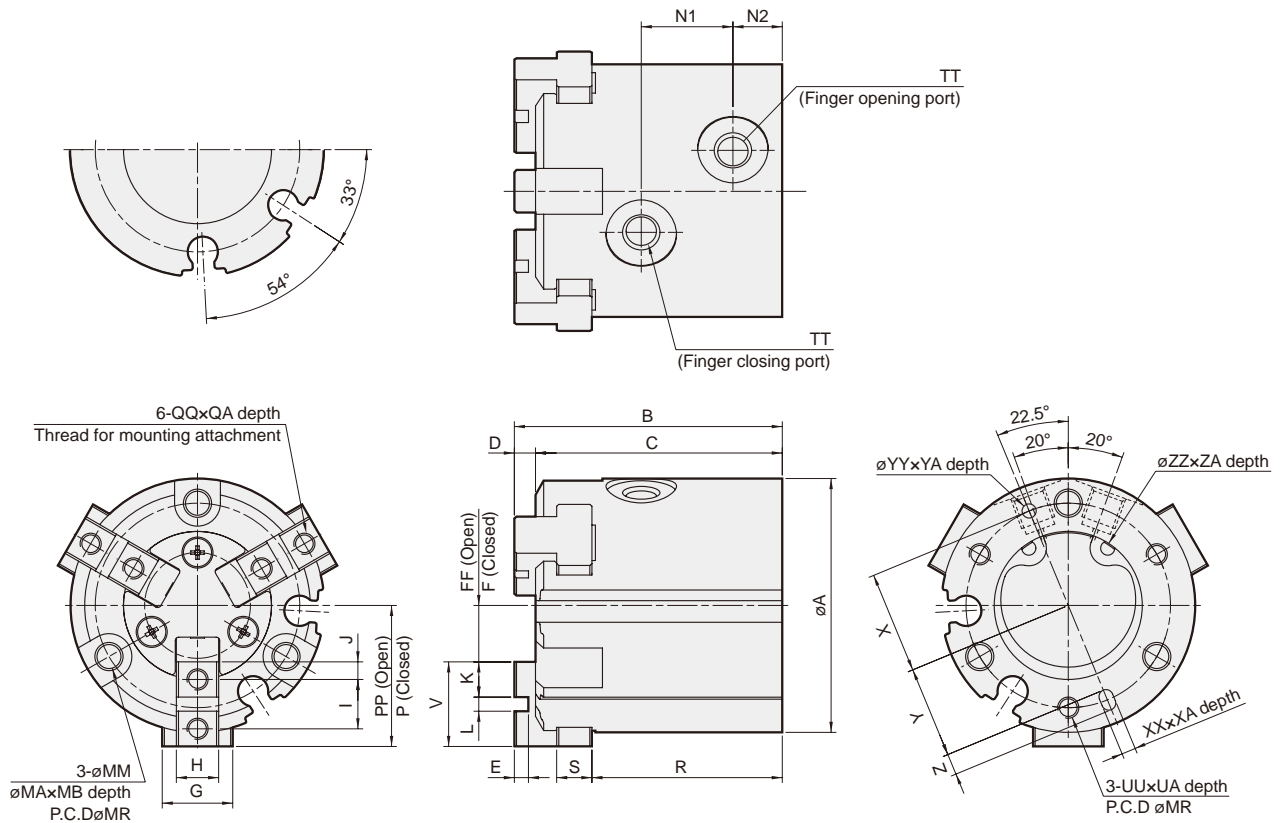
MCHG2-40



MCHG2-125



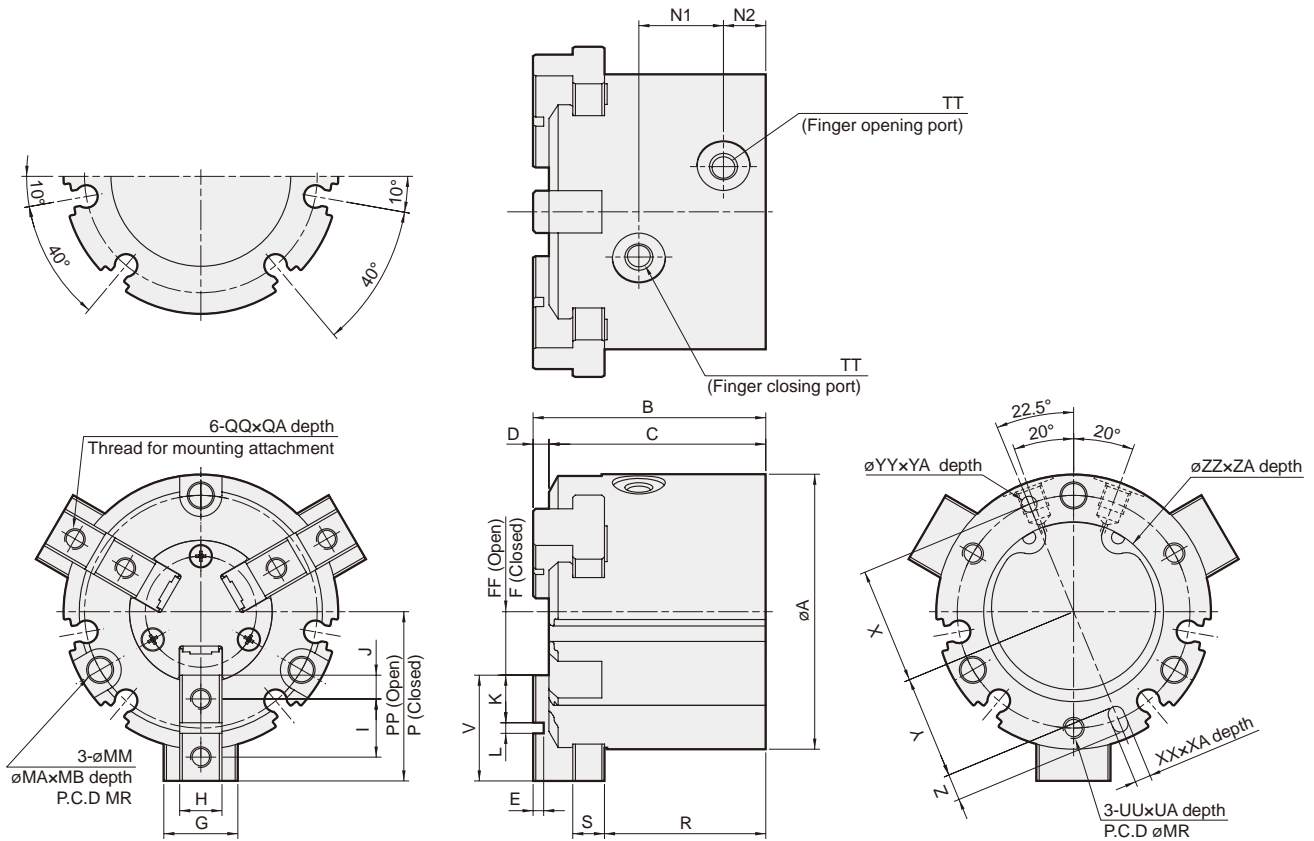
PARALLEL GRIPPER (3-Finger)



Code Tube I.D.	A	B	C	D	E	F	FF	G	H	I	J	K	L	MA	MB	MM	MR	N1	N2	P	PP	QA	QQ	R	S	TT
16	30	35	32	3	2	5	7	8	5h9 ⁺⁰ _{-0.030}	6	2	4	2H9 ^{+0.025} ₀	6.5	8	3.4	25	11	7	15	17	5	M3x0.5	25	4	M3x0.5
20	36	38	35	3	2	6	8	10	6h9 ⁺⁰ _{-0.030}	7	2.5	5	2H9 ^{+0.025} ₀	6.5	9.5	3.4	29	13	7	18	20	6	M3x0.5	27	5	M5x0.8
25	42	40	37	3	2	7	10	12	6h9 ⁺⁰ _{-0.030}	8	3	6	2H9 ^{+0.025} ₀	8	10	4.5	34	15	7	21	24	6	M3x0.5	28	5	M5x0.8

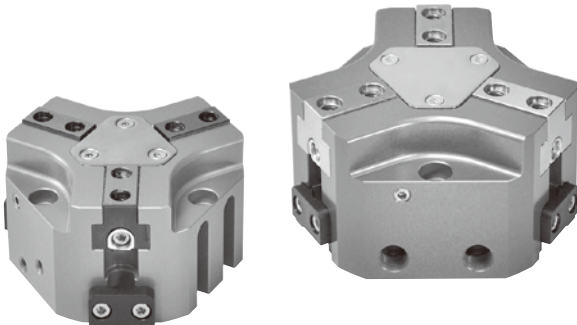
Code Tube I.D.	UA	UU	V	X	XA	XX	Y	YA	YY	Z	ZA	ZZ
16	4.5	M3x0.5	10	12.5	2	2H9 ^{+0.025} ₀	11	2	2H9 ^{+0.025} ₀	3	1.5	17H9 ^{+0.043} ₀
20	6	M3x0.5	12	14.5	2	2H9 ^{+0.025} ₀	13	2	2H9 ^{+0.025} ₀	3	1.5	21H9 ^{+0.052} ₀
25	6	M4x0.7	14	17	3	3H9 ^{+0.025} ₀	14.5	3	3H9 ^{+0.025} ₀	5	1.5	26H9 ^{+0.052} ₀

PARALLEL GRIPPER (3-Finger)



Code Tube I.D.	A	B	C	D	E	F	FF	G	H	I	J	K	L	MA	MB	MM	MR	N1	N2	P	PP	QA	QQ
32	52	44	41	3	2	8	12	14	8h9 ⁺⁰ _{-0.036}	11	4.5	9	2H9 ^{+0.025} ₋₀	8	9	4.5	44	16	8	28	32	8	M4x0.7
40	62	47	44	3	2	10	14	16	8h9 ⁺⁰ _{-0.036}	12	4.5	9	3H9 ^{+0.025} ₋₀	9.5	9	5.5	53	17	9	31	35	8	M4x0.7
50	70	55	52	3	2	11	17	18	10h9 ⁺⁰ _{-0.036}	14	5	10	4H9 ^{+0.030} ₋₀	9.5	12	5.5	62	20	9	35	41	10	M5x0.8
63	86	66	62	4	3	15	23	24	12h9 ⁺⁰ _{-0.043}	17	5.5	11	6H9 ^{+0.030} ₋₀	11	14	6.6	76	22	12	43	51	10	M5x0.8
80	106	82	77	5	4	21.5	31.5	28	14h9 ⁺⁰ _{-0.043}	20	6	12	8H9 ^{+0.036} ₋₀	11	19	6.6	95	27	13.5	53.5	63.5	12	M6x1.0
100	134	96	90	6	4	28	40	34	18h9 ⁺⁰ _{-0.043}	23	7.5	15	8H9 ^{+0.036} ₋₀	14	21	9	118	30.6	18	66	78	16	M8x1.25
125	166	122	114	8	6	30	46	40	22h9 ⁺⁰ _{-0.052}	31	10.5	21	10H9 ^{+0.036} ₋₀	17.5	34	11	148	38	23.5	82	98	20	M10x1.5

Code Tube I.D.	R	S	TT	UU	UA	V	X	XA	XX	Y	YY	YA	Z	ZA	ZZ
32	30.5	6	M5x0.8	M4x0.7	6	20	22	3	3H9 ^{+0.025} ₋₀	19.5	3H9 ^{+0.025} ₋₀	3	5	2	34H9 ^{+0.062} ₋₀
40	32	7	M5x0.8	M5x0.8	7.5	21	26.5	4	4H9 ^{+0.030} ₋₀	23.5	4H9 ^{+0.030} ₋₀	4	6	2	42H9 ^{+0.062} ₋₀
50	37.5	9	M5x0.8	M5x0.8	10	24	31	4	4H9 ^{+0.030} ₋₀	28	4H9 ^{+0.030} ₋₀	4	6	2	52H9 ^{+0.074} ₋₀
63	44	11	M5x0.8	M6x1.0	9	28	38	5	5H9 ^{+0.030} ₋₀	34.5	5H9 ^{+0.030} ₋₀	5	7	2.5	65H9 ^{+0.074} ₋₀
80	56	12	Rc1/8	M6x1.0	12	32	47.5	6	6H9 ^{+0.030} ₋₀	43.5	6H9 ^{+0.030} ₋₀	6	8	3	82H9 ^{+0.087} ₋₀
100	63	15	Rc1/4	M8x1.25	16	38	59	6	8H9 ^{+0.036} ₋₀	54	8H9 ^{+0.036} ₋₀	6	10	4	102H9 ^{+0.087} ₋₀
125	84	18	Rc3/8	M10x1.5	20	52	74	8	10H9 ^{+0.036} ₋₀	68	10H9 ^{+0.036} ₋₀	8	12	6	130H9 ^{+0.100} ₋₀



Order example

MCHJ – 50

MODEL

BODY SPECIFICATION
50, 66, 80, 100,
125, 160, 200, 300

* The body specification 50~160 with pressure piece is also available, please consult our sales department.

Features

- Compact design to ensure minimum interference while operating; robust T rail design, ensure accurate gripping.
- Can reach maximum torque suitable for long jaws design.
- Circular piston-driven design ensure maximum clamping force.
- Hose-free direct connection: Air supply channel can connect directly without piping or through tread to assure the flexibility of supplying compressed air on any kind of automation system.

Specification

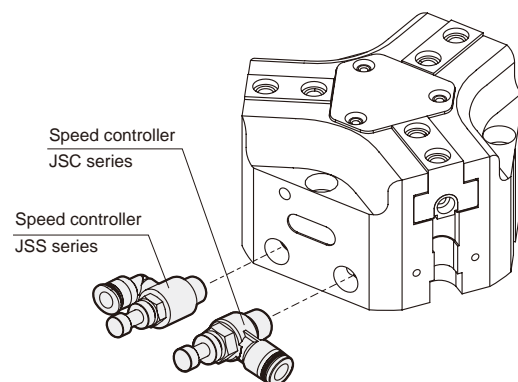
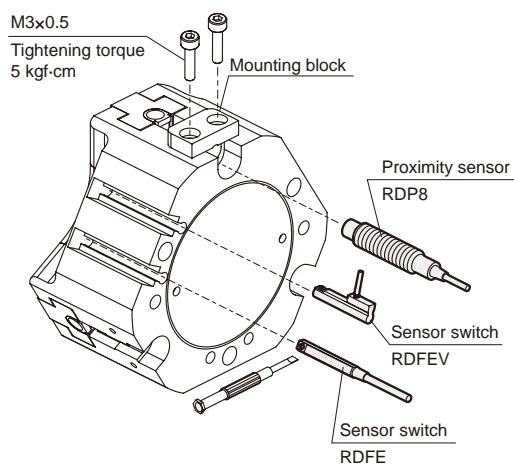
Model	MCHJ							
Acting type	Double acting							
Body specification	50	66	80	100	125	160	200	300
Stroke per-jaw (mm)	4	6	8	10	12	16	20	30
Effective external gripping force (N) (*1)	113	188	292	483	906	1747	2851	5247
Close/Open time (1/s)	0.025	0.03	0.05	0.1	0.2	0.25	0.35	0.8
Medium	Air							
Operating pressure range	0.2~0.8 MPa							
Compressed air consumption (cm ³)	9.2	21.5	47	100	195	485	850	2300
Ambient temperature	+5°C~ +80°C							
Lubrication	Not required							
Sensor switch (*3)	2 wire	*2	RDFE(V): Non-contact					
	3 wire	*2	RNFE(V): NPN, RPFE(V): PNP					
Proximity sensor	–		RDP8 (Please refer to page 5-13)					
Accessories	Mounting block, Accessory kits							
Weight (kg)	0.22	0.5	0.85	1.6	2.8	5.2	10.8	26.5
Recom. work piece weight (kg)	2.2	3.8	6.1	10.2	17.8	33.1	41.8	78

*1. Under the condition of clamping length 40mm and operation pressure 0.6 MPa.

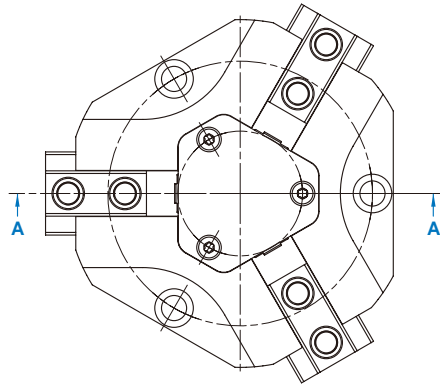
*2. Body specification 50 use RDGV sensor switch.

*3. R*FE(V), RDGV specification, please refer to page 5-11, 12.

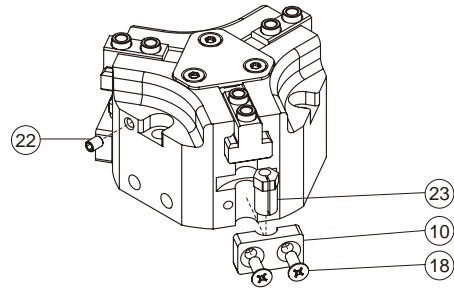
Installation of sensor switch & speed controller



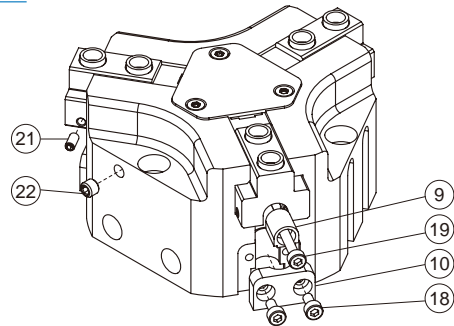
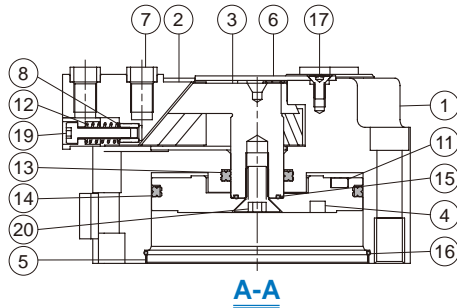
* Each gripper needs at least two speed control valves to control speed.
* Speed controller specification, please refer to page 7-15 (Vol.1).



50



66~160



Material

No.	Body spec Part name	50	66	80	100	125	160	Q'y	Repair kits (inclusion)	
1	Body	Aluminum alloy						1		
2	Finger	Mid carbon steel						3		
3	Rod	Mid carbon steel						1		
4	Piston	Aluminum alloy						1		
5	End cover	Stainless steel						1		
6	Plate cover	Stainless steel						1		
7	Centering sleeve	Stainless steel						6		
8	Thread insert	-	Brass						3	
9	Sensor adj block	-	Aluminum alloy						2	
10	Magnet holder	*1	PBT+30%GF						2	
11	Magnet	Magnet material						1*2		
12	Spring	-	SWP						2	
13	Rod packing	NBR						1	●	
14	Piston packing	NBR						1	●	
15	O-ring	NBR						1	●	
16	O-ring	NBR						1	●	
17	Screw	Carbon steel						3		
18	Bolt	Stainless steel						4		
19	Hex bolt	-	Stainless steel						2	
20	Bolt	Stainless steel						1		
21	Hex screw	-	Stainless steel						4	
22	Hex screw	Stainless steel						3		
23	Adjust socket	SUS	-						2	





*1. Aluminum alloy *2. Body spec 125 Q'y: 2 pcs

Order example of repair kits

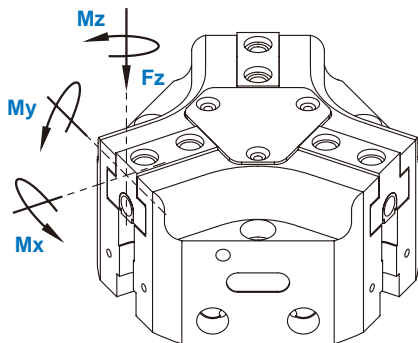
Model	Repair kits
MCHJ-50	PS-MCHJ-50
MCHJ-66	PS-MCHJ-66
MCHJ-80	PS-MCHJ-80
MCHJ-100	PS-MCHJ-100
MCHJ-125	PS-MCHJ-125
MCHJ-160	PS-MCHJ-160

Order example of accessory kits

Model	Accessory kits
MCHJ-50	AK-MCHJ-50
MCHJ-66	AK-MCHJ-66
MCHJ-80	AK-MCHJ-80
MCHJ-100	AK-MCHJ-100
MCHJ-125	AK-MCHJ-125
MCHJ-160	AK-MCHJ-160

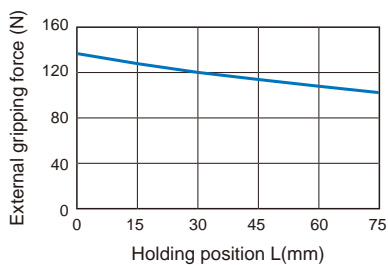
	
O-ring (x2)	Iron plug (x2)
	
PIN (x2)	Centering sleeve (x6)

Holding force

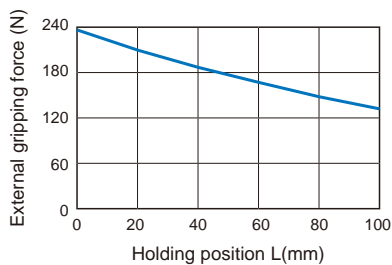


Code Model	Mx max. (Nm)	My max. (Nm)	Mz max. (Nm)	Fz max. (N)
MCHJ-50	15	15	8	700
MCHJ-66	50	45	35	1200
MCHJ-80	80	60	50	1800
MCHJ-100	100	90	75	2500
MCHJ-125	120	120	100	3200
MCHJ-160	160	180	140	5000
MCHJ-200	180	220	170	7000
MCHJ-300	275	300	200	9000

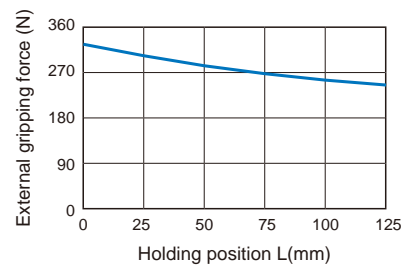
MCHJ-50



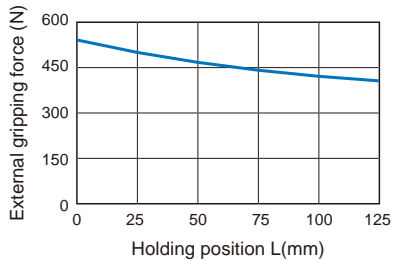
MCHJ-66



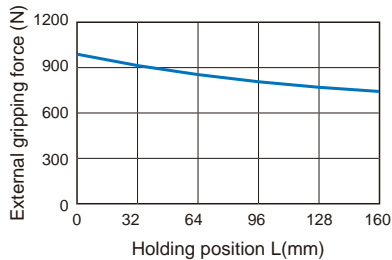
MCHJ-80



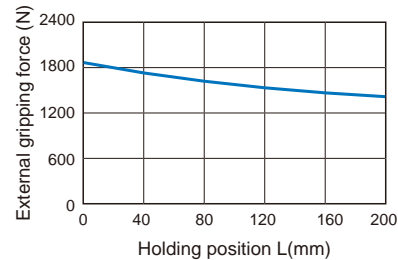
MCHJ-100



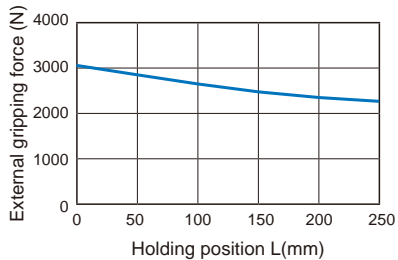
MCHJ-125



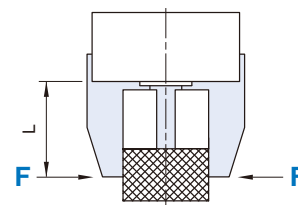
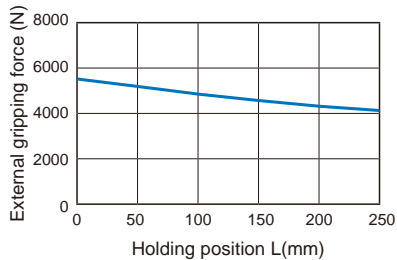
MCHJ-160



MCHJ-200



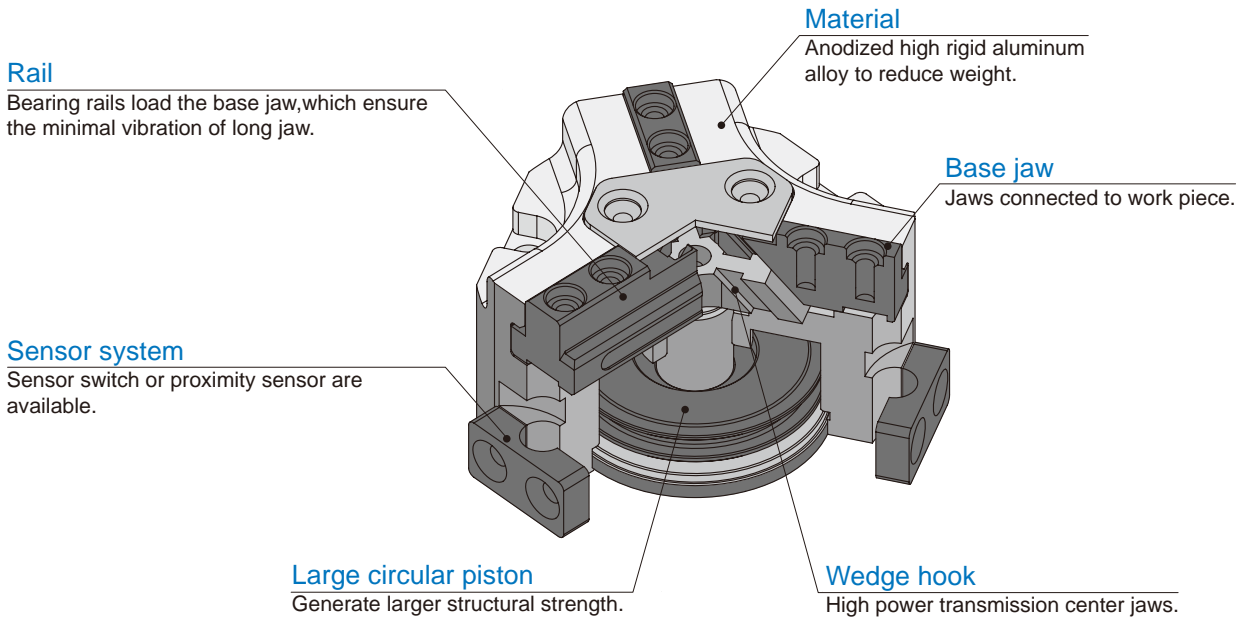
MCHJ-300



* Operating pressure 0.6 MPa.

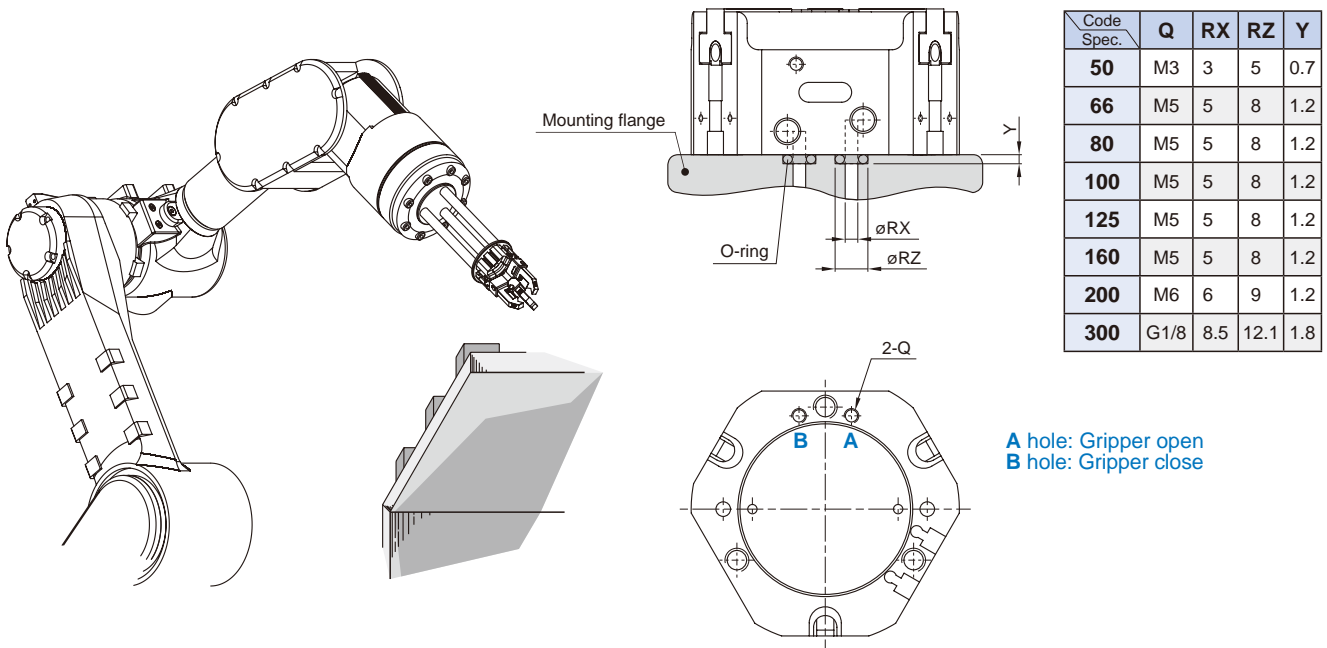
Internal structure & Movement description

Compressed air will push or press the circular piston.
By tilting the working surface, the wedge hook will transfer the movement to side movement, and initiate the action of the three base jaws simultaneously.

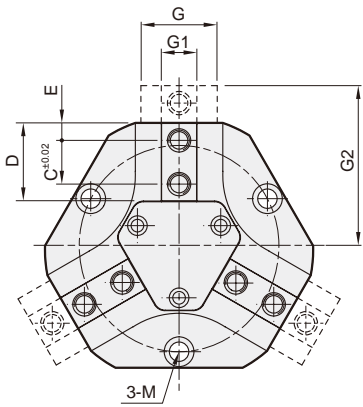


Application examples

Hose-free direct connection

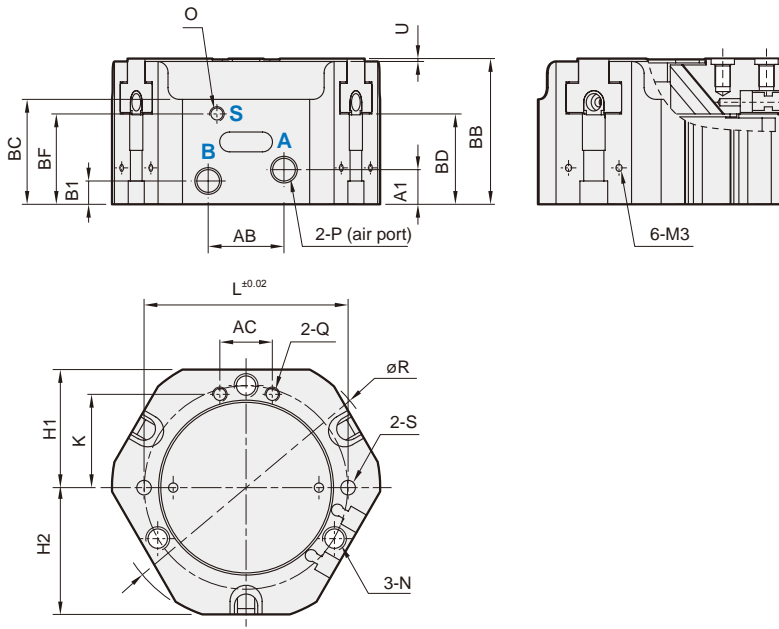
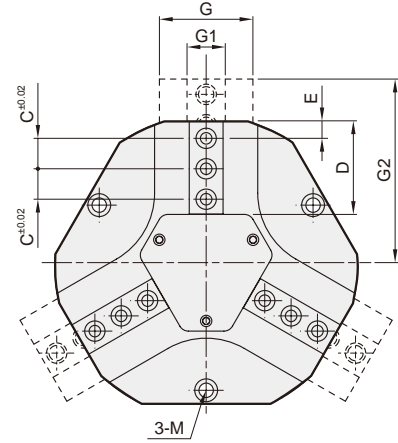


PARALLEL GRIPPER (3-Finger)



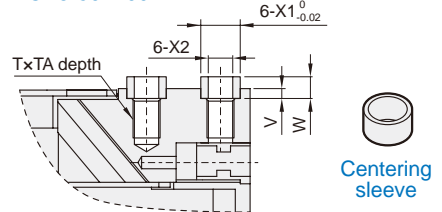
A hole: Gripper open
B hole: Gripper close
S hole: External vents

MCHJ-125~300

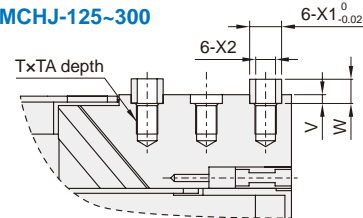


Centering sleeve

MCHJ-50~100



MCHJ-125~300



Code Spec.	A1	AB	AC	B1	BB	BC	BD	BF	C	D	E	G	G1	G2	H1	H2	K	L
50	5	12	12	5	35	26	23	23	8	16	4	12	6.5	31	26	27	19	45
66	11.5	12	18	5	43	32	27	27	12	22	5	17	10	41	33	35	25	56
80	8	26	18	8	50	36	31	31	15	26.7	6	22	12	51.5	40.5	43.5	32	70
100	13.5	24	24	10	60	41	38	34	18	34.2	10	26	14	64	51	54	42	90
125	17	30	30	10	68	49	42.5	37	12.5	42.3	10	31	15.5	79	64	67	53	112
160	20	44	38	10.5	80	55	48	45	18	54.8	10	39	20	102	81	86	67.5	146
200	29	54	54	19.5	107	82	68	64	22	67.5	12	42	22	126	100	106	75	180
300	36.1	80	80	29.1	153.1	105.1	101.1	87.1	30	91	15	66	32	172	132.5	142	105	240

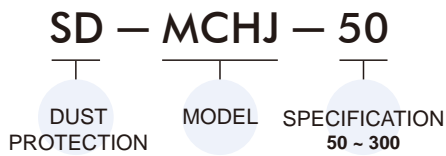
Code Spec.	M	N	O	P	Q	R	S	T	TA	U	V	W	X1	X2
50	ø7.3x4.1dp, ø4.3 thru, P.C.D.ø45	M5x0.8x8dp	M3	M5x0.8	M3	57	ø4H7x5	6-M3x0.5	7	1	2	3.9	ø5	ø3
66	ø9x5.1dp, ø5.1 thru, P.C.D.ø56	M6x1.0x10dp	M5	M5x0.8	M5	74	ø4H7x8	6-M4x0.7	8	1	2	3.9	ø6	ø4
80	ø10.2x6.1dp, ø6.8 thru, P.C.D.ø70	M8x1.25x12dp	M5	G1/8	M5	92	ø5H7x8	6-M6x1.0	10	1	2	3.9	ø8	ø6
100	ø10.5x6.5dp, ø6.8 thru, P.C.D.ø90	M8x1.25x12dp	M5	G1/8	M5	114	ø5H7x8	6-M6x1.0	12	1	2	3.9	ø10	ø6
125	ø13.5x8.1dp, ø8.6 thru, P.C.D.ø112	M10x1.5x15dp	M5	G1/8	M5	139	ø6H7x10	9-M6x1.0	14	1	2	3.9	ø10	ø6
160	ø13.5x8.1dp, ø8.5 thru, P.C.D.ø146	M10x1.5x24dp	M5	G1/8	M5	179	ø6H7x10	9-M8x1.25	14	1	2	3.9	ø12	ø8
200	ø17x10.5dp, ø10.3 thru, P.C.D.ø180	M12x1.75x25dp	M5	G1/4	M5	218	ø10H7x19	9-M10x1.5	20	1	2.5	4.9	ø14	ø10
300	ø18.5x12.2dp, ø12.5 thru, P.C.D.ø240	M16x2.0x39.1dp	M5	G1/4	G1/8	292	ø10H7x19	9-M12x1.75	20	2	2.5	4.9	ø18	ø12

PARALLEL GRIPPER (3-Finger)

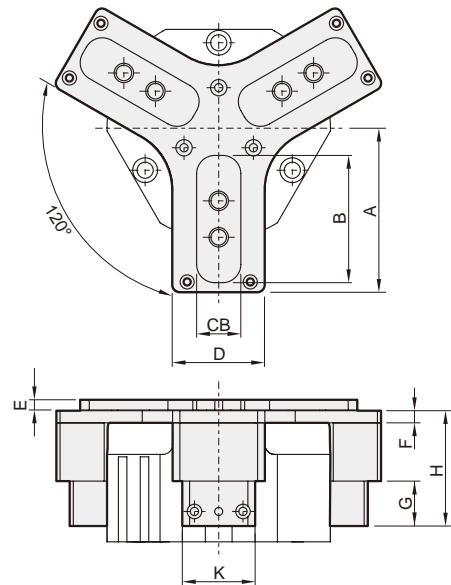
Dust protection module

Dust protection upgraded the IP class to prevent dust entering the gripper, suitable for dirty environment.
The length of fingers need to be measured from the surface of dust cover.
(Anti corrosion & hear-resistance are available, please contact us.)

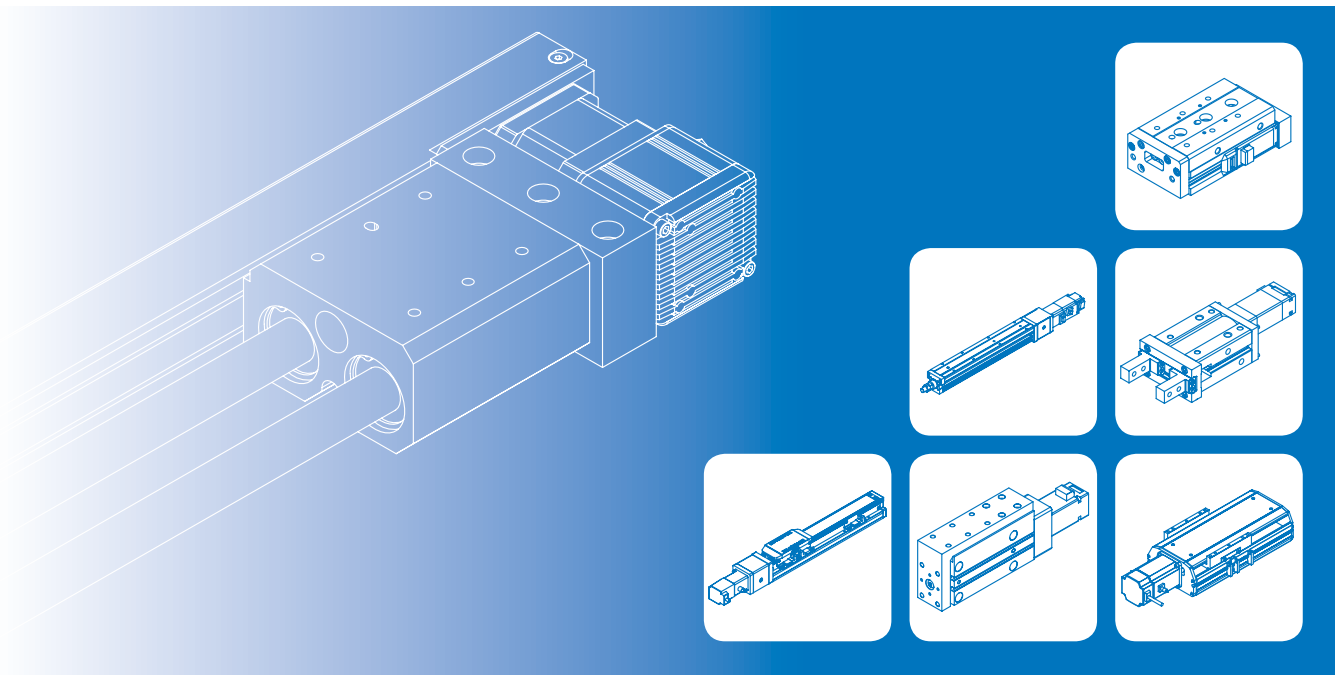
Order example



Code Spec.	A	B	CB	D	E	F	G	H	K
50	43	30	13	17	4.5	5	16	35.5	19
66	51	41	16.2	24	4.5	5	19.8	44.8	24
80	67.5	52.4	18.1	38	4.5	5	18.5	47.5	30
100	80	61	22	37	4.5	5	15	43	37
125	95	72	22	50	4.5	5	17	47	37
160	121	93	25	60	4.5	6	16.3	54.3	50
200	151	118	30	74	6.3	6	28	66	52
300	197	162	38	112	8.3	6	19.5	78.5	68



ELECTRIC ACTUATOR



	SLIDER ELECTRIC CYLINDER- BELT DRIVEN	
MEAT	(With Motor)	4-2
METFB	(Without Motor)	
	METFB-25 New	4-5
	METFB-32 New	4-11
	METFB-40 New	4-17
METB	(Without Motor) □42~□80	4-23
	SLIDER ELECTRIC CYLINDER- BALL SCREW DRIVE	
	Selector Table	4-28
	Applications.....	4-32
	Inner Structure	4-36
METG	(Without Motor)	
	METG-4	4-42
	METG-5	4-46
	METG-8 New	4-50
METS2	(Without Motor)	
	METS2-10 New	4-54
	METS2-14 New	4-58
	METS2-17 New	4-63
METS	(Without Motor)	
	METS-22	4-67
	Measuring Tools	4-72
	Technical Wording Reference ..	4-74
	Ball screw information	4-76

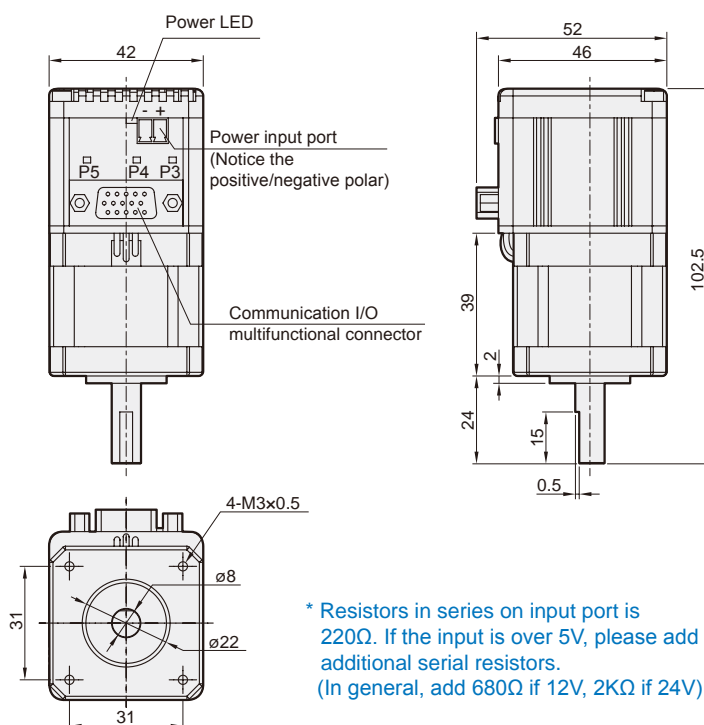
	ROD TYPE ELECTRIC ACTUATOR	
MEQG	(Without Motor)	
	MEQG-5 New	4-78
	MEQG-8 New	4-82
MEQI	(Without Motor)	
	MEQI-50 New	4-86
	MEQI-63 New	4-86
	MINIATURE ELECTRIC CYLINDER	
MESS2	(With Motor)	
	MESS2-16 New	4-96
	MESS2-25 New	4-96
MESH2	(With Motor)	
	MESH2-16 New	4-99
	MESH2-20 New	4-99
	ELECTRIC GRIPPER	
MEHC2	(With Motor)	
	MEHC2-16 New	4-102
	MEHC2-25 New	4-102
	MOTOR DRIVE	
MECQ1	New	4-106
MECP	New	4-108

Specification

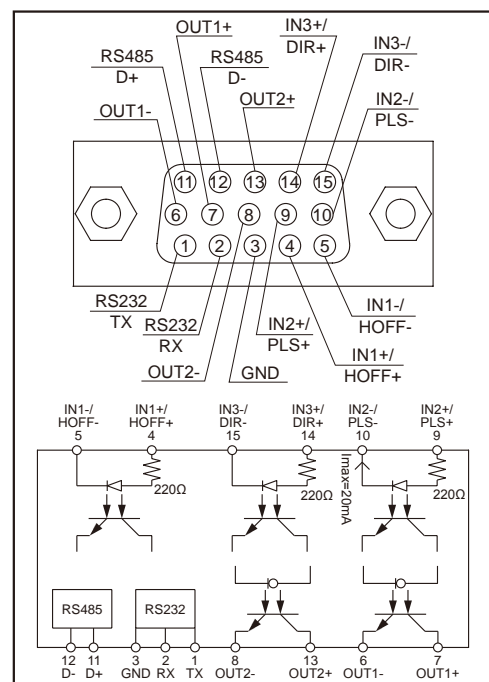
Motor size	Servo type three-phase stepper motor	
Power	DC 24V	
Rated current / Max. instant current	4A / 6A	
Rated torque	0.25 N.m	
Cooling type	Natural cooling	
Resolution encoder	Incremental type 10000 resolution/per cycle	
Control mode	Position, terminal control, Modbus communication control	
Position control	Max input pulse frequency	Differential Signaling: Below 500K PPS, Open Collector Signaling: 200K PPS
	Pulsed mode	CW/CCW, Pulse/DIR
	Smoothing filter	Cushion, Trapezoidal velocity profile acceleration /deceleration
	Electronic gear ratio	Electronic gear ratio (A/B) > 1/9999, A/B < 9999
	Registration complete check	0 ~ 999 Pulse
Terminal control	Internal operation instruction	Executing movement command from Windows Terminal
	Scripts edit control	Program input point, programmable set external INPUT ON/OFF signal for positioning.
Interface	RS232(for Windows Terminal) / RS485 / Modbus	
JOG function	Run manually(The speed is according to the parameter of configuration)	
Brake function	Output the control signal of Z-Axis brake, according to the servo ON/OFF status.	
Abnormal function	Servo control stop, positive / negative turn actuation restricted	
Protective device	Over current, over voltage, over temperature, encoder abnormal, low voltage, input pulse over limit, follow abnormal detection.	
Input signal	Servo control ON/OFF, zero point signal, pulse control signal.	
Output Signal	Servo control ready (Z axis brake control signal), location complete, actuation abnormal output (parameter setting).	

* Recommend installation environment: Places without moisture, oily dusty, corrosive and flammable liquid. Without floating dusty and metallic particle. Firm and static places without electrical interference, megathermal equipment.

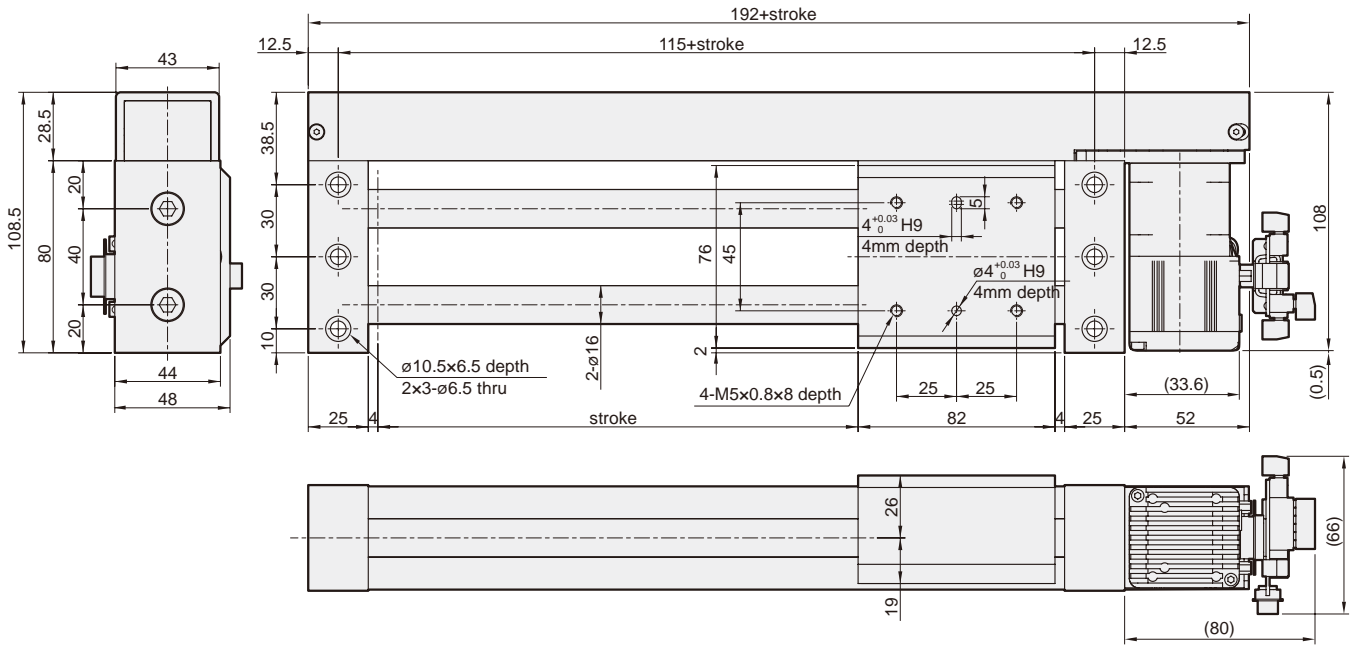
Dimensions



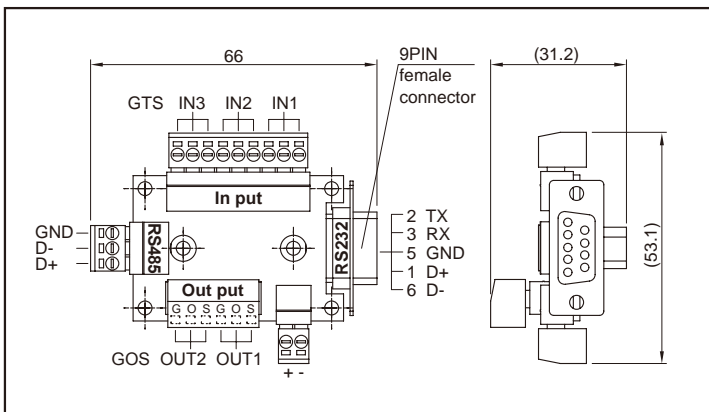
Definition of three-row 15pin DE-15 connector



Dimensions (Including expansion I/O card)



Expansion I/O card



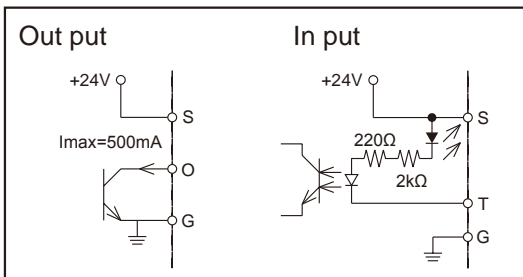
Order example

EAT - 1

Expansion I/O card

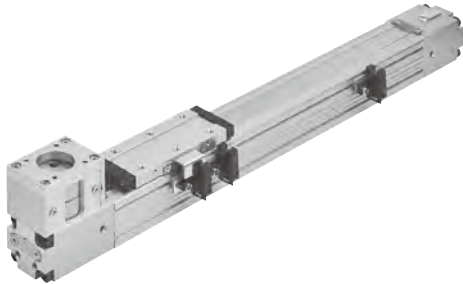
* When in control mode, all inputs/outputs are not defined and should be defined by program. (I/O card is optional)

Outputs/inputs circuit diagram



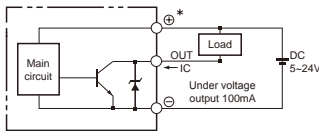
METFB-25 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Motor type	Servo / Step	Transmission	Timing belt
Environment	Standard	Guide type	Linear guide

Sensor layout



Specification

Model		METFB-25
Position repeatability	(mm)	±0.05
Lead	(mm/rev)	50
Belt pitch	(mm)	2
Stroke	(mm)	100~1000/50 pitch
No-load torque	(N.m)	0.1
Sensor switch		EE-SX672 (NPN)

Motor type	AC servo	Step
Motor output / size	100W	□35
Max. speed *1	(mm/s)	1500
Work load *2	Horizontal (kg)	5
	Vertical (kg)	—

*1. Acceleration and deceleration value is set 0.5 second.

*2. The operating speed under work load is less than maximum speed.

Order example

METFB-25 N - 1000 BW - S35 B - A3 - XA00

Model Size Stroke Special order No.

100~1000 mm
50 mm pitch

Guide installation		Motor position		Motor band		Power output		Brakes		Limit sensor	
N	Without guide	BW	Motor top side	M	Mitsubishi	10	100W Servo	-	No brake	-	No sensor
GR	Guide right side	BM	Motor bottom side	P	Panasonic			B	With brake	A1	1 pc
GL	Guide left side			Y	Yaskawa			A2	2 pcs		
				D	Delta			A3	3 pcs		
				S	Mindman	35	□35 Step				

Weight

Unit: kg

Model	Basic weight METFB-25N	Stroke 100 mm METFB-25N	Basic weight (with guide) METFB-25G*	Stroke 100 mm (with guide) METFB-25G*
Size				
25	0.97	0.18	1.3	0.27

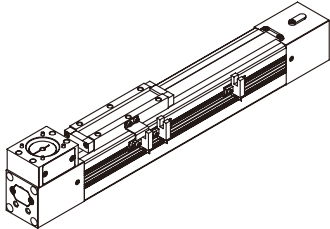
* The form is the weight of the type of motor top side.

METFB-25 Motor specification

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

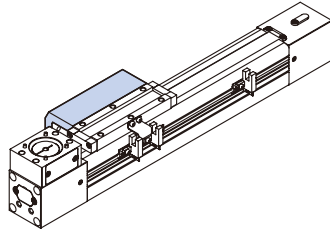


Guide installation



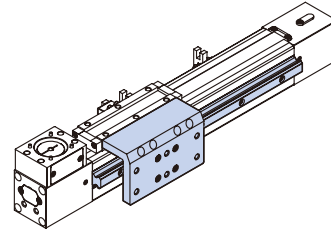
N

Without guide



GR

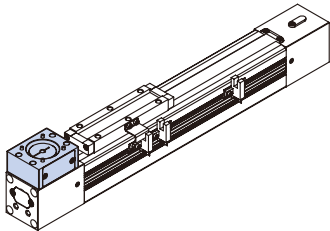
Guide right side



GL

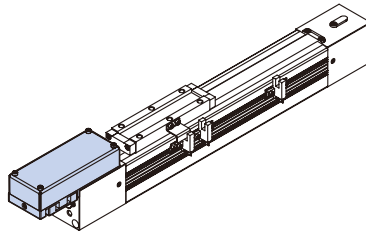
Guide left side

Motor position



BW

Motor top side



BM

Motor bottom side

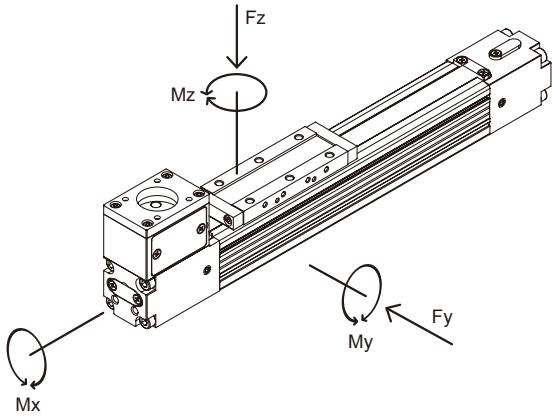
Standard motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod dia. (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	100W	HG-KN13J	HG-KN13B J	ø8	46	2-ø4.5
Panasonic	P	100W	MSMF012L1U2M	MSMF012L1V2M	ø8	45	4-ø3.4
Yasukawa	Y	100W	SGM7J-01A7A21	SGM7J-01A7A2C	ø8	46	2-ø4.3
Delta	D	100W	ECMA-C20401PS	ECMA-C20401FS	ø8	46	4-ø4.5
Mindman	S	□35	-	-	ø5	□26	4-M3x4.5L

* If your inquiry is not included in above table, please kindly contact us.

METFB-25 Capacity

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Forces & Moments

Model	Mx	My	Mz	Fy	Fz	
	Max. allowed moment (N.m)			Max. allowed load(N)		
METFB-25	Without guide	5	12	12	-	300
	With guide	38	42	42	2400	2700

Attention: In case of undefinable situations the above max. values have to be reduced by 10~20%.

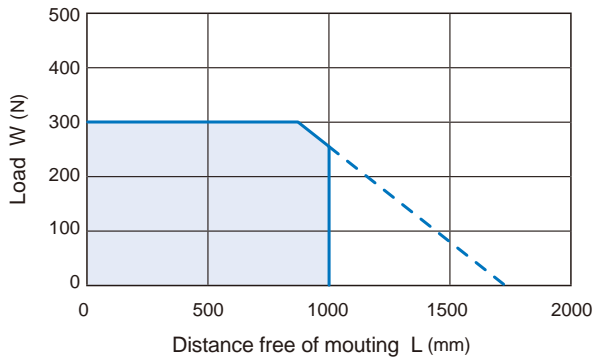
Please refer to the following formula when combined loads are applied.

$$\frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} + \frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} \leq 1$$

* The A letters show the calculated value.

Positioning of cylinder mountings

METFB-25 Without guide



METFB-25 With guide

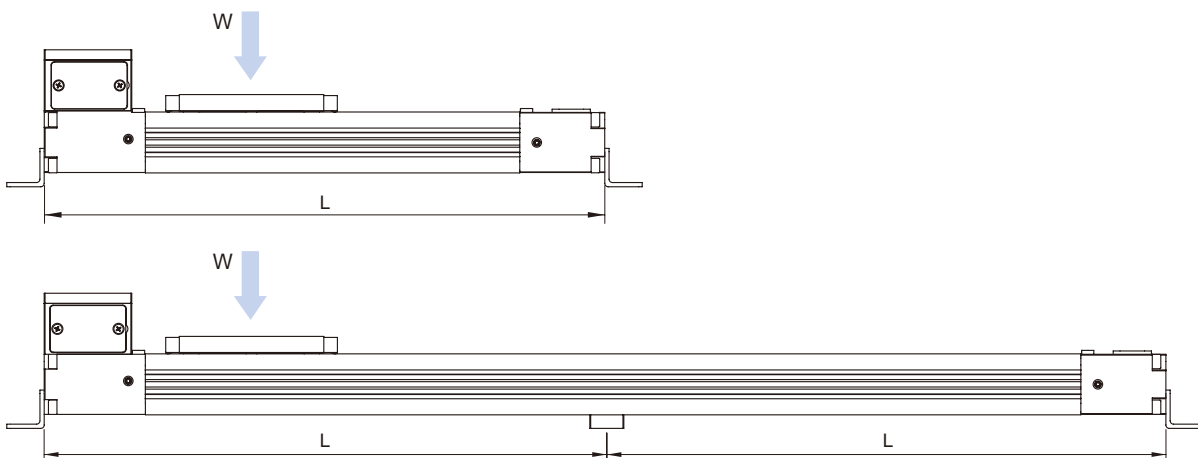
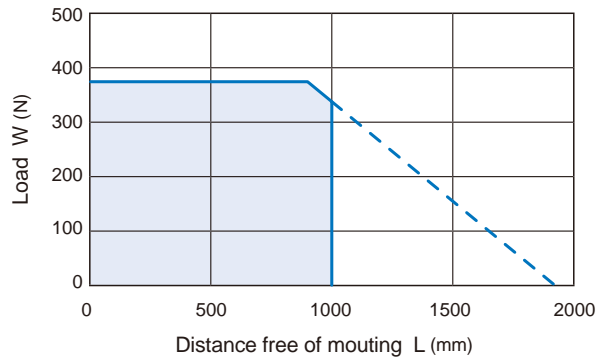


Diagram information

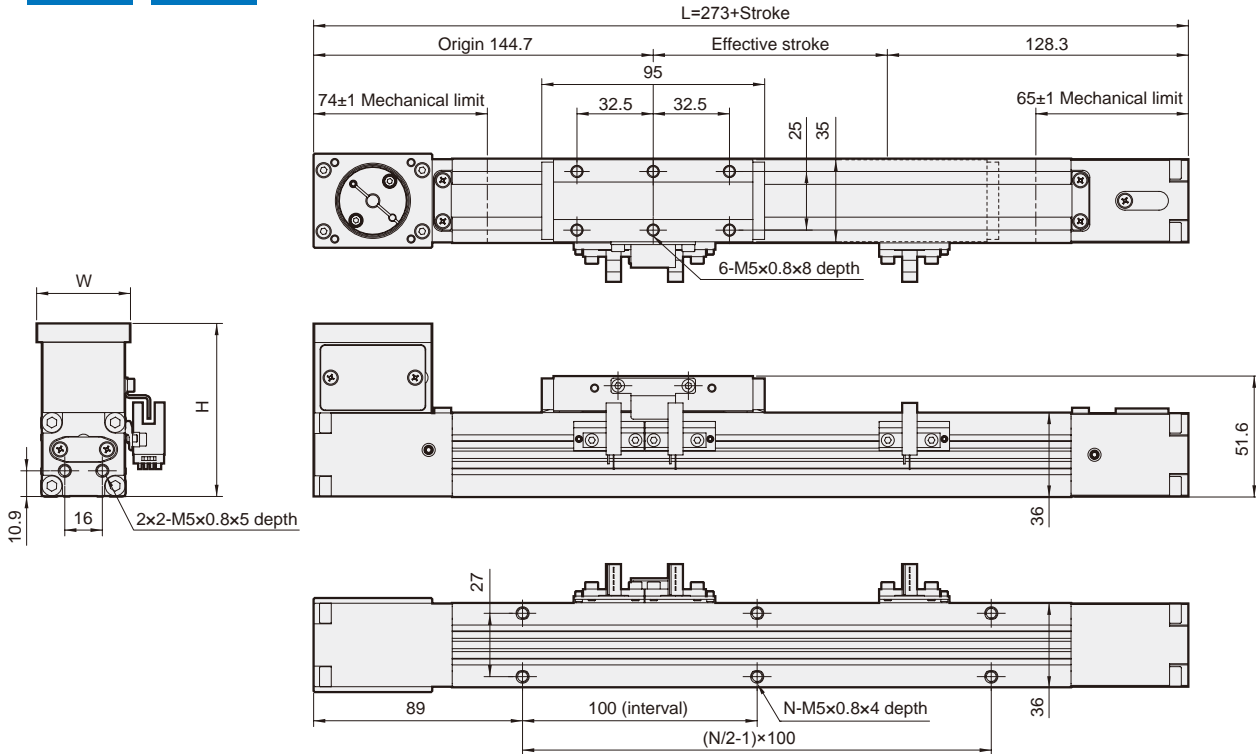
- Calculated deflections without support of 0.5~1 mm allow exceeding of the approved limits.
- Calculated deflections without support of > 1~1.5 mm require reduction of approved limits.

METFB-25 Dimensions

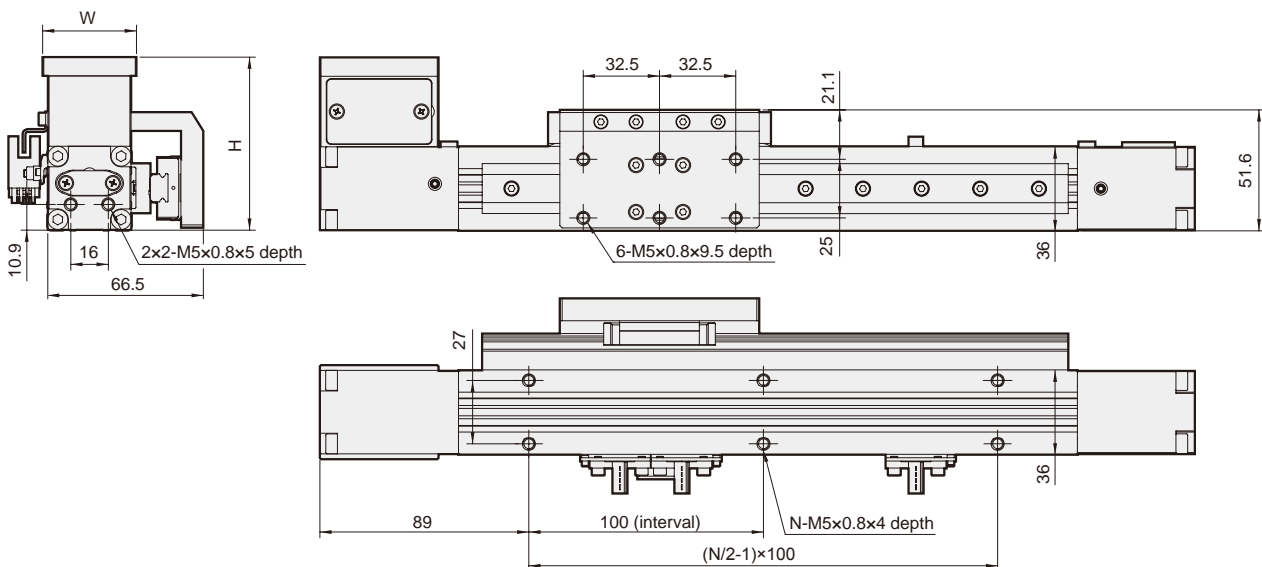
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



N BW Without guide • Motor top side



GL BW Guide left side • Motor top side



Unit: mm

Stroke Code	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	373	423	473	523	573	623	673	723	773	823	873	923	973	1023	1073	1123	1173	1223	1273
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24

Stroke Code	Servo	Step
W	40	35.5
H	73.8	71.8

METFB-25 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

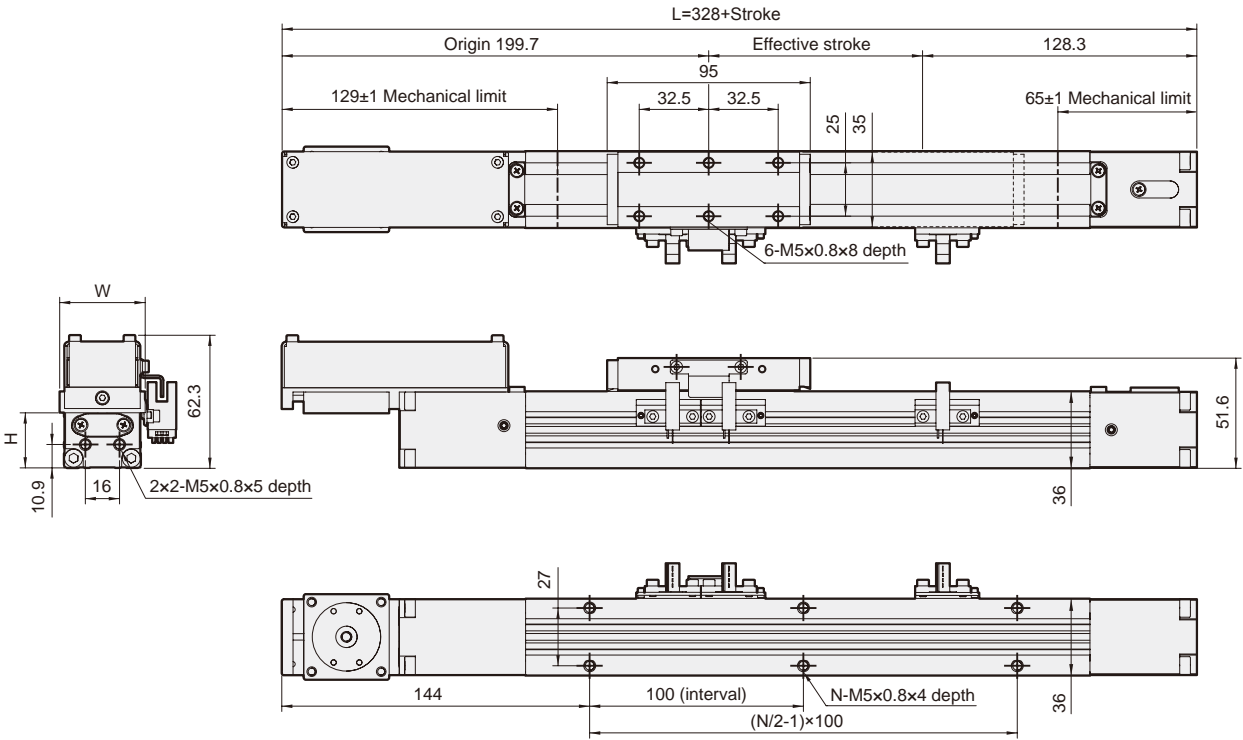
Auxiliary Equipment

Hydraulic Cylinder

N

BM

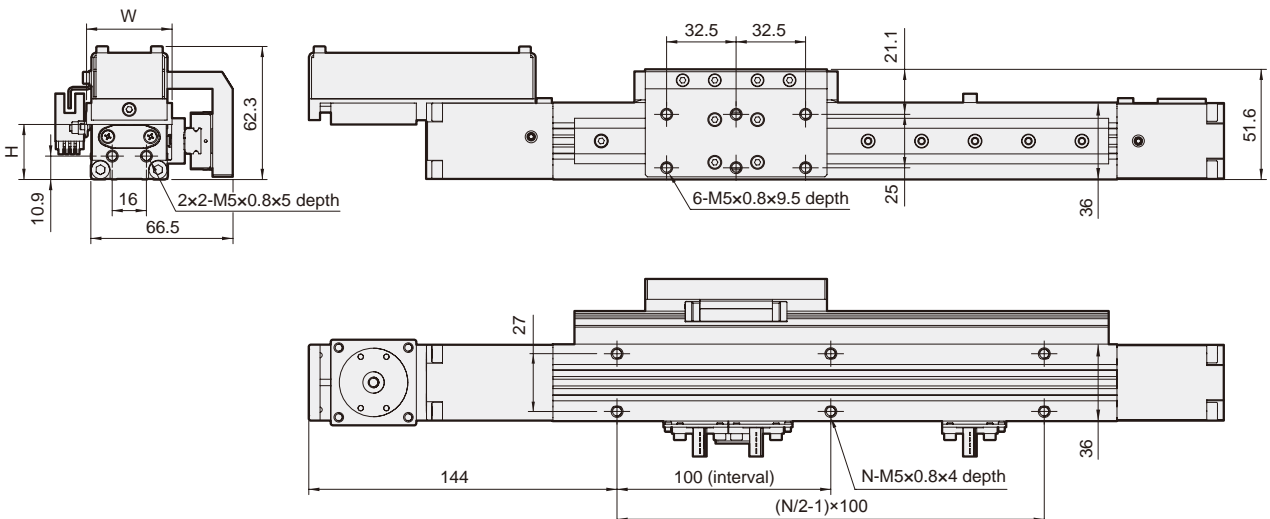
Without guide • Motor bottom side



GL

BM

Guide left side • Motor bottom side



Unit: mm

Stroke Code	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	428	478	528	578	628	678	728	778	828	878	928	978	1028	1078	1128	1178	1228	1278	1328
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24

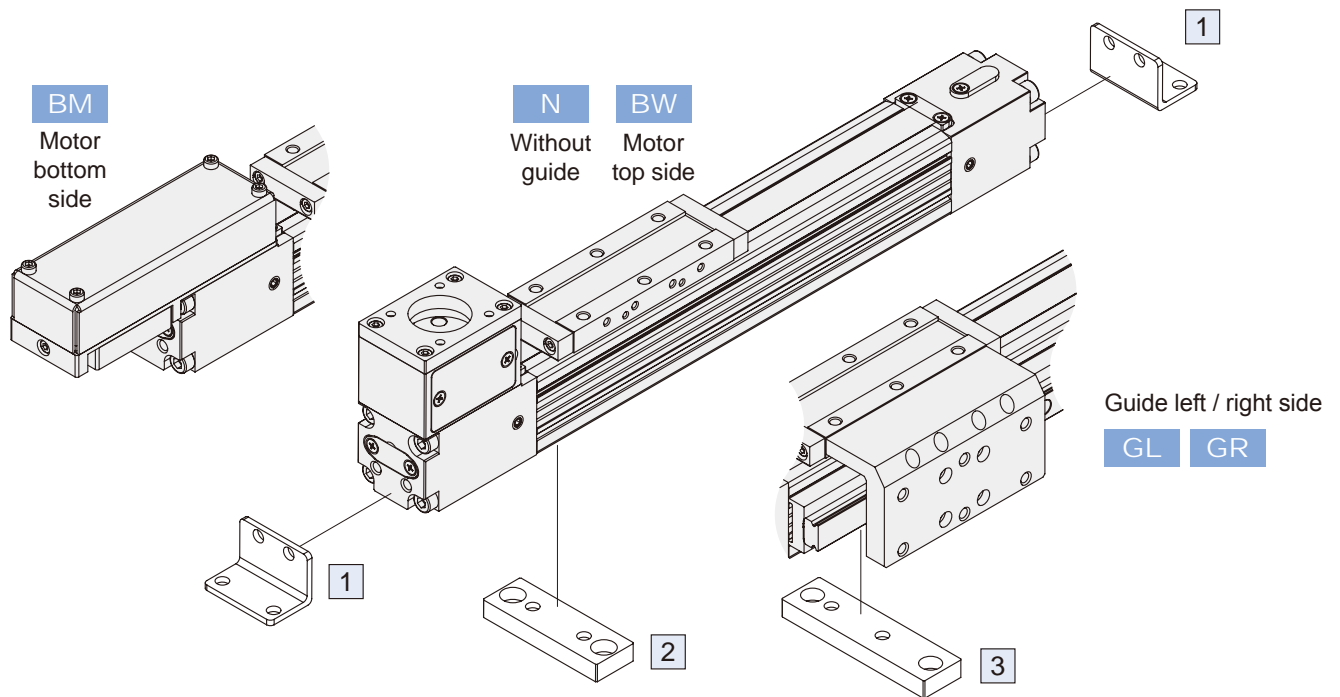
Stroke Code	Servo	Step
W	40	35.5
H	25.8	25.8

METFB-25 Mounting accessories

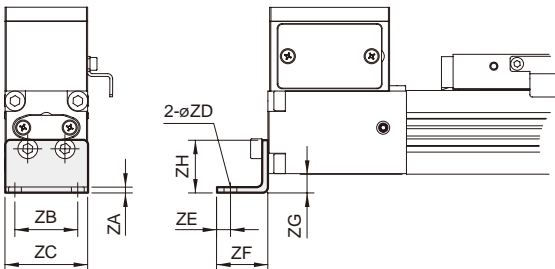
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



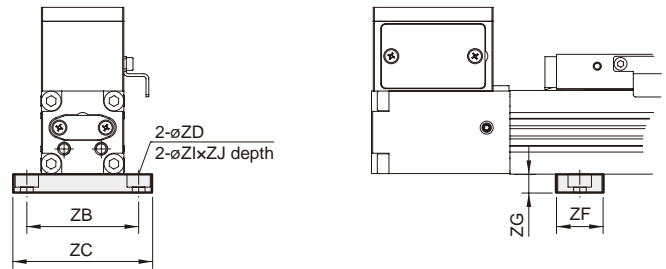
Mindman



1 End cover bracket (2pcs/set)

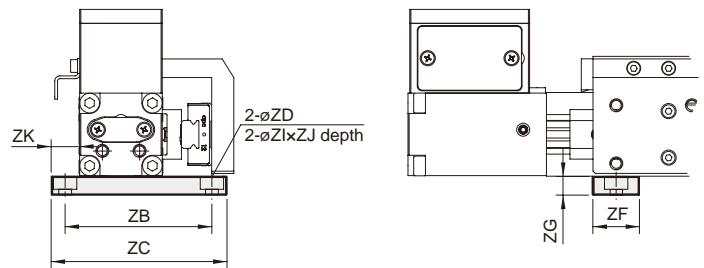


2 Mid section support *Applicable for (N) without guide.



* Not applicable for (BM) motor bottom side.

3 Mid section support * Applicable for (GR / GL) with guide.



Unit: mm

Item	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	Weight (g)	Order number
1	2.5	27	35.5	5.5	6	22	8	22.6	-	-	-	27	ETFB25-1
2	-	48	60	5.5	-	20	8	-	10	5.5	-	21	ETFB25-2
3	-	63	75	5.5	-	20	8	-	10	5.5	12	27	ETFB25-3

METFB-32 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



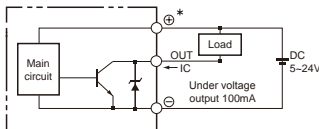
Specification

Model		METFB-32
Position repeatability	(mm)	±0.05
Lead	(mm/rev)	72
Belt pitch	(mm)	3
Stroke	(mm)	100~2000/50 pitch
No-load torque	(N.m)	0.2
Sensor switch		EE-SX672 (NPN)

Motor type	AC servo	Step
Motor output / size	200W	□42
Max. speed *1	(mm/s)	2400
Work load *2	Horizontal (kg)	9
	Vertical (kg)	—

Motor type	Servo / Step	Transmission	Timing belt
Environment	Standard	Guide type	Linear guide

Sensor layout



*1. Acceleration and deceleration value is set 0.5 second.

*2. The operating speed under work load is less than maximum speed.

Order example

METFB-32 N - 1000 BW - S42 B - A3 - XA00

Model Size Stroke Special order No.

100~2000 mm
50 mm pitch

Guide installation		Motor position		Motor band		Power output		Brakes		Limit sensor	
N	Without guide	BW	Motor top side	M	Mitsubishi	20	200W Servo	-	No brake	-	No sensor
GR	Guide right side	BM	Motor bottom side	P	Panasonic			B	With brake	A1	1 pc
GL	Guide left side			Y	Yaskawa			A2	2 pcs		
				D	Delta			A3	3 pcs		
				S	Mindman	42	□42 Step				

Weight

Unit: kg

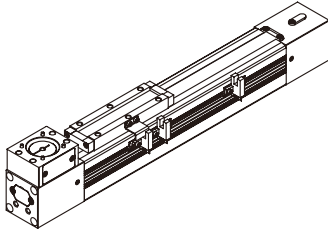
Model	Basic weight METFB-32N	Stroke 100 mm METFB-32N	Basic weight (with guide) METFB-32G*	Stroke 100 mm (with guide) METFB-32G*
Size				
32	2.06	0.36	2.7	0.49

* The form is the weight of the type of motor top side.

METFB-32 Motor specification

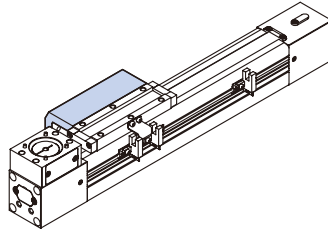
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Guide installtion



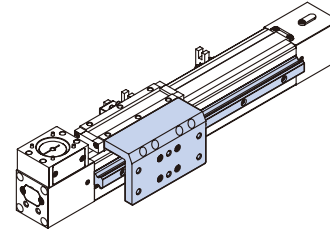
N

Without guide



GR

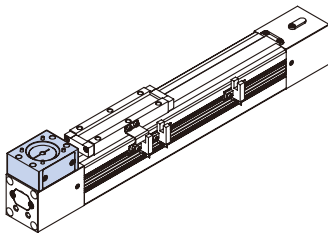
Guide right side



GL

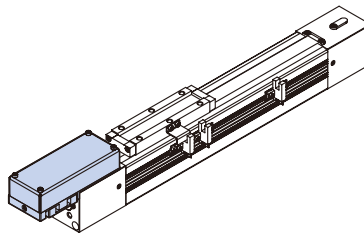
Guide left side

Motor position



BW

Motor top side



BM

Motor bottom side

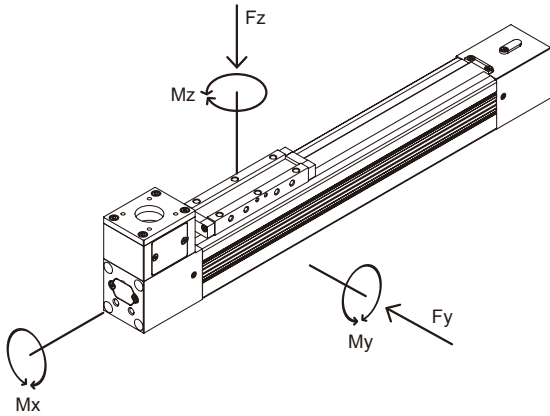
Standard motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod dia. (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	200W	HG-KN23J	HG-KN23B J	ø14	70	4-ø5.8
Panasonic	P	200W	MHMF022L1U2M	MHMF022L1V2M	ø11	70	4-ø4.5
Yasukawa	Y	200W	SGM7J-02A7A21	SGM7J-02A7A2C	ø14	70	4-ø5.5
Delta	D	200W	ECMA-C20602PS	ECMA-C20602FS	ø14	70	4-ø5.5
Mindman	S	□42	-	-	ø5	□31	4-M3×4.5L

* If your inquiry is not included in above table, please kindly contact us.

METFB-32 Capacity

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Forces & Moments

Model	Mx	My	Mz	Fy	Fz	
	Max. allowed moment (N.m)			Max. allowed load(N)		
METFB-32	Without guide	5.5	22	22	-	500
	With guide	47.5	48	48	2800	3300

Attention: In case of undefinable situations the above max. values have to be reduced by 10~20%.

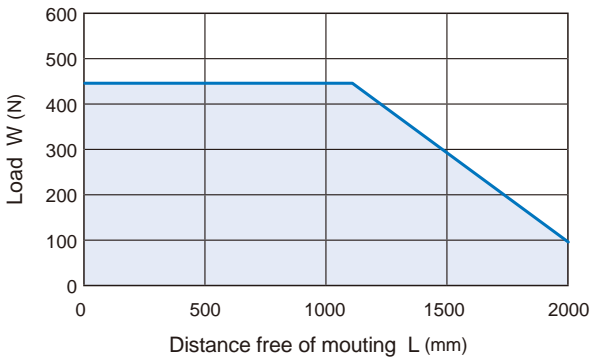
Please refer to the following formula when combined loads are applied.

$$\frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} + \frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} \leq 1$$

* The A letters show the calculated value.

Positioning of cylinder mountings

METFB-32 Without guide



METFB-32 With guide

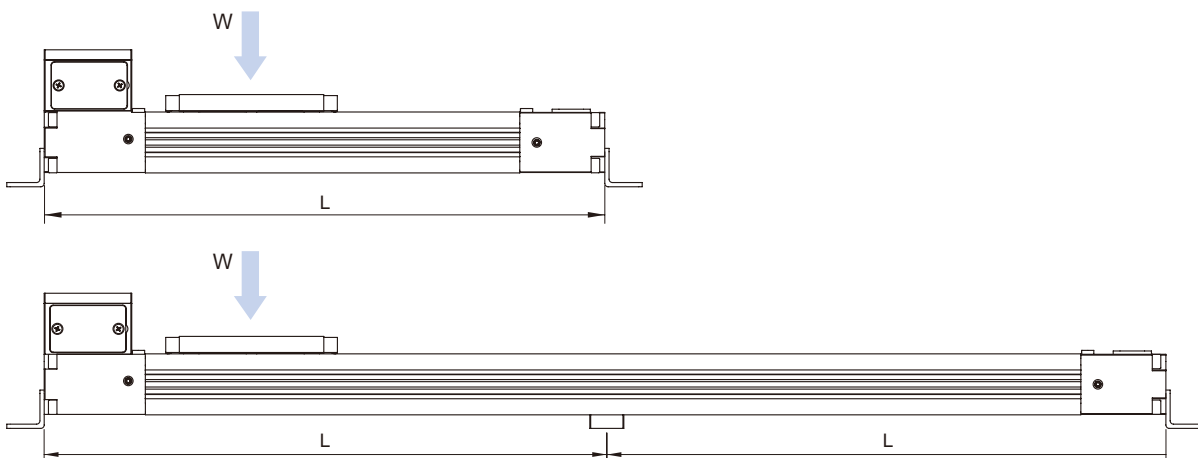
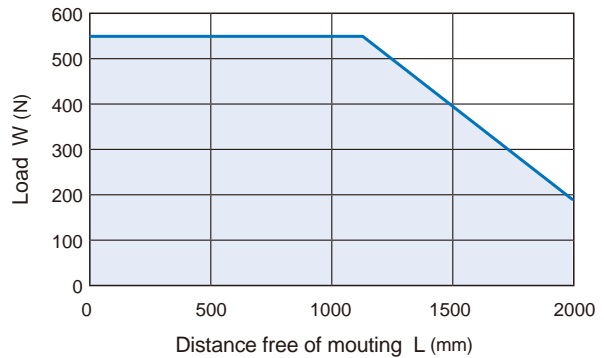


Diagram information

- Calculated deflections without support of 0.5~1 mm allow exceeding of the approved limits.
- Calculated deflections without support of > 1~1.5 mm require reduction of approved limits.

METFB-32 Dimensions

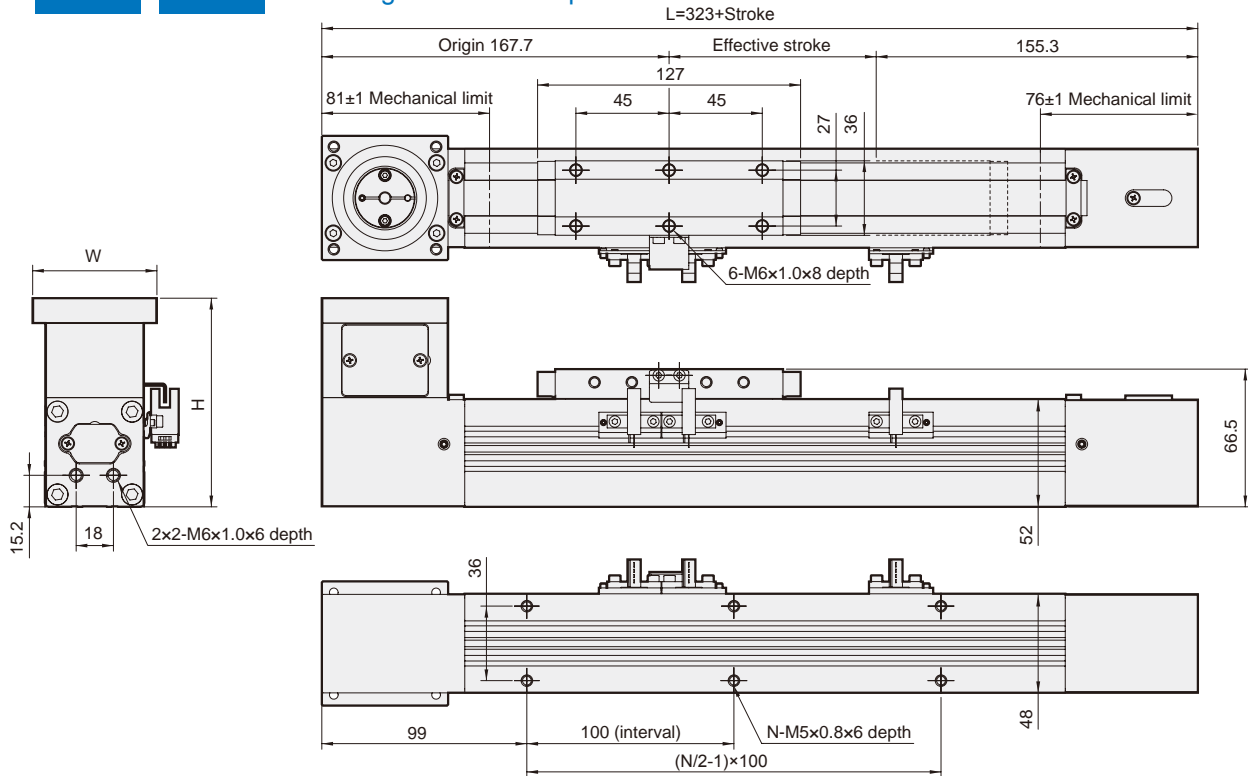
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



N

BW

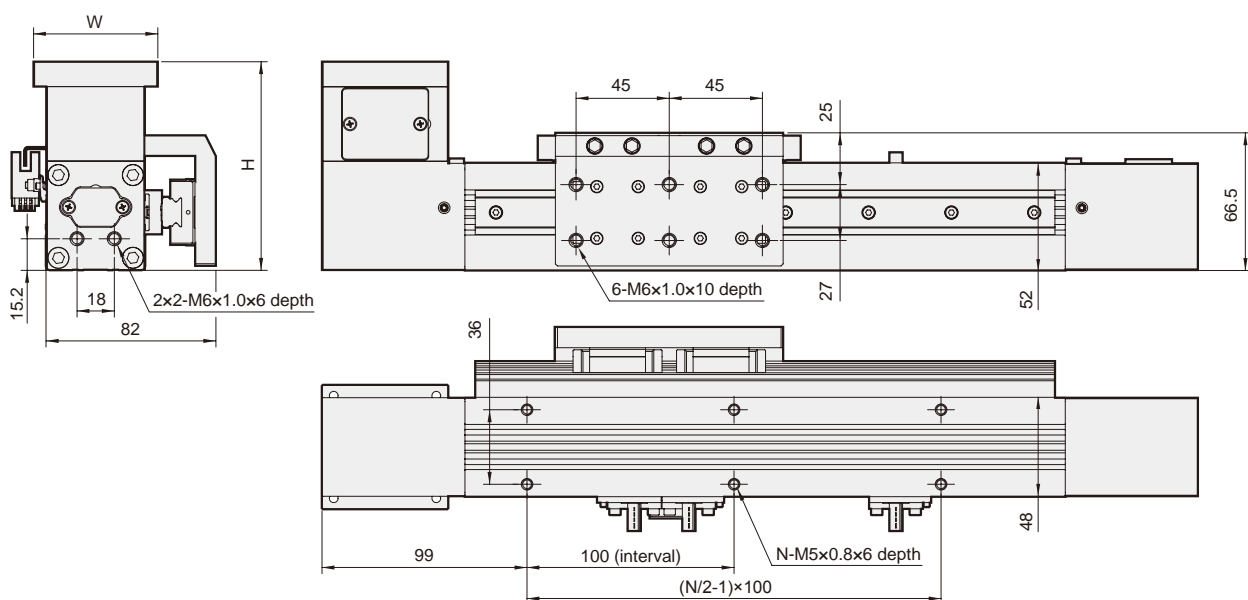
Without guide • Motor top side



GL

BW

Guide left side • Motor top side



Unit: mm

Stroke Code	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
L	423	523	623	723	823	923	1023	1123	1223	1323	1423	1523	1623	1723	1823	1923	2023	2123	2223	2323
N	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44

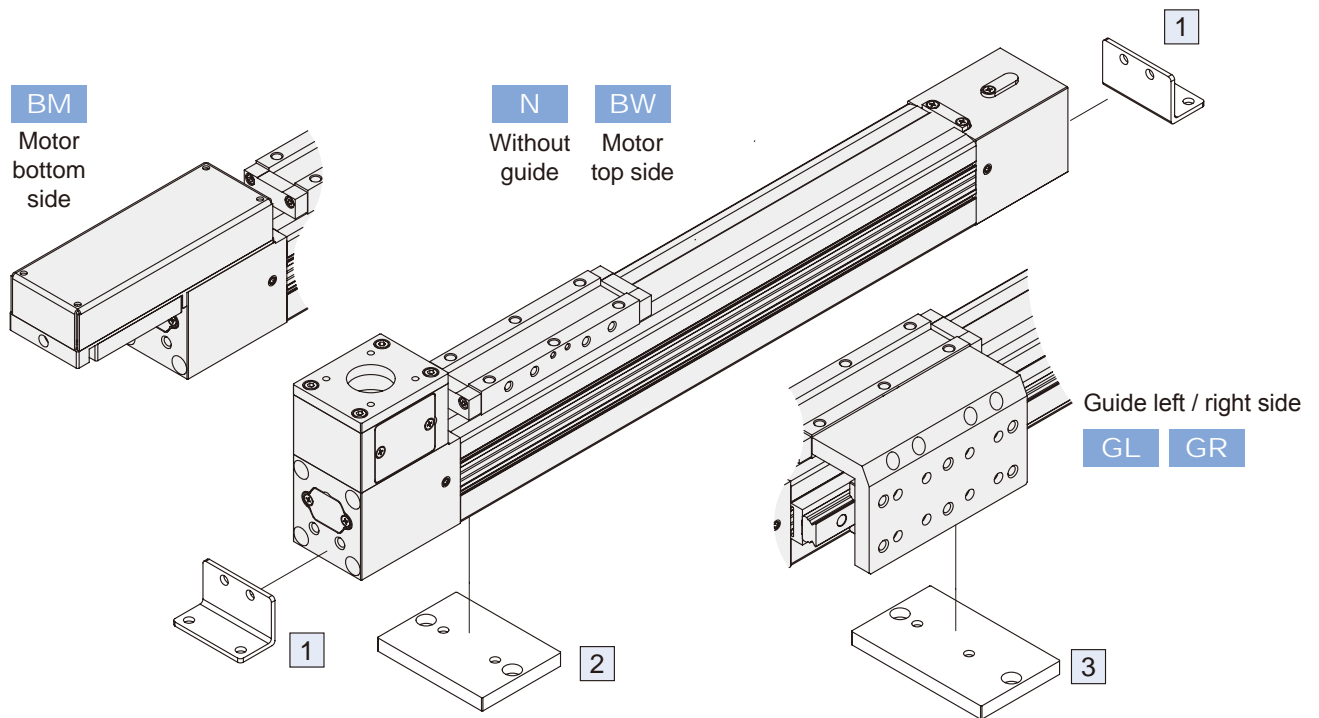
Stroke Code	Servo	Step
W	60	47.6
H	100.8	94.8

METFB-32 Mounting accessories

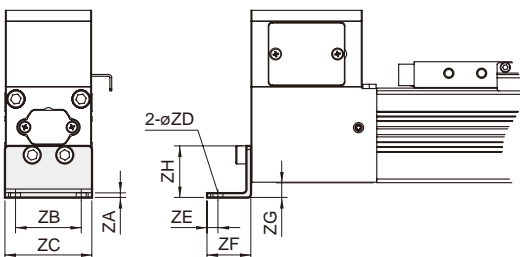
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Mindman

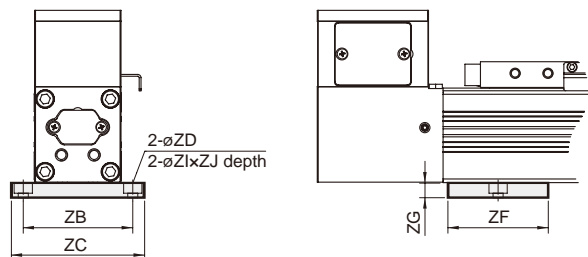


1 End cover bracket (2pcs/set)

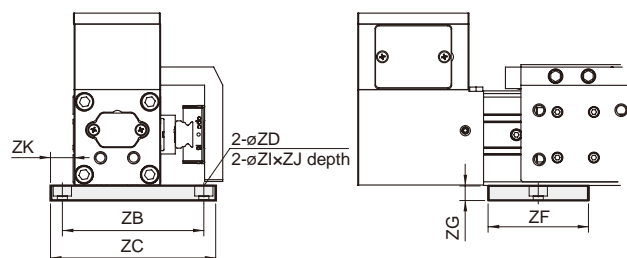


* Not applicable for (BM) motor bottom side.

2 Mid section support *Applicable for (N) without guide.



3 Mid section support *Applicable for (GR / GL) with guide.



Unit: mm

Item	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	Weight (g)	Order number
1	2.5	36	47.6	5.5	6	24	8	28.3	-	-	-	46	ETFB32-1
2	-	60	72	5.5	-	55	8	-	10	5.5	-	82	ETFB32-2
3	-	78	90	5.5	-	55	8	-	10	5.5	12.5	103	ETFB32-3

METFB-40 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



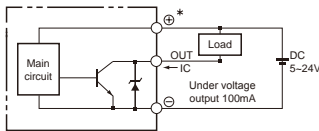
Specification

Model		METFB-40
Position repeatability	(mm)	±0.05
Lead	(mm/rev)	72
Belt pitch	(mm)	3
Stroke	(mm)	100~2000/50 pitch
No-load torque	(N.m)	0.6
Sensor switch		EE-SX672 (NPN)

Motor type	AC servo	Step
Motor output / size	400W	□56
Max. speed *1	(mm/s)	2400
Work load *2	Horizontal (kg)	15
	Vertical (kg)	—

Motor type	Servo / Step	Transmission	Timing belt
Environment	Standard	Guide type	Linear guide

Sensor layout



*1. Acceleration and deceleration value is set 0.5 second.

*2. The operating speed under work load is less than maximum speed.

Order example

METFB-40 N - 1000 BW - S56 B - A3 - XA00

Model Size Stroke Special order No.

100~2000 mm
50 mm pitch

Guide installation		Motor position		Motor band		Power output		Brakes		Limit sensor	
N	Without guide	BW	Motor top side	M	Mitsubishi	40	400W Servo	-	No brake	-	No sensor
GR	Guide right side	BM	Motor bottom side	P	Panasonic			B	With brake	A1	1 pc
GL	Guide left side			Y	Yaskawa			A2	2 pcs		
				D	Delta			A3	3 pcs		
				S	Mindman	56	□56 Step				

Weight

Unit: kg

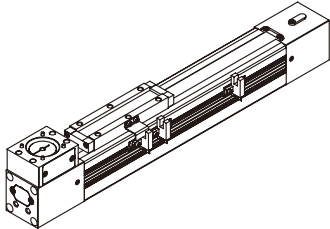
Model	Basic weight METFB-40N	Stroke 100 mm METFB-40N	Basic weight (with guide) METFB-40G*	Stroke 100 mm (with guide) METFB-40G*
Size				
40	2.96	0.5	3.73	0.62

* The form is the weight of the type of motor top side.

METFB-40 Motor specification

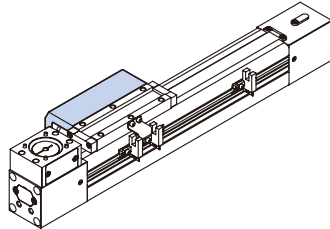
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Guide installtion



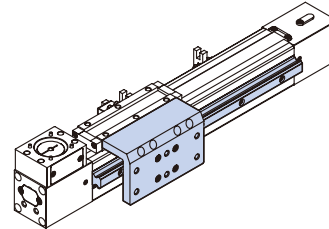
N

Without guide



GR

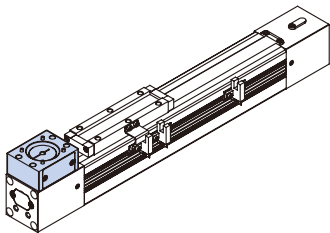
Guide right side



GL

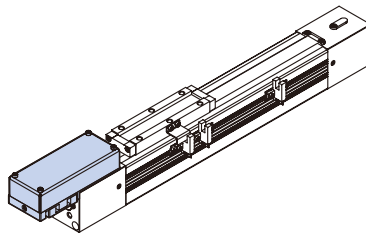
Guide left side

Motor position



BW

Motor top side



BM

Motor bottom side

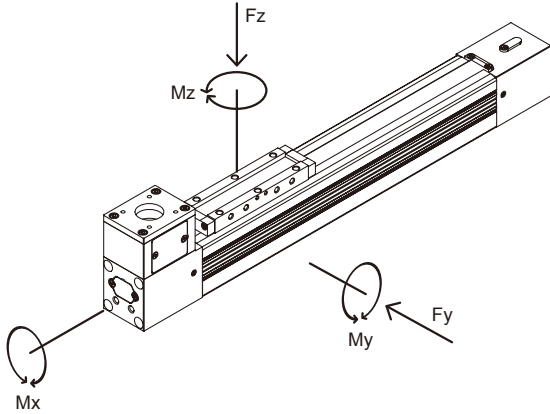
Standard motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod dia. (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	400W	HG-KN43J	HG-KN43B J	ø14	70	4-ø5.8
Panasonic	P	400W	MHMF042L1U2M	MHMF042L1V2M	ø14	70	4-ø4.5
Yasukawa	Y	400W	SGM7J-04A7A21	SGM7J-04A7A2C	ø14	70	4-ø5.5
Delta	D	400W	ECMA-C20604PS	ECMA-C20604QS	ø14	70	4-ø5.5
Mindman	S	□56	-	-	ø6.35	□47.14	4-ø5

* If your inquiry is not included in above table, please kindly contact us.

METFB-40 Capacity

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Forces & Moments

Model	Mx	My	Mz	Fy	Fz	
	Max. allowed moment (N.m)			Max. allowed load(N)		
METFB-40	Without guide	10	30	30	-	600
	With guide	78	90	90	4000	4600

Attention: In case of undefinable situations the above max. values have to be reduced by 10~20%.

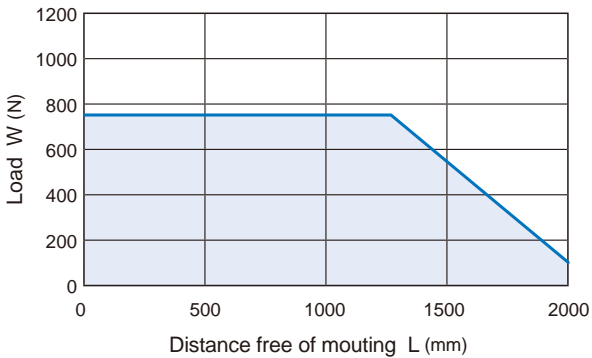
Please refer to the following formula when combined loads are applied.

$$\frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} + \frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} \leq 1$$

* The A letters show the calculated value.

Positioning of cylinder mountings

METFB-40 Without guide



METFB-40 With guide

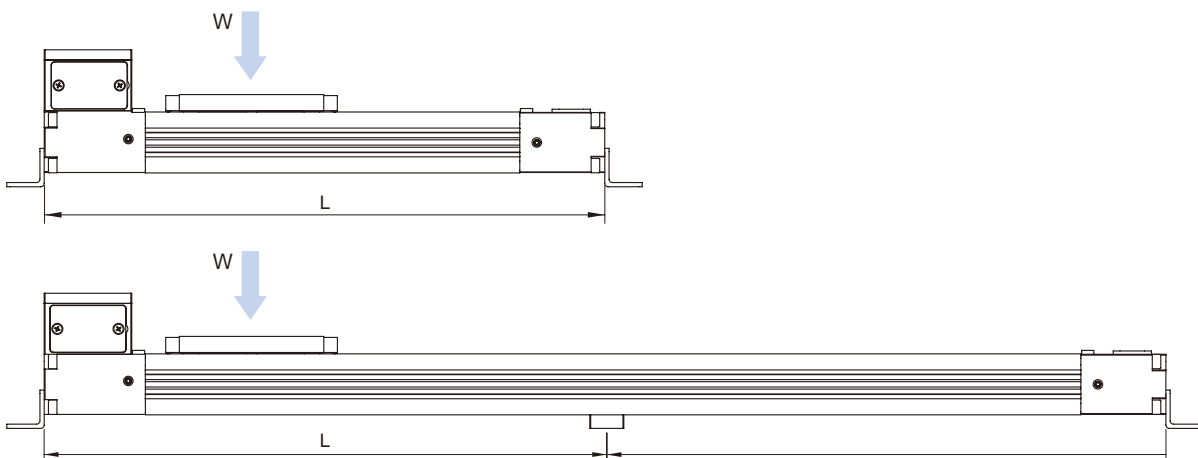
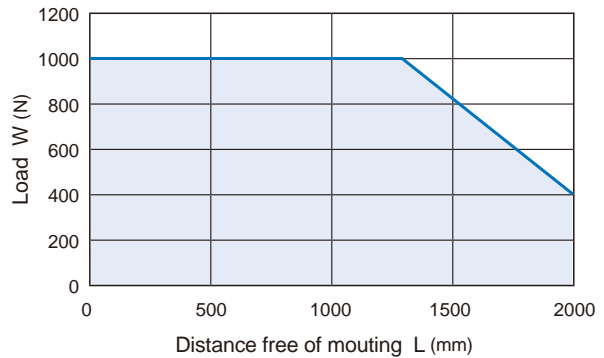


Diagram information

- Calculated deflections without support of 0.5~1 mm allow exceeding of the approved limits.
- Calculated deflections without support of > 1~1.5 mm require reduction of approved limits.

METFB-40 Dimensions

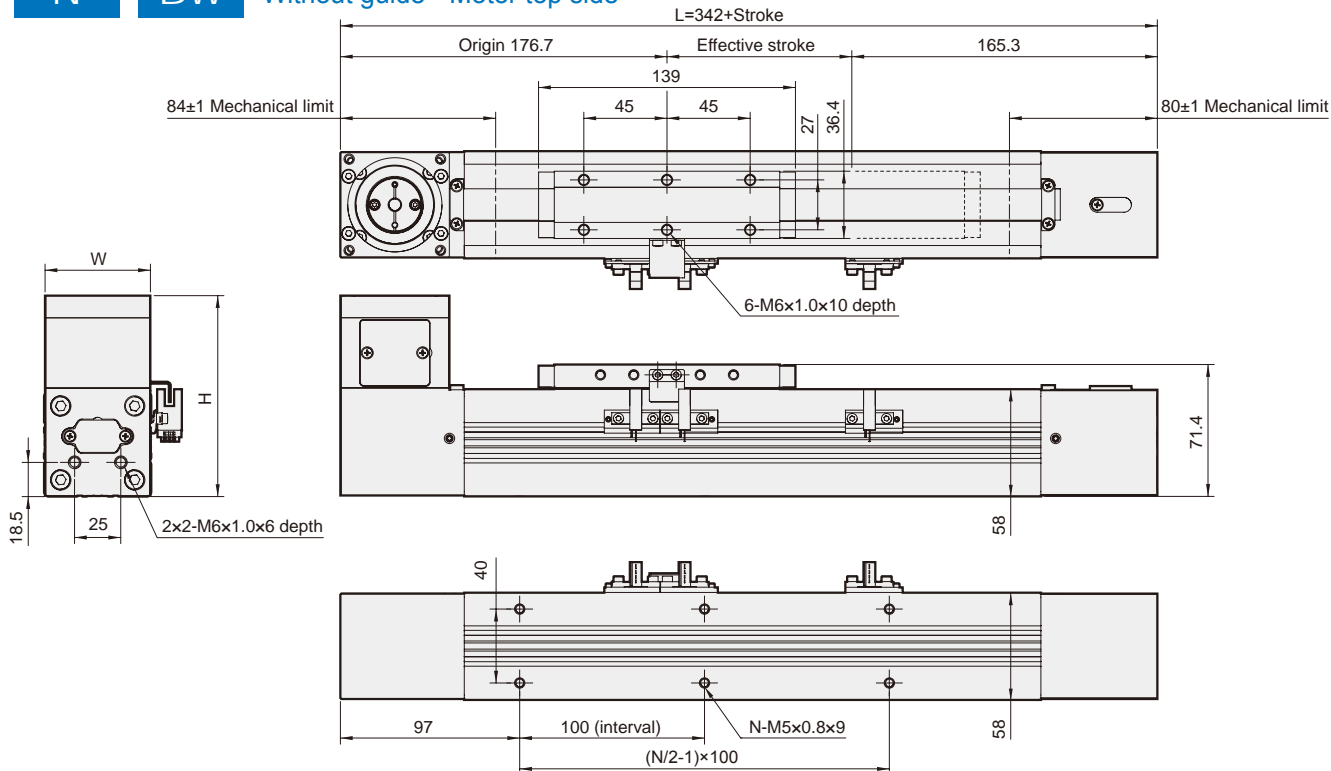
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



N

BW

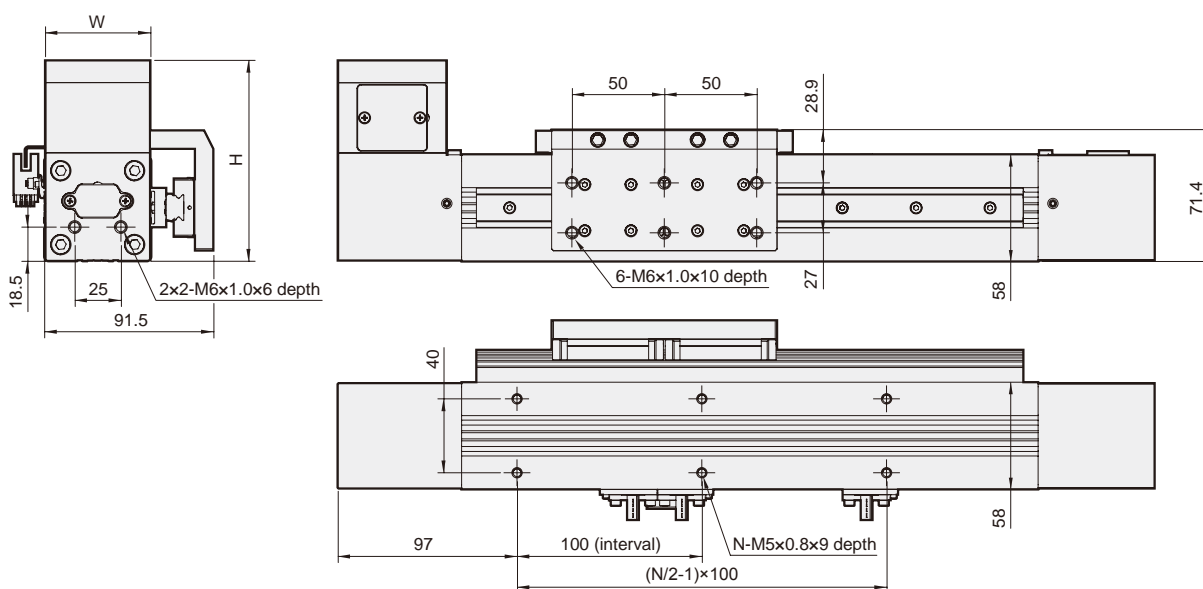
Without guide • Motor top side



GL

BW

Guide left side • Motor top side



Unit: mm

Stroke Code	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
L	442	542	642	742	842	942	1042	1142	1242	1342	1442	1542	1642	1742	1842	1942	2042	2142	2242	2342
N	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44

Stroke Code	Servo	Step
W	57	57
H	108.7	102.7

METFB-40 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

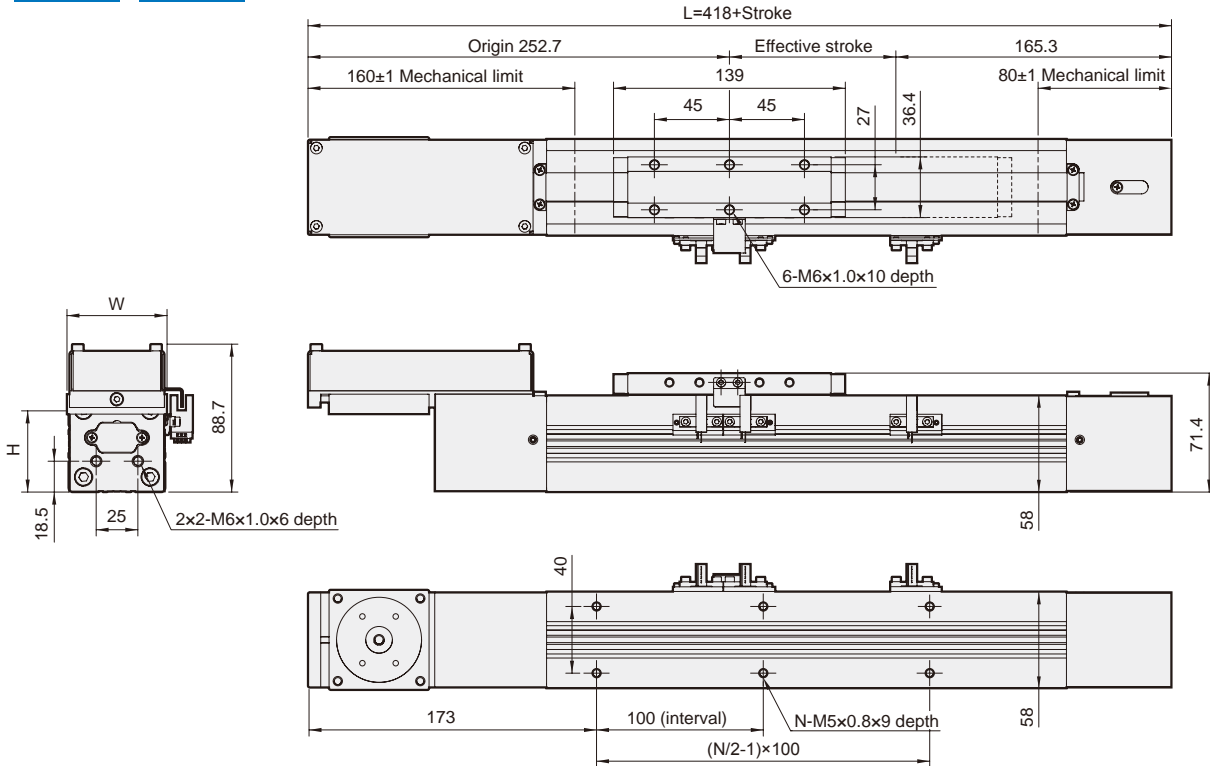
Auxiliary Equipment

Hydraulic Cylinder

N

BM

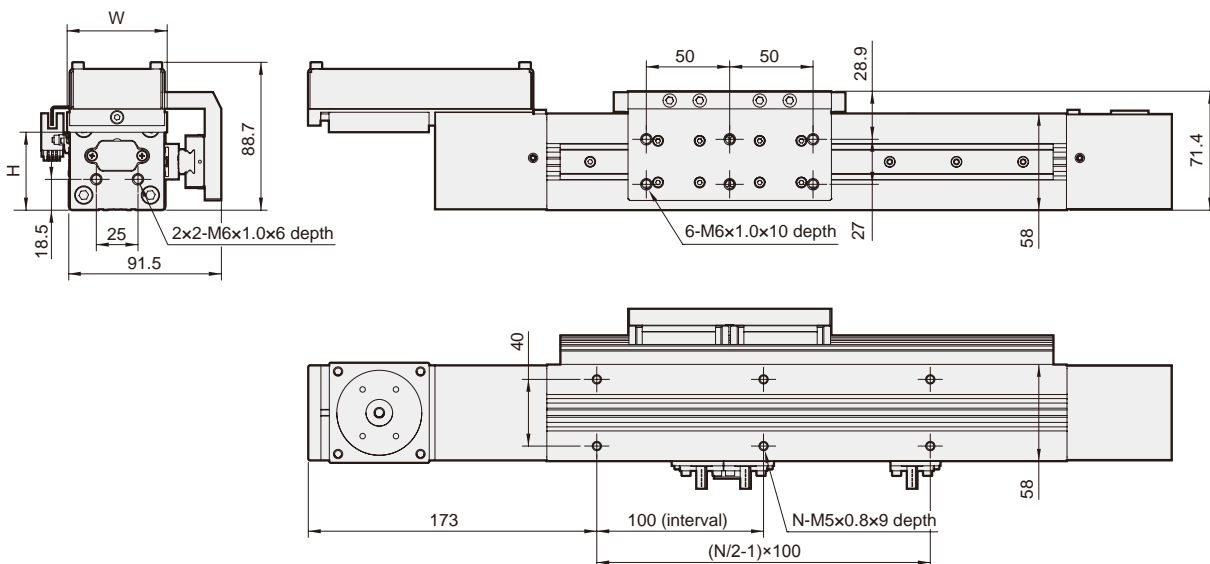
Without guide • Motor bottom side



GL

BM

Guide left side • Motor bottom side



Unit: mm

Stroke Code	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
L	518	618	718	818	918	1018	1118	1218	1318	1418	1518	1618	1718	1818	1918	2018	2118	2218	2318	2418
N	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44

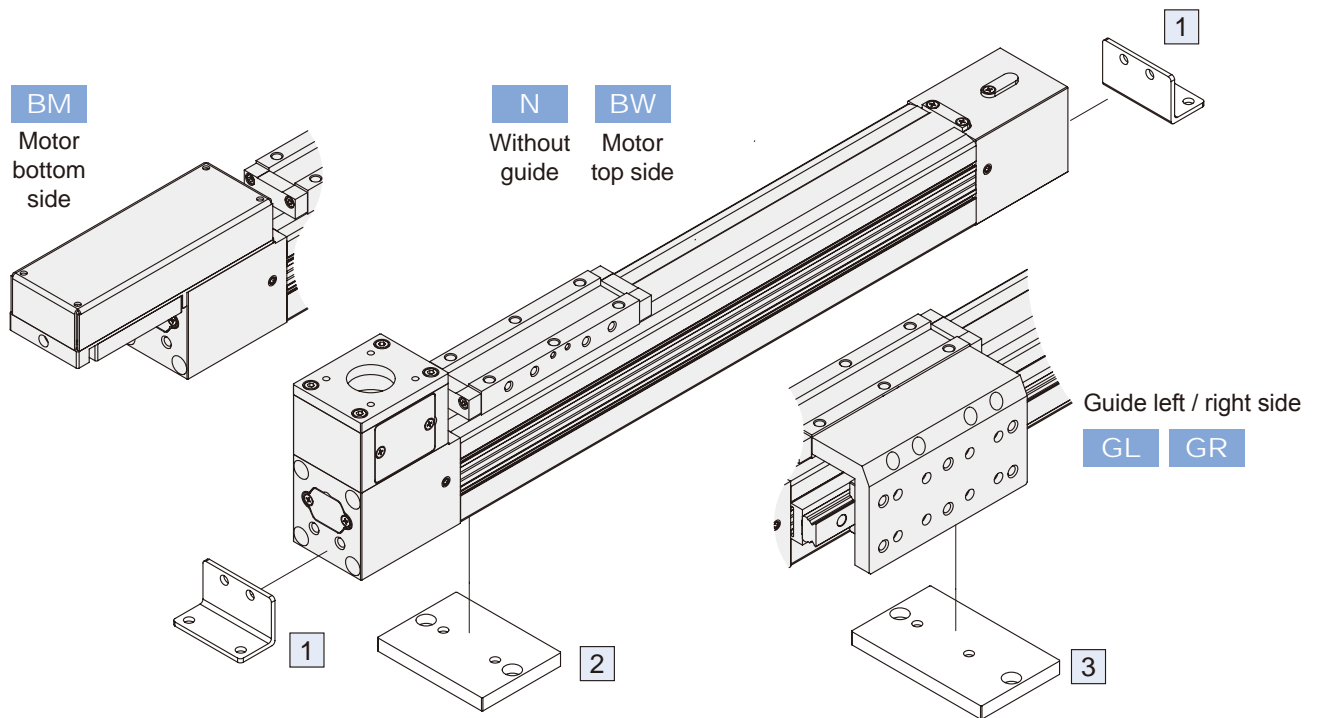
Stroke Code	Servo	Step
W	60	57
H	46.7	48.7

METFB-40 Mounting accessories

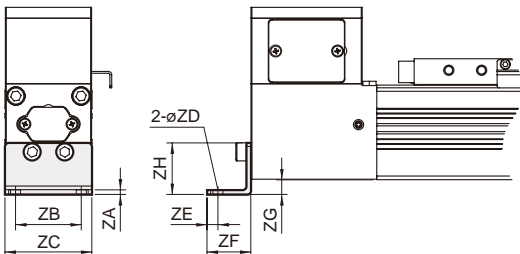
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Mindman

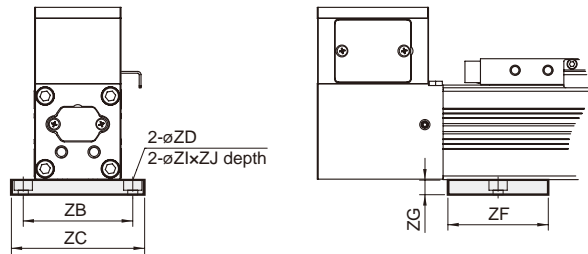


1 End cover bracket (2pcs/set)

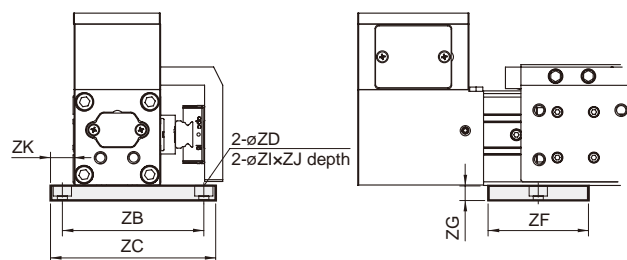


* Not applicable for (BM) motor bottom side.

2 Mid section support *Applicable for (N) without guide.



3 Mid section support *Applicable for (GR / GL) with guide.



Unit: mm

Item	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	Weight (g)	Order number
1	2.5	40	57	5.5	6	24	8	31.5	-	-	-	59	ETFB40-1
2	-	70	85	5.5	-	60	8	-	10	5.5	-	105	ETFB40-2
3	-	88	103	5.5	-	60	8	-	10	5.5	13.5	128	ETFB40-3

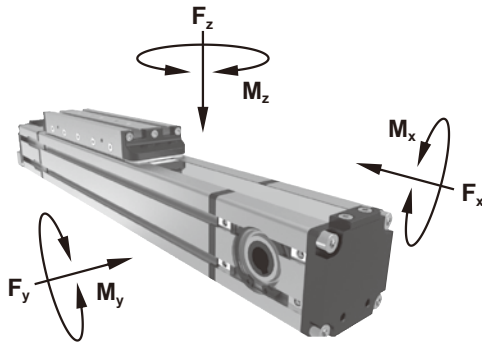


Max values for dynamic conditions.

Please refer to the following formula when combined loads are applied.

$$\frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} + \frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} \leq 1$$

* The A letters show the calculated value.



Features

- Belt driven unit with railway integrated.
- Extruded aluminum anodized 6060 alloy, tempered stainless steel protection band.
- Carriage with sealed system to protect against pollution.

Specification

Model		METB		
Size	(mm)	42	55	80
Max. speed	(m/s)	3	3	3
Max. stroke length	(mm)	6000	6000	6000
Min. stroke length	(mm)	100	100	100
Pulley drive ratio	(mm)	90	120	160
Number of teeth of pulley	(mm)	18	24	32
Teeth belt with steel reinforced polyurethane ATL 5 profile clearance 0, width	(mm)	12	16	25
Max rpm	(g/min)	2000	1500	1150
Base weight	(kg)	1.6	4.4	6
Add for 100 mm of stroke	(kg)	0.25	0.37	0.9
Max. load	Fx (N)	460	820	1650
	Fy (N)	1560	1850	4500
	Fz (N)	1560	1850	4500
Moments	Mx (Nm)	20	25	80
	My (Nm)	55	120	450
	Mz (Nm)	55	120	450
Inertia moment aluminum profile	Ix (cm ⁴)	11.8	36	183
	Iy (cm ⁴)	14.2	45	226
Repeatability	(mm)	±0.05	±0.05	±0.05
Max. radial load on input shaft	(N)	220	300	300
No load torque	(Nm)	>0.1	>0.5	0.9
Sensor switch (*)		RCI		

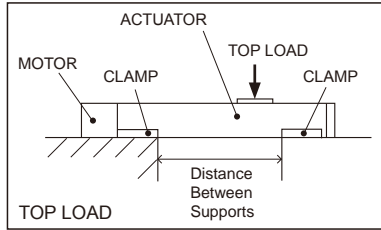
* RCI specification, please refer to page 5-8.

Order example

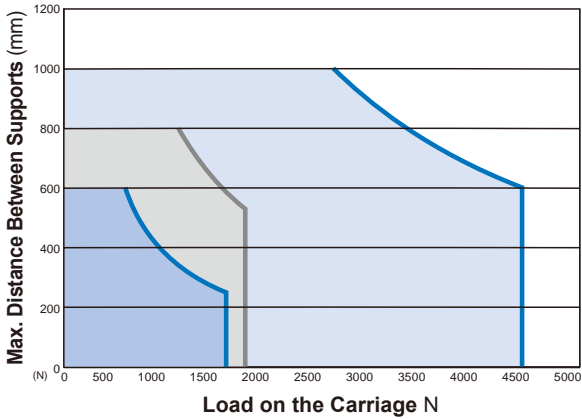
METB - 42 - 0100 - F08 L - EM2A

Model	Size (mm)	Stroke	Shaft versions				Male shaft		Accessory		
METB	42 42x42 55 55x55 80 80x80	100~6000 mm (4 codes) <small>* Minimum stroke unit 1mm.</small>	Size	Type	ø	Part No.	L	Left shaft	E	End cap mounting	
			42	Female shaft	8	F08	R	Right shaft	M□ ^{*1}	Mid section mounting	
				Male shaft	12	M12			A□ ^{*2}	Limit switch adapters	
				Double male shaft	12	D12			* A type only for size 80. *1. Number of accessory		
			55	Female shaft	8	F08			Blank	1 set (2 pcs)	
				Male shaft	16	M16			2	2 set (4 pcs)	
				Double male shaft	16	D16			n	"n" set (nx2 pcs)	
			80	Female shaft	19	F19			*2. Number of accessory		
				Male shaft	19	M19			Blank	1 pc	
				Double male shaft	19	D19			2	2 pcs	
									n	"n" pcs	

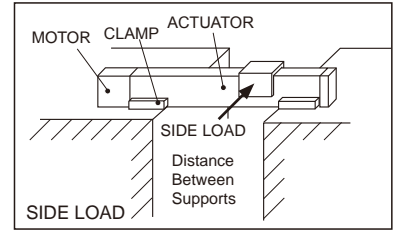
End supported top load



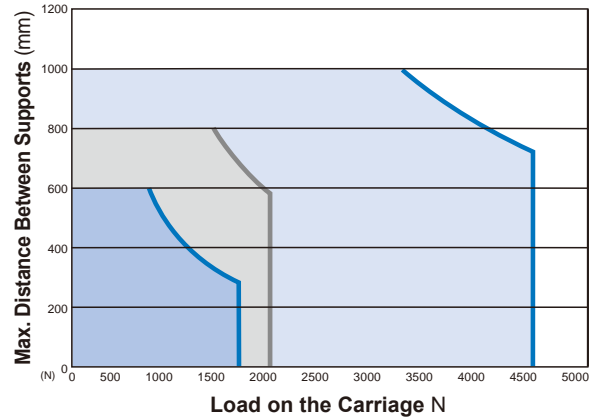
- METB-42
- METB-55
- METB-80



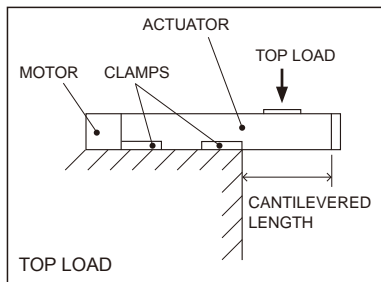
End supported side load



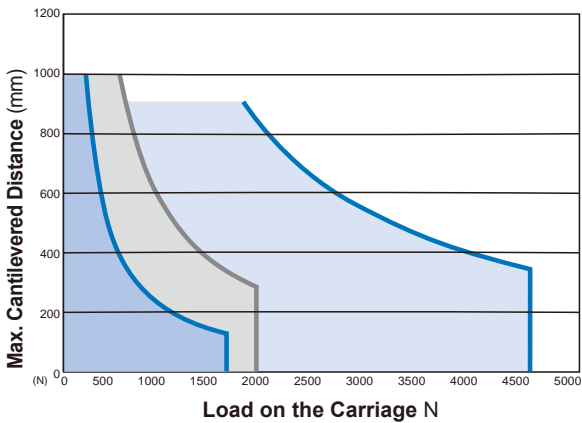
- METB-42
- METB-55
- METB-80



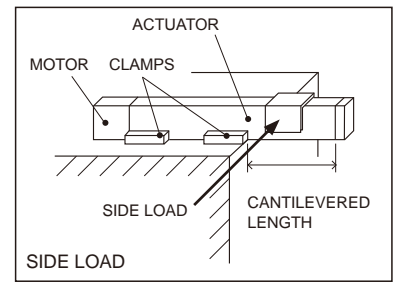
Cantilevered top load



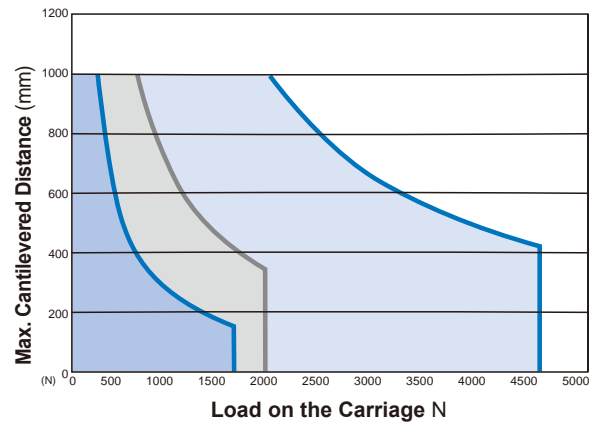
- METB-42
- METB-55
- METB-80



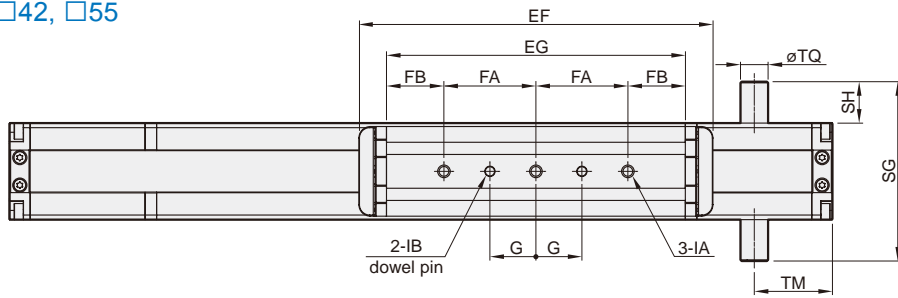
Cantilevered side load



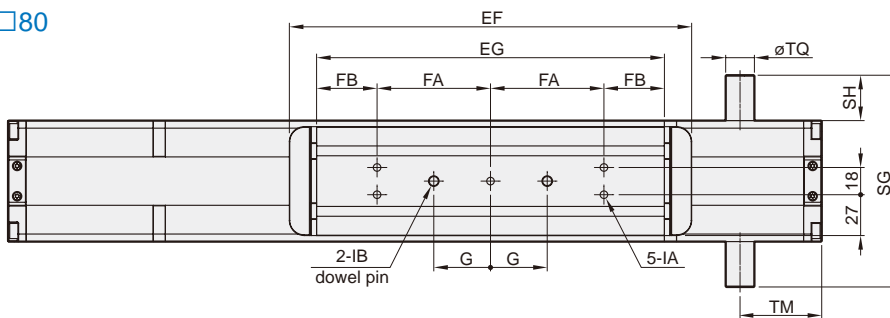
- METB-42
- METB-55
- METB-80



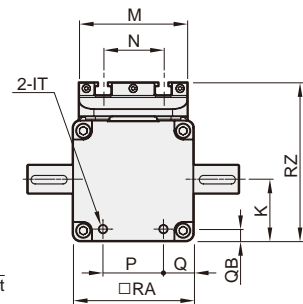
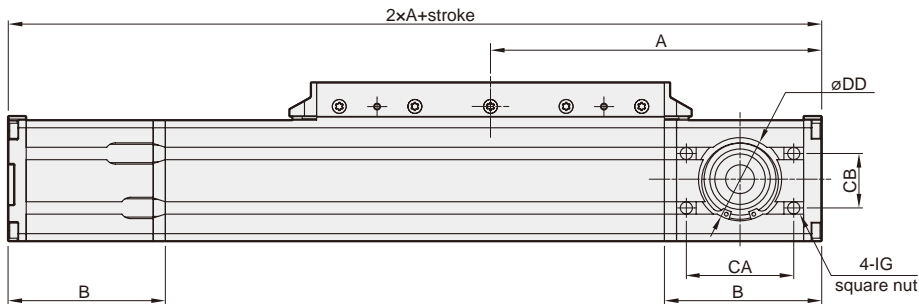
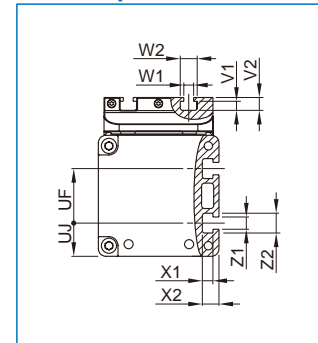
□42, □55



□80

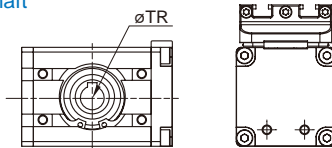


Groove position

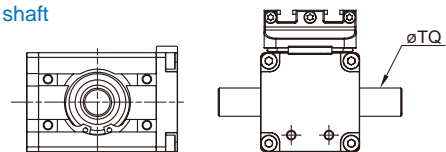


Shaft versions

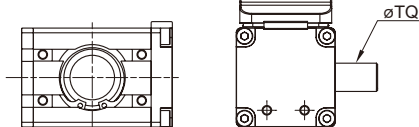
Female shaft



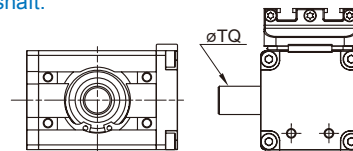
Double male shaft



Single male shaft:
side right



Single male shaft:
side left

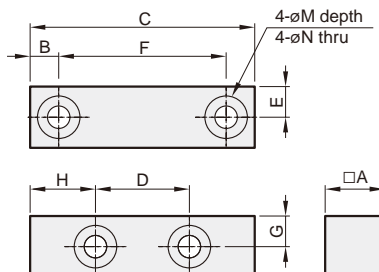


Code Tube I.D.	A	B	CA	CB	DD	EF	EG	FA	FB	G	IA	IB	IG
42	129	64	max. 42	19.5	∅28xH7x1.5 depth	154	130	40	25	20	M5x0.8x5 depth	∅4xH7x5 depth	M5x0.8 DIN 562
55	166	88	max. 55	22	∅32xH7x1.5 depth	190	150	55	20	30	M5x0.8x7.5 depth	∅5xH7x5 depth	M5x0.8 DIN 562
80	219	104	max. 71	35.9	∅55xH7x1.5 depth	266	230	75	40	37.5	M6x1.0x10 depth	∅6xH7x10 depth	M8x1.25 DIN 562

Code Tube I.D.	IT	K	M	N	P	Q	QB	RA	RZ	SG	SH	TM	TQ	TR	UF	UJ	V1	V2	W1	W2	X1	X2	Z1	Z2
42	M4x7 depth	21	39	20	16	13	7	42	60	82	20	34	12	8	19.5	11	3.2	4.9	5.3	8.6	3.2	4.9	5.3	8.6
55	M5x7 depth	25	50	28	23	16	8	55	76	92	18.5	48.5	16	8	22	16.5	4.2	6.2	5.2	8.4	4.3	6.3	5.3	8.6
80	M6x8 depth	41	72	40	40	20	8	80	105	140	30	54	19	19	36	22	6	8.5	6.5	11.2	7	11	8.2	13.2

End cap mounting

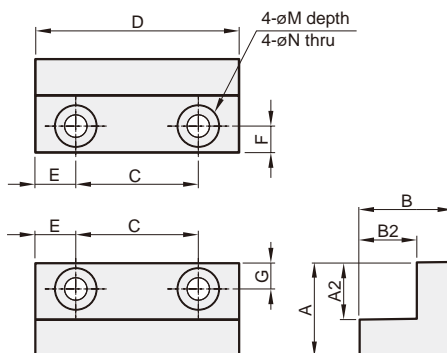
(2 pcs/set)



Code Size	A	B	C	D	E	F	G	H	M	N	Order number
METB-42	14	5	42	16	7	32	7	13	8x4.4 depth	4.5	ETB42-1
METB-55	15	7	55	23	7.5	41	7	16	10x5 depth	5.5	ETB55-1
METB-80	16	8	80	40	8	64	8	20	11x6 depth	6.6	ETB80-1

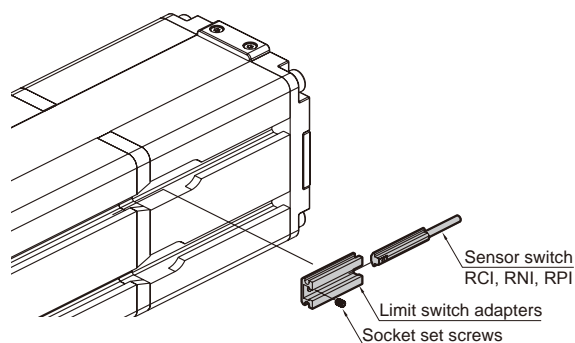
Mid section mounting

(2 pcs/set)



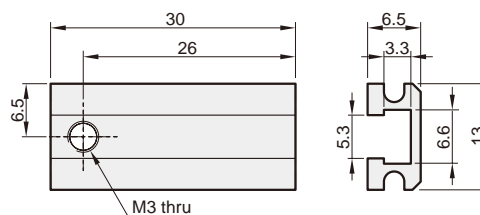
Code Size	A	A2	B	B2	C	D	E	F	G	M	N	Order number
METB-42	17	12	17	12	25	40	7.5	6	6	10x3.5 depth	5.5	ETB42-2
METB-55	23	14	23	14	30	50	10	6.5	6.5	10x5.5 depth	5.5	ETB55-2
METB-80	32	19	34	21	40	60	10	8	10	15x8.6 depth	9	ETB80-2

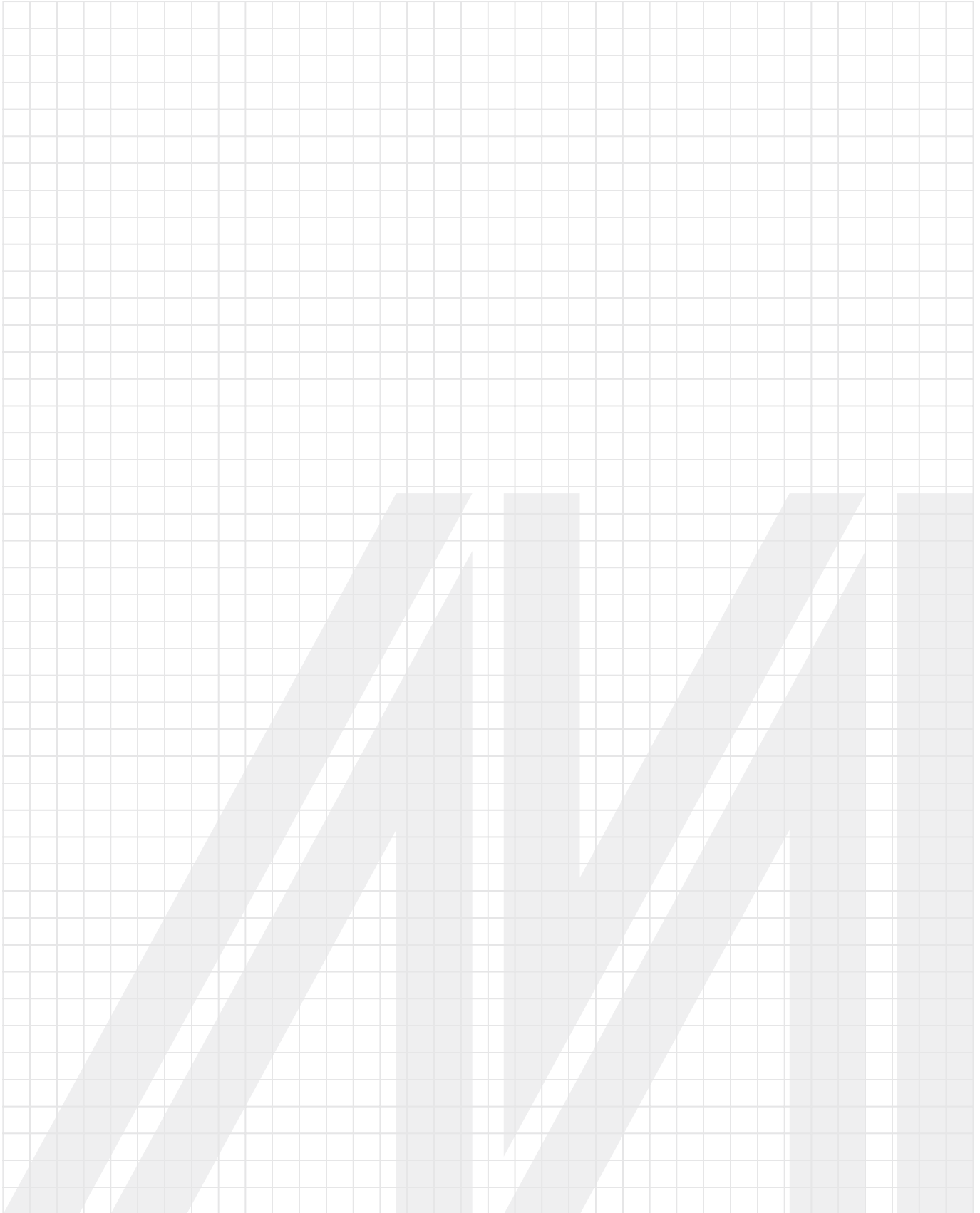
Installation of sensor switch



Limit switch adapters

ETB80-3 (Only for size 80)





METG / METS2 / METS / MEQG / MEQI

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Use where	Drive mode	Model	Motor output (W)	Width (mm)	Repeatability (mm)	Ball screw spec		Ball screw spec (kg)		Max. speed *1 (mm/s)
						Outer diameter (mm)	Lead (mm)	Horizontal (mm)	Vertical (mm)	
Standard	Ball screw	METG-4	50W	44	±0.01	10	2	25	8	100
			100W				6	20	5	300
		12		12	2		600			
		2		25	8	100				
		METG-5	100W	54	±0.01	12	6	20	8	300
							12	12	3.5	600
							2	30	10	100
		METG-8	200W 400W	82	±0.01	16	5	50	15	250
							10	30	8	500
							20	18	3	1000
		METS2-10	100W	102	±0.01	16	5	50	12	250
							10	30	8	500
							20	18	3	1000
		METS2-14	200W	135	±0.01	16	5	50	12	250
							10	30	8	500
							20	18	3	1000
		METS2-14	400W	135	±0.01	16	5	95	27	250
							10	75	18	500
							20	35	6	1000
		METS2-17	200W	170	±0.01	20	5	110	33	250
							10	88	22	500
							20	40	10	1000
		METS2-17	750W	170	±0.01	20	5	120	50	250
							10	120	40	500
							20	83	25	1000
		METS-22	750W	220	±0.01	25	5	150	55	250
							10	150	45	500
						20	120	20	1250	
		MEQG-5	100W	54	±0.01	12	40	60	10	2000
							2	30	10	100
							5	30	10	250
		MEQG-8	200W 400W	82	±0.01	16	10	15	5	500
							20	10	2.5	1000
							5	50	15	250
		MEQI-50	400W	50	±0.02	16	10	30	8	500
							20	18	3	1000
							5	110	33	250
		MEQI-50	□56	50	±0.02	16	10	88	22	500
							20	40	10	1000
							5	110	33	125
		MEQI-63	400W	63	±0.02	20	10	88	22	250
							20	40	10	500
							5	110	33	250
		MEQI-63	□56	63	±0.02	20	10	88	22	500
							20	40	10	1000
							5	110	33	125
		MEQI-63	□56	63	±0.02	20	10	88	22	250
							20	40	10	500
5	110						33	250		

*1. The highest speed is based on the maximum servo motor's rpm (3000).

	Stroke (mm) & Max. speed (mm/s) *2															Speed															Page					
	Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450		1500				
						100						90	80	70	60	50																				
						300						270	240	210	180	150																				
						600						540	480	420	360	300																				
						100						90	80	70	60	50																				
						300						270	240	210	180	150																				
						600						540	480	420	360	300																				
						100						90	80	70	60																					
						250						270	200	175	150																					
						500						450	400	350	300	300																				
						1000						900	800	700	600	700	600																			
						250						225	200	175	150	125	100	75																		
						500						450	400	350	300	250	200	150																		
						1000						900	800	700	600	500	400	300																		
		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
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		N/A				250						225	200	175	150	125																				
		N/A				500						450	400	350	300	250																				
		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
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		N/A				1000						900	800	700	600	500																				
		N/A				250						225	200	175	150	125																				
		N/A				500																														

MESS2 / MESH2 / MEHC2

MINIATURE ELECTRIC CYLINDER / ELECTRIC GRIPPER (WITH MOTOR)

MESS2 / MESH2 Miniature electric cylinder

Use where	Drive mode	Model	Motor dimension (mm)	Width of profile (mm)	Position repeatability (mm)	Ball screw spec (Accuracy C10)		Max. payload(kg)		Rated thrust (N)
						Outer diameter (mm)	Lead (mm)	Horizontal (mm)	Vertical (mm)	
Standard	Ball screw	MESS2-16	□ 20	65	±0.02		2	3	0.8	18~60
		MESS2-25	□ 28	95	±0.02		2	6	1.8	64~195
							8	1.5	0.8	18~48
		MESH2-16	□ 20	54	±0.02		2	3	0.8	24~68
		MESH2-20	□ 28	65	±0.02		2	6	1.8	64~195
	8					1.5	0.8	18~48		

*1. The working condition of max. speed is restricted limited.
Please refer to the curve graph of speed and loading in this catalog.

MEHC2 Electric gripper

Use where	Drive mode	Model	Motor dimension (mm)	Width of profile (mm)	Position repeatability (mm)	Open/close stroke *1 (mm/s)	Gripping force (N)	Main body weight *2 (g)
Standard	Lead screw	MEHC-16	□ 20	38	±0.02	6	19.5	222
		MEHC-25	□ 28	63	±0.02	14	26	662

*1. Total stroke of both sides.
*2. Weight of model with motor.

	Max. speed *1 (mm/s)	Stroke (mm) & Max. speed (mm/s) *2						Page
		Stroke	30	50	75	100	150	
	50	50						4-96
	100	100						
	400	400						
	50	50						4-99
	100	100						
	400	400						

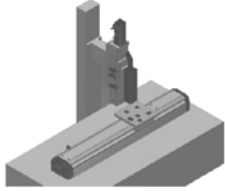
	Gripping force (N)						Page
	5	10	15	20	25	30	
		6~19.5					4-102
			12~26				4-102

Applications for single axis

SLIDER ELECTRIC CYLINDER



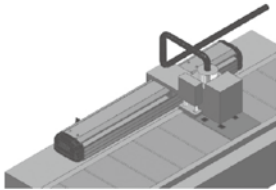
Suitable industry: PCB / CD / DVD / Semi-conductor / Packaging / Testing



Spray-Printing device for PCB substrate boards

Fixes the substrate board onto the electric cylinder. Use the character of equal-speed sliding to execute the spray printing.

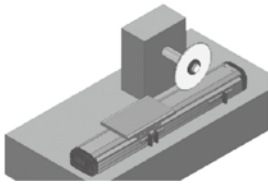
Use specifications
METG-8 / METS2-10 / METS2-14



Surface cleaning device for circuit boards

Fixes the plasma on to the motor slide and moves back and forth on top of the conveyor to clean surface for circuit boards.

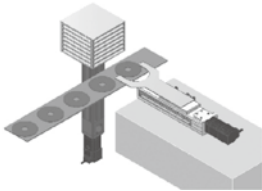
Use specifications
METG-8 / METS2-14



Cutting device for PCB circuit boards

Place the PCB board on the electric cylinder and do the cutting by using external cutting devices.

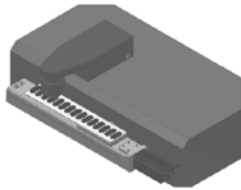
Use specifications
METG-8 / METS2-14 / METS2-17



Compact disc receiving device

Use the feature "multi-positioning" of electric cylinder to do loading and unloading of the disc box.

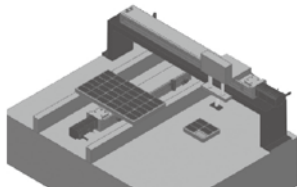
Use specifications
METG-5 / METG-8 / METS2-14 / MEQG-8



IC printer device

Place the IC device on the electric cylinder. Use the character of equal-speed sliding and capable to adapt servo motor and stepping motor to execute the laser printing.

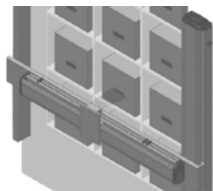
Use specifications
METG-5



Aligning device for pick-and-place of IC boards

Install two single electric cylinder to combine a simple IC pick-and-place system.

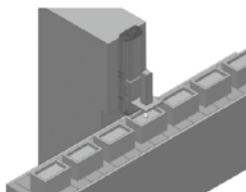
Use specifications
METG-5 / METS2-14



Barcode scanning device

Install the X-Y multi-axis system to automated warehouse to execute the scanning of barcode.

Use specifications
METS2-14 / METS2-17 / METS-22



Fillings device

In order to adapt to filling of different products, we can execute the filling at different height of position by programmable feature.

Use specifications
METG-5 / METG-8 / METS2-14

Applications for single axis

SLIDER ELECTRIC CYLINDER

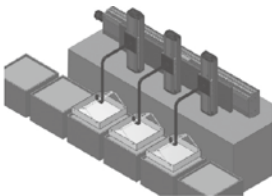
Suitable industry: Automotive / Component processing / Assembling / Surface processing / Mobile phones / Traditional manufacturing / Food / Raw material



Tire surface check machine

Mount the C.C.D on the electric cylinder. Use the character of equal-speed sliding to check the defects on the tire surface and report to the on-site worker immediately.

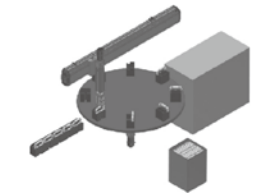
Use specifications
METG-5 / METG-8



Mobile device for surface processing

Mount the working piece on the electric cylinder and dip it into the solvents. Use the character of moving up and down, left and right at high speed to do the surface treatment processing.

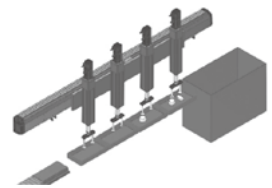
Use specifications
METS2-14 / METS2-17 / METS-22



Assembling device on disc machine

Install two single electric cylinders to combine an X-Y system. Then mount it onto the disc machine to do the components assembly.

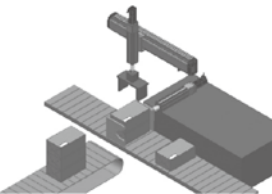
Use specifications
METG-8 / METS2-10 / METS2-14 / MEQG-5



Assembling device for small components

Use the feature multi-positioning of the electric cylinder to drive the sucker and cylinder to do the assembly of small components.

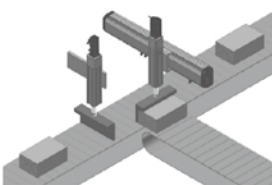
Use specifications
METG-5 / METG-8 / MEQG-5



Conveyance device for assembly lines

Utilizes uniaxial motor slides to assemble into a XY mechanism and performs conveyance of items on top of the conveyor.

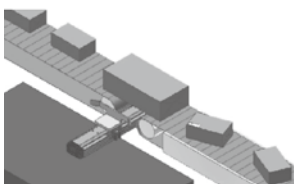
Use specifications
METG-8 / METS2-14 / METS2-17 / MEQI-50



Separator device for assembly lines

Utilizes motor slides to categorize products on the assembly line with conveyors.

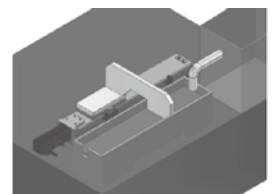
Use specifications
METG-8 / METS2-14 / MEQI-50



Aligning device for packaging

Utilizes slides with servo motors to align products of different sizes on the moving conveyors, which substantially saves the working time.

Use specifications
METG-8 / METS2-14 / METS2-17

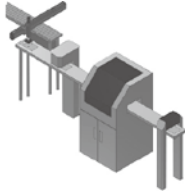


Leveling mechanism for solvent surfaces

Utilizes the characteristics of motor slides moving at equal speeds to level the surface of glutinous solvents.

Use specifications
METG-5

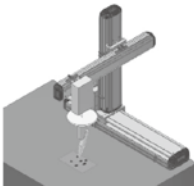
Suitable industry: PCB circuit boards / CD / DVD / Mobile phones



Conveyance device for circuit boards

Assembles two uniaxial motor slides into a X-Z biaxial mechanism and conveys the circuit board across left and right as well as up and down.

Use specifications
X axis METS2-14 / Z axis METG-8



Auto-soldering device

Fixes soldering device onto the X-Y-Z axes assembled from uniaxial motor slides, which can solder for circuit board components.

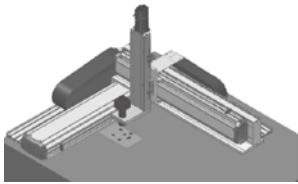
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METS2-14



Piling device for circuit boards

Utilizes uniaxial motor slides to assemble into X-Y-Z axes, which can be used on receiver mechanism for circuit board assembly lines.

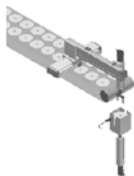
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5



Visual checking device for CCD imaging

Fixes the visual system onto the X-Y-Z axes and performs AOI checks on the appearance of PCB boards.

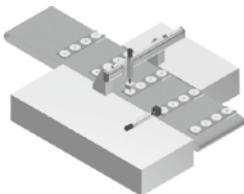
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5



Piling device for compact discs

Utilizes uniaxial motor slides to assemble into a X-Y-Z axes, which can be used on receiver mechanism for compact disc assembly lines.

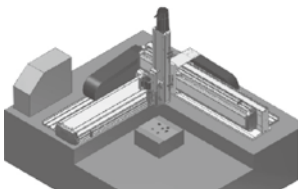
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5



Ultra-violet exposure device for compact discs

Utilizes uniaxial motor slides to assemble into a X-Z bi-axial mechanism, which can be used on ultra-violet exposure devices for compact discs.

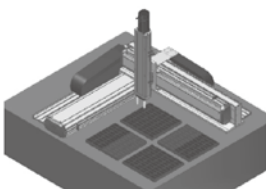
Use specifications
X axis METG-8 / Z axis METG-5



Screw-tightening device

Utilizes the X-Y-axis mechanism for pick-and-place of screws.

Use specifications
X axis METG-8 / Y axis METG-5



Pick-and-place device for small components

Utilizes uniaxial motor slides to assemble into X-Y-Z axes, which can be used on pick-and-place devices for small components.

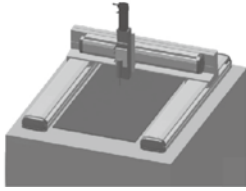
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5

Applications for multi axis

SLIDER ELECTRIC CYLINDER



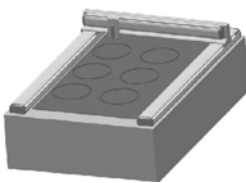
Suitable industry: LCD / Automotive / Machine processing / Solar / Food



Rubberizing device for large-size LCD glass substrate boards

Utilizes two synchronous X-axis motor slides and one Y-axis slide along with Z-axis to assemble into one package of high-speed rubberizing devices for LCD glass substrate boards.

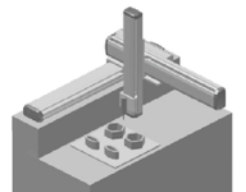
Use specifications
X axis METS2-14-2 pcs / Y axis METG-8 / Z axis METG-5



Cutting for glass substrate boards

Utilizes two synchronous X-axis motor slides with one Y-axis slide to assemble into one package of simple cutting mechanism for glass boards.

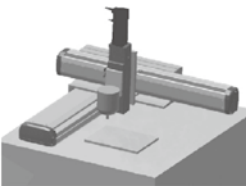
Use specifications
X axis METS2-17-2 pcs / Y axis METS2-14



Coating device for various small components

Assembles three uniaxial motor slides into a X-Y-Z mechanism that can perform dispensing and rubberizing operations with costs way cheaper than one rubberizing machine and utilize the rubberizing operation on the assembly line.

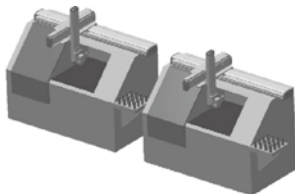
Use specifications
X axis METS2-14, METS2-17 / Y axis METG-8 / Z axis METG-5



Mobile device for spray coating

Utilizes X-Y-Z axes to clean or spray coating.

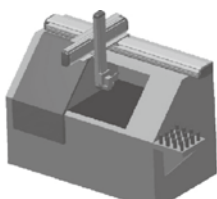
Use specifications
X axis METS2-14, METS2-17 / Y axis METG-8, METS2-14 / Z axis METG-5



Pick-and-place device for processed parts from machine tools

Utilizes uniaxial motor slides to assemble into X-Y-Z axes that can be installed onto two or three CNC machine tools as the pick-and-place mechanism for loading and unloading of processed parts from multiple processing.

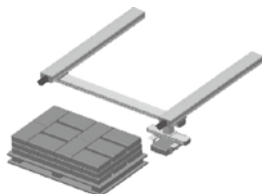
Use specifications
X axis METS-22 / Y axis METS2-17 / Z axis METS2-14



Pick-and-place device for processed parts from machine tools

Utilizes uniaxial motor slides to assemble into a X-Y-Z axes that can be installed onto CNC machine tools as the pick-and-place mechanism for loading and unloading of processed parts, with a cost saving more than 6-axis mechanical arms.

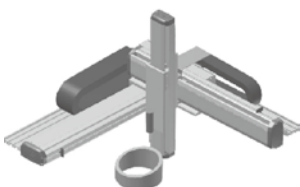
Use specifications
X axis METS-22 / Y axis METS2-17 / Z axis METS2-14



Conveyance device for large items

Utilizes two synchronous X-axis motor slides with one Y-axis motor slide to assemble into one package of conveyance device for large-size items, with a cost saving more than 6-axis mechanical arms.

Use specifications
X axis METS-22-2 pcs / Y axis METS2-17



3-Dimensional rubberizing device

Utilizes X-Y-Z axes to assemble into a cantilever rubberizing mechanism that can perform 3-dimensional rubberizing.

Use specifications
X axis METS2-14, METS2-17 / Y axis METG-8, METS2-14 / Z axis METG-5

Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

METG Inner structure

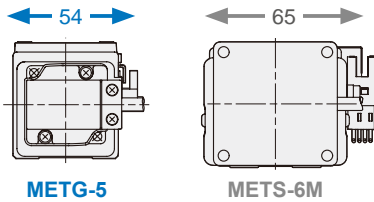
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Point 1 Rigidity improved

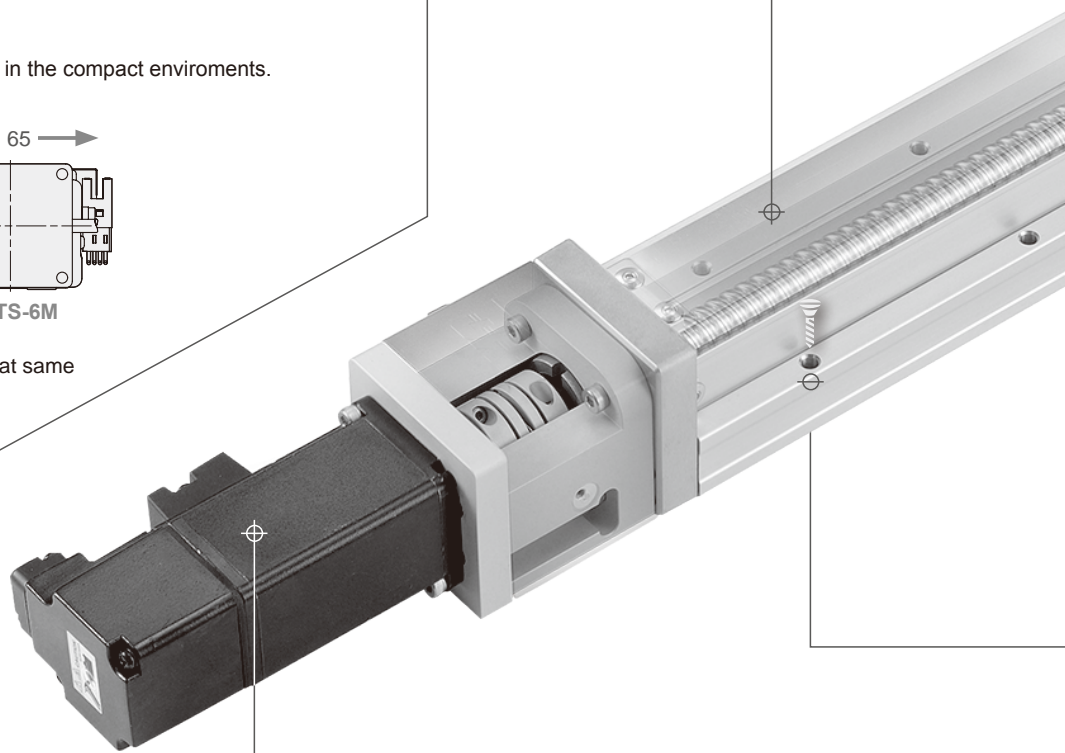
Actuator body and carriage are made from steel that can improve the rigidity of body and carriage.

Point 2 Smaller size

Reduced width that can fitting in the compact environments.



* Compare with METS series at same condition (30 kg padload).



Point 3 Motor brand

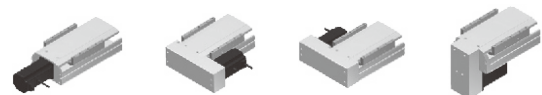
Customer specified servo motor.

Standard suitable motor brands			
Mitsubishi	Panasonic	Yaskawa	Delta

© Please consult our sales personnel for other motor specifications.

Point 4 Motor assembly location

Multiple motor installation positions for added flexibility in tool design.

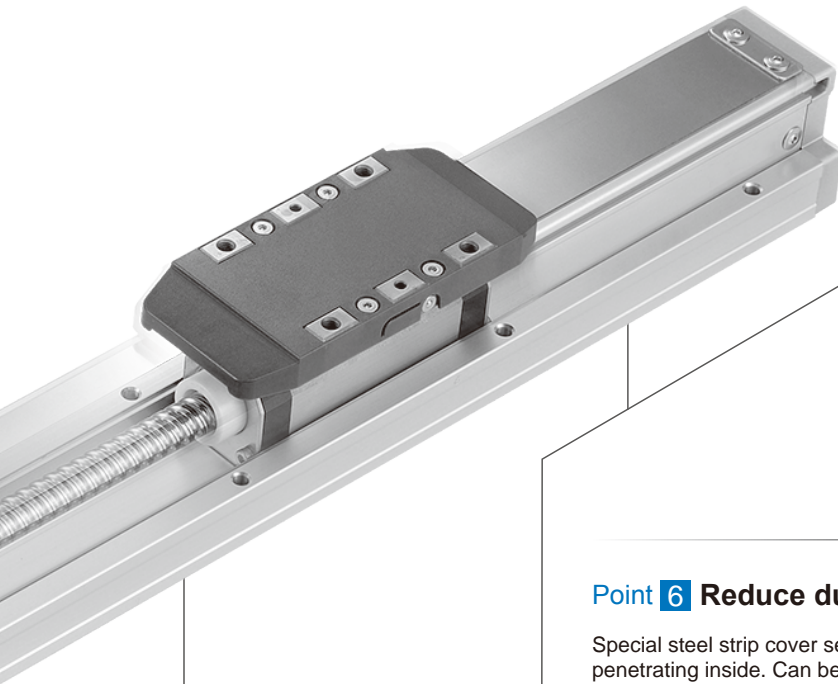


BC motor exposed

BL motor on left side

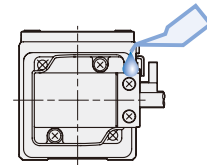
BR motor on right side

BM motor on lower side



Point 5 Easy to maintain

External greasing design, easy maintenance without removing the cover.

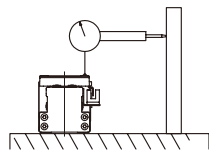


Point 6 Reduce dust

Special steel strip cover sealing design can prevent dirt and foreign objects from penetrating inside. Can be used in clean room environment.

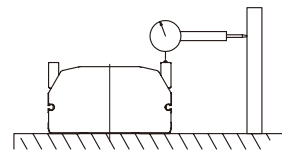
Point 7 Flat straightness

Built in linear rail design, straightness and flatness are highly improved to $\pm 0.02\text{mm}$.



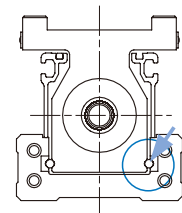
Straightness of **METG-5** is $\pm 0.02\text{mm}$.

* Measure length is 800mm.



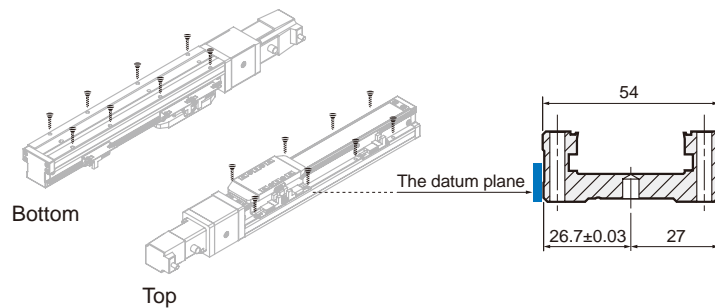
Straightness of **METS-10** is $\pm 0.05\text{mm}$.

* Measure length is 1000mm.



Point 8 Easy assemble

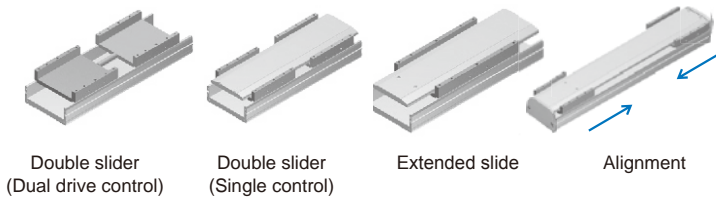
1. Can be fixed from the top and bottom without removing the cover.
2. Mounting datum plane designed on the side of the body.
3. Built in pin holes.



METS2 Inner structure

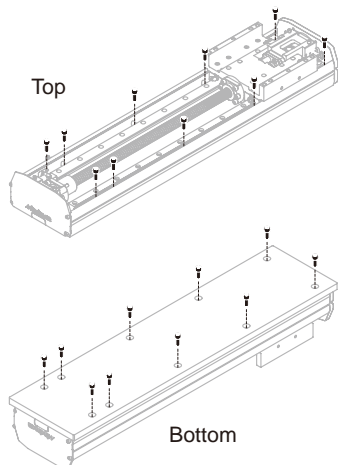
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Point 1 Various slide options



Point 2 Easy assemble

Can be fixed from the top and bottom without removing the cover.



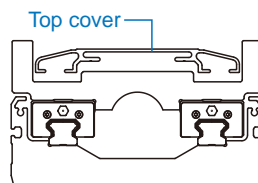
Point 3 High rigidity body and cover

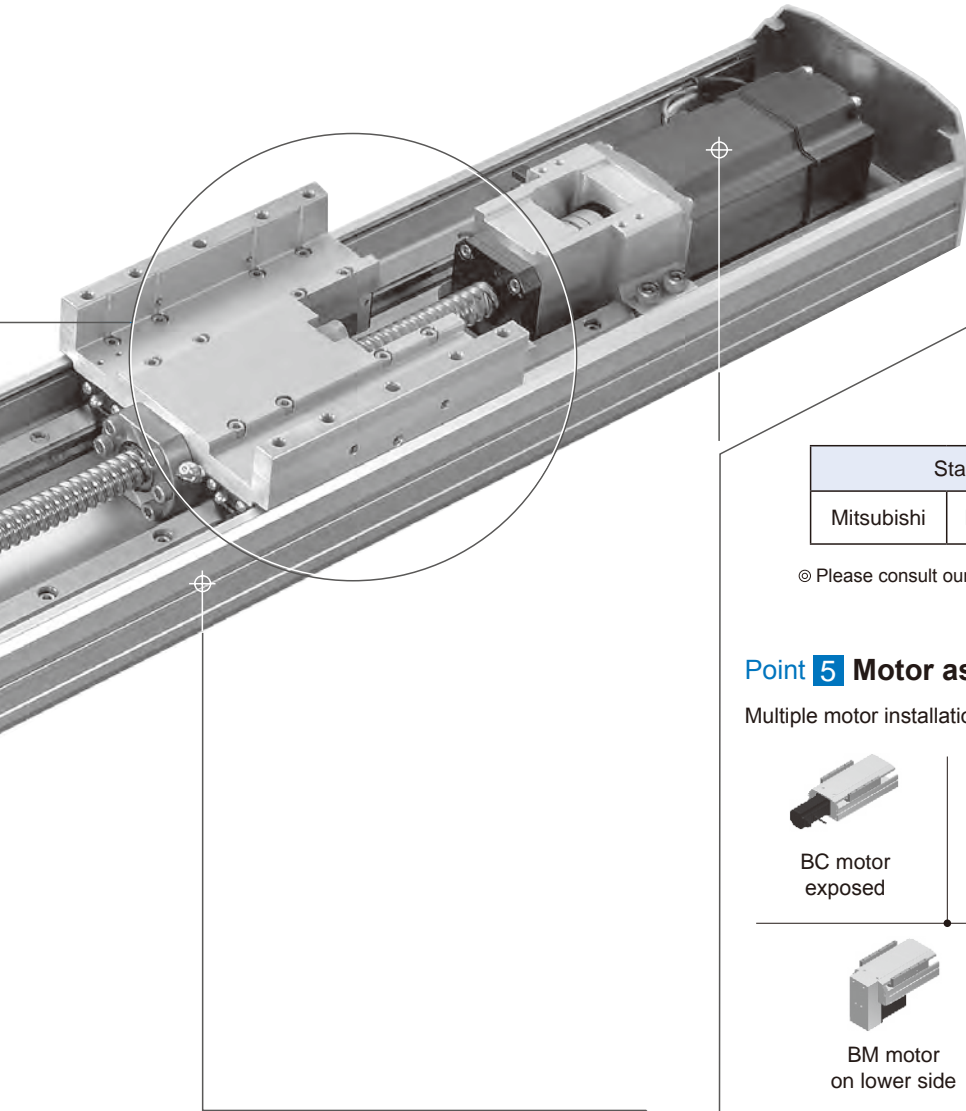
High rigidity mainframe and cover

One piece extruded aluminum structure for optimal rigidity and weight ratio.

Torsion resist top lid

Special torsion-resistant top lid design to prevent deformation during long stroke.





Point 4 Motor brand

Customer specified servo motor.

Standard suitable motor brands			
Mitsubishi	Panasonic	Yaskawa	Delta

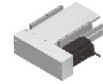
© Please consult our sales personnel for other motor specifications.

Point 5 Motor assembly location

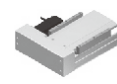
Multiple motor installation positions for added flexibility in tool design.



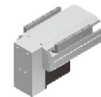
BC motor exposed



BL motor on left side



BR motor on right side



BM motor on lower side



M motor hidden in the structure

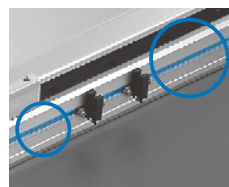
Point 7 Ball screw lead

Can customize screw specification and brand to match different precision and speed.

Screw lead pitch	
05	5 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
40	40 mm

Point 6 Sensor switch

1. Adjustable plug-in set up, can be installed on both sides.
2. Sensors' position are adjustable in designed grooves.



External sensor



External sensor trigger device

MEQG Inner structure

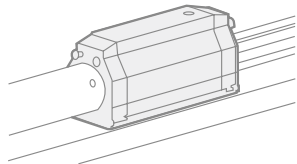
ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

Point 1 Rigidity improved

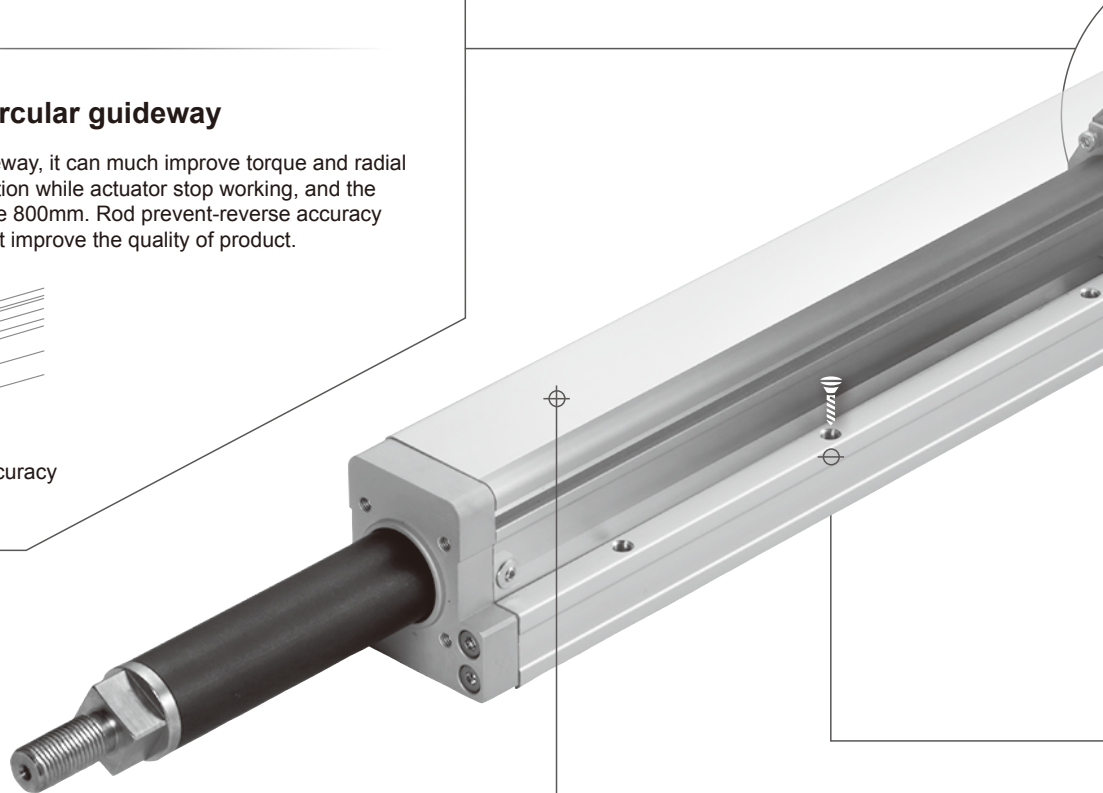
Actuator body and carriage are made from steel that can improve the rigidity of body and carriage.

Point 2 Built-in circular guideway

With built-in circular guideway, it can much improve torque and radial load. It can improve vibration while actuator stop working, and the maximum of stroke can be 800mm. Rod prevent-reverse accuracy can be 0 degree and high improve the quality of product.

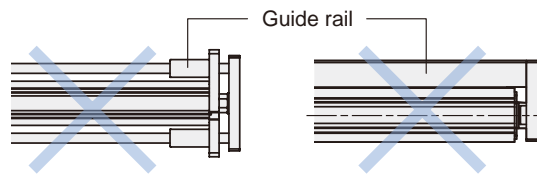


* Rod prevent-reverse accuracy can be 0 degree.

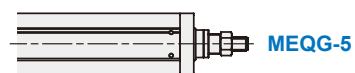


Point 3 Smaller

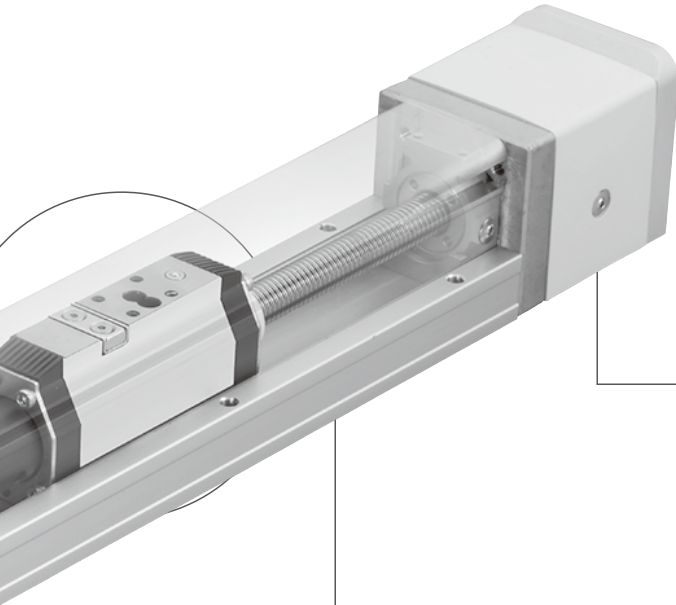
No need to add additional ancillary guide, decreasing space for location.



Additional guide rail structure is needed for anti-rotating accuracy. Rod prevent-reverse accuracy can be $\pm 0.05^\circ$.



Rod prevent-reverse accuracy can be 0° .



Point 4 Motor brand

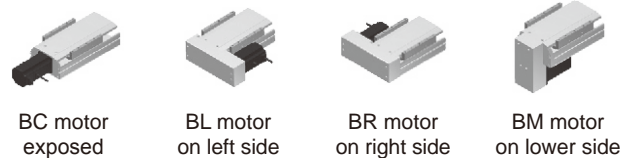
Customer specified servo motor.

Standard suitable motor brands			
Mitsubishi	Panasonic	Yaskawa	Delta

© Please consult our sales personnel for other motor specifications.

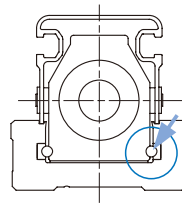
Point 5 Motor assembly location

Multiple motor installation positions for added flexibility in tool design.



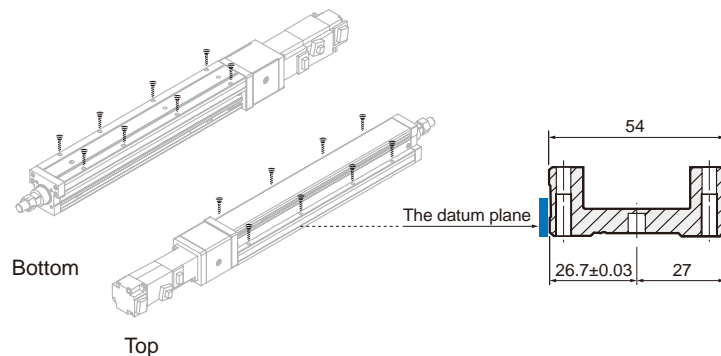
Point 6 Flat straightness

Built in linear rail design, straightness and flatness are highly improved to $\pm 0.02\text{mm}$.



Point 7 Easy assemble

1. Can be fixed from the top and bottom without removing the cover.
2. Mounting datum plane designed on the side of the body.
3. Built in pin holes.





Specification

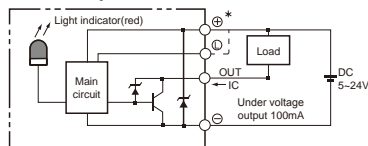
Model		METG-4		
Repeatability	(mm)	±0.01		
Ball screw lead	(mm)	2	6	12
Max. speed (*1)	(mm/s)	100	300	600
AC servo motor	(W)	50, 100		
Max. payload (*2)	Horizontal (kg)	25	20	12
	Vertical (kg)	8 (8)	5 (8)	2 (3.5)
Rated thrust	(N)	424	414	71
Stroke (*3)	(mm)	50~800 / 50 pitch		
Ball screw	(mm)	C7ø8		
Coupling	(mm)	7×8		
Home sensor		EE-SX674 (NPN)		

*1. Acceleration and deceleration value is set 0.2 second.

*2. () The value for power output 100W.

*3. When the stroke is over 550mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstances.

Sensor layout



Order example

METG – 4 – L02 – 100 – BC – M05B – C4 – 0001

Model

Size

Stroke

Special order no.

50~800 mm
50 mm pitch

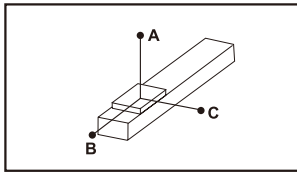
Ball screw lead		Motor position		Motor brand, power output, brakes				Home sensor		Limit sensor		
L02	2 mm	BC	Exposed	SERVO motor				Out side		Out side		
L06	6 mm	BM	On lower side	M	Mitsubishi	05 10	50W 100W	B	C	Motor side	3	1 Pc
L12	12 mm	BR	On right side	P	Panasonic				D	Opposite motor side	4	2 Pcs
		BL	On left side	Y	Yaskawa				No sensor		No sensor	
				T	Delta				E	None	5	None

* Need not show B with no brake.

* When the stroke is 50mm, the sensor installation has the following restrictions.

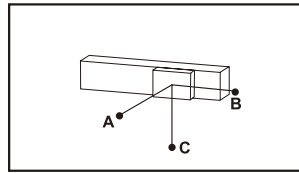
1. Home sensor and limit sensor has to be installed on the different side of body.
2. Both sides of slider need to install the sensor trigger device.

Allowable overhang



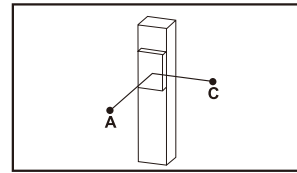
Unit: mm

Horizontal installation		A	B	C
Lead 2	12kg	1000	55	80
	18kg	750	35	50
	25kg	500	23	32
Lead 6	10kg	550	53	70
	15kg	350	32	45
	20kg	250	22	31
Lead 12	8kg	305	59	75
	10kg	240	45	57
	12kg	195	37	47



Unit: mm

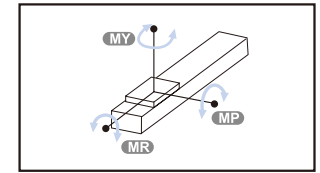
Wall installation		A	B	C
Lead 2	12kg	80	55	1000
	18kg	50	35	750
	25kg	32	23	500
Lead 6	10kg	72	52	550
	15kg	45	32	345
	20kg	31	22	250
Lead 12	8kg	75	59	300
	10kg	45	32	240
	12kg	31	22	250



Unit: mm

Vertical installation		A	C
Lead 2	4kg	200 (195)	200 (195)
	8kg	100	100
Lead 6	3kg	200 (150)	200 (150)
	5kg	120 (75)	120 (75)
Lead 12	1.5kg	350 (260)	350 (260)
	2kg	260 (150)	260 (150)

Static loading moment



Unit: N.m

MY	79
MP	79
MR	116

- The torque value in the chart indicate the center of gravity.
- Operation life is 10000km when the product is using under the specified conditions.
- Data information is not for ceiling-mount inverse use.
Contact us for the details if you want to apply ceiling-mount inverse usage.
- () The value for power output 100W.

Standard servo motors

Brand	Mark	Brake	Watt	AC-Voltage	Motor model	Compatible driver model
Mitsubishi	M	No brake(Horizontal type)	50	220	HG-KR053	MR-J4-10A
			100	220	HG-KR13	
		With brake(Vertical type)	50	220	HG-KR053B	
			100	220	HG-KR13B	
Panasonic	P	No brake(Horizontal type)	50	220	MSMD5A2G1U	MADHT1505
			100	220	MSMD012G1U	
		With brake(Vertical type)	50	220	MSMD5A2G1V	
			100	220	MSMD012G1V	
Delta	T	No brake(Horizontal type)	50	220	ECMA-C1040FES	ASD-B20121-B
			100	220	ECMA-C20401ES	
		With brake(Vertical type)	50	220	ECMA-C1040FFS	
			100	220	ECMA-C20401FS	

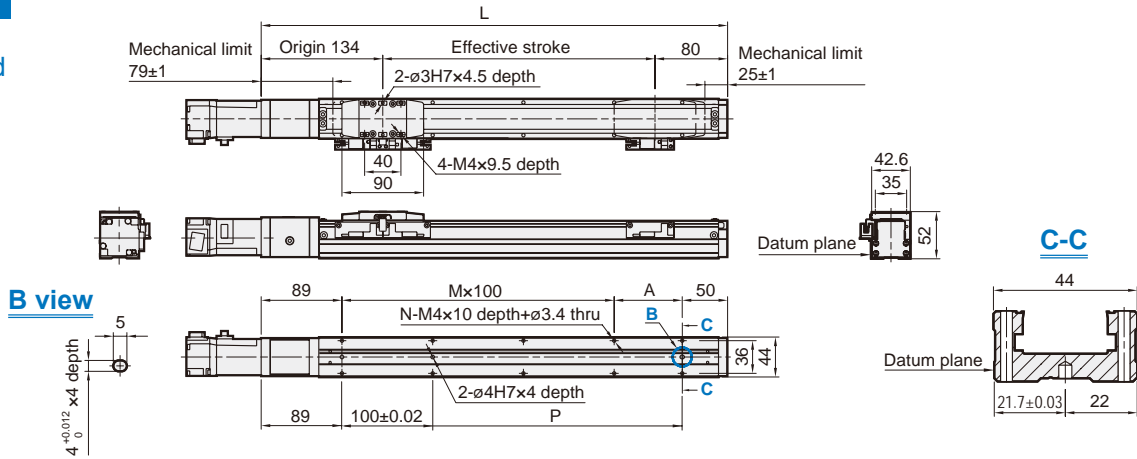
METG-4 Dimensions

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



BC

Motor exposed

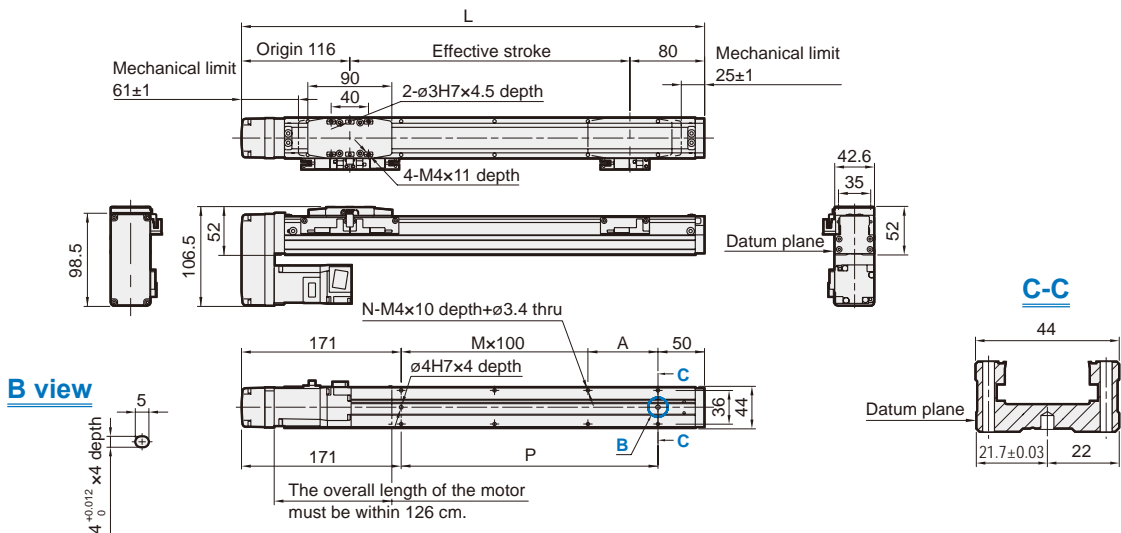


Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	264	314	364	414	464	514	564	614	664	714	764	814	864	914	964	1014
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	1.36	1.61	1.86	2.11	2.35	2.6	2.85	3.1	3.34	3.59	3.84	4.09	4.34	4.59	4.84	5.09

BM

Motor on lower side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	246	296	346	396	446	496	546	596	646	696	746	796	846	896	946	996
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7
N	4	4	6	6	8	8	10	10	12	12	15	14	16	16	18	18
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	1.66	1.91	2.16	2.4	2.65	2.9	3.14	3.39	3.64	3.89	4.14	4.39	4.64	4.89	5.14	5.39

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

METG-4 Dimensions

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

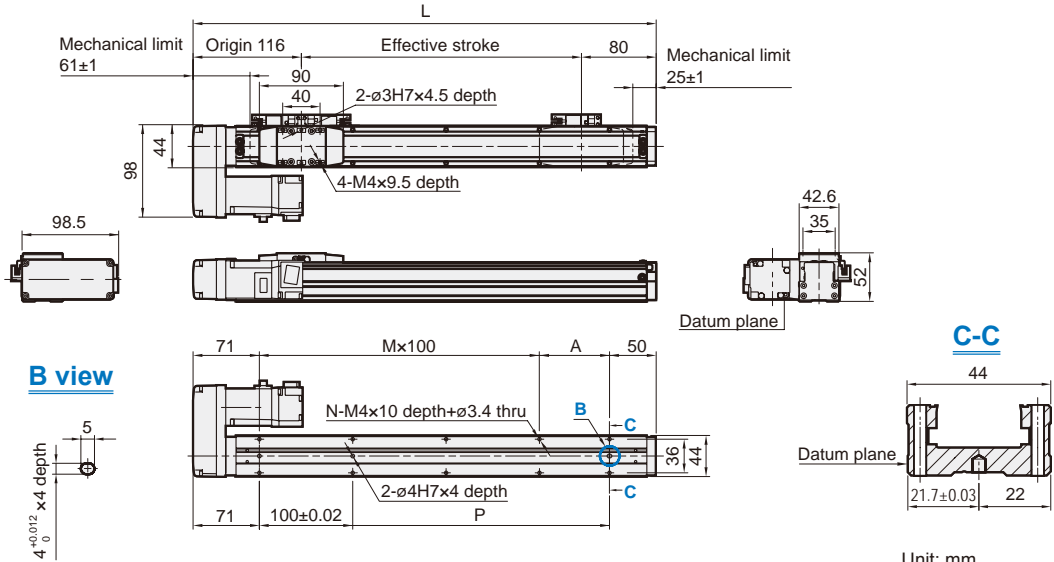
Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

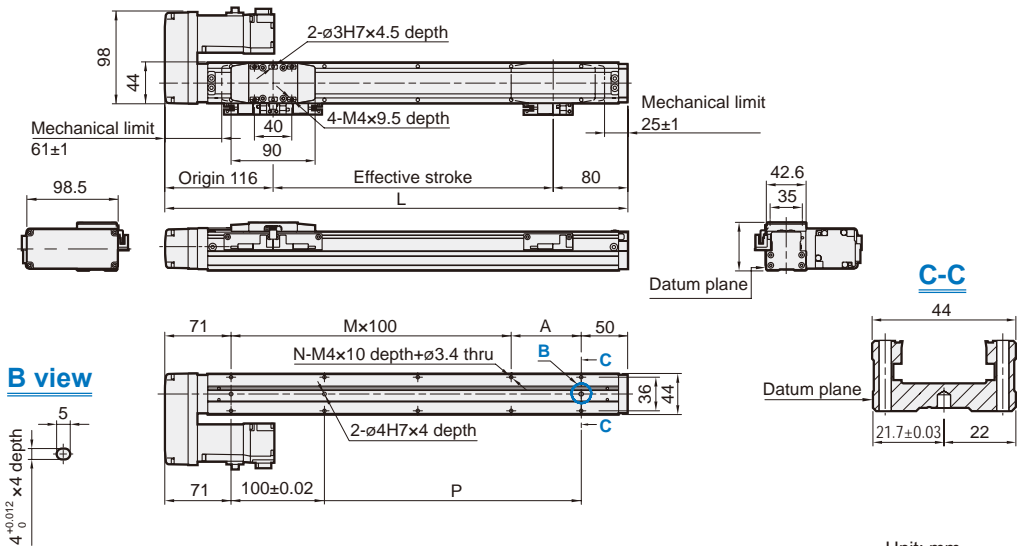
BL
Motor on left side



Unit: mm

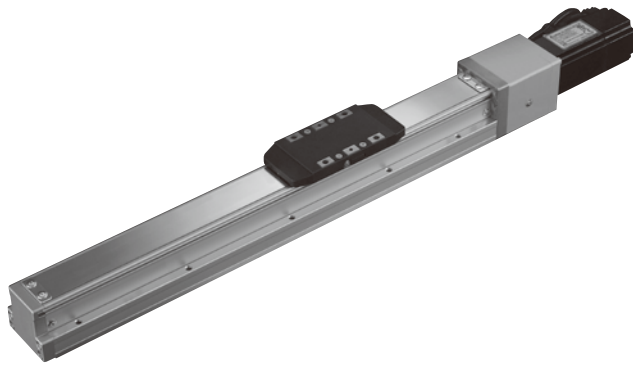
Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	246	296	346	396	446	496	546	596	646	696	746	796	846	896	946	996
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	1.66	1.91	2.16	2.4	2.65	2.9	3.14	3.39	3.64	3.89	4.14	4.39	4.64	4.89	5.14	5.39

BR
Motor on right side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	246	296	346	396	446	496	546	596	646	696	746	796	846	896	946	996
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	1.66	1.91	2.16	2.4	2.65	2.9	3.14	3.39	3.64	3.89	4.14	4.39	4.64	4.89	5.14	5.39



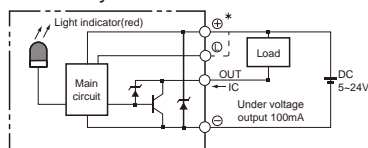
Specification

Model		METG-5			
Repeatability	(mm)	±0.01			
Ball screw lead	(mm)	2	5	10	20
Max. speed (*1)	(mm/s)	100	250	500	1000
AC servo motor	(W)	100W			
Max. payload	Horizontal (kg)	30	30	15	10
	Vertical (kg)	10	10	5	2.5
Rated thrust	(N)	854	341	170	85
Stroke (*2)	(mm)	50~800 / 50 pitch			
Ball screw	(mm)	C7Ø12			
Coupling	(mm)	7x8			
Home sensor		EE-SX674 (NPN)			

*1. Acceleration and deceleration value is set 0.2 second.

*2. When the stroke is over 600mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstances.

Sensor layout



Order example

METG – 5 – L02 – 100 – BC – M10B – C4 – 0001

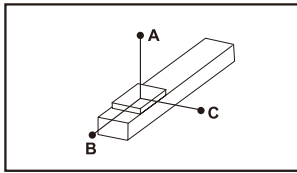
Model	Size	Stroke	Motor position	Motor brand, power output, brakes	Home sensor	Limit sensor																		
METG	5	100	BC	M10B	C4	0001																		
		50~800 mm 50 mm pitch																						
L02	2 mm		BC	<table border="1"> <thead> <tr> <th colspan="4">SERVO motor</th> </tr> </thead> <tbody> <tr> <td>M</td> <td>Mitsubishi</td> <td rowspan="4">10</td> <td rowspan="4">100W</td> </tr> <tr> <td>P</td> <td>Panasonic</td> </tr> <tr> <td>Y</td> <td>Yaskawa</td> </tr> <tr> <td>T</td> <td>Delta</td> </tr> <tr> <td></td> <td></td> <td></td> <td>B</td> </tr> </tbody> </table>	SERVO motor				M	Mitsubishi	10	100W	P	Panasonic	Y	Yaskawa	T	Delta				B	C	3
SERVO motor																								
M	Mitsubishi	10	100W																					
P	Panasonic																							
Y	Yaskawa																							
T	Delta																							
			B																					
L05	5 mm		BM	D	4																			
L10	10 mm		BR	E	5																			
L20	20 mm		BL																					
					Out side	Out side																		
					Motor side	1 Pc																		
					Opposite motor side	2 Pcs																		
					No sensor	No sensor																		
					None	None																		

* Need not show B with no brake.

* When the stroke is 50mm, the sensor installation has the following restrictions.

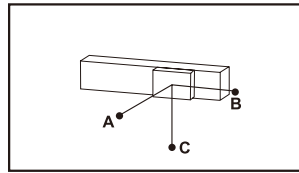
1. Home sensor and limit sensor has to be installed on the different side of body.
2. Both sides of slider need to install the sensor trigger device.

Allowable overhang



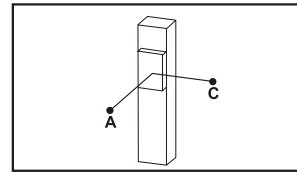
Unit: mm

Horizontal installation		A	B	C
Lead 2	10kg	900	100	135
	20kg	700	45	60
	30kg	550	25	35
Lead 5	10kg	650	75	100
	20kg	440	32	45
	30kg	270	19	25
Lead 10	5kg	600	145	185
	10kg	370	70	85
	15kg	250	42	52
Lead 20	5kg	320	120	130
	8kg	220	70	80
	10kg	175	55	60



Unit: mm

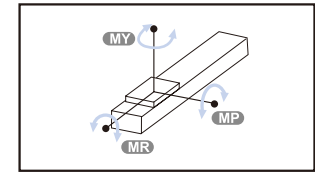
Wall installation		A	B	C
Lead 2	10kg	135	100	900
	20kg	60	45	700
	30kg	37	27	550
Lead 5	10kg	100	75	650
	20kg	45	32	420
	30kg	25	19	260
Lead 10	5kg	180	145	600
	10kg	85	68	370
	15kg	52	42	250
Lead 20	5kg	130	120	320
	8kg	75	70	220
	10kg	60	55	170



Unit: mm

Vertical installation		A	C
Lead 2	6kg	180	180
	8kg	135	135
	10kg	110	110
Lead 5	6kg	145	145
	8kg	110	110
	10kg	90	90
Lead 10	1kg	800	800
	3kg	260	260
	5kg	155	155
Lead 20	1kg	600	600
	2kg	300	300
	2.5kg	250	250

Static loading moment



Unit: N.m

MY	103
MP	103
MR	144

- The torque value in the chart indicate the center of gravity.
- Operation life is 10000km when the product is using under the specified conditions.
- Data information is not for ceiling-mount inverse use.
Contact us for the details if you want to apply ceiling-mount inverse usage.

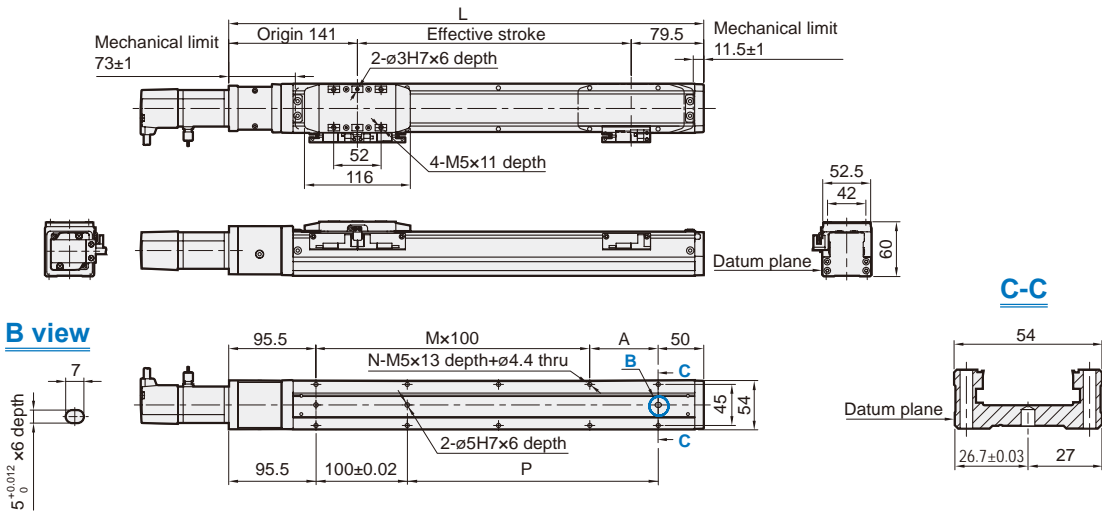
Standard servo motors

Brand	Mark	Brake	Watt	AC-Voltage	Motor model	Compatible driver model
Mitsubishi	M	No brake(Horizontal type)	100	220	KG-KR13	MR-J4-10A
		With brake(Vertical type)	100	220	HG-KR13B	MR-J4-10A
Panasonic	P	No brake(Horizontal type)	100	220	MSMD012G1U	MADHT1505
		With brake(Vertical type)	100	220	MSMD012G1V	MADHT1505
Delta	T	No brake(Horizontal type)	100	220	ECMA-C20401ES	ASD-B20121-B
		With brake(Vertical type)	100	220	ECMA-C20401FS	ASD-B20121-B

METG-5 Dimensions

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

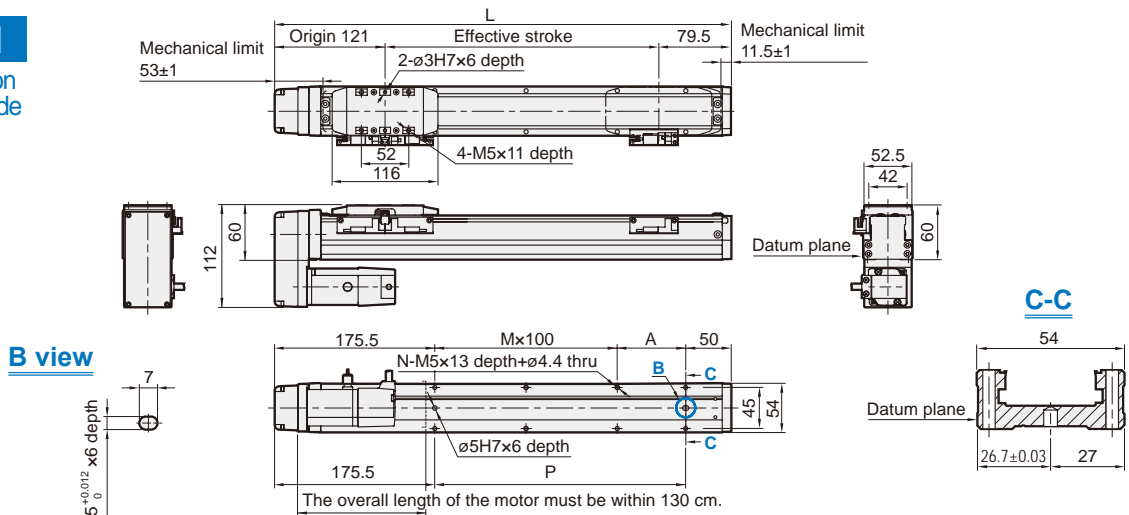
BC
Motor exposed



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	270.5	320.5	370.5	420.5	470.5	520.5	570.5	620.5	670.5	720.5	770.5	820.5	870.5	920.5	970.5	1020.5
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	2.23	2.42	2.62	2.82	3.01	3.21	3.41	3.6	3.8	4	4.19	4.39	4.59	4.78	4.98	5.18

BM
Motor on lower side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	250.5	300.5	350.5	400.5	450.5	500.5	550.5	600.5	650.5	700.5	750.5	800.5	850.5	900.5	950.5	1000.5
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7
N	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	2.4	2.59	2.79	2.99	3.18	3.38	3.58	3.77	3.97	4.17	4.36	4.56	4.76	4.95	5.15	5.35

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

METG-5 Dimensions

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

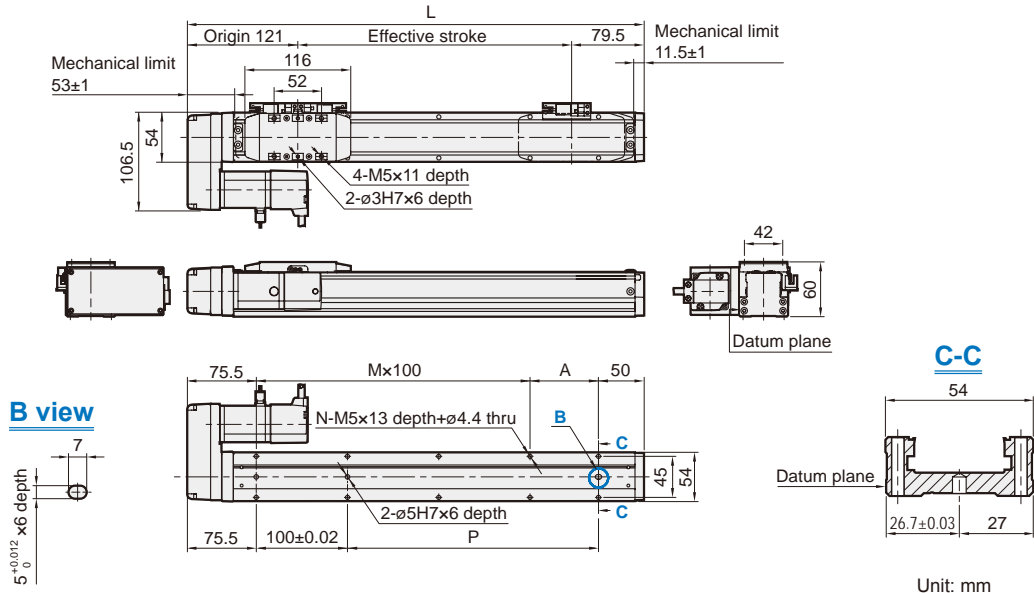
Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

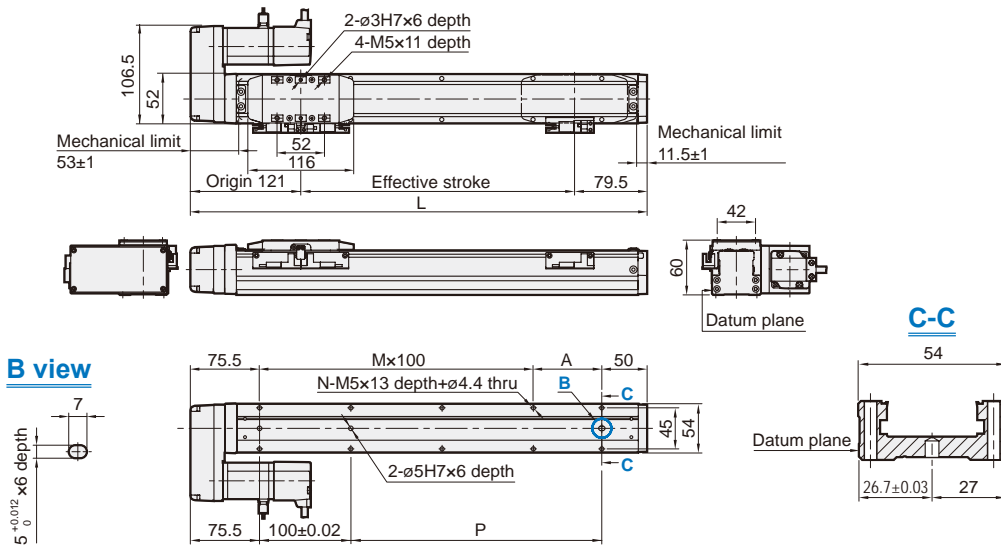
BL
Motor on left side



Unit: mm

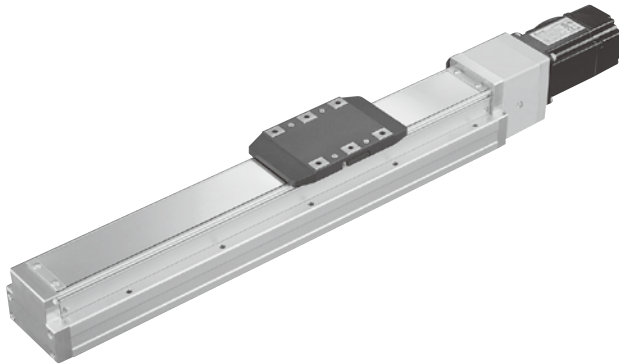
Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	250.5	300.5	350.5	400.5	450.5	500.5	550.5	600.5	650.5	700.5	750.5	800.5	850.5	900.5	950.5	1000.5
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	2.4	2.59	2.79	2.99	3.18	3.38	3.58	3.77	3.97	4.17	4.36	4.56	4.76	4.95	5.15	5.35

BR
Motor on right side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	250.5	300.5	350.5	400.5	450.5	500.5	550.5	600.5	650.5	700.5	750.5	800.5	850.5	900.5	950.5	1000.5
A	25	75	25	75	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	25	75	125	175	225	275	325	375	425	475	525	575	625	675	725	775
KG	2.4	2.59	2.79	2.99	3.18	3.38	3.58	3.77	3.97	4.17	4.36	4.56	4.76	4.95	5.15	5.35



Specification

Model		METG-8		
Repeatability	(mm)	±0.01		
Ball screw lead	(mm)	5	10	20
Max. speed (*1)	(mm/s)	250	500	1000
AC servo motor	(W)	200W, 400W		
Max. payload	Horizontal (kg)	50	30	18
	Vertical (kg)	15	8	3
Rated thrust (*2)	(N)	683 (1388)	341 (694)	174 (347)
Stroke (*3)	(mm)	50~1100 / 50 pitch		
Ball screw	(mm)	C7Ø16		
Coupling	(mm)	10×14/11 (*4)		
Home sensor		EE-SX674 (NPN)		

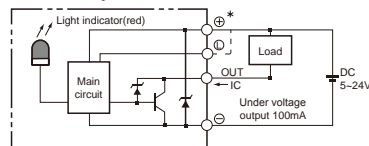
*1. Acceleration and deceleration value is set 0.2 second.

*2. () The value for power output 400W.

*3. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstances.

*4. Motor 200W shaft diameter: Panasonic: 11mm, Other: 14 mm.

Sensor layout



Order example

METG – 8 – L10 – 100 – BC – M20B – C4 – 0001

Model

Size

Stroke

Special order no.

50~1100 mm
50 mm pitch

Ball screw lead		Motor position		Motor brand, power output, brakes				Home sensor		Limit sensor		
L05	5 mm	BC	Exposed	SERVO motor				Out side		Out side		
L10	10 mm	BM	On lower side	M	Mitsubishi	20 40	200W 400W	B	C	Motor side	3	1 Pc
L20	20 mm	BR	On right side	P	Panasonic				D	Opposite motor side	4	2 Pcs
		BL	On left side	Y	Yaskawa				No sensor		No sensor	
				T	Delta				E	None	5	None

* Need not show B with no brake.

* When the stroke is 50mm, the sensor installation has the following restrictions.

1. Home sensor and limit sensor has to be installed on the different side of body.
2. Both sides of slider need to install the sensor trigger device.

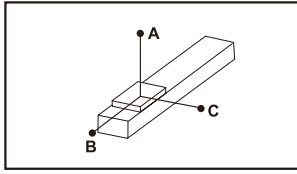
METG-8 Performance charts



SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

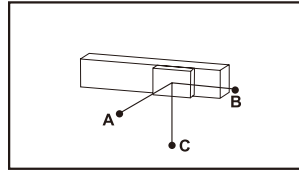
mindman

Allowable overhang



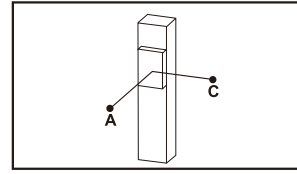
Unit: mm

Horizontal installation		A	B	C
Lead 5	20kg	1560	153	237
	35kg	890	81	126
	50kg	550	53	82
Lead 10	10kg	1730	286	412
	20kg	839	136	196
	30kg	541	86	124
Lead 20	6kg	1213	403	493
	9kg	800	264	323
	18kg	592	194	238



Unit: mm

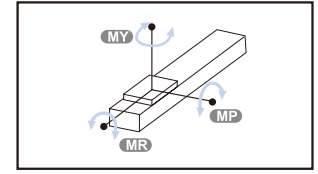
Wall installation		A	B	C
Lead 5	20kg	214	153	1435
	35kg	113	81	845
	50kg	74	53	506
Lead 10	10kg	370	286	1400
	20kg	176	136	800
	30kg	112	86	495
Lead 20	6kg	444	403	760
	9kg	292	264	277
	18kg	214	194	544



Unit: mm

Vertical installation		A	C
Lead 5	10kg	331	331
	15kg	220	220
	-	-	-
Lead 10	5kg	589	589
	8kg	368	368
	-	-	-
Lead 20	3kg	935	935
	-	-	-
	-	-	-

Static loading moment



Unit: N.m

MY	318
MP	318
MR	626

- The torque value in the chart indicate the center of gravity.
- Operation life is 10000km when the product is using under the specified conditions.
- Data information is not for ceiling-mount inverse use.
Contact us for the details if you want to apply ceiling-mount inverse usage.

Standard servo motors

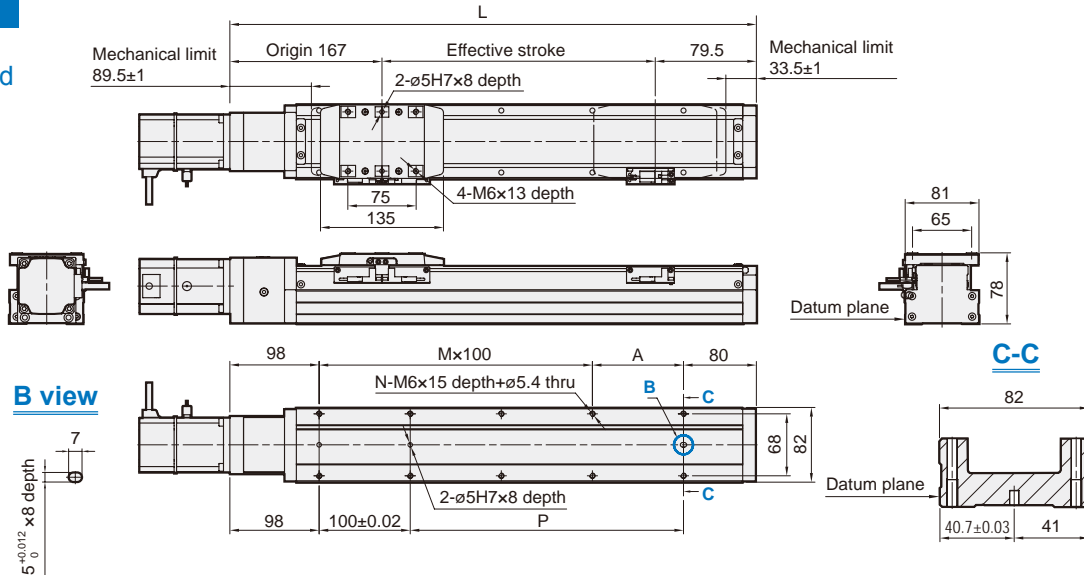
Brand	Mark	Brake	Watt	AC-Voltage	Motor model	Compatible driver model
Mitsubishi	M	No brake(Horizontal type)	200	220	HG-KR23	MR-J4-20A
			400	220	HG-KR43	MR-J4-40A
		With brake(Vertical type)	200	220	HG-KR23B	MR-J4-20A
			400	220	HG-KR43B	MR-J4-40A
Panasonic	P	No brake(Horizontal type)	200	220	MHMD022G1U	MADHT1507
			400	220	MHMD042G1U	MBDHT2510
		With brake(Vertical type)	200	220	MHMD022G1V	MADHT1507
			400	220	MHMD042G1V	MBDHT2510
Delta	T	No brake(Horizontal type)	200	220	ECMA-C20602ES	ASD-B20221-B
			400	220	ECMA-C20604ES	ASD-B20421-B
		With brake(Vertical type)	200	220	ECMA-C20602FS	ASD-B20221-B
			400	220	ECMA-C20604FS	ASD-B20421-B

METG-8 series

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



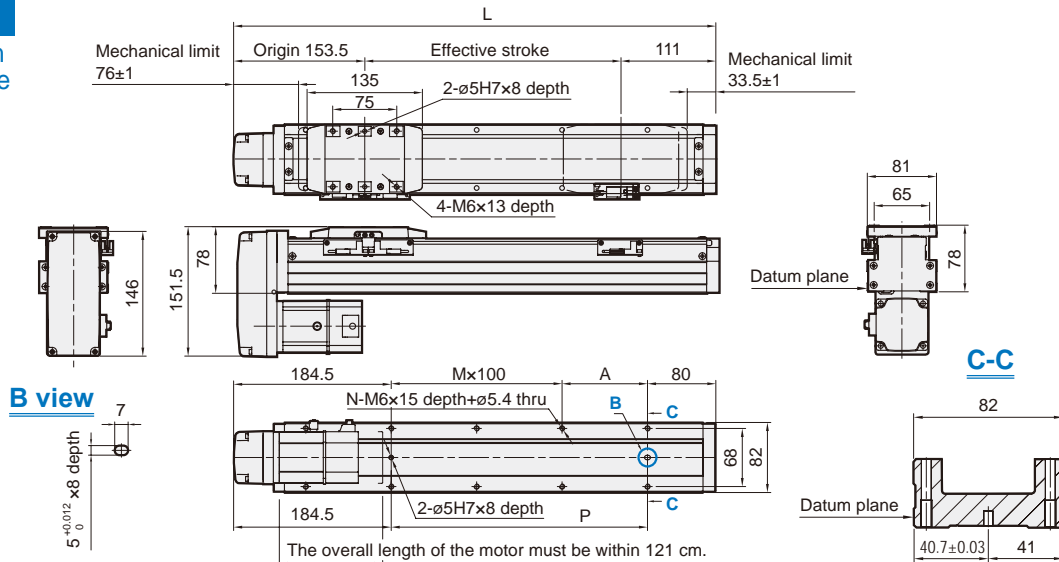
BC Motor exposed



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
L	328	378	428	478	528	578	628	678	728	778	828	878	928	978	1028	1078	1128	1178	1228	1278	1328	1378
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
KG	5.18	5.54	5.91	6.27	6.64	7	7.37	7.73	8.1	8.46	8.83	9.19	9.56	9.92	10.29	10.65	11.02	11.38	11.75	12.11	12.48	12.85

BM Motor on lower side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
L	314.5	364.5	414.5	464.5	514.5	564.5	614.5	664.5	714.5	764.5	814.5	864.5	914.5	964.5	1014.5	1064.5	1114.5	1164.5	1214.5	1264.5	1314.5	1364.5
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10
N	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
KG	5.19	5.6	6.12	6.64	7.16	7.68	8.2	8.72	9.24	9.76	10.28	10.8	11.32	11.84	12.36	12.88	13.4	13.92	14.44	14.96	15.48	16

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

METG-8 Performance charts

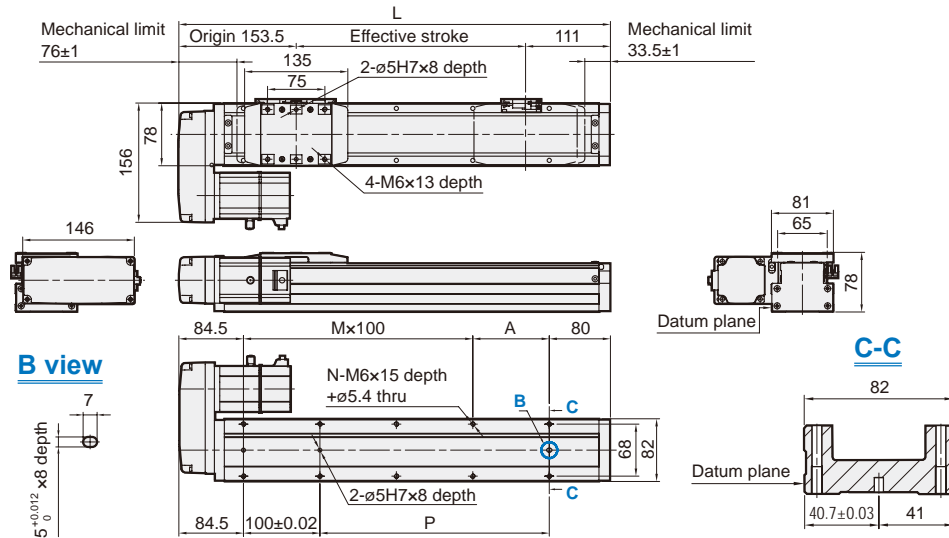


SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

mindman

BL

Motor on left side

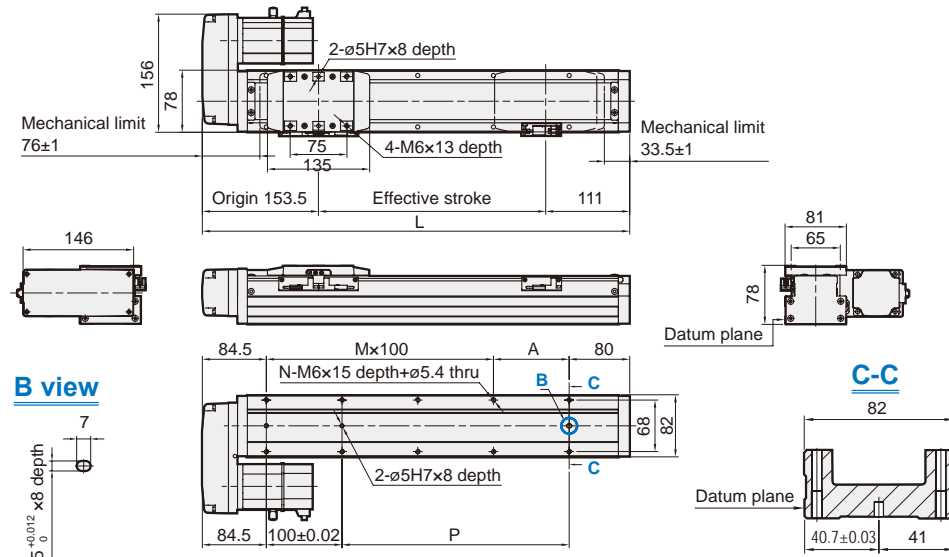


Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
L	314.5	364.5	414.5	464.5	514.5	564.5	614.5	664.5	714.5	764.5	814.5	864.5	914.5	964.5	1014.5	1064.5	1114.5	1164.5	1214.5	1264.5	1314.5	1364.5
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
KG	5.19	5.6	6.12	6.64	7.16	7.68	8.2	8.72	9.24	9.76	10.28	10.8	11.32	11.84	12.36	12.88	13.4	13.92	14.44	14.96	15.48	16

BR

Motor on right side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
L	314.5	364.5	414.5	464.5	514.5	564.5	614.5	664.5	714.5	764.5	814.5	864.5	914.5	964.5	1014.5	1064.5	1114.5	1164.5	1214.5	1264.5	1314.5	1364.5
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20	22	22	24	24	26	26
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
KG	5.19	5.6	6.12	6.64	7.16	7.68	8.2	8.72	9.24	9.76	10.28	10.8	11.32	11.84	12.36	12.88	13.4	13.92	14.44	14.96	15.48	16

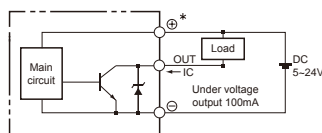
METS2-10 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Environment	Standard	Servo motor	100W / 200W
Actuation type	Ball screw	Guide type	Linear guide

Sensor layout



Specification

Model	METS2-10		
Position repeatability (mm)	±0.01		
Lead (mm)	5	10	20
Max. speed (mm/s)	250	500	1000
Stroke (mm)	100~1000 / 50 pitch		
Ball screw O.D. (mm)	C7 ø16		
Home sensor	EE-SX672 (NPN)		

AC servo motor	100W		
Coupling (mm)	10×8 / 5 (*1)		
Max. payload	Horizontal (kg)	50	30
	Vertical (kg)	12	8
Rated thrust (N)	341	170	85

AC servo motor	200W		
Coupling (mm)	10×14 / 11 (*2)		
Max. payload	Horizontal (kg)	50	30
	Vertical (kg)	12	8
Rated thrust (N)	683	341	174

*1. Motor □42 shaft diameter: ø5, other ø8.

*2. Panasonic motor 200W shaft diameter: ø11, other ø14.

*3. When the stroke is over 750mm, the run-out of the ballscrew will occur.

We recommend to low down the working speed under this circumstances.

*4. Acceleration and deceleration value is set 0.2 second.

Order example

METS2-10 - L05 - 100 - BC - M20 B - A3 - XA00

Model	Size	Stroke	Motor position	Motor brand	Power output	Brakes	Limit sensor
L05	5 mm	100~1000 mm 50 mm pitch	M Motor built-in (*)	M Mitsubishi	10 20 100W 200W servo	- No brake	- No sensor
L10	10 mm		BC Motor exposed	P Panasonic		B With brake	A1 1 pc
L20	20 mm		BM Motor bottom side	Y Yaskawa		A2 2 pcs	
		BR Motor right side	D Delta	A3 3 pcs			
		BL Motor left side	E Else				
			S Mindman	42 □42			

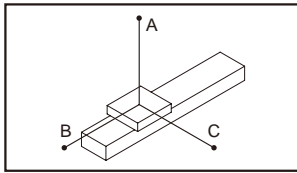
* Not suit for 200W servo.

Standard servo motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod dim. (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	100 W	HG-KN13J	HG-KN13B J	ø8	ø46	2-ø4.5
		200 W	HG-KN23J	HG-KN23B J	ø14	ø70	4-ø5.8
Panasonic	P	100 W	MSMF012L1U2M	MSMF012L1V2M	ø8	ø45	4-ø3.4
		200 W	MHMF022L1U2M	MHMF022L1V2M	ø11	ø70	4-ø4.5
Yaskawa	Y	100 W	SGM7J-01A7A21	SGM7J-01A7A2C	ø8	ø46	2-ø4.3
		200 W	SGM7J-02A7A21	SGM7J-02A7A2C	ø14	ø70	4-ø5.5
Delta	D	100 W	ECMA-C20401PS	ECMA-C20401FS	ø8	ø46	4-ø4.5
		200 W	ECMA-C20602PS	ECMA-C20602FS	ø14	ø70	4-ø5.5
Mindman	S	□42	-	-	ø5	□31	4-M3×4.5L

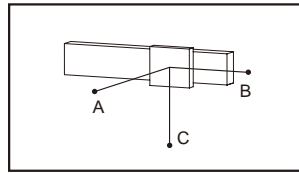
* If your inquiry is not included in above table, please kindly contact us.

Allowable overhang



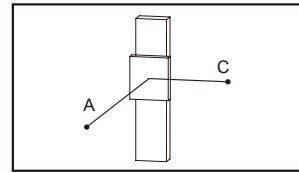
Unit: mm

Horizontal installation	A	B	C
AC servo motor 100W / 200W			
Lead 5	30kg	547	42
	40kg	391	29
	50kg	298	22
Lead 10	15kg	521	84
	25kg	298	47
	30kg	242	37
Lead 20	5kg	675	224
	10kg	330	107
	18kg	175	55



Unit: mm

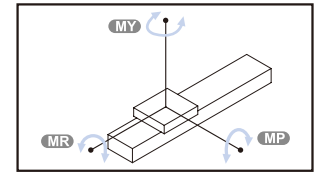
Wall installation	A	B	C
AC servo motor 100W / 200W			
Lead 5	25kg	52	53
	35kg	35	35
	50kg	21	22
Lead 10	10kg	124	131
	20kg	58	61
	30kg	35	37
Lead 20	6kg	160	185
	12kg	76	88
	18kg	48	55



Unit: mm

Vertical installation	A	C
AC servo motor 100W / 200W		
Lead 5	5kg	310
	8kg	192
	12kg	129
Lead 10	4kg	344
	8kg	172
	-	-
Lead 20	2kg	546
	3kg	364
	-	-

Static loading moment

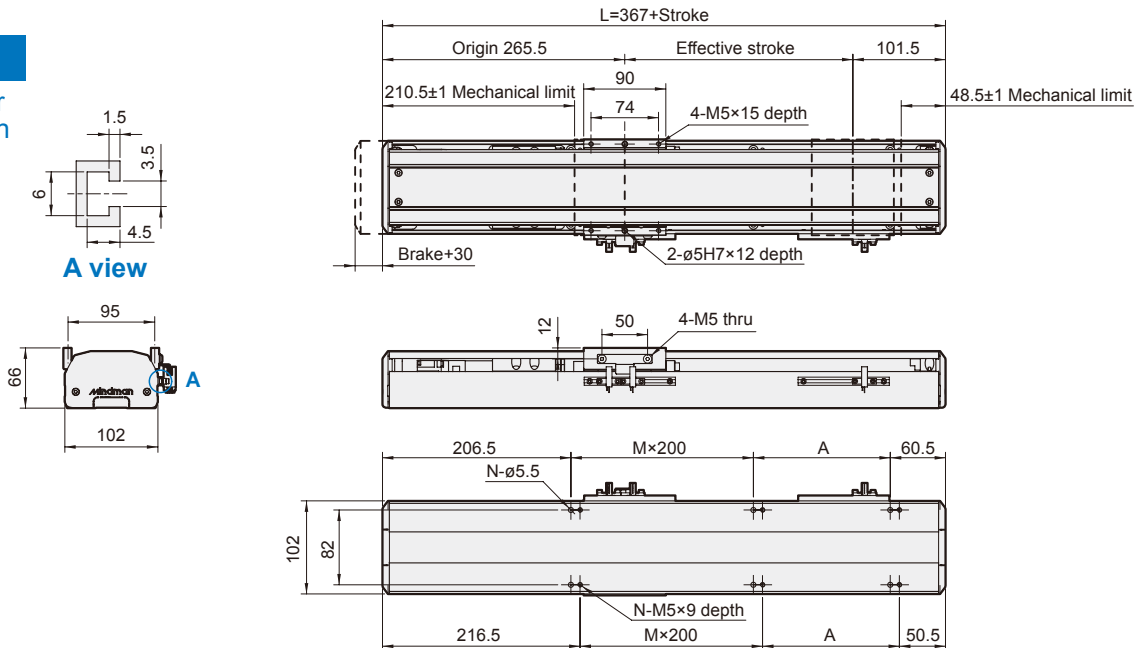


Unit: N.m

Horizontal	
AC servo motor 100W / 200W	
MY	110
MP	110
MR	120

Dimensions

M
Motor built-in



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	467	517	567	617	667	717	767	817	867	917	967	1017	1067	1117	1167	1217	1267	1317	1367
A	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
N	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14

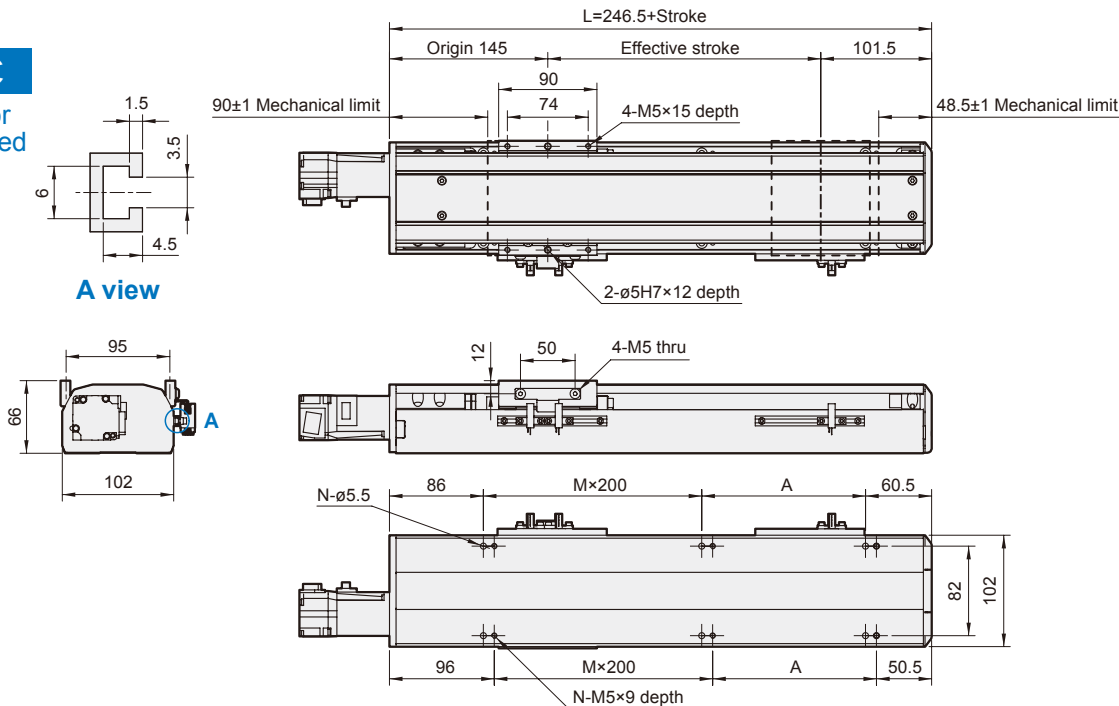
* When delta 100W, brake +40.

METS2-10 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

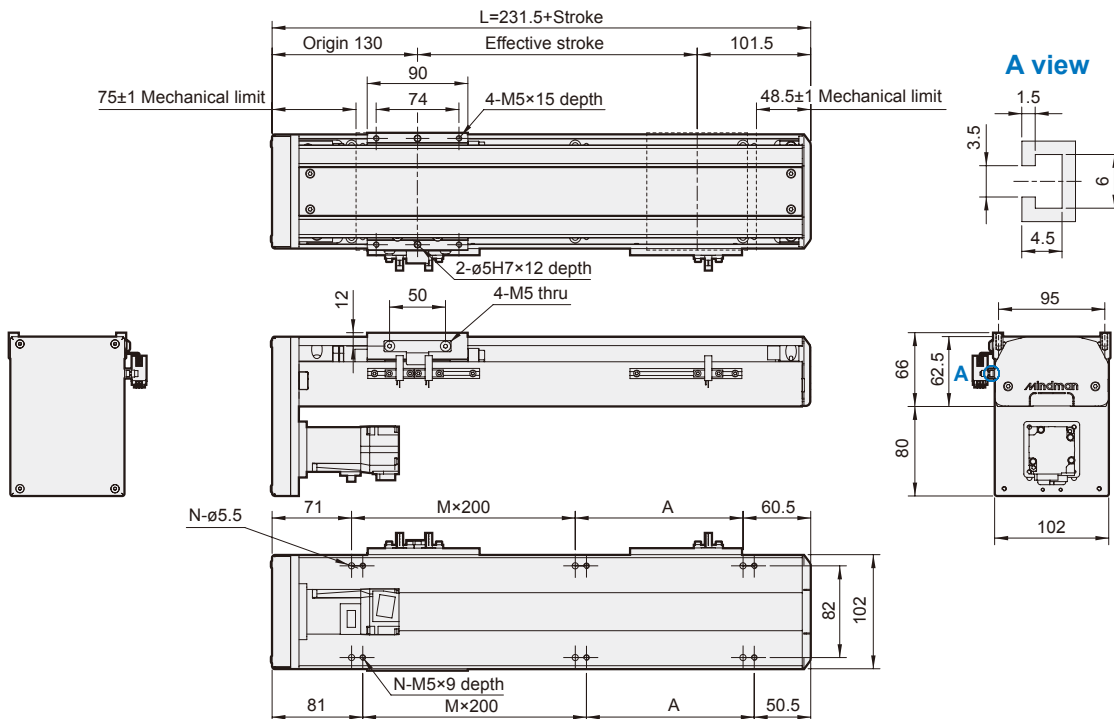


BC
Motor exposed



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	346.5	396.5	446.5	496.5	546.5	596.5	646.5	696.5	746.5	796.5	846.5	896.5	946.5	996.5	1046.5	1096.5	1146.5	1196.5	1246.5
A	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
N	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14

BM
Motor bottom side



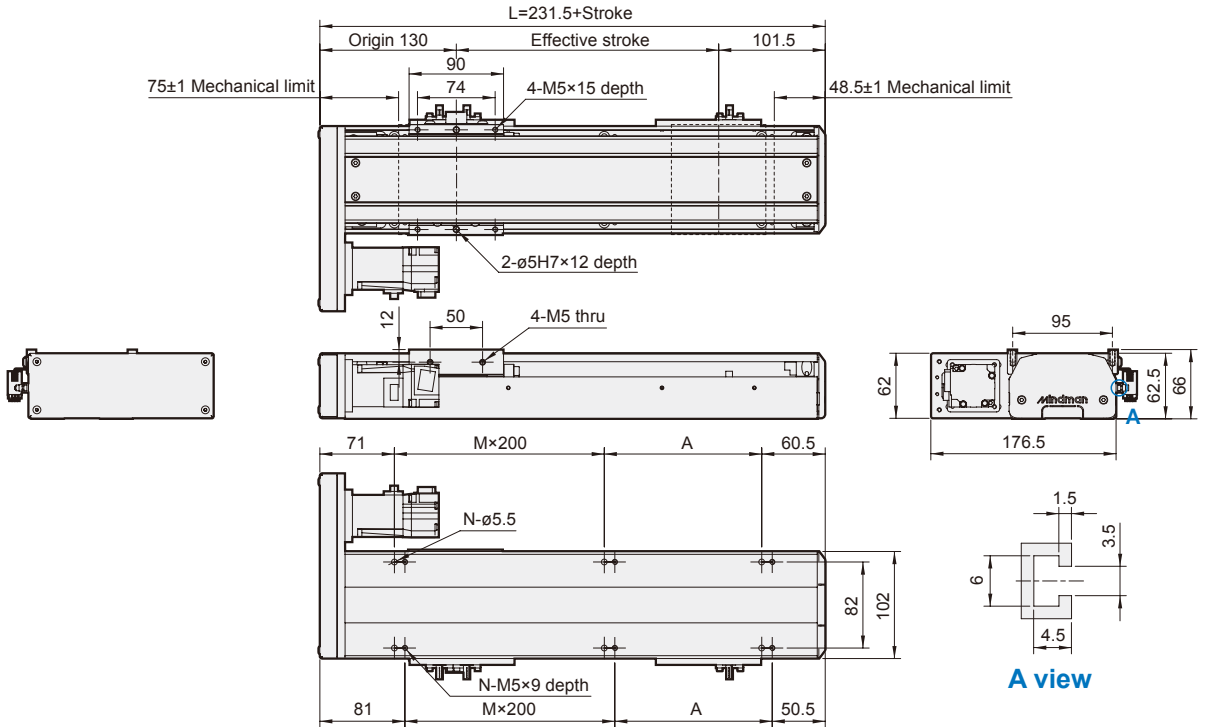
Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	331.5	381.5	431.5	481.5	531.5	581.5	631.5	681.5	731.5	781.5	831.5	881.5	931.5	981.5	1031.5	1081.5	1131.5	1181.5	1231.5
A	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
N	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14

METS2-10 Dimensions



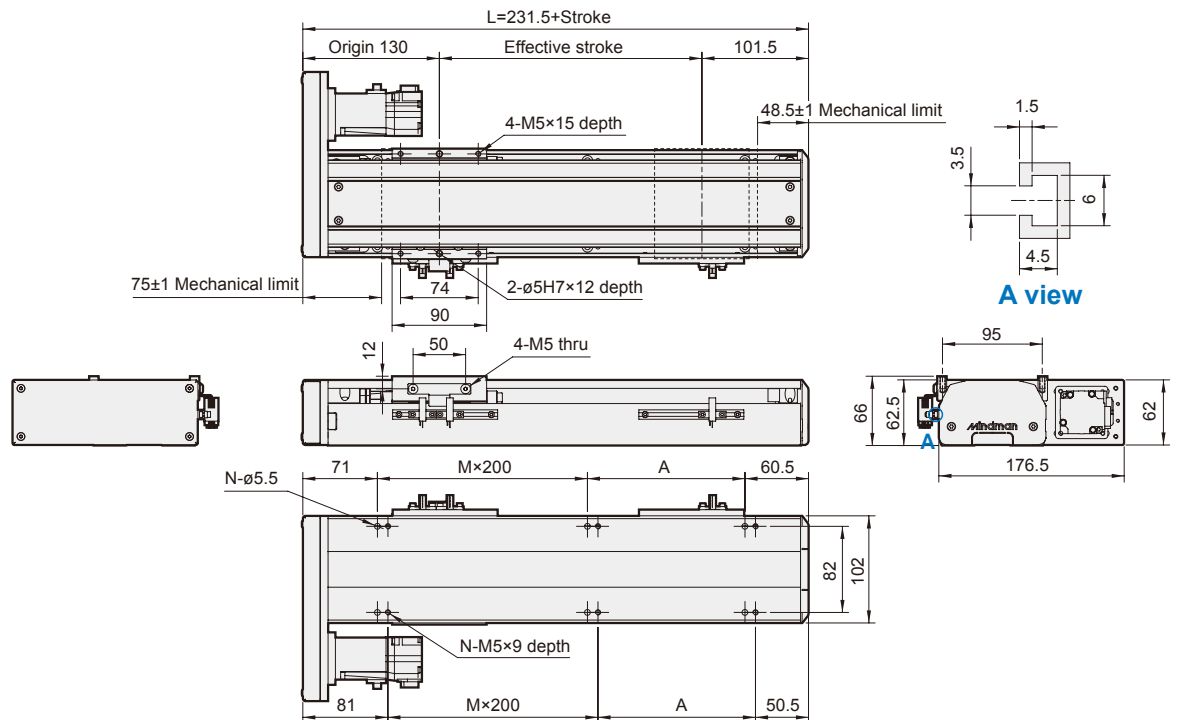
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

BL
Motor left side



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	331.5	381.5	431.5	481.5	531.5	581.5	631.5	681.5	731.5	781.5	831.5	881.5	931.5	981.5	1031.5	1081.5	1131.5	1181.5	1231.5
A	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
N	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14

BR
Motor right side



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	331.5	381.5	431.5	481.5	531.5	581.5	631.5	681.5	731.5	781.5	831.5	881.5	931.5	981.5	1031.5	1081.5	1131.5	1181.5	1231.5
A	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
N	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14

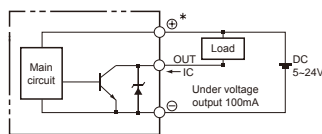
METS2-14 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Use environment	Standard	Servo motor	200W / 400W
Actuation type	Ball screw	Guide type	Linear guide

Sensor layout



Feature

- Modular product can save your time of designing and assembly, and greatly increase your development efficiency.
- High stiffness body made with integrated aluminum extrusion.
- It provides several position for motor installment.
- It is available for customized service.

Specification

Model	METS2-14		
Position repeatability (mm)	±0.01		
Lead (mm)	5	10	20
Max. speed (mm/s)	250	500	1000
Stroke (mm)	100~1000 / 50 pitch		
Ball screw O.D. (mm)	C7 ø16		
Coupling (mm)	10×14 / 10×11 (*1)		
Home sensor	EE-SX672 (NPN)		

AC servo motor	200W			
Max. payload	Horizontal (kg)	95	75	35
	Vertical (kg)	27	18	6
Rated thrust (N)		683	341	174

AC servo motor	400W			
Max. payload	Horizontal (kg)	110	88	40
	Vertical (kg)	33	22	8
Rated thrust (N)		1388	694	347

*1. Motor (200W) shaft diameter : Panasonic ø11, other ø14.

*2. When the stroke is over 750mm, the run-out of the ball screw will occur. We recommend to low down the working speed under this circumstances.

*3. Acceleration and deceleration value is set 0.2 second.

Order example

METS2-14 - L05 - 100 - BC - M20 B - A3 - XA00

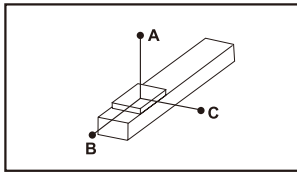
Model		Size		Motor position		Motor brand		Power output		Brakes		Limit sensor	
L05	5 mm	100~1000 mm 50 mm pitch	M	Mitsubishi	20 40	200W 400W	-	No brake	-	No sensor			
L10	10 mm		BC	Panasonic			B	With brake	A1	1 pc			
L20	20 mm		BM	Yaskawa			A2	2 pcs					
		BR	Delta	A3			3 pcs						
		BL	Else										

* Sensor is packaged separately, and is freely operated for customer's adjustment.

* If you choose built-in position, we will need to be notified whether a brake is used in your motor. Our default length will be the motor equipped with brake.

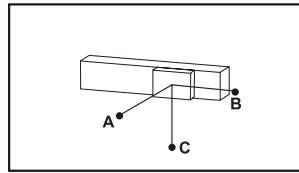
* If customized service is required, please kindly contact us.

Allowable overhang



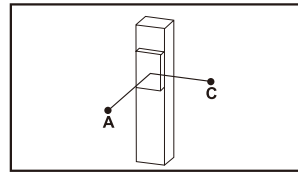
Unit: mm

Horizontal installation	A	B	C
AC servo motor 200W			
Lead 5	60kg	2300	250
	80kg	1600	180
	95kg	1150	145
Lead 10	30kg	2000	500
	50kg	1400	280
	75kg	1000	170
Lead 20	10kg	2300	1200
	20kg	1400	600
	35kg	1000	330



Unit: mm

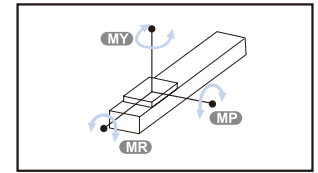
Wall installation	A	B	C
AC servo motor 200W			
Lead 5	60kg	200	110
	80kg	130	55
	95kg	85	25
Lead 10	30kg	415	330
	50kg	235	155
	75kg	130	55
Lead 20	10kg	995	1200
	20kg	500	555
	35kg	270	230



Unit: mm

Vertical installation	A	C
AC servo motor 200W		
Lead 5	20kg	755
	25kg	605
	27kg	500
Lead 10	10kg	1350
	15kg	900
	18kg	675
Lead 20	6kg	1695
	—	—
	—	—
AC servo motor 400W		
Lead 20	4kg	2400
	6kg	1700
	8kg	1300

Static loading moment



Unit: N.m

Horizontal	
AC servo motor 200W	
MY	262
MP	262
MR	261

* When the motor power is 400W, the max. payload is 110 kg (lead 5), 88 kg (lead 10), 40 kg (lead 20), and the load torque distance remains unchanged.

* When the motor power is 400W, the max. payload is 33 kg (lead 5), 22kg (lead 10), and the load torque distance remains unchanged.

Standard servo motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod dim. (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	200W	HG-KN23J	HG-KN23B J	ø14	ø70	4-ø5.8
		400W	HG-KN43J	HG-KN43B J	ø14	ø70	4-ø5.8
Panasonic	P	200W	MHMF022L1U2M	MHMF022L1V2M	ø11	ø70	4-ø4.5
		400W	MHMF042L1U2M	MHMF042L1V2M	ø14	ø70	4-ø4.5
Yaskawa	Y	200W	SGM7J-02A7A21	SGM7J-02A7A2C	ø16	ø70	4-ø5.5
		400W	SGM7J-04A7A21	SGM7J-04A7A2C	ø16	ø70	4-ø5.5
Delta	D	200W	ECMA-C20602PS	ECMA-C20602FS	ø14	ø70	4-ø4.5
		400W	ECMA-C20604PS	ECMA-C20604QS	ø14	ø70	4-ø5.5

*1. Motor (200W) shaft diameter : Panasonic ø11, other ø14.

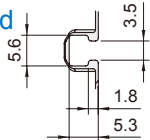
*2. If your inquiry is not included in above table, please kindly contact us.

METS2-14 Dimensions

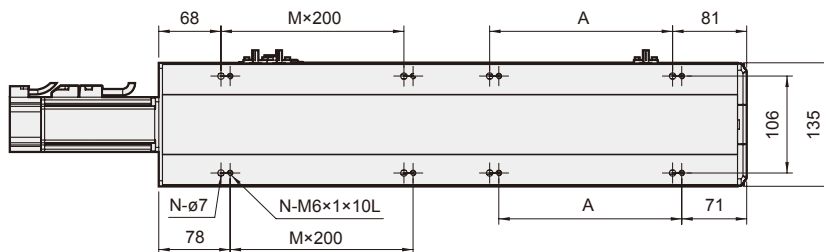
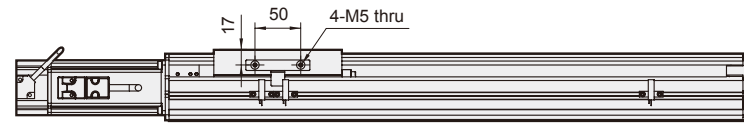
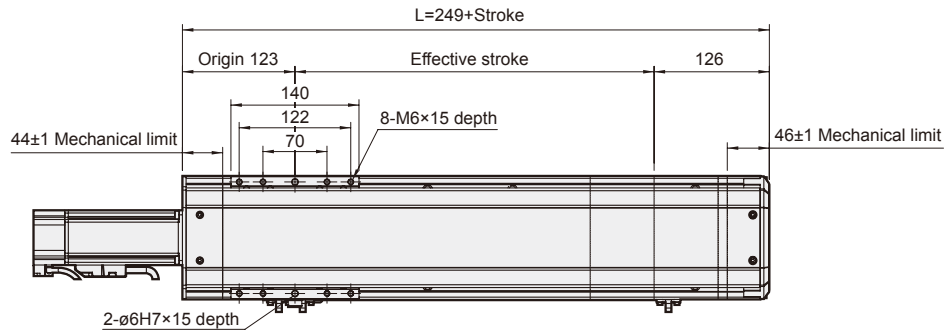
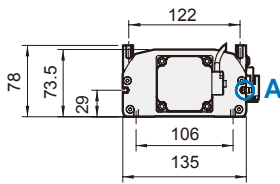
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



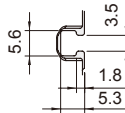
BC
Motor exposed



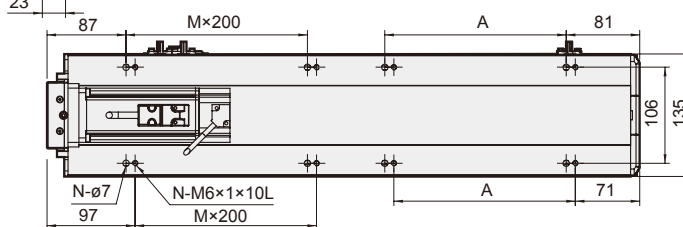
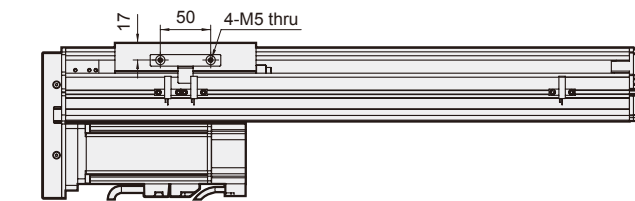
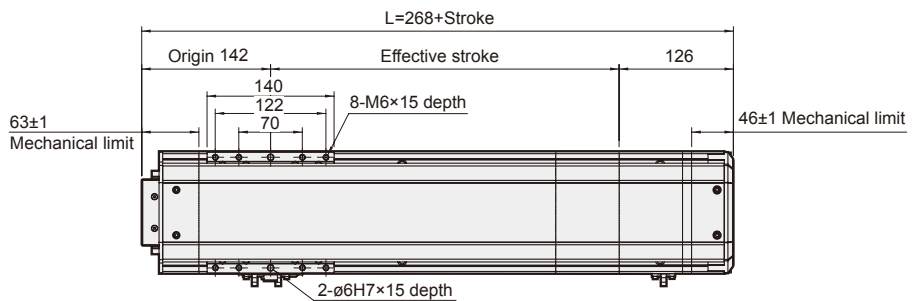
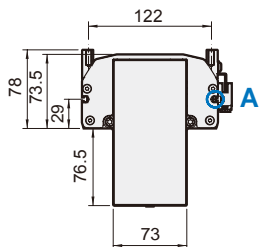
A view



BM
Motor bottom side



A view



Unit: mm

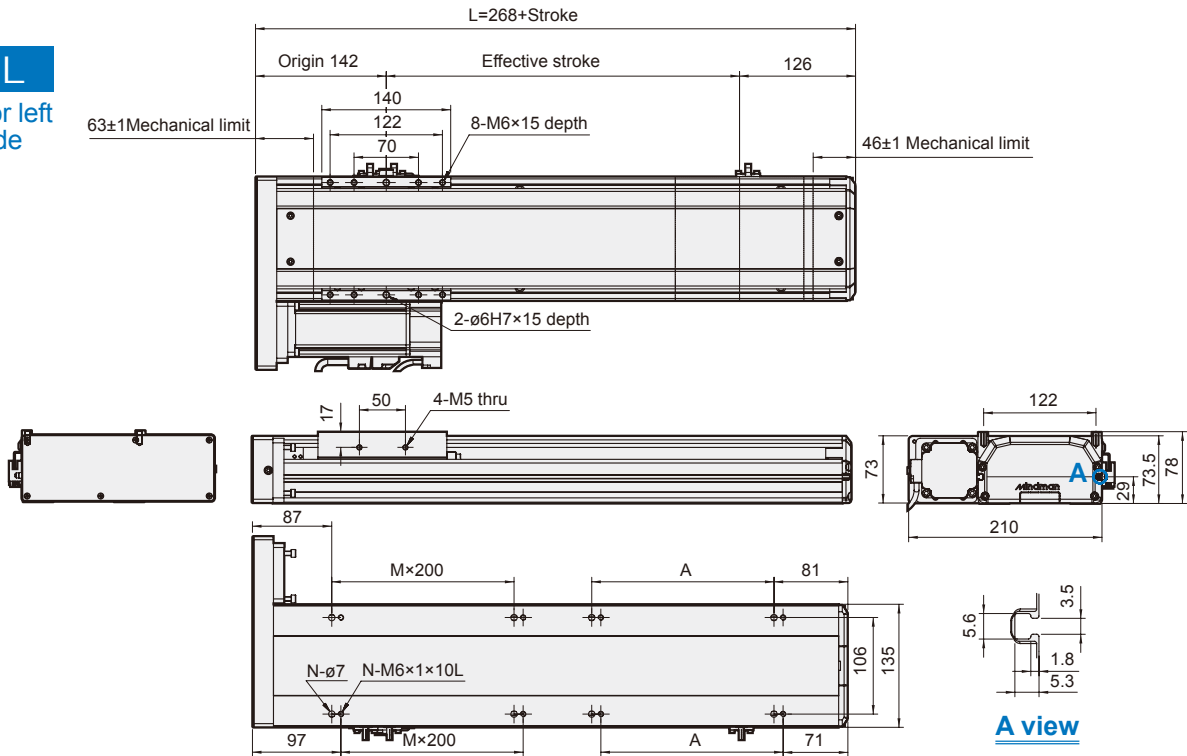
Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	
L	BC	349	399	449	499	549	599	649	699	749	799	849	899	949	999	1049	1099	1149	1199	1249
	BM	368	418	468	518	568	618	668	718	768	818	868	918	968	1018	1068	1118	1168	1218	1268
A	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	100
M	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5
N	4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14

METS2-14 Dimensions

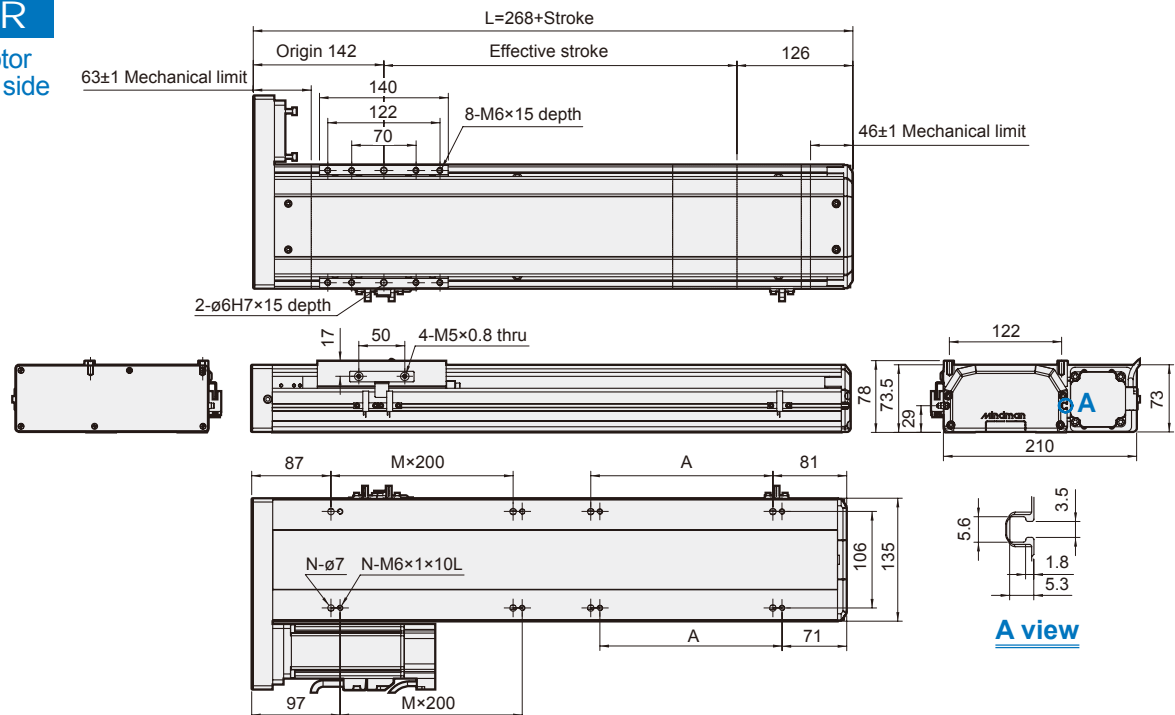
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



BL
Motor left side



BR
Motor right side



Unit: mm

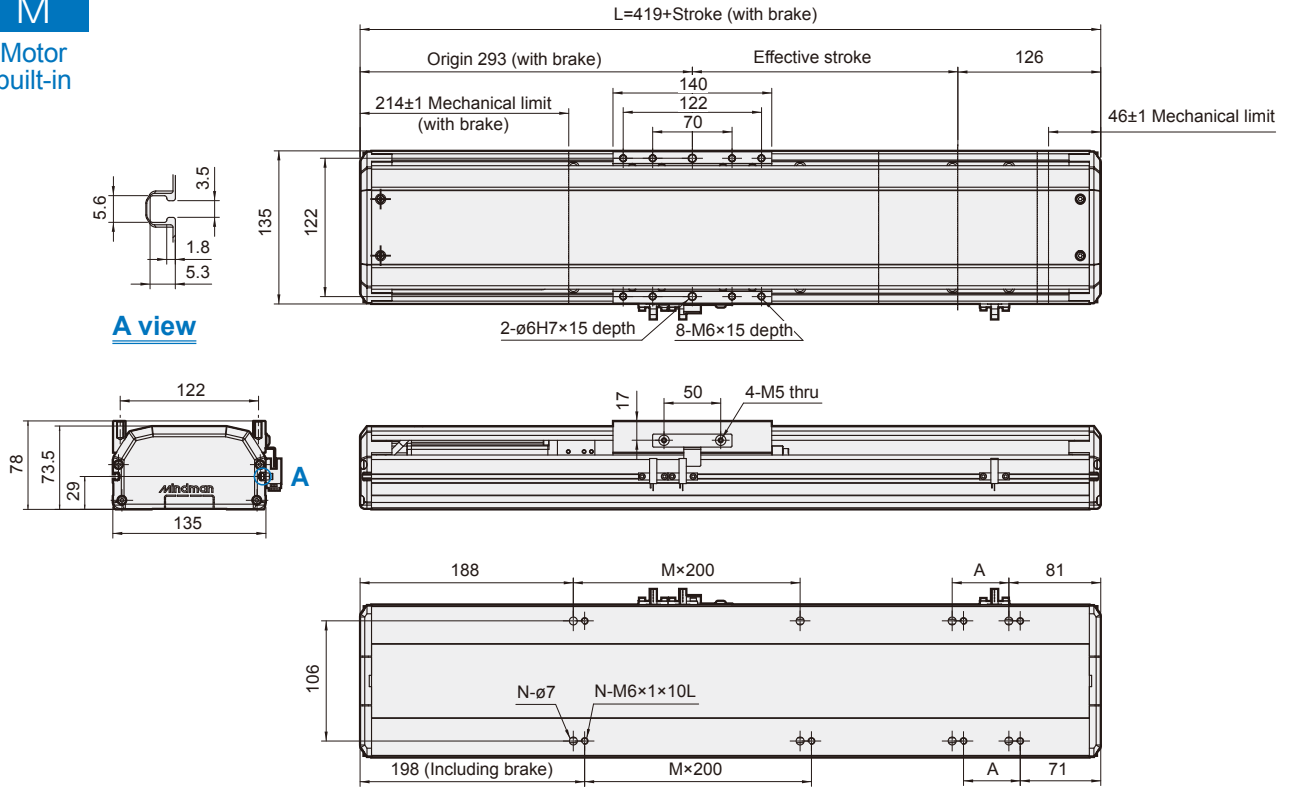
Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	
L	BL	368	418	468	518	568	618	668	718	768	818	868	918	968	1018	1068	1118	1168	1218	1268
	BR	368	418	468	518	568	618	668	718	768	818	868	918	968	1018	1068	1118	1168	1218	1268
A		200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M		0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5
N		4	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14

METS2-14 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



M
Motor
built-in



Unit: mm

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
L	519	569	619	669	719	769	819	869	919	969	1019	1069	1119	1169	1219	1269	1319	1369	1419
A	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150
M	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5
N	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14

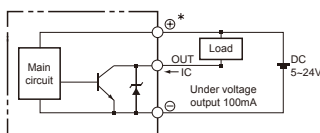
METS2-17 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Environment	Standard	Servo motor	400W / 750W
Actuation type	Ball screw	Guide type	Linear guide

Sensor layout



Specification

Model	METS2-17		
Position repeatability (mm)	±0.01		
Lead (mm)	5	10	20
Max. speed (mm/s)	250	500	1000
Stroke (mm)	100~1200 / 50 pitch		
Ball screw O.D. (mm)	C7 ø20		
Home sensor	EE-SX672 (NPN)		

AC servo motor	400W			
Coupling (mm)	10×14 / 6.35 (*1)			
Max. payload	Horizontal (kg)	120	110	75
	Vertical (kg)	40	30	14
Rated thrust (N)	1388	694	347	

AC servo motor	750W			
Coupling (mm)	10×19			
Max. payload	Horizontal (kg)	120	120	83
	Vertical (kg)	50	40	25
Rated thrust (N)	2563	1281	640	

*1. Motor □56 shaft diameter: ø6.35, other ø14.

*2. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstances.

*3. Acceleration and deceleration value is set 0.2 second.

Order example

METS2-17 - L05 - 100 - BC - M40 B - A3 - XA00

Model	Size	Stroke	Motor position	Motor brand	Power output	Brakes	Limit sensor
L05	5 mm	100~1200 mm 50 mm pitch	M Motor built-in (*)	M Mitsubishi	40 75 400W 750W servo	- No brake	- No sensor
L10	10 mm		BC Motor exposed	P Panasonic		B With brake	A1 1 pc
L20	20 mm		BM Motor bottom side	Y Yaskawa		A2 2 pcs	
		BR Motor right side	D Delta	A3 3 pcs			
		BL Motor left side	E Else				
			S Mindman	56 □56			

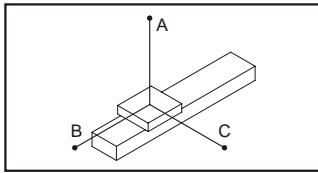
* Not suit for 750W servo.

Standard servo motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod dim. (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	400W	HG-KN43J	HG-KN43B J	ø14	ø70	4-ø5.8
		750W	HG-KN73J	HG-KN73B J	ø19	ø90	4-ø6.6
Panasonic	P	400W	MHMF042L1U2M	MHMF042L1V2M	ø14	ø70	4-ø4.5
		750W	MHMF082L1U2M	MHMF082L1V2M	ø19	ø90	4-ø6.0
Yaskawa	Y	400W	SGM7J-04A7A21	SGM7J-04A7A2C	ø14	ø70	4-ø5.5
		750W	SGM7J-08A7A21	SGM7J-08A7A2C	ø19	ø90	4-ø7.0
Delta	D	400W	ECMA-C20604PS	ECMA-C20604QS	ø14	ø70	4-ø5.5
		750W	ECMA-C20807PS	ECMA-C20807FS	ø19	ø90	4-ø6.6
Mindman	S	□56	-	-	ø6.35	□47.14	4-ø5.0

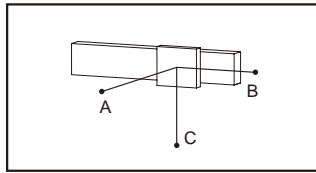
* If your inquiry is not included in above table, please kindly contact us.

Allowable overhang



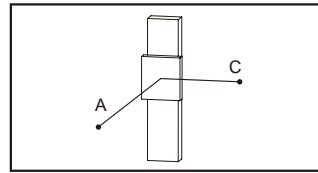
Unit: mm

Horizontal installation		A	B	C
AC servo motor 400W / 750W				
Lead 5	70kg	3235	349	408
	90kg	2482	263	306
	120kg	1850	187	217
Lead 10	65kg	1911	338	373
	85kg	1445	248	276
	110kg	1102	182	202
	120kg*	1000	164	182
Lead 20	35kg	1666	547	538
	55kg	1030	331	328
	75kg	733	231	230
	83kg*	654	206	204



Unit: mm

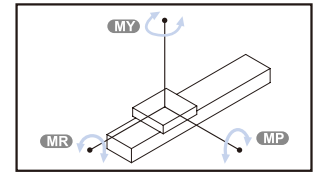
Wall installation		A	B	C
AC servo motor 400W / 750W				
Lead 5	75kg	377	322	2988
	95kg	288	246	2333
	120kg	218	187	1850
Lead 10	60kg	408	368	2092
	80kg	296	266	1554
	110kg	202	182	1102
	120kg*	182	164	1002
Lead 20	30kg	633	644	1961
	50kg	365	369	1143
	75kg	230	231	733
	83kg*	204	206	656



Unit: mm

Vertical installation		A	C
AC servo motor 400W / 750W			
Lead 5	20kg	1368	1368
	30kg	911	911
	40kg	683	683
	50kg*	546	546
Lead 10	15kg	1618	1618
	25kg	970	970
	30kg	808	808
Lead 20	40kg*	607	607
	10kg	1922	1922
	14kg	1377	1377
	25kg*	769	769

Static loading moment



Unit: N.m

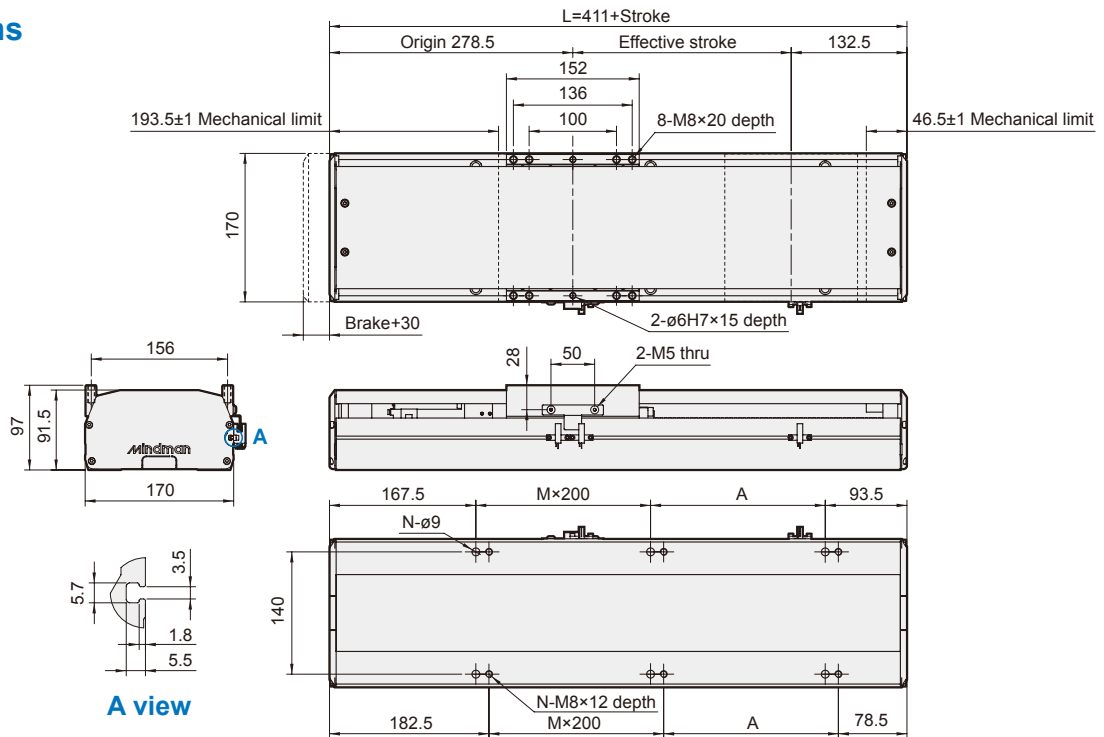
Horizontal	
AC servo motor 400W / 750W	
MY	1032
MP	1034
MR	908

* Only for 750W motor.

Dimensions

M

Motor built-in



A view

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
L	511	561	611	661	711	761	811	861	911	961	1011	1061	1111	1161	1211	1261	1311	1361	1411	1461	1511	1561	1611
A	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150
M	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6
N	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16

METS2-17 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

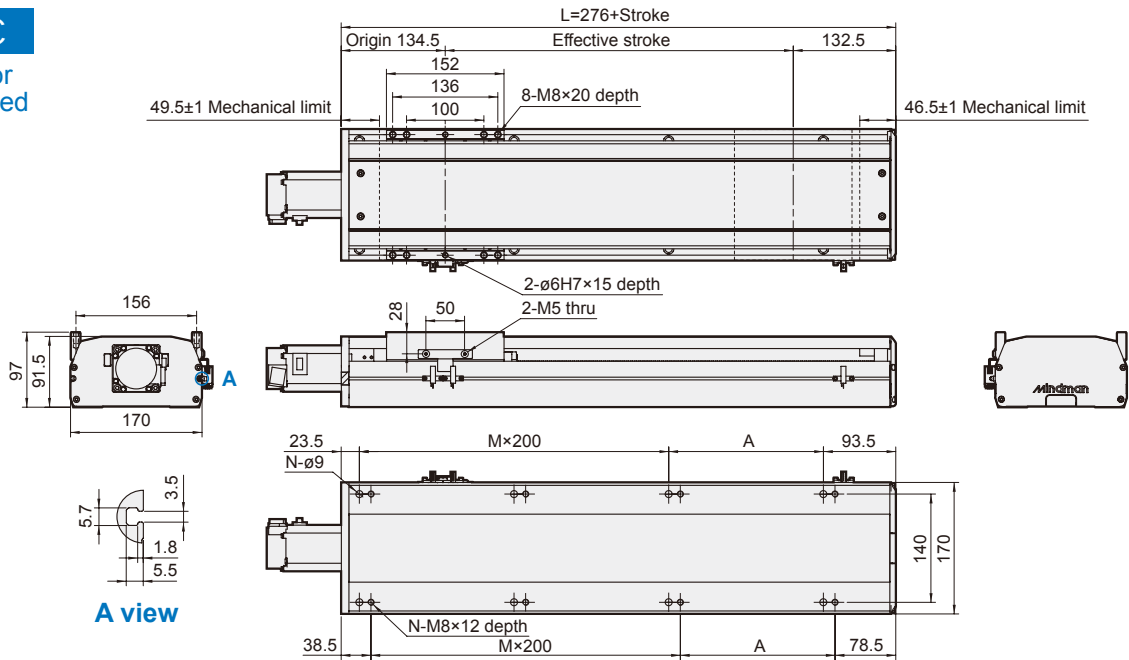
Gripper

Electric Actuator

Auxiliary Equipment

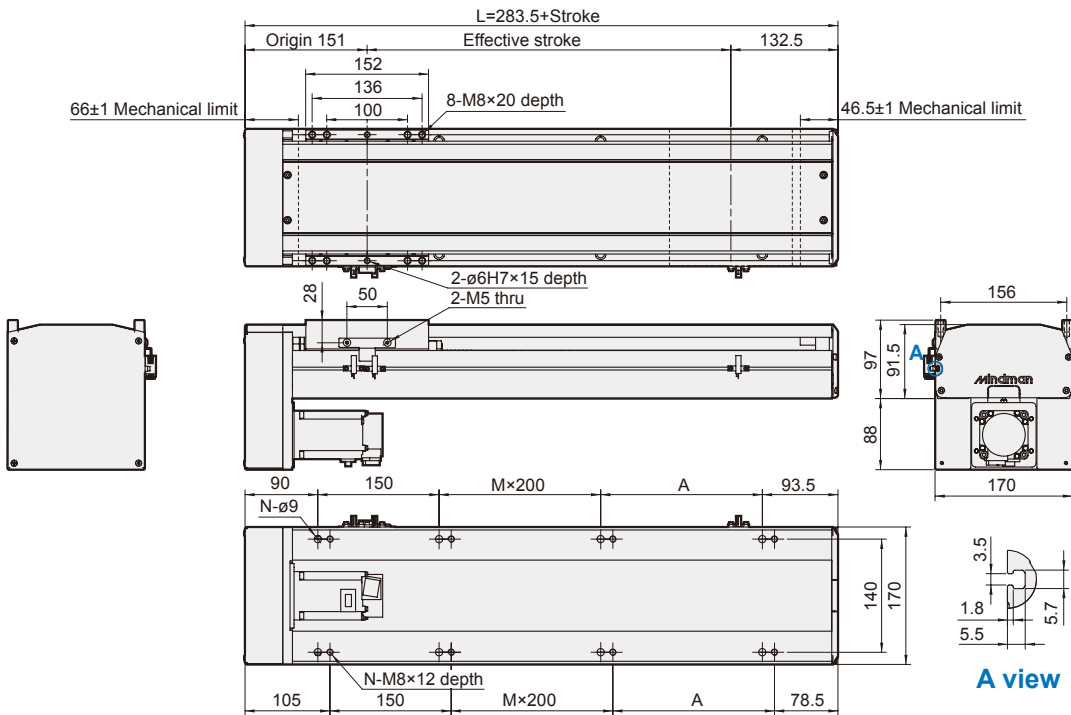
Hydraulic Cylinder

BC
Motor exposed



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
L	367	417	467	517	567	617	667	717	767	817	867	917	967	1017	1067	1117	1167	1217	1267	1317	1367	1417	1467
A	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150
M	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6
N	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16

BM
Motor bottom side



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
L	383.5	433.5	483.5	533.5	583.5	633.5	683.5	733.5	783.5	833.5	883.5	933.5	983.5	1033.5	1083.5	1133.5	1183.5	1233.5	1283.5	1333.5	1383.5	1433.5	1483.5
A	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150
M	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5
N	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16

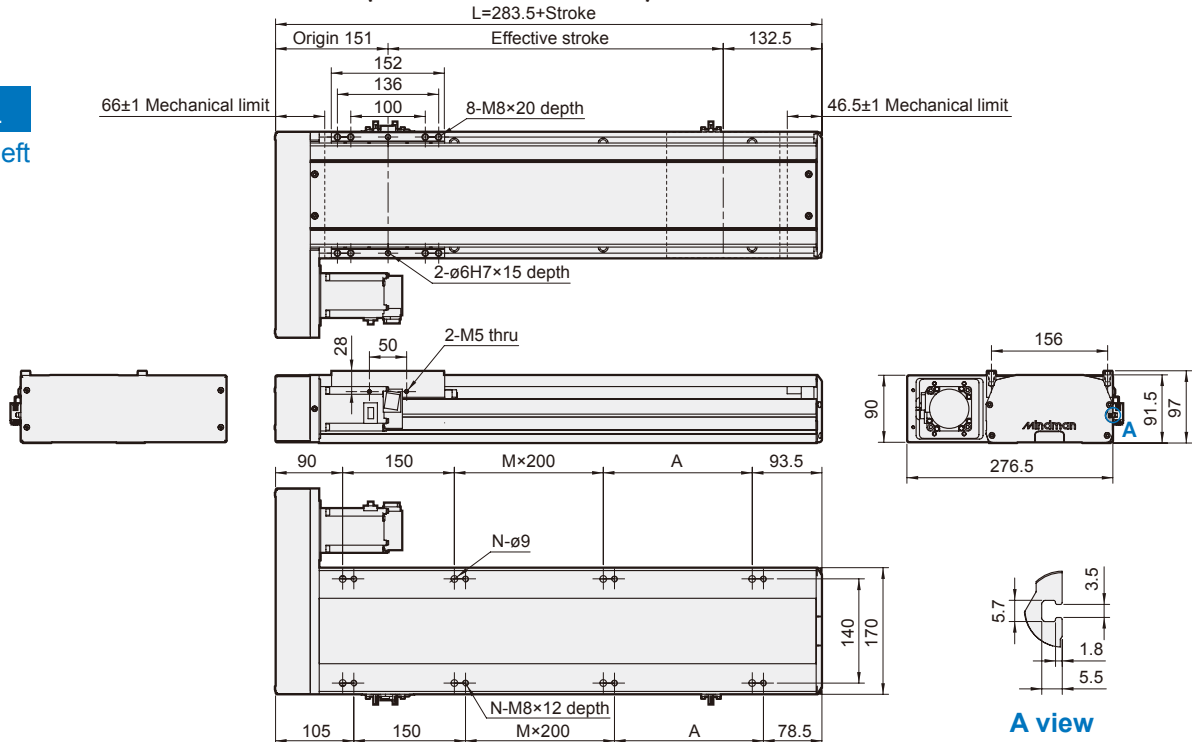
METS2-17 Dimensions



SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

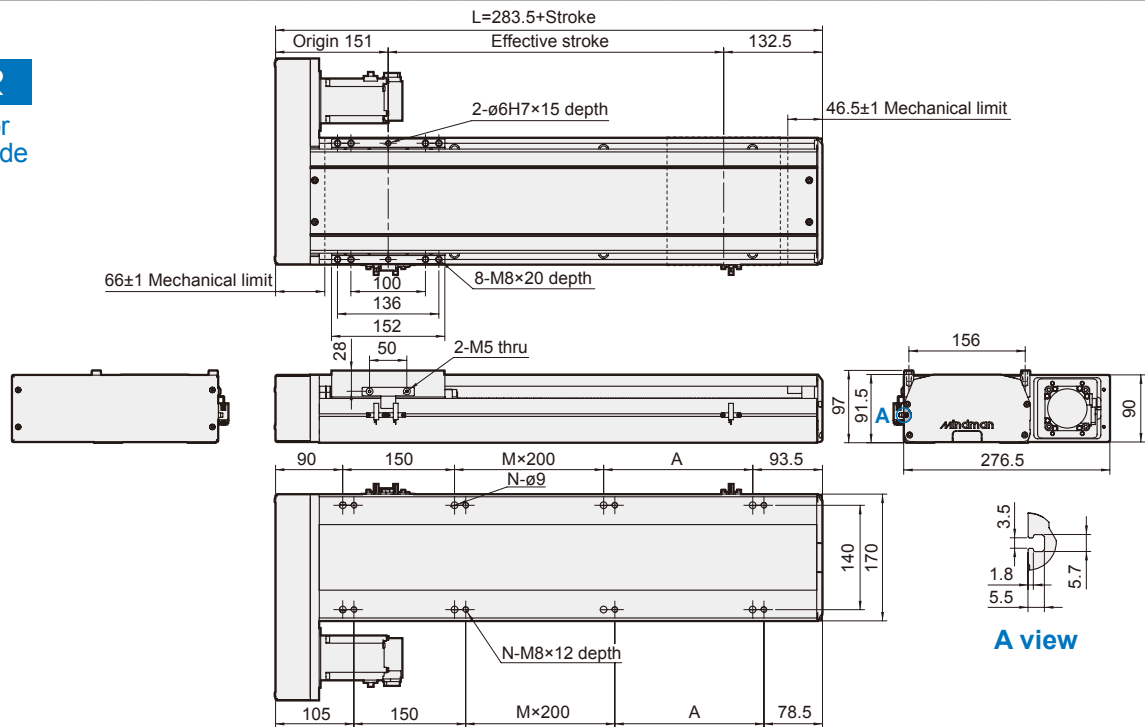
mindman

BL
Motor left side



Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
L	383.5	433.5	483.5	533.5	583.5	633.5	683.5	733.5	783.5	833.5	883.5	933.5	983.5	1033.5	1083.5	1133.5	1183.5	1233.5	1283.5	1333.5	1383.5	1433.5	1483.5
A	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150
M	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5
N	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16

BR
Motor right side



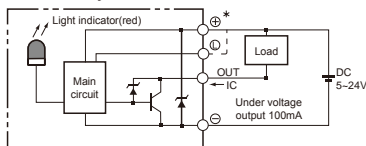
Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
L	383.5	433.5	483.5	533.5	583.5	633.5	683.5	733.5	783.5	833.5	883.5	933.5	983.5	1033.5	1083.5	1133.5	1183.5	1233.5	1283.5	1333.5	1383.5	1433.5	1483.5
A	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150
M	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5
N	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16



Specification

Model		METS-22			
Repeatability	(mm)	±0.01			
Ball screw lead	(mm)	5	10	25	40
Max. speed	(mm/s)	250	500	1250	2000
AC servo motor	(W)	750W			
Max. payload	Horizontal (kg)	150	150	120	60
	Vertical (kg)	55	45	20	10
Rated thrust	(N)	2563	1281	640	320
Stroke	(mm)	100~1500 / 50 pitch			
Ball screw	(mm)	C7ø25	C7ø25	C7ø25	C7ø20
High rigidity linear guide	(mm)	W23×H18			
Coupling	(mm)	17×19			12×19
Home sensor	Outside	EE-SX672 (NPN)			
	Built in	EE-SX674 (NPN)			

Sensor layout



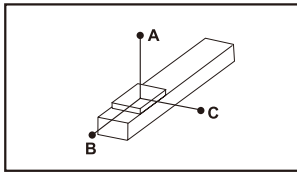
Order example

METS-22 - L10 - 100 - M - M75 B - C4 - 0001

- Model**: METS-22
- Size**: L10
- Stroke**: 100 mm (100~1500 mm, 50 mm pitch)
- Brakes**: B (With brake)
- Special order no.**: 0001

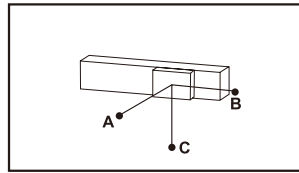
Ball screw lead		Motor position		Motor brand		Power output		Home sensor		Limit sensor	
L05	5 mm	M	Motor built-in	M	Mitsubishi	75	750W	In side		In side	
L10	10 mm	BC	Motor exposed	P	Panasonic			A	Motor side	1	1 Pc
L25	25 mm	BM	Motor bottom side	Y	Yaskawa			B	Opposite motor side	2	2 Pcs
L40	40 mm	BR	Motor right side	D	Delta			Out side		Out side	
		BL	Motor left side	E	Else	C	Motor side	3	1 Pc		
						D	Opposite motor side	4	2 Pcs		
						No sensor		No sensor			
						E	None	5	None		

Allowable overhang



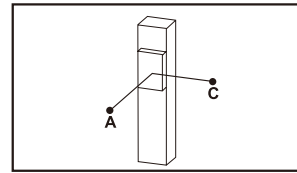
Unit: mm

Horizontal installation		A	B	C
Lead 5	60kg	3672	653	866
	100kg	3000	370	497
	150kg	2493	273	363
Lead 10	60kg	2652	899	994
	100kg	1775	526	593
	150kg	1396	317	267
Lead 25	50kg	2862	956	1191
	80kg	2412	581	773
	120kg	2025	373	556
Lead 40	10kg	4010	4010	3460
	30kg	3011	2003	1911
	60kg	2453	730	980



Unit: mm

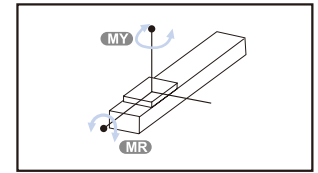
Wall installation		A	B	C
Lead 5	60kg	795	525	3657
	100kg	416	248	2993
	150kg	290	159	2479
Lead 10	60kg	982	815	2573
	100kg	569	442	1680
	150kg	337	232	1258
Lead 25	50kg	1207	879	2862
	80kg	779	504	2412
	120kg	515	295	2025
Lead 40	10kg	3057	4113	4113
	30kg	2112	2108	3387
	60kg	1020	668	2461



Unit: mm

Vertical installation		A	C
Lead 5	30kg	2688	2688
	50kg	1893	1893
	70kg	1640	1640
Lead 10	20kg	2297	2297
	30kg	1518	1518
	45kg	999	999
Lead 25	15kg	2767	2767
	20kg	2100	2100
	25kg	1702	1702
Lead 40	-	-	-
	-	-	-
	-	-	-

Static loading moment



Unit: N.m

MY	2052
MP	2052
MR	1810

Standard servo motors

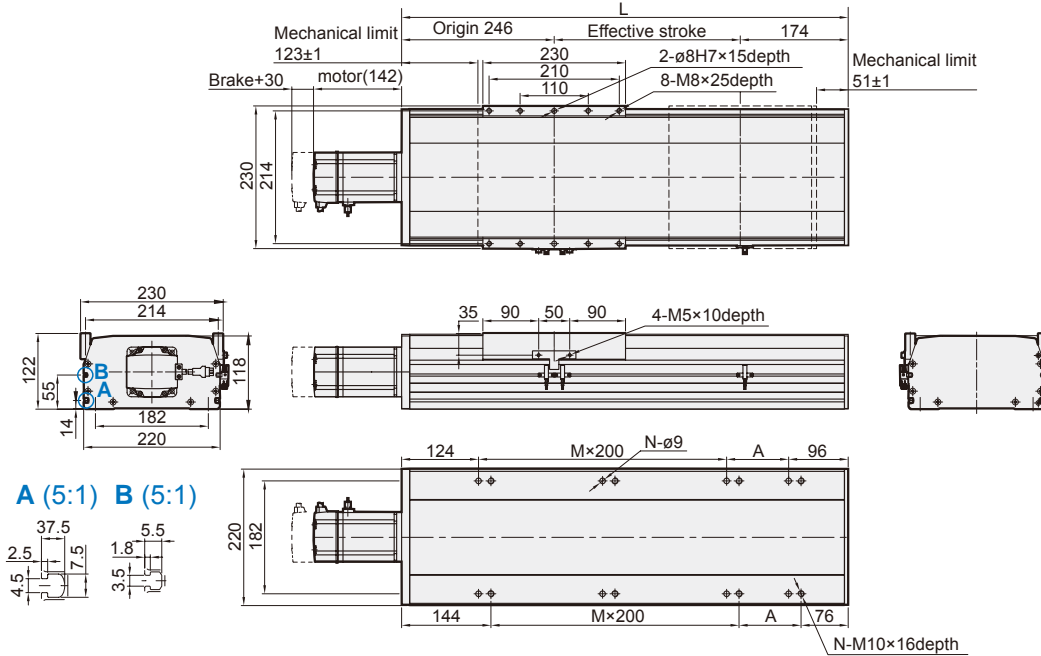
Brand	Mark	Brake	Watt	AC-Voltage	Motor model	Compatible driver model
Mitsubishi	M	No brake(Horizontal type)	750	220	HF-KP73	MR-J3-70A
		With brake(Vertical type)	750	220	HF-KP73B	MR-J3-70A
Panasonic	P	No brake(Horizontal type)	750	220	MHMD082P1S	MADDT3520
		With brake(Vertical type)	750	220	MHMD082P1T	MADDT3520
Delta	T	No brake(Horizontal type)	750	220	ECMA-C20807ES	ASD-B20721-B
		With brake(Vertical type)	750	220	ECMA-C20807FS	ASD-B20721-B

METS-22 Dimensions – Servo motor 750W



SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

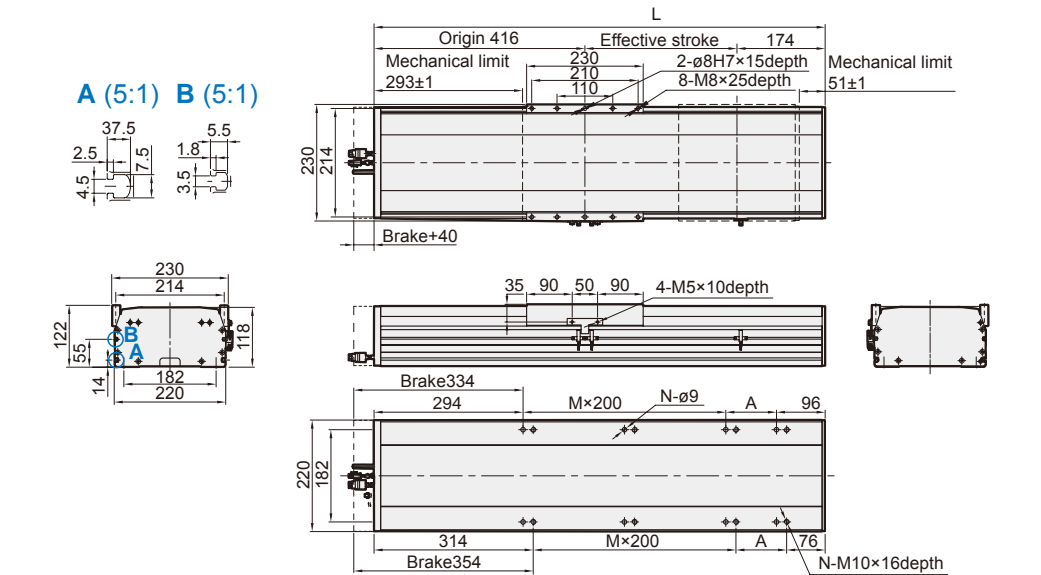
BC
Motor exposed



Unit: mm

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
L	520	570	620	670	720	770	820	870	920	970	1020	1070	1120	1170	1220	1270	1320	1370	1420	1470	1520	1570	1620	1670	1720	1770	1820	1870	1920
A	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	7	8	8
N	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20
KG	26.86	28.32	29.78	31.24	32.7	34.16	35.62	37.08	38.54	40	41.46	42.92	44.38	45.84	47.3	48.76	50.22	51.68	53.14	54.6	56.06	57.52	58.98	60.44	61.9	63.36	64.82	66.28	67.74

M
Motor built-in



Unit: mm

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
L	690	740	790	840	890	940	990	1040	1090	1140	1190	1240	1290	1340	1390	1440	1490	1540	1590	1640	1690	1740	1790	1840	1890	1940	1990	2040	2090
A	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8
N	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20
KG	29.32	30.79	32.26	33.73	35.2	36.67	38.14	39.61	41.08	42.55	44.02	45.49	46.96	48.43	49.9	51.37	52.84	54.31	55.78	57.25	58.72	60.19	61.66	63.13	64.6	66.07	67.54	69.01	70.48

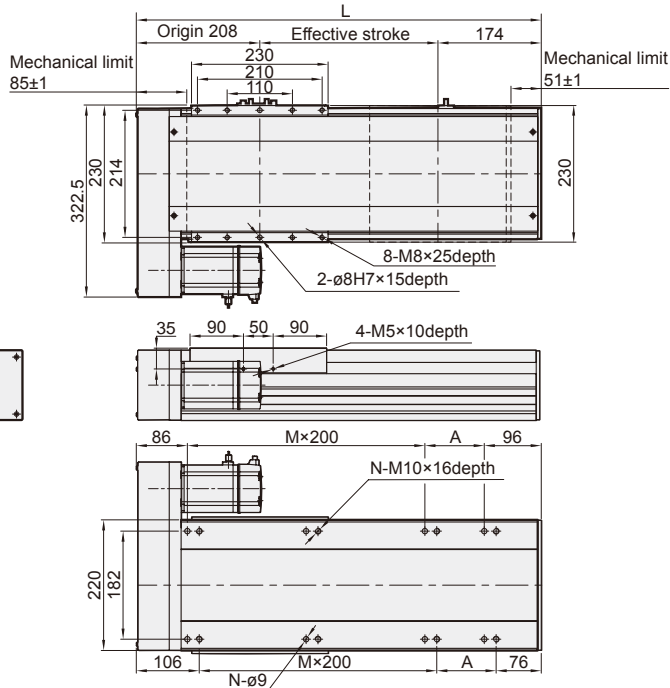
METS-22 Dimensions – Servo motor 750W



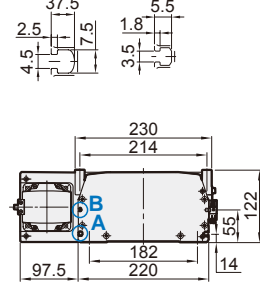
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

BL

Motor on left side



A (5:1) B (5:1)

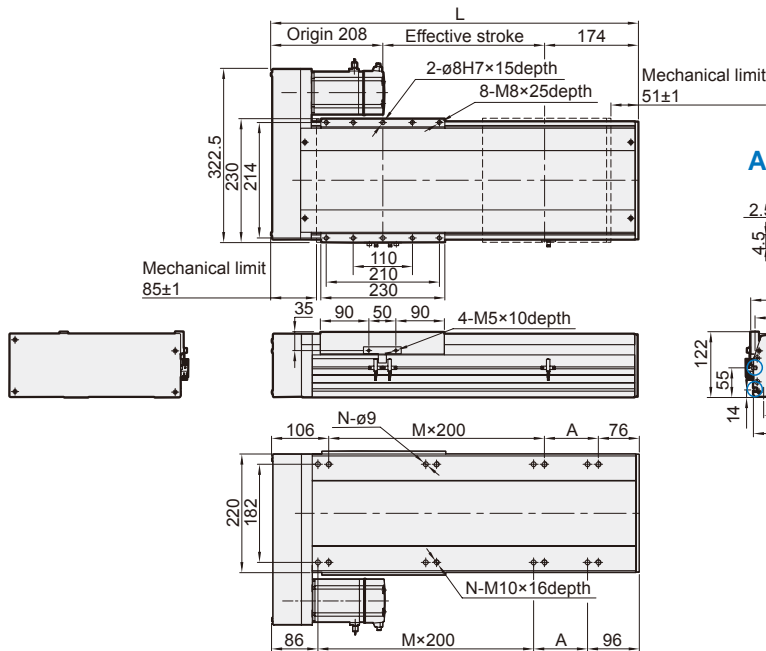


Unit: mm

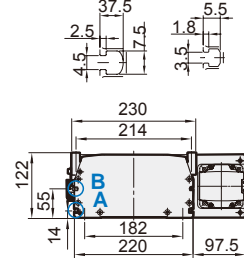
Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
L	482	532	582	632	682	732	782	832	882	932	982	1032	1082	1132	1182	1232	1282	1332	1382	1432	1482	1532	1582	1632	1682	1732	1782	1832	1882
A	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8
N	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20
KG	25.66	27.12	28.58	30.04	31.5	32.96	34.42	35.88	37.34	38.8	40.26	41.72	43.18	44.64	46.1	47.56	49.02	50.48	51.94	53.4	54.86	56.32	57.78	59.24	60.7	62.16	63.62	65.08	66.54

BR

Motor on right side



A (5:1) B (5:1)



Unit: mm

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
L	482	532	582	632	682	732	782	832	882	932	982	1032	1082	1132	1182	1232	1282	1332	1382	1432	1482	1532	1582	1632	1682	1732	1782	1832	1882
A	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8
N	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20
KG	25.66	27.12	28.58	30.04	31.5	32.96	34.42	35.88	37.34	38.8	40.26	41.72	43.18	44.64	46.1	47.56	49.02	50.48	51.94	53.4	54.86	56.32	57.78	59.24	60.7	62.16	63.62	65.08	66.54

METS-22 Dimensions – Servo motor 750W

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

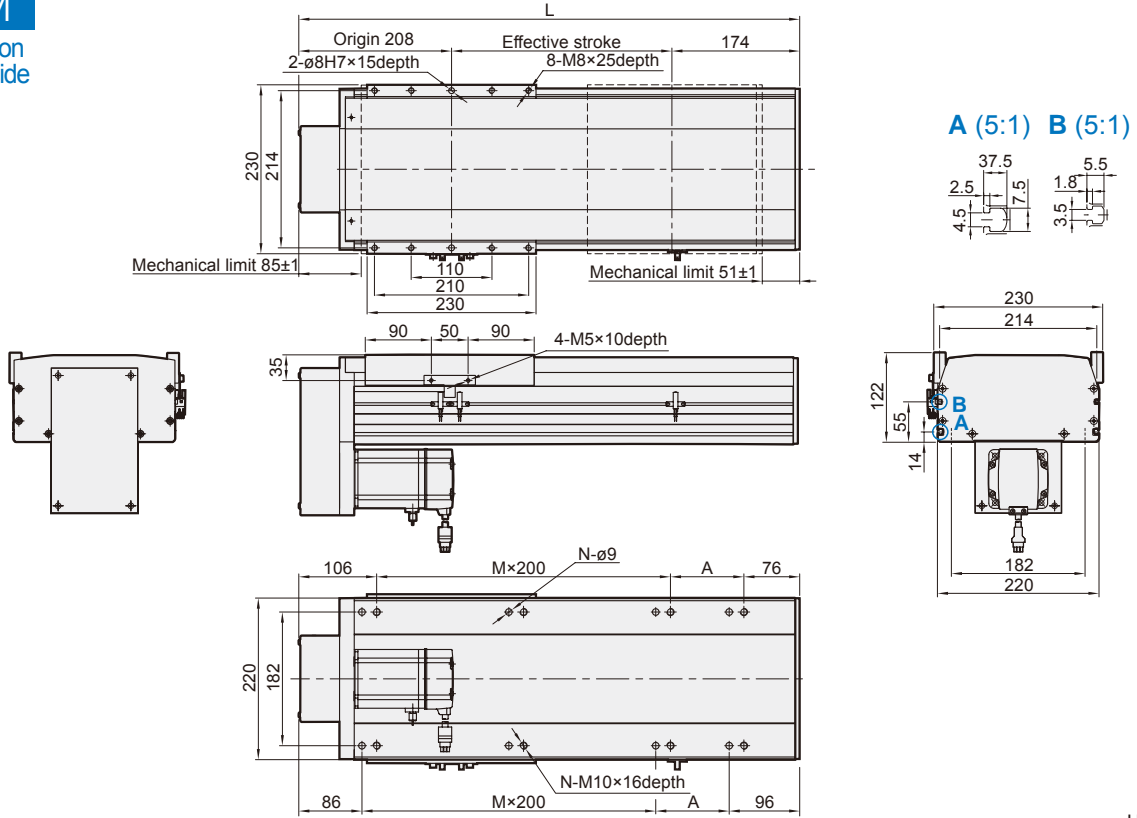
Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

BM

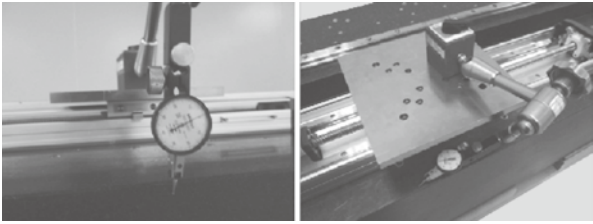
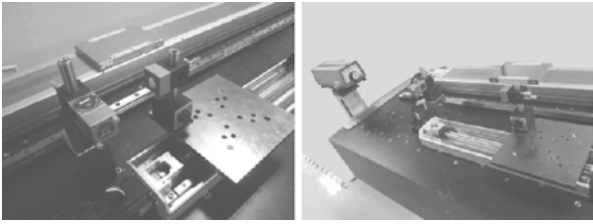
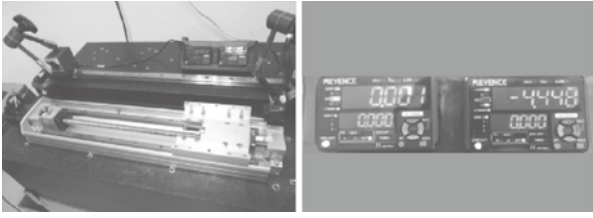
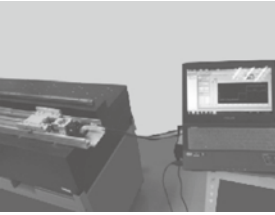


Motor on lower side




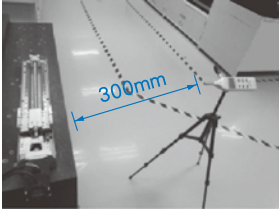
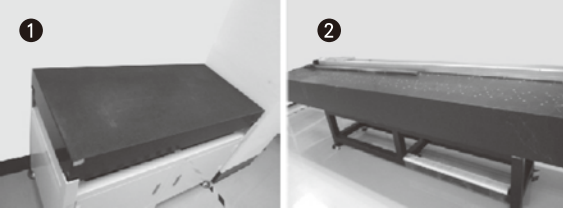
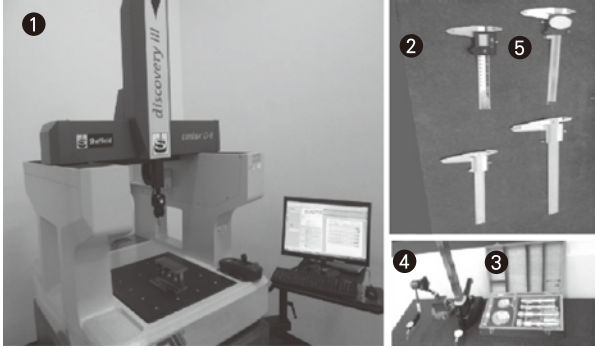
Unit: mm

Stroke	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
L	482	532	582	632	682	732	782	832	882	932	982	1032	1082	1132	1182	1232	1282	1332	1382	1432	1482	1532	1582	1632	1682	1732	1782	1832	1882
A	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100	150	200	50	100
M	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7	7	8	8
N	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20
KG	25.66	27.12	28.58	30.04	31.5	32.96	34.42	35.88	37.34	38.8	40.26	41.72	43.18	44.64	46.1	47.56	49.02	50.48	51.94	53.4	54.86	56.32	57.78	59.24	60.7	62.16	63.62	65.08	66.54

Measuring tools

		1. Parallelism testing / Height testing	
		Measuring tools	Dial gauge and Dial indicator
		2. Absolute straightness accuracy testing	
		Measuring tools	Laser interferometer detection
		3. Absolute straightness accuracy testing	
		Measuring tools	Laser position detection
		4. Power drive situation testing by motor electric current	
		Measuring tools	Mitsubishi servo driver 100W, 200W, 400W
		5. Smoothness testing	
		Measuring tools	Pull tension gauge
		Measuring methods	<ol style="list-style-type: none"> 1. Fix the actuator on granite. 2. Push the slider using pull tension gauge. 3. As photo display. 4. Record it as a reference.

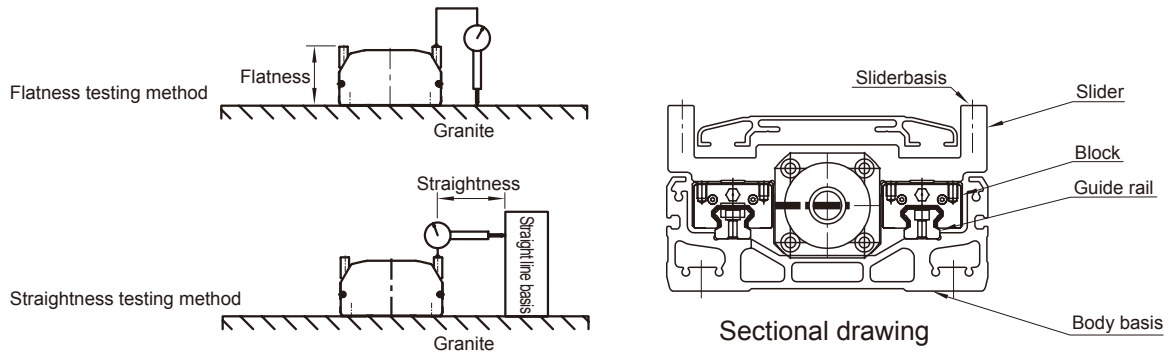
Measuring tools

	6. Belt tension testing	
Measuring tools	Pull tension gauge	
Measuring methods	<ol style="list-style-type: none"> 1. Fix the actuator on granite. 2. Use belt tension gauge to test the vibration of the belt. 3. As photo display. 4. Record it on shipping testing. 	
	7. Decibel testing	
Measuring tools	Decibel meter	
Measuring methods	<ol style="list-style-type: none"> 1. Fix the actuator on granite. 2. Decibel meter put at the distance of 300mm. 3. Use motor to drive actuator in high speed. 4. As photo display. 5. Record it on shipping testing report. 	
	8. Measuring tool- Granite platform	
Granite specifications	<ol style="list-style-type: none"> 1. Size 1295mm*600mm*140mm 2. Size 4020mm*800mm*300mm 	
	9. Material tools	
Measuring tools	<ol style="list-style-type: none"> 1. 3D Inspection testing machine. 2. Electronic vernier caliper, vernier caliper. 3. Inside micrometer, outside micrometer. 4. Altimeter, vertical meter. 5. Electronic level meter. 6. Dial gauge, Dial indicator. 7. Steel tape, Steel ruler. 	
Measuring tools calibration standards	Block gauge, ring gauge (regularly qualified) QC Room <ol style="list-style-type: none"> 1. Control temperature and humidity to keep the stability of the measurement. 2. Measuring tools calibrate regularly. 	

Flatness and straightness standard

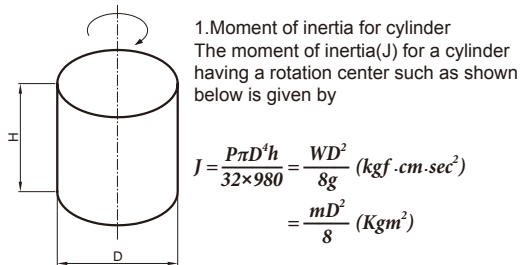
Flatness standard=The parallelism of body basis and slider basis is less then 0.05mm/M

Straightness standard=The parallelism of slider basis and straight line basis is less then 0.05mm/M



Equation of moment of inertia calculation

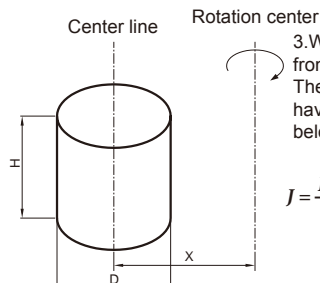
Usually the load is not simple form, and the calculation of the moment of inertia is not easy. As a method, load is replaced with several factors that resemble a simple form for which the moment of inertia can be calculated. The total of the moment of inertia for these factors is the obtained. The objects and equations often used for the calculation of the moment of inertia are shown below.



$$J = \frac{P\pi D^4 h}{32 \times 980} = \frac{WD^2}{8g} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{mD^2}{8} \text{ (Kgm}^2\text{)}$$

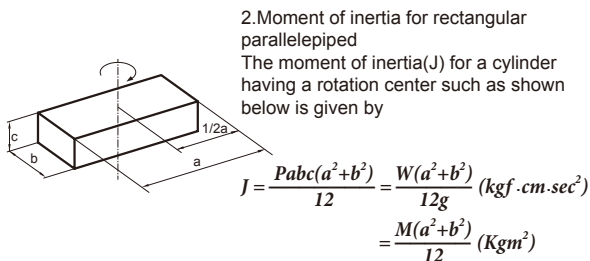
P = Density (kg/cm³)
g = Gravitational acceleration (cm/sec²)
W =Weight of cylinder (kgf)
m = Mass of cylinder (kg)



$$J = \frac{P\pi D^4 h}{32} + \frac{P\pi D^4 h}{4} = \frac{WD^2}{8g} + \frac{WX^2}{G} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{mD^2}{8} + mX^2 \text{ (Kgm}^2\text{)}$$

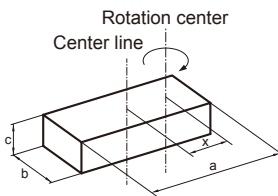
P = Density (kg/cm³)
g = Gravitational acceleration (cm/sec²)
W =Weight of cylinder (kgf)
m = Mass of cylinder (kg)



$$J = \frac{Pabc(a^2+b^2)}{12} = \frac{W(a^2+b^2)}{12g} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{M(a^2+b^2)}{12} \text{ (Kgm}^2\text{)}$$

P = Density (kg/cm³)
g = Gravitational acceleration (cm/sec²)
W =Weight of cylinder (kgf)
m = Mass of cylinder (kg)



$$J = \frac{Pabc(a^2+b^2)}{12} + \frac{PabcX^2}{G}$$

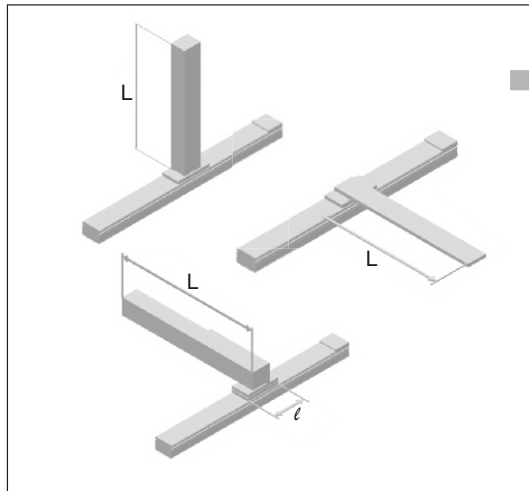
$$= \frac{W(a^2+b^2)}{12g} + \frac{WX^2}{G} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{M(a^2+b^2)}{12} + mX^2 \text{ (Kgm}^2\text{)}$$

W =Weight of prism (kgf)
m = Mass of prism (kg)

Overhang load length

An overhang load length is specified for a slider-type actuator to indicate the length of overhang (offset) from the actuator. When the length of an object mounted to the slider actuator exceeds this length, it will generate vibration and increase the setting time. So, pay attention to the allowable overhang length as well as the allowable dynamic moment.



The allowable overhang load length is determined by the slider length.

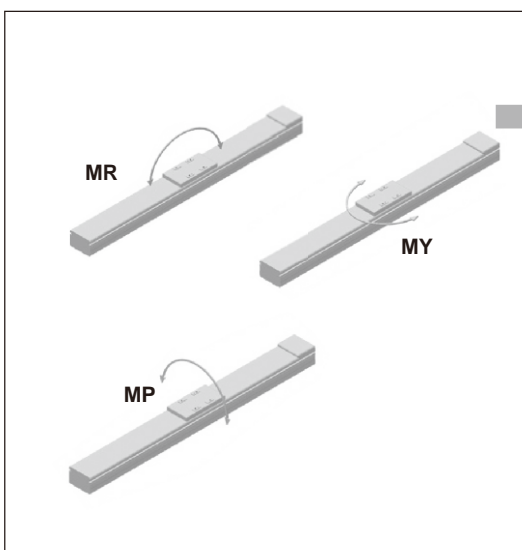
An overhang that exceeds the allowable overhang length will generate vibration and increase settling time.

$L/l = 5$ Within
* Between 3 to 4 for a camera equipped measuring machine.

- For example
 $L/l = 1.2$ Mechanical machine
 $L/l = 3$ Mechanical machine
 $L/l = 5$ Robot

Allowable dynamic moment

The allowable dynamic moment is the maximum offset load exerted on the slider, calculated from the guide life. The direction in which force is exerted on the guide is categorized into 3 directions-MP(pitch), MY(yaw), MR(roll)-the tolerance for each of which are set for each actuator. Applying a moment exceeding the allowable value will reduce the service life of the actuator. Use an auxiliary guide when working within or in excess of these tolerances.



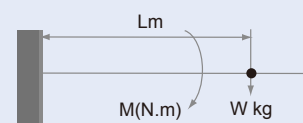
The allowable dynamic moment is calculated from the service life of the guide.

Over the moment would reduce the life of actuator.

*Moment is based on the following basis

$$M(\text{N.m}) = W(\text{kg}) \times L(\text{m}) \times 9.8$$

$W(\text{kg}) = \text{Load}$
 $L(\text{m}) = \text{Distance from work point to the center of gravity of payload.}$



Lead accuracy

PMI's precision ground ball screws are controlled in accordance with JIS B 1192. The permissible values and each part of definitions are shown below.

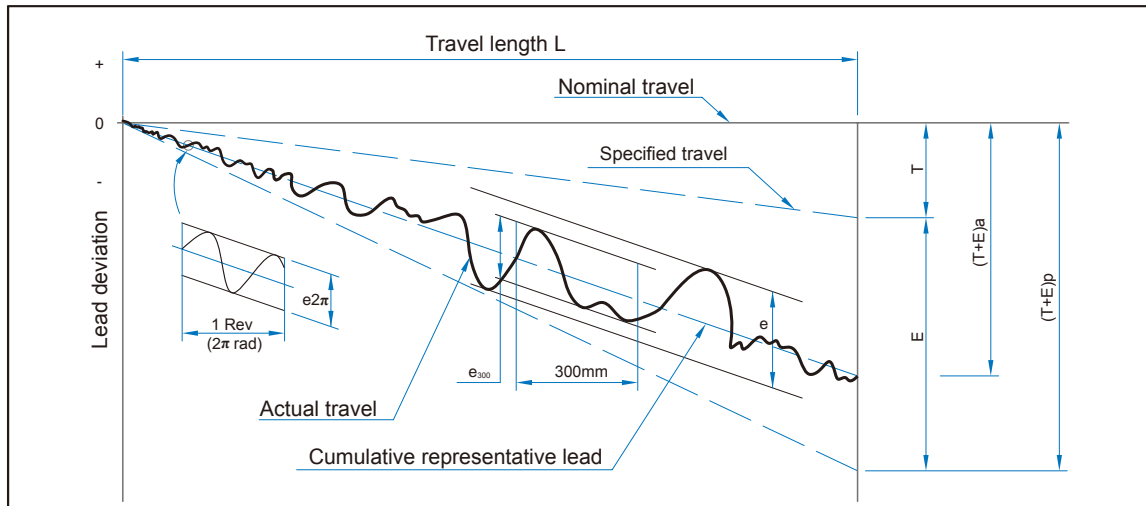


Fig.1 Technical terms concerning the lead

■ Table 1 Terms

T+E	Cumulative representative lead	Cumulative representative lead. A straight line representing the tendency of the cumulative actual lead. This is obtained by least square method and measured by laser system.
P		Permissible value.
a		Actual value.
T	Specified travel specify the target value	Specified travel. This value is determined by customer and maker as it depends on different application requirements.
E	Cumulative representative lead error	Accumulated reference lead deviation. This is allowable deviation of specified travel. It is decided by both of the accuracy grade and effective thread length.
e	Change	Total relative lead variation maximum width of variation over the travel length.
e₃₀₀		Lead deviation in random 300 mm.
e_{2π}		Lead deviation in random 1 revolution 2π rad.

■ Table 2 Accumulated reference lead deviation ($\pm E$) and total relative variation (e)

Effective thread length (mm)	Grade		C0		C1		C2		C3		C4		C5		C6	C7	C8
	E	e	E	e	E	e	E	e	E	e	E	e	E	e			
Over up to	E	e	E	e	E	e	E	e	E	e	E	e	E	e	± 0.025	± 0.050	± 0.120
315	4	3.5	6	5	5	7	12	8	12	12	23	18					
315 400	5	3.5	7	5	7	7	13	10	14	12	25	20	300mm	300mm	300mm		
400 500	6	4	8	5	8	7	15	10	16	12	27	20					
500 630	6	4	9	6	9	7	16	12	18	14	30	23					
630 800	7	5	10	7	10	7	18	13	20	14	35	25					
800 1000	8	6	11	8	11	8	21	15	22	16	40	27					
1000 1250	9	6	13	9	13	9	24	16	25	18	46	30					
1250 1600	11	7	15	10	15	10	29	18	29	20	54	35					
1600 2000			18	11	18	11	35	21	35	22	65	40					
2000 2500			22	12	21	13	41	24	41	25	77	46					
2500 3150			26	15	25	15	50	29	50	29	93	54					
3150 4000			32	18	30	18	62	35	62	35	115	65					
4000 5000					36	21	76	41	76	41	140	77					
5000 6300							85	50	85	50	170	96					
6300 8000							106	62	106	62	213	115					
8000									132	75	265	140					

■ Table 3 Accuracy grade

Variation in random 300mm (e_{300}) and wobble ($e_{2\pi}$)

α_{522}

Grade	C0	C1	C2	C3	C4	C5	C6	C7	C10
JIS	3.5	5		8		18		50	210
PMI	3.5	5	7	8	12	18	25	50	210

$\alpha_{4\pi}$

Grade	C0	C1	C2	C3	C4	C5
JIS	3	4		6		8
PMI	3	4	4	6	8	8



Specification

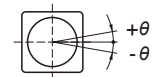
Model		MEQG-5				
Repeatability	(mm)	±0.01				
Ball screw lead	(mm)	2	5	10	20	
Maximum speed (*1)	(mm/s)	100	250	500	1000	
Maximum payload (*2)	Horizontal	(kg)	30	30	15	10
	Vertical	(kg)	10	10	5	2.5
Rated thrust	(N)	854	341	170	85	
Stroke / pitch	(mm)	50~600 / 50 Pitch				
Motor output	(W)	100				
Ball screw spec	(mm)	C7ø12				
Coupling	(mm)	7×8				
Home sensor (Outside)		CS-6T (NPN)				
Anti-rotating accuracy (*3) (θ)		±0°				

*1. Acceleration and deceleration value is set 0.2 second.

*2. If payload is near maximum, it requires to collocate externally with auxiliary radial load.

*3. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod. This may cause deformation of the anti-rotating guide, abnormal responses of the auto switch, play in the internal guide or an increase in the sliding resistance.

Anti-rotating accuracy of rod



Order example

MEQG-5 — **L05** — **100** — **BC** — **M10B** — **C4** — **0001**

Model Size Stroke Special order no.

50~600 mm
50 mm pitch

Ball screw lead		Motor position		Motor brand, power output, brakes				Home sensor		Limit sensor		
L02	2 mm	BC	Exposed	SERVO motor				Out side		Out side		
L05	5 mm	BM	On lower side	M	Mitsubishi	10	100W	B	C	Motor side	3	1 Pc
L10	10 mm	BR	On right side	P	Panasonic				D	Opposite motor side	4	2 Pcs
L20	20 mm	BL	On left side	Y	Yaskawa				No sensor		No sensor	
				T	Delta				E	None	5	None

* Need not show B with no brake.

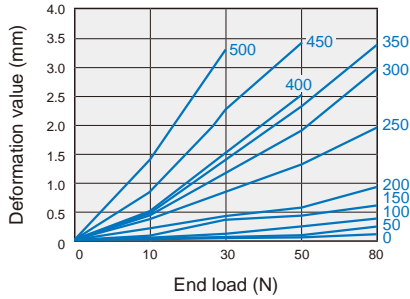
MEQG-5 Performance charts

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

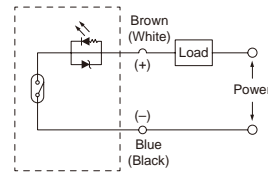


Shaft output deformation value

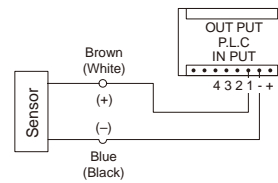
This form is only reference values.



Sensor layout



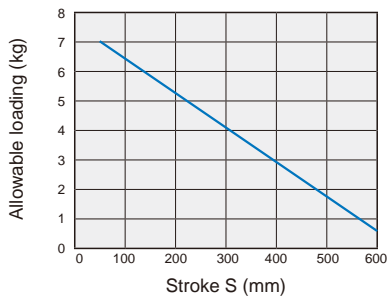
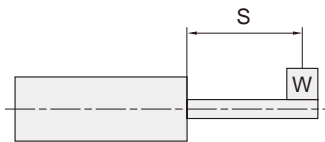
General load:
Such as relay or other resistive load.



Programmable controller connection diagram.

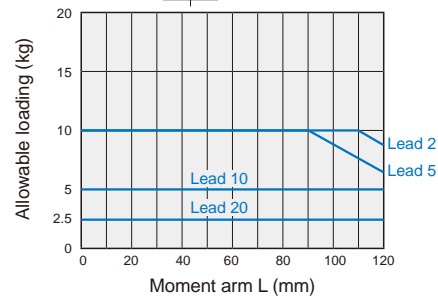
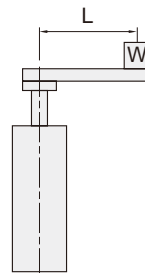
Allowable installation load

No external auxiliary mechanism, extension distance of load = 0



Load in vertical installation

Calculation conditions: 3000 rpm/min, acceleration and deceleration: 0.2s



Standard servo motors

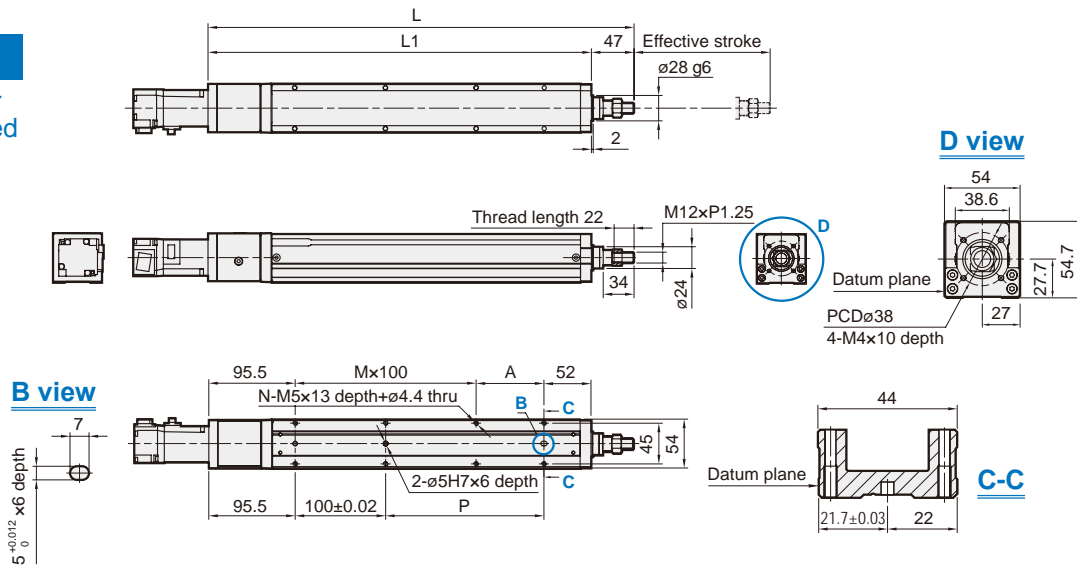
Brand	Mark	Brake	Watt	AC-Voltage	Motor model	Compatible driver model
Mitsubishi	M	No brake(Horizontal type)	100	220	HG-KR13	MR-J4-10A
		With brake(Vertical type)	100	220	HG-KR13B	MR-J4-10A
Panasonic	P	No brake(Horizontal type)	100	220	MSMD012G1U	MADHT1505
		With brake(Vertical type)	100	220	MSMD012G1V	MADHT1505
Delta	T	No brake(Horizontal type)	100	220	ECMA-C20401ES	ASD-B20221-B
		With brake(Vertical type)	100	220	ECMA-C20401FS	ASD-B20221-B

MEQG-5 Dimensions

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)



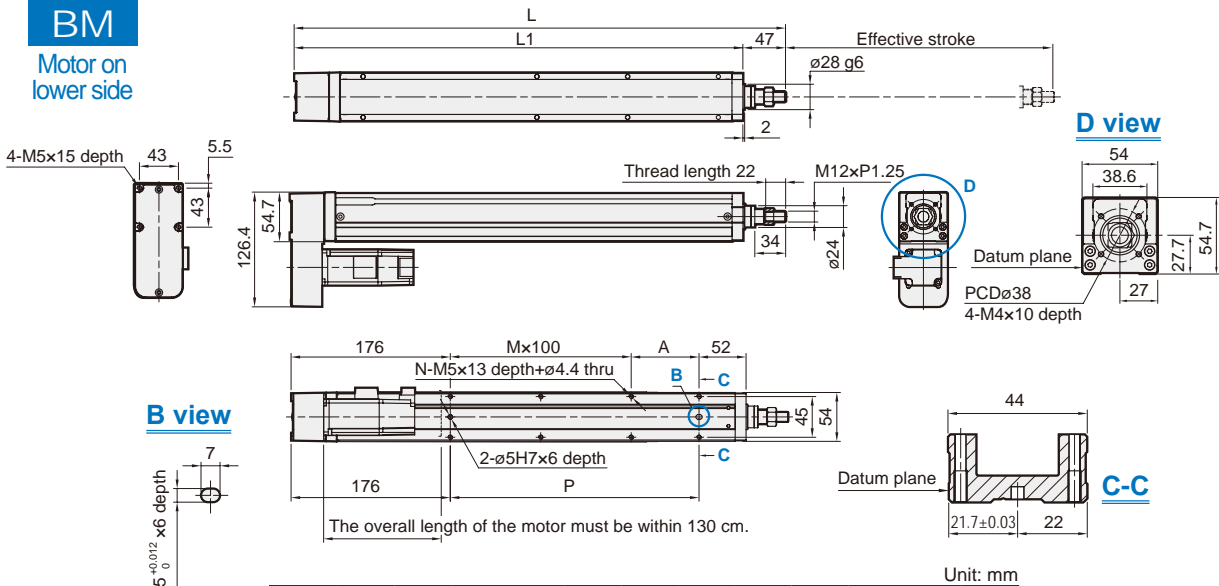
BC
Motor exposed



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600
L	319.5	369.5	419.5	469.5	519.5	569.5	619.5	669.5	719.5	769.5	819.5	869.5
L1	272.5	322.5	372.5	422.5	472.5	522.5	572.5	622.5	672.5	722.5	772.5	822.5
A	25	75	25	75	25	75	25	75	25	75	25	75
M	1	1	2	2	3	3	4	4	5	5	6	6
N	6	6	8	8	10	10	12	12	14	14	16	16
P	25	75	125	175	225	275	325	375	425	475	525	575
KG	2.17	2.36	2.56	2.76	2.95	3.15	3.35	3.54	3.74	3.94	4.13	4.33

BM
Motor on lower side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600
L	300	350	400	450	500	550	600	650	700	750	800	850
L1	253	303	353	403	453	503	553	603	653	703	753	803
A	25	75	25	75	25	75	25	75	25	75	25	75
M	0	0	1	1	2	2	3	3	4	4	5	5
N	4	4	6	6	8	8	10	10	12	12	14	14
P	25	75	125	175	225	275	325	375	425	475	525	575
KG	2.34	2.53	2.73	2.93	3.12	3.32	3.52	3.71	3.91	4.11	4.3	4.5

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.



Specification

Model		MEQG-8			
Repeatability	(mm)	±0.01			
Ball screw lead	(mm)	5	10	20	
Maximum speed (*1)	(mm/s)	250	500	1000	
Maximum payload (*2)	Horizontal	(kg)	50	30	18
	Vertical	(kg)	15	8	3
Rated thrust (*3)	(N)	683 (1388)	341 (694)	174 (347)	
Stroke / pitch (*4)	(mm)	50~800 / 50 Pitch			
Motor output	(W)	200, 400			
Ball screw spec.	(mm)	C7ø16			
Coupling	(mm)	10x14/11(*6)			
Home sensor (Outside)		CS-6T (NPN)			
Anti-rotating accuracy (*5)	(θ)	±0°			

*1. Acceleration and deceleration value is set 0.2 second.

*2. If payload is near maximum, it requires to collocate externally with auxiliary radial load.

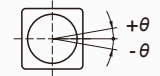
*3. () The value for power output 400W.

*4. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstances.

*5. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod. This may cause deformation of the anti-rotating guide, abnormal responses of the auto switch, play in the internal guide or an increase in the sliding resistance.

*6. Motor 200W shaft diameter: Panasonic: 11mm, Other: 14 mm.

Anti-rotating accuracy of rod



Order example

MEQG-8 - L10 - 100 - BC - M20B - C4 - 0001

Model

Size

Stroke

Special order no.

50~800 mm
50 mm pitch

Ball screw lead		Motor position		Motor brand, power output, brakes				Home sensor		Limit sensor		
L05	5 mm	BC	Exposed	SERVO motor				Out side		Out side		
L10	10 mm	BM	On lower side	M	Mitsubishi	20 40	200W 400W	B	C	Motor side	3	1 Pc
L20	20 mm	BR	On right side	P	Panasonic				D	Opposite motor side	4	2 Pcs
		BL	On left side	Y	Yaskawa				No sensor		No sensor	
				T	Delta				E	None	5	None

* Need not show **B** with no brake.

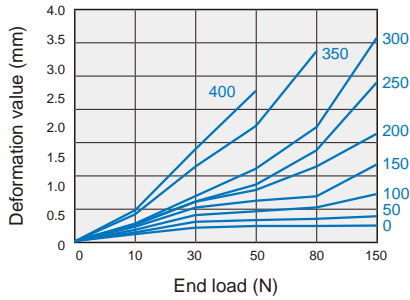
MEQG-8 Performance charts

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

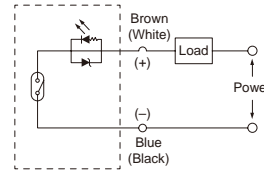


Shaft output deformation value

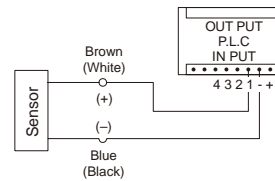
This form is only reference values.



Sensor layout



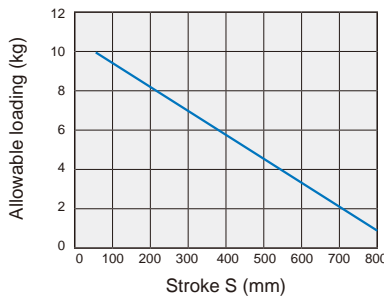
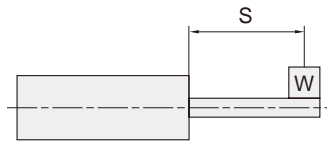
General load:
Such as relay or other resistive load.



Programmable controller connection diagram.

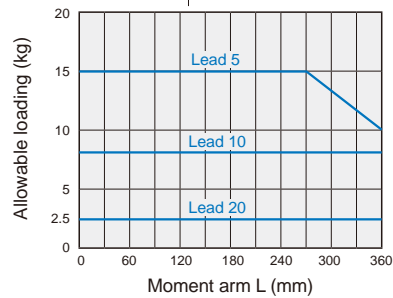
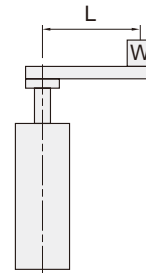
Allowable installation load

No external auxiliary mechanism, extension distance of load = 0



Load in vertical installation

Calculation conditions: 3000 rpm/min, acceleration and deceleration: 0.2s



Standard servo motors

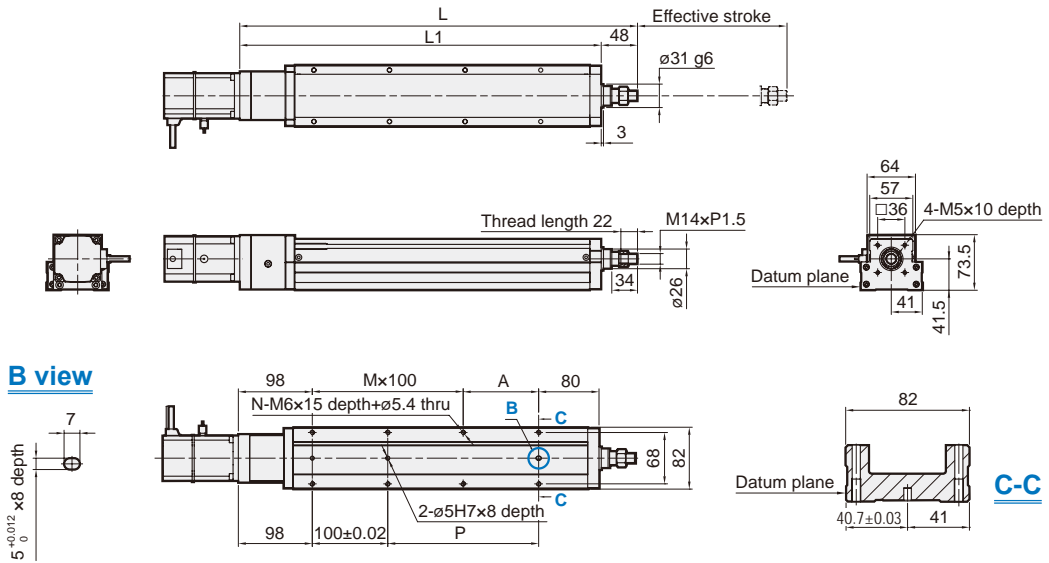
Brand	Mark	Brake	Watt	AC-Voltage	Motor model	Compatible driver model
Mitsubishi	M	No brake(Horizontal type)	200	220	HG-KR23	MR-J4-20A
			400	220	HG-KR43	MR-J4-40A
		With brake(Vertical type)	200	220	HG-KR23B	MR-J4-20A
			400	220	HG-KR43B	MR-J4-40A
Panasonic	P	No brake(Horizontal type)	200	220	MHMD022G1U	MADHT1507
			400	220	MHMD042G1U	MBDHT2510
		With brake(Vertical type)	200	220	MHMD022G1V	MADHT1507
			400	220	MHMD042G1V	MBDHT2510
Delta	T	No brake(Horizontal type)	200	220	ECMA-C20602ES	ASD-B20221-B
			400	220	ECMA-C20604ES	ASD-B20421-B
		With brake(Vertical type)	200	220	ECMA-C20602FS	ASD-B20221-B
			400	220	ECMA-C20604FS	ASD-B20421-B

MEQG-8 Dimensions

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)



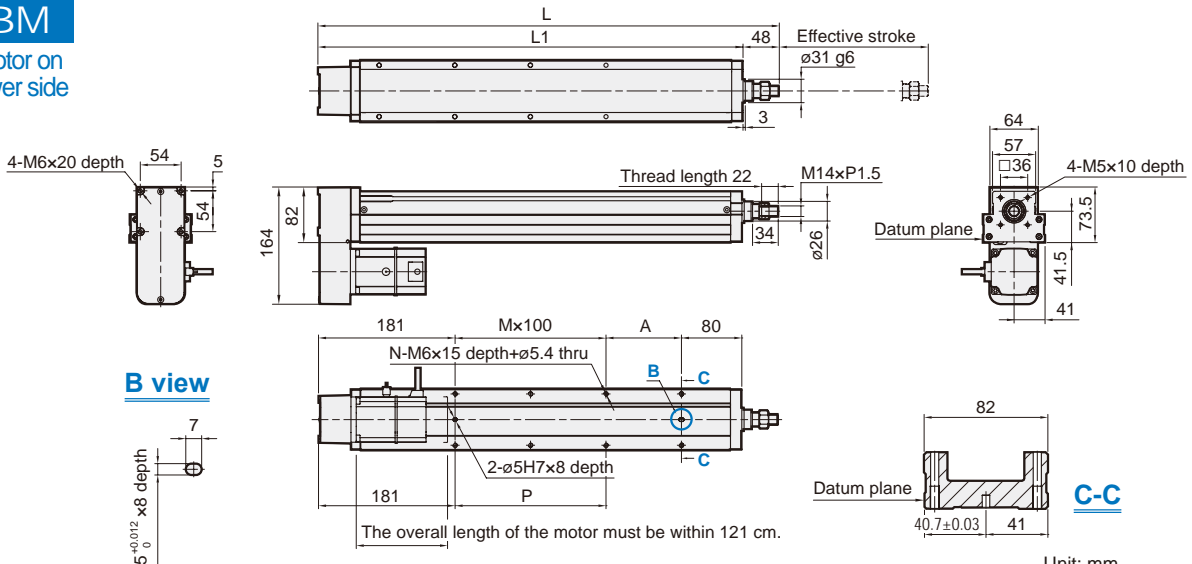
BC
Motor exposed



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	376	426	476	526	576	626	676	726	775	826	876	926	976	1026	1076	1126
L1	328	378	428	478	528	578	628	678	728	778	828	878	928	978	1028	1078
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
KG	5.08	5.44	5.81	6.17	6.54	6.9	7.27	7.63	8	8.36	8.73	9.09	9.46	9.82	10.19	10.55

BM
Motor on lower side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	359	409	459	509	559	609	659	709	775	809	859	909	959	1009	1059	1109
L1	311	361	411	461	511	561	611	661	711	761	811	861	911	961	1011	1061
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7
N	4	4	6	6	8	8	10	10	12	12	14	14	16	16	18	18
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
KG	5.82	6.17	6.53	6.88	7.24	7.59	7.95	8.3	8.66	9.01	9.37	9.72	10.08	10.43	10.79	11.14

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

MEQG-8 Dimensions

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

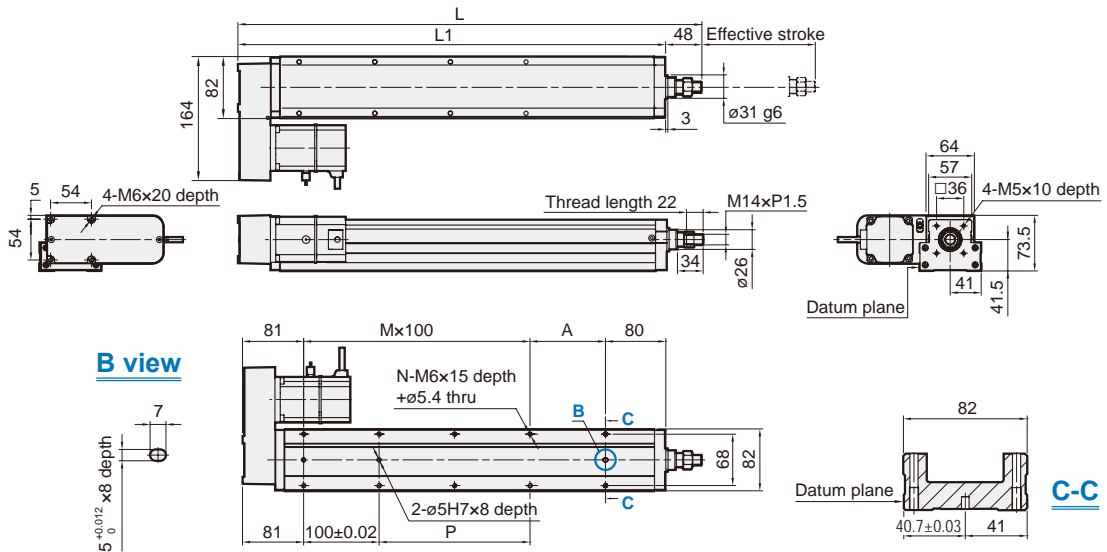
Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

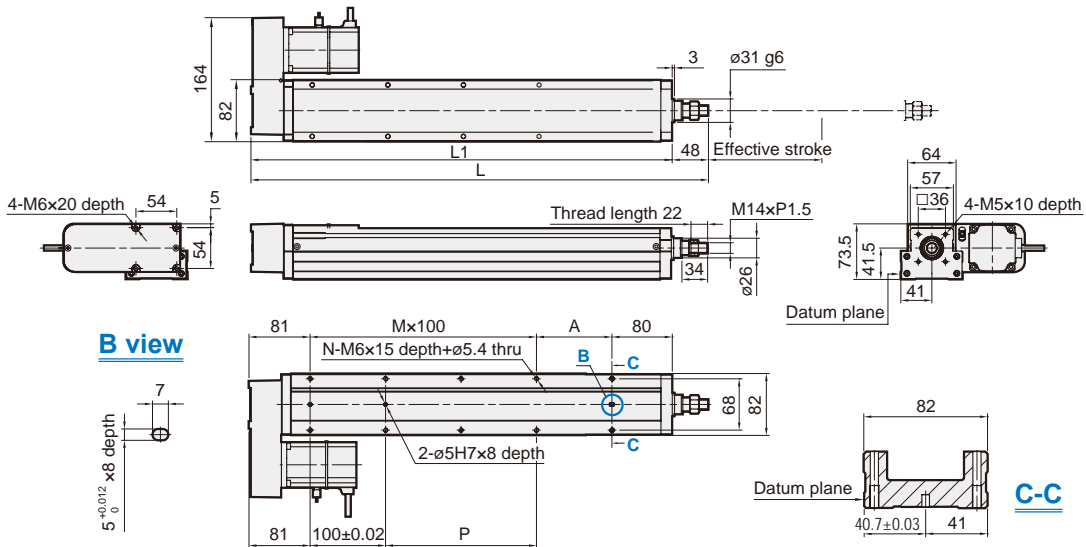
BL
Motor on left side



Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	359	409	459	509	559	609	659	709	775	809	859	909	959	1009	1059	1109
L1	311	361	411	461	511	561	611	661	711	761	811	861	911	961	1011	1061
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
KG	5.82	6.17	6.53	6.88	7.24	7.59	7.95	8.3	8.66	9.01	9.37	9.72	10.08	10.43	10.79	11.14

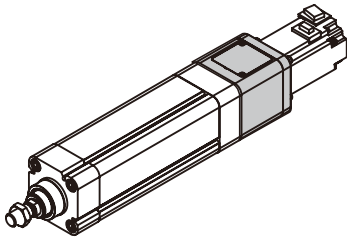
BR
Motor on right side



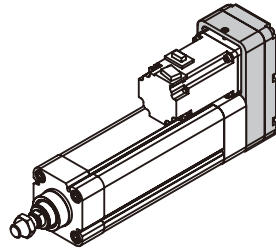
Unit: mm

Stroke	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
L	359	409	459	509	559	609	659	709	775	809	859	909	959	1009	1059	1109
L1	311	361	411	461	511	561	611	661	711	761	811	861	911	961	1011	1061
A	50	100	50	100	50	100	50	100	50	100	50	100	50	100	50	100
M	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
N	6	6	8	8	10	10	12	12	14	14	16	16	18	18	20	20
P	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
KG	5.82	6.17	6.53	6.88	7.24	7.59	7.95	8.3	8.66	9.01	9.37	9.72	10.08	10.43	10.79	11.14

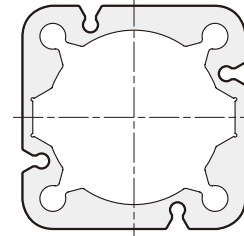
Motor position



BC



BA



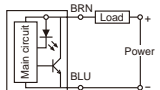
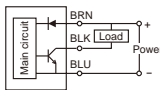
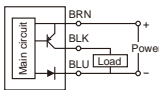
Unlimited installation on all sides due to symmetrical design.

Standard motors

Brand	Mark	Power output	Motor model (Without brake)	Motor model (With brake)	Motor rod (mm)	Motor mount P.C.D (mm)	Mounting port (mm)
Mitsubishi	M	400W	HG-KN43J	HG-KN43B J	ø14	ø70	4-ø5.8
Panasonic	P	400W	MHMF042L1U2M	MHMF042L1V2M			4-ø4.5
Yaskawa	Y	400W	SGM7J-04A7A21	SGM7J-04A7A2C			4-ø5.5
Delta	D	400W	ECMA-C20604PS	ECMA-C20604QS			4-ø5.5
Mindman	S	□56	-	-	ø6.35	□47.14	4-ø5

* If your inquiry is not included in above table, please kindly contact us.

Sensor specification

Model	RDFE	RNFE	RPFE
Wiring method	2 wire	3 wire	
Switching logic	Solid state output, Normally open		
Switch Type	Non-contact	NPN current sinking	PNP current sourcing
Operating voltage	5~30V DC	5~30V DC	5~30V DC
Switching current	50mA max.		
Contact rating *1	1.5W max.		
Current consumption	—	10mA @24V DC max.	
Voltage drop	3.5V max.	0.5V @ 50mA max.	
Leakage current	0.1mA(40uA) max.	0.01mA max.	
Indicator	Red LED		
Connect diagram			

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Caution for safety please refer to page 8-8~9.

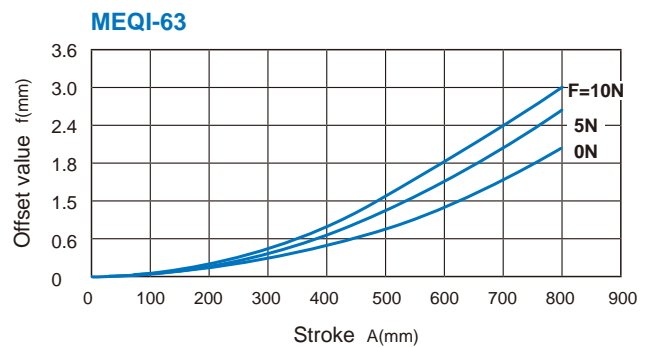
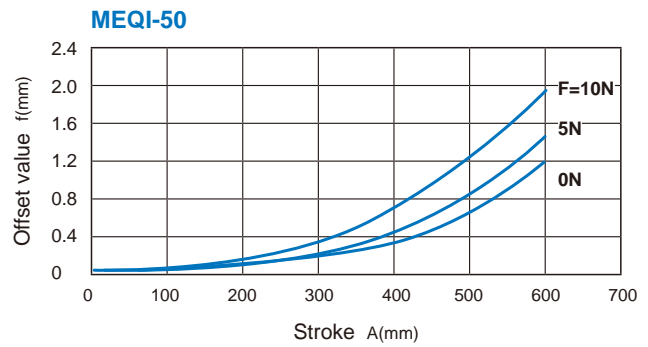
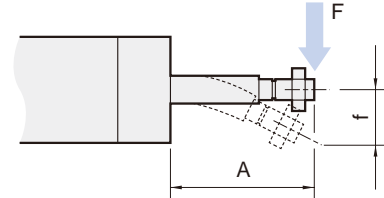
Mounting accessories

* Use the same accessories with MCQV.

FAC — MCQV — 50

Mounting type	Model	Size
	LB	50 63
	CA	
	CB	
	CDB (Extra purchase CB+Pin)	
	FAC	
	FBC	
	Y	
	I	
	YS (Y+Floating pin)	
	LC	
	TFA	MEQI
	TFB	
	TC	

Rod bending offset



Weight

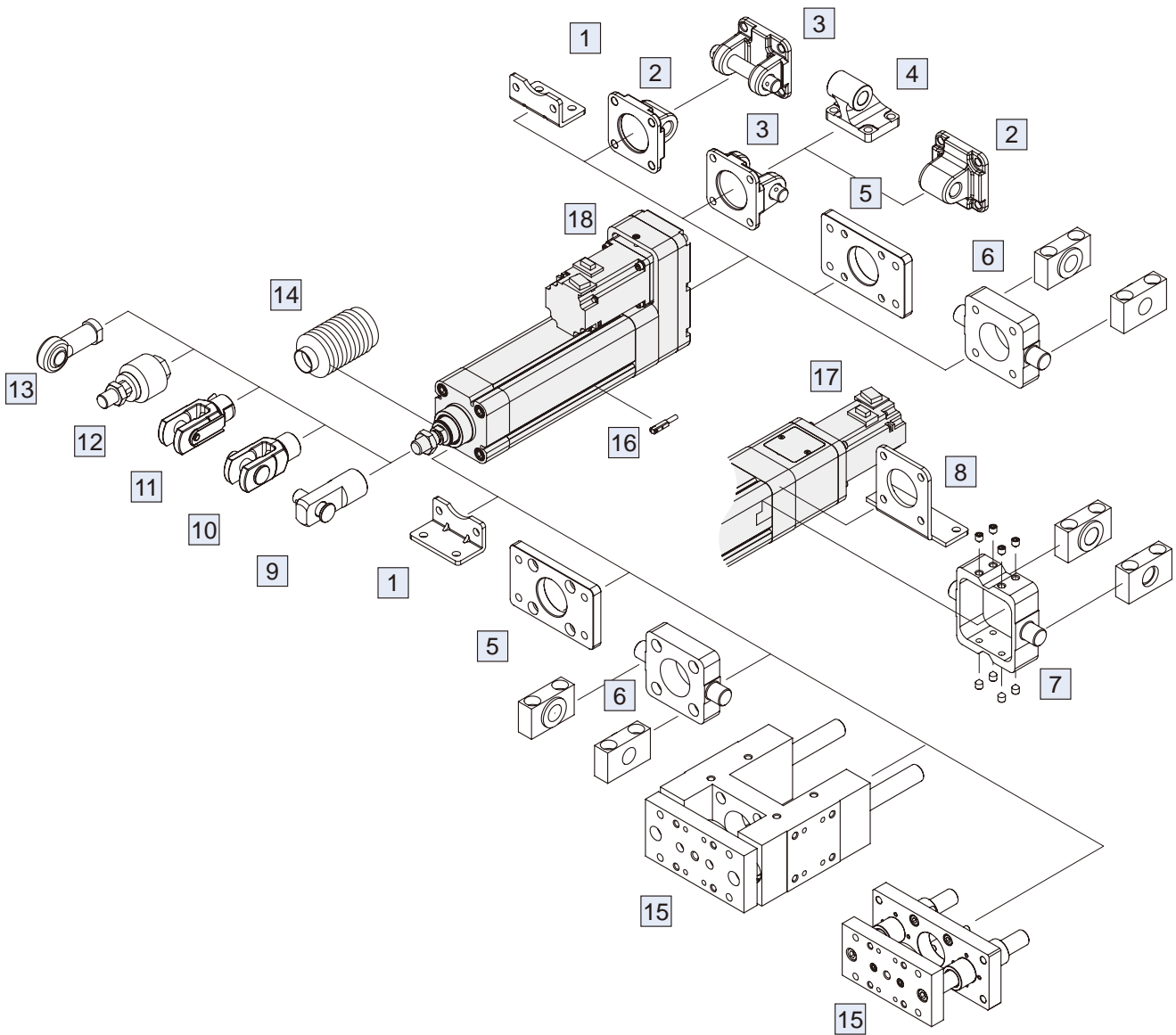
Unit: kg

Model	Basic weight MEQI	Stroke 100 mm MEQI
Size		
50	1.99	0.73
63	2.85	0.99

* This table is the basic weight of the motor exposed version.

Model	LB	LC	CA	CB	CDB	FAC / FBC	TC	TFA / TFB
Size								
50	0.32	0.29	0.39	0.35	0.46	0.46	0.51	0.61
63	0.40	0.36	0.67	0.54	0.55	0.68	0.80	1.20

Model	Y	I	PIN		YS
			Y / I	CA / CB	
Size					
50	0.27	0.34	0.08	0.07	—
63	0.27	0.33	0.08	0.15	—

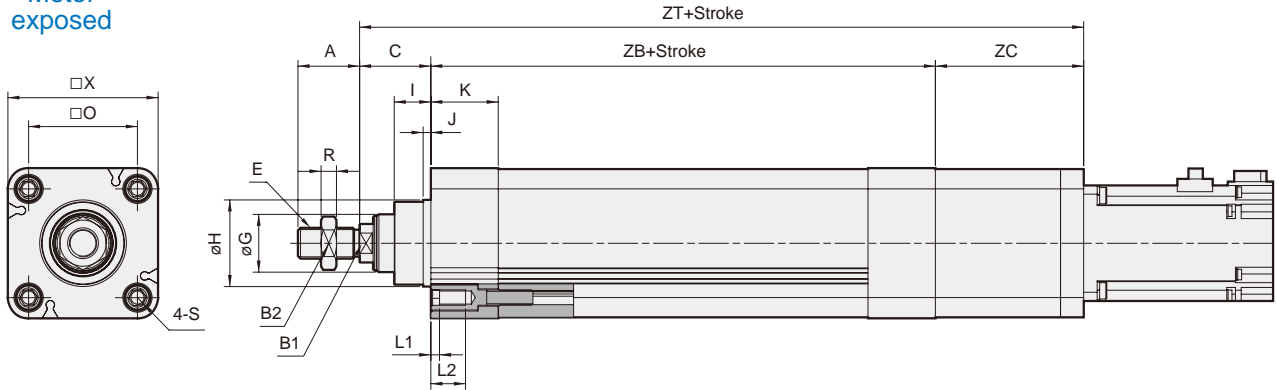


No.	Accessories	Page
1	Mounting accessories LB	4-91
2	Mounting accessories CA	4-93
3	Mounting accessories CB	4-93
4	Mounting accessories CDB	4-94
5	Mounting accessories FAC/FBC	4-92
6	Mounting accessories TFA/TFB	4-95
7	Mounting accessories TC	4-94
8	Mounting accessories LC	4-91
9	Accessories I+PIN	1-46 (Vol.2)
10	Accessories Y+PIN	1-46 (Vol.2)

No.	Accessories	Page
11	Accessories YS	1-46 (Vol.2)
12	Floating joint MFC	8-2 (Vol.2)
13	Female rod ends PHS	8-6 (Vol.2)
14	Protective bellows kit	—
15	MGTB/TU/TX Guide holder assembly	4-33 (Vol.2)
16	Sensor switch RDFE	5-11
17	Motor exposed kit BC	4-90
18	Motor turned kit BA	4-90

BC

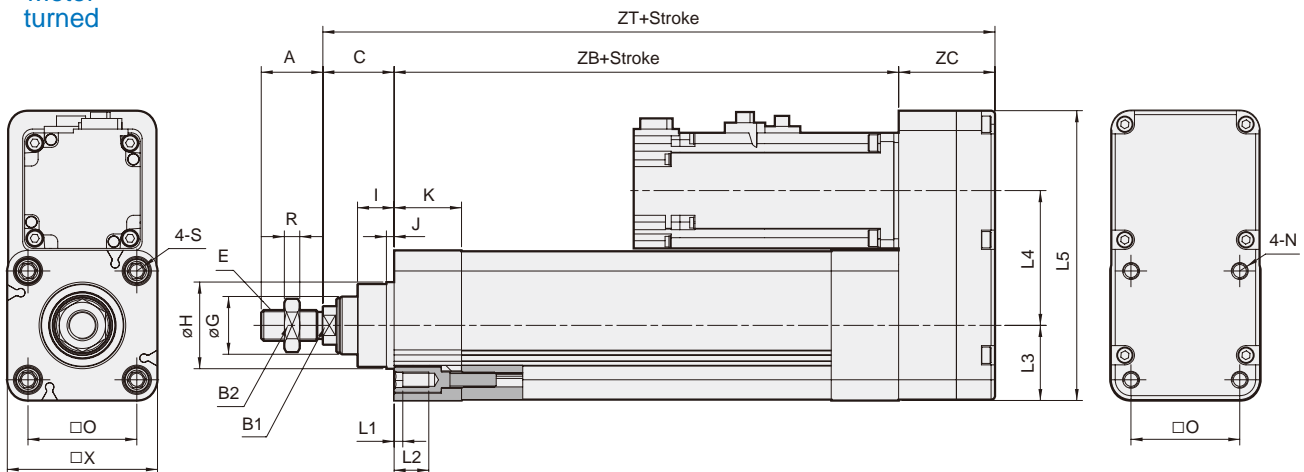
Motor exposed



Code Size	A	B1	B2	C	E	G	H	I	J	K	L1	L2	O	R	S	X	ZB	ZC		ZT	
																		servo	step	servo	step
50	32	17	24	37	M16x1.5	25	40	19	4	31	4.5	18	46.5	8	M8x1.25	65	152	67	48	256	237
63	32	17	24	37	M16x1.5	30	45	19	4	35	4.5	18	56.5	8	M8x1.25	78	162	77	55	276	254

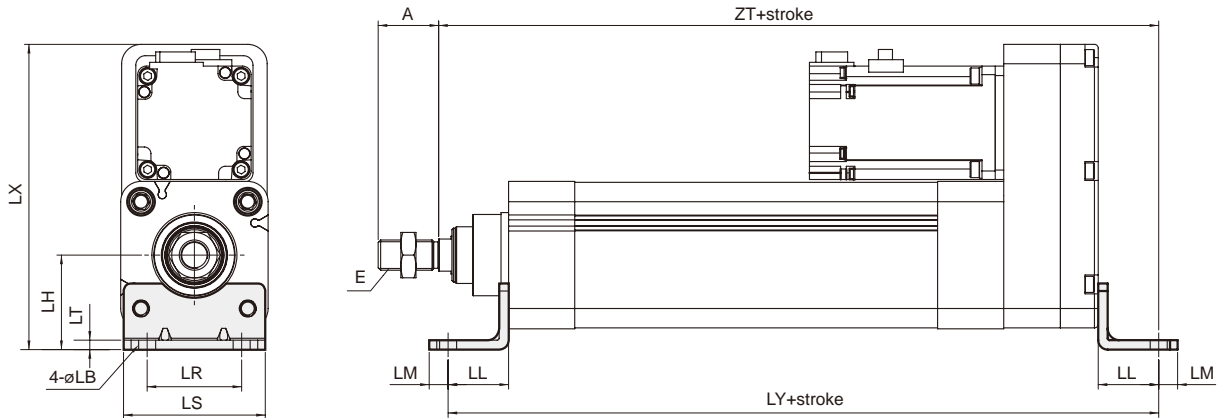
BA

Motor turned



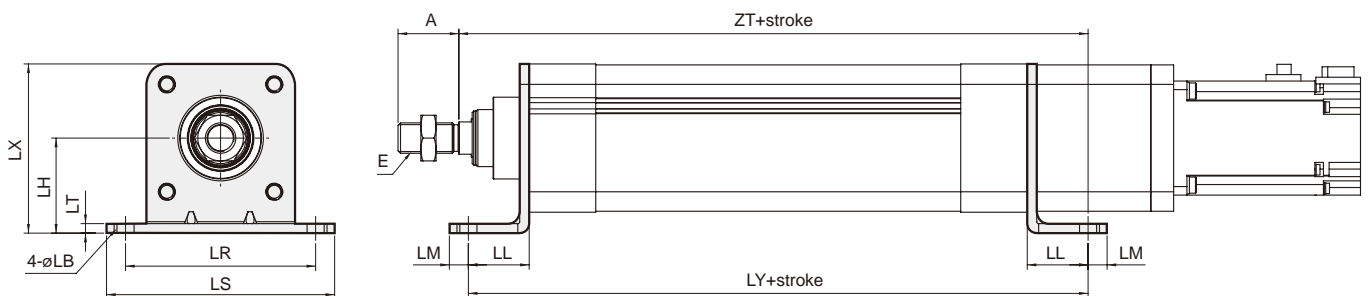
Code Size	A	B1	B2	C	E	G	H	I	J	K	L1	L2	L3	L4	L5	N	O	R	S	X	ZB	ZC	ZT
63	32	17	24	37	M16x1.5	30	45	19	4	35	4.5	18	39.0	70	150.5	M8x1.25x12L	56.5	8	M8x1.25	78	162	50	249

LB



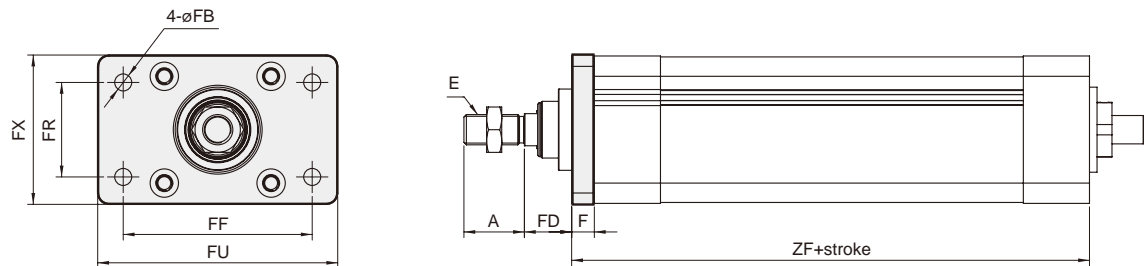
Code Size	A	E	LB	LH	LL	LM	LR	LS	LT	LX	LY	ZT
50	32	M16x1.5	9	45	32	10	45	65	5	163.0	266	271
63	32	M16x1.5	9	50	32	10	50	75	5	161.5	276	281

LC



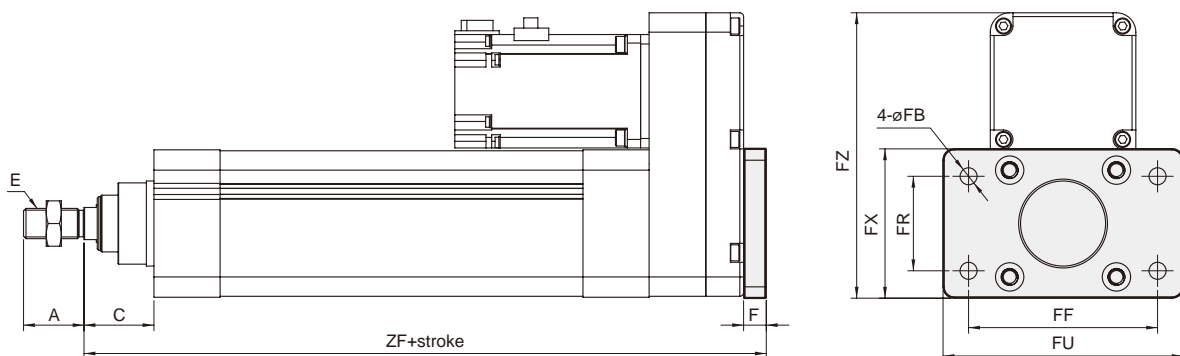
Code Size	A	E	LB	LH	LL	LM	LR	LS	LT	LX	LY	ZT
50	32	M16x1.5	9	45	32	10	90	110	5	77.5	216	221
63	32	M16x1.5	9	50	32	10	100	120	5	89.0	226	231

FAC



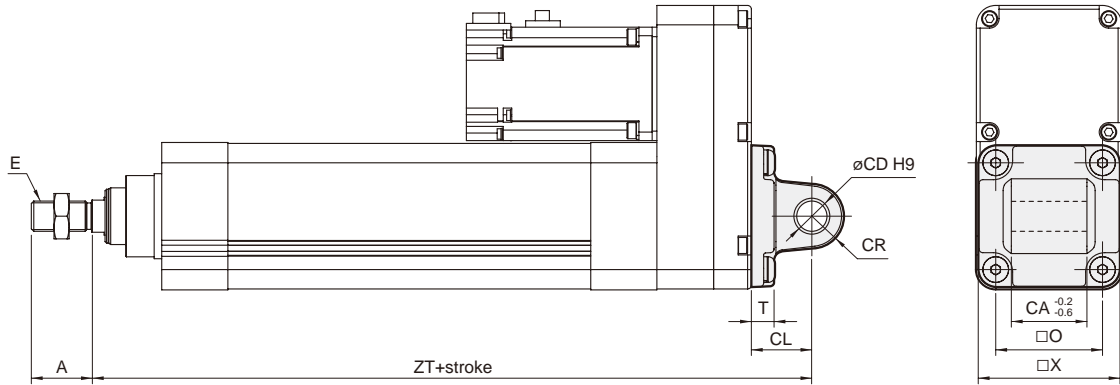
Code Size	A	E	F	FB	FD	FF	FR	FU	FX	ZF
50	32	M16x1.5	12	9	25	90	45	112	67	164
63	32	M16x1.5	12	9	25	100	50	127	79	174

FBC



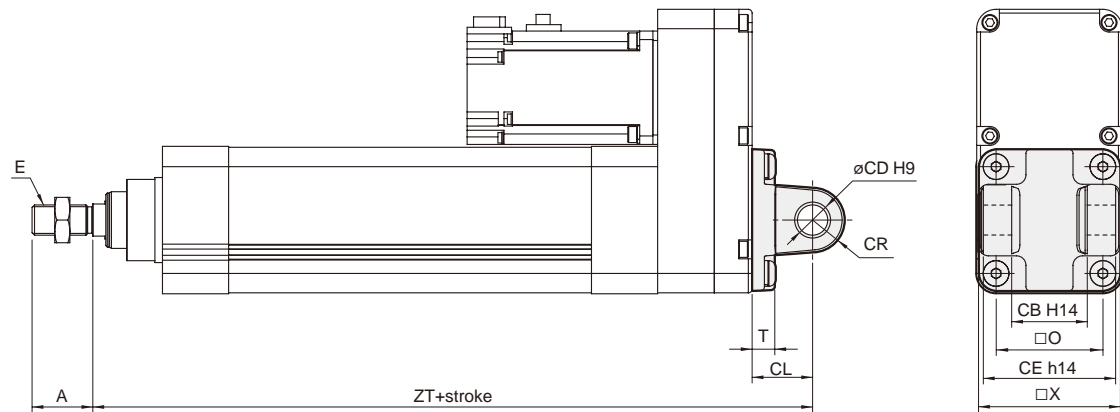
Code Size	A	C	E	F	FB	FF	FR	FU	FX	FZ	ZF
50	32	37	M16x1.5	12	9	90	45	112	67	151.5	251
63	32	37	M16x1.5	12	9	100	50	127	79	151.0	261

CA



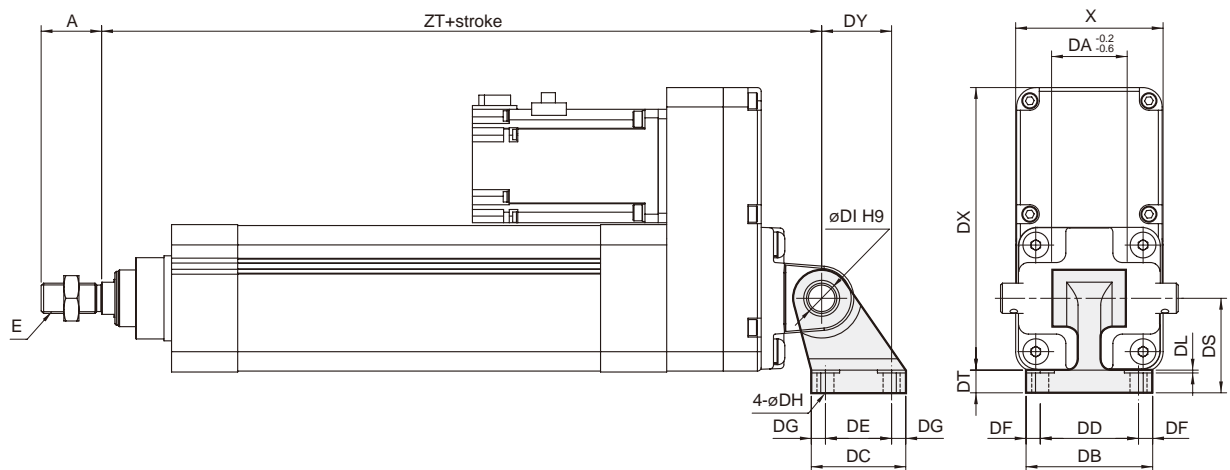
Code Size	A	CA	CD	CL	CR	E	O	T	X	ZT
50	32	32	12	27	R13	M16x1.5	46.5	12	64	266
63	32	40	16	32	R17	M16x1.5	56.5	12	75	281

CB



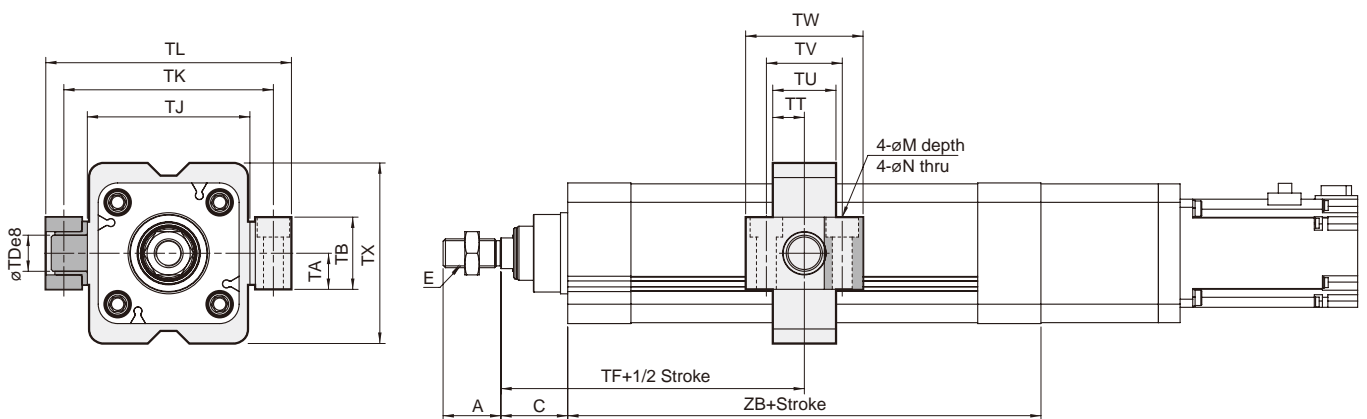
Code Size	A	CB	CD	CE	CL	CR	E	O	T	X	ZT
50	32	32	12	60	27	R13	M16x1.5	46.5	12	64	266
63	32	40	16	70	32	R17	M16x1.5	56.5	12	75	281

CDB



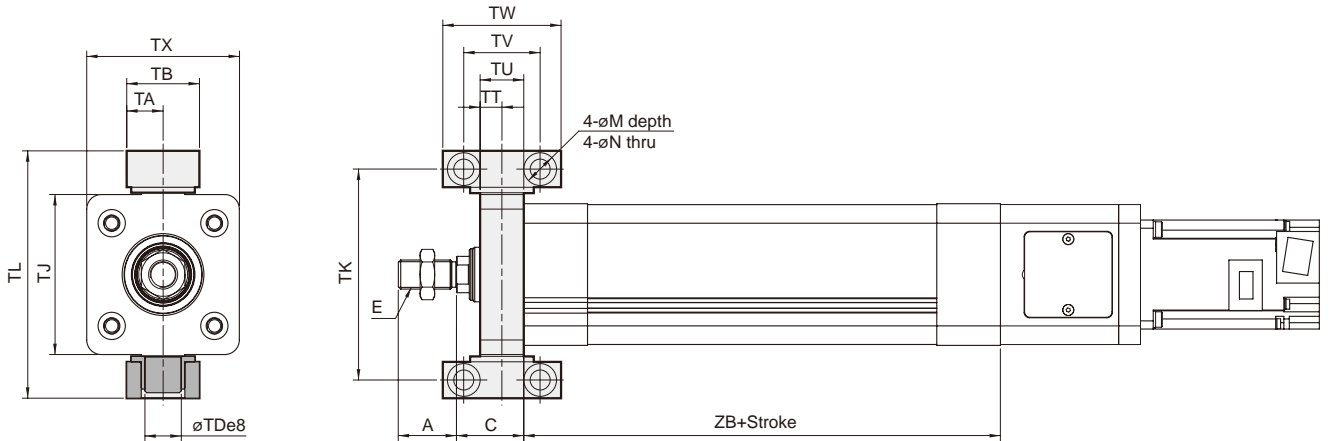
Code Size	A	DA	DB	DC	DD	DE	DF	DG	DH	DI	DL	DS	DT	DX	DY	E	X	ZT
50	32	32	65	45	50	30	7.5	7.5	9	12	1.5	45	12	151.0	33	M16x1.5	65	266
63	32	40	67	50	52	35	7.5	7.5	9	16	1.5	50	12	149.5	37	M16x1.5	78	281

TC



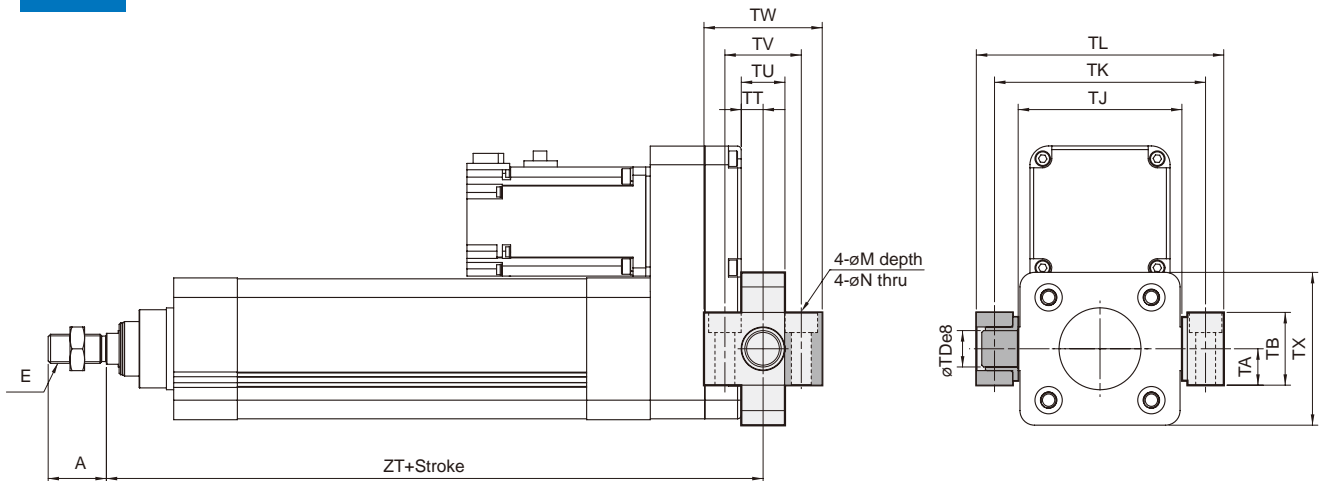
Code Size	A	C	E	M	N	TA	TB	TD	TF	TJ	TK	TL	TT	TU	TV	TW	TX	ZB
50	32	37	M16x1.5	15x9	9	18	36	16	113	75	99	117	16	32	36	55	85	152
63	32	37	M16x1.5	18x11	11	20	40	20	118	90	116	136	17.5	35	42	65	100	162

TFA

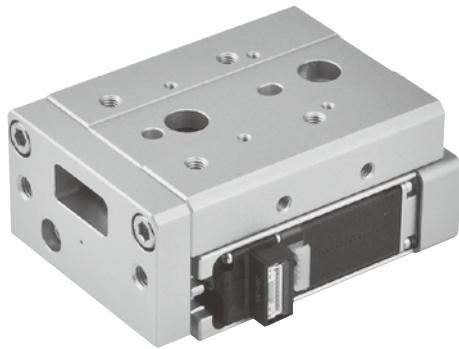


Code Size	A	C	E	M	N	TA	TB	TD	TJ	TK	TL	TT	TU	TV	TW	TX	ZB
50	32	37	M16x1.5	15x9	9	18	36	16	75	99	117	9.5	19	36	55	69	152
63	32	37	M16x1.5	18x11	11	20	40	20	90	116	136	12	24	42	65	84	162

TFB



Code Size	A	E	M	N	TA	TB	TD	TJ	TK	TL	TT	TU	TV	TW	TX	ZT
50	32	M16x1.5	15x9	9	18	36	16	75	99	117	9.5	19	36	55	69	248.5
63	32	M16x1.5	18x11	11	20	40	20	90	116	136	12	24	42	65	84	261.0



Specification

Model	MESS2		
Size	16	25	
Position repeatability (mm)	±0.02		
Lead (mm)	2	2	8
Maximum speed *1 (mm/s)	≤50	≤100	≤400
Work load *2	Horizontal (kg)	3	1.5
	Vertical (kg)	0.8	0.8
Pushing force *1,3,4 (N)	18 ~ 60	64 ~ 195	18 ~ 48
Stroke (mm)	30 / 50	30 / 50 / 75 / 100	
Motor size (mm)	□20	□28	
Encoder	Incremental A/B/Z (4000PPR)		
Rated voltage	DC 24V±10%		

Motor type	Step motor	Transmission	Ball screw + Belt
Environment	Standard	Guide type	Cross roller guide

*1. The speed and force may change depending on the cable length, load, stroke and mounting conditions.

*2. The maximum load capacity decreases as the speed increases.

*3. The accuracy of pushing force is ± 20%.

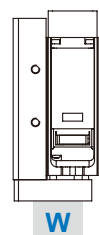
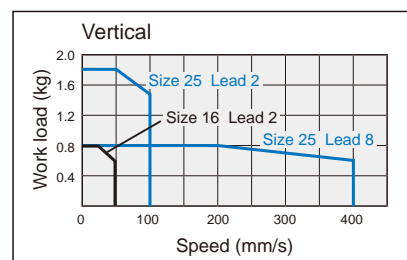
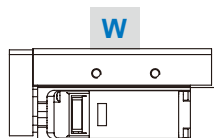
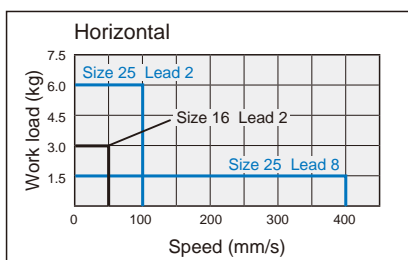
*4. Pushing force for MESS2 is from 30% to 90%.

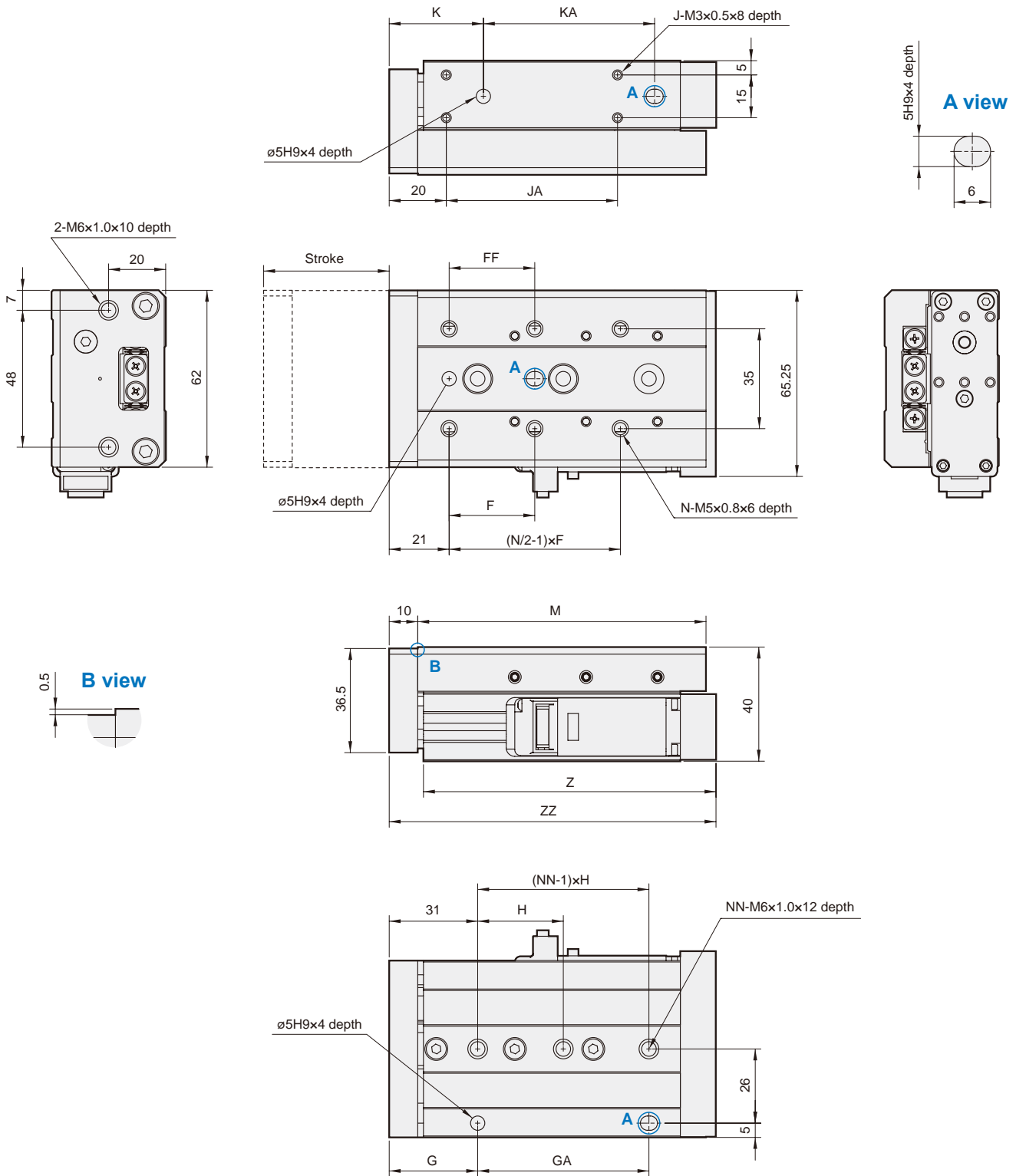
Order example

MESS2 - 16 L02 - 30 - CQ1 03 N 01 - XA00

Model						Special order no.
Size	Ball screw lead	Stroke	Controller	I/O type	I/O cable length	
16	L02 2 mm	30 30 mm	CQ1 MECQ1	N NPN	01 1.5 m	03 3 m
25	L02 2 mm	50 50 mm	* Please refer to page 4-106.		* Standard: 1.5 m	
	L08 8 mm	75* 75 mm				
		100* 100 mm				
* Only for Spec. 25.			Actuator cable length			
			01 1.5 m			
			03 3 m			
			05 5 m			
			* Standard: 3 m			

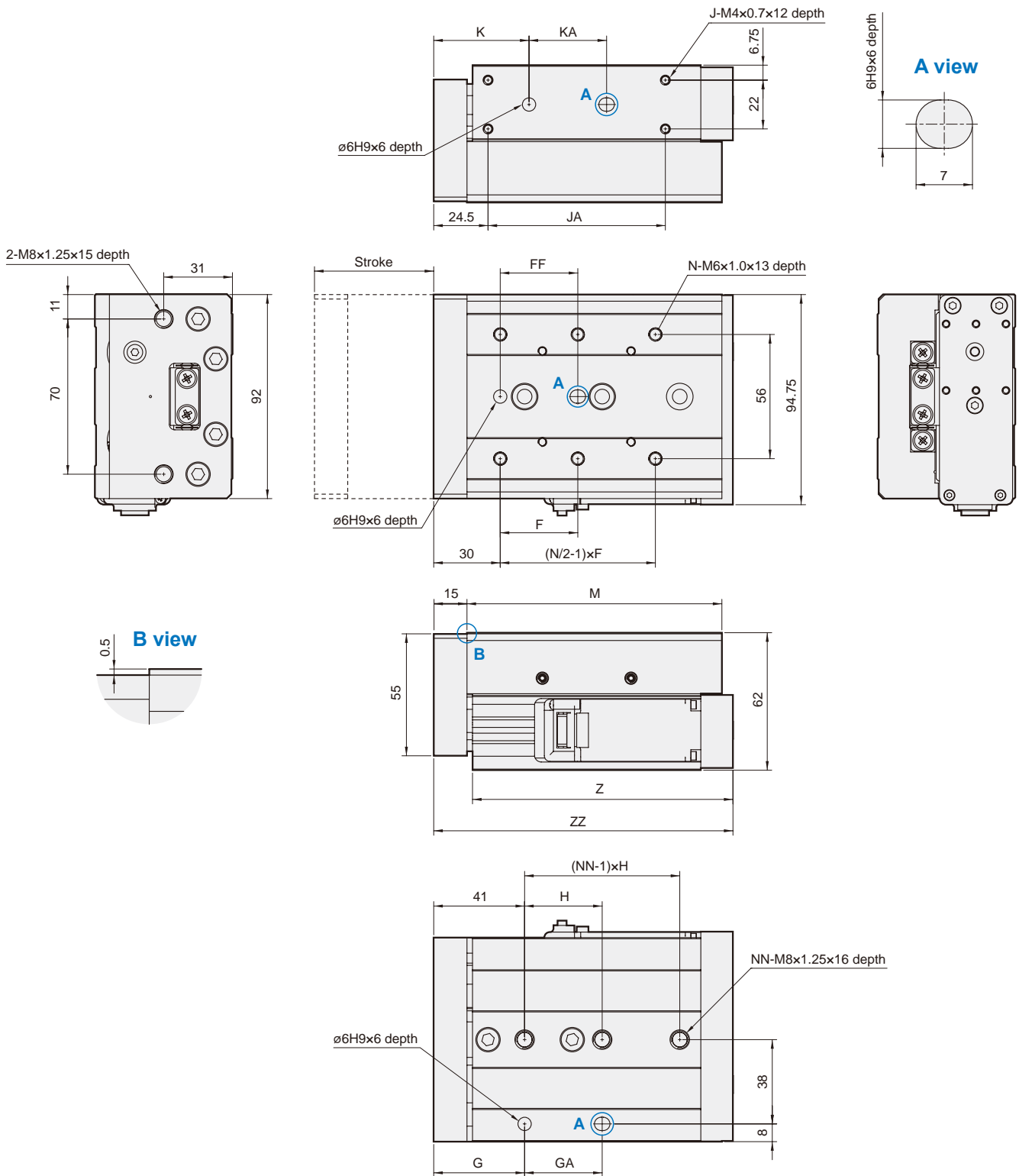
Speed-work load curve diagram





Unit: mm

Stroke	F	FF	G	GA	H	J	JA	K	KA	M	N	NN	Z	ZZ	Weight (g)
30	35	35	27	40	40	4	40	29	40	76	4	2	77.5	89.5	634
50	30	30	31	60	30	4	60	33	60	101	6	3	102.5	114.5	812



Unit: mm

Stroke	F	FF	G	GA	H	J	JA	K	KA	M	N	NN	Z	ZZ	Weight (g)
30	50	40	30.5	45	45	4	40	32.5	45	92	4	2	94.5	112	1743
50	35	35	41	35	35	4	80	43	35	115	6	3	117.5	135	2030
75	60	60	41	70	35	6	120	43	70	156	6	4	158.5	176	2680
100	70	70	41	70	35	6	160	43	70	197	6	5	199.5	217	3380



Specification

Model	MESH2		
Size	16	20	
Position repeatability (mm)	±0.02		
Lead (mm)	2	2	8
Maximum speed *1 (mm/s)	≤50	≤100	≤400
Work load *2	Horizontal (kg)	3	1.5
	Vertical (kg)	0.8	0.8
Pushing force *1,3,4 (N)	24 ~ 68	64 ~ 195	18 ~ 48
Stroke (mm)	30 / 50		
Motor size (mm)	□20	□28	
Encoder	Incremental A/B/Z (4000PPR)		
Rated voltage	DC 24V±10%		

*1. The speed and force may change depending on the cable length, load, stroke and mounting conditions.

*2. The maximum load capacity decreases as the speed increases.

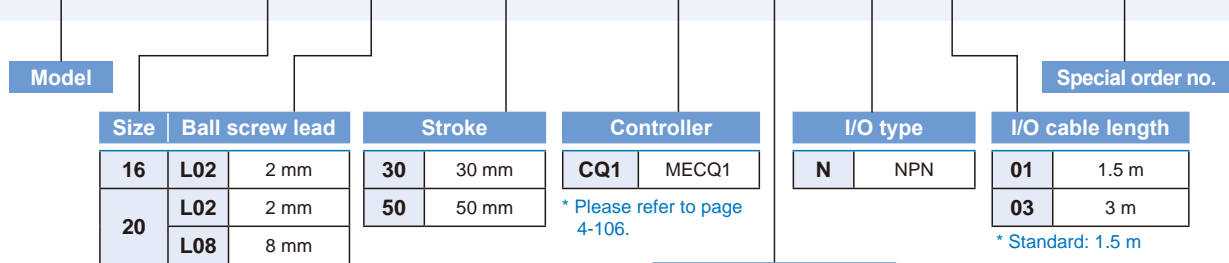
*3. The accuracy of pushing force is ± 20%.

*4. Pushing force for MESH2 is from 30% to 90%.

Motor type	Step motor	Transmission	Ball screw
Environment	Standard	Guide type	Linear guideway

Order example

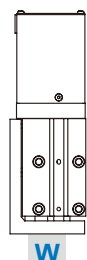
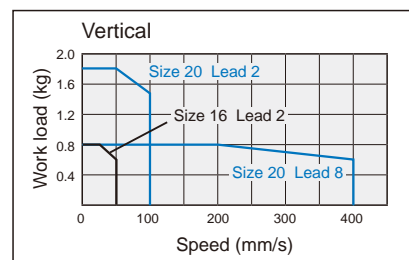
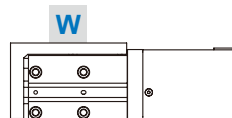
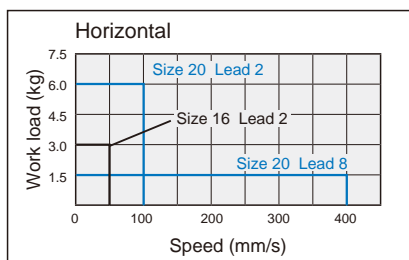
MESH2 - 16 L02 - 30 - CQ1 03 N 01 - XA00

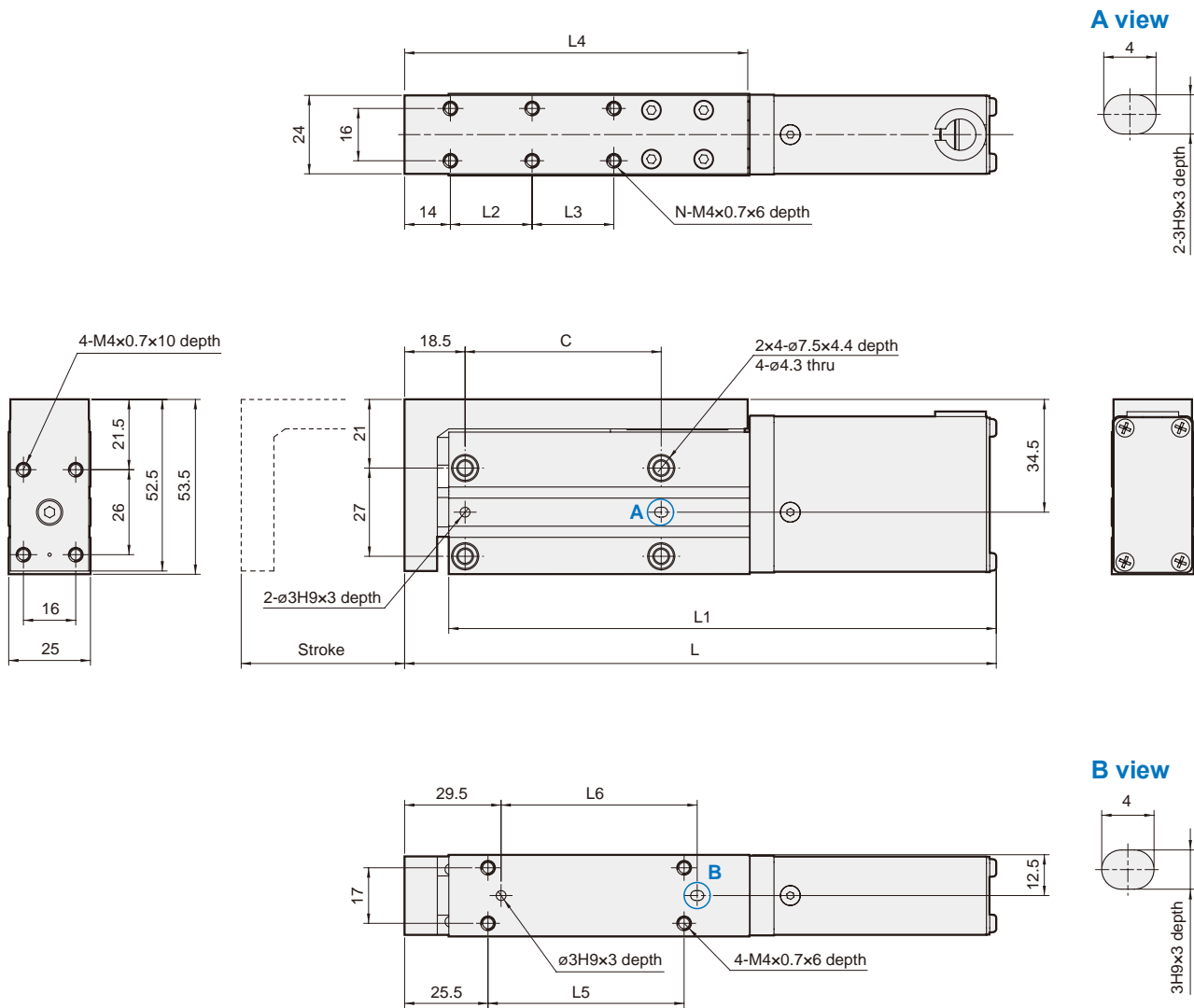


Actuator cable length	
01	1.5 m
03	3 m
05	5 m

* Standard: 3 m

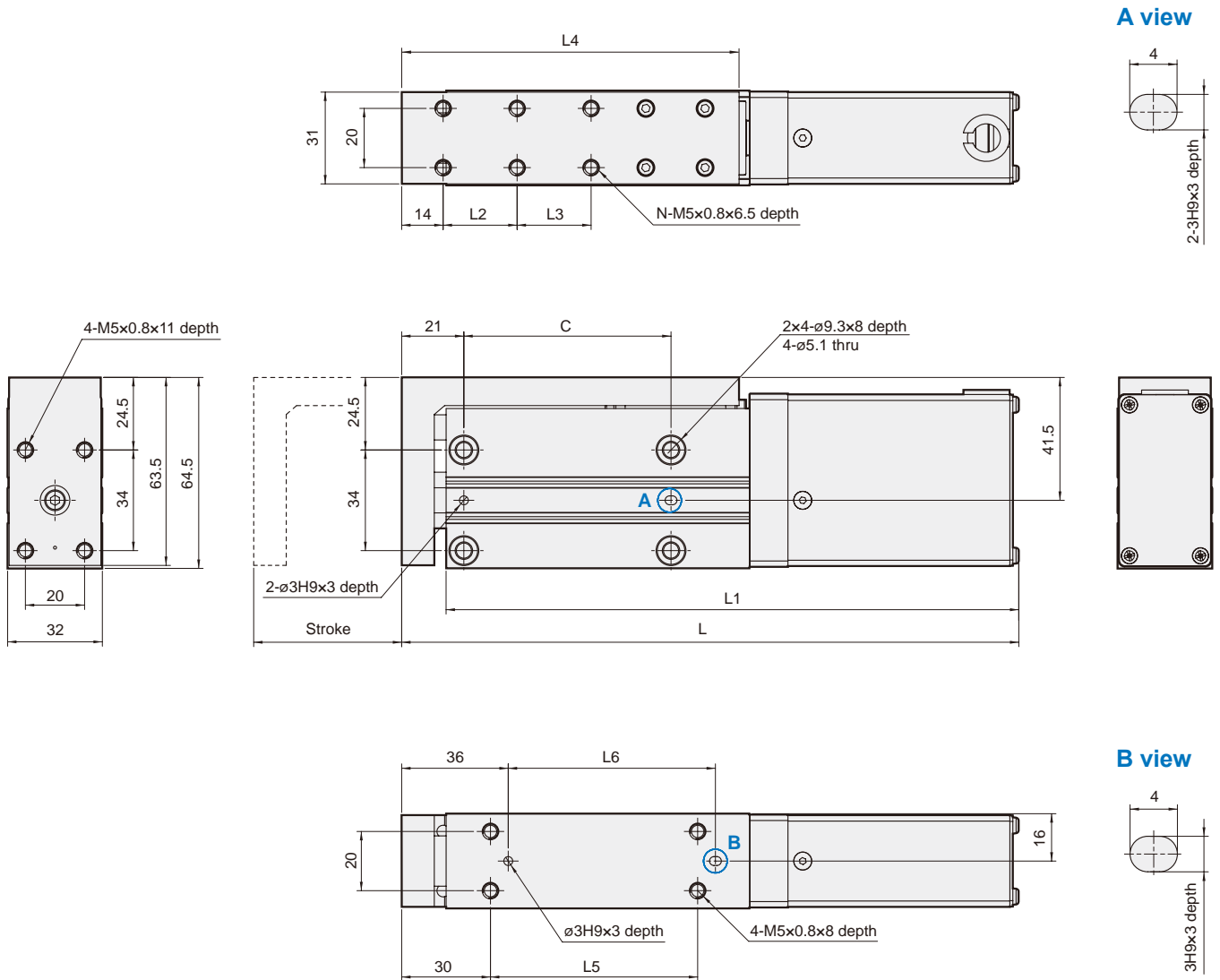
Speed-work load curve diagram





Unit: mm

Stroke	C	L	L1	L2	L3	L4	L5	L6	N	Weight (g)
30	40	161	147.5	30	-	85	40	40	4	500
50	60	181	167.5	25	25	105	60	60	6	562

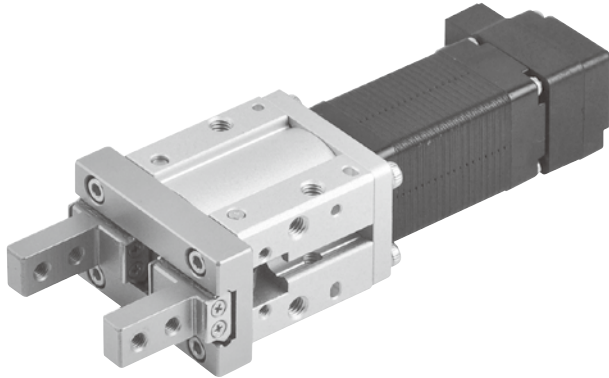


Unit: mm

Stroke	C	L	L1	L2	L3	L4	L5	L6	N	Weight (g)
30	40	188.5	173.5	30	-	97	40	40	4	950
50	70	208.5	193.5	25	25	114	70	70	6	1049

MEHC2 series

ELECTRIC GRIPPER (WITH MOTOR)



Specification

Model	MEHC2	
Size	16	25
Gripping force *1 (N)	19.5	26
Opening / Closing stroke (mm)	6	14
Position repeatability *2 (mm)	±0.02	
Motor size (mm)	□20	□28
Encoder	Incremental A/B/Z (4000PPR)	
Rated voltage	DC24 V ±10%	
Gripping mass *3 (kg)	0.4	0.8
Weight (g)	222	662

*1. Gripping force tolerance ± 20%.

*2. When under same procedure, the position repeatability of workpiece.

*3. The gripping mass may change depending on the gripper attachments or friction coefficient.

Motor type Step motor Transmission Lead screw

Environment Standard Guide type Linear guideway

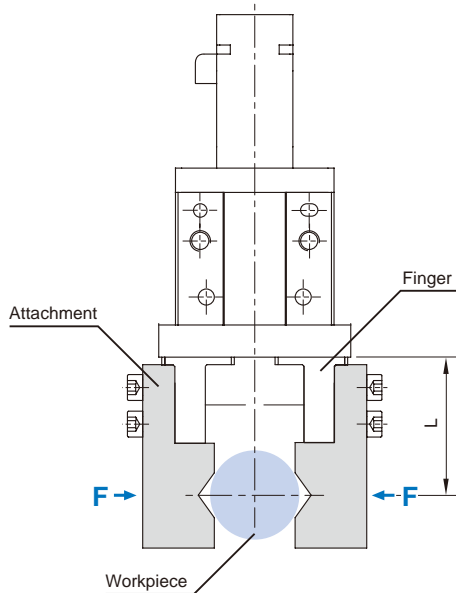
Order example

MEHC2 - 16 - N F - CQ1 03 N 01 - XA00

Model Size Special order no.

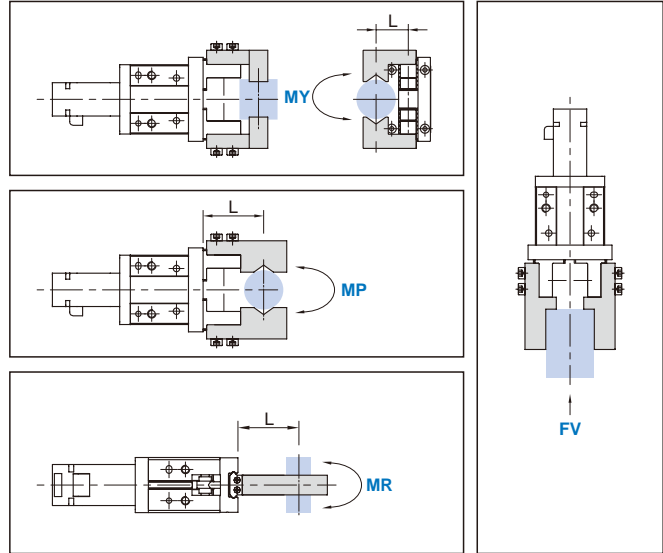
Spec. and type		Motor cable entry	Controller	I/O type	I/O cable length
Blank: Standard	1: Standard type with side tapped	Blank: Parallel	CQ1 MECQ1	N NPN	01 1.5 m 03 3 m
			* Please refer to page 4-106.		* Standard: 1.5 m
N: Narrow	N1: Narrow type with side tapped	F: Perpendicular		Actuator cable length	
				01 1.5 m 03 3 m 05 5 m	
				* Standard: 3 m	

Evaluation of gripping force



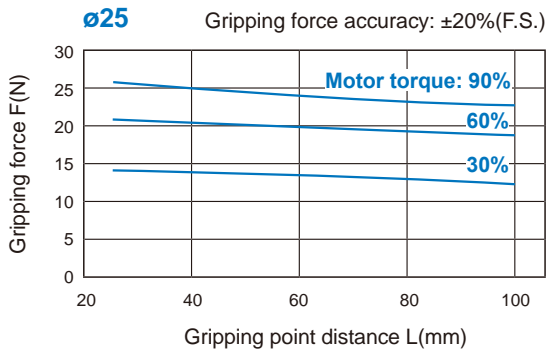
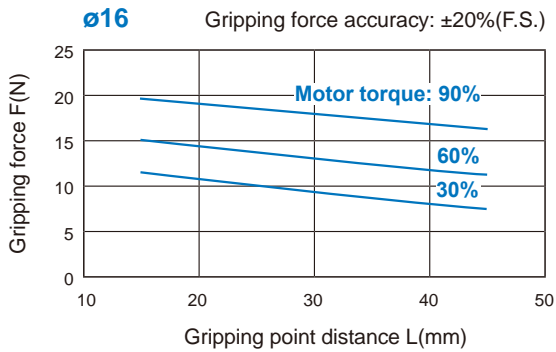
L = Gripping point distance
F = Gripping force

Allowable moment and force (N.m / N)



Model	MY	MP	MR	FV
	Max. moment (N.m)			Max. force (N)
MEHC2-16	0.68	0.68	1.36	98
MEHC2-25	1.94	1.94	3.88	255

Diagram



Calculation of allowable external force

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

*MY: Allowable yaw moment *FV: Vertical maximum force
*MP: Allowable pitch moment *L: Distance to the loading location (mm).
*MR: Allowable roll moment

Example

When a static load of 20N is operating, which applies roll Moment to point L=25mm from the MEHC2-16 guide.

$$\text{Allowable load } F(N) = \frac{MR}{L(m)} = \frac{1.36}{0.025} = 54.4 \text{ N}$$

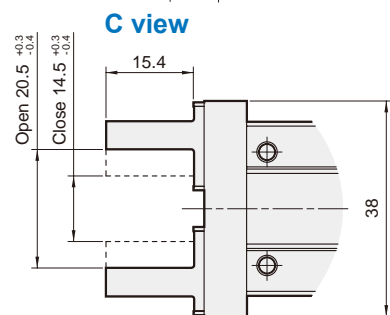
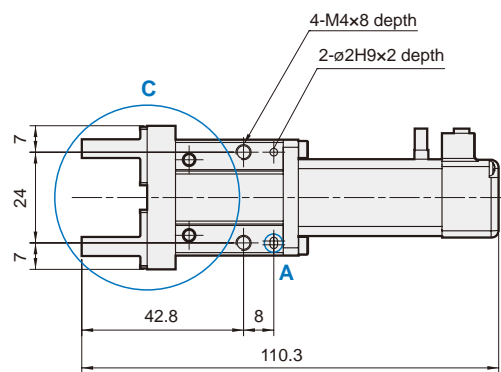
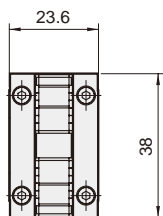
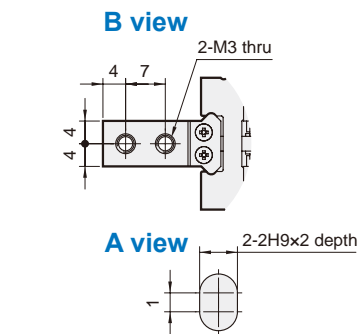
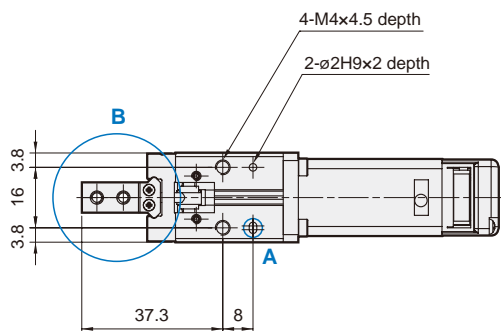
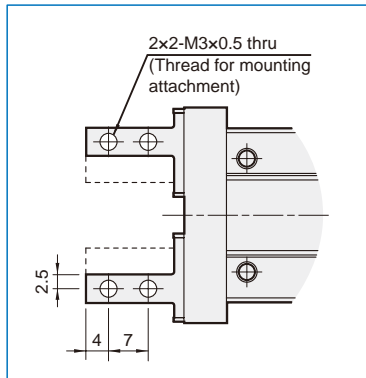
Since actual load 20N is less than allowable load 54.4 N, the gripper can be used.

MEHC2 Dimensions $\varnothing 16$

ELECTRIC GRIPPER (WITH MOTOR)

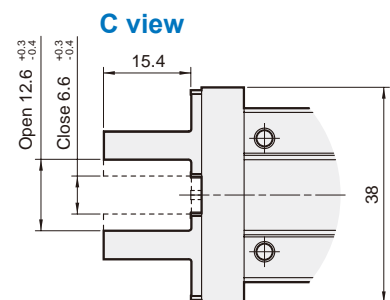
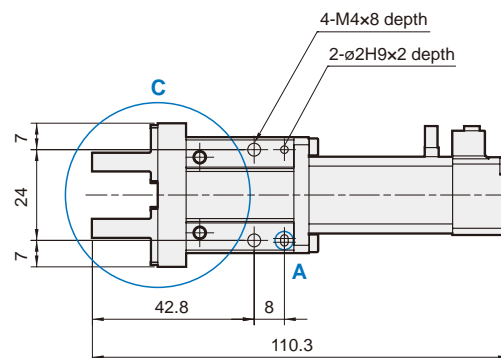
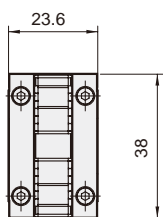
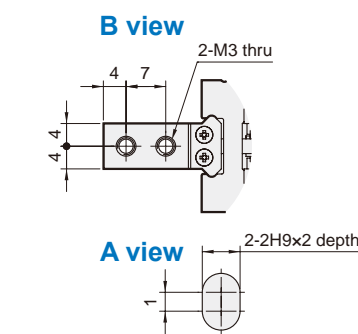
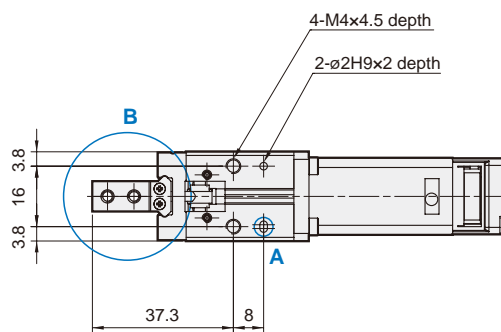
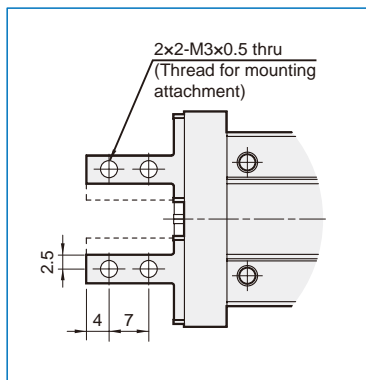


1: Standard type with side tapping



N Narrow type

N1: Narrow type with side tapping

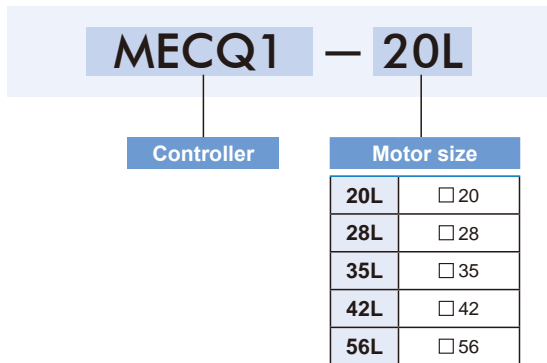




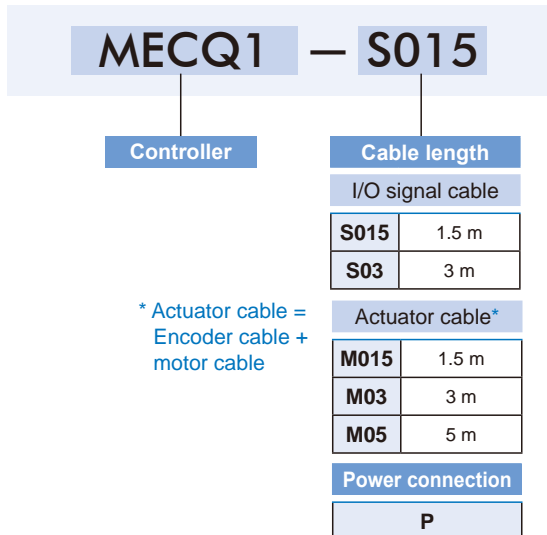
Specification

Model	MECQ1	
Input voltage	DC 24V ±10%	
Number of axis	Control 16 axes by daisy-chaining through RS-485 port	
Dimension (mm)	W134 × H83 × D26.5	
Motor size	□20 / □28 / □35 / □42 / □56	
Encoder	Incremental A/B/Z (4000PPR)	
Operation mode	I/O trigger, Communication control	
Motion control mode	ABS mode	
	INC mode	
	Continuous mode	
	Push mode	
Position	Number of rows	256
	Rows setting	I/O, Software

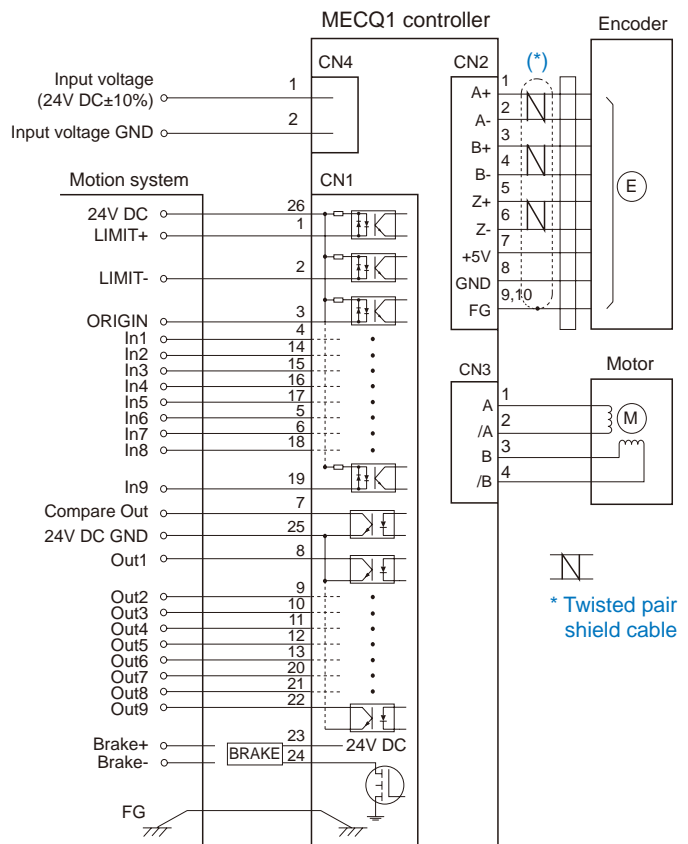
Order example



Accessories

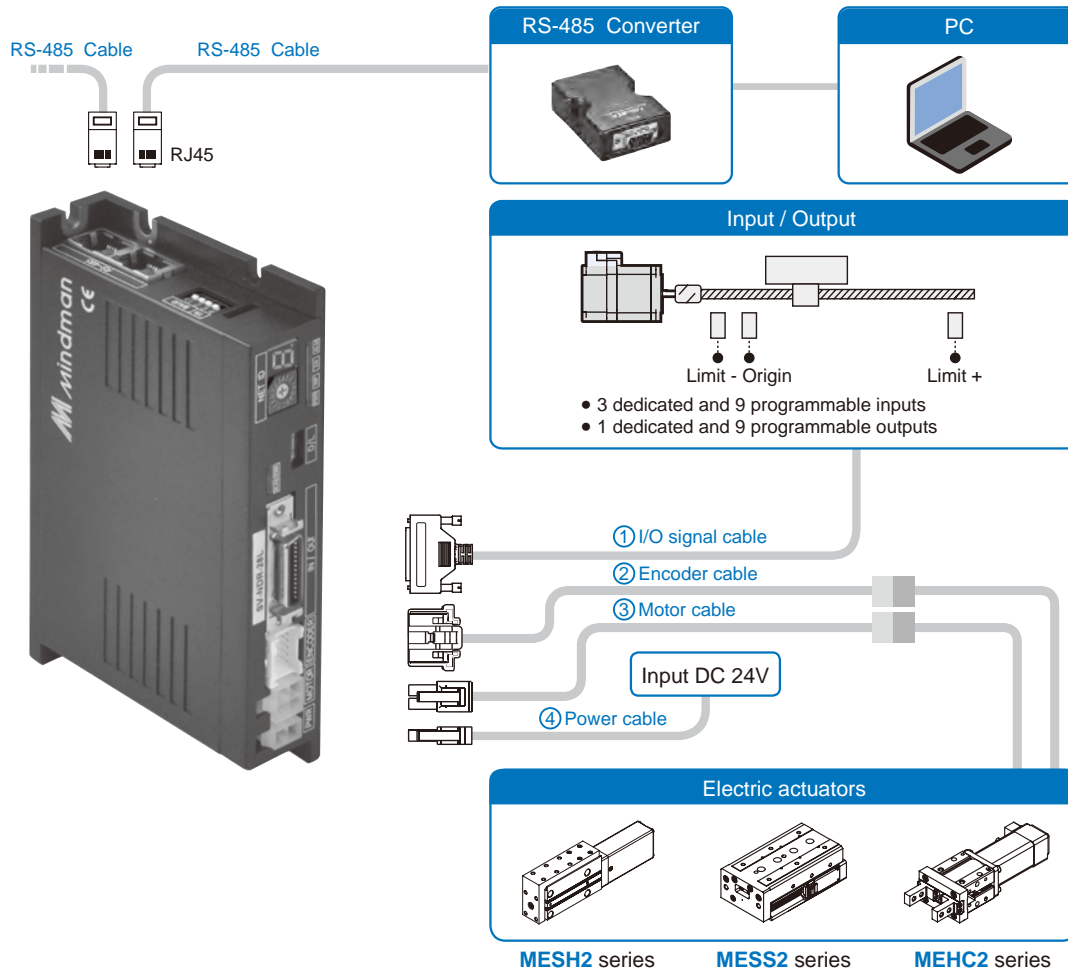


External wiring diagram

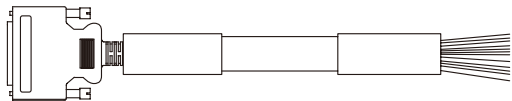
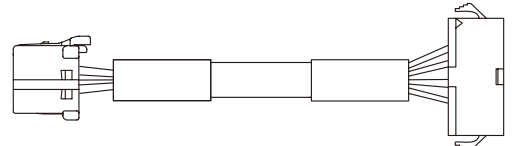
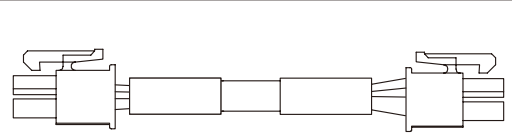
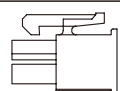


Caution

- Please refer to the manual when connects motor extension cable.
- Careful connection will be required to protect any damages.



Accessories

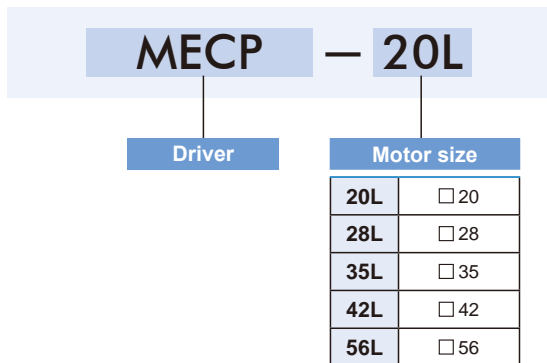
No.	Purpose	Item	Note	Exterior		
①	I/O signal cable	Shell	10326-52FO-008	Isolation		
		Connector	10126-3000PE			
②	Encoder cable	Drive side	Housing	51353-1000	Isolation + Flexible	
		Terminal	56134-9000			
	Encoder side	Housing	SMP-09V-NC			
	Terminal	SHF-001T-0.8BS				
③	Motor cable	Drive side	Housing	5557-04R	Flexible	
		Terminal	5556T			
	Motor side	Housing	5557-04R			
	Terminal	5556T				
④	Power connection	Housing	5557-02R	Housing and terminal only		
		Terminal	5556T			



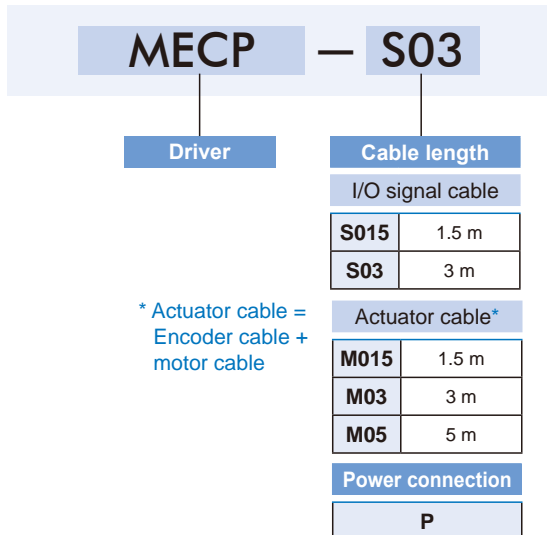
Specification

Model	MECP	
Input voltage	DC 24V ±10%	
Dimension (mm)	W115.5 × H66 × D25.3	
Motor size	□20 / □28 / □35 / □42 / □56	
Encoder	Incremental A/B/Z (4000PPR)	
Operation mode	Pulse control	
Functions	Resolution (P/R)	500~50000(Selectable by DIP switch) * Default: 4000
	LED display	Power status, In-position status, Enable status, Alarm status
	Max frequency	500KHz (Duty 50%)
I/O Singal	Input singal	Position command pulse, Enable, Alarm reset (Photocoupler input)
	Output singal	In-position, Alarm (Photocoupler output), Brake

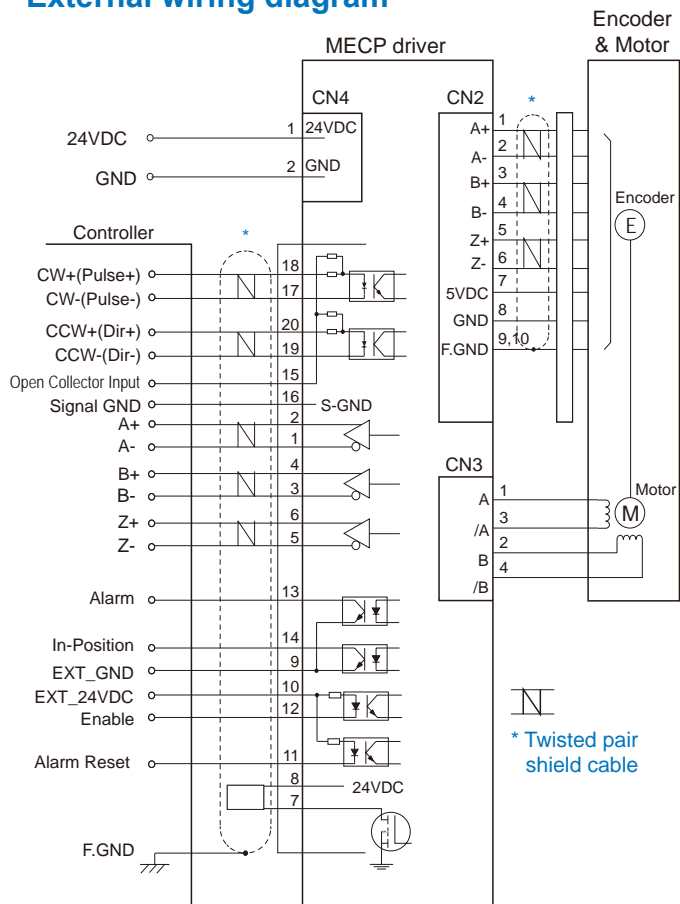
Order example



Accessories

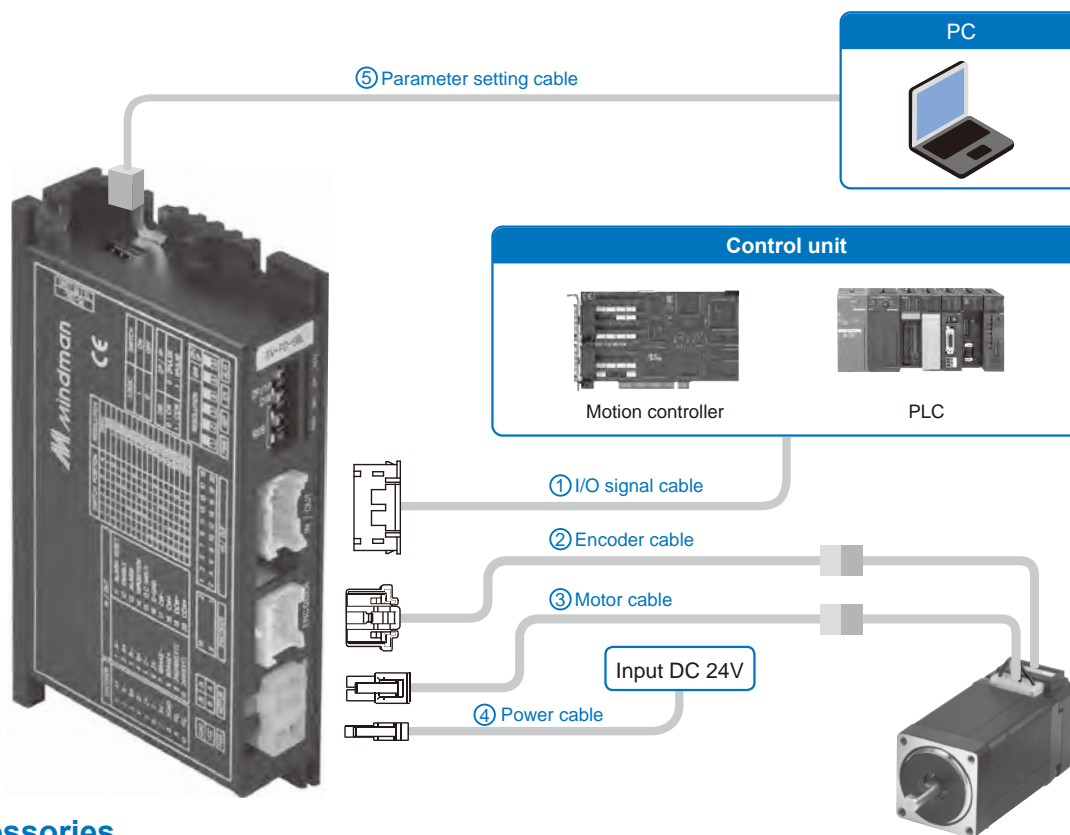


External wiring diagram

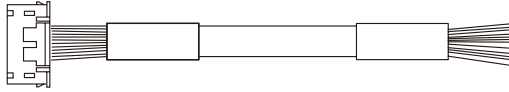
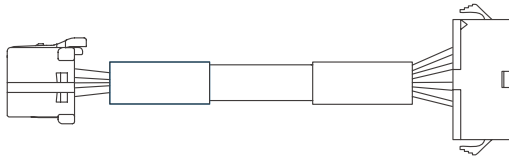
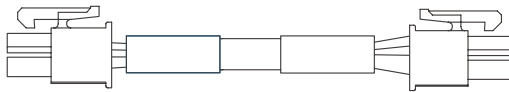
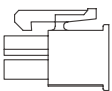



Caution

- Please refer to the manual when connects motor extension cable.
- Careful connection will be required to protect any damages.
- * When connects I/O cable between controller and drive, please turn off the power of both controller and drive, in order to protect the drive from any damage.

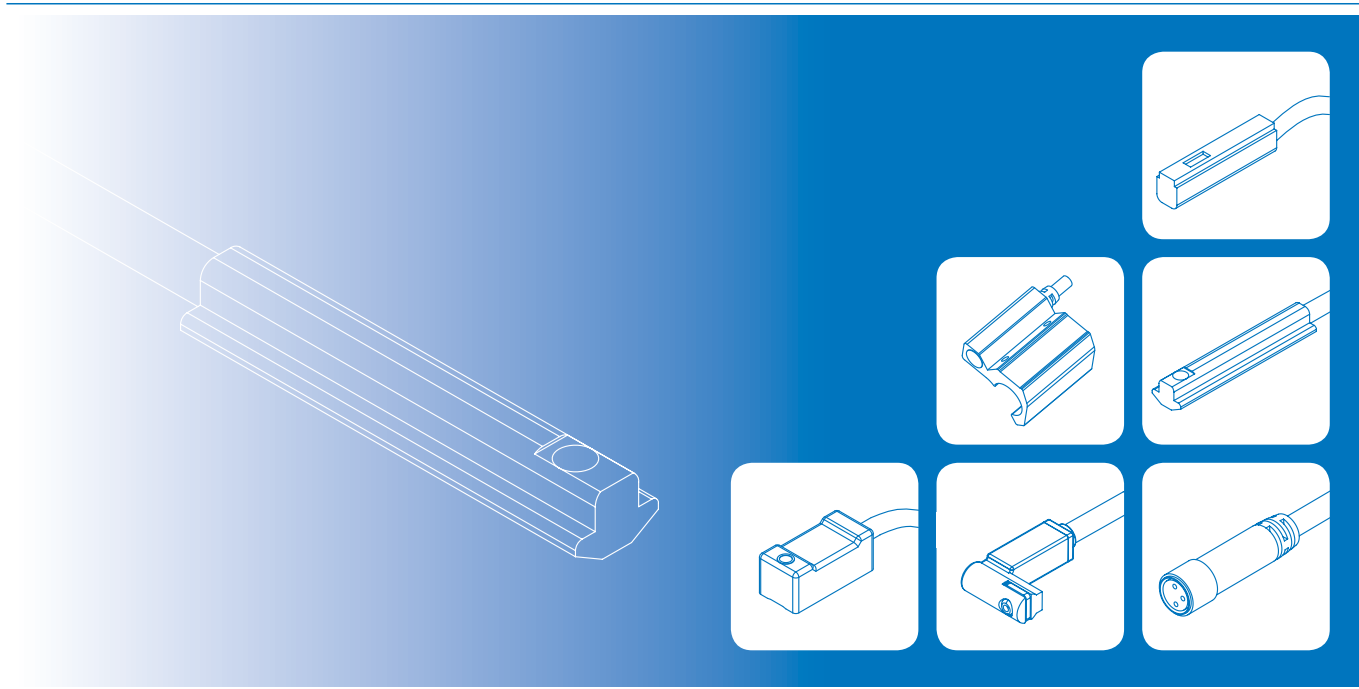


Accessories

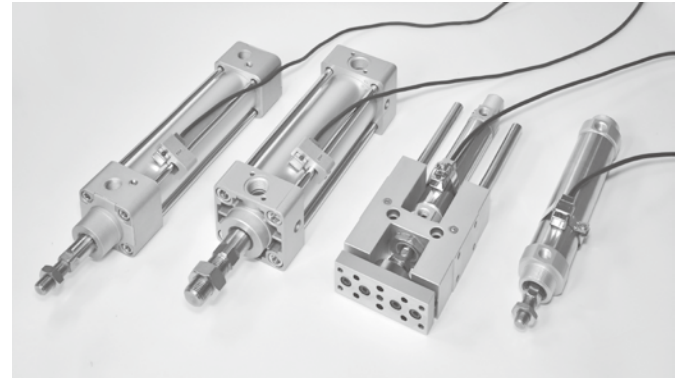
No.	Purpose	Item		Note	Exterior	
①	I/O signal cable	Housing	PADP-20V-1-S	Isolation		
		Terminal	SPH-002T-P0.5L			
②	Encoder cable	Drive side	Housing	51353-1000	Isolation + Flexible	
			Terminal	56134-9000		
		Encoder side	Housing	SMP-09V-NC		
			Terminal	SHF-001T-0.8BS		
③	Motor cable	Drive side	Housing	5557-04R	Flexible	
			Terminal	5556T		
		Motor side	Housing	5557-04R		
			Terminal	5556T		
④	Power connection	Housing	5557-02R	Housing and terminal only		
		Terminal	5556T			
⑤	Parameter setting cable	Housing	5264-03	Housing and terminal only		
		Terminal	5263			



AUXILIARY EQUIPMENT



		SENSOR SWITCH	
RC*	RCA.....		5-2
	RCB.....		5-4
	RCD.....		5-5
	RCE.....		5-6
	RCE1.....		5-7
	RCI.....		5-8
	RD*	RDEP.....	
	RDFE.....		5-11
	RDGV.....		5-12
	RDP8 New		5-13
	RNKD / RPKD New		5-14
LN*	LN01G.....		5-15
	LN01P.....		5-16
	LN32H.....		5-17
	LN40R.....		5-18
	LN65 New		5-19
		CABLE WITH CONNECTOR	
M8*	M83* / M84*.....		5-20
	M83R-F New		5-21



Order example

* Special order is available.

RCA — □

MODEL

RCA: Reed switch
RDA: Without contact
RNA: NPN
RNAE: NPN
RPA: PNP
RPAE: PNP

WIRE LENGTH

Blank: L=2000mm
1M: L=1000mm
QD: M8, 3 Pin connector
EQD: M8, 3 Pin connector

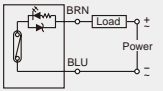
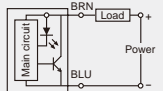
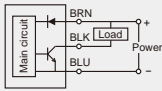

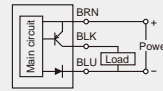

Switch holder / band

HV1

SWITCH HOLDER

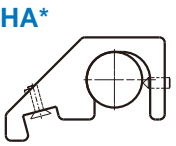
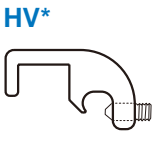
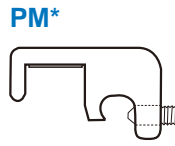
HA*: for MCQA, MCQV
HV*: for MCQA, MCQV, MCQV2, MCQV3, MCQV2L, MCBQV, MCBQV2, MCBQV3, MCQN
HS*: for MSB*-ø50
BGA*: for MCKG*
PN-A*: for MCKA
PM*: for MCQA, MCQV

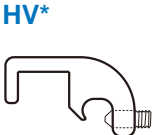
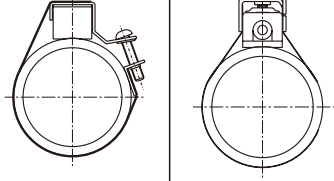
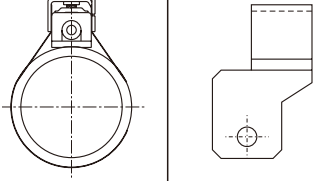
Specification

Model	RCA	RDA	RNA	RNAE	RPA	RPAE
Wiring method	2 wire		3 wire			
Switching logic	SPST N.O.	Solid state output, normally open				
Switch type	Reed switch	Non-contact	NPN current sinking		PNP current sourcing	
Operating voltage	5~240V DC/AC		5~30V DC			
Switching current	100mA max.	50mA max.	200mA max.			
Switching rating (*1)	10W max.	1.5W max.	6W max.			
Current consumption	—		15 mA@24V DC max.	6 mA@24V DC max.	15 mA@24V DC max.	6 mA@24V DC max.
Voltage drop	3.5V max.	3.7V max.	1.5V max.	0.5max.	1.5V max.	0.5max.
Leakage current	—	0.1mA(40uA) max.	0.01mA max.			
Indicator	Green LED	Red LED			Green LED	
Cable	ø4, 2C, PVC		ø4, 3C, PVC			
Temperature range	-10~+70°C (No freezing)					
Shock (*2)	30G		50G			
Vibration (*3)	9G					
Enclosure classification	IEC 60529 IP67					
Protection circuit (*4)	1	3,4	2,3,4	3,4	2,3,4	3,4
Weight	46 g (2m cable)					
Connect diagram						

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 8-8~9.

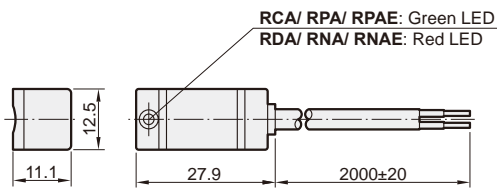
Assembling style

Cylinder type	MCQA					MCQV2 / MCBQV2			MCQV			MCQV3 / MCBQV3
Mounting clamps	Hold					Hold						Hold
Order	HV2	HV4	PM14	PM16	HA5	HV1	HV2	HV3	HV4	PM16	HA5V	HV2
Cylinder tube I.D.	40,50,63	80,100	125	150	200	32,40	50,63	80,100	125	160	200	50,63
Pictures												

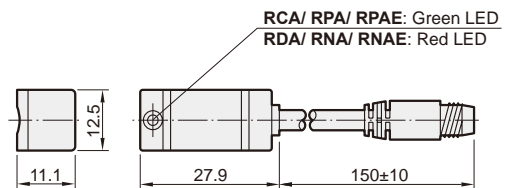
Cylinder type	MCBQV	MCQV2L		MCQN			MCKG*		MCKA	MSB* $\phi 50$
Mounting clamps	Hold	Hold		Hold			Band		Band	Hold
Order	HV4	HV2	HV3	HV1	HV2	HV3	BGA50	BGA63	PN-A40	HS
Cylinder tube I.D.	125	63	80	40	50,63	80,100	50	63	40	50
Pictures										

Dimension

RCA/ RDA/ RNA/ RNAE/ RPA/ RPAE

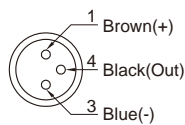
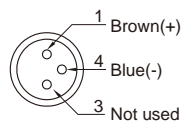
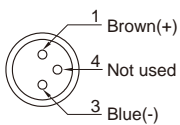


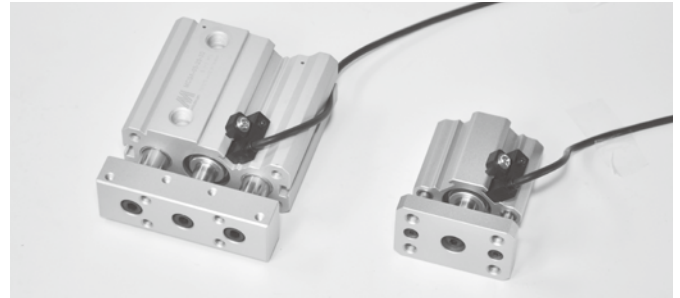
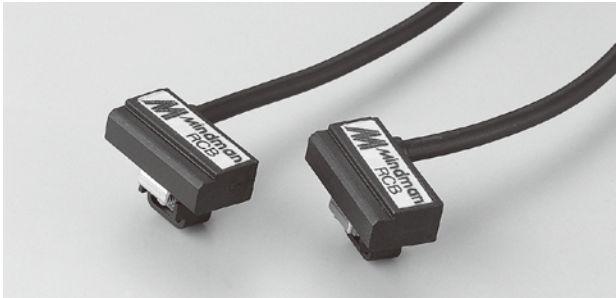
RCA-QD/ RDA-QD/ RNA-QD/ RNAE-QD/ RPA-QD/ RPAE-QD



Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring





Order example

RCB — □

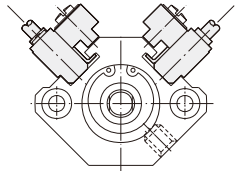
MODEL

RCB: Reed switch
RDB: Without contact
RNB: NPN
RNBE: NPN
RPB: PNP
RPBE: PNP

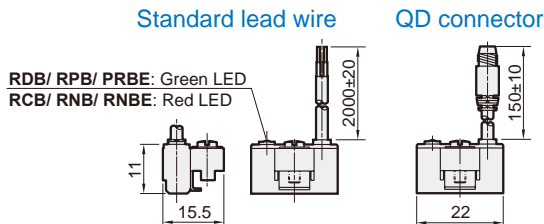
WIRE LENGTH

Blank: L=2000mm
1M: L=1000mm
QD: M8, 3 Pin connector
EQD: M8, 3 Pin connector
* Special order is available.

Assembling style

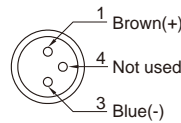
Cylinder type	Mounting clamp
MCJA, MCJQ, MCJQ2, MCGA, MCGJ, MCG3 MCDA, MCRA, MCKB, MSB*, MSLD	

Dimension

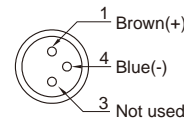


Wiring of the QD

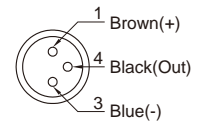
• 2 wire QD wiring



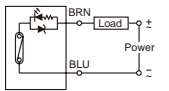
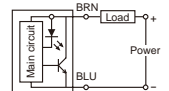
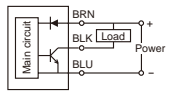
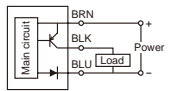
• 2 wire EQD wiring



• 3 wire QD wiring



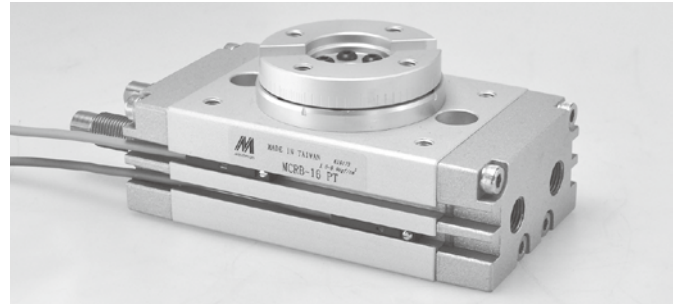
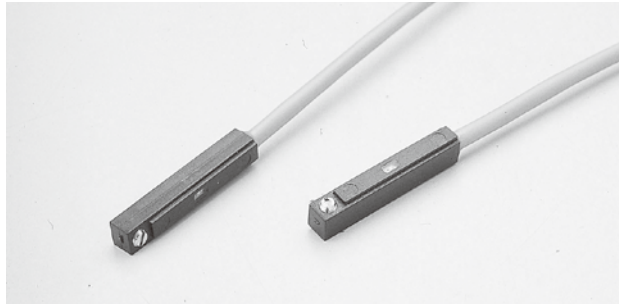
Specification

Model	RCB	RDB	RNB	RNBE	RPB	RPBE
Wiring method	2 wire		3 wire			
Switching logic	SPST normally open		Solid state output, normally open			
Switch Type	Reed switch	Non-contact	NPN current sinking		PNP current sourcing	
Operating voltage	5~240V DC/AC		5~30V DC			
Switching current	100mA max.	50mA max.	200mA max.			
Switching rating(*1)	10W max.	1.5W max.	6W max.			
Current consumption	-		22 mA@24V DC max.	6 mA@24V DC max.	20 mA@24V DC max.	6 mA@24V DC max.
Voltage drop	3.5V max.	3.7V max.	0.5V max.			
Leakage current	-	0.1mA(40uA) max.	0.01mA max.			
Indicator	Red LED	Green LED	Red LED		Green LED	
Cable	ø3.3, 2C, PVC		ø3.3, 3C, PVC			
Temperature range	-10~+70°C (No freezing)					
Shock (*2)	30G		50G			
Vibration (*3)	9G					
Enclosure classification	IEC 60529 IP67					
Protection circuit (*4)	1		3,4			
Weight	33 g (2m cable)					
Connect diagram						

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
*5. Caution for safety please refer to the page 8-8~9.

RCD series

SENSOR SWITCH



Order example

RCD — □

MODEL

- RCD: Reed switch
- RDD: Without contact
- RND: NPN
- RNDE: NPN
- RPD: PNP
- RPDE: PNP

WIRE LENGTH

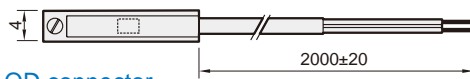
- Blank: L=2000mm
- 1M: L=1000mm
- QD: M8, 3 Pin connector
- EQD: M8, 3 Pin connector
- * Special order is available.

Assembling style

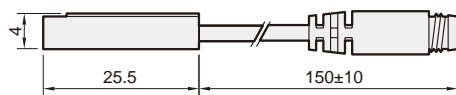
Cylinder type	Mounting clamp
MCRPMS, MCRB	

Dimension

Standard lead wire

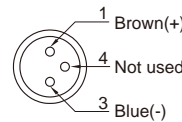


QD connector

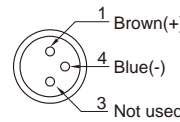


Wiring of the QD

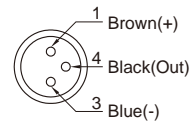
• 2 wire QD wiring



• 2 wire EQD wiring



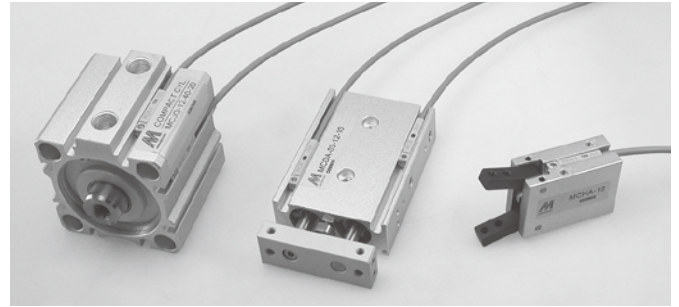
• 3 wire QD wiring



Specification

Model	RCD	RDD	RND	RNDE	RPD	RPDE
Wiring method	2 wire		3 wire			
Switching logic	SPST normally open		Solid state output, normally open			
Switch Type	Reed switch	Non-contact	NPN current sinking		PNP current sourcing	
Operating voltage	5~120V DC/AC		5~30V DC			
Switching current	100mA max.	50mA max.	200mA max.			
Contact rating (*1)	10W max.	1.5W max.	6W max.			
Current consumption	-		8 mA@24V DC Max	6 mA@24V DC Max	8 mA@24V DC Max	6 mA@24V DC Max
Voltage drop	3.5V max.	3.7V max.	1V@200mA Max	0.5V@200mA Max	1V@200mA Max	0.5V@200mA Max
Leakage current	-	0.1mA(40uA) Max	0.01mA Max			
Indicator	Red LED			Green LED		
Cable	ø2.8, 2C, PUR		ø2.8, 3C, PUR			
Temperature range	-10~+70°C (No freezing)					
Shock (*2)	30G		50G			
Vibration (*3)	9 G					
Enclosure classification	IEC 60529 IP67					
Protection circuit (*4)	1	3, 4	2, 3, 4	3, 4	2, 3, 4	3, 4
Weight	20 g (2m cable)					
Connect diagram						

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 8-8~9.



Order example * Special order is available.

RCE — □

MODEL

- RCE: Reed Switch
- RDE: Non-contact
- RDE-D: Non-contact, two indicators
- RNE: NPN
- RNEE: NPN
- RPE: PNP
- RPEE: PNP

WIRE LENGTH

- Blank: L=2000mm
- 1M: L=1000mm
- QD: M8, 3 Pin connector
- EQD: M8, 3 Pin connector

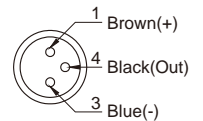
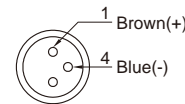
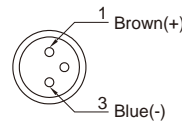
Assembling style

Cylinder type	Mounting clamp
MCJA, MCJQ, MCKJQ, MCFA, MCGB, MCGS, MCGD, MCGJ, MCG3, MCDA, MCSH, MCSS, MCSQ, MCSF, MCRPMD, MCRA, MCKB, MCKC, MCHA, MCHB, MCHC, MSB*, MSL*	

* RDE not applicable to MCDA-12, MCSS-6/8, MCSQ.

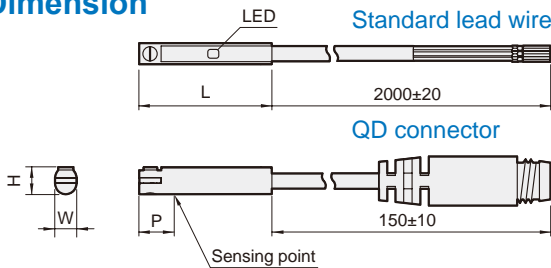
Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring



Code Model	H	L	P	W
RCE	5	24	12	4
RDE, RDE-D	5	24	6	4
RNE, RPE	4.65	22	6	4.1
RNEE, RPEE	5	22	6	4

Dimension



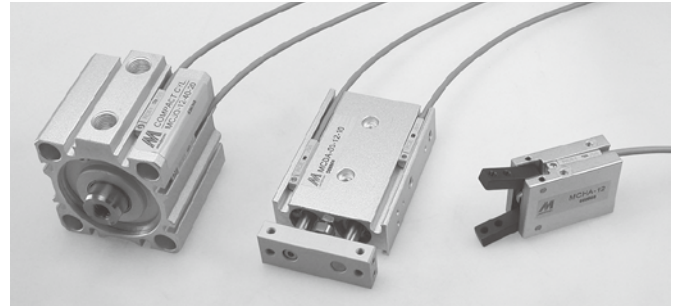
Specification

Model	RCE	RDE	RDE-D	RNE	RNEE	RPE	RPEE
Wiring method	2 wire			3 wire			
Switching logic	SPST normally open			Solid state output, normally open			
Switch Type	Reed switch	Non-contact		NPN current sinking		PNP current sourcing	
Operating voltage	5~220V DC/AC		10~28V DC	5~30V DC			
Switching current	50mA max.	50mA max.	80mA max.	50mA max.	200mA max.	50mA max.	200mA max.
Switching rating(*1)	10W max.	1.5W max.	2W max.	1.5W max.	6W max.	1.5W max.	6W max.
Current consumption	—			10 mA@24V DC max.	6 mA@24V DC max.	12 mA@24V DC max.	6 mA@24V DC max.
Voltage drop	3.5V max.		4V max.	0.5V max.	0.5V @200mA max.	1.5V max.	0.5V @200mA max.
Leakage current	—	0.1mA max.	1mA max.	0.01mA max.			
Indicator (LED)	Red		Red/Green	Red		Green	
Cable	ø2.8,2C,PUR	ø2.8,2C,PUR		ø3, 3C, PU			
Temperature range	-10~+70°C (No freezing)						
Shock (*2)	30G		50G				
Vibration (*3)	9G						
Enclosure classification	IEC 60529 IP67						
Protection circuit (*4)	1	3,4	2,3,4	3,4			
Weight	20 g (2m cable)						
Connect diagram							

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to the page 8-8-9.

RCE1 series

SENSOR SWITCH



Order example * Special order is available.

RCE1 — □

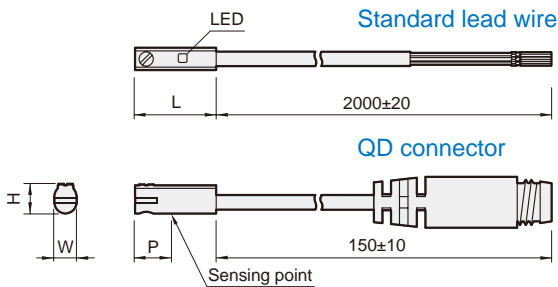
MODEL

RCE1: Reed Switch
RDE1E: Non-contact
RNE1E: NPN
RPE1E: PNP

WIRE LENGTH

Blank: L=2000mm
1M: L=1000mm
QD: M8, 3 Pin connector
EQD: M8, 3 Pin connector

Dimension



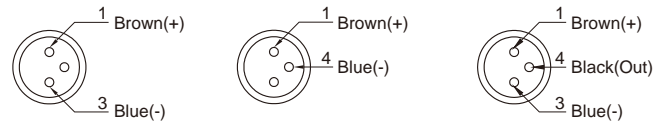
Assembling style

Cylinder type	Mounting clamp
MCJA, MCJQ, MCKJQ, MCFA, MCGB, MCGS, MCGD, MCGJ, MCG3, MCDA, MCSH, MCSS, MCSQ, MCSF, MCRPMD, MCRA, MCKB, MCKC, MCHA, MCHB, MCHC, MSB*, MSL*	

* RNE1E not applicable to MCDA-12.

Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring

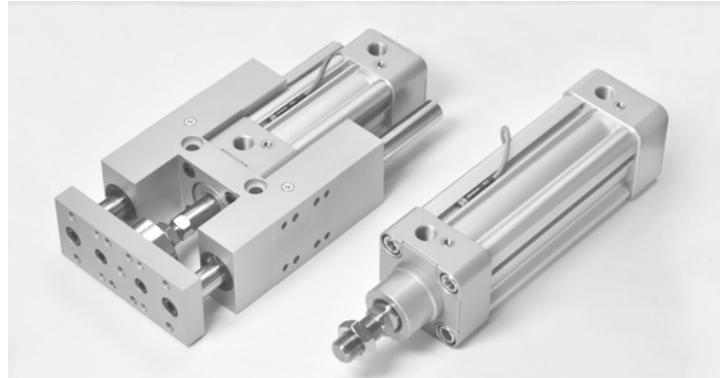


Code Model	H	L	P	W
RCE1	4.65	22.0	12	4.1
RDE1E	5	14.2	6	4
RNE1E	5	14.2	6	4
RPE1E	5	14.2	6	4

Specification

Model	RCE1	RDE1E	RNE1E	RPE1E
Wiring method	2 wire		3 wire	
Switching logic	Solid state output, normally open			
Switch Type	Reed switch	Non-contact	NPN current sinking	PNP current sourcing
Operating voltage	5~120V DC/AC		5~30V DC	
Switching current	100mA max.	50mA max.	80mA max.	
Switching rating(*1)	10W max.	1.5W max.	2.2W max.	
Current consumption	—		10 mA@24V DC max.	
Voltage drop	3.5V max.		0.5V @50mA max.	
Leakage current	—	0.1mA(40uA) max.	0.01mA max.	
Indicator (LED)	Red			
Cable	ø2.8,2C,PU	ø2.6,2C,PVC	ø2.6,3C,PVC	
Temperature range	-10~+70°C (No freezing)			
Shock (*2)	30G	50G		
Vibration (*3)	9G			
Enclosure classification	IEC 60529 IP67			
Protection circuit (*4)	1	3,4		
Weight	20 g (2m cable)			
Connect diagram				

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
*5. Caution for safety please refer to the page 8-8-9.



Order example

RCI - N - □

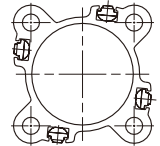
MODEL

RCI: Reed Switch
RCI-N: Reed Switch NPN
RCI-P: Reed Switch PNP
RNI: NPN
RPI: PNP

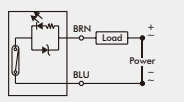
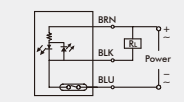
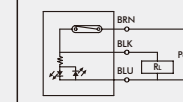
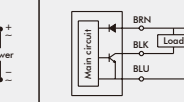
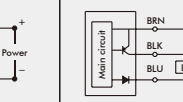
WIRE LENGTH

Blank: L=2000mm
1M: L=1000mm
QD: M8, 3 Pin connector
EQD: M8, 3 Pin connector
* Special order is available.

Assembling style

Cylinder type	Mounting clamp
MCQI2, MCQI3, MCKQI2, MCBQI2, MCBQI3, MCJI, MCGI, MGTB, MGTU, MGTX, METB	

Specification

Model	RCI	RCI-N	RCI-P	RNI	RPI
Wiring	2 wire	3 wire		3 wire	
Switching logic	Normal open				
Switch Type	Reed switch	Reed switch NPN	Reed switch PNP	NPN current sinking	PNP current sourcing
Voltage range	5~240V DC/AC	10~30V DC		10~30V DC	
Current range	100mA max.	500mA max.		200mA max.	
Contact rating(*1)	10W max.			6W max.	
Current consumption	—	5 mA@24V DC max.		20 mA@24V DC max.	
Voltage drop	3.5V max.	0.1V@100mA max.		1.5V max.	
Leakage current	—	—	—	0.05mA max.	
Indicator	Red LED	Yellow LED		Red LED	Yellow LED
Cable	ø3,2C,PUR	ø3,3C,PUR		ø3,3C,PUR	
Temperature	-10~+70°C (No freezing)				
Shock (*2)	30G			50G	
Vibration (*3)	9G				
Protection classification	IEC 60529 IP67				
Protection circuit (*4)	1			2,3,4	
Weight	23 g (2m cable)				
Connect diagram					

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.

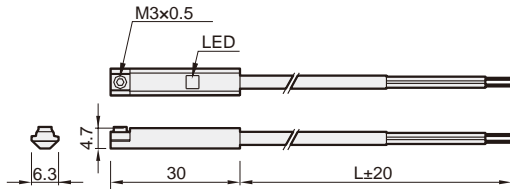
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.

*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression

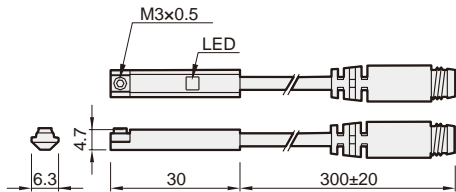
*5. Caution for safety please refer to page 8-8~9.

Dimension

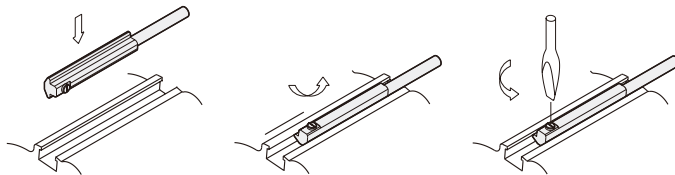
RCI-*/RNI/RPI



RCI-*-QD/RNI-QD/RPI-QD

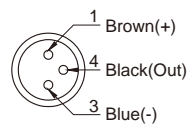
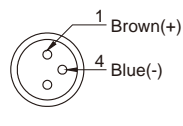
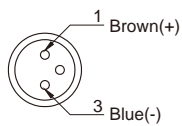


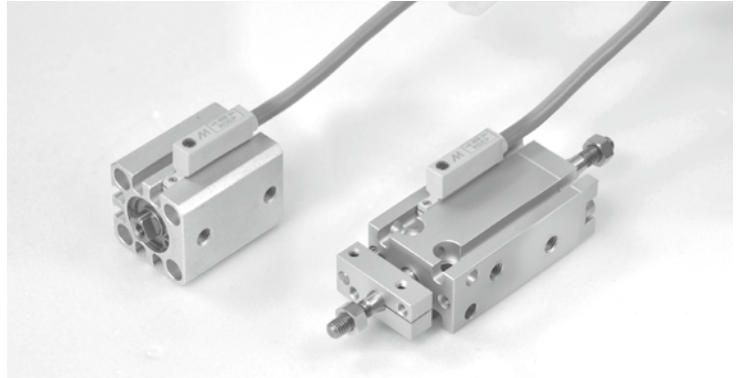
Mounting



Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring





Application environment

- RDEP can be applied in the strong magnetic field environment such as automotive manufacturing or areas near welding machine.
- When RDEP detects the magnetic AC field (50 or 60Hz) it will keep the status of output and will not be effected.

Order example

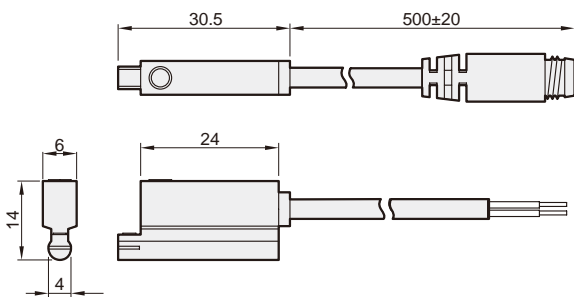
RDEP — □

MODEL

WIRE LENGTH

Blank: 3000mm
QD: M12, 4Pin connector

Dimension



Specification

Model	RDEP
Wiring method	2 wire
Switching logic	Solid state output, normally open
Switch type	Current sourcing
Operating voltage	10~28V DC
Switching current	5~50mA max.
Switching rating (*1)	1.5W max.
Current consumption	—
Voltage drop	5V max.
Leakage current	1mA max.
Indicator	Unstable: Red LED ; Stable: Green LED
Cable	ø4.8, 2C, PVC
Temperature range	-10°C~+60°C (No freezing)
Shock (*2)	50G
Vibration (*3)	9G
Enclosure classification	IEC 60529 IP67
Protection circuit (*4)	3, 4
Weight	100 g (3m cable)
Connect diagram	

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.

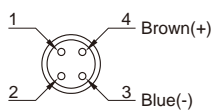
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.

*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression

*5. Caution for safety please refer to page 8-8~9.

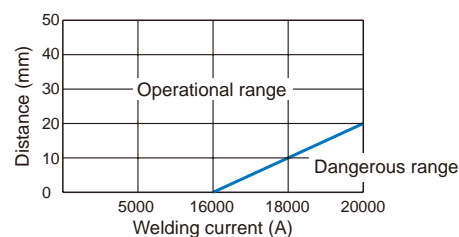
Wiring of the QD

- 2 wire



Weld-field immune

The operational distance can be 0mm between sensor and welding gun (welding conductor or cable) when the welding current less than 16000A.

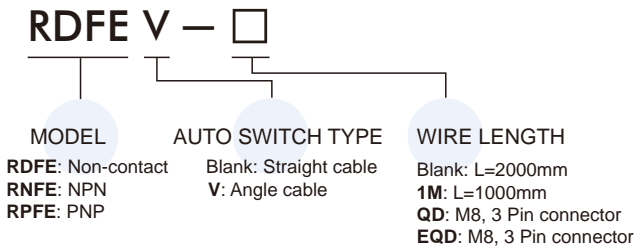


Assembling style

Cylinder type	Mounting clamp
MCJA, MCJQ, MCKJQ, MCFA, MCGB, MCGS, MCGD, MCGJ, MCG3, MCDA, MCSS, MCSH, MCSQ, MCRA, MCKB, MCKC, MSB*, MSL*	



Order example * Special order is available.



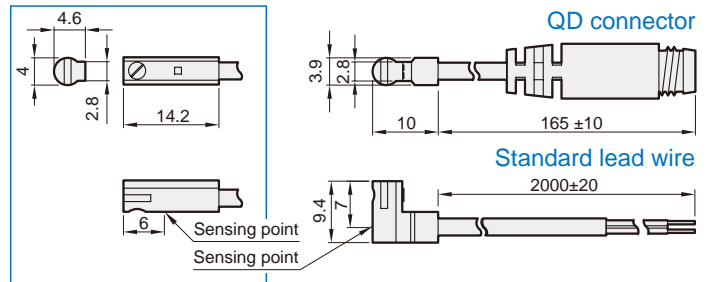
Assembling style

Applicable model	Mounting clamp
MAM*, MCJU, MCFB, MCMJP, MCDJ, MSBE, MCRJ-S, MCRQ, MCRQ-S, MCHC-6, MCHD, MCHH, MCHU, MCHS, MCHX, MCHG2, MCHJ, MCHY, MEQI	

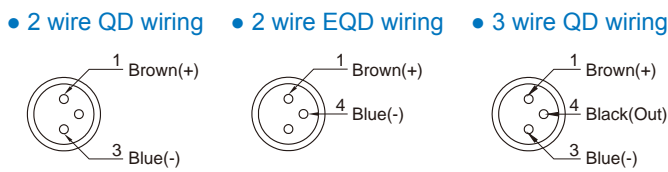
Dimension

Straight cable

Angle cable



Wiring of the QD



Specification

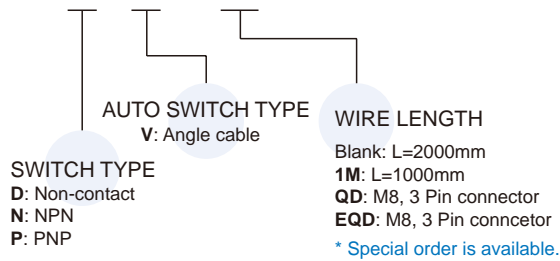
Model	RDFE / RDFEV	RNFE	RNFEV	RPFE	RPFEV
Wiring method	2 wire	3 wire			
Switching logic	Solid state output, Normally open				
Switch Type	Non-contact	NPN current sinking		PNP current sourcing	
Operating voltage	5~30V DC	5~30V DC		5~30V DC	
Switching current	50mA max.	50mA max.	80mA max.	50mA max.	80mA max.
Contact rating(*1)	1.5W max.	1.5W max.	2.2W max.	1.5W max.	2.2W max.
Current consumption	—	10mA @24V DC max.	6mA @24V DC max.	10mA @24V DC max.	6mA @24V DC max.
Voltage drop	3.5V max.	0.5V @ 50mA max.			
Leakage current	0.1mA(40uA) max.	0.01mA max.			
Indicator	Red LED				
Cable	∅2.6, 2C, PVC	∅2.6, 3C, PVC			
Temperature range	-10~+70°C (No freezing)				
Shock (*2)	50G				
Vibration (*3)	9G				
Enclosure classification	IEC 60529 IP67				
Protection circuit (*4)	3, 4				
Weight	12.8 g (1m cable) / 23.8 g (2m cable)				
Connect diagram					

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 8-8~9.



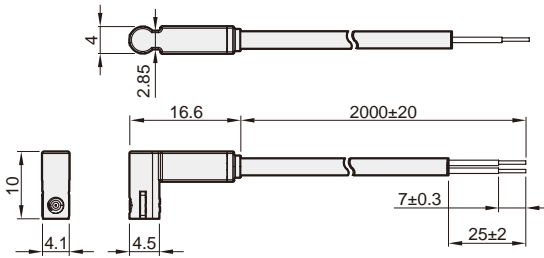
Order example

RDGV — □

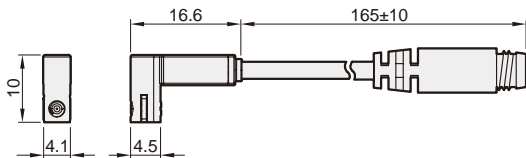


Dimension

RDGV / RNGV / RPGV

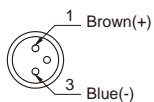


RDGV-QD / RNGV-QD / RPGV-QD

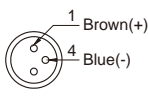


Wiring of the QD

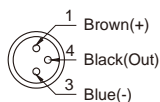
• 2 wire QD wiring



• 2 wire EQD wiring



• 3 wire QD wiring



Specification

Model	RDGV	RNGV	RPGV
Wiring method	2 wire	3 wire	
Switching logic	Solid state output, Normally open		
Switch type	Non-contact	NPN current sinking	PNP current sourcing
Operating voltage	10~28V DC	5~28V DC	
Switching current	4~20mA max.	50mA max.	
Contact rating (*1)	0.6W max.	1.5W max.	
Current consumption	—	10mA @24V DC max.	
Voltage drop	3.5V max.	0.5V @ 50mA max.	
Leakage current	0.8mA max.	0.01mA max.	
Indicator	Red LED		
Cable	ø2.6, 2C, PVC	ø2.6, 3C, PVC	
Temperature range	-10°C~+70°C (No freezing)		
Shock (*2)	50G		
Vibration (*3)	9G		
Enclosure classification	IEC 60529 IP67		
Protection circuit (*4)	4	3, 4	
Weight	23 g (2m cable)		
Connect diagram			

- * 1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
- * 2. Sin wave / X.Y.Z. 3 Directions / 3 Times each direction / 11ms each time.
- * 3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 Directions / 1 Hour each time.
- * 4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.
- * 5. Caution for safety please refer to page 8-8-9.

Assembling style

Cylinder type	Mounting clamp
<p>MCJU, MCFB, MCMJP, MCGS, MCDJ, MCHJ-50</p>	



Order example

RDP8 — N — 3M

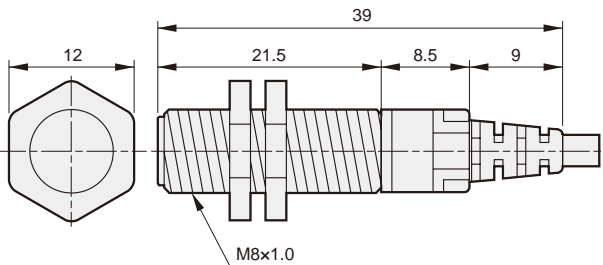
MODEL SWITCH TYPE WIRE LENGTH
 N: NPN
 P: PNP
 3M: 3000mm

Specification

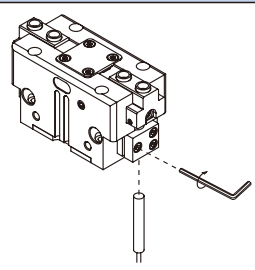
Model	RDP8
Operating voltage	10~30V DC
Power ripple	20% peak to peak
Current consumption	10mA max.
Detection distance	1.8~2.0 mm for steel 0.4~0.6mm for aluminum
Hysteresis	10% of sensing distance max.
Response frequency	2.5KHz min.
Output type	NPN, PNP
Output logic	N.O.
Output current	150mA max.
Residual voltage	0.1V max.
Leakage current	0.8mA max.
Protection type	Short circuit & polarity reversed protection
Indicator (LED)	White
Cable length	3m±0.1 m
Cable	3c/ø3, gray cover, oil and shaking resistance
Maximum voltage resistance	2.5kv / 1 minute min.
Operating environment	-20°C ~ +80°C, 35% ~ 85% RH
Protection class	IP 67

* Caution for safety please refer to the page 8-8~9.

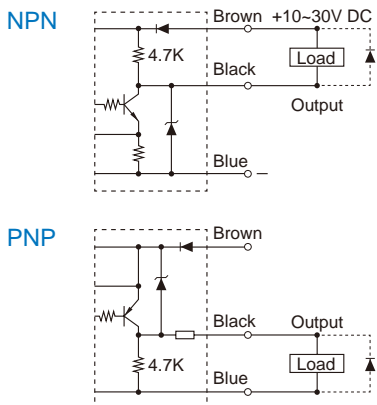
Dimension

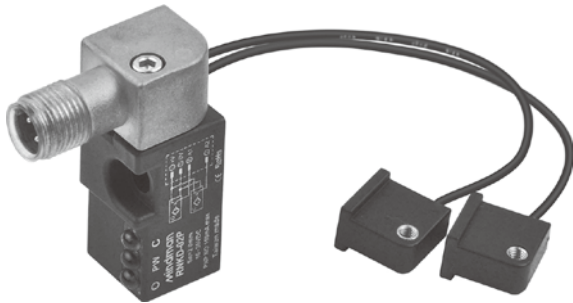


Assembling style

Cylinder type	Mounting clamp
MCHJ, MCHS	

Connect diagram





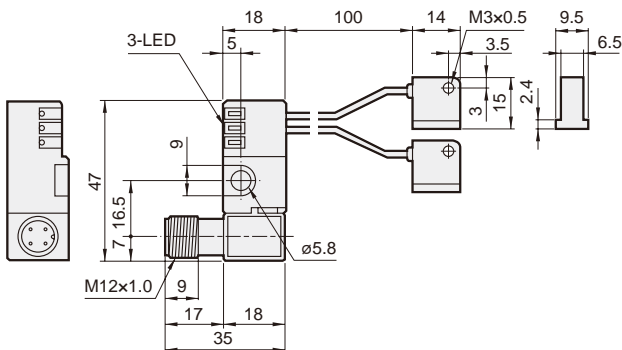
Order example

R N K D

SWITCH TYPE

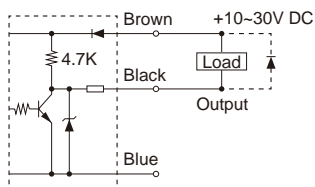
N: NPN
P: PNP

Dimension

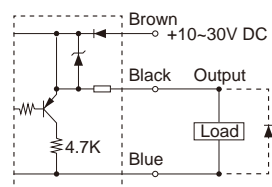


Connect diagram

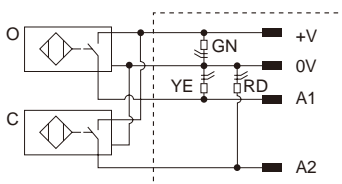
NPN



PNP



M12 Connection



Connection wires

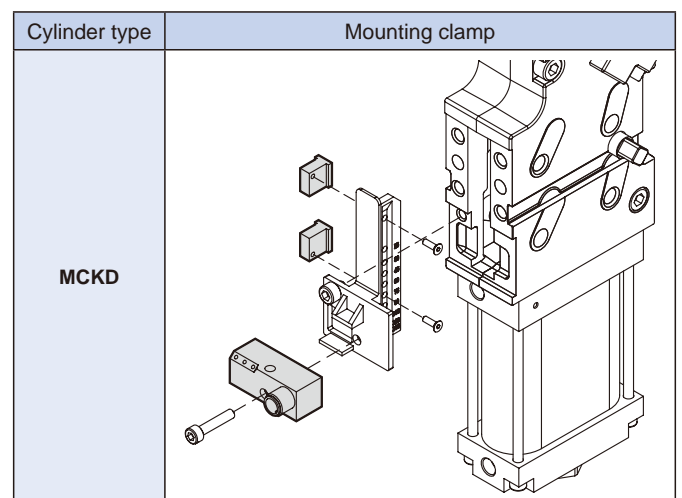
Brown: +V Blue: 0V
Black: Open White: Close

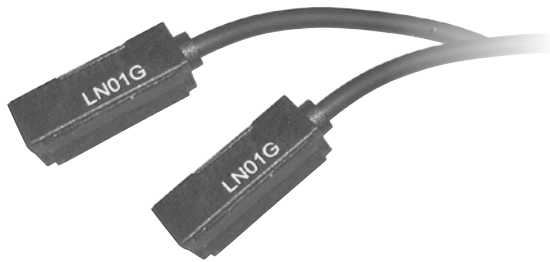
Specification

Model	RNKD	RPKD
Output method	NPN	PNP
Voltage	10~30V DC	
Current consumption	15mA max.	
Output current	150mA max.	
Voltage drop	0.8V	
Leakage current	0.1mA	
Sensing distance	2.5mm±10%	
Effective sensing distance	80% of sensing distance min.	
Hysteresis	10% of sensing distance max.	
Thermal drift	10µm/°C max.	
Accuracy	2% of sensing distance max.	
Pilot LED	Power: Green, Open: Yellow, Close: Red	
Frequency	100 Hz max.	
Protection circuit	Short circuit & polarity reversal protection	
Housing material	PBT	
Protection class	IEC 60529 IP67	
Vibration resistance	300m/s ² / (55~2000Hz)(IEC-60068-2-6)	
Shock resistance	300m/s ² with 11ms (IEC-60068-2-27)	
EMC interference	IEC 61000-6-4	
Dielectric strength	2.5kv / 1 minute min.	
Insulation strength	100 MΩ / 500V DC	
Operating environment	-20°C ~ +80°C, 100%RH max. (Condensation permitted)	

* Caution for safety please refer to the page 8-8~9.

Assembling style





Specification

Model	LN01G	LN01G-N	LN01G-P
Wiring method	2 wire	3 wire	
Switching logic	Normally open	Solid state output, normally open	
Switch Type	Reed switch	NPN current sinking	PNP current sourcing
Operating voltage	5~240V DC/AC	5~30V DC	
Switching current	100mA max.	200mA max.	
Switching rating(*1)	10W max.	6W max.	
Current consumption	—	OFF:7mA(24V) ON:20mA(24V) max.	
Voltage drop	3V max.	0.5V@200mA max.	
Indicator	Red LED		Green LED
Cable	ø3.3, 2C, PVC	ø3.3, 3C, PVC	
Temperature range	-10~+70°C (No freezing)		
Enclosure classification	IEC 60529 IP67		
Protection circuit (*2)	1	3, 4	
Symbol			

Order example

LN01G — P — □

MODEL



Blank: Lead wire
QD: Connector

SWITCH TYPE
Blank: Reed switch
N: NPN
P: PNP

*1. Warning: Never exceed rating (watt=voltage×amperage).

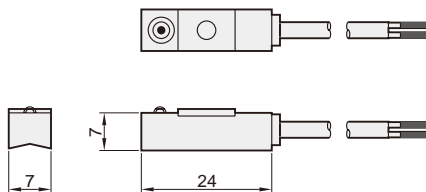
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 8-8-9.

Assembling style

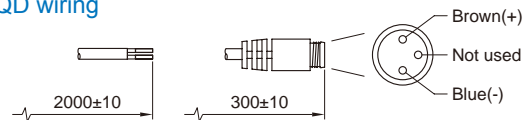
Cylinder type	MDO*	
Order	LN01G	
Tube I.D.	20	32
Mounting clamp		

Dimension

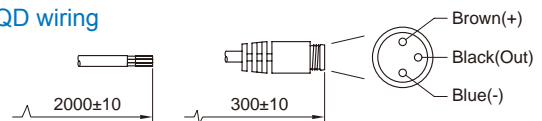


Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring





Order example

LN01P — AN — □

MODEL



LN01P



LN02P

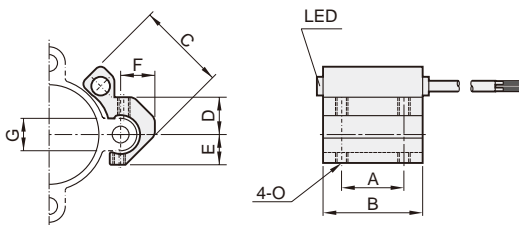


LN03P

Blank: Lead wire
QD: Connector

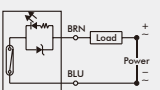
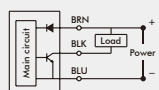
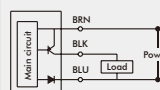
SWITCH TYPE
Blank: Reed switch
AN: NPN
AP: PNP

Dimension



Model	A	B	C	D	E	F	G	O
LN01P	20	32	28.5	12	9.8	11	10.5	M4
LN02P	20	32	37.5	15	13.5	12	13.5	M4
LN03P	20	32	56	18	15	14	17	M4

Specification

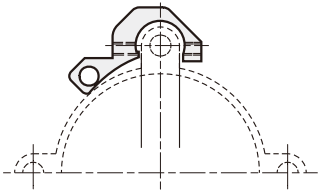
Model	LN0*P	LN0*P-AN	LN0*P-AP
Wiring method	2 wire	3 wire	
Switching logic	Normally open	Solid state output, normally open	
Switch Type	Reed switch	NPN current sinking	PNP current sourcing
Operating voltage	10~220V DC/AC	5~30V DC	
Switching current	100mA max.	200mA max.	
Switching rating(*1)	10W max.	6W max.	
Current consumption	—	OFF:7mA(24V) ON:20mA(24V) max.	
Voltage drop	3V max.	0.5V@200mA max.	
Indicator	Red LED		Green LED
Cable	ø3.3, 2C, PVC	ø3.3, 3C, PVC	
Temperature range	-10~+70°C (No freezing)		
Enclosure classification	IEC 60529 IP67		
Protection circuit (*2)	1	3, 4	
Symbol			

*1. Warning: Never exceed rating (watt=voltage×amperage).

*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

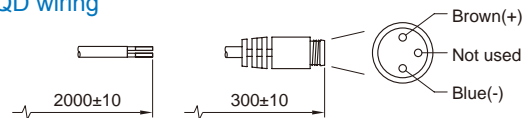
*3. Caution for safety please refer to page 8-8-9.

Assembling style

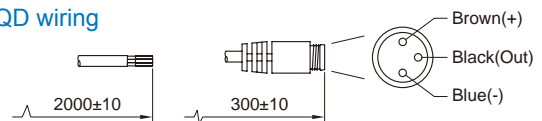
Cylinder type	MDM*					MRPH	
Order	LN01P	LN02P	LN03P	80	100	LN01P	
Tube I.D.	40	50	63	80	100	32	40
Mounting clamp							

Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring





Order example

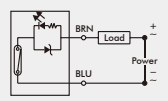
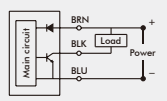
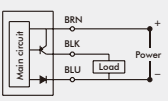
LN32H — P — □

MODEL

Blank: Lead wire
QD: Connector

SWITCH TYPE
Blank: Reed switch
N: NPN
P: PNP

Specification

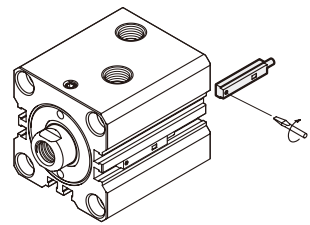
Model	LN32H	LN32H-N	LN32H-P
Wiring method	2 wire	3 wire	
Switching logic	Normally open	Solid state output, normally open	
Switch Type	Reed switch	NPN current sinking	PNP current sinking
Operating voltage	5~240V DC/AC	10~30V DC	
Switching current	100mA max.	200mA max.	
Switching rating(*1)	10W max.	3W max.	
Current consumption	—	OFF:7mA(24V) ON:17mA(24V) max.	
Voltage drop	3.5V max.	2.0V max.	
Indicator	Red LED		Yellow LED
Cable	ø3.3, 2C, PVC	ø3.3, 3C, PVC	
Temperature range	-10~+70°C (No freezing)		
Enclosure classification	IEC 60529 IP67		
Protection circuit (*2)	1	3, 4	
Symbol			

*1. Warning: Never exceed rating (watt=voltage×amperage).

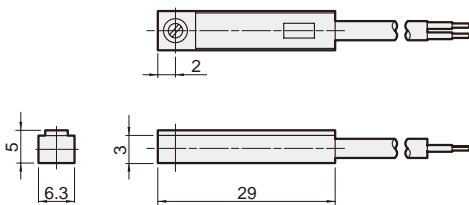
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 8-8-9.

Assembling style

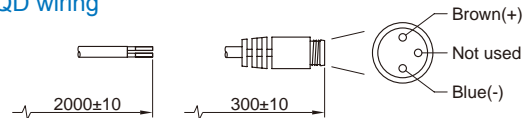
Cylinder type	MHCB-M				
Order	LN32H				
Tube I.D.	25	32	40	50	63
Mounting clamp					

Dimension

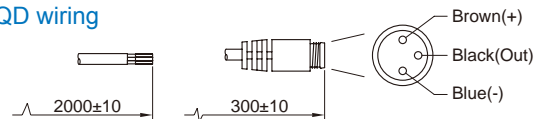


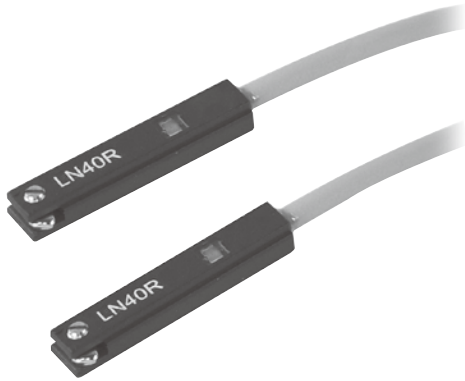
Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring





Order example

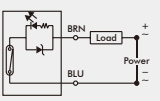
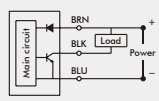
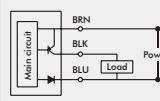
LN40R — P — □

MODEL

Blank: Lead wire
QD: Connector

SWITCH TYPE
Blank: Reed switch
N: NPN
P: PNP

Specification

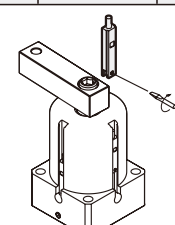
Model	LN40R	LN40R-N	LN40R-P
Wiring method	2 wire	3 wire	
Switching logic	Normally open	Solid state output, normally open	
Switch Type	Reed switch	NPN current sinking	PNP current sinking
Operating voltage	5~120V DC/AC	50~30V DC	
Switching current	100mA max.	200mA max.	
Switching rating(*1)	10W max.	3W max.	
Current consumption	—	OFF:7mA(24V) ON:17mA(24V) max.	
Voltage drop	2.5V max.	1.5V@100mA max.	
Indicator	Red LED		Yellow LED
Cable	ø3, 2C, PVC	ø3, 3C, PVC	
Temperature range	-10~+70°C (No freezing)		
Enclosure classification	IEC 60529 IP67		
Protection circuit (*2)	1	3, 4	
Symbol			

*1. Warning: Never exceed rating (watt=voltage×amperage).

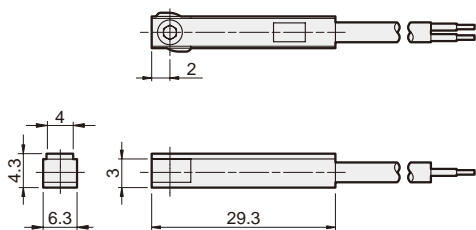
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 8-8~9.

Assembling style

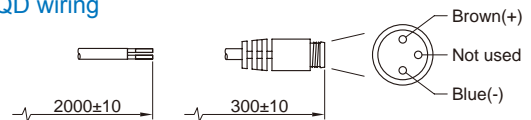
Cylinder type	MTAD / MTAS				
Order	LN40R				
Tube I.D.	25	32	40	50	63
Mounting clamp					

Dimension

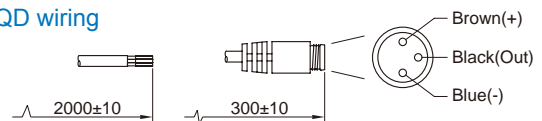


Wiring of the QD

• 2 wire QD wiring

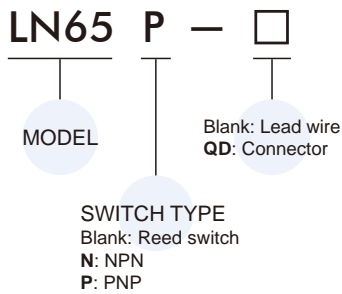


• 3 wire QD wiring

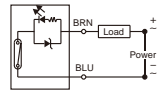
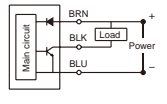
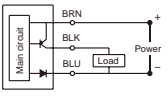




Order example



Specification

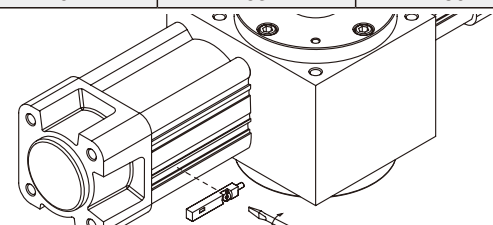
Model	LN65	LN65N	LN65P
Wiring method	2 wire	3 wire	
Switching logic	Normally open	Solid state output, normally open	
Switch Type	Reed switch	NPN current sinking	PNP current sinking
Operating voltage	5~240V DC/AC	5~30V DC	
Switching current	100mA max.	200mA max.	
Switching rating(*1)	10W max.	6W max.	
Current consumption	—	OFF:7mA(24V) ON:20mA(24V) max.	
Voltage drop	3.0V max.	0.5V@200mA max.	
Operating frequency	< 2ms	< 1ms	
Indicator	Red LED		Yellow LED
Cable	ø2.8, 2C, PUR	ø2.8, 3C, PUR	
Temperature range	-10~+70°C (No freezing)		
Enclosure classification	IP67		
Protection circuit (*2)	1	3, 4	
Symbol			

*1. Warning: Never exceed rating (watt=voltage×amperage).

*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

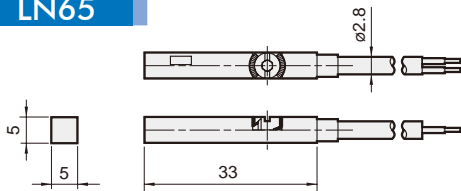
*3. Caution for safety please refer to page 8-8~9.

Assembling style

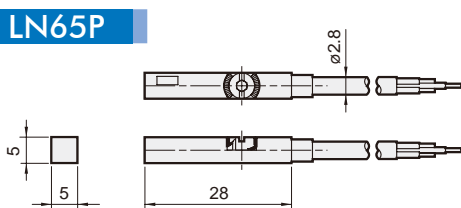
Cylinder type	MRTF / MRTH		
Order	LN65		
Tube I.D.	40	63	80
Mounting clamp			

Dimension

LN65



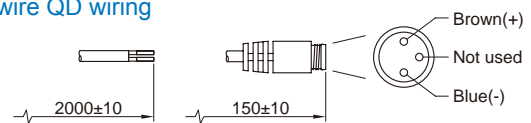
LN65N



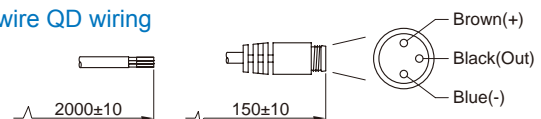
LN65P

Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring



M83*/ M84* series

CABLE WITH CONNECTOR / M8 (MALE)



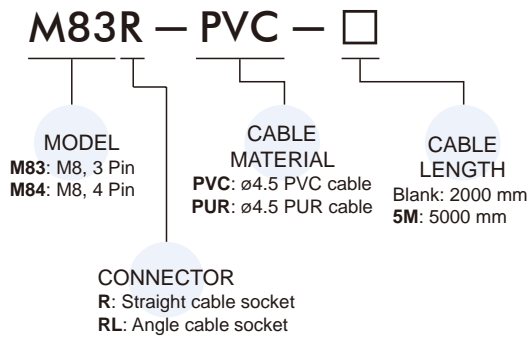
mindman



Specification

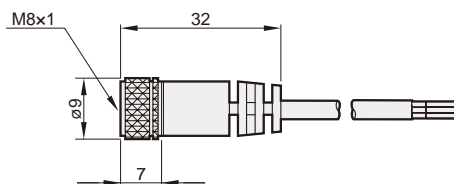
Model	M83R / M83RL		M84R / M84RL	
Female pin out				
Number of contacts	3		4	
Rated voltage	60V DC/AC			
Rated current	3A			
Contact material	Gold plated brass			
Contact bearer material	PA			
Housing material	PP			
Housing color	Black			
Cable material	ø4.5, PVC	ø4.5, PUR	ø4.5, PVC	ø4.5, PUR
Cable color	Gray	Black	Gray	Black
Temperature	-20°C~+80°C (No freezing)			
Cable conductor	24AWG			
Protection class	IEC60529 IP 67			

Order example

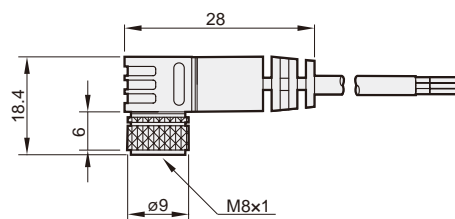


Dimension

• Straight cable socket (R)



• Angle cable socket (RL)



M83R-F series



CABLE WITH CONNECTOR / M8 (MALE) – M8 (FEMALE)

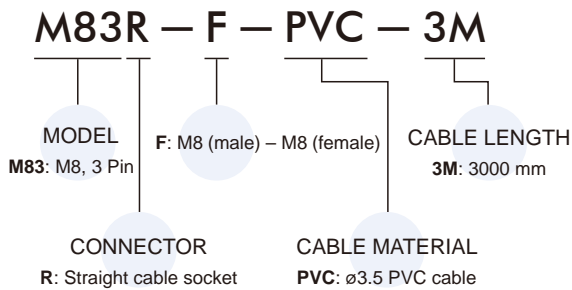
mindman



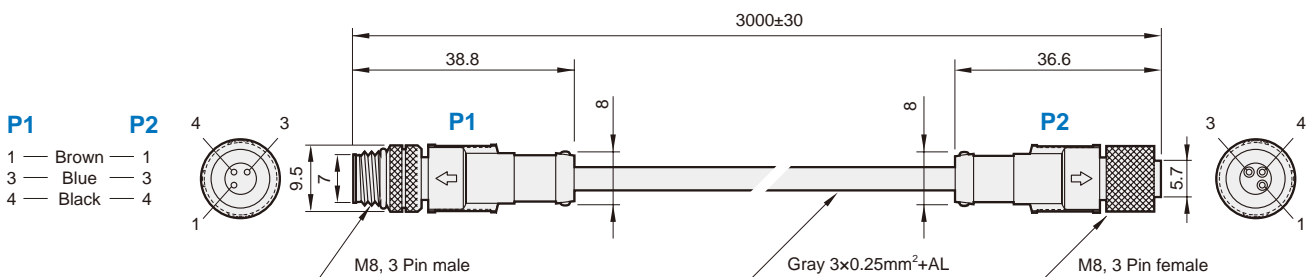
Specification

Model	M83R-F	
Male / Female pin out		
Number of contacts	3	3
Rated voltage	125V DC/AC	
Rated current	3A	
Contact material	Brass (Au plating)	
Contact bearer material	PVC	
Housing color	Gray	
Cable material	ø3.5, PVC	
Cable color	Gray	
Temperature	-20°C~+60°C (No freezing)	
Cable conductor	0.25mm ² / 24AWG	
Protection class of contact	IP 67	

Order example

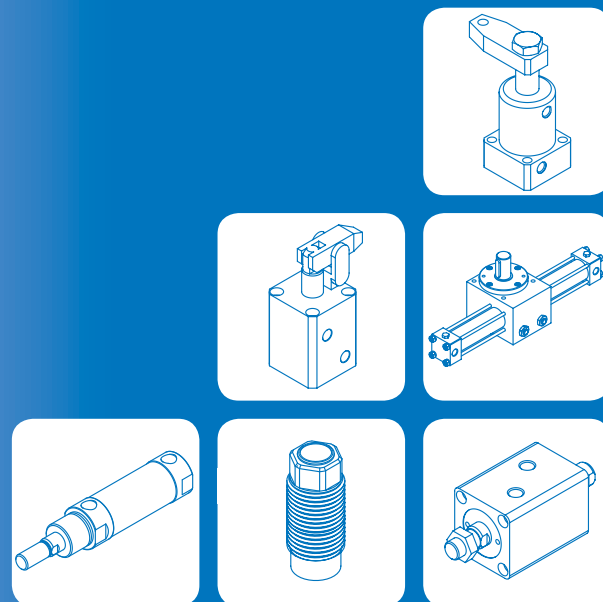
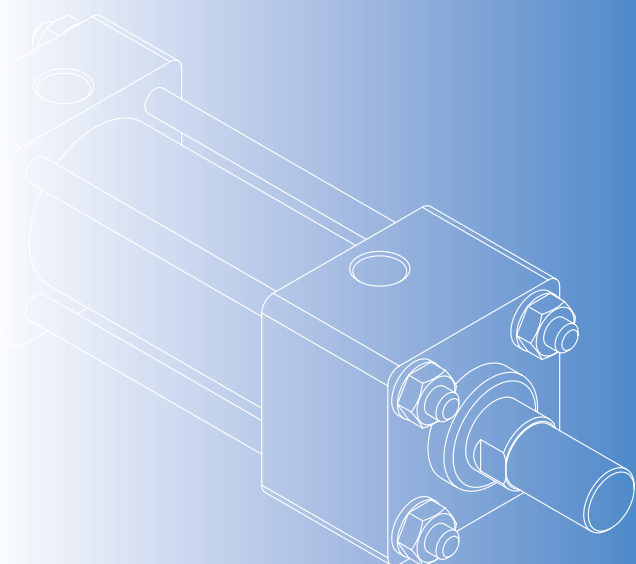


Dimension



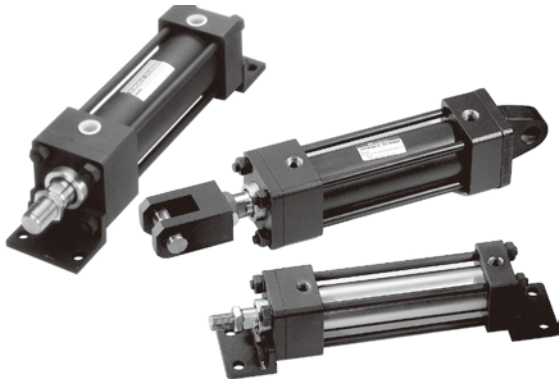


HYDRAULIC CYLINDER



	Double Acting Cylinder	
MDH*	MDHB / MDHD / MDHN.....	6-2
	Double Acting Cylinder-with Magnet	
MDM*	MDMB / MDMD / MDMN.....	6-2
	Compact Hydraulic Cylinder	
MHC*	MHCB / MHCQ	6-15
	Compact Hydraulic with Piston Sensing Cylinder	
	MHCB-M / MHCB-MZ	6-32
	Manifold type Hydraulic Cylinder	
MHCB*	MHCBR / MHCBF / MHCBS	6-35
	Hydraulic with Piston Sensing Cylinder	
MDO*	MDOC / MDOA / MDOD / MDON	6-44
	Hydraulic Rotary Actuator	
MRPH	6-51
	Hydraulic Lever-type Cylinder	
MHCK	MHCK / MHCK-F	6-54
	Hydraulic - Swing Clamp Cylinder	
MTH*	MTHS / MTHD	6-56
MHS*	MHS / MHSD	6-63
MHTS*	MHTS / MHTSD	6-63
	High oil pressure Swing clamping Cylinder	
MF*	MFS / MFT	6-66
MD*	MDS / MDT	6-66

	Threaded-body Cylinder	
MTC	MTC-**A/B	6-69
	Hydraulic Work Support	
MSP	MSP-**A/B	6-70



Specification

Model	MDHB, MDHD, MDHN	
Tube I.D. (mm)	40, 50, 63	80, 100, 125, 150
Standard stroke (mm)	50, 100, 150, 200, 250, 300, 350, 400, 450, 500	
The range of stroke	Max.1500 mm	Max.1900 mm
Medium	Filtered oil	
Material of cylinder barrel	Carbon steel STKM 13C	
Max. operating pressure	14 MPa	
Ambient temperature	-10~+60°C (No freezing)	

Model	MDMB, MDMD, MDMN		
Tube I.D. (mm)	40, 50	63	80, 100
Standard stroke (mm)	50, 100, 150, 200, 250, 300, 350, 400, 450, 500		
Medium	Filtered oil		
Material of cylinder barrel	SUS304 Stainless steel		
Max. operating pressure	7 MPa		
Proof pressure	10.5 MPa		
Speed range (mm/sec)	0.5~300 mm/sec		
Ambient temperature	-10~+60°C (No freezing)		
Sensor switch (*)	LN01P	LN02P	LN03P

Double acting

MDHB	Standard type	
MDHD	Double rod type	
MDHN-A/B	Adjustable forward stroke cylinder	

Double acting (with magnet)

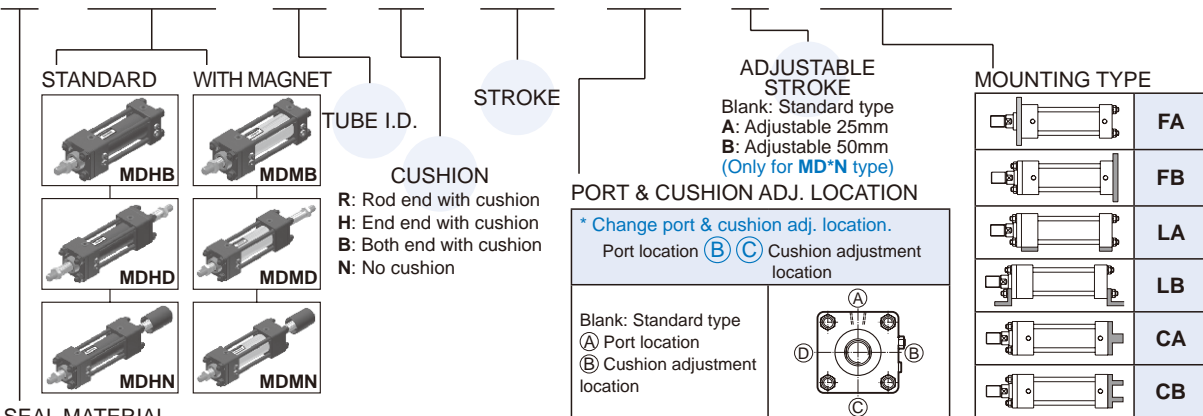
MDMB	Standard type	
MDMD	Double rod type	
MDMN-A/B	Adjustable forward stroke cylinder	

* LN**P specification, please refer to page 5-16.

* The series of hydraulic cylinder can be with cushion.

Order example

1 - MDHB - 50 - N - 100 - BC - A - LB - Y



SEAL MATERIAL

Symbol	Seal material	Kind of fluid				
		Petroleum - based fluid	Water - glycol fluid	Phosphate - ester fluid	Water in oil fluid	Oil in water fluid
1	NBR Nitrile rubber	○	○	×	○	○
2	PU Polyurethane rubber	○	×	×	△	△
3	VITON Fluoro elastomer	○	×	○	○	○

Note. ○ allowable × unallowable △ consult us

HYDRAULIC CYLINDER

MDHB, MDHD, MDHN Standard stroke

Unit: mm

Tube I.D.	50	100	150	200	250	300	350	400	450	500
$\varnothing 40$	●	●	●	●	●	●	—	—	—	—
$\varnothing 50$	●	●	●	●	●	●	—	—	—	—
$\varnothing 63$	●	●	●	●	●	●	●	●	●	●
$\varnothing 80$	●	●	●	●	●	●	●	●	●	●
$\varnothing 100$	●	●	●	●	●	●	●	●	●	●
$\varnothing 125$	●	●	●	●	●	●	●	●	●	●
$\varnothing 150$	●	●	●	●	●	●	●	●	●	●

Note. May to order of unstandard stroke.

MDMB, MDMD, MDMN Standard stroke

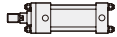
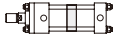


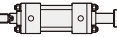
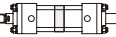
Unit: mm







Tube I.D.	50	100	150	200	250	300	350	400	450	500
$\varnothing 40$	●	●	●	●	●	●	—	—	—	—
$\varnothing 50$	●	●	●	●	●	●	—	—	—	—
$\varnothing 63$	●	●	●	●	●	●	●	●	●	●
$\varnothing 80$	●	●	●	●	●	●	●	●	●	●
$\varnothing 100$	●	●	●	●	●	●	●	●	●	●











Note. May to order of unstandard stroke.

Cylinder weight

Unit: kg

Model	Basic weight MDHB	Stroke 25 mm MDHB	Basic weight MDHD	Basic weight MDHN-A	Basic weight MDHN-B	Stroke 25 mm MDHD/MDHN
Tube I.D.						
$\varnothing 40$	3.7	0.155	4.8	5.5	5.8	0.21
$\varnothing 50$	6.2	0.244	8.0	9.1	9.6	0.34
$\varnothing 63$	8.9	0.421	11.2	12.8	13.4	0.60
$\varnothing 80$	14.6	0.546	17.3	19.5	20.3	0.80
$\varnothing 100$	24.2	0.895	28.2	31.3	32.3	1.28
$\varnothing 125$	40.9	1.462	49.4	53.2	54.4	2.01
$\varnothing 150$	64.5	2.337	80.5	87.6	89.4	3.31

Model	Basic weight MDMB	Stroke 25 mm MDMB	Basic weight MDMD	Basic weight MDMN-A	Basic weight MDMN-B	Stroke 25 mm MDMD/MDMN
Tube I.D.						
$\varnothing 40$	3.66	0.14	4.8	5.5	5.8	0.21
$\varnothing 50$	6.15	0.22	8.0	9.1	9.5	0.32
$\varnothing 63$	8.70	0.34	11.0	12.6	13.2	0.53
$\varnothing 80$	14.60	0.54	17.3	19.5	20.3	0.80
$\varnothing 100$	23.80	0.75	27.8	30.9	32.0	1.14

Model	FA	FB	LA	LB	CA	CB+Pin	TC	Y+Pin	I	Nut (Rod)
Tube I.D.										
$\varnothing 40$	0.3	0.6	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.02
$\varnothing 50$	0.8	1.2	0.9	0.8	1.0	1.1	1.0	0.9	0.9	0.04
$\varnothing 63$	1.3	1.8	1.0	1.4	1.8	2.1	1.2	1.5	1.2	0.08
$\varnothing 80$	1.4	2.7	1.6	1.8	3.0	3.6	2.1	1.8	1.8	0.08
$\varnothing 100$	2.2	4.8	1.9	3.0	5.1	6.6	3.8	4.2	3.3	0.18
$\varnothing 125$	3.6	8.1	3.6	6.0	10.2	12.9	6.2	6.9	6.0	0.22
$\varnothing 150$	6.2	13.5	5.1	8.4	16.2	20.4	10.9	10.8	9.6	0.57

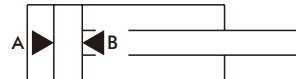
HYDRAULIC CYLINDER

Stroke tolerance

Unit: mm

stroke	~100	101~250	251~630	631~1000	1001~1600	1601~2000
Tolerance	+0.8	+1.0	+1.25	+1.4	+1.6	+1.8
	0	0	0	0	0	0

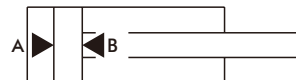
MDHB, MDHD, MDHN Theoretic force



Unit: KN

Tube I.D. (mm)	Rod (mm)	Area (mm ²)	Operating pressure (MPa)									
			6	7	8	9	10	11	12	13	14	
ø40	ø20	A	1256	7.54	8.79	10.05	11.30	12.56	13.82	15.07	16.33	17.58
		B	942	5.65	6.59	7.54	8.48	9.42	10.36	11.30	12.25	13.19
ø50	ø25	A	1963	11.78	13.74	15.70	17.67	19.63	21.59	23.56	25.52	27.48
		B	1472	8.83	10.30	11.78	13.25	14.72	16.19	17.66	19.14	20.61
ø63	ø35	A	3116	18.70	21.81	24.93	28.06	31.18	34.28	37.39	40.51	43.62
		B	2154	12.92	15.08	17.23	19.39	21.54	23.69	25.85	28.00	30.16
ø80	ø40	A	5024	30.14	35.17	40.19	45.22	50.24	55.26	60.29	65.31	70.34
		B	3768	22.61	26.38	30.14	33.91	37.68	41.45	45.22	48.98	52.75
ø100	ø50	A	7850	47.10	54.95	62.80	70.65	78.50	86.35	94.20	102.05	109.90
		B	5887	35.32	41.21	47.10	52.98	58.87	64.76	70.64	76.53	82.42
ø125	ø60	A	12266	73.60	85.86	98.13	110.39	122.66	134.93	147.19	159.46	171.72
		B	9440	56.64	66.08	75.52	84.96	94.40	103.84	113.28	122.72	132.16
ø150	ø80	A	17662	105.97	123.63	141.30	158.96	176.62	194.28	211.94	229.61	247.27
		B	12638	75.83	88.47	101.10	113.74	126.38	139.02	151.66	164.29	176.93

MDMB, MDMD, MDMN Theoretic force



Unit: N

Tube I.D. (mm)	Rod (mm)	Area (mm ²)	Operating pressure (MPa)									
			2	3	4	5	6	7	8	9	10	
ø40	ø20	A	1256	2512	3768	5024	6280	7536	8792	10048	11304	12560
		B	942	1884	2826	3768	4710	5652	6594	7536	8478	9420
ø50	ø25	A	1963	3926	5889	7852	9815	11778	13741	15704	17667	19630
		B	1472	2944	4416	5888	7360	8832	10304	11776	13248	14720
ø63	ø35	A	3116	6232	9348	12464	15580	18696	21812	24928	28062	31180
		B	2154	4308	6462	8616	10770	12924	15078	17232	19386	21540
ø80	ø40	A	5024	10048	15072	20096	25120	30144	35168	40192	45216	50240
		B	3768	7536	11304	15072	18840	22608	26376	30144	33912	37680
ø100	ø50	A	7850	15700	23550	31400	39250	47100	54950	62800	70650	78500
		B	5887	11774	17661	23548	29435	35322	41209	47196	52983	58870

The method of calculation (Hydraulic cylinders' force)

$$F = P \times A - f$$

F :	Cylinders' force	(N)
P :	Operating pressure	(MPa)
A :	Piston area	(mm ²)
f :	Friction drag	(N)

HYDRAULIC CYLINDER

How to order the seal kit

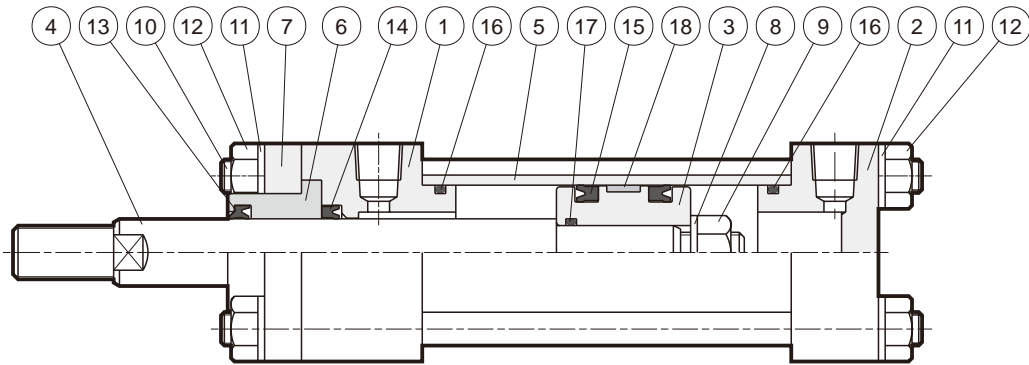
MDHBSK

Tube I.D.	Seal kit
40	MDHBSK40 - Including No.13,14,15,16,17,18
50	MDHBSK50 - Including No.13,14,15,16,17,18
63	MDHBSK63 - Including No.13,14,15,16,17,18
80	MDHBSK80 - Including No.13,14,15,16,17,18
100	MDHBSK100 - Including No.13,14,15,16,17,18
125	MDHBSK125 - Including No.13,14,15,16,17,18
150	MDHBSK150 - Including No.13,14,15,16,17,18

MDHDSK

Tube I.D.	Seal kit
40	MDHDSK40 - Including No.10,11,12,13,14,15
50	MDHDSK50 - Including No.10,11,12,13,14,15
63	MDHDSK63 - Including No.10,11,12,13,14,15
80	MDHDSK80 - Including No.10,11,12,13,14,15
100	MDHDSK100 - Including No.10,11,12,13,14,15
125	MDHDSK125 - Including No.10,11,12,13,14,15
150	MDHDSK150 - Including No.10,11,12,13,14,15

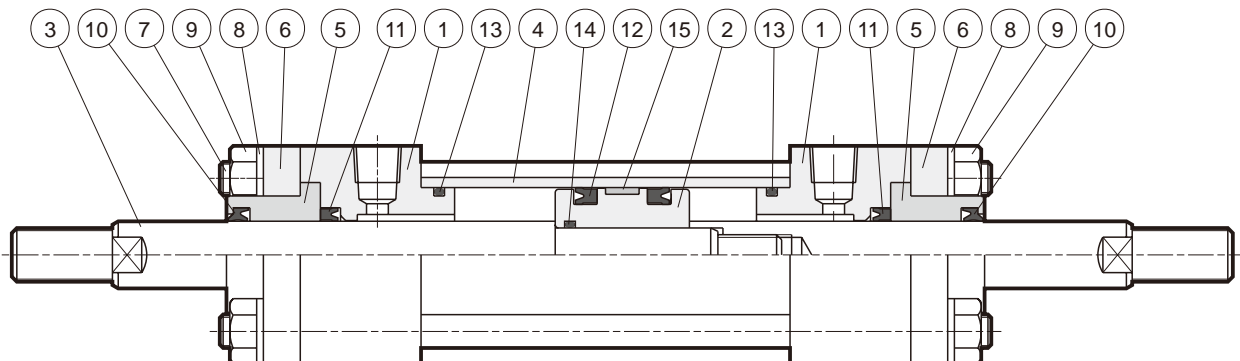
MDHB



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	1	7	End plate	1	13	Dust wiper	1
2	Head cover	1	8	Spring washer	1	14	Rod packing	1
3	Piston	1	9	Piston nut	1	15	Piston packing	2
4	Piston rod	1	10	Tie bolt	4	16	Cylinder gasket	2
5	Cylinder tube	1	11	Spring washer	8	17	Piston gasket	1
6	Rod bush	1	12	Nut	8	18	Wearing ring	1

MDHD



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	2	6	End plate	2	11	Rod packing	2
2	Piston	1	7	Tie bolt	4	12	Piston packing	2
3	Piston rod	1	8	Spring washer	8	13	Cylinder gasket	2
4	Cylinder tube	1	9	Nut	8	14	Piston gasket	1
5	Rod bush	2	10	Dust wiper	2	15	Wearing ring	1

HYDRAULIC CYLINDER

How to order the seal kit

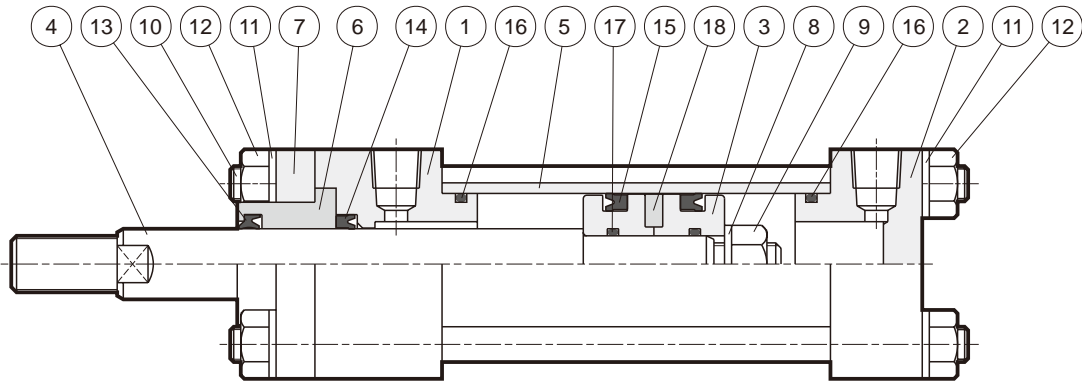
MDMBSK

Tube I.D.	Seal kit
40	MDMBSK40 - Including No.13,14,15,16,17
50	MDMBSK50 - Including No.13,14,15,16,17
63	MDMBSK63 - Including No.13,14,15,16,17
80	MDMBSK80 - Including No.13,14,15,16,17
100	MDMBSK100 - Including No.13,14,15,16,17

MDMDSK

Tube I.D.	Seal kit
40	MDMDSK40 - Including No.10,11,12,13,14
50	MDMDSK50 - Including No.10,11,12,13,14
63	MDMDSK63 - Including No.10,11,12,13,14
80	MDMDSK80 - Including No.10,11,12,13,14
100	MDMDSK100 - Including No.10,11,12,13,14

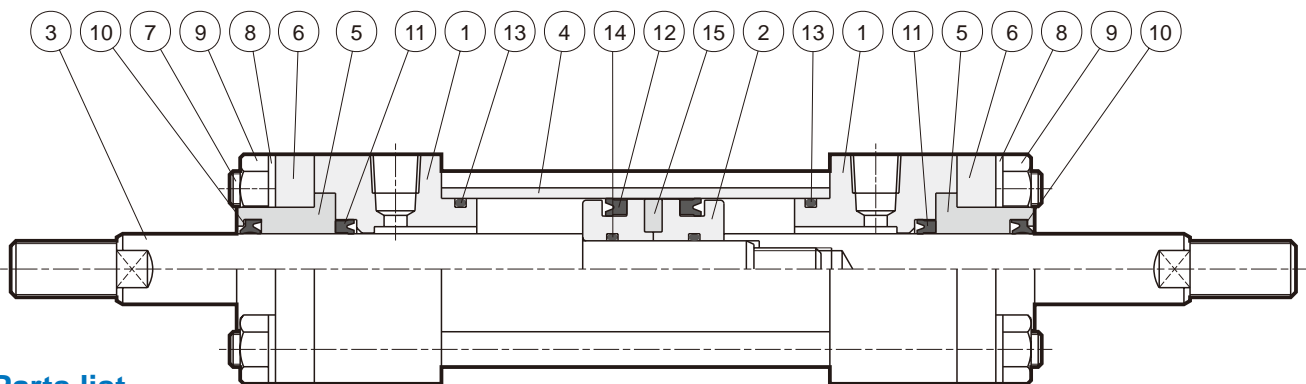
MDMB



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	1	7	End plate	1	13	Dust wiper	1
2	Head cover	1	8	Spring washer	1	14	Rod packing	1
3	Piston	1	9	Nut	1	15	Piston packing	2
4	Piston rod	1	10	Tie bolt	4	16	Cylinder gasket	2
5	Cylinder tube	1	11	Spring washer	8	17	Piston gasket	1
6	Rod bush	1	12	Nut	8	18	Magnet	1

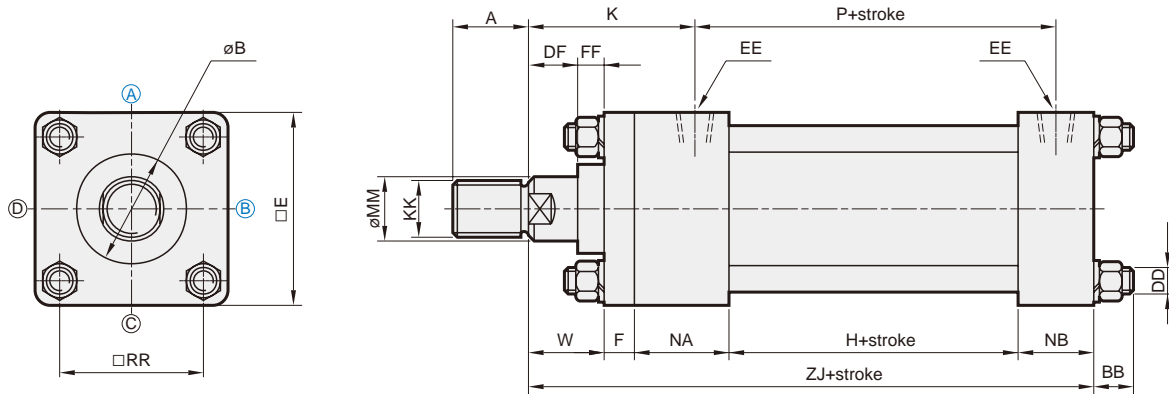
MDMD



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	2	6	End plate	2	11	Rod packing	2
2	Piston	1	7	Tie bolt	4	12	Piston packing	2
3	Piston rod	1	8	Spring washer	8	13	Cylinder gasket	2
4	Cylinder tube	1	9	Nut	8	14	Piston gasket	1
5	Rod bush	2	10	Dust wiper	2	15	Magnet	1

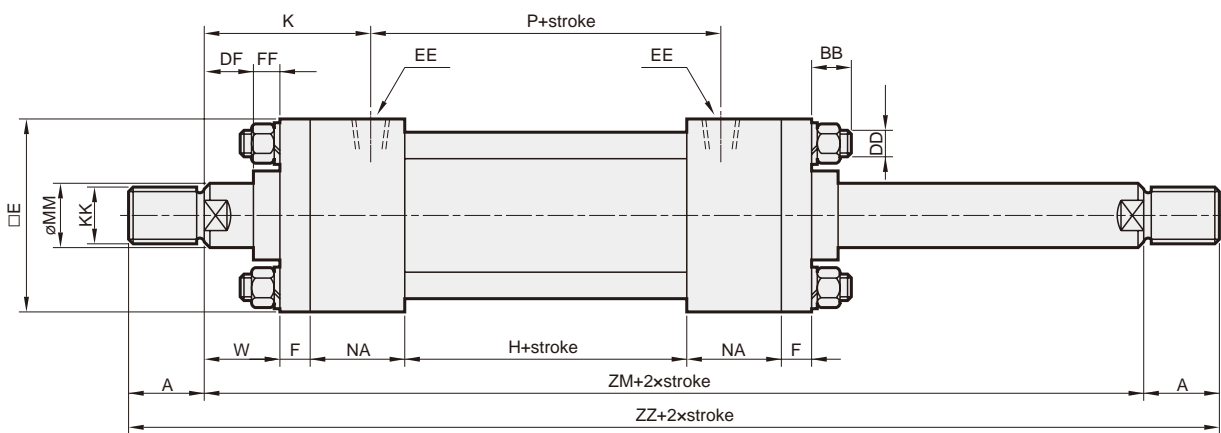
MDHB / MDMB Standard type



Note. (A) Port location
(B) Cushion adjustment location

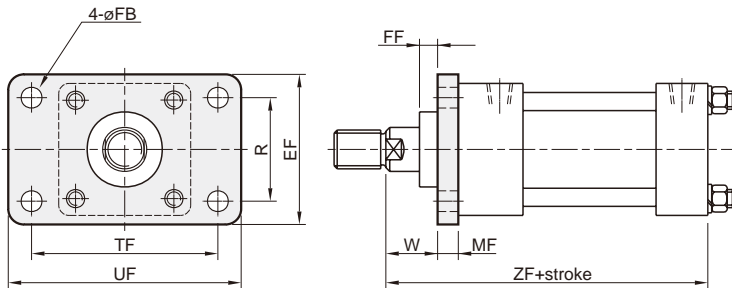
Code Tube I.D.	A	B	BB	DD	DF	E	EE	F	FF	H	K	KK	MM	NA	NB	P	RR	W	ZJ
$\varnothing 40$	30	35	16	M10x1.25	14	65	Rc1/4	11	11	60	60	M16x1.5	20	36	26	84	45	25	158
$\varnothing 50$	35	40	16	M10x1.25	16	75	Rc3/8	13	9	60	66	M22x1.5	25	42	34	88	52	25	174
$\varnothing 63$	40	50	18	M12x1.5	21	90	Rc3/8	15	9	65	73	M30x1.5	35	42	34	93	63	30	186
$\varnothing 80$	45	55	18	M16x1.5	23	110	Rc1/2	18	7	65	79	M30x1.5	40	46	39	95	80	30	198
$\varnothing 100$	50	65	25	M18x1.5	33	135	Rc1/2	20	7	74	95	M40x2.0	50	50	40	104	102	40	224
$\varnothing 125$	60	75	30	M22x1.5	38	165	Rc3/4	25	7	74	109	M48x2.0	60	58	47	112	122	45	249
$\varnothing 150$	70	95	30	M26x1.5	43	195	Rc3/4	30	7	90	119	M72x2.0	80	58	48	128	148	50	276

MDHD / MDMD Double rod type



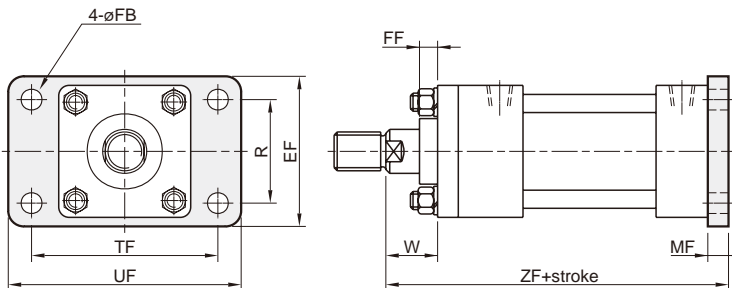
Code Tube I.D.	A	B	BB	DD	DF	E	EE	F	FF	H	K	KK	MM	NA	P	RR	W	ZM	ZZ
$\varnothing 40$	30	35	16	M10x1.25	14	65	Rc1/4	11	11	60	60	M16x1.5	20	36	84	45	25	204	264
$\varnothing 50$	35	40	16	M10x1.25	16	75	Rc3/8	13	9	60	66	M22x1.5	25	42	88	52	25	220	290
$\varnothing 63$	40	50	18	M12x1.5	21	90	Rc3/8	15	9	65	73	M30x1.5	35	42	93	63	30	239	319
$\varnothing 80$	45	55	18	M16x1.5	23	110	Rc1/2	18	7	65	79	M30x1.5	40	46	95	80	30	253	343
$\varnothing 100$	50	65	25	M18x1.5	33	135	Rc1/2	20	7	74	95	M40x2.0	50	50	104	102	40	294	394
$\varnothing 125$	60	75	30	M22x1.5	38	165	Rc3/4	25	7	74	109	M48x2.0	60	58	112	122	45	330	450
$\varnothing 150$	70	95	30	M26x1.5	43	195	Rc3/4	30	7	90	119	M72x2.0	80	58	128	148	50	366	506

FA Front flange



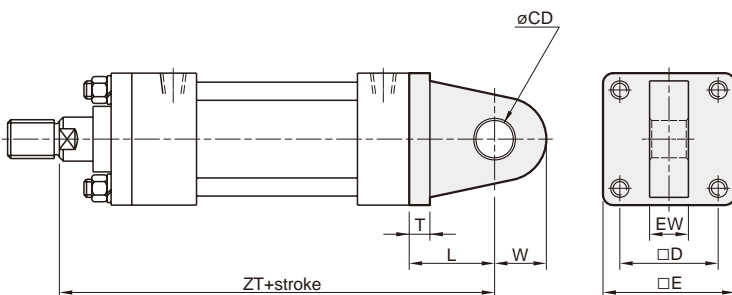
Code Tube I.D.	EF	FB	FF	MF	R	TF	UF	W	ZF
$\varnothing 40$	69	11	11	11	46	95	118	25	158
$\varnothing 50$	85	11	9	13	58	115	145	25	174
$\varnothing 63$	98	14	9	15	65	132	165	30	186
$\varnothing 80$	118	18	7	18	87	155	190	30	198
$\varnothing 100$	150	22	7	20	109	190	230	40	224
$\varnothing 125$	175	24	7	25	130	224	272	45	249
$\varnothing 150$	210	28	7	30	155	270	320	50	276

FB Rear flange



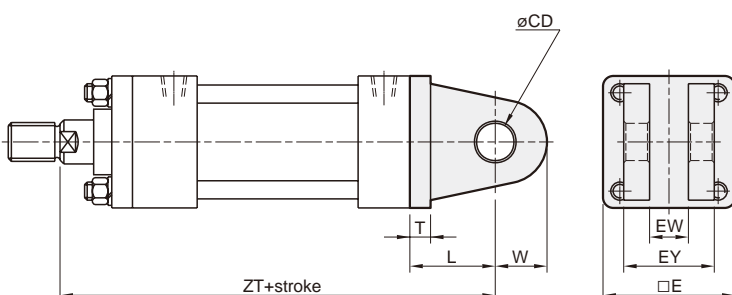
Code Tube I.D.	EF	FB	FF	MF	R	TF	UF	W	ZF
$\varnothing 40$	69	11	11	11	46	95	118	25	169
$\varnothing 50$	85	11	9	13	58	115	145	25	187
$\varnothing 63$	98	14	9	15	65	132	165	30	201
$\varnothing 80$	118	18	7	18	87	155	190	30	216
$\varnothing 100$	150	22	7	20	109	190	230	40	244
$\varnothing 125$	175	24	7	25	130	224	272	45	274
$\varnothing 150$	210	28	7	30	155	270	320	50	306

CA Male pivot



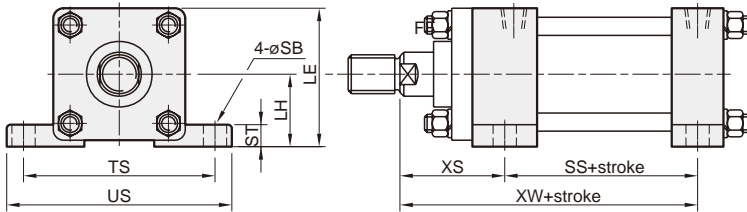
Code Tube I.D.	CD	D	E	EW	L	T	W	ZT
$\varnothing 40$	16	45	65	20	38	11	16	196
$\varnothing 50$	20	52	75	25	45	13	20	219
$\varnothing 63$	25	63	90	30	54	15	25	240
$\varnothing 80$	30	80	110	35	71	18	30	269
$\varnothing 100$	40	102	135	40	86	20	40	310
$\varnothing 125$	50	122	165	50	110	25	50	359
$\varnothing 150$	60	148	195	60	109	30	60	385

CB Female pivot



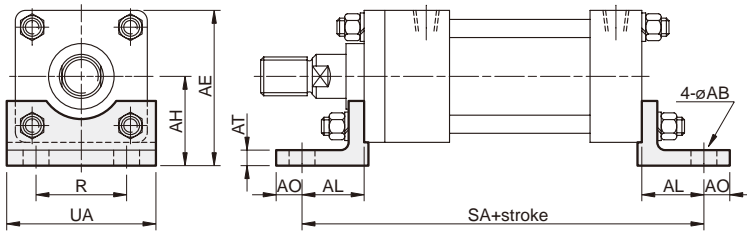
Code Tube I.D.	CD	E	EW	EY	L	T	W	ZT
$\varnothing 40$	16	65	20	50	38	11	16	196
$\varnothing 50$	20	75	25	57	45	13	20	219
$\varnothing 63$	25	90	30	70	54	15	25	240
$\varnothing 80$	30	110	35	80	71	18	30	269
$\varnothing 100$	40	135	40	100	86	20	40	310
$\varnothing 125$	50	165	50	126	110	25	50	359
$\varnothing 150$	60	195	60	160	109	30	60	385

LA Side lugs



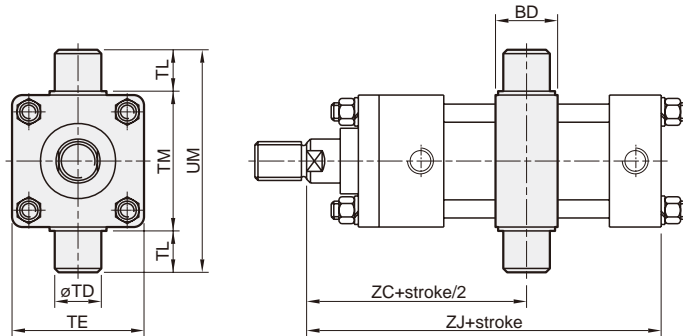
Code Tube I.D.	LE	LH	SB	SS	ST	TS	XS	XW	US
ø40	70	37.5	11	91	14	95	54	145	118
ø50	82.5	45	11	98	17	115	59	157	145
ø63	95	50	14	103	19	132	66	169	165
ø80	115	60	18	107.5	25	155	71	178.5	190
ø100	138.5	71	22	119	27	190	85	204	230
ø125	167.5	85	24	126.5	32	224	99	225.5	272
ø150	203.5	106	28	143	37	270	109	252	320

LB Foot mouting



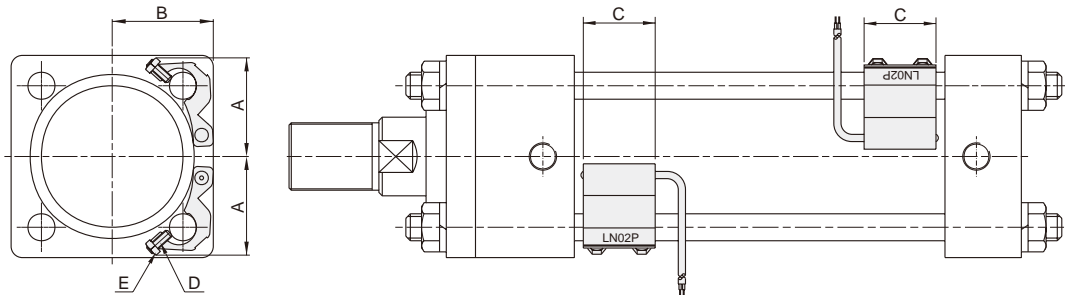
Code Tube I.D.	AB	AE	AH	AL	AO	AT	R	SA	UA
ø40	11	75.5	43	32.5	13	8	46	198	69
ø50	11	87.5	50	32.5	15	8	58	214	85
ø63	14	105	60	37	18	10	65	230	98
ø80	18	127	72	49	20	12	87	266	118
ø100	22	152.5	85	58	23	12	109	300	150
ø125	24	187.5	105	68.5	29	15	130	341	175
ø150	28	220.5	123	74.5	30	18	155	375	210

TC Intermediate pivot



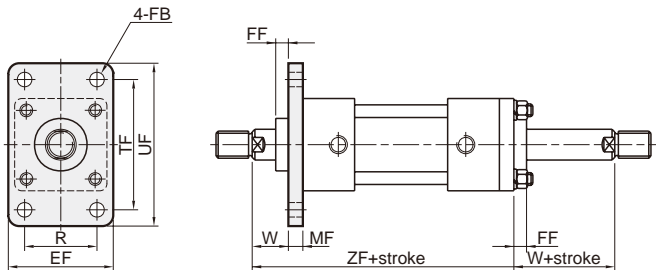
Code Tube I.D.	BD	TE	TD	TL	TM	UM	ZC	ZJ
ø40	28	65	20	20	69	109	102	158
ø50	33	75	25	25	85	135	110	174
ø63	38	90	30	30	98	158	119.5	186
ø80	38	110	30	30	118	178	126.5	198
ø100	48	135	40	40	145	225	147	224
ø125	58	165	50	50	175	275	165	249
ø150	73	195	60	63	205	331	183	276

Installation of sensor switches



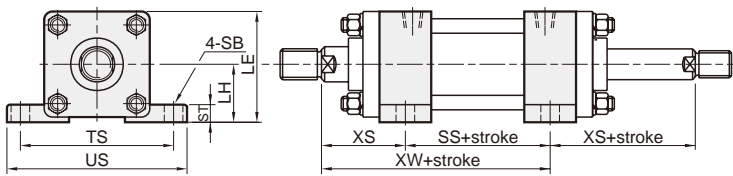
Code Tube I.D.	Sensor switch	A	B	C	D	E
ø40	LN01P	33.7	33	32	M4x12L	M4
ø50	LN01P	36.6	37	32	M4x12L	M4
ø63	LN02P	44	45	32	M4x12L	M4
ø80	LN03P	54	56	32	M4x12L	M4
ø100	LN03P	65	67	32	M4x12L	M4

FA Front flange



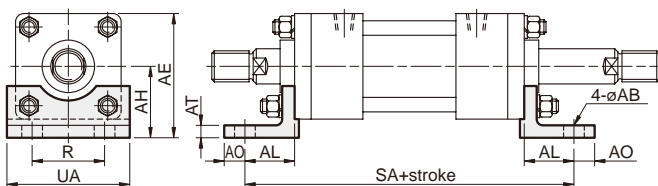
Code Tube I.D.	EF	FB	FF	MF	R	TF	UF	W	ZF
$\varnothing 40$	69	11	11	11	46	95	118	25	179
$\varnothing 50$	85	11	9	13	58	115	145	25	195
$\varnothing 63$	98	14	9	15	65	132	165	30	209
$\varnothing 80$	118	18	7	18	87	155	190	30	223
$\varnothing 100$	150	22	7	20	109	190	230	40	254
$\varnothing 125$	175	24	7	25	130	224	272	45	285
$\varnothing 150$	210	28	7	30	155	270	320	50	316

LA Side lugs



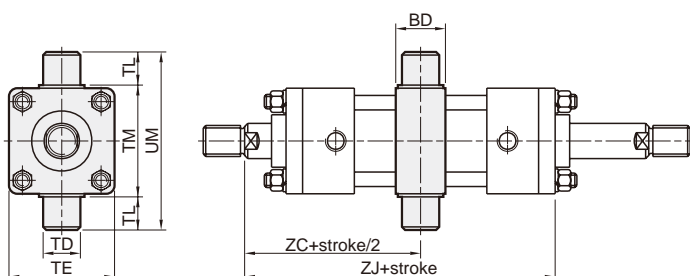
Code Tube I.D.	LE	LH	SB	SS	ST	TS	XS	XW	US
$\varnothing 40$	70	37.5	11	96	14	95	54	150	118
$\varnothing 50$	82.5	45	11	102	17	115	59	161	145
$\varnothing 63$	95	50	14	107	19	132	66	173	165
$\varnothing 80$	115	60	18	111	25	155	71	182	190
$\varnothing 100$	138.5	71	22	124	27	190	85	209	230
$\varnothing 125$	167.5	85	24	132	32	224	99	231	272
$\varnothing 150$	203.5	106	28	148	37	270	109	257	320

LB Foot mounting



Code Tube I.D.	AB	AE	AH	AL	AO	AT	R	SA	UA
$\varnothing 40$	11	75.5	43	32.5	13	8	46	219	69
$\varnothing 50$	11	87.5	50	32.5	15	8	58	235	85
$\varnothing 63$	14	105	60	37	18	10	65	253	98
$\varnothing 80$	18	127	72	49	20	12	87	291	118
$\varnothing 100$	22	152.5	85	58	23	12	109	330	150
$\varnothing 125$	24	187.5	105	68.5	29	15	130	377	175
$\varnothing 150$	28	220.5	123	74.5	30	18	155	415	210

TC Intermediate pivot



Code Tube I.D.	BD	TE	TD	TL	TM	UM	ZC	ZJ
$\varnothing 40$	28	65	20	20	69	109	102	179
$\varnothing 50$	33	75	25	25	85	135	110	195
$\varnothing 63$	38	90	30	30	98	158	119.5	209
$\varnothing 80$	38	110	30	30	118	178	126.5	223
$\varnothing 100$	48	135	40	40	145	225	147	254
$\varnothing 125$	58	165	50	50	175	275	165	285
$\varnothing 150$	73	195	60	63	205	331	183	316

MDHN / MDMN Adjustable stroke $\varnothing 40\sim\varnothing 150$

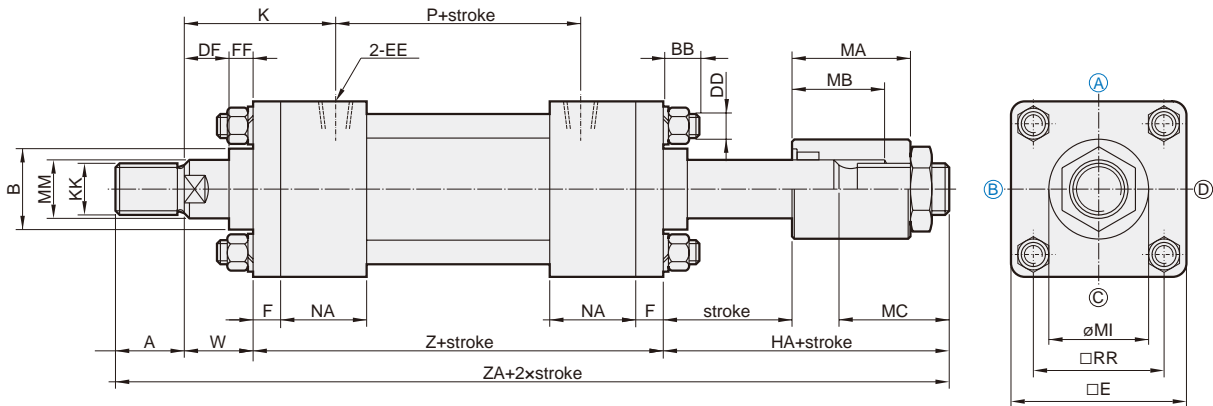


HYDRAULIC CYLINDER

mindman

MDHN / MDMN (A : adjustable stroke 25 mm)

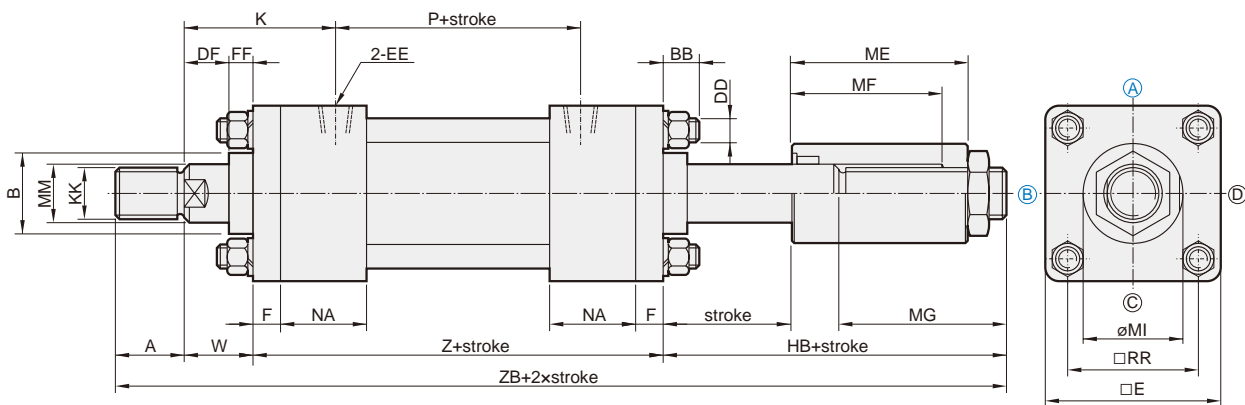
Note. (A) Port location
(B) Cushion adjustment location



Code Tube I.D.	A	B	BB	DD	DF	E	EE	F	FF	HA	K	KK	MA	MB	MC	MI	MM	NA	P	RR	W	Z	ZA
$\varnothing 40$	30	35	14	M10x1.25	14	65	Rc1/4	11	11	71	59	M16x1.5	60	45	51	42	20	36	86	45	25	154	280
$\varnothing 50$	35	40	14	M10x1.25	16	75	Rc3/8	13	9	77	65	M22x1.5	63	45	57	50	25	42	90	52	25	170	307
$\varnothing 63$	40	50	16	M12x1.5	21	90	Rc3/8	15	9	81	72	M30x1.5	65	45	61	60	35	42	95	63	30	179	330
$\varnothing 80$	45	55	19	M16x1.5	23	110	Rc1/2	18	7	81	76	M30x1.5	65	45	61	70	40	46	101	80	30	193	349
$\varnothing 100$	50	65	25	M18x1.5	33	135	Rc1/2	20	7	88	92	M40x2.0	70	45	68	80	50	50	110	102	40	214	392
$\varnothing 125$	60	75	30	M22x1.5	38	165	Rc3/4	25	7	97	108	M48x2.0	76	46	73	85	60	58	114	122	45	240	442
$\varnothing 150$	70	95	30	M26x1.5	43	195	Rc3/4	30	7	112	118	M72x2.0	86	46	92	110	80	58	130	148	50	266	498

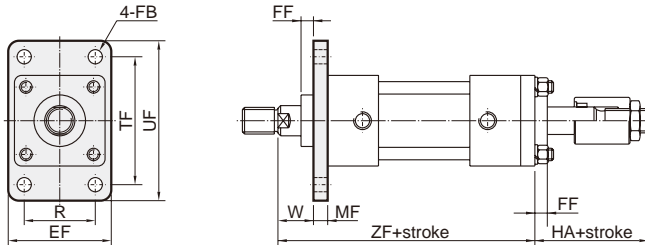
MDHN / MDMN (B : adjustable stroke 50 mm)

Note. (A) Port location
(B) Cushion adjustment location



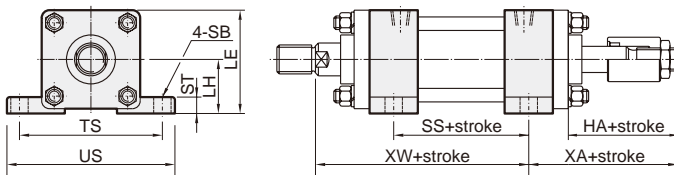
Code Tube I.D.	A	B	BB	DD	DF	E	EE	F	FF	HB	K	KK	ME	MF	MG	MI	MM	NA	P	RR	W	Z	ZB
$\varnothing 40$	30	35	14	M10x1.25	14	65	Rc1/4	11	11	96	59	M16x1.5	85	70	76	42	20	36	86	45	25	154	305
$\varnothing 50$	35	40	14	M10x1.25	16	75	Rc3/8	13	9	102	65	M22x1.5	88	70	82	50	25	42	90	52	25	170	332
$\varnothing 63$	40	50	16	M12x1.5	21	90	Rc3/8	15	9	106	72	M30x1.5	90	70	86	60	35	42	95	63	30	179	355
$\varnothing 80$	45	55	19	M16x1.5	23	110	Rc1/2	18	7	106	76	M30x1.5	90	70	86	70	40	46	101	80	30	193	374
$\varnothing 100$	50	65	25	M18x1.5	33	135	Rc1/2	20	7	113	92	M40x2.0	95	70	93	80	50	50	110	102	40	214	417
$\varnothing 125$	60	75	30	M22x1.5	38	165	Rc3/4	25	7	122	108	M48x2.0	101	71	98	85	60	58	114	122	45	240	467
$\varnothing 150$	70	95	30	M26x1.5	43	195	Rc3/4	30	7	137	118	M72x2.0	111	71	117	110	80	58	130	148	50	266	523

FA (A : adjustable stroke 25 mm)



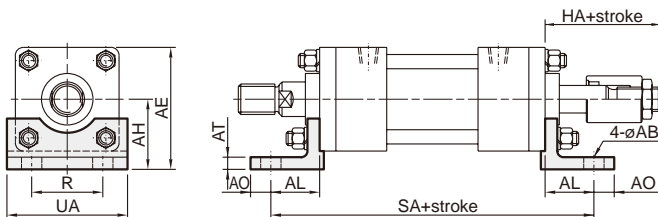
Code Tube I.D.	EF	FB	FF	HA	MF	R	TF	UF	W	ZF
$\varnothing 40$	69	11	11	71	11	46	95	118	25	179
$\varnothing 50$	85	11	9	77	13	58	115	145	25	195
$\varnothing 63$	98	14	9	81	15	65	132	165	30	209
$\varnothing 80$	118	18	7	81	18	87	155	190	30	223
$\varnothing 100$	150	22	7	88	20	109	190	230	40	254
$\varnothing 125$	175	24	7	97	25	130	224	272	45	285
$\varnothing 150$	210	28	7	112	30	155	270	320	50	316

LA (A : adjustable stroke 25 mm)



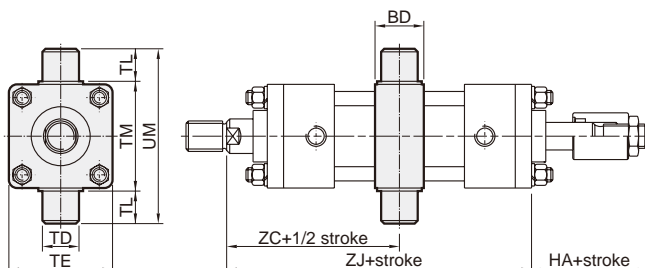
Code Tube I.D.	LE	LH	HA	SB	SS	ST	TS	XA	XW	US
$\varnothing 40$	70	37.5	71	11	96	14	95	100	150	118
$\varnothing 50$	82.5	45	77	11	102	17	115	111	161	145
$\varnothing 63$	95	50	81	14	107	19	132	117	173	165
$\varnothing 80$	115	60	81	18	111	25	155	122	182	190
$\varnothing 100$	138.5	71	88	22	124	27	190	133	209	230
$\varnothing 125$	167.5	85	97	24	132	32	224	151	231	272
$\varnothing 150$	203.5	106	112	28	148	37	270	171	257	320

LB (A : adjustable stroke 25 mm)



Code Tube I.D.	AB	AE	AH	AL	AO	AT	HA	R	SA	UA
$\varnothing 40$	11	75.5	43	32.5	13	8	71	46	219	69
$\varnothing 50$	11	87.5	50	32.5	15	8	77	58	235	85
$\varnothing 63$	14	105	60	37	18	10	81	65	253	98
$\varnothing 80$	18	127	72	49	20	12	81	87	291	118
$\varnothing 100$	22	152.5	85	58	23	12	88	109	330	150
$\varnothing 125$	24	187.5	105	68.5	29	15	97	130	377	175
$\varnothing 150$	28	220.5	123	74.5	30	18	112	155	415	210

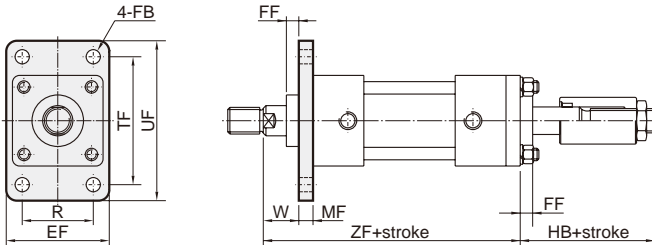
TC (A : adjustable stroke 25 mm)



Code Tube I.D.	BD	HA	TE	TD	TL	TM	UM	ZC	ZJ
$\varnothing 40$	28	71	65	20	20	69	109	102	179
$\varnothing 50$	33	77	75	25	25	85	135	110	195
$\varnothing 63$	38	81	90	30	30	98	158	119.5	209
$\varnothing 80$	38	81	110	30	30	118	178	126.5	223
$\varnothing 100$	48	88	135	40	40	145	225	147	254
$\varnothing 125$	58	97	165	50	50	175	275	165	285
$\varnothing 150$	73	112	195	60	63	205	331	183	316

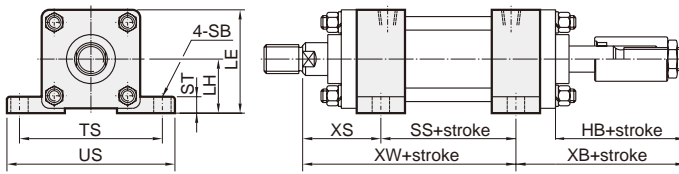
HYDRAULIC CYLINDER

FA (B : adjustable stroke 50 mm)



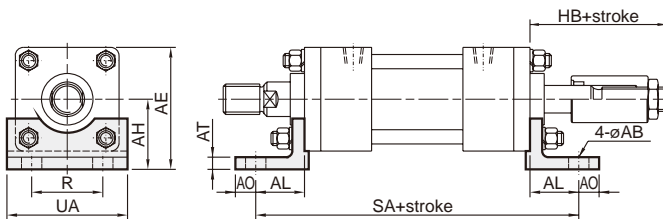
Code Tube I.D.	EF	FB	FF	HB	MF	R	TF	UF	W	ZF
$\varnothing 40$	69	11	11	96	11	46	95	118	25	179
$\varnothing 50$	85	11	9	102	13	58	115	145	25	195
$\varnothing 63$	98	14	9	106	15	65	132	165	30	209
$\varnothing 80$	118	18	7	106	18	87	155	190	30	223
$\varnothing 100$	150	22	7	113	20	109	190	230	40	254
$\varnothing 125$	175	24	7	122	25	130	224	272	45	285
$\varnothing 150$	210	28	7	137	30	155	270	320	50	316

LA (B : adjustable stroke 50 mm)



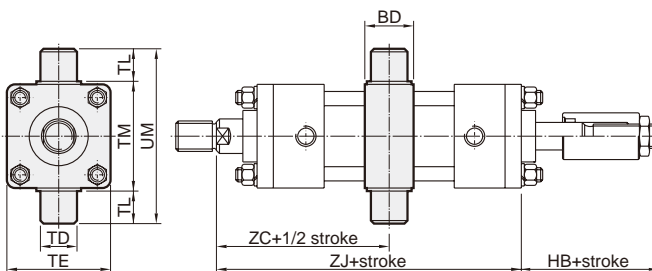
Code Tube I.D.	LE	LH	HB	SB	SS	ST	TS	XB	XW	US
$\varnothing 40$	70	37.5	96	11	96	14	95	125	150	118
$\varnothing 50$	82.5	45	102	11	102	17	115	136	161	145
$\varnothing 63$	95	50	106	14	107	19	132	142	173	165
$\varnothing 80$	115	60	106	18	111	25	155	147	182	190
$\varnothing 100$	138.5	71	113	22	124	27	190	158	209	230
$\varnothing 125$	167.5	85	122	24	132	32	224	176	231	272
$\varnothing 150$	203.5	106	137	28	148	37	270	196	257	320

LB (B : adjustable stroke 50 mm)



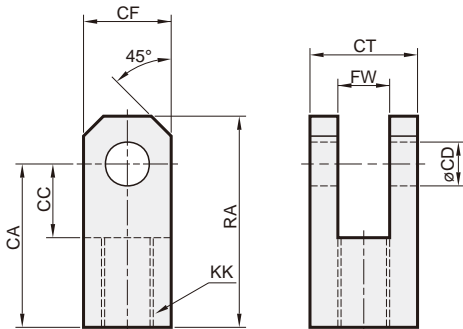
Code Tube I.D.	AB	AE	AH	AL	AO	AT	HB	R	SA	UA
$\varnothing 40$	11	75.5	43	32.5	13	8	96	46	219	69
$\varnothing 50$	11	87.5	50	32.5	15	8	102	58	235	85
$\varnothing 63$	14	105	60	37	18	10	106	65	253	98
$\varnothing 80$	18	127	72	49	20	12	106	87	291	118
$\varnothing 100$	22	152.5	85	58	23	12	113	109	330	150
$\varnothing 125$	24	187.5	105	68.5	29	15	122	130	377	175
$\varnothing 150$	28	220.5	123	74.5	30	18	137	155	415	210

TC (B : adjustable stroke 50 mm)



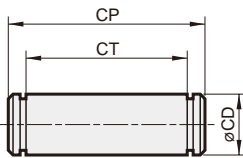
Code Tube I.D.	BD	HB	TE	TD	TL	TM	UM	ZC	ZJ
$\varnothing 40$	28	96	65	20	20	69	109	102	179
$\varnothing 50$	33	102	75	25	25	85	135	110	195
$\varnothing 63$	38	106	90	30	30	98	158	119.5	209
$\varnothing 80$	38	106	110	30	30	118	178	126.5	223
$\varnothing 100$	48	113	135	40	40	145	225	147	254
$\varnothing 125$	58	122	165	50	50	175	275	165	285
$\varnothing 150$	73	137	195	60	63	205	331	183	316

Y connector



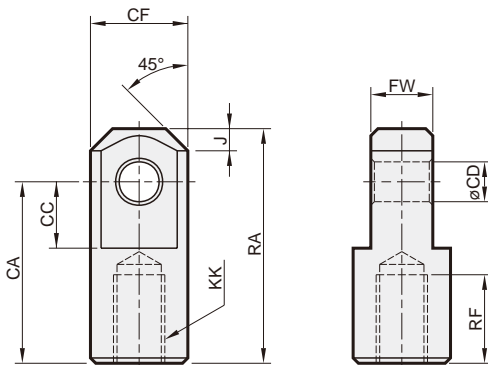
Model	Tube I.D.	CA	CC	CD	CF	CT	FW	KK	RF
Y-M16x1.5	$\varnothing 40$	50	26	16	35	45	20	M16x1.5	24
Y-M22x1.5	$\varnothing 50$	60	30	20	40	50	25	M22x1.5	30
Y-M30x1.5	$\varnothing 63$	80	40	25	50	60	30	M30x1.5	40
Y-M30x1.5	$\varnothing 80$	80	40	30	60	65	35	M30x1.5	40
Y-M40x2.0	$\varnothing 100$	90	50	40	80	90	40	M40x2.0	40
Y-M48x2.0	$\varnothing 125$	110	60	50	100	100	50	M48x2.0	50
Y-M72x2.0	$\varnothing 150$	130	70	60	120	120	60	M72x2.0	60

Pin



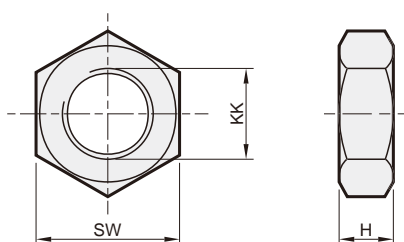
Model	Tube I.D.	CD	CP	CT
P1659	$\varnothing 40$	16	59	46
P2066	$\varnothing 50$	20	66	51
P2576	$\varnothing 63$	25	76	61
P3081	$\varnothing 80$	30	81	66
P40114	$\varnothing 100$	40	114	91
P50124	$\varnothing 125$	50	124	101
P60156	$\varnothing 150$	60	156	121

I connector

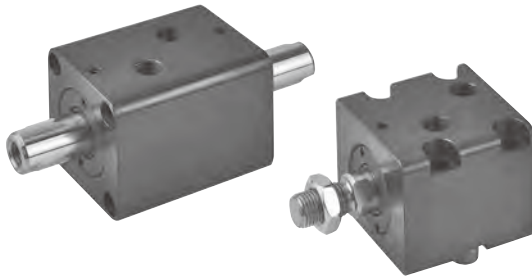


Model	Tube I.D.	CA	CC	CD	CF	FW	J	KK	RA	RF
I-M16x1.5	$\varnothing 40$	55	30	16	40	20	8	M16x1.5	75	20
I-M22x1.5	$\varnothing 50$	65	35	20	50	25	10	M22x1.5	90	25
I-M30x1.5	$\varnothing 63$	80	40	25	55	30	12.5	M30x1.5	110	35
I-M30x1.5	$\varnothing 80$	90	45	30	60	35	15	M30x1.5	125	35
I-M40x2.0	$\varnothing 100$	105	55	40	80	40	20	M40x2.0	145	40
I-M48x2.0	$\varnothing 125$	120	65	50	100	50	30	M48x2.0	170	50
I-M72x2.0	$\varnothing 150$	140	75	60	120	60	30	M72x2.0	200	55

Mounting nut



Model	Tube I.D.	H	KK	SW
N-M16x1.5	$\varnothing 40$	8	M16x1.5	24
N-M22x1.5	$\varnothing 50$	11	M22x1.5	32
N-M30x1.5	$\varnothing 63$	13	M30x1.5	41
N-M30x1.5	$\varnothing 80$	13	M30x1.5	41
N-M40x2.0	$\varnothing 100$	15	M40x2.0	57
N-M48x2.0	$\varnothing 125$	15	M48x2.0	65
N-M72x2.0	$\varnothing 150$	20	M72x2.0	100


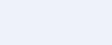

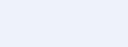
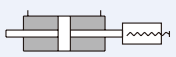


Features

- Compact body design keeps overall length to a minimum.
- Cylinder barrel internally honed to ensure smooth and consistent piston movement.
- High quality materials are used throughout construction.


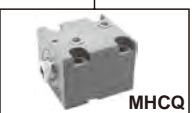
Specification

Model	MHC*						
Tube I.D. (mm)	20	25	32	40	50	63	80
The range of stroke (mm)	30	30	60	80	90	100	
Medium	Filtered oil						
Material	Carbon steel						
Max. operating pressure	14 MPa						
Ambient temperature	-10~+60°C (No freezing)						

MHCB	Front mounting (Single rod type)	
MHCQ	Side mounting (Single rod type)	
MHCB-D	Front mounting (Double rod type)	
MHCB-Q	Side mounting (Double rod type)	
MHC*-DA	Adjustable forward 25/50mm stroke cylinder	
MHC*-DB	(Double rod type)	

Order example

MHCB — 50 — 30 — ZDA

MODEL	TUBE I.D.	STROKE	ROD END TYPE	D: Double rod
 MHCB	50	30	Blank	Single rod / Female thread
 MHCQ			Z	Single rod / Male thread
			D	Double rod / Female thread
			DA	Double rod / Female thread / Adjustable stroke 25mm
			DB	Double rod / Female thread / Adjustable stroke 50mm
			ZD	Double rod / Male thread
			ZDA	Double rod / Male thread / Adjustable stroke 25mm
			ZDB	Double rod / Male thread / Adjustable stroke 50mm
			LD	Double rod / One female thread, One male thread
			RD (*)	Double rod / One male thread, One female thread

* Only for MHCQ model.

Standard stroke

● Standard products ○ Made to order

Model	Stroke Tube I.D.	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	
MHCB MHCB-Z	ø20	○	●	○	●	○	●	○	●	—	—	—	—	—	—	—	
	ø25	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø32	●	●	●	●	●	●	○	●	○	●	●	—	—	—	—	
	ø40	●	●	●	●	●	●	○	●	○	●	●	●	●	—	—	
	ø50	●	●	●	●	●	●	○	●	○	●	●	●	●	●	—	
	ø63	●	●	●	●	●	●	○	●	○	●	●	●	●	●	●	●
	ø80	●	●	●	●	●	●	○	●	○	●	●	●	●	●	●	●
MHCB-D MHCB-ZD MHCB-LD	ø32	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø40	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø50	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø63	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø80	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
MHCB-DA MHCB-ZDA MHCB-DB MHCB-ZDB	ø32	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø40	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø50	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø63	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	
	ø80	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—	

Model	Stroke Tube I.D.	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100
MHCQ MHCQ-Z	ø32	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø40	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø50	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø63	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
MHCQ-D MHCQ-ZD MHCQ-RD MHCQ-LD	ø32	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø40	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø50	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø63	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
MHCQ-DA MHCQ-ZDA MHCQ-DB MHCQ-ZDB	ø32	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø40	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø50	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—
	ø63	○	●	○	●	○	●	○	●	○	●	—	—	—	—	—

Theoretic force

Unit: KN

Tube I.D. (mm)	Rod (mm)	Area (mm ²)	Operating pressure (MPa)									
			6	7	8	9	10	11	12	13	14	
ø20	ø12	A	314	1.88	2.20	2.51	2.83	3.14	3.46	3.77	4.08	4.40
		B	201	1.21	1.41	1.61	1.81	2.01	2.21	2.41	2.61	2.81
ø25	ø14	A	491	2.95	3.44	3.93	4.42	4.91	5.40	5.89	6.38	6.87
		B	337	2.02	2.36	2.70	3.03	3.37	3.71	4.04	4.38	4.72
ø32	ø20	A	804	4.83	5.63	6.43	7.24	8.04	8.85	9.65	10.46	11.26
		B	490	2.94	3.43	3.92	4.41	4.90	5.39	5.88	6.37	6.86
ø40	ø25	A	1257	7.54	8.80	10.05	11.31	12.57	13.82	15.08	16.34	17.59
		B	766	4.59	5.36	6.13	6.89	7.66	8.42	9.19	9.95	10.72
ø50	ø30	A	1963	11.78	13.74	15.71	17.67	19.63	21.60	23.56	25.53	27.49
		B	1257	7.54	8.80	10.05	11.31	12.57	13.82	15.08	16.34	17.59
ø63	ø35	A	3117	18.70	21.82	24.94	28.06	31.17	34.29	37.41	40.52	43.64
		B	2155	12.93	15.09	17.24	19.40	21.55	23.71	25.86	28.02	30.17
ø80	ø45	A	5027	30.16	35.19	40.21	45.24	50.27	55.29	60.32	65.35	70.37
		B	3436	20.62	24.05	27.49	30.93	34.36	37.80	41.23	44.67	48.11

The method of calculation
(Hydraulic cylinders' force)

$$F = P \times A - f$$

F:	Cylinders' force	(N)
P:	Operating pressure	(MPa)
A:	Piston area	(mm ²)
f :	Friction drag	(N)

How to order the seal kit

MHC□SK □

B
Q

Tube I.D.	Seal kit
20	MHCB20 - Including No.6,7,8,9,10
25	MHCB25 - Including No.6,7,8,9,10
32	MHCB32,MHCQ32 - Including No.6,7,8,9,10
40	MHCB40,MHCQ40 - Including No.6,7,8,9,10
50	MHCB50,MHCQ50 - Including No.6,7,8,9,10
63	MHCB63,MHCQ63 - Including No.6,7,8,9,10
80	MHCB80 - Including No.6,7,8,9,10

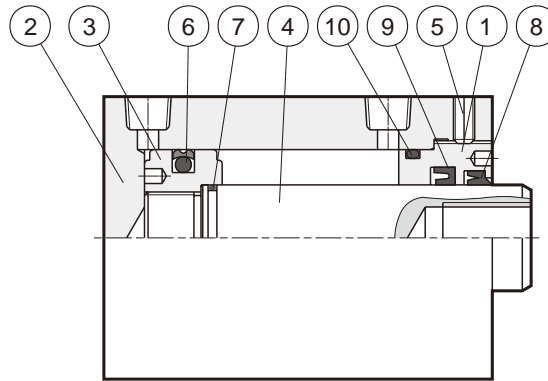
MHC□SK □ D

B
Q

Tube I.D.	Seal kit
32	MHCB32D,MHCQ32D - Including No.6,7,8,9,10
40	MHCB40D,MHCQ40D - Including No.6,7,8,9,10
50	MHCB50D,MHCQ50D - Including No.6,7,8,9,10
63	MHCB63D,MHCQ63D - Including No.6,7,8,9,10
80	MHCB80D - Including No.6,7,8,9,10

MHCB

MHCQ

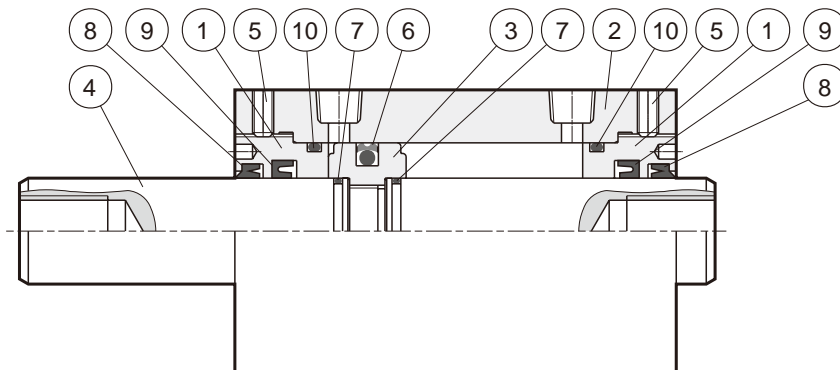


Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	1	5	Set screw	1	9	Rod packing	1
2	Cylinder tube	1	6	Piston packing	1	10	Cylinder gasket	1
3	Piston	1	7	Piston gasket	1	11		
4	Piston rod	1	8	Dust wiper	1	12		

MHCB-D

MHCQ-D



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	2	5	Set screw	2	9	Rod packing	2
2	Cylinder tube	1	6	Piston packing	1	10	Cylinder gasket	2
3	Piston	1	7	Piston gasket	2	11		
4	Piston rod	1	8	Dust wiper	2	12		

COMPACT HYDRAULIC CYLINDER

How to order the seal kit

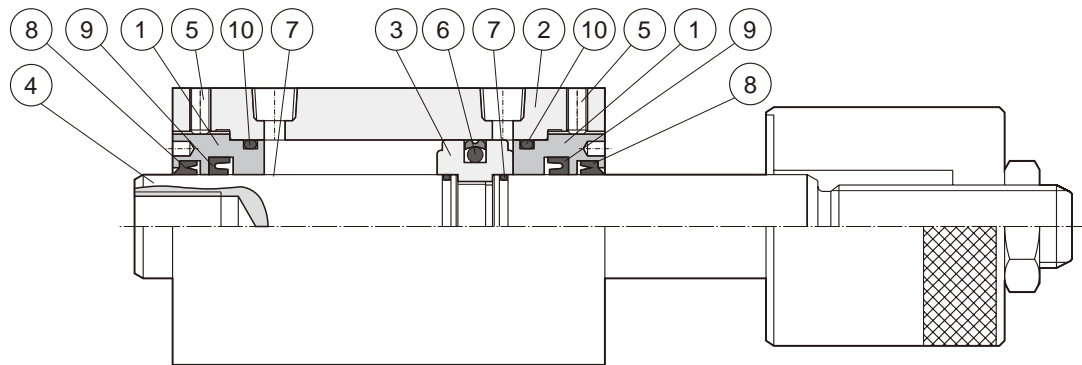
MHC SK D

B
 Q

Tube I.D.	Seal kit
32	MHCBSK32D,MHCQSK32D - Including No.6,7,8,9,10
40	MHCBSK40D,MHCQSK40D - Including No.6,7,8,9,10
50	MHCBSK50D,MHCQSK50D - Including No.6,7,8,9,10
63	MHCBSK63D,MHCQSK63D - Including No.6,7,8,9,10
80	MHCBSK80D - Including No.6,7,8,9,10

MHCB-DA

MHCB-DB

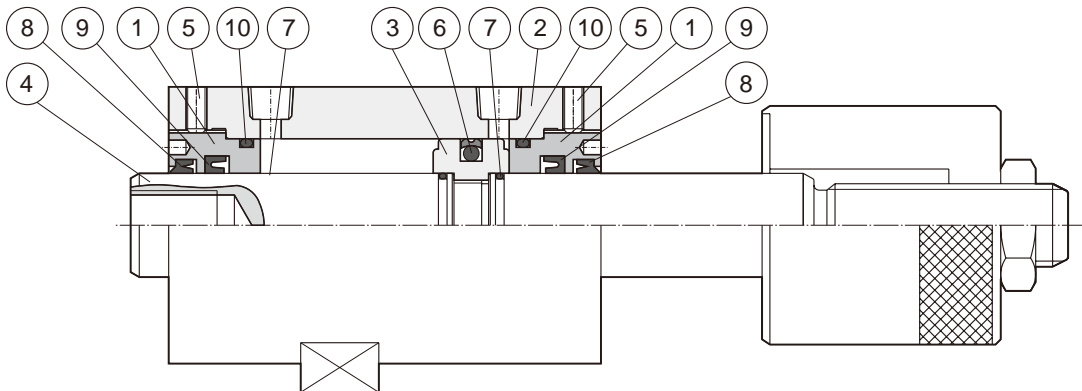


Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	1	5	Set screw	1	9	Rod packing	1
2	Cylinder tube	1	6	Piston packing	1	10	Cylinder gasket	1
3	Piston	1	7	Piston gasket	1	11		
4	Piston rod	1	8	Dust wiper	1	12		

MHCQ-DA

MHCQ-DB



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	2	5	Set screw	2	9	Rod packing	2
2	Cylinder tube	1	6	Piston packing	1	10	Cylinder gasket	2
3	Piston	1	7	Piston gasket	2	11		
4	Piston rod	1	8	Dust wiper	2	12		

Cylinder weight (Including the mounting nut)

Tube I.D.	ø20		ø25		ø32				ø40				ø50				ø63				ø80	
	MHCB		MHCB		MHCB		MHCQ		MHCB		MHCQ		MHCB		MHCQ		MHCB		MHCQ		MHCB	
	N	Z	N	Z	N	Z	N	Z	N	Z	N	Z	N	Z	N	Z	N	Z	N	Z	N	Z
5	0.64	0.69	0.88	0.93	1.61	1.71	1.72	1.82	2.00	2.20	2.21	2.41	2.78	3.03	3.27	3.52	4.24	4.69	5.28	5.73	7.46	8.31
10	0.63	0.68	0.87	0.92	1.73	1.83	1.71	1.81	2.15	2.35	2.19	2.39	2.96	3.21	3.24	3.49	4.48	4.93	5.22	5.67	7.80	8.65
15	0.75	0.80	1.02	1.07	1.85	1.95	1.98	2.08	2.30	2.50	2.55	2.75	3.14	3.39	3.71	3.96	4.72	5.17	5.90	6.35	8.14	8.99
20	0.74	0.79	1.01	1.06	1.97	2.07	1.97	2.07	2.45	2.65	2.53	2.73	3.32	3.57	3.68	3.93	4.96	5.41	5.84	6.29	8.48	9.33
25	0.86	0.91	1.16	1.21	2.09	2.19	2.24	2.34	2.60	2.80	2.89	3.09	3.50	3.75	4.15	4.40	5.20	5.65	6.52	6.97	8.82	9.67
30	0.85	0.90	1.15	1.20	2.21	2.31	2.23	2.33	2.75	2.95	2.87	3.07	3.68	3.93	4.12	4.37	5.44	5.89	6.46	6.91	9.16	10.01
35	0.97	1.02	1.30	1.35	2.46	2.56	2.50	2.60	3.07	3.27	3.23	3.43	4.07	4.32	4.59	4.84	5.98	6.43	7.14	7.59	9.93	10.78
40	0.96	1.01	1.29	1.34	2.45	2.55	2.49	2.59	3.05	3.25	3.21	3.41	4.04	4.29	4.56	4.81	5.92	6.37	7.08	7.53	9.84	10.69
45	—	—	1.44	1.49	2.70	2.80	2.76	2.86	3.37	3.57	3.57	3.77	4.43	4.68	5.03	5.28	6.46	6.91	7.76	8.21	10.61	11.46
50	—	—	1.43	1.48	2.69	2.79	2.75	2.85	3.35	3.55	3.55	3.75	4.40	4.65	5.00	5.25	6.40	6.85	7.70	8.15	10.52	11.37
60	—	—	—	—	2.93	3.03	3.01	3.11	3.65	3.85	3.89	4.09	4.76	5.01	5.44	5.69	6.88	7.33	8.32	8.77	11.20	12.05
70	—	—	—	—	3.17	3.27	3.27	3.37	3.95	4.15	4.23	4.43	5.12	5.37	5.88	6.13	7.36	7.81	8.94	9.39	11.88	12.73
80	—	—	—	—	3.41	3.51	3.53	3.63	4.25	4.45	4.57	4.77	5.48	5.73	6.32	6.57	7.84	8.29	9.56	10.01	12.56	13.41
90	—	—	—	—	3.65	3.75	3.79	3.89	4.55	4.75	4.91	5.11	5.84	6.09	6.76	7.01	8.32	8.77	10.18	10.63	13.24	14.09
100	—	—	—	—	3.89	3.99	4.05	4.15	4.85	5.05	5.25	5.45	6.20	6.45	7.20	7.45	8.80	9.25	10.80	11.25	13.92	14.77


* N (Female thread); Z (Male thread)

Tube I.D.	ø32						ø40						ø50						ø63						ø80		
	MHCB_D			MHCQ_D			MHCB_D			MHCQ_D			MHCB_D			MHCQ_D			MHCB_D			MHCQ_D			MHCB_D		
	N	Z	L	N	Z	L,R	N	Z	L	N	Z	L,R	N	Z	L	N	Z	L,R	N	Z	L	N	Z	L,R	N	Z	L
5	1.89	2.06	1.97	1.90	2.07	1.99	2.37	2.71	2.54	2.45	2.79	2.62	3.22	3.65	3.44	3.63	4.05	3.84	4.85	5.61	5.23	5.59	6.35	5.98	10.18	11.63	10.90
10	1.89	2.06	1.97	1.90	2.07	1.99	2.37	2.71	2.54	2.45	2.79	2.62	3.22	3.65	3.43	3.62	4.05	3.84	4.83	5.59	5.21	5.58	6.34	5.96	10.15	11.60	10.88
15	2.11	2.28	2.20	2.14	2.31	2.23	2.66	3.00	2.83	2.77	3.11	2.94	3.58	4.00	3.79	4.05	4.47	4.26	5.32	6.08	5.70	6.18	6.95	6.57	10.87	12.31	11.59
20	2.11	2.28	2.20	2.14	2.31	2.23	2.66	3.00	2.83	2.77	3.11	2.94	3.57	4.00	3.79	4.04	4.47	4.26	5.30	6.07	5.68	6.17	6.93	6.55	10.84	12.28	11.58
25	2.34	2.51	2.42	2.38	2.55	2.47	2.94	3.28	3.11	3.09	3.43	3.26	3.93	4.36	4.14	4.47	4.90	4.68	5.79	6.56	6.17	6.78	7.54	7.16	11.55	12.99	12.27
30	2.34	2.51	2.42	2.39	2.56	2.47	2.95	3.29	3.12	3.10	3.44	3.27	3.93	4.35	4.14	4.47	4.89	4.68	5.77	6.54	6.15	6.76	7.52	7.14	11.52	12.97	12.25
35	2.56	2.73	2.65	2.63	2.80	2.71	3.23	3.57	3.40	3.42	3.76	3.59	4.28	4.71	4.50	4.89	5.32	5.10	6.26	7.03	6.64	7.37	8.13	7.75	12.23	13.68	12.96
40	2.56	2.73	2.65	2.63	2.80	2.71	3.23	3.57	3.40	3.42	3.76	3.59	4.28	4.71	4.49	4.89	5.31	5.10	6.24	7.01	6.63	7.35	8.11	7.73	12.21	13.65	12.93
45	2.79	2.96	2.87	2.87	3.04	2.95	3.52	3.86	3.69	3.74	4.08	3.91	4.64	5.06	4.85	5.31	5.74	5.52	6.73	7.50	7.12	7.96	8.72	8.34	12.92	14.35	13.64
50	2.79	2.96	2.87	2.87	3.04	2.96	3.52	3.86	3.69	3.74	4.08	3.91	4.63	5.06	4.85	5.31	5.73	5.52	6.72	7.48	7.10	7.94	8.71	8.32	12.89	14.34	13.61

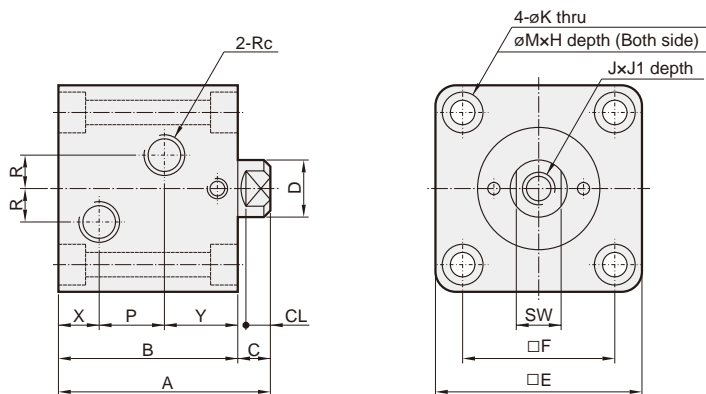
* N (Bilateral Female thread); Z (Bilateral Male thread); L, R (Unilateral Female thread)

Mounting weight

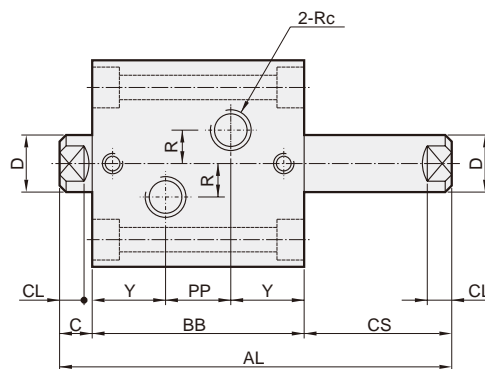
Unit: kg

Tube I.D. (mm)	Adjustable Nut		Nut (Rod)
	A Adjustable Stroke 25mm	B Adjustable Stroke 50mm	
ø32	0.6	0.9	0.02
ø40	1.0	1.45	0.04
ø50	1.15	1.7	0.08
ø63	2.15	3	0.08
ø80	3.4	4.2	0.18

MHCB

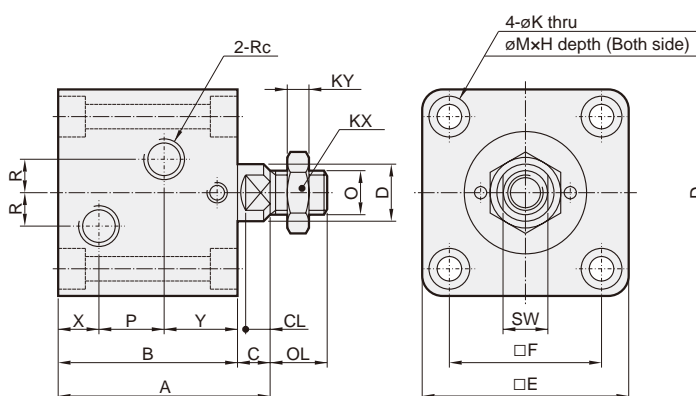


MHCB-D

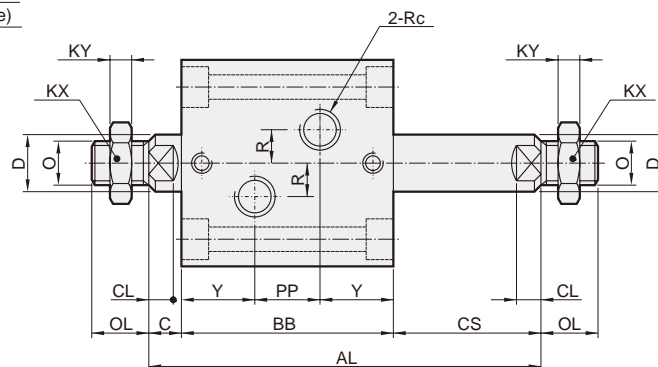


CS=C+stroke

MHCB-Z

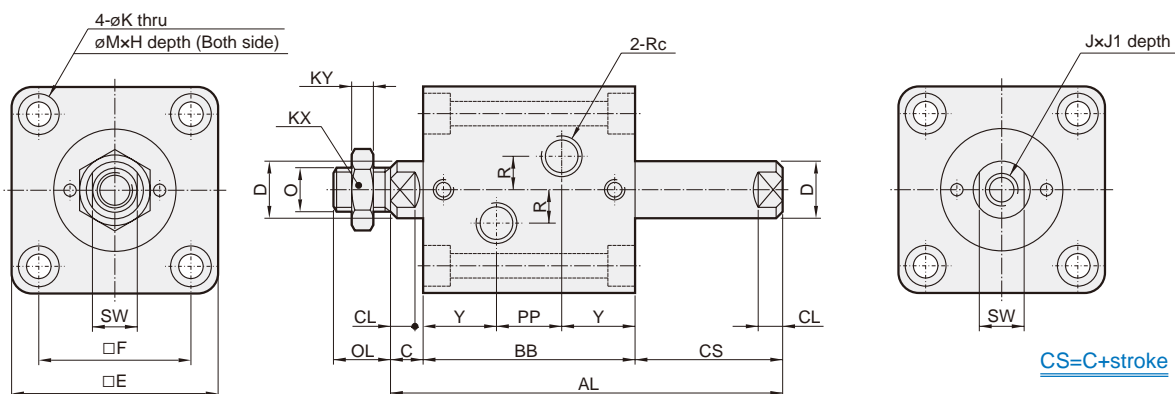


MHCB-ZD



CS=C+stroke

MHCB-LD



CS=C+stroke



COMPACT HYDRAULIC CYLINDER

mindman

Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

Auxiliary Equipment

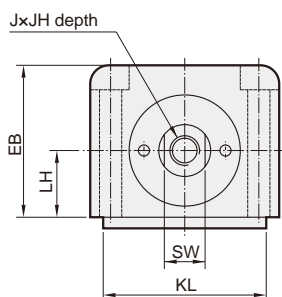
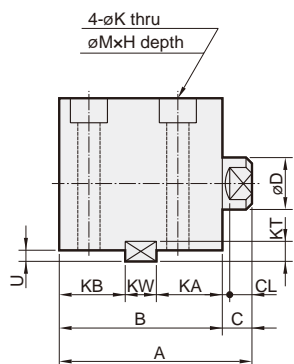
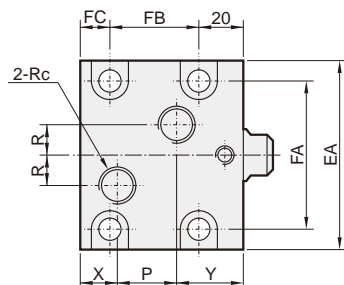
Hydraulic Cylinder

Tube I.D.	Model	MHCB / MHCB-Z														
	Stroke	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100
$\varnothing 20$	A	61	61	71	71	81	81	91	91	-	-	-	-	-	-	-
	B	53	53	63	63	73	73	83	83	-	-	-	-	-	-	-
	P	20	20	30	30	40	40	50	50	-	-	-	-	-	-	-
$\varnothing 25$	A	63	63	73	73	83	83	93	93	103	103	-	-	-	-	-
	B	55	55	65	65	75	75	85	85	95	95	-	-	-	-	-
	P	22	22	32	32	42	42	52	52	62	62	-	-	-	-	-
$\varnothing 32$	A	69	74	79	84	89	94	104	104	114	114	124	-	-	-	-
	B	59	64	69	74	79	84	94	94	104	104	114	-	-	-	-
	P	19	24	29	34	39	44	54	54	64	64	74	-	-	-	-
$\varnothing 40$	A	70	75	80	85	90	95	105	105	115	115	125	135	145	-	-
	B	60	65	70	75	80	85	95	95	105	105	115	125	135	-	-
	P	20	25	30	35	40	45	55	55	65	65	75	85	95	-	-
$\varnothing 50$	A	76	81	86	91	96	101	111	111	121	121	131	141	151	161	-
	B	65	70	75	80	85	90	100	100	110	110	120	130	140	150	-
	P	23	28	33	38	43	48	58	58	68	68	78	88	98	108	-
$\varnothing 63$	A	85	90	95	100	105	110	120	120	130	130	140	150	160	170	180
	B	72	77	82	87	92	97	107	107	117	117	127	137	147	157	167
	P	25	30	35	40	45	50	60	60	70	70	80	90	100	110	120
$\varnothing 80$	A	100	105	110	115	120	125	135	135	145	145	155	165	175	185	195
	B	83	88	93	98	103	108	118	118	128	128	138	148	158	168	178
	P	32	37	42	47	52	57	67	67	77	77	87	97	107	117	127

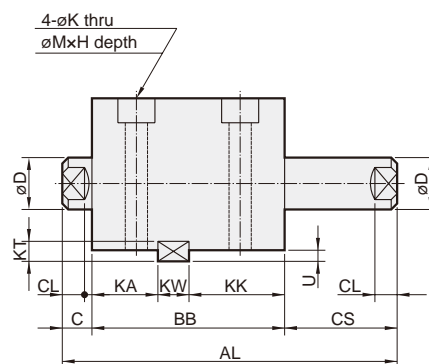
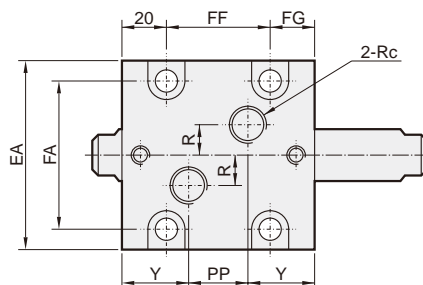
Tube I.D.	Model	MHCB-D / MHCB-ZD / MHCB-LD														
	Stroke	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100
$\varnothing 32$	AL	104	109	124	129	144	149	164	169	184	189	-	-	-	-	-
	BB	79	79	89	89	99	99	109	109	119	119	-	-	-	-	-
	CS	15	20	25	30	35	40	45	50	55	60	-	-	-	-	-
	PP	23	23	33	33	43	43	53	53	63	63	-	-	-	-	-
$\varnothing 40$	AL	105	110	125	130	145	150	165	170	185	190	-	-	-	-	-
	BB	80	80	90	90	100	100	110	110	120	120	-	-	-	-	-
	CS	15	20	25	30	35	40	45	50	55	60	-	-	-	-	-
	PP	24	24	34	34	44	44	54	54	64	64	-	-	-	-	-
$\varnothing 50$	AL	112	117	132	137	152	157	172	177	192	197	-	-	-	-	-
	BB	85	85	95	95	105	105	115	115	125	125	-	-	-	-	-
	CS	16	21	26	31	36	41	46	51	56	61	-	-	-	-	-
	PP	26	26	36	36	46	46	56	56	66	66	-	-	-	-	-
$\varnothing 63$	AL	123	128	143	148	163	168	183	188	203	208	-	-	-	-	-
	BB	92	92	102	102	112	112	122	122	132	132	-	-	-	-	-
	CS	18	23	28	33	38	43	48	53	58	63	-	-	-	-	-
	PP	30	30	40	40	50	50	60	60	70	70	-	-	-	-	-
$\varnothing 80$	AL	142	147	162	167	182	187	202	207	222	227	-	-	-	-	-
	BB	103	103	113	113	123	123	133	133	143	143	-	-	-	-	-
	CS	22	27	32	37	42	47	52	57	62	67	-	-	-	-	-
	PP	37	37	47	47	57	57	67	67	77	77	-	-	-	-	-

Code Tube I.D.	C	CL	D	E	F	H	J	J1	K	KX	KY	M	O	OL	PT	R	SW	X	Y
$\varnothing 20$	8	6	12	42	30	5.5	M8x1.25	12	5.6	17	6	9	M10x1.25	20	Rc1/8	5	10	10	23
$\varnothing 25$	8	6	14	48	36	5.5	M10x1.5	15	5.6	19	7	9	M12x1.25	22	Rc1/8	5	12	10	23
$\varnothing 32$	10	7	20	62	47	6.5	M12x1.75	15	6.6	24	8	11	M16x1.5	25	Rc1/4	10	17	12	28
$\varnothing 40$	10	7	25	70	52	9	M16x2.0	20	9	32	11	14	M22x1.5	30	Rc1/4	10	22	12	28
$\varnothing 50$	11	8	30	80	58	11	M20x2.5	25	11	35	14	18	M26x1.5	35	Rc1/4	10	27	12.5	29.5
$\varnothing 63$	13	10	35	94	69	13	M27x3.0	35	13	41	13	20	M30x1.5	40	Rc3/8	10	32	16	31
$\varnothing 80$	17	14	45	114	86	15	M30x3.5	35	15	50	10	22	M39x1.5	45	Rc3/8	15	41	18	33

MHCQ

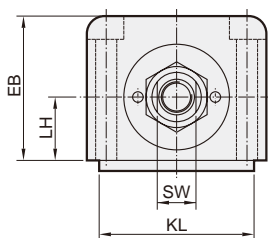
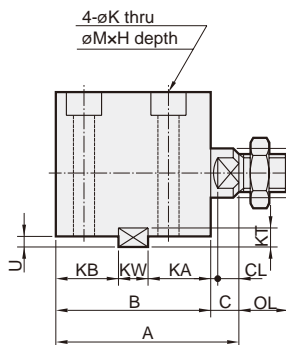
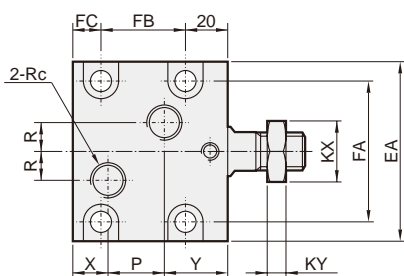


MHCQ-D

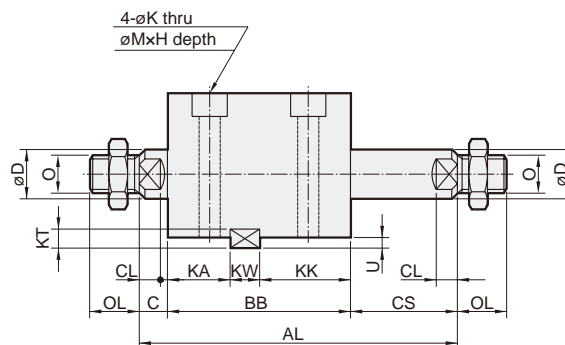
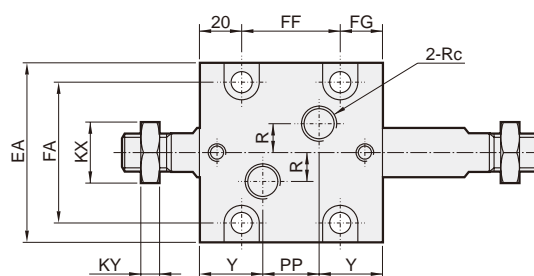


CS=C+stroke

MHCQ-Z



MHCQ-ZD



CS=C+stroke

Tube I.D.	Model Stroke	MHCQ / MHCQ-Z									
		5	10	15	20	25	30	35	40	45	50
ø32	A	74	74	84	84	94	94	104	104	114	114
	B	64	64	74	74	84	84	94	94	104	104
	FB	34	34	44	44	54	54	64	64	74	74
	KB	24	24	34	34	44	44	54	54	64	64
	P	24	24	34	34	44	44	54	54	64	64
ø40	A	75	75	85	85	95	95	105	105	115	115
	B	65	65	75	75	85	85	95	95	105	105
	FB	33	33	43	43	53	53	63	63	73	73
	KB	25	25	35	35	45	45	55	55	65	65
	P	25	25	35	35	45	45	55	55	65	65
ø50	A	81	81	91	91	101	101	111	111	121	121
	B	70	70	80	80	90	90	100	100	110	110
	FB	37	37	47	47	57	57	67	67	77	77
	KB	27	27	37	37	47	47	57	57	67	67
	P	28	28	38	38	48	48	58	58	68	68
ø63	A	90	90	100	100	110	110	120	120	130	130
	B	77	77	87	87	97	97	107	107	117	117
	FB	42	42	52	52	62	62	72	72	82	82
	KB	30	30	40	40	50	50	60	60	70	70
	P	30	30	40	40	50	50	60	60	70	70

Tube I.D.	Model Stroke	MHCQ-D / MHCQ-ZD									
		5	10	15	20	25	30	35	40	45	50
ø32	AA	104	109	124	129	144	149	164	169	184	189
	BB	79	79	89	89	99	99	109	109	119	119
	CS	15	20	25	30	35	40	45	50	55	60
	FF	42	42	52	52	62	62	72	72	82	82
	KK	39	39	49	49	59	59	69	69	79	79
	PP	23	23	33	33	43	43	53	53	63	63
ø40	AA	105	110	125	130	145	150	165	170	185	190
	BB	80	80	90	90	100	100	110	110	120	120
	CS	15	20	25	30	35	40	45	50	55	60
	FF	42	42	52	52	62	62	72	72	82	82
	KK	40	40	50	50	60	60	70	70	80	80
	PP	24	24	34	34	44	44	54	54	64	64
ø50	AA	112	117	132	137	152	157	172	177	192	197
	BB	85	85	95	95	105	105	115	115	125	125
	CS	16	21	26	31	36	41	46	51	56	61
	FF	45	45	55	55	65	65	75	75	85	85
	KK	42	42	52	52	62	62	72	72	82	82
	PP	26	26	36	36	46	46	56	56	66	66
ø63	AA	123	128	143	148	163	168	183	188	203	208
	BB	92	92	102	102	112	112	122	122	132	132
	CS	18	23	28	33	38	43	48	53	58	63
	FF	52	52	62	62	72	72	82	82	92	92
	KK	45	45	55	55	65	65	75	75	85	85
	PP	30	30	40	40	50	50	60	60	70	70

Code Tube I.D.	C	CL	D	EA	EB	FA	FC	FG	H	J	JH	K	KA	KL
ø32	10	7	20	70	56	56	10	17	9	M12×1.75	15	9	28	63
ø40	10	7	25	80	64	62	12	18	11	M16×2.0	20	11	28	70
ø50	11	8	30	94	74	74	13	20	13	M20×2.5	25	13	29	80
ø63	13	10	35	114	89	90	15	20	15	M27×3.0	35	15	31	100

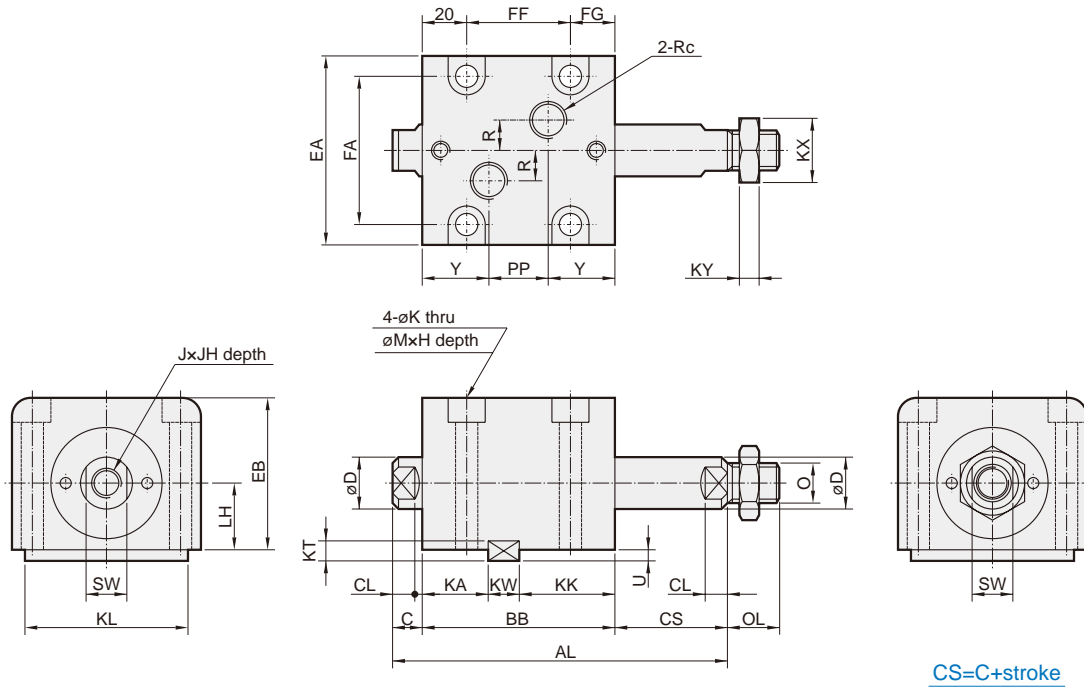
Code Tube I.D.	KT	KW	KX	KY	LH	M	O	OL	PT	R	SW	U	X	Y
ø32	8	12	24	8	25	14	M16×1.5	25	Rc1/4	10	17	4.5	12	28
ø40	8	12	32	11	29	18	M22×1.5	30	Rc1/4	10	22	4.5	12	28
ø50	9	14	35	14	34	20	M26×1.5	35	Rc1/4	10	27	5	12.5	29.5
ø63	10	16	41	13	42	22	M30×1.5	40	Rc3/8	10	32	5.5	16	31

MHCQ-*D Dimensions – Double rod $\phi 32\sim\phi 63$

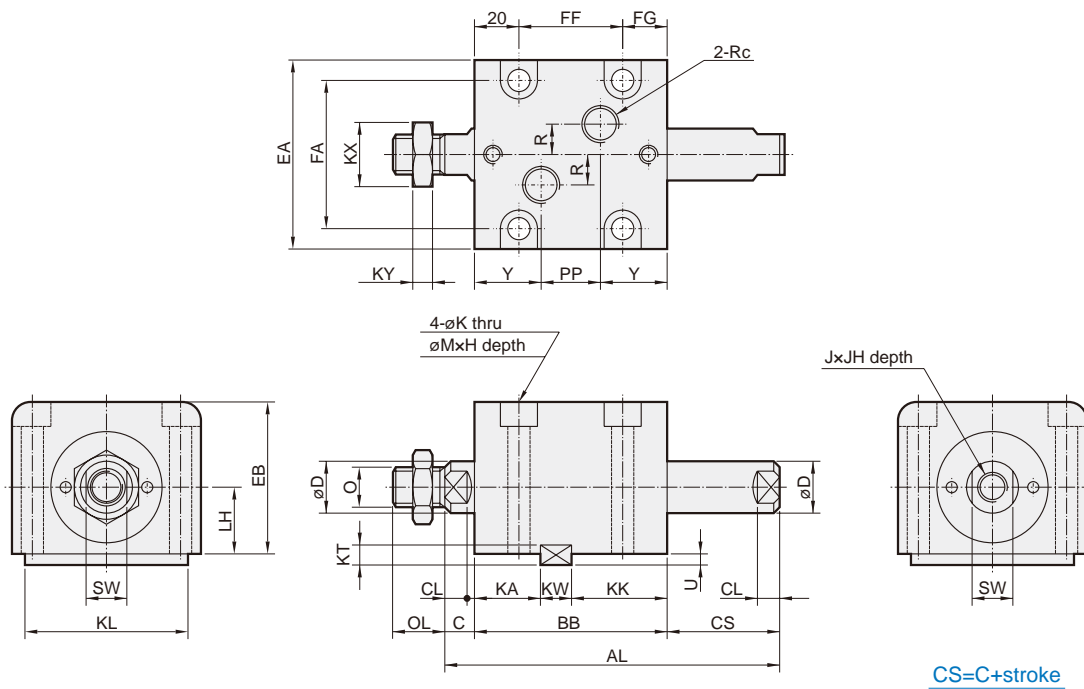
COMPACT HYDRAULIC CYLINDER



MHCQ-RD



MHCQ-LD



MHCQ-*D Dimensions – Double rod ø32~ø63



COMPACT HYDRAULIC CYLINDER

Mindman

Tube I.D.	Model	MHCQ-RD / MHCQ-LD									
	Stroke	5	10	15	20	25	30	35	40	45	50
ø32	AA	104	109	124	129	144	149	164	169	184	189
	BB	79	79	89	89	99	99	109	109	119	119
	CS	15	20	25	30	35	40	45	50	55	60
	FF	42	42	52	52	62	62	72	72	82	82
	KK	39	39	49	49	59	59	69	69	79	79
	PP	23	23	33	33	43	43	53	53	63	63
ø40	AA	105	110	125	130	145	150	165	170	185	190
	BB	80	80	90	90	100	100	110	110	120	120
	CS	15	20	25	30	35	40	45	50	55	60
	FF	42	42	52	52	62	62	72	72	82	82
	KK	40	40	50	50	60	60	70	70	80	80
	PP	24	24	34	34	44	44	54	54	64	64
ø50	AA	112	117	132	137	152	157	172	177	192	197
	BB	85	85	95	95	105	105	115	115	125	125
	CS	16	21	26	31	36	41	46	51	56	61
	FF	45	45	55	55	65	65	75	75	85	85
	KK	42	42	52	52	62	62	72	72	82	82
	PP	26	26	36	36	46	46	56	56	66	66
ø63	AA	123	128	143	148	163	168	183	188	203	208
	BB	92	92	102	102	112	112	122	122	132	132
	CS	18	23	28	33	38	43	48	53	58	63
	FF	52	52	62	62	72	72	82	82	92	92
	KK	45	45	55	55	65	65	75	75	85	85
	PP	30	30	40	40	50	50	60	60	70	70

Code Tube I.D.	C	CL	D	EA	EB	FA	FG	H	J	JH	K	KA	KL	KT
ø32	10	7	20	70	56	56	17	9	M12x1.75	15	9	28	63	8
ø40	10	7	25	80	64	62	18	11	M16x2.0	20	11	28	70	8
ø50	11	8	30	94	74	74	20	13	M20x2.5	25	13	29	80	9
ø63	13	10	35	114	89	90	20	15	M27x3.0	35	15	31	100	10

Code Tube I.D.	KW	KX	KY	LH	M	O	OL	PT	R	SW	U	Y
ø32	12	24	8	25	14	M16x1.5	25	Rc1/4	10	17	4.5	28
ø40	12	32	11	29	18	M22x1.5	30	Rc1/4	10	22	4.5	28
ø50	14	35	14	34	20	M26x1.5	35	Rc1/4	10	27	5	29.5
ø63	16	41	13	42	22	M30x1.5	40	Rc3/8	10	32	5.5	31

MHCB Dimensions – Adjustable stroke $\varnothing 32\sim\varnothing 80$

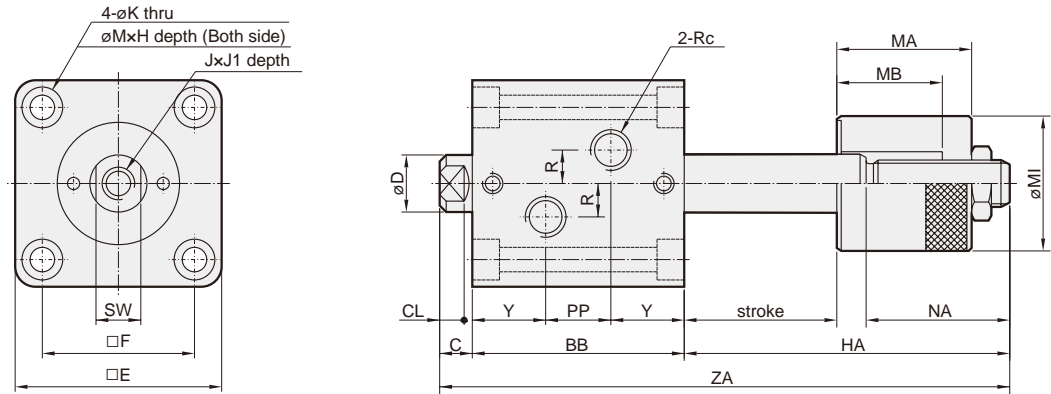


COMPACT HYDRAULIC CYLINDER

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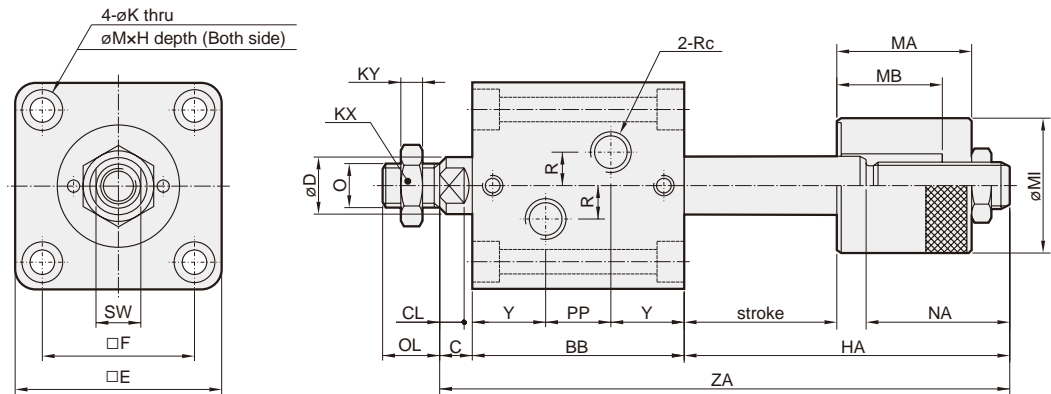
MHCB-DA

Adjustable stroke
25 mm



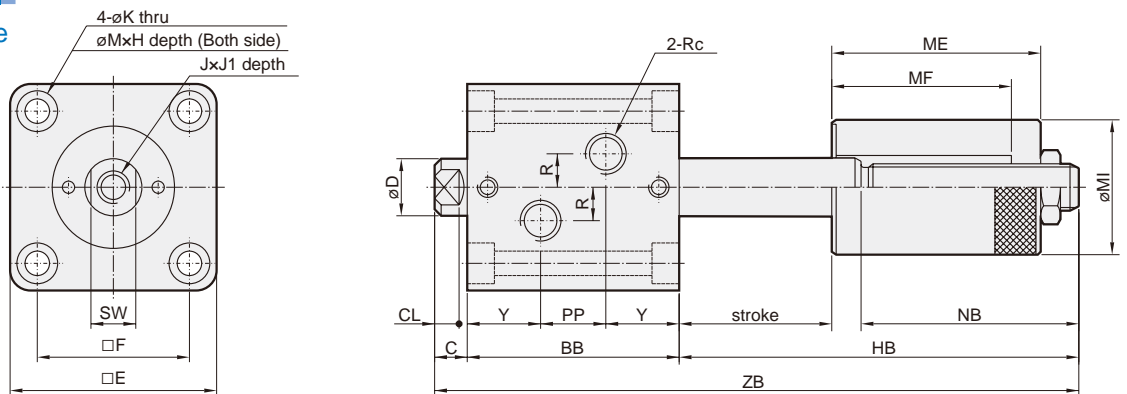
MHCB-ZDA

Adjustable stroke
25 mm



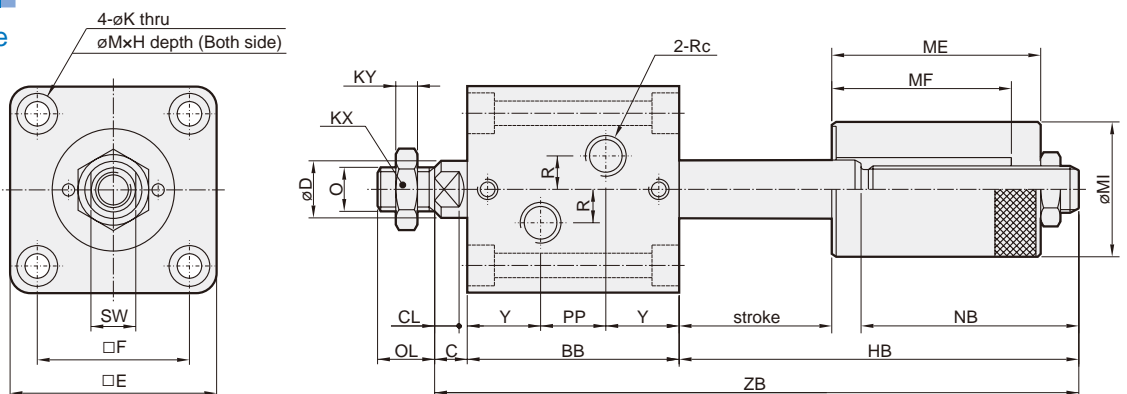
MHCB-DB

Adjustable stroke
50 mm



MHCB-ZDB

Adjustable stroke
50 mm





COMPACT HYDRAULIC CYLINDER

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Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

Tube I.D.	Model	MHCB-DA / MHCB-ZDA														
	Stroke	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100
$\varnothing 32$	ZA	153	158	173	178	193	198	213	218	233	238	-	-	-	-	-
	BB	79	79	89	89	99	99	109	109	119	119	-	-	-	-	-
	PP	23	23	33	33	43	43	53	53	63	63	-	-	-	-	-
	HA	64	69	74	79	84	89	94	99	104	109	-	-	-	-	-
$\varnothing 40$	ZA	163	168	183	188	203	208	223	228	243	248	-	-	-	-	-
	BB	80	80	90	90	100	100	110	110	120	120	-	-	-	-	-
	PP	24	24	34	34	44	44	54	54	64	64	-	-	-	-	-
	HA	73	78	83	88	93	98	103	108	113	118	-	-	-	-	-
$\varnothing 50$	ZA	171	176	191	196	211	216	231	236	251	256	-	-	-	-	-
	BB	85	85	95	95	105	105	115	115	125	125	-	-	-	-	-
	PP	26	26	36	36	46	46	56	56	66	66	-	-	-	-	-
	HA	75	80	85	90	95	100	105	110	115	120	-	-	-	-	-
$\varnothing 63$	ZA	188	193	208	213	228	233	248	253	268	273	-	-	-	-	-
	BB	92	92	102	102	112	112	122	122	132	132	-	-	-	-	-
	PP	30	30	40	40	50	50	60	60	70	70	-	-	-	-	-
	HA	83	88	93	98	103	108	113	118	123	128	-	-	-	-	-
$\varnothing 80$	ZA	207	212	227	232	247	252	267	272	287	292	-	-	-	-	-
	BB	103	103	113	113	123	123	133	133	143	143	-	-	-	-	-
	PP	37	37	47	47	57	57	67	67	77	77	-	-	-	-	-
	HA	87	92	97	102	107	112	117	122	127	132	-	-	-	-	-

Tube I.D.	Model	MHCB-DB / MHCB-ZDB														
	Stroke	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100
$\varnothing 32$	ZB	178	183	198	203	218	223	238	243	258	263	-	-	-	-	-
	BB	79	79	89	89	99	99	109	109	119	119	-	-	-	-	-
	PP	23	23	33	33	43	43	53	53	63	63	-	-	-	-	-
	HB	89	94	99	104	109	114	119	124	129	134	-	-	-	-	-
$\varnothing 40$	ZB	188	193	208	213	228	233	248	253	268	273	-	-	-	-	-
	BB	80	80	90	90	100	100	110	110	120	120	-	-	-	-	-
	PP	24	24	34	34	44	44	54	54	64	64	-	-	-	-	-
	HB	98	103	108	113	118	123	128	133	138	143	-	-	-	-	-
$\varnothing 50$	ZB	196	201	216	221	236	241	256	261	276	281	-	-	-	-	-
	BB	85	85	95	95	105	105	115	115	125	125	-	-	-	-	-
	PP	26	26	36	36	46	46	56	56	66	66	-	-	-	-	-
	HB	100	105	110	115	120	125	130	135	140	145	-	-	-	-	-
$\varnothing 63$	ZB	213	218	233	238	253	258	273	278	293	298	-	-	-	-	-
	BB	92	92	102	102	112	112	122	122	132	132	-	-	-	-	-
	PP	30	30	40	40	50	50	60	60	70	70	-	-	-	-	-
	HB	108	113	118	123	128	133	138	143	148	153	-	-	-	-	-
$\varnothing 80$	ZB	232	237	252	257	272	277	292	297	312	317	-	-	-	-	-
	BB	103	103	113	113	123	123	133	133	143	143	-	-	-	-	-
	PP	37	37	47	47	57	57	67	67	77	77	-	-	-	-	-
	HB	112	117	122	127	132	137	142	147	152	157	-	-	-	-	-

Code Tube I.D.	C	CL	D	E	F	H	J	J1	K	KX	KY	M	MI	MA
$\varnothing 32$	10	7	20	62	47	6.5	M12x1.75	15	6.6	24	8	11	45	46
$\varnothing 40$	10	7	25	70	52	9	M16x2.0	20	9	32	11	14	55	54
$\varnothing 50$	11	8	30	80	58	11	M20x2.5	25	11	35	14	18	60	53
$\varnothing 63$	13	10	35	94	69	13	M27x3.0	35	13	41	13	20	75	63
$\varnothing 80$	17	14	45	114	86	15	M30x3.5	35	15	50	10	22	90	70

Code Tube I.D.	MB	ME	MF	NA	NB	O	OL	PT	R	SW	Y
$\varnothing 32$	36	71	61	49	74	M16x1.5	25	Rc1/4	10	17	28
$\varnothing 40$	36	79	61	58	83	M22x1.5	30	Rc1/4	10	22	28
$\varnothing 50$	37	78	62	59	84	M26x1.5	35	Rc1/4	10	27	29.5
$\varnothing 63$	39	88	64	65	90	M30x1.5	40	Rc3/8	10	32	31
$\varnothing 80$	43	95	68	65	90	M39x1.5	45	Rc3/8	15	41	33

MHCQ-DA Dimensions – Adjustable stroke ø32~ø63



COMPACT HYDRAULIC CYLINDER

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Tube I.D.	Model	MHCQ-DA / MHCQ-ZDA									
		Stroke	5	10	15	20	25	30	35	40	45
ø32	ZA	153	158	173	178	193	198	213	218	233	238
	BB	79	79	89	89	99	99	109	109	119	119
	FF	42	42	52	52	62	62	72	72	82	82
	KK	39	39	49	49	59	59	69	69	79	79
	PP	23	23	33	33	43	43	53	53	63	63
	HA	64	69	74	79	84	89	94	99	104	109
ø40	ZA	163	168	183	188	203	208	223	228	243	248
	BB	80	80	90	90	100	100	110	110	120	120
	FF	42	42	52	52	62	62	72	72	82	82
	KK	40	40	50	50	60	60	70	70	80	80
	PP	24	24	34	34	44	44	54	54	64	64
	HA	73	78	83	88	93	98	103	108	113	118
ø50	ZA	171	176	191	196	211	216	231	236	251	256
	BB	85	85	95	95	105	105	115	115	125	125
	FF	45	45	55	55	65	65	75	75	85	85
	KK	42	42	52	52	62	62	72	72	82	82
	PP	26	26	36	36	46	46	56	56	66	66
	HA	75	80	85	90	95	100	105	110	115	120
ø63	ZA	188	193	208	213	228	233	248	253	268	273
	BB	92	92	102	102	112	112	122	122	132	132
	FF	52	52	62	62	72	72	82	82	92	92
	KK	45	45	55	55	65	65	75	75	85	85
	PP	30	30	40	40	50	50	60	60	70	70
	HA	83	88	93	98	103	108	113	118	123	128

Code Tube I.D.	C	CL	D	EA	EB	FA	FG	H	J	JH	K	KA	KL	KT	KW
ø32	10	7	20	70	56	56	17	9	M12×1.75	15	9	28	63	8	12
ø40	10	7	25	80	64	62	18	11	M16×2.0	20	11	28	70	8	12
ø50	11	8	30	94	74	74	20	13	M20×2.5	25	13	29	80	9	14
ø63	13	10	35	114	89	90	20	15	M27×3.0	35	15	31	100	10	16

Code Tube I.D.	KX	KY	LH	M	MI	MA	MB	NA	O	OL	PT	R	SW	U	Y
ø32	24	8	25	14	45	46	36	49	M16×1.5	25	Rc1/4	10	17	4.5	28
ø40	32	11	29	18	55	54	36	58	M22×1.5	30	Rc1/4	10	22	4.5	28
ø50	35	14	34	20	60	53	37	59	M26×1.5	35	Rc1/4	10	27	5	29.5
ø63	41	13	42	22	75	63	39	65	M30×1.5	40	Rc3/8	10	32	5.5	31

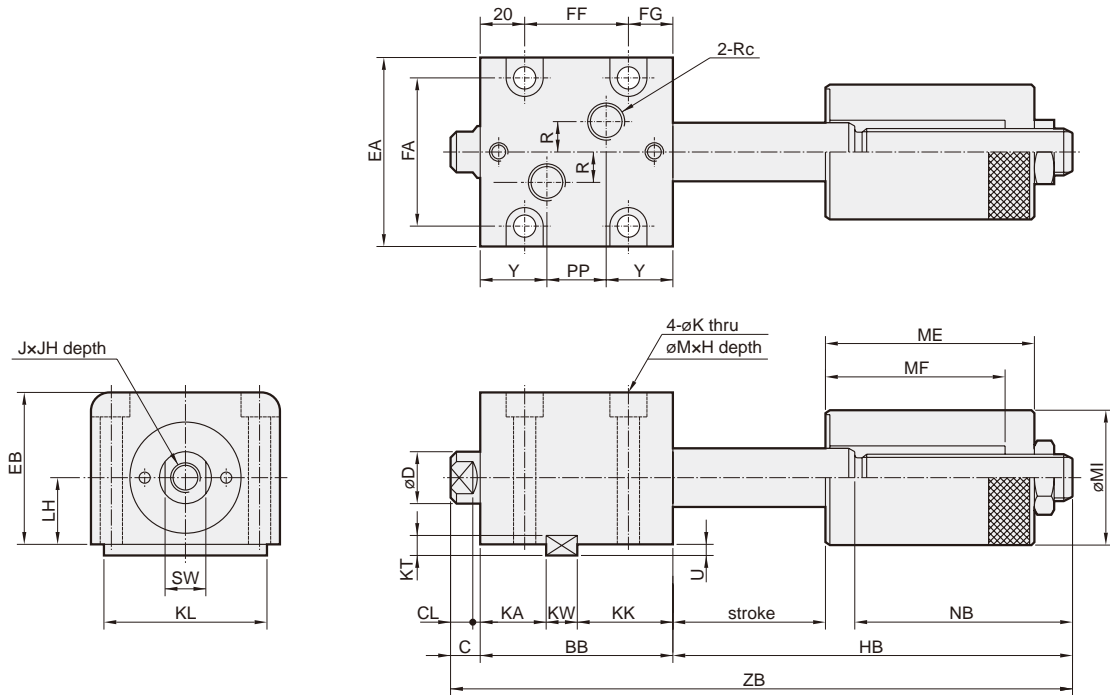
MHCQ-DB Dimensions – Adjustable stroke $\varnothing 32\sim\varnothing 63$



COMPACT HYDRAULIC CYLINDER

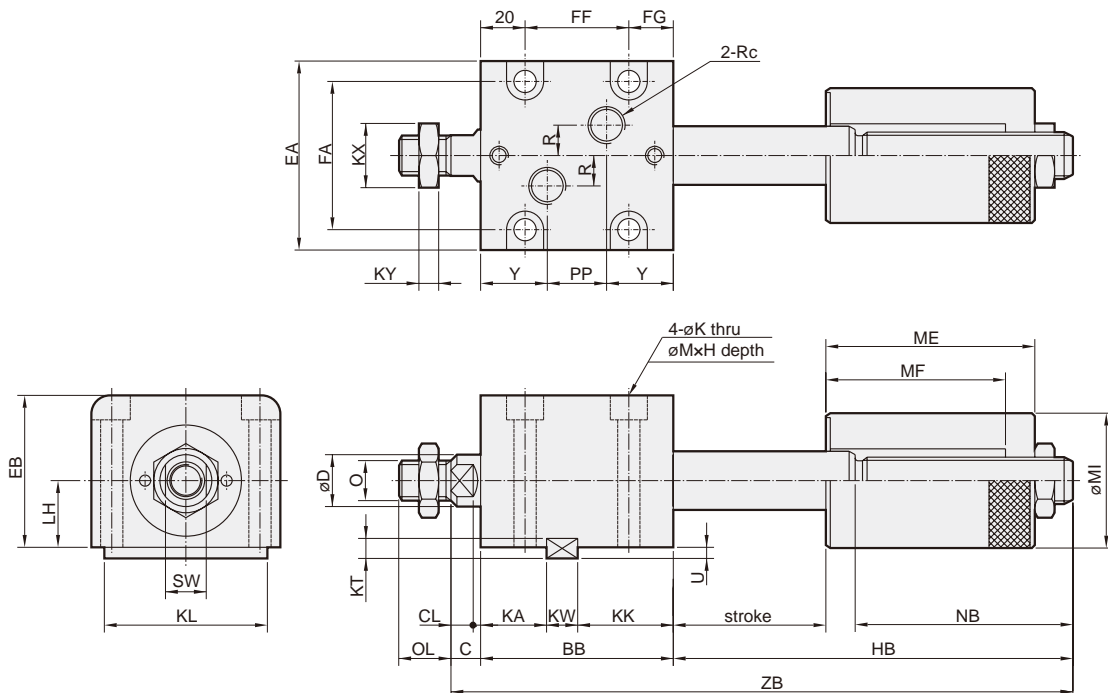
MHCQ-DB

Adjustable stroke 50 mm



MHCQ-ZDB

Adjustable stroke 50 mm



MHCQ-DB Dimensions – Adjustable stroke ø32~ø63



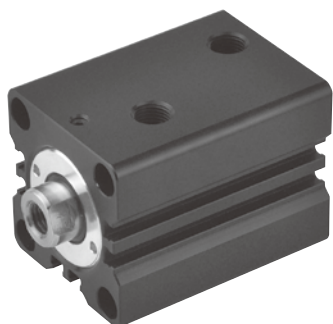
COMPACT HYDRAULIC CYLINDER

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Tube I.D.	Model	MHCQ-DB / MHCQ-ZDB									
		Stroke	5	10	15	20	25	30	35	40	45
ø32	ZB	178	183	198	203	218	223	238	243	258	263
	BB	79	79	89	89	99	99	109	109	119	119
	FF	42	42	52	52	62	62	72	72	82	82
	KK	39	39	49	49	59	59	69	69	79	79
	PP	23	23	33	33	43	43	53	53	63	63
	HB	89	94	99	104	109	114	119	124	129	134
ø40	ZB	188	193	208	213	228	233	248	253	268	273
	BB	80	80	90	90	100	100	110	110	120	120
	FF	42	42	52	52	62	62	72	72	82	82
	KK	40	40	50	50	60	60	70	70	80	80
	PP	24	24	34	34	44	44	54	54	64	64
	HB	98	103	108	113	118	123	128	133	138	143
ø50	ZB	196	201	216	221	236	241	256	261	276	281
	BB	85	85	95	95	105	105	115	115	125	125
	FF	45	45	55	55	65	65	75	75	85	85
	KK	42	42	52	52	62	62	72	72	82	82
	PP	26	26	36	36	46	46	56	56	66	66
	HB	100	105	110	115	120	125	130	135	140	145
ø63	ZB	213	218	233	238	253	258	273	278	293	298
	BB	92	92	102	102	112	112	122	122	132	132
	FF	52	52	62	62	72	72	82	82	92	92
	KK	45	45	55	55	65	65	75	75	85	85
	PP	30	30	40	40	50	50	60	60	70	70
	HB	108	113	118	123	128	133	138	143	148	153

Code Tube I.D.	C	CL	D	EA	EB	FA	FG	H	J	JH	K	KA	KL	KT	KW
ø32	10	7	20	70	56	56	17	9	M12×1.75	15	9	28	63	8	12
ø40	10	7	25	80	64	62	18	11	M16×2.0	20	11	28	70	8	12
ø50	11	8	30	94	74	74	20	13	M20×2.5	25	13	29	80	9	14
ø63	13	10	35	114	89	90	20	15	M27×3.0	35	15	31	100	10	16

Code Tube I.D.	KX	KY	LH	M	MI	ME	MF	NB	O	OL	PT	R	SW	U	Y
ø32	24	8	25	14	45	71	61	74	M16×1.5	25	Rc1/4	10	17	4.5	28
ø40	32	11	29	18	55	79	61	83	M22×1.5	30	Rc1/4	10	22	4.5	28
ø50	35	14	34	20	60	78	62	84	M26×1.5	35	Rc1/4	10	27	5	29.5
ø63	41	13	42	22	75	88	64	90	M30×1.5	40	Rc3/8	10	32	5.5	31



Features

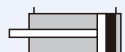
- Compact body design keeps overall length to a minimum.
- Cylinder barrel internally honed to ensure smooth and consistent piston movement.
- High quality materials are used throughout construction.
- Magnetic as standard.

Specification

Model	MHCB-M
Tube I.D. (mm)	32, 40, 50, 63, 80
The range of stroke (mm)	10 ~ 50
Medium	Filtered oil
Material	Anodised aluminum alloy
Max. operating pressure	7 MPa
Ambient temperature	-10~+60°C (No freezing)
Sensor switch	LN32H (Please refer to page 5-17)

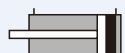
MHCB..M

Front mounting



MHCB..MZ

Front mounting
(Male thread type)



Standard stroke

Model	Stroke Tube I.D.	10	20	30	40	50
	MHCB-M	ø32	●	●	●	●
ø40		●	●	●	●	●
ø50		●	●	●	●	●
ø63		●	●	●	●	●
ø80		●	●	●	●	●

Order example

MHCB — 50 M — 30 — Z

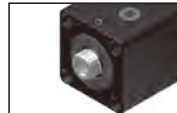
MODEL

TUBE I.D.

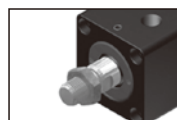
STROKE

ROD END TYPE

M: Magnet

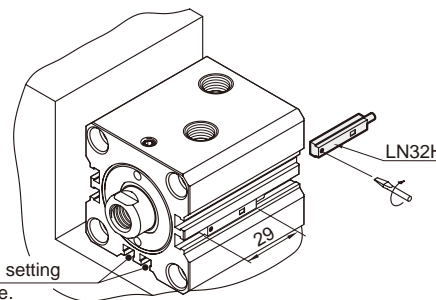


Blank: Female thread



Z: Male thread

Installation of sensor switch



The sensor switch setting here is not suitable.

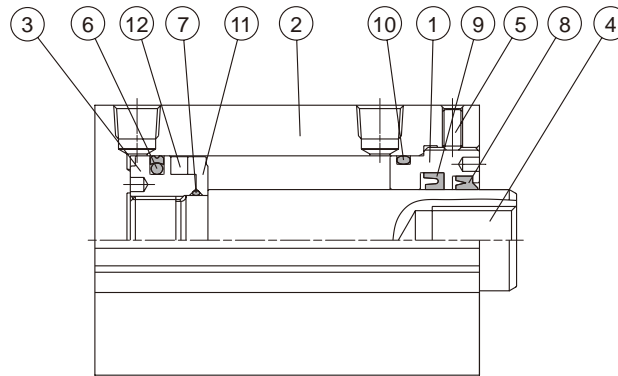
© When setting the sensor switch, it can't be near with magnet materials (carbon steel, cast iron). The distance must be over 10mm. If it is quite near, the sensor switch will be inactive easily.

How to order the seal kit

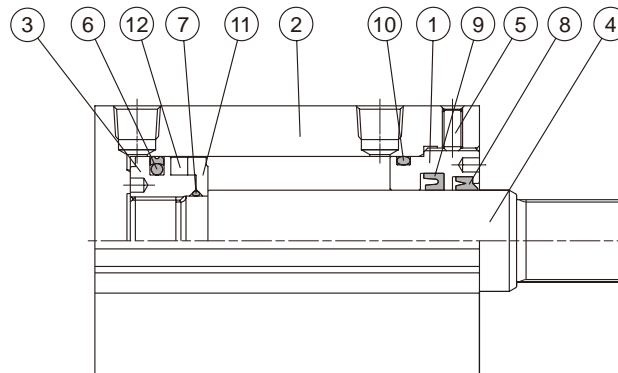
MHCB-MSK

Tube I.D.	Seal kit
32	MHCB-MSK32 - Including No.6,7,8,9,10
40	MHCB-MSK40 - Including No.6,7,8,9,10
50	MHCB-MSK50 - Including No.6,7,8,9,10
63	MHCB-MSK63 - Including No.6,7,8,9,10
80	MHCB-MSK80 - Including No.6,7,8,9,10

MHCB-M



MHCB-MZ



Parts list

No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	1	5	Set screw	1	9	Rod packing	1
2	Cylinder tube	1	6	Piston packing	1	10	Cylinder gasket	1
3	Piston	1	7	Piston gasket	1	11	Washer	1
4	Piston rod	1	8	Dust wiper	1	12	Magnet	1

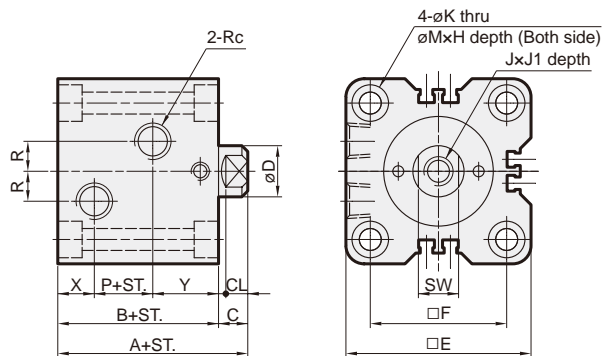
MHCB-M Dimensions $\varnothing 32\sim\varnothing 80$



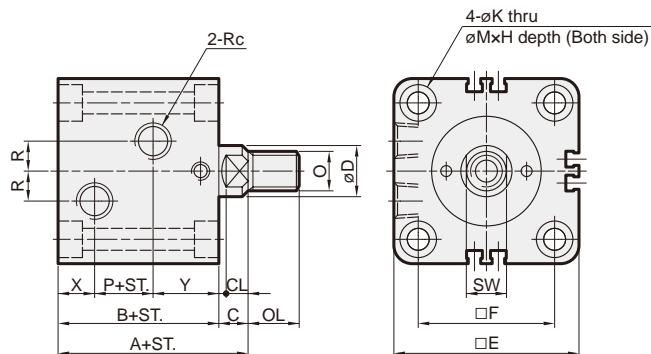
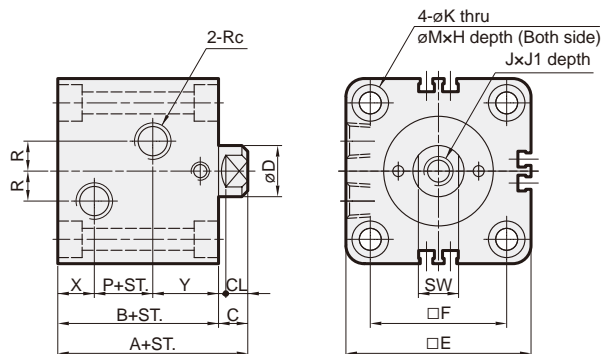
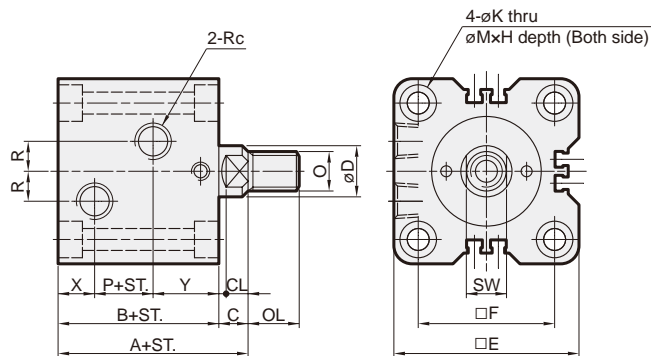
COMPACT HYDRAULIC WITH PISTON SENSING CYLINDER

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MHCB-M



MHCB-MZ



ST.=stroke

Code Tube I.D.	C	CL	D	E	F	H	J	J1	K	M	O	OL	PT	R	SW	X	Y
$\varnothing 32$	10	7	20	62	47	6.5	M12x1.75	15	6.6	11	M16x1.5	25	Rc1/4	10	17	12	28
$\varnothing 40$	10	7	25	70	52	9	M16x2.0	20	9	14	M22x1.5	30	Rc1/4	10	22	12	28
$\varnothing 50$	11	8	30	80	58	11	M20x2.5	25	11	18	M26x1.5	35	Rc1/4	10	27	12.5	29.5
$\varnothing 63$	13	10	35	94	69	13	M27x3.0	35	13	20	M30x1.5	40	Rc3/8	10	32	16	31
$\varnothing 80$	17	14	45	114	86	15	M30x3.5	35	15	22	M39x1.5	45	Rc3/8	15	41	18	33

Tube I.D. (mm)		Stroke									
		5	10	15	20	25	30	35	40	45	50
$\varnothing 32$	A	74	74	84	84	94	94	104	104	114	114
	B	64	64	74	74	84	84	94	94	104	104
	P	24	24	34	34	44	44	54	54	64	64
$\varnothing 40$	A	75	75	85	85	95	95	105	105	115	115
	B	65	65	75	75	85	85	95	95	105	105
	P	25	25	35	35	45	45	55	55	65	65
$\varnothing 50$	A	81	81	91	91	101	101	111	111	121	121
	B	70	70	80	80	90	90	100	100	110	110
	P	28	28	38	38	48	48	58	58	68	68
$\varnothing 63$	A	90	90	100	100	110	110	120	120	130	130
	B	77	77	87	87	97	97	107	107	117	117
	P	30	30	40	40	50	50	60	60	70	70
$\varnothing 80$	A	105	105	115	115	125	125	135	135	145	145
	B	88	88	98	98	108	108	118	118	128	128
	P	37	37	47	47	57	57	67	67	77	77



Features

- Compact body design keeps overall length to a minimum.
- Cylinder barrel internally honed to ensure smooth and consistent piston movement.
- High quality materials are used throughout construction.

Specification

Model	MHCB*						
Tube I.D. (mm)	20	25	32	40	50	63	80
The range of stroke (mm)	30		50				
Medium	Filtered oil						
Material	Carbon steel						
Max. operating pressure	14 MPa						
Ambient temperature	-10~+60°C (No freezing)						

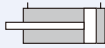
Standard stroke

● Standard products ○ Made to order

Type	Stroke Tube I.D.	5	10	15	20	25	30	35	40	45	50
MHCBR MHCBF	ø20	○	●	○	●	○	●	-	-	-	-
	ø25	○	●	○	●	○	●	-	-	-	-
	ø32	●	●	●	●	●	○	●	○	●	●
	ø40	●	●	●	●	●	●	○	●	○	●
	ø50	●	●	●	●	●	●	○	●	○	●
	ø63	●	●	●	●	●	●	○	●	○	●
MHCBS	ø32	○	●	○	●	○	●	○	●	○	●
	ø40	○	●	○	●	○	●	○	●	○	●
	ø50	○	●	○	●	○	●	○	●	○	●
	ø63	○	●	○	●	○	●	○	●	○	●

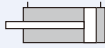
MHCBR

Front mounting
(Axial front manifold type)



MHCBF

Front mounting
(Axial back manifold type)



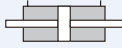
MHCBS

Side mounting
(Manifold type)



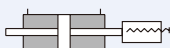
MHCBS-D

Side mounting
(Double rod type)
(Manifold type)



MHCBS-DA MHCBS-DB

Adjustable forward
stroke cylinder



Order example

MHCBS — 50 — 30 — ZDA

MODEL



TUBE I.D.

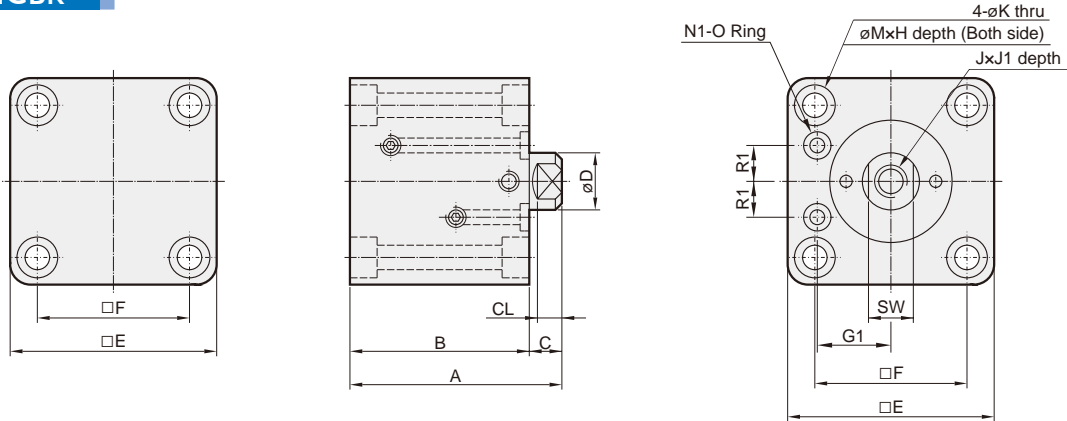
STROKE

ROD END TYPE **D**: Double rod

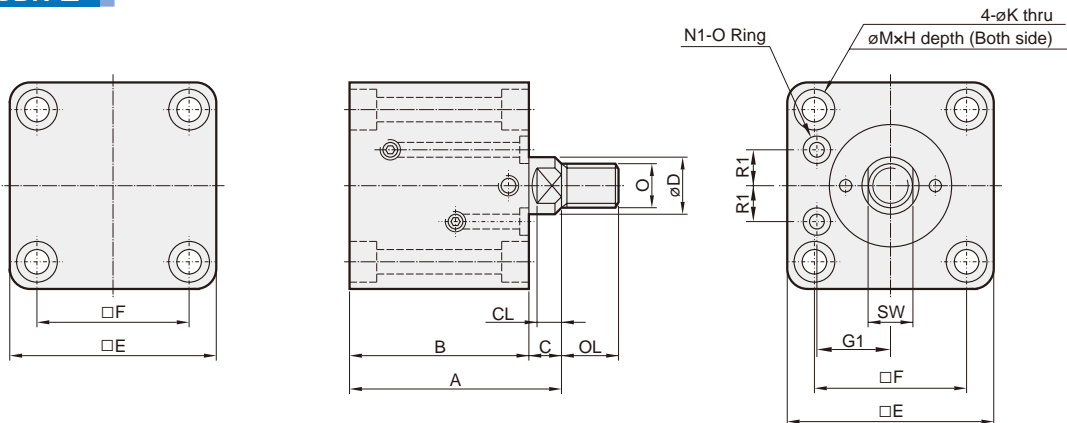
Blank		Single rod / Female thread	DA (*)		Double rod / Female thread / Adjustable stroke 25 mm
Z		Single rod / Male thread	DB (*)		Double rod / Female thread / Adjustable stroke 50 mm
D (*)		Double rod / Female thread	ZDA (*)		Double rod / Male thread / Adjustable stroke 25 mm
ZD (*)		Double rod / Male thread	ZDB (*)		Double rod / Male thread / Adjustable stroke 50 mm

* Only for MHCBS model.

MHCBR



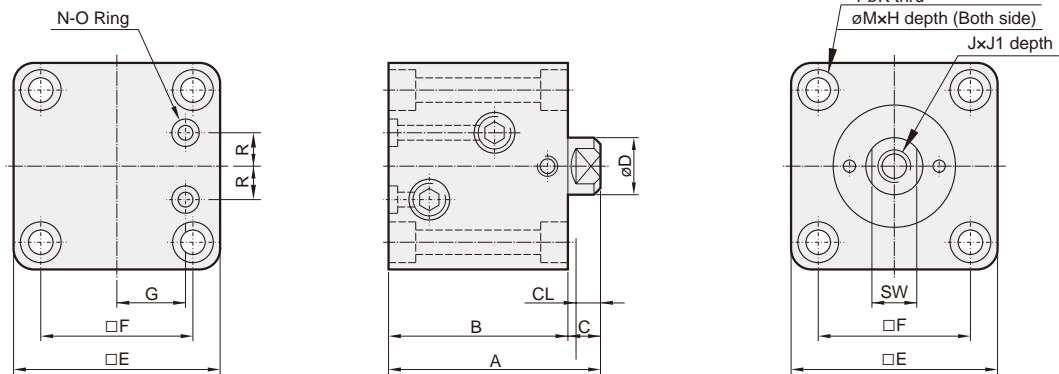
MHCBR-Z



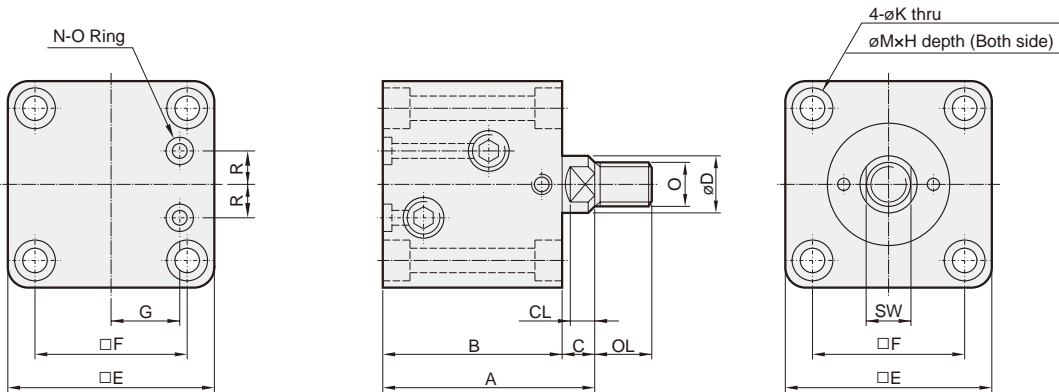
Tube I.D. (mm)	Type Stroke	MHCBR / MHCBR-Z									
		5	10	15	20	25	30	35	40	45	50
ø20	A	61	61	71	71	81	81	-	-	-	-
	B	53	53	63	63	73	73	-	-	-	-
ø25	A	63	63	73	73	83	83	-	-	-	-
	B	55	55	65	65	75	75	-	-	-	-
ø32	A	69	74	79	84	89	94	104	104	114	114
	B	59	64	69	74	79	84	94	94	104	104
ø40	A	70	75	80	85	90	95	105	105	115	115
	B	60	65	70	75	80	85	95	95	105	105
ø50	A	76	81	86	91	96	101	111	111	121	121
	B	65	70	75	80	85	90	100	100	110	110
ø63	A	85	90	95	100	105	110	120	120	130	130
	B	72	77	82	87	92	97	107	107	117	117
ø80	A	100	105	110	115	120	125	135	135	145	145
	B	83	88	93	98	103	108	118	118	128	128

Code Tube I.D.	C	CL	D	E	F	G1	H	J	J1	K	M	N1	O	OL	R1	SW
ø20	8	6	12	42	30	16.5	5.5	M8x1.25	12	5.6	9	P4	M10x1.25	20	6.5	10
ø25	8	6	14	48	36	19.5	5.5	M10x1.5	15	5.6	9	P4	M12x1.25	22	9	12
ø32	10	7	20	62	47	24	6.5	M12x1.75	15	6.6	11	P6	M16x1.5	25	12	17
ø40	10	7	25	70	52	27	9	M16x2.0	20	9	14	P6	M22x1.5	30	13	22
ø50	11	8	30	80	58	32	11	M20x2.5	25	11	18	P8	M26x1.5	35	13.5	27
ø63	13	10	35	94	69	38	13	M27x3.0	35	13	20	P8	M30x1.5	40	17.5	32
ø80	17	14	45	114	86	47	15	M30x3.5	35	15	22	P11	M39x1.5	45	22.5	41

MHCBF



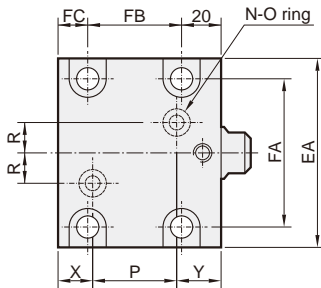
MHCBF-Z



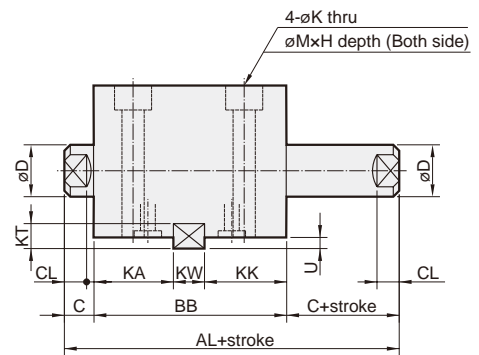
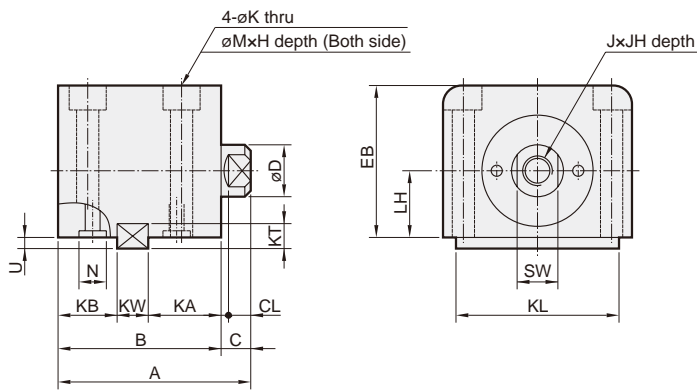
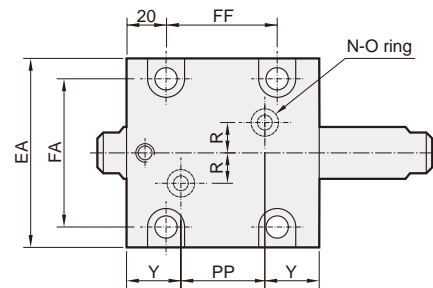
Tube I.D. (mm)	Type Stroke	MHCBF / MHCBF-Z									
		5	10	15	20	25	30	35	40	45	50
$\phi 20$	A	61	61	71	71	81	81	-	-	-	-
	B	53	53	63	63	73	73	-	-	-	-
$\phi 25$	A	63	63	73	73	83	83	-	-	-	-
	B	55	55	65	65	75	75	-	-	-	-
$\phi 32$	A	69	74	79	84	89	94	104	104	114	114
	B	59	64	69	74	79	84	94	94	104	104
$\phi 40$	A	70	75	80	85	90	95	105	105	115	115
	B	60	65	70	75	80	85	95	95	105	105
$\phi 50$	A	76	81	86	91	96	101	111	111	121	121
	B	65	70	75	80	85	90	100	100	110	110
$\phi 63$	A	85	90	95	100	105	110	120	120	130	130
	B	72	77	82	87	92	97	107	107	117	117
$\phi 80$	A	100	105	110	115	120	125	135	135	145	145
	B	83	88	93	98	103	108	118	118	128	128

Code Tube I.D.	C	CL	D	E	F	G	H	J	J1	K	M	N	O	OL	R	SW
$\phi 20$	8	6	12	42	30	13	5.5	M8x1.25	12	5.6	9	P5	M10x1.25	20	5.5	10
$\phi 25$	8	6	14	48	36	15	5.5	M10x1.5	15	5.6	9	P7	M12x1.25	22	6.5	12
$\phi 32$	10	7	20	62	47	20	6.5	M12x1.75	15	6.6	11	P9	M16x1.5	25	10	17
$\phi 40$	10	7	25	70	52	24	9	M16x2.0	20	9	14	P9	M22x1.5	30	10	22
$\phi 50$	11	8	30	80	58	29	11	M20x2.5	25	11	18	P9	M26x1.5	35	10	27
$\phi 63$	13	10	35	94	69	35	13	M27x3.0	35	13	20	P11	M30x1.5	40	13	32
$\phi 80$	17	14	45	114	86	44	15	M30x3.5	35	15	22	P11	M39x1.5	45	15	41

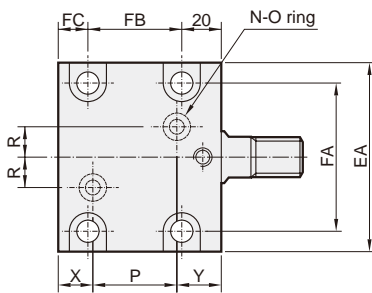
MHCBS



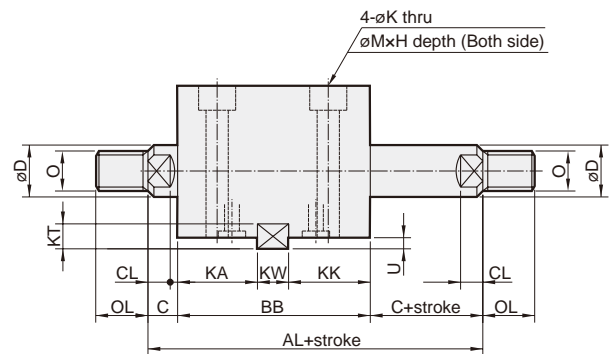
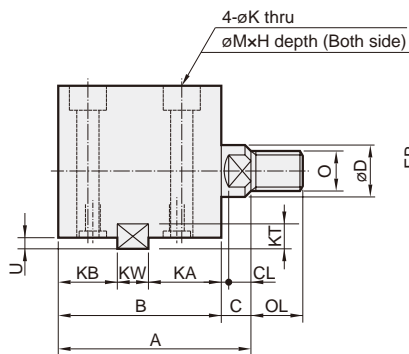
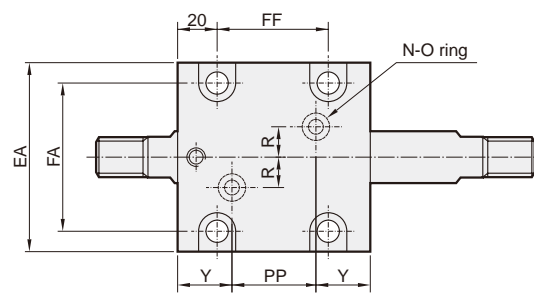
MHCBS-D



MHCBS-Z



MHCBS-ZD



Tube I.D. (mm)	Type	MHCBS / MHCBS-Z									
	Stroke	5	10	15	20	25	30	35	40	45	50
$\varnothing 32$	A	74	74	84	84	94	94	104	104	114	114
	B	64	64	74	74	84	84	94	94	104	104
	FB	34	34	44	44	54	54	64	64	74	74
	KB	—	—	24	24	34	34	44	44	54	54
	P	24	24	34	34	44	44	54	54	64	64
$\varnothing 40$	A	75	75	85	85	95	95	105	105	115	115
	B	65	65	75	75	85	85	95	95	105	105
	FB	33	33	43	43	53	53	63	63	73	73
	KB	—	—	25	25	35	35	45	45	55	55
$\varnothing 50$	A	81	81	91	91	101	101	111	111	121	121
	B	70	70	80	80	90	90	100	100	110	110
	FB	37	37	47	47	57	57	67	67	77	77
	KB	—	—	26	26	36	36	46	46	56	56
$\varnothing 63$	A	90	90	100	100	110	110	120	120	130	130
	B	77	77	87	87	97	97	107	107	117	117
	FB	42	42	52	52	62	62	72	72	82	82
	KB	—	—	29	29	39	39	49	49	59	59
	P	30	30	40	40	50	50	60	60	70	70

Tube I.D. (mm)	Type	MHCBS-D / MHCBS-ZD									
	Stroke	5	10	15	20	25	30	35	40	45	50
$\varnothing 32$	AL	104	109	124	129	144	149	164	169	184	189
	BB	79	79	89	89	99	99	109	109	119	119
	FF	42	42	52	52	62	62	72	72	82	82
	KK	—	—	39	39	49	49	59	59	69	69
	PP	23	23	33	33	43	43	53	53	63	63
$\varnothing 40$	AL	105	110	125	130	145	150	165	170	185	190
	BB	80	80	90	90	100	100	110	110	120	120
	FF	42	42	52	52	62	62	72	72	82	82
	KK	—	—	40	40	50	50	60	60	70	70
$\varnothing 50$	AL	112	117	132	137	152	157	172	177	192	197
	BB	85	85	95	95	105	105	115	115	125	125
	FF	45	45	55	55	65	65	75	75	85	85
	KK	—	—	41	41	51	51	61	61	71	71
$\varnothing 63$	AL	123	128	143	148	163	168	183	188	203	208
	BB	92	92	102	102	112	112	122	122	132	132
	FF	52	52	62	62	72	72	82	82	92	92
	KK	—	—	44	44	54	54	64	64	74	74
	PP	30	30	40	40	50	50	60	60	70	70

Code Tube I.D.	C	CL	D	EA	EB	FA	FC	H	J	JH	K	KA	KL	KT
$\varnothing 32$	10	7	20	70	56	56	10	9	M12x1.75	15	9	38	63	8
$\varnothing 40$	10	7	25	80	64	62	12	11	M16x2.0	20	11	38	70	8
$\varnothing 50$	11	8	30	94	74	74	13	13	M20x2.5	25	13	40	80	9
$\varnothing 63$	13	10	35	114	89	90	15	15	M27x3.0	35	15	42	100	10

Code Tube I.D.	KW	LH	M	N	O	OL	R	SW	U	X	Y
$\varnothing 32$	12	25	14	P9	M16x1.5	25	10	17	4.5	12	28
$\varnothing 40$	12	29	18	P9	M22x1.5	30	10	22	4.5	12	28
$\varnothing 50$	14	34	20	P11	M26x1.5	35	10	27	5	12.5	29.5
$\varnothing 63$	16	42	22	P11	M30x1.5	40	10	32	5.5	16	31

MHCBS Dimensions – Adjustable stroke A $\varnothing 32\sim\varnothing 63$

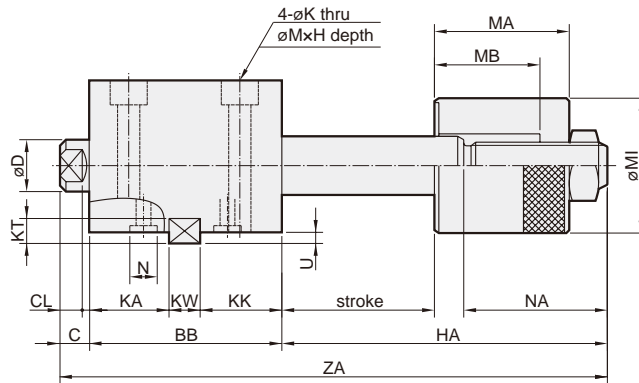
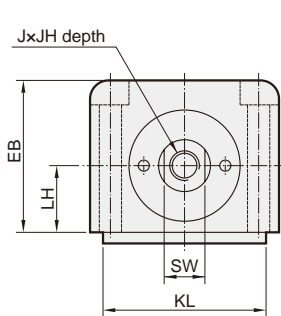
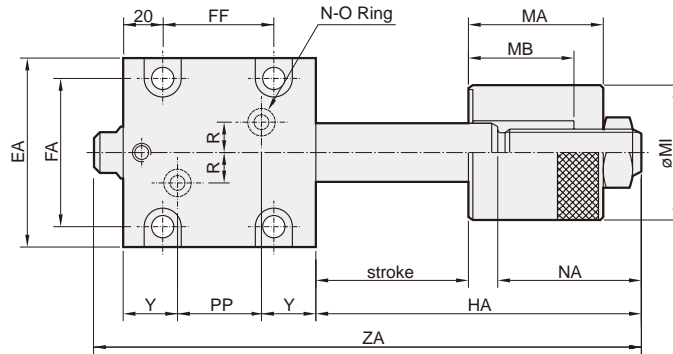


MANIFOLD TYPE HYDRAULIC CYLINDER

Mindman

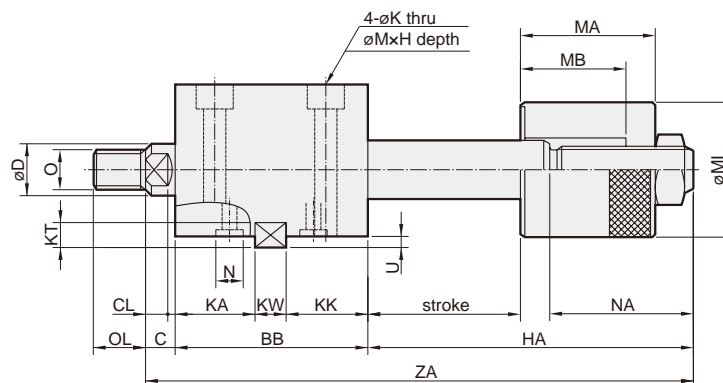
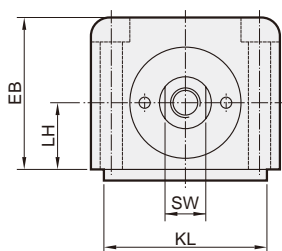
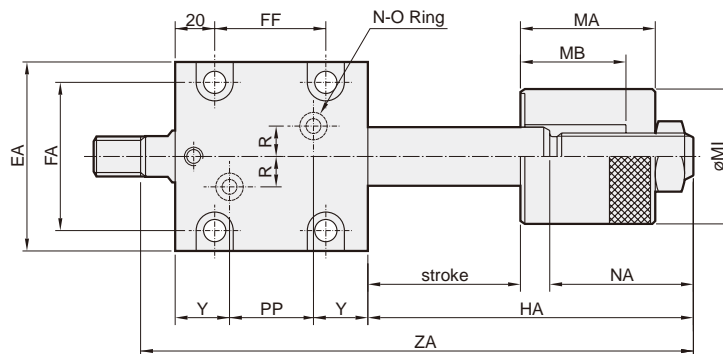
MHCBS-DA

Adjustable stroke 25 mm



MHCBS-ZDA

Adjustable stroke 25 mm





MANIFOLD TYPE HYDRAULIC CYLINDER

mindman

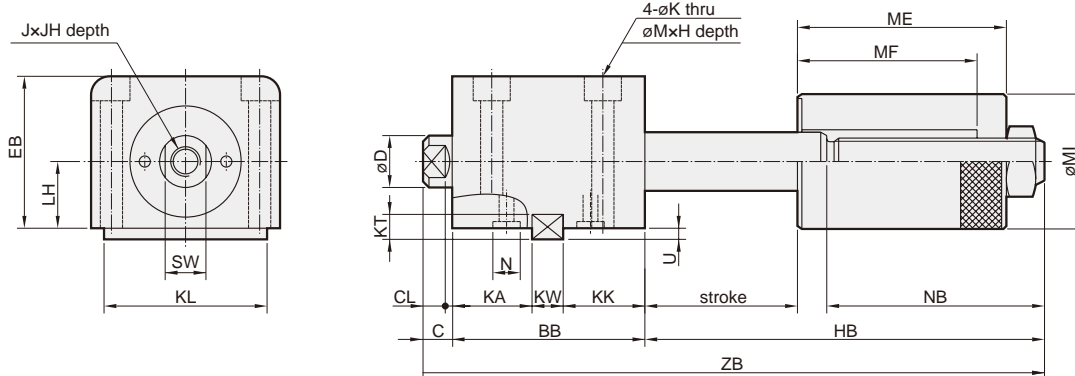
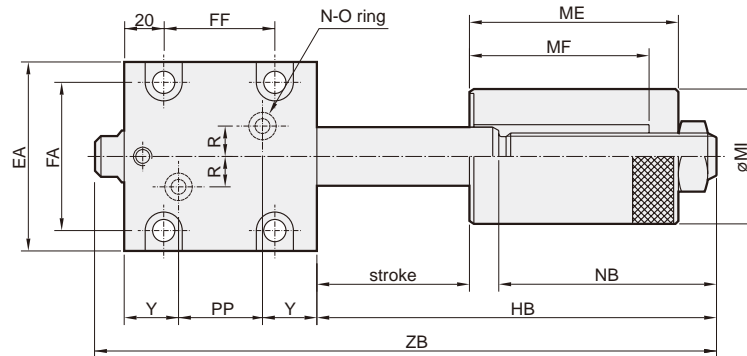
Tube I.D. (mm)	Type Stroke	MHCBS-DA / MHCBS-ZDA									
		5	10	15	20	25	30	35	40	45	50
ø32	ZA	153	158	173	178	193	198	213	218	233	238
	BB	79	79	89	89	99	99	109	109	119	119
	FF	42	42	52	52	62	62	72	72	82	82
	KK	—	—	39	39	49	49	59	59	69	69
	PP	23	23	33	33	43	43	53	53	63	63
	HA	64	69	74	79	84	89	94	99	104	109
ø40	ZA	163	168	183	188	203	208	223	228	243	248
	BB	80	80	90	90	100	100	110	110	120	120
	FF	42	42	52	52	62	62	72	72	82	82
	KK	—	—	40	40	50	50	60	60	70	70
	PP	24	24	34	34	44	44	54	54	64	64
	HA	73	78	83	88	93	98	103	108	113	118
ø50	ZA	171	176	191	196	211	216	231	236	251	256
	BB	85	85	95	95	105	105	115	115	125	125
	FF	45	45	55	55	65	65	75	75	85	85
	KK	—	—	41	41	51	51	61	61	71	71
	PP	26	26	36	36	46	46	56	56	66	66
	HA	75	80	85	90	95	100	105	110	115	120
ø63	ZA	188	193	208	213	228	233	248	253	268	273
	BB	92	92	102	102	112	112	122	122	132	132
	FF	52	52	62	62	72	72	82	82	92	92
	KK	—	—	44	44	54	54	64	64	74	74
	PP	30	30	40	40	50	50	60	60	70	70
	HA	83	88	93	98	103	108	113	118	123	128

Code Tube I.D.	C	CL	D	EA	EB	FA	H	J	JH	K	KA	KL	KT	KW	LH
ø32	10	7	20	70	56	56	9	M12×1.75	15	9	38	63	8	12	25
ø40	10	7	25	80	64	62	11	M16×2.0	20	11	38	70	8	12	29
ø50	11	8	30	94	74	74	13	M20×2.5	25	13	40	80	9	14	34
ø63	13	10	35	114	89	90	15	M27×3.0	35	15	42	100	10	16	42

Code Tube I.D.	M	MI	MA	MB	N	NA	O	OL	R	SW	U	Y
ø32	14	45	46	36	P9	49	M16×1.5	25	10	17	4.5	28
ø40	18	55	54	36	P9	58	M22×1.5	30	10	22	4.5	28
ø50	20	60	53	37	P11	59	M26×1.5	35	10	27	5	29.5
ø63	22	75	63	39	P11	65	M30×1.5	40	10	32	5.5	31

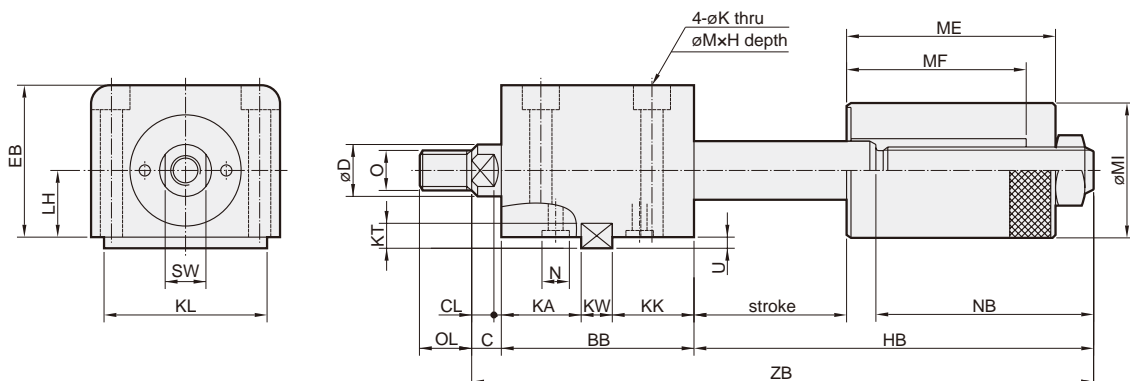
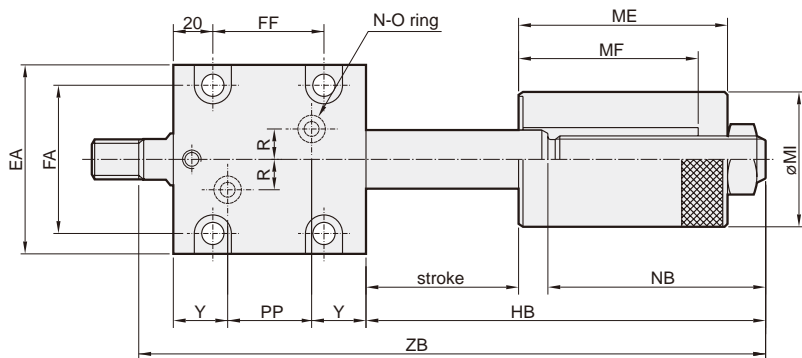
MHCBS-DB

Adjustable stroke 50 mm



MHCBS-ZDB

Adjustable stroke 50 mm





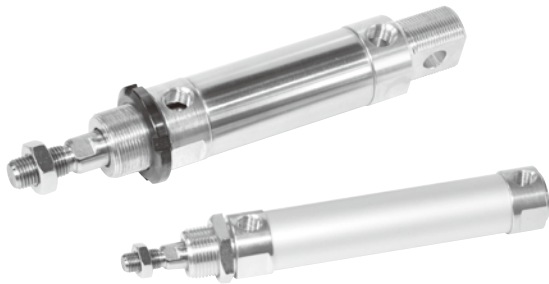
MANIFOLD TYPE HYDRAULIC CYLINDER

Mindman

Tube I.D. (mm)	Type Stroke	MHCBS-DB / MHCBS-ZDB									
		5	10	15	20	25	30	35	40	45	50
ø32	ZB	178	183	198	203	218	223	238	243	258	263
	BB	79	79	89	89	99	99	109	109	119	119
	FF	42	42	52	52	62	62	72	72	82	82
	KK	—	—	39	39	49	49	59	59	69	69
	PP	23	23	33	33	43	43	53	53	63	63
	HB	89	94	99	104	109	114	119	124	129	134
ø40	ZB	188	193	208	213	228	233	248	253	268	273
	BB	80	80	90	90	100	100	110	110	120	120
	FF	42	42	52	52	62	62	72	72	82	82
	KK	—	—	40	40	50	50	60	60	70	70
	PP	24	24	34	34	44	44	54	54	64	64
	HB	98	103	108	113	118	123	128	133	138	143
ø50	ZB	196	201	216	221	236	241	256	261	276	281
	BB	85	85	95	95	105	105	115	115	125	125
	FF	45	45	55	55	65	65	75	75	85	85
	KK	—	—	41	41	51	51	61	61	71	71
	PP	26	26	36	36	46	46	56	56	66	66
	HB	100	105	110	115	120	125	130	135	140	145
ø63	ZB	213	218	233	238	253	258	273	278	293	298
	BB	92	92	102	102	112	112	122	122	132	132
	FF	52	52	62	62	72	72	82	82	92	92
	KK	—	—	44	44	54	54	64	64	74	74
	PP	30	30	40	40	50	50	60	60	70	70
	HB	108	113	118	123	128	133	138	143	148	153

Code Tube I.D.	C	CL	D	EA	EB	FA	H	J	JH	K	KA	KL	KT	KW	LH
ø32	10	7	20	70	56	56	9	M12×1.75	15	9	38	63	8	12	25
ø40	10	7	25	80	64	62	11	M16×2.0	20	11	38	70	8	12	29
ø50	11	8	30	94	74	74	13	M20×2.5	25	13	40	80	9	14	34
ø63	13	10	35	114	89	90	15	M27×3.0	35	15	42	100	10	16	42

Code Tube I.D.	M	MI	ME	MF	N	NB	O	OL	R	SW	U	Y
ø32	14	45	71	61	P9	74	M16×1.5	25	10	17	4.5	28
ø40	18	55	79	61	P9	83	M22×1.5	30	10	22	4.5	28
ø50	20	60	78	62	P11	84	M26×1.5	35	10	27	5	29.5
ø63	22	75	88	64	P11	90	M30×1.5	40	10	32	5.5	31



Features

- Hydraulic cylinder with magnetic piston allows sensors to be used.
- Large range of mounting accessories.
- Adjustable stroke available.
- Magnetic as standard.

Specification


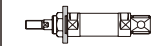

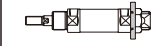

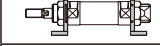

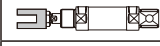
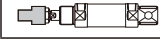
Model	MDO*	
Tube I.D. (mm)	20	32
Medium	Filtered oil	
Material of cylinder barrel	Anodised aluminum	Stainless steel
Max. operating pressure	3.5 MPa	
Proof pressure	5 MPa	
Speed range	0.5~300 mm/sec	
The range of temperature	-10~+60°C (No freezing)	
Sensor switch	LN01G (Please refer to page 5-15)	

Double acting hydraulic cylinders

MDOC	Pivot type	
MDOA	Front nose mounting type	
MDOD	Double rod type	
MDON	Adjustable forward stroke type	

Order example

MDON — 32 — 100 — A — LB — Y

MODEL	TUBE I.D.	STROKE	ADJUSTABLE STROKE	ACCESSORY
 MDOC	32	100	Blank: Standard type A: Adjustable 25mm B: Adjustable 50mm * Only for MDON model.	 FA
 MDOA				 FB
 MDOD				 LB
 MDON				 Y
				 I

Standard stroke

Tube I.D.	25	50	75	100	125	150	200	250	300
$\varnothing 20$	●	●	●	●	●	●	●	—	—
$\varnothing 32$	●	●	●	●	●	●	●	●	●

Unit: mm

Note. May to order of unstandard stroke.



Theoretic force

Tube I.D. (mm)	Rod (mm)	Area (mm ²)	Operating pressure (MPa)							
			0.5	1.0	1.5	2.0	2.5	3.0	3.5	
$\varnothing 20$	$\varnothing 12$	A	314	157	314	471	628	785	942	1099
		B	201	101	201	302	402	503	603	704
$\varnothing 32$	$\varnothing 16$	A	707	354	707	1061	1414	1768	2121	2475
		B	506	253	506	759	1012	1265	1518	1771

Unit: N

The method of calculation (Hydraulic cylinders' force)

$$F = P \times A - f$$

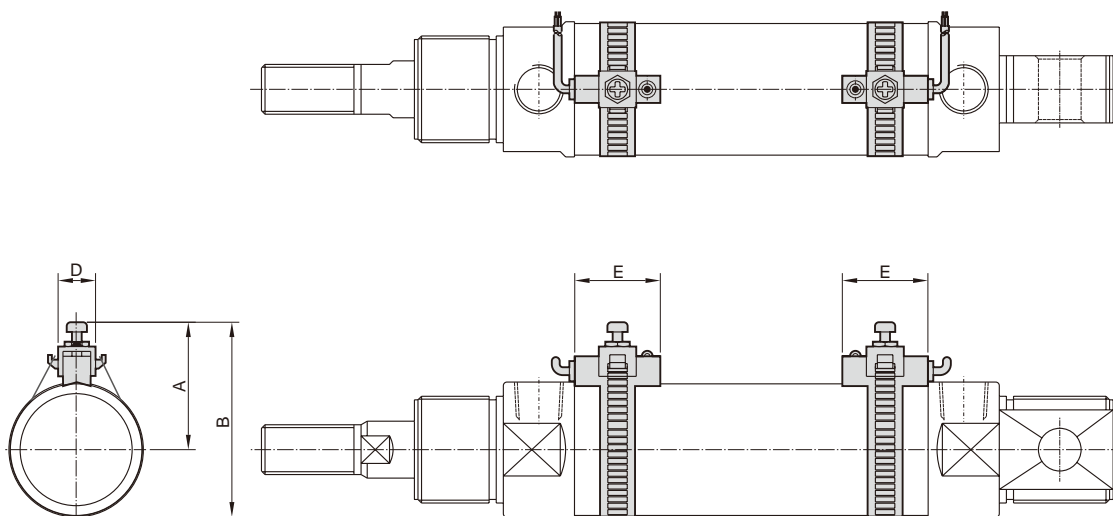
F: Cylinders' force (N)

P: Operating pressure (MPa)

A: Piston area (mm²)

f : Friction drag (N)

Installation of sensor switches



Tube I.D.	Sensor switch	A	B	D	E
20	LN01G	28	40.5	7	22
32	LN01G	33	49.5	7	22

How to order the seal kit

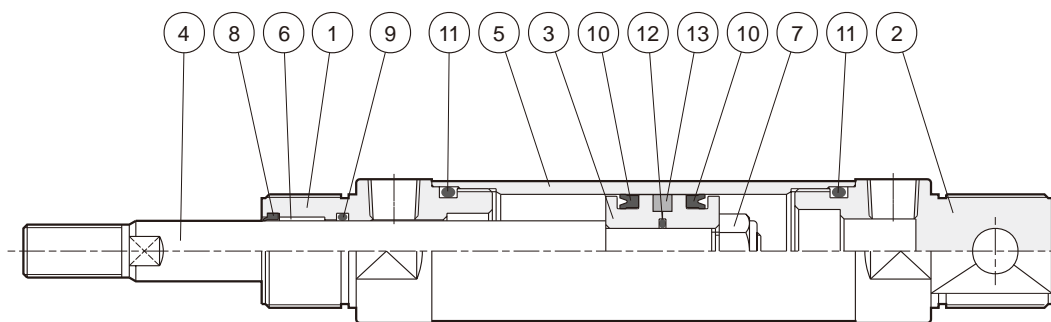
MDOSK

Tube I.D.	Seal kit
20	MDOSK20 - Including No.8,9,10,11,12
32	MDOSK32 - Including No.8,9,10,11,12

MDODSK

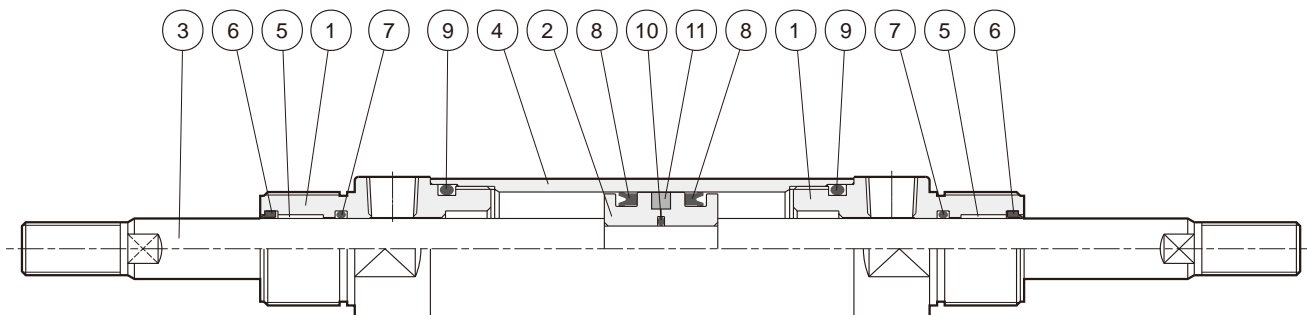
Tube I.D.	Seal kit
20	MDODSK20 - Including No.6,7,8,9,10
32	MDODSK32 - Including No.6,7,8,9,10

MDOA / MDOC



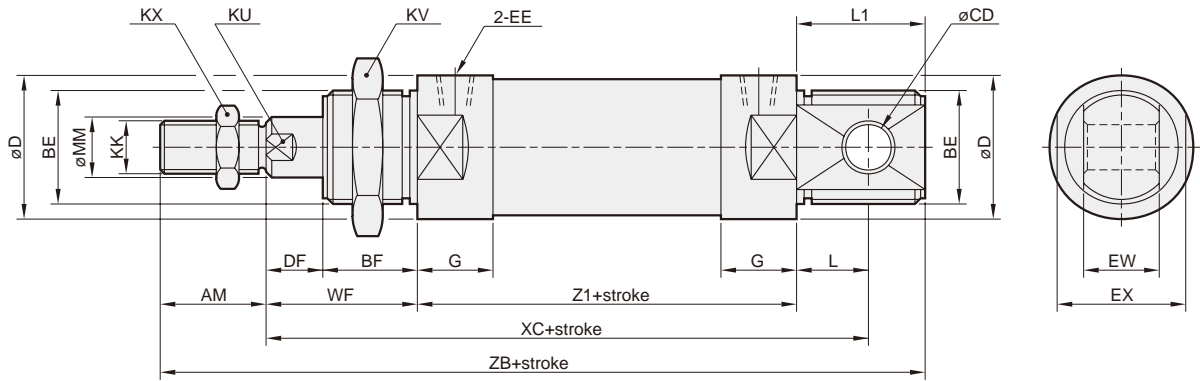
No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	1	6	Oilless bearing	1	11	Cylinder gasket	2
2	Head cover	1	7	Nut	1	12	Piston gasket	1
3	Piston	1	8	Dust wiper	1	13	Magnet	1
4	Piston rod	1	9	Rod packing	1			
5	Cylinder tube	1	10	Piston packing	2			

MDOD

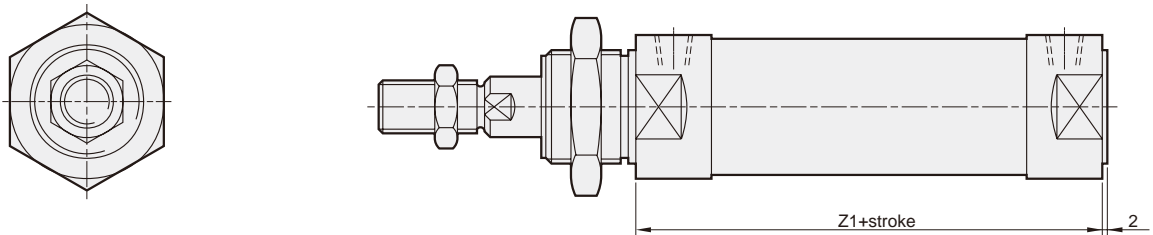


No.	Part name	Q'y	No.	Part name	Q'y	No.	Part name	Q'y
1	Rod cover	2	5	Oilless bearing	2	9	Cylinder gasket	2
2	Piston	1	6	Dust wiper	2	10	Piston gasket	1
3	Piston rod	1	7	Rod packing	2	11	Magnet	1
4	Cylinder tube	1	8	Piston packing	2			

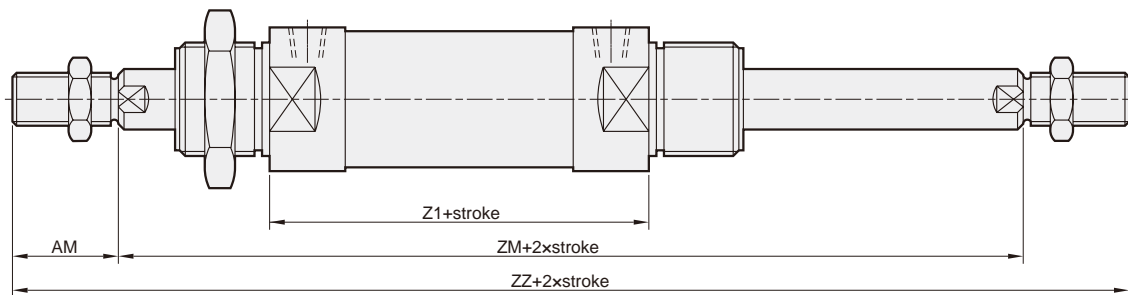
MDOC



MDOA

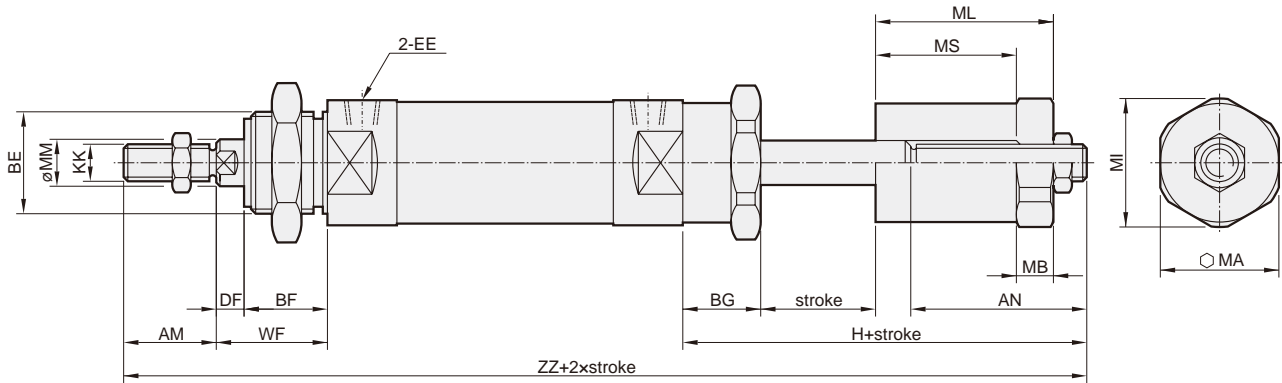


MDOD



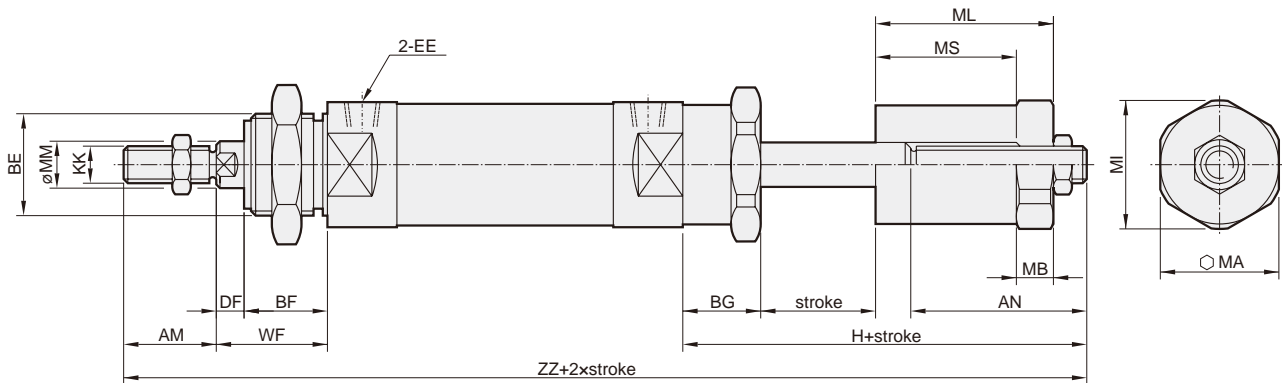
Code Tube I.D.	AM	BE	BF	CD	D	DF	EE	EX	EW	G	KK	KU	KV	KX	L	L1	MM	WF	XC	Z1	ZB	ZM	ZZ
$\phi 20$	20	M22x1.5	20	10	28	8	Rc1/8	25	12	16	M10x1.25	10	27	17	15	25	12	28	130	87	160	143	183
$\phi 32$	28	M30x1.5	25	12	38	15	Rc1/4	35	20	20	M14x1.5	14	41	22	17	32	16	40	159	102	202	182	238

MDON (A : Adjustable stroke 25mm)



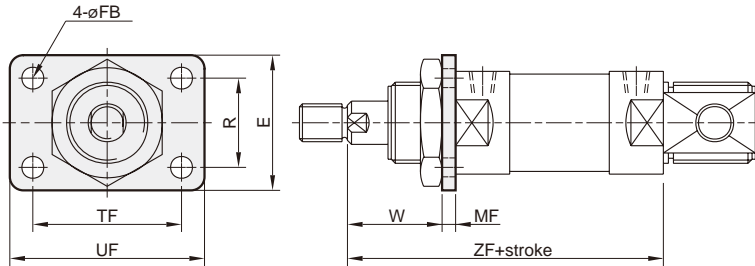
Code Tube I.D.	AN	AM	BE	BF	BG	DF	EE	H	KK	MA	MB	MI	ML	MM	MS	WF	ZZ
$\varnothing 20$	48	20	M22x1.5	20	25	8	G1/8	81	M10x1.25	27	10	29	47	12	35	28	216
$\varnothing 32$	48	28	M30x1.5	25	30	15	G1/4	88	M14x1.5	32	10	44	47	16	37	40	258

MDON (B : Adjustable stroke 50mm)



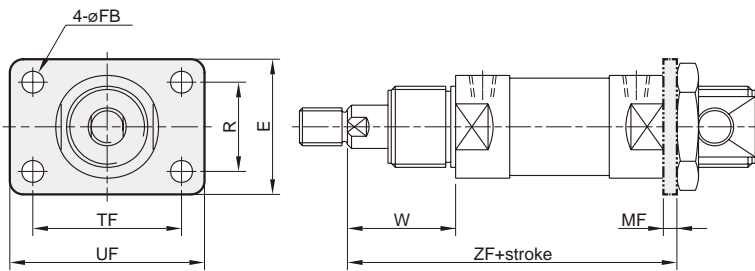
Code Tube I.D.	AN	AM	BE	BF	BG	DF	EE	H	KK	MA	MB	MI	ML	MM	MS	WF	ZZ
$\varnothing 20$	73	20	M22x1.5	20	25	8	G1/8	106	M10x1.25	27	10	29	72	12	60	28	241
$\varnothing 32$	73	28	M30x1.5	25	30	15	G1/4	113	M14x1.5	32	10	44	72	16	62	40	283

FA



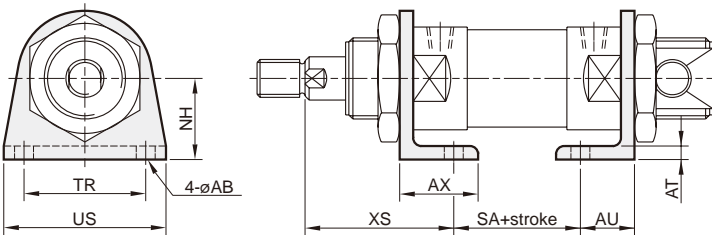
Code Tube I.D.	E	FB	MF	R	TF	UF	W	ZF
$\varnothing 20$	38	7	6	21	51	68	22	115
$\varnothing 32$	50	7	9	33	55	72	31	142

FB



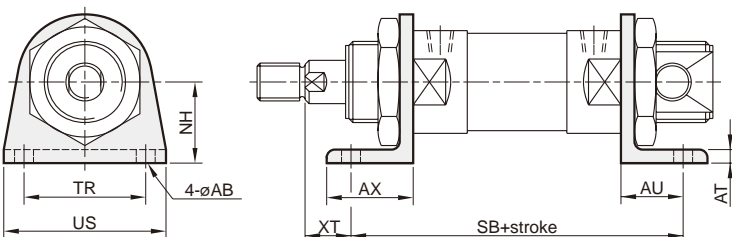
Code Tube I.D.	E	FB	MF	R	TF	UF	W	ZF
$\varnothing 20$	38	7	6	21	51	68	28	121
$\varnothing 32$	50	7	9	33	55	72	40	151

LB



Code Tube I.D.	AB	AT	AU	AX	NH	SA	TR	US	XS
$\varnothing 20$	7	5	17	25	25	63	40	54	40
$\varnothing 32$	7	5	20	30	35	72	40	55	55

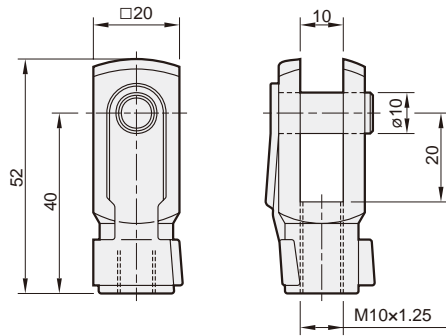
LB



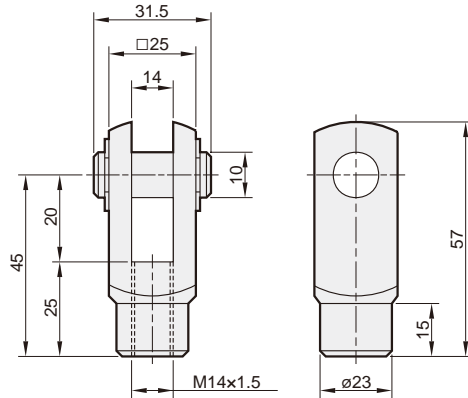
Code Tube I.D.	AB	AT	AU	AX	NH	SB	TR	US	XT
$\varnothing 20$	7	5	17	25	25	121	40	54	11
$\varnothing 32$	7	5	20	30	35	142	40	55	20

Y connector Pin (Extra purchase)

Type Y - M10x1.25

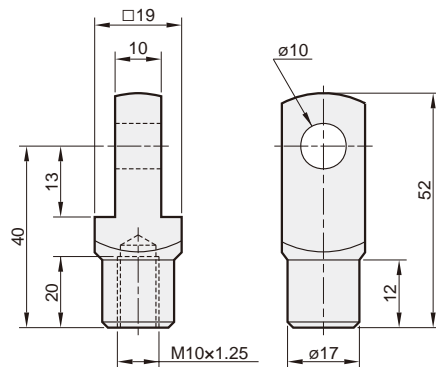


Type Y - M14x1.5

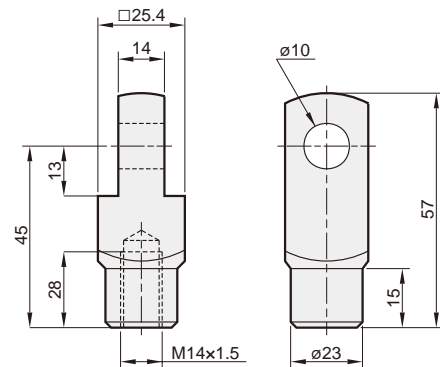


I connector

Type I - M10x1.25

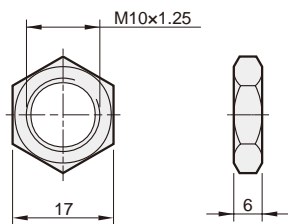


Type I - M14x1.5

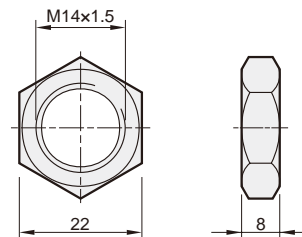


Mounting nut

Type N - M10x1.25

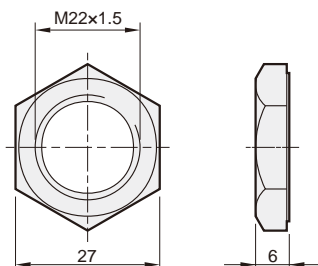


Type N - M14x1.5

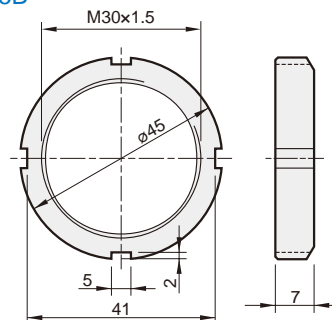


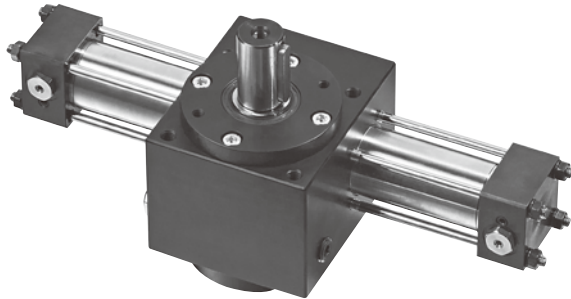
Mounting nut

Type N - M22x1.5



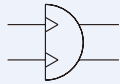
Type N - M30x1.5B





MRPH

Male pivot gear



Order example

MRPH — 40 — 90

MODEL

TUBE I.D.

ROTATION

32

40

90: 90°

180: 180°

Features

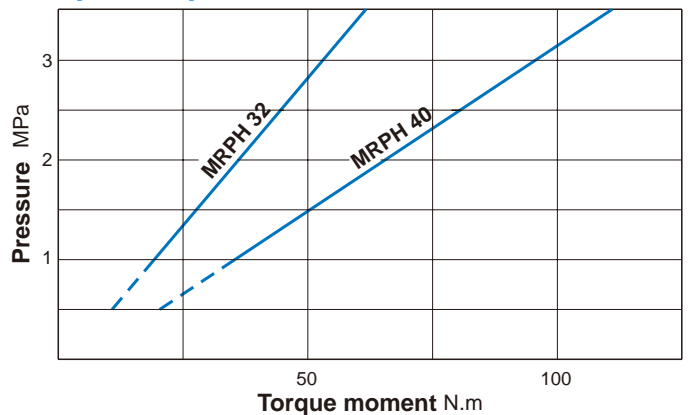
- Compact body manufactured from anodised aluminum.
- Functional design with clean appearance.
- Rotation angle can be adjusted via screw

Specification

Model	MRPH	
Tube I.D. (mm)	32	40
Standard rotation	90±5°, 180±5°	
Rotating shaft dia. (mm)	24	28
Initial position of slot (mm)	See dimensional feature	
Medium	Filtered air with or without lubrication	
Max. operating pressure	3.5 MPa	
Ambient temperature	-10~+60°C (No freezing)	
Max. allowable axial thrust	12 kg	20 kg
Sensor switch (*)	LN01P	

* LN01P specification, please refer to page 5-16.

Output torque table



Kind of fluid

Petroleum - based fluid	Water - glycol fluid	Phosphate - ester fluid	Water in oil fluid	Oil in water fluid
○	×	×	△	△

Note. ○ allowable × unallowable △ consult us

Oil volume per

Unit: ml

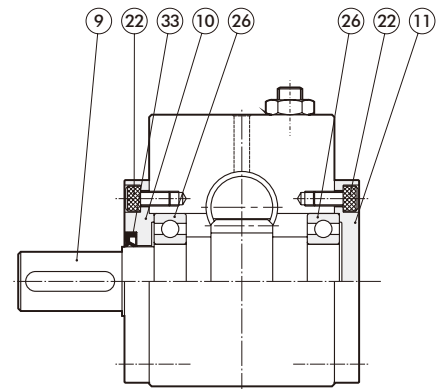
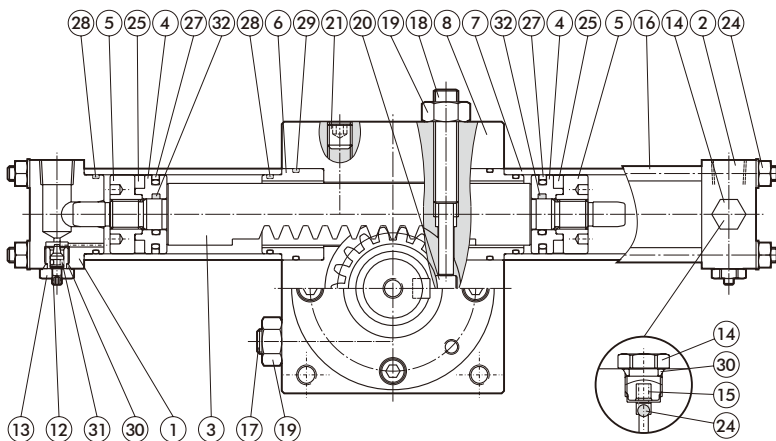
Rotary angle Tube I.D.	90°	180°
32	29	54
40	52	100

HYDRAULIC ROTARY ACTUATOR

How to order the seal kit

MRPHSK

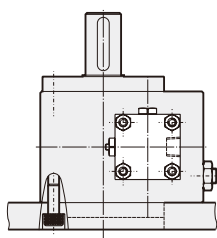
Tube I.D.	Seal kit
32	MRPHSK32 - Including No.27,28,29,30,31,32,33
40	MRPHSK40 - Including No.27,28,29,30,31,32,33



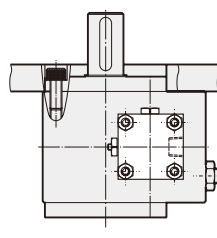
Parts list

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	End cap	1	12	Cushion needle	2	23	Nut & Spring washer	8
2	End cap	1	13	Cushion plug	2	24	Steel ball	2
3	Rack	1	14	Check valve	2	25	Magnet	2
4	Piston	2	15	Spring	2	26	Ball bearing	2
5	Magnet holder	2	16	Tie bolt	8	27	Piston packing	2
6	Rod bush	2	17	Adjusting screw	1	28	Cylinder gasket	4
7	Cylinder tube	2	18	Adjusting screw	1	29	O-ring	2
8	Housing	1	19	Lock nut	2	30	O-ring	4
9	Pinion shaft	1	20	Stopper pin	1	31	O-ring	2
10	End cover	1	21	Set screw	1	32	Piston gasket	2
11	End cover	1	22	Hexagon socket head screw	8	33	Rod packing	1

Mounting type

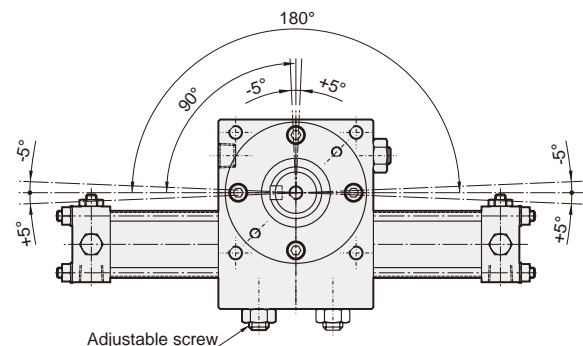


Bottom mounting

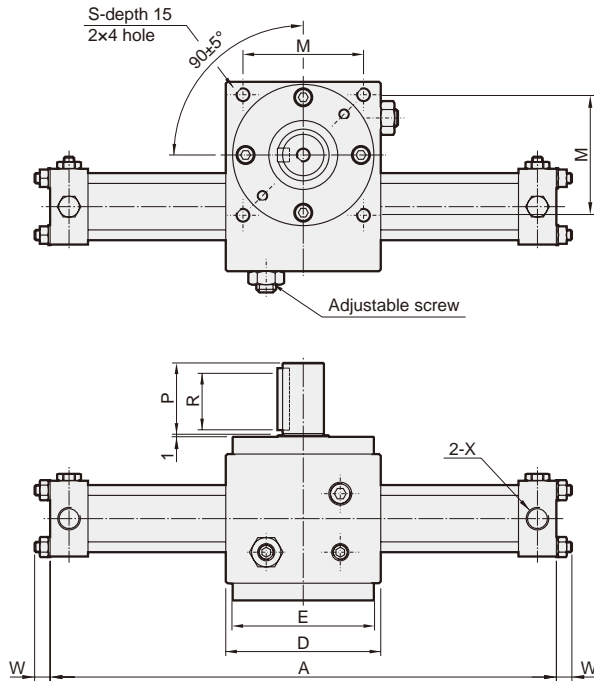


Top mounting

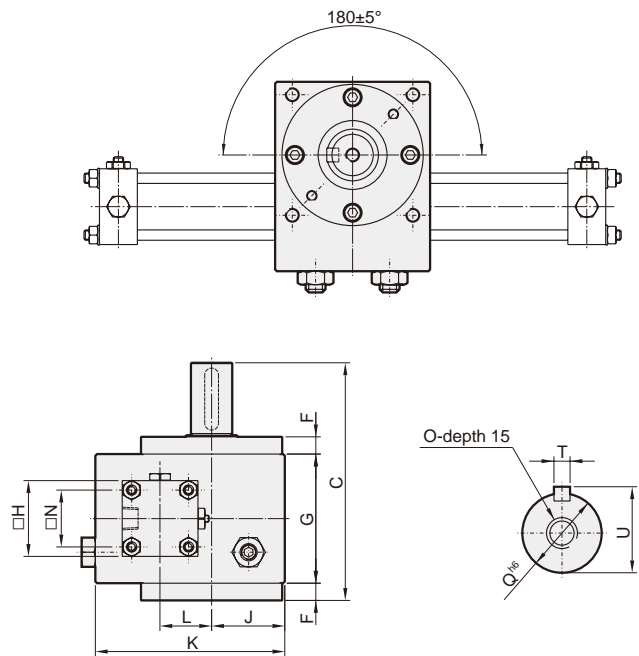
Rotating direction and adjustable angle



Angle of rotation 90°

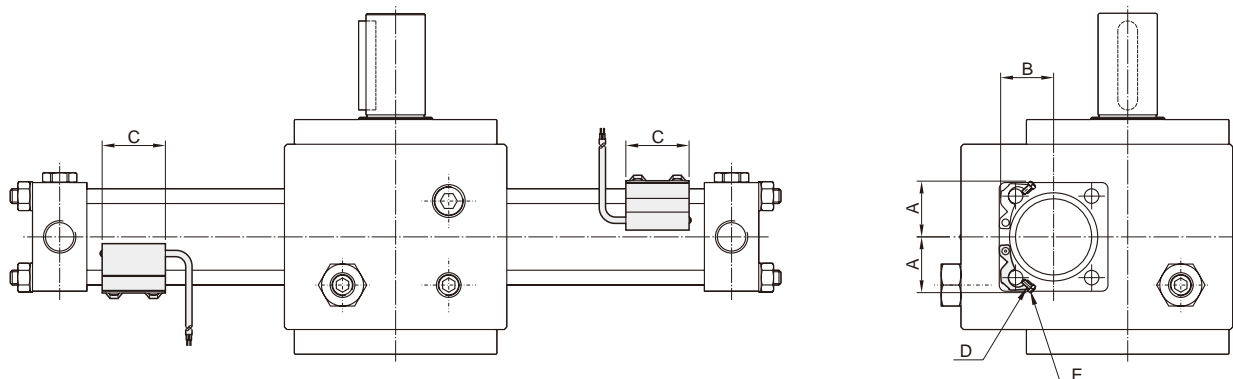


Angle of rotation 180°

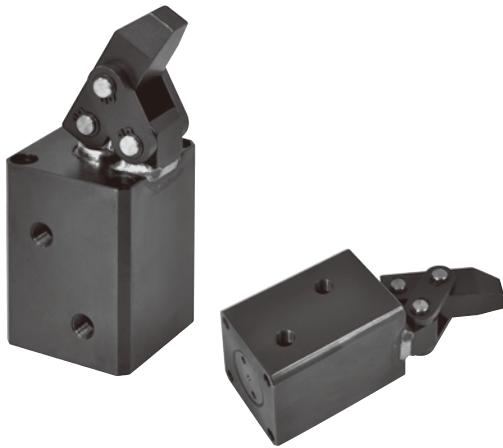


Code	A		C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	W	X
	90°	180°																				
32	286	357	138	90	82	10	75	44	42.5	110	30	70	33	M8	42	24	36	M8	8	27	9	Rc1/4
40	315	400	170	105	96	12	95	50	51.5	135	36	82	37	M8	50	28	45	M10	8	31	9	Rc3/8

Installation of sensor switches



Code	Sensor switch	A	B	C	D	E
32	LN01P	25	29	32	M4x16L	M4
40	LN01P	27	30	32	M4x16L	M4



Features

- Lever type clamp cylinder gives high clamping force.
- Manifold or freestanding model available.
- Carbon steel body ensures long life of unit.
- Ideal for use on CNC machine tools where repetitive clamping is required.

Specification

Model	MHCK				
Tube I.D. (mm)	25	32	40	50	63
Piston-rod (mm)	18	20	22.4	28	35
Standard stroke (mm)	25	25	30	35	40
Operating pressure range	0.5~5 MPa				
Proof pressure	7 MPa				
Clamping force (3 MPa)	1296N	2123N	3063N	4531N	6471N

MHCK

Standard type



MHCK-F

Manifold type



Order example

MHCK – 25 – F

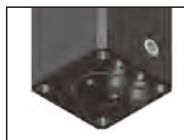
MODEL

TUBE I.D.

MANIFOLD TYPE



Blank: Standard type

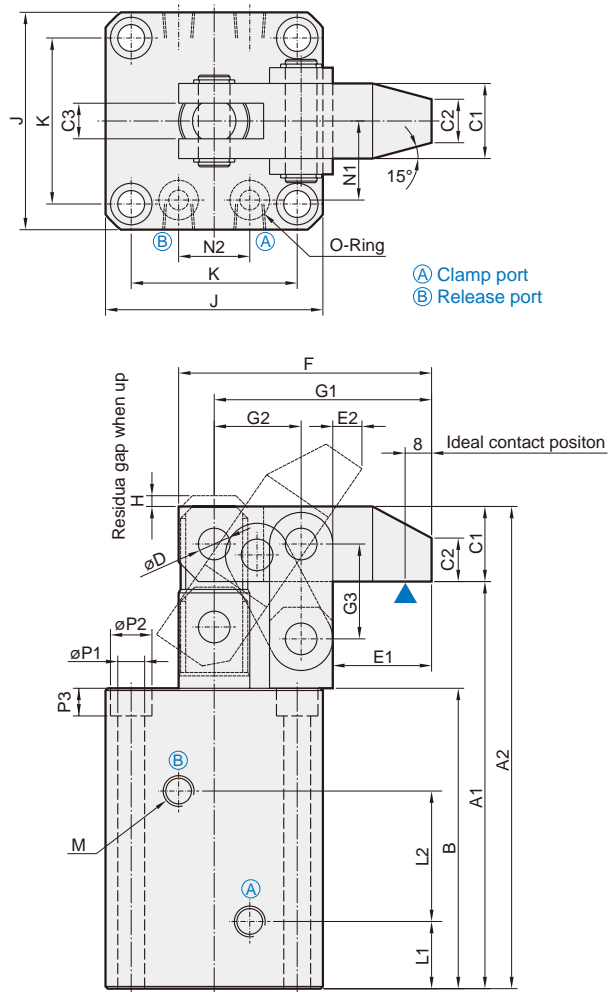


F: Manifold type

HYDRAULIC LEVER-TYPE CYLINDER

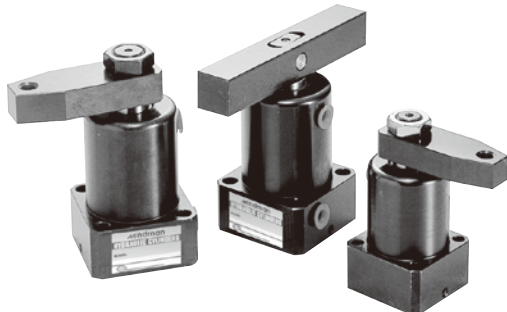
MHCK

MHCK-F



Code Tube I.D.	A1	A2	B	C1	C2	C3	D	E1	E2	F	G1	G2	G3	H	J
25	103	122	76	19	11	9	8	25	5	64	55	22	24	3	55
32	112	131	85	19	11	9	8	25	5	64	55	22	24	3	57
40	122	144.2	90	22.2	13	10	10	30	5.5	77	66	26	29	4	69
50	137	162.4	100	25.4	15	11	12	35.5	6.5	90	77	30	33	5	75
63	155	186.8	111	31.8	19	15	15	43	12.8	110	94	36	39	4	96

Code Tube I.D.	K	L1	L2	M	N1	N2	O	P1	P2	P3
25	42	17	33	Rc1/8	20	18	P7	6.8	10.5	7
32	44	19	38	Rc1/8	22	22	P7	6.8	10.5	7
40	52	19	40	Rc1/4	26	26	P8	9	14	9
50	58	21.5	45	Rc1/4	30	32	P8	9	14	9
63	75	22	52	Rc1/4	38	38	P9	11	18	11



Double acting

MTHS / MTHD

Single side clamping arm / Double sides clamping arm



Double acting (manifold type)

MTHS..FC / MTHD..FC

Single side clamping arm / Double sides clamping arm
(With flow control) (With flow control)



MTHS..F / MTHD..F

Single side clamping arm / Double sides clamping arm



MTHS..MF / MTHD..MF

Single side clamping arm / Double sides clamping arm



Features

- Compact design available with large range of bore sizes.
- Available with both clockwise and anti clockwise movement.
- Available with single or double arms.
- Available with inbuilt flow control.

Note

- Please don't exceed 1.5 times of the original length, if it is necessary to increase the length of the clamping arm.
- Suggested to install a flow control valve protect cylinder barrel and internal components against fretting wear

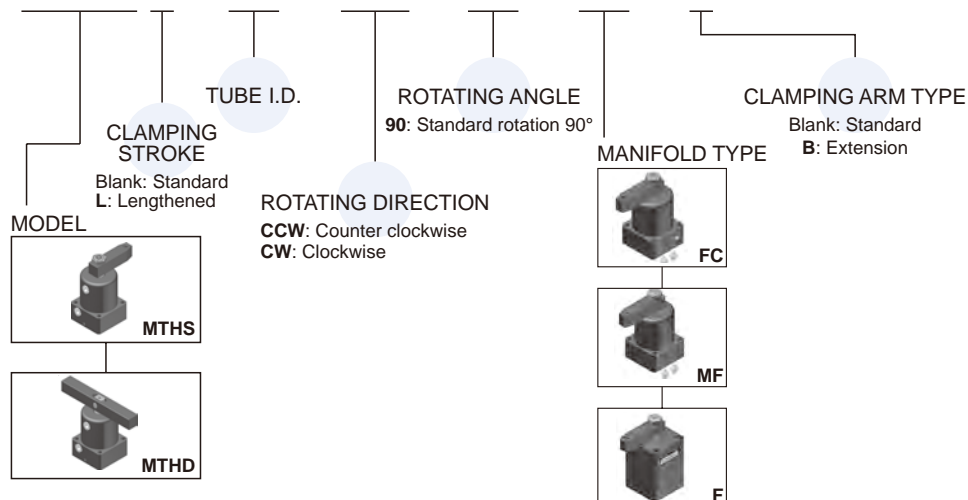
Specification

Model	MTHS, MTHD
Tube I.D. (mm)	25, 32, 40, 50, 63
Acting type	Double acting
Medium	Filtered oil
Operating pressure range	0.5~7 MPa
Proof pressure	10 MPa
Material of cylinder barrel	Carbon steel
Standard angle of rotation	90°±2° (Angles of 0°, 45° and 60° are optional)
Rotating direction	Clockwise or counter clockwise

Tube I.D.		25	32	40	50	63
Model						
MTHS	MTHD	○	○	○	○	○
MTHSL	MTHDL	×	○	○	○	○
MTHS-FC	MTHD-FC	○	○	○	○	○
MTHS-MF	MTHD-MF	○	○	○	○	○
MTHS-F	MTHD-F	○	○	○	○	×

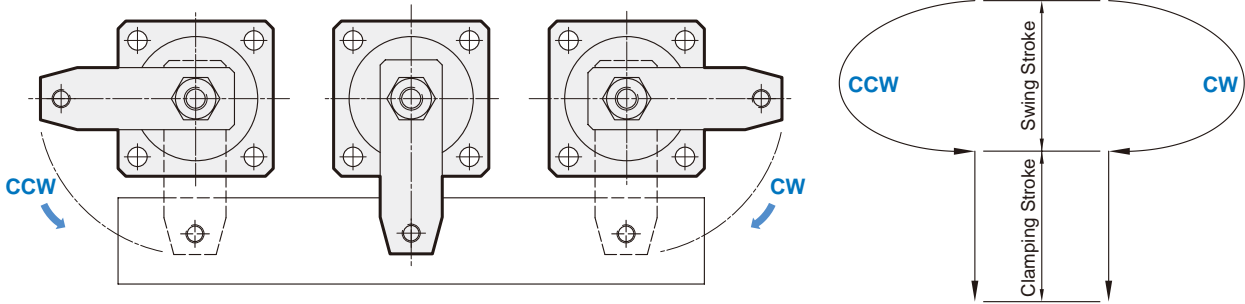
Order example

MTHS L – 25 – CW – 90 – FC – B

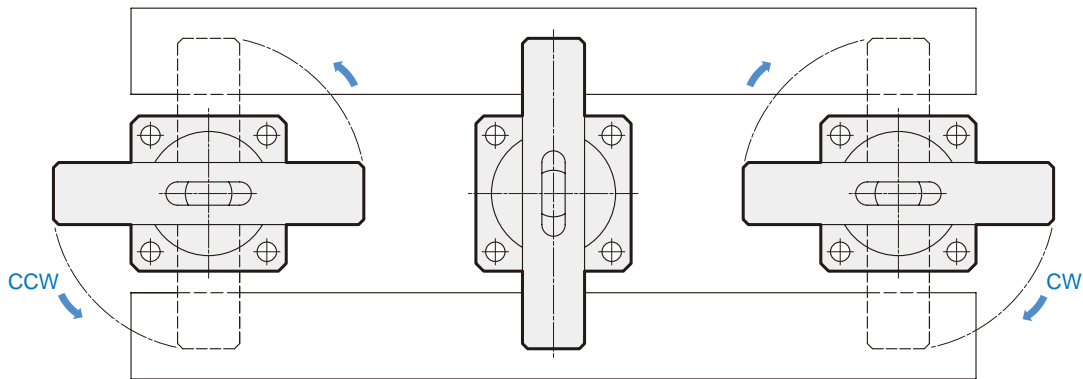


HYDRAULIC SWING CLAMP CYLINDER

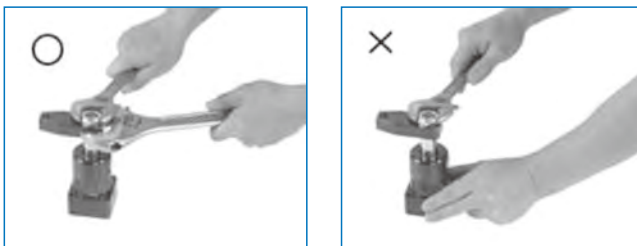
Single side swing clamp



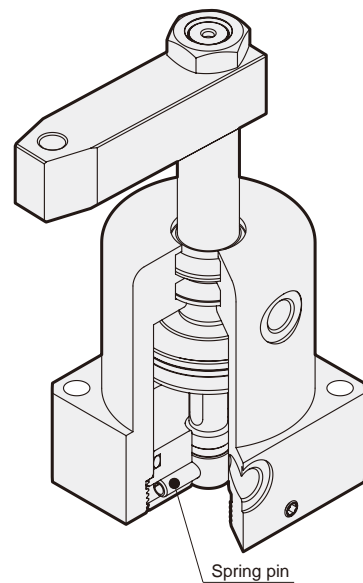
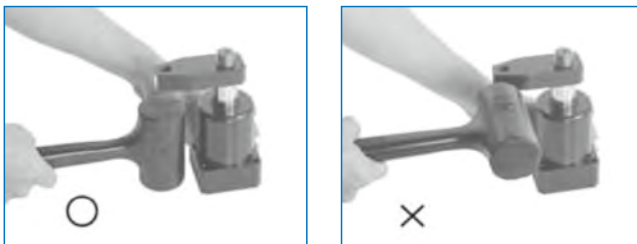
Double side swing clamp



Clamping arm mounting methods

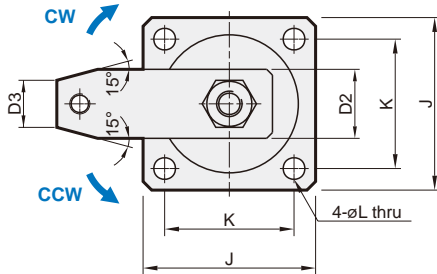


Clamping arm removing methods

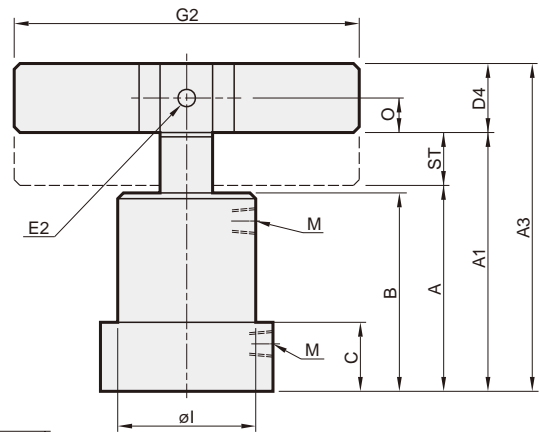
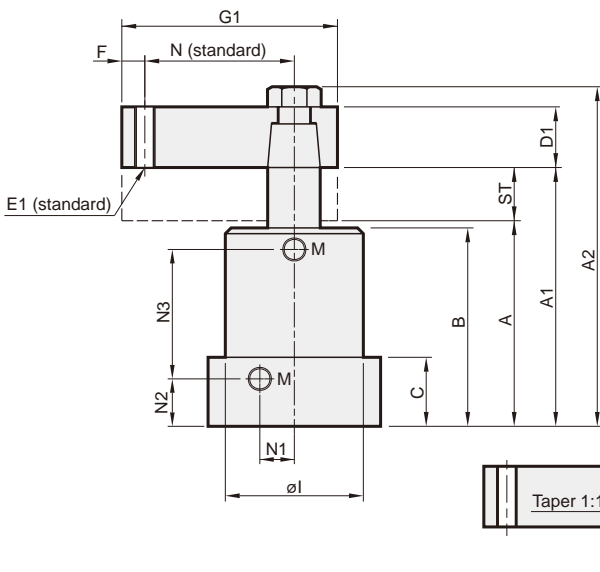
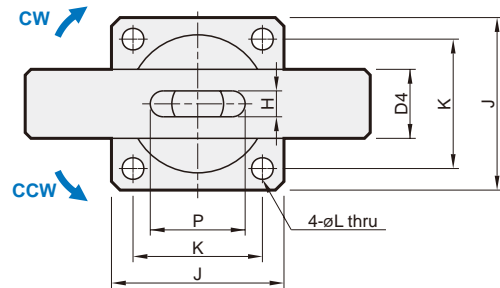


Note. If the clamping arm is wrong mounting and removing, the spring pin is broken easily. Then the rotation angle is deviation or the action is not smooth when the cylinder works.

MTHS / MTHSL



MTHD / MTHDL



Single side clamping arm

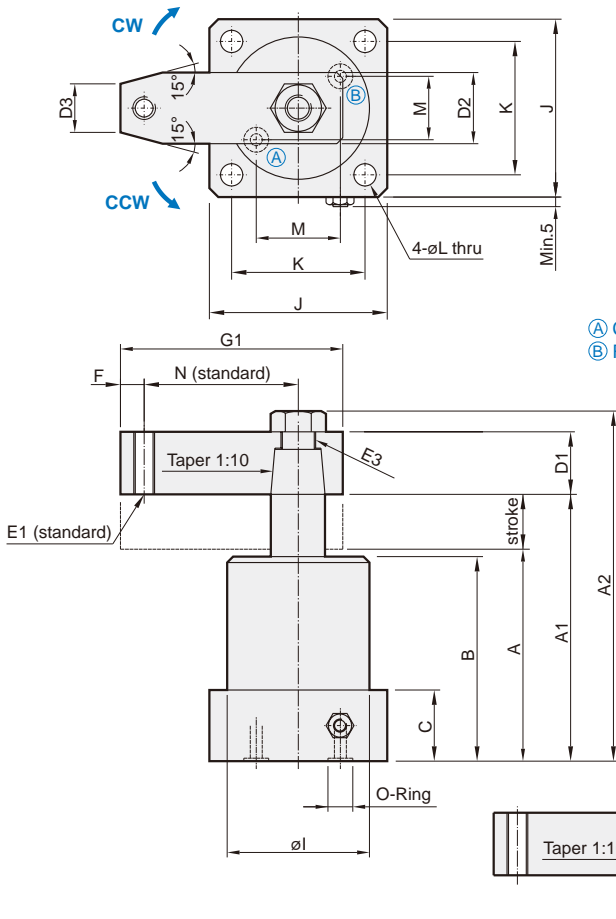
* Clamping stroke lengthened type.

Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)		Pressure area push/pull (mm ²)	Clamping force (N) 3.5MPa	Clamping arm type				
				Standard	*			G1		G2		
								Standard	Extension	Standard	Extension	
MTHS-25	MTHD-25	ø25	ø18	9	13	—	491 / 237	830	74	100	140	200
MTHS-32	MTHD-32	ø32	ø20	11	15	30	804 / 490	1720	81	110	160	230
MTHS-40	MTHD-40	ø40	ø22.4	11	15	30	1257 / 863	3020	86	120	160	230
MTHS-50	MTHD-50	ø50	ø28	13	17	34	1963 / 1347	4710	96	130	180	260
MTHS-63	MTHD-63	ø63	ø35	13	17	34	3117 / 2155	7540	114	150	200	—

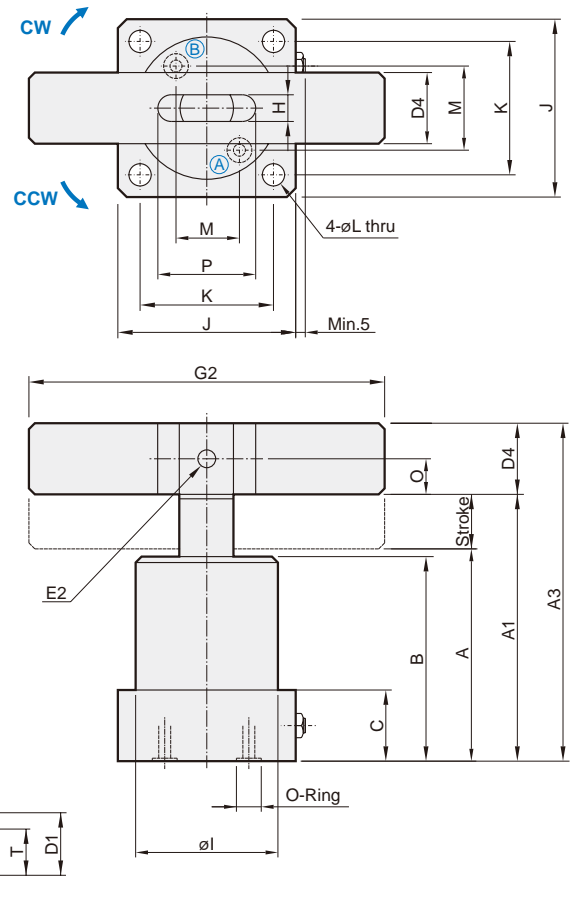
Code Model	Standard type						Clamping stroke lengthened type *						C	D1	D2	D3	D4	E1	E2	
	A	A1	A2	A3	B	ST	A	A1	A2	A3	B	ST								
MTHS-25	MTHD-25	79	101	124	120	76	22	—	—	—	—	—	—	27	15	27	15	□19	M10x1.5	ø8
MTHS-32	MTHD-32	89	115	140	137.2	85	26	104	145	170	167.2	100	41	30	17	31	17	□22.2	M10x1.5	ø8
MTHS-40	MTHD-40	94	120	148	142.2	90	26	109	150	178	172.2	105	41	30	18	31	17	□22.2	M10x1.5	ø10
MTHS-50	MTHD-50	104	134	166	159.4	100	30	121	168	200	193.4	117	47	34	20	37	19	□25.4	M12x1.75	ø12
MTHS-63	MTHD-63	109	139	175	170.8	105	30	126	173	209	204.8	122	47	34	23	48	24	□31.8	M16x2.0	ø15

Code Model	F	H	I	J	K	L	M	N	N1	N2	N3		O	P	R	S	T	
											Standard	*						
MTHS-25	MTHD-25	10	9	ø46	52	40	ø6.8	Rc1/8	50	8	17	46	—	9.5	25	ø15	ø18	13
MTHS-32	MTHD-32	10	10	ø50	56	44	ø6.8	Rc1/8	55	10	19	52	67	11.1	29	ø17	ø20	14
MTHS-40	MTHD-40	10	10	ø54	63	48	ø9	Rc1/8	60	12	19	57	72	11.1	31	ø19	ø22.4	15
MTHS-50	MTHD-50	12	12	ø66	72	57	ø9	Rc1/4	65	15	21.5	63.5	80.5	12.7	38	ø21	ø28	16
MTHS-63	MTHD-63	15	15	ø80	88	70	ø11	Rc1/4	75	17	22	68	85	15.9	48	ø27	ø35	18

MTHS-FC



MTHD-FC



Single side clamping arm

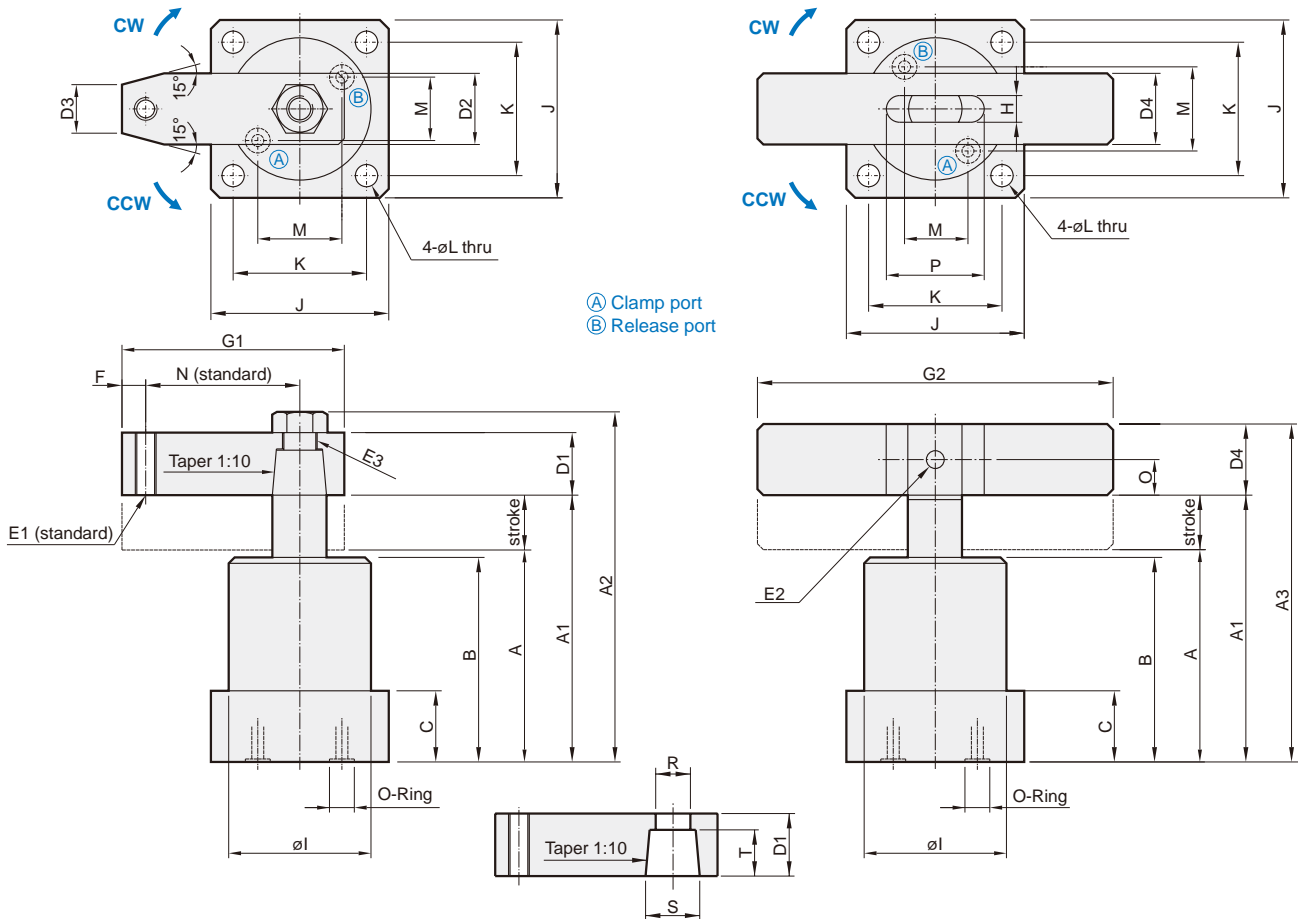
Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/pull (mm ²)	Clamping force (N) 3.5MPa	Clamping arm type				
							G1		G2		
							Standard	Extension	Standard	Extension	
MTHS-25FC	MTHD-25FC	$\varnothing 25$	$\varnothing 18$	9	13	491 / 237	830	74	100	140	200
MTHS-32FC	MTHD-32FC	$\varnothing 32$	$\varnothing 20$	11	15	804 / 490	1720	81	110	160	230
MTHS-40FC	MTHD-40FC	$\varnothing 40$	$\varnothing 22.4$	11	15	1257 / 863	3020	86	120	160	230
MTHS-50FC	MTHD-50FC	$\varnothing 50$	$\varnothing 28$	13	17	1963 / 1347	4710	96	130	180	260
MTHS-63FC	MTHD-63FC	$\varnothing 63$	$\varnothing 35$	13	17	3117 / 2155	7540	114	150	200	—

Code Model	ST	A	A1	A2	A3	B	C	D1	D2	D3	D4	E1	E2	E3	
MTHS-25FC	MTHD-25FC	22	79	101	124	120	76	22	15	27	15	$\square 19$	M10x1.5	$\varnothing 8$	M14x1.5
MTHS-32FC	MTHD-32FC	26	89	115	140	137.2	85	25	17	31	17	$\square 22.2$	M10x1.5	$\varnothing 8$	M16x1.5
MTHS-40FC	MTHD-40FC	26	94	120	148	142.2	90	25	18	31	17	$\square 22.2$	M10x1.5	$\varnothing 10$	M18x1.5
MTHS-50FC	MTHD-50FC	30	104	134	166	159.2	100	30	20	37	19	$\square 25.4$	M12x1.75	$\varnothing 12$	M20x1.5
MTHS-63FC	MTHD-63FC	30	109	139	175	170.8	105	30	23	48	24	$\square 31.8$	M16x2.0	$\varnothing 15$	M26x1.5

Code Model	F	G1	G2	H	I	J	K	L	M	N	O	O-Ring	P	R	S	T	
MTHS-25FC	MTHD-25FC	10	74	140	9	$\varnothing 46$	55	42	$\varnothing 6.8$	19	50	9.5	P7	25	$\varnothing 15$	$\varnothing 18$	13
MTHS-32FC	MTHD-32FC	10	81	160	10	$\varnothing 50$	57	44	$\varnothing 6.8$	21	55	11.1	P7	29	$\varnothing 17$	$\varnothing 20$	14
MTHS-40FC	MTHD-40FC	10	86	160	10	$\varnothing 54$	63	48	$\varnothing 9$	23	60	11.1	P9	31	$\varnothing 19$	$\varnothing 22.4$	15
MTHS-50FC	MTHD-50FC	12	96	180	12	$\varnothing 66$	72	57	$\varnothing 9$	28	65	12.7	P9	38	$\varnothing 21$	$\varnothing 28$	16
MTHS-63FC	MTHD-63FC	15	114	200	15	$\varnothing 80$	88	70	$\varnothing 11$	32	75	15.9	P9	48	$\varnothing 27$	$\varnothing 35$	18

MTHS-MF

MTHD-MF



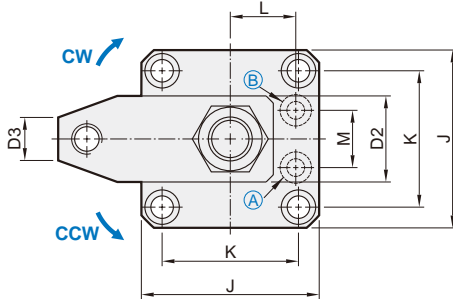
Single side clamping arm

Model	Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/pull (mm ²)	Clamping force (N) 3.5MPa	Clamping arm type				
							G1		G2		
							Standard	Extension	Standard	Extension	
MTHS-25MF	MTHD-25MF	$\phi 25$	$\phi 18$	9	13	491 / 237	830	74	100	140	200
MTHS-32MF	MTHD-32MF	$\phi 32$	$\phi 20$	11	15	804 / 490	1720	81	110	160	230
MTHS-40MF	MTHD-40MF	$\phi 40$	$\phi 22.4$	11	15	1257 / 863	3020	86	120	160	230
MTHS-50MF	MTHD-50MF	$\phi 50$	$\phi 28$	13	17	1963 / 1347	4710	96	130	180	260
MTHS-63MF	MTHD-63MF	$\phi 63$	$\phi 35$	13	17	3117 / 2155	7540	114	150	200	—

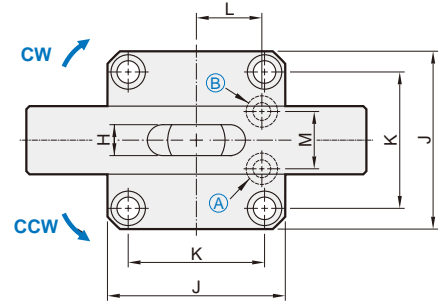
Code Model	ST	A	A1	A2	A3	B	C	D1	D2	D3	D4	E1	E2	E3	
MTHS-25MF	MTHD-25MF	22	79	101	124	120	76	22	15	27	15	□19	M10x1.5	$\phi 8$	M14x1.5
MTHS-32MF	MTHD-32MF	26	89	115	140	137.2	85	25	17	31	17	□22.2	M10x1.5	$\phi 8$	M16x1.5
MTHS-40MF	MTHD-40MF	26	94	120	148	142.2	90	25	18	31	17	□22.2	M10x1.5	$\phi 10$	M18x1.5
MTHS-50MF	MTHD-50MF	30	104	134	166	159.2	100	30	20	37	19	□25.4	M12x1.75	$\phi 12$	M20x1.5
MTHS-63MF	MTHD-63MF	30	109	139	175	170.8	105	30	23	48	24	□31.8	M16x2.0	$\phi 15$	M26x1.5

Code Model	F	G1	G2	H	I	J	K	L	M	N	O	O-Ring	P	R	S	T	
MTHS-25MF	MTHD-25MF	10	74	140	9	$\phi 46$	55	42	$\phi 6.8$	19	50	9.5	P7	25	$\phi 15$	$\phi 18$	13
MTHS-32MF	MTHD-32MF	10	81	160	10	$\phi 50$	57	44	$\phi 6.8$	21	55	11.1	P7	29	$\phi 17$	$\phi 20$	14
MTHS-40MF	MTHD-40MF	10	86	160	10	$\phi 54$	63	48	$\phi 9$	23	60	11.1	P9	31	$\phi 19$	$\phi 22.4$	15
MTHS-50MF	MTHD-50MF	12	96	180	12	$\phi 66$	72	57	$\phi 9$	28	65	12.7	P9	38	$\phi 21$	$\phi 28$	16
MTHS-63MF	MTHD-63MF	15	114	200	15	$\phi 80$	88	70	$\phi 11$	32	75	15.9	P9	48	$\phi 27$	$\phi 35$	18

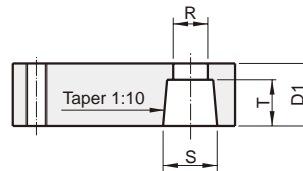
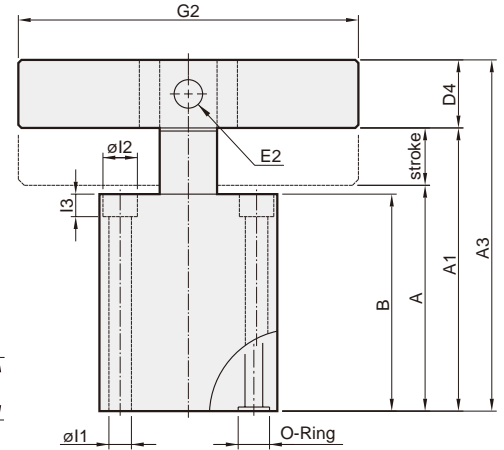
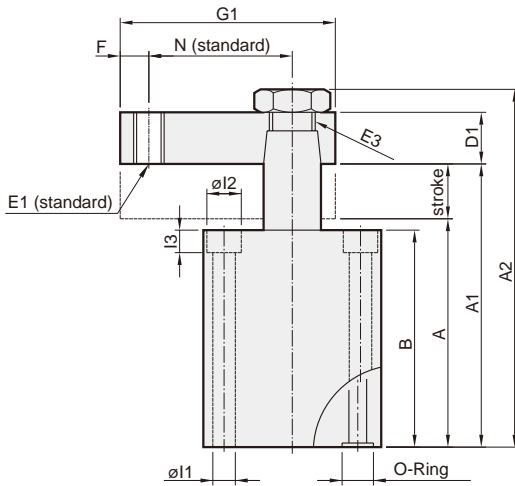
MTHS-F



MTHD-F



Ⓐ Clamp port
Ⓑ Release port



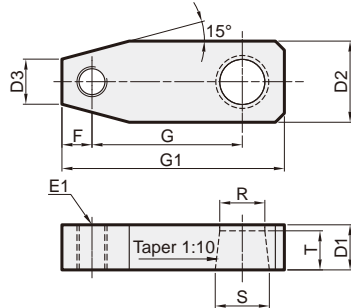
Single side clamping arm

Model		Tube I.D. (mm)	Piston rod (mm)	Swing stroke (mm)	Clamping stroke (mm)	Pressure area push/pull (mm ²)	Clamping force (N) 3.5MPa	Clamping arm type			
								G1		G2	
								Standard	Extension	Standard	Extension
MTHS-25F	MTHD-25F	$\phi 25$	$\phi 18$	9	13	491 / 237	830	74	100	140	200
MTHS-32F	MTHD-32F	$\phi 32$	$\phi 20$	11	15	804 / 490	1720	81	110	160	230
MTHS-40F	MTHD-40F	$\phi 40$	$\phi 22.4$	11	15	1257 / 863	3020	86	120	160	230
MTHS-50F	MTHD-50F	$\phi 50$	$\phi 28$	13	17	1963 / 1347	4710	96	130	180	260

Code Model		ST	A	A1	A2	A3	B	C	D1	D2	D3	D4	E1	E2	E3
MTHS-25F	MTHD-25F	22	79	101	124	120	76	22	15	27	15	$\square 19$	M10x1.5	$\phi 8$	M14x1.5
MTHS-32F	MTHD-32F	26	89	115	140	137.2	85	25	17	31	17	$\square 22.2$	M10x1.5	$\phi 8$	M16x1.5
MTHS-40F	MTHD-40F	26	94	120	148	142.2	90	25	18	31	17	$\square 22.2$	M10x1.5	$\phi 10$	M18x1.5
MTHS-50F	MTHD-50F	30	104	134	166	159.2	100	30	20	37	19	$\square 25.4$	M12x1.75	$\phi 12$	M20x1.5

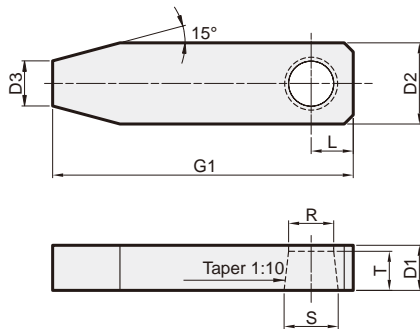
Code Model		F	G1	G2	H	I1	I2	I3	J	K	L	M	N	O-Ring	R	S	T
MTHS-25F	MTHD-25F	10	74	140	9	$\phi 6.8$	$\phi 10.5$	7	55	42	20	18	50	P7	$\phi 15$	$\phi 18$	13
MTHS-32F	MTHD-32F	10	81	160	10	$\phi 6.8$	$\phi 10.5$	7	57	44	22	22	55	P7	$\phi 17$	$\phi 20$	14
MTHS-40F	MTHD-40F	10	86	160	10	$\phi 9$	$\phi 14$	9	69	52	26	26	60	P8	$\phi 19$	$\phi 22.4$	15
MTHS-50F	MTHD-50F	12	96	180	12	$\phi 9$	$\phi 14$	9	75	58	30	32	65	P8	$\phi 21$	$\phi 28$	16

Single side clamping arm (Standard type with thread)



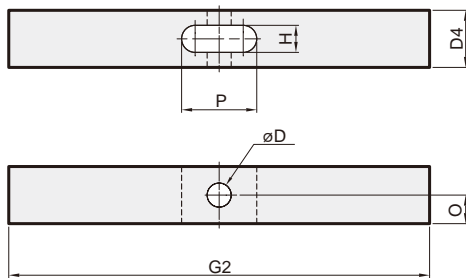
Code Model	D1	D2	D3	F	G	G1	E1	R	S	T
MTHS-25	15	27	15	10	50	74	M10x1.5	15	18	13
MTHS-32	17	31	17	10	55	81	M10x1.5	17	20	14
MTHS-40	18	31	17	10	60	86	M10x1.5	19	22.4	15
MTHS-50	20	37	19	12	65	96	M12x1.75	21	28	16
MTHS-63	23	48	24	15	75	114	M16x2.0	27	35	18

Single side clamping arm B type (Extension type without thread)



Code Model	D1	D2	D3	L	G1	R	S	T
MTHS-25 B	15	27	15	14	100	15	18	13
MTHS-32 B	17	31	17	16	110	17	20	14
MTHS-40 B	18	31	17	16	120	19	22.4	15
MTHS-50 B	20	37	19	19	130	21	28	16
MTHS-63 B	23	48	24	24	150	27	35	18

Double side clamping arm
(Standard & Extension type)



Double side clamping arm (Standard type)

Code Model	D	D4	O	P	H	G2
MTHD-25	$\varnothing 8$	$\square 19$	9.5	25	9	140
MTHD-32	$\varnothing 8$	$\square 22.2$	11.1	29	10	160
MTHD-40	$\varnothing 10$	$\square 22.2$	11.1	31	10	160
MTHD-50	$\varnothing 12$	$\square 25.4$	12.7	38	12	180
MTHD-63	$\varnothing 15$	$\square 31.8$	15.9	48	15	200

Double side clamping arm B type (Extension type)

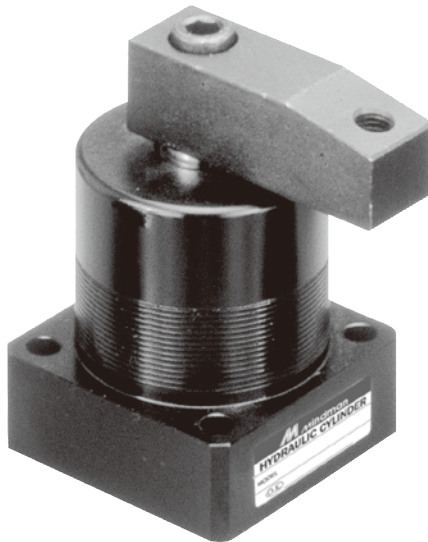
Code Model	D	D4	O	P	H	G2
MTHD-25 B	$\varnothing 8$	$\square 19$	9.5	25	9	200
MTHD-32 B	$\varnothing 8$	$\square 22.2$	11.1	29	10	230
MTHD-40 B	$\varnothing 10$	$\square 22.2$	11.1	31	10	230
MTHD-50 B	$\varnothing 12$	$\square 25.4$	12.7	38	12	260

Cylinder weight

Model			Weight
MTHS-25	MTHS-25MF	MTHS-25FC	1.3
MTHD-25	MTHD-25MF	MTHD-25FC	1.5
MTHS-32	MTHS-32MF	MTHS-32FC	1.7
MTHD-32	MTHD-32MF	MTHD-32FC	2.0
MTHS-40	MTHS-40MF	MTHS-40FC	2.0
MTHD-40	MTHD-40MF	MTHD-40FC	2.3
MTHS-50	MTHS-50MF	MTHS-50FC	3.2
MTHD-50	MTHD-50MF	MTHD-50FC	3.5
MTHS-63	MTHS-63MF	MTHS-63FC	5.1
MTHD-63	MTHD-63MF	MTHD-63FC	5.7

Unit: kg

Model	Weight	Model	Weight
MTHS-25F	1.8	MTHSL-32	2.4
MTHD-25F	2.0	MTHDL-32	2.7
MTHS-32F	2.2	MTHSL-40	2.8
MTHD-32F	2.5	MTHDL-40	3.1
MTHS-40F	3.3	MTHSL-50	4.5
MTHD-40F	3.5	MTHDL-50	4.8
MTHS-50F	4.3	MTHSL-63	7.1
MTHD-50F	4.65	MTHDL-63	7.7



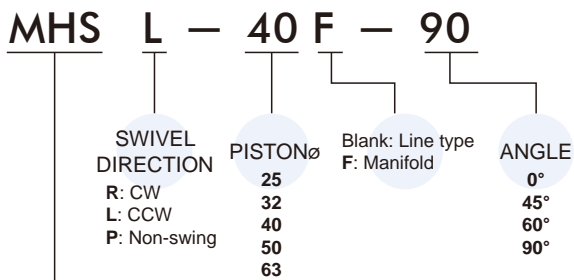
Features

- Double clamp retracting, the piston rod rotates, causing the clamping arm to swing in either a clockwise or counterclockwise direction. Clamping then takes place as the rod continues to retract in a straight line, pulling the arm against the workpieces.
- Pull cylinder type, Available models offer angles of rotation of 0°, 45°, 60° or 90°.
- The cylinder body is made of aluminum alloy and the surface is hard membrane treated.
- Mounting methods: Square base type, threaded type, flange type.

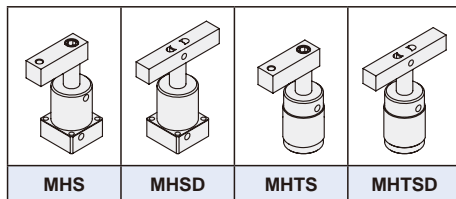
Note

- When it is necessary to change the length of the clamping arm, it should be noted that do not exceed 1.2 times of the original G value in order to avoid the serious slanting of the piston rod.
- Suggested to add a flow control valve to the hydraulic inlet to control the motion of the swing angle in order to prevent the inertial impact.
- A workpiece should not be clamped within a swing stroke, and it should be clamped within the vertical downward clamping stroke.
- Whenever placing and taking off a workpiece, it is necessary to use an air gun to clean the piston and the seal for removing the iron slag or foreigner objects attached thereon in order to prevent the foreigner objects from entering the seal to cause oil leakage.

Order example



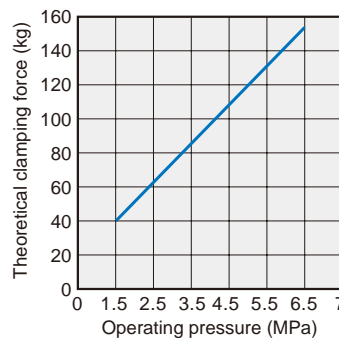
MODEL



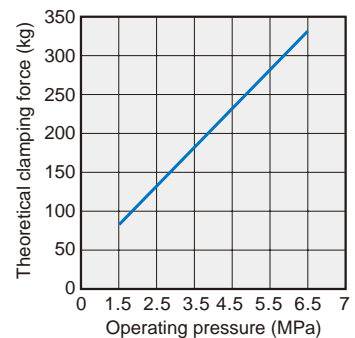
* MHTS and MHTSD produced by order.

Schematic view showing a theoretical clamping force under different hydraulic pressure.

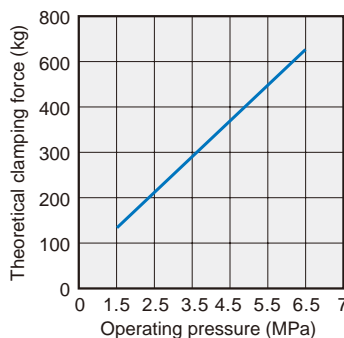
MHS-25



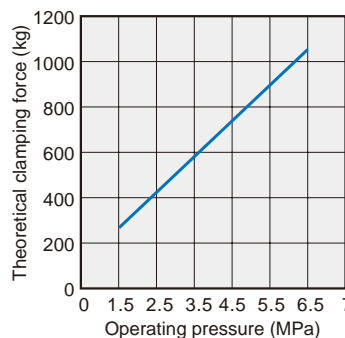
MHS-32



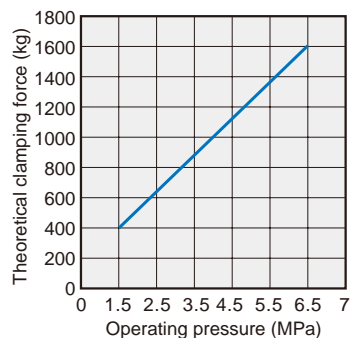
MHS-40



MHS-50

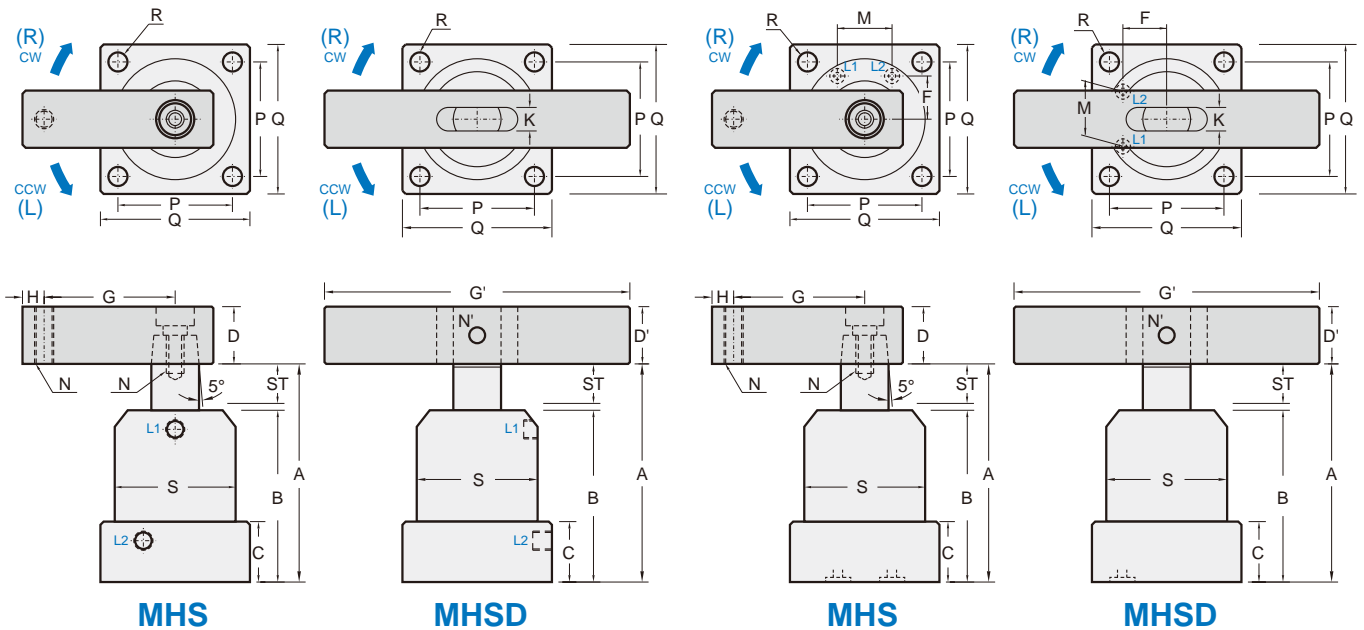


MHS-63



MHS*

MHS*-F



MHS

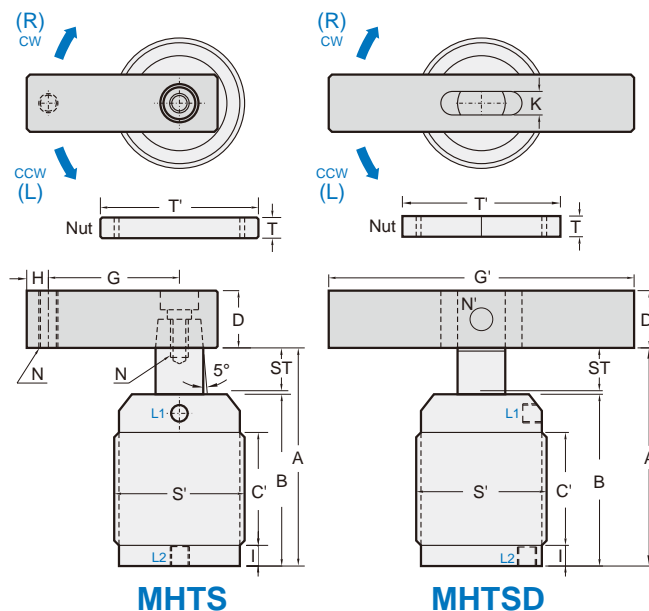
MHSD

MHS

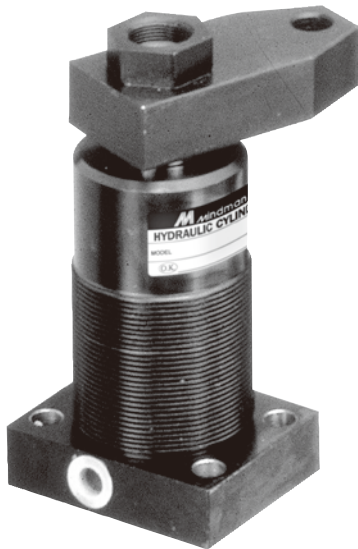
MHSD

Flange type	MHS-25 MHSD-25	MHS-32 MHSD-32	MHS-40 MHSD-40	MHS-50 MHSD-50	MHS-63 MHSD-63
Operating pressure range	2~4.5 MPa				
Proof pressure	7 MPa				
Cylinder operating	Double acting				
Swivel angle	90°(60°,45°,0°)±2°				
Swivel stroke (mm)	12	14	14	14	14
Clamping stroke (mm)	14	15	15	15	15
Piston \varnothing (mm)	25	32	40	50	63
Piston rod \varnothing (mm)	18	20	20	20	25
Theoretical force (2.5 MPa)	59kg	125kg	200kg	400kg	600kg
A (unclamp) (mm)	100	111	113.6	114.5	118
B (mm)	70	76	80	80	85
C (mm)	23	25	27	27	32
D (mm)	□25.4	□25.4	□25.4	□25.4	□32
D' (mm)	□19	□22	□22	□22	□25.4
G (mm)	50	55	55	55	75
G' (mm)	100	120	120	120	140
H (mm)	10	10	10	10	11
K (mm)	9	10	10	10	12
L1 (clamp) L2 (unclamp)	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8
O-ring manifold	S4	S4	S4	S4	S4
N (mm)	M10x1.5	M10x1.5	M10x1.5	M10x1.5	M12x1.75
N' (mm)	∅8	∅8	∅8	∅8	∅10
P (mm)	40	44	48	57	70
Q (mm)	50	55	62	74	88
R (mm)	∅6.5	∅6.5	∅8.5	∅8.5	∅10.5
S (mm)	∅45	∅50	∅54	∅65	∅80
M (mm)	18	24	26	30	40
F (mm)	15	17	20	25	30
Weight (kg)	0.8	1.0	1.1	1.4	2.3

MHTS*



Threaded type (produced by order)	MHTS-25 MHTSD-25	MHTS-32 MHTSD-32	MHTS-40 MHTSD-40	MHTS-50 MHTSD-50
Operating pressure range	2~4.5 MPa			
Proof pressure	7 MPa			
Cylinder operating	Double acting			
Swivel angle	$90^\circ(60^\circ, 45^\circ, 0^\circ)\pm 2^\circ$			
Swivel stroke (mm)	12	14	14	14
Clamping stroke (mm)	14	15	15	15
Piston \varnothing (mm)	25	32	40	50
Piston rod \varnothing (mm)	18	20	20	20
Theoretical force (2.5 MPa)	59kg	125kg	200kg	400kg
A (unclamp) (mm)	100	111	113.6	114.5
B (mm)	70	76	80	80
C' (mm)	35	45	45	45
D (mm)	$\square 25.4$	$\square 25.4$	$\square 25.4$	$\square 25.4$
D' (mm)	$\square 19$	$\square 22$	$\square 22$	$\square 22$
G (mm)	50	55	55	55
G' (mm)	100	120	120	120
H (mm)	10	10	10	10
I (mm)	9	9	9	9
K (mm)	9	10	10	10
L1 (clamp) L2 (unclamp)	Rc1/8	Rc1/8	Rc1/8	Rc1/8
N (mm)	M10x1.5	M10x1.5	M10x1.5	M10x1.5
N' (mm)	$\varnothing 8$	$\varnothing 8$	$\varnothing 8$	$\varnothing 8$
S' (mm)	M45x1.5	M50x1.5	M55x1.5	M65x1.5
T (x2 pcs nut) (mm)	10	11	11	12
T' (mm)	$\varnothing 65$	$\varnothing 70$	$\varnothing 75$	$\varnothing 85$
Weight (kg)	0.8	1.1	1.25	1.7



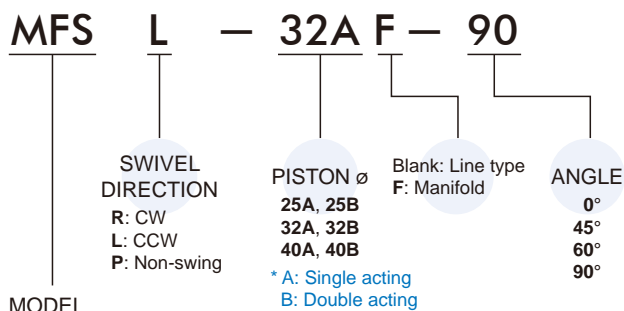
Features

- Double clamp retracting, the piston rod rotates, causing the clamping arm to swing in either a clockwise or counterclockwise direction. Clamping then takes place as the rod continues to retract in a straight line, pulling the arm against the workpieces.
- Pull cylinder type, Available models offer angles of rotation of 0°, 45°, 60° or 90°.
- The cylinder body is made of carbon steel and the surface is hard membrane treated.

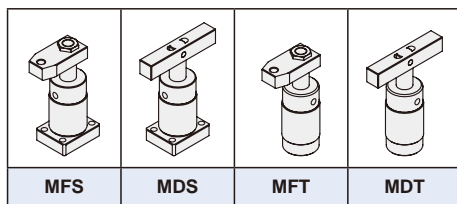
Note

- When it is necessary to change the length of the clamping arm, it should be noted that do not exceed 1.2 times of the original G value in order to avoid the serious slanting of the piston rod.
- Suggested to add a flow control valve to the hydraulic inlet to control the motion of the swing angle in order to prevent the inertial impaction.
- A workpiece should not be clamped within a swing stroke, and it should be calmped within the vertical downward clamping stroke.
- Whenever placing and taking off a workpiece, it is necessary to use an air gun to clean the piston and the seal for removing the iron slag or foreigner objects attached thereon in order to prevent the foreigner objects form entering the seal to cause oil leakage.

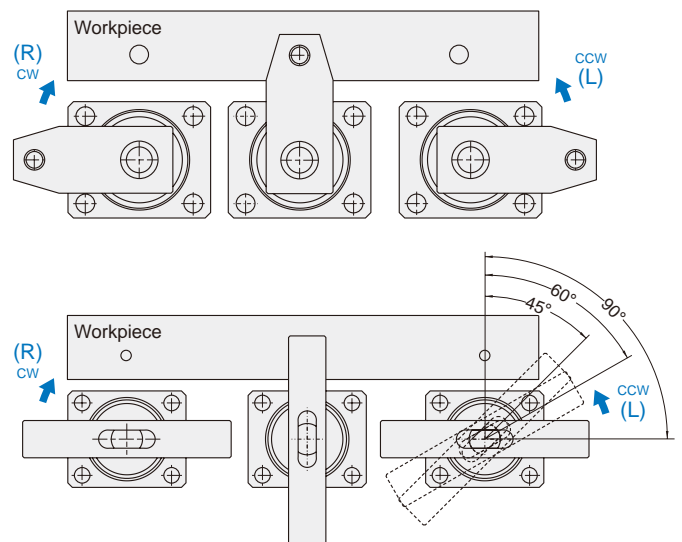
Order example



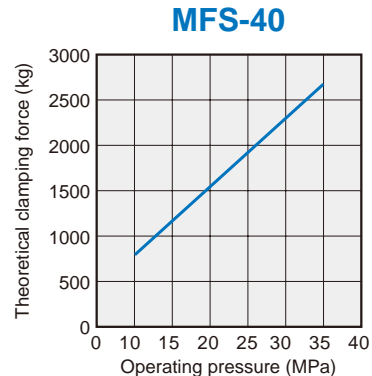
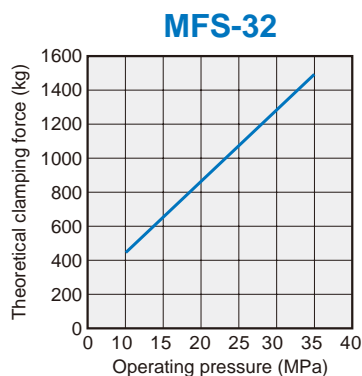
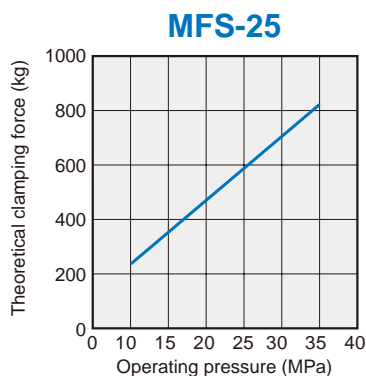
MODEL



Swivel dir. definition

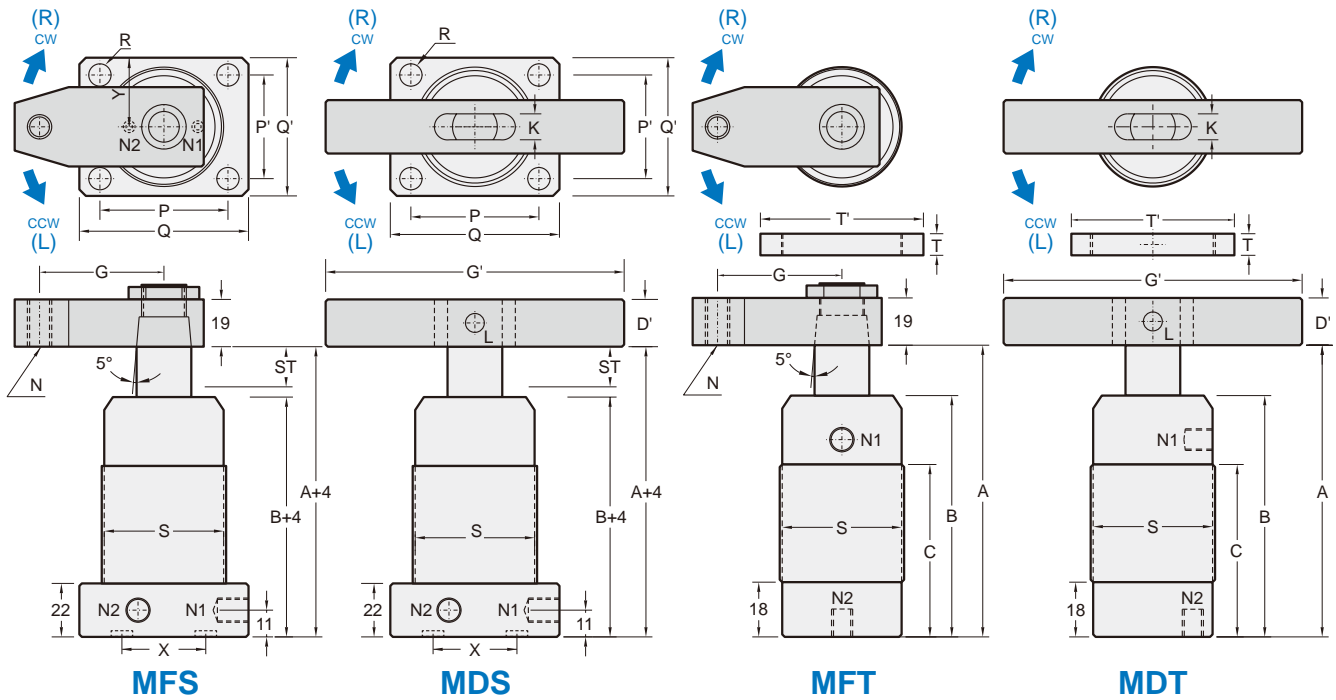


Schematic view showing a theoretical clamping force under different hydraulic pressure.



MF* / MD* Dimensions $\phi 25\sim\phi 40$

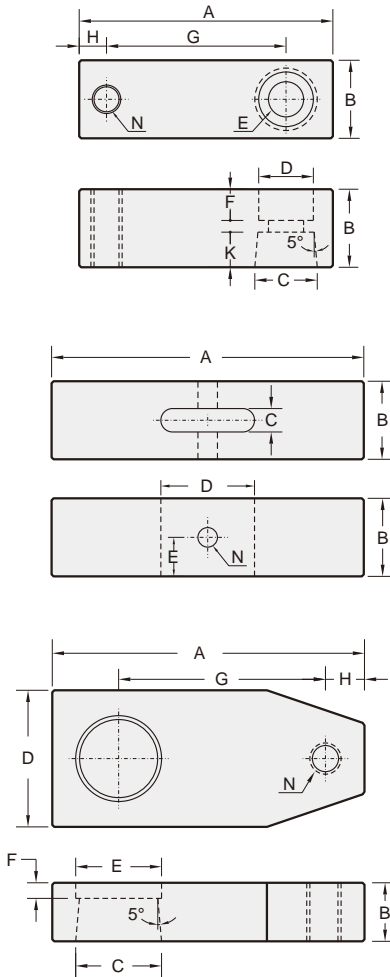
HIGH OIL PRESSURE SWING CLAMP CYLINDER



Flange type	MFS-25A MDS-25A	MFS-32A MDS-32A	MFS-40A MDS-40A	MFS-25B MDS-25B	MFS-32B MDS-32B	MFS-40B MDS-40B
Threaded type	MFT-25A MDT-25A	MFT-32A MDT-32A	MFT-40A MDT-40A	MFT-25B MDT-25B	MFT-32B MDT-32B	MFT-40B MDT-40B
Operating pressure range	5~21 MPa					
Proof pressure	35 MPa					
Cylinder operating	Single acting			Double acting		
Swivel stroke (mm)	12			15		
Clamping stroke (mm)	11			18		
Swivel angle	90°(60°,45°,0°) $\pm 2^\circ$					
Piston ϕ (mm)	25	32	40	25	32	40
Piston rod ϕ (mm)	18	22	25	18	22	25
Theoretical force (21 MPa)	495kg	890kg	1600kg	495kg	890kg	1600kg
A (unclamp) (mm)	127	127	127	134	133	134
B (mm)	102	97	98	102	97	98
C (mm)	66	70	72	66	70	72
D' (mm)	$\square 19$	$\square 22$	$\square 25.4$	$\square 19$	$\square 22$	$\square 25.4$
G (mm)	45	50	50	45	50	50
G' (mm)	100	120	140	100	120	140
K (mm)	9	10	12	9	10	12
L (mm)	$\phi 8$	$\phi 8$	$\phi 10$	$\phi 8$	$\phi 8$	$\phi 10$
N1 (clamp)/ N2 (unclamp) (mm)	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8
O-ring manifold	P7	P7	P7	P7	P7	P7
N (mm)	M12x1.75	M12x1.75	M12x1.75	M12x1.75	M12x1.75	M12x1.75
P (mm)	50	54	66	50	54	66
P' (mm)	30	34	40	30	34	40
Q (mm)	64	68	84	64	68	84
Q' (mm)	46	54	64	46	54	64
R (mm)	$\phi 6.5$	$\phi 8.5$	$\phi 8.5$	$\phi 6.5$	$\phi 8.5$	$\phi 8.5$
S (mm)	M45x1.5	M50x1.5	M60x1.5	M45x1.5	M50x1.5	M60x1.5
T (x2 pcs) (mm)	10	11	11	10	11	11
T' (mm)	$\phi 65$	$\phi 70$	$\phi 80$	$\phi 65$	$\phi 70$	$\phi 80$
X (mm)	35	40	50	35	40	50
Y (mm)	23	27	32	23	27	32
Weight (kg)	1.5	1.9	2.9	1.5	1.9	2.9

HIGH OIL PRESSURE SWING CLAMP CYLINDER

Clamping arm



Unit: mm

Code Model	A	B	C	D	E	F	G	H	K	N
MAS-25	50	□16	14	11	7	6	30	8	6	M6
MAS-32 MATS-32 MAS-40 MATS-40	70	□19	16	14	9	7	50	9	9	M8
MHS-32 MHTS-32 MHS-40 MHTS-40 MHS-50 MHTS-50	80	□25	20	17	11	9	55	10	12	M10
MAS-50 MATS-50 MAS-63	95	□25	20	17	11	9	70	10	12	M10
MHS-25	74	□25	18	17	11	9	50	10	12	M10
MHS-63	103	□32	25	19	13	12	75	11	14	M12

Unit: mm

Code Model	A	B	C	D	E	N
MASD-32 MATSD-32 MHSD-25 MDS-25 MASD-40 MATSD-40 MDT-25	100	□19	9	30	9.5	8
MASD-50 MATSD-50 MHSD-32 MHTSD-32 MDS-32 MASD-63 MHSD-40 MHTSD-40 MDT-32 MHSD-50 MHTSD-50	120	□22	10	35	11	8
MHSD-63 MDS-40 MDT-40	140	□25	12	42	12.5	10

Unit: mm

Code Model	A	B	C	D	E	F	G	H	N
MFS-25, MFT-25	70	19	18	38	23	7	45	10	M12
MFS-32, MFT-32	78	19	22	38	25	7	50	10	M12
MFS-40, MFT-40	78	19	25	38	27	7	50	10	M12

Flange type for manifold mounting with o-ring seal

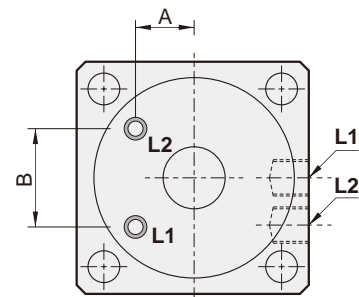
Flange type dil cavity paths are reserved on square base type of hydraulic & high pressure cylinder, contently for fixture design.

Unit: mm

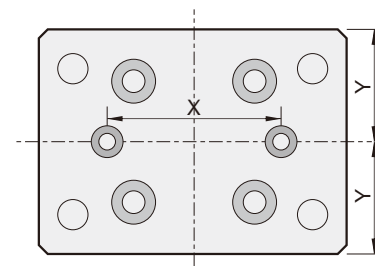
Code Model	A	B	O-ring
MHS-25	15	18	S4
MHS-32	17	24	S4
MHS-40	20	26	S4
MHS-50	25	30	S4
MHS-63	30	40	S4

Unit: mm

Code Model	X	Y	O-ring
MFS-25, MDS-25	35	23	S4
MFS-32, MDS-32	40	27	S4
MFS-40, MDS-40	50	32	S4



Top view



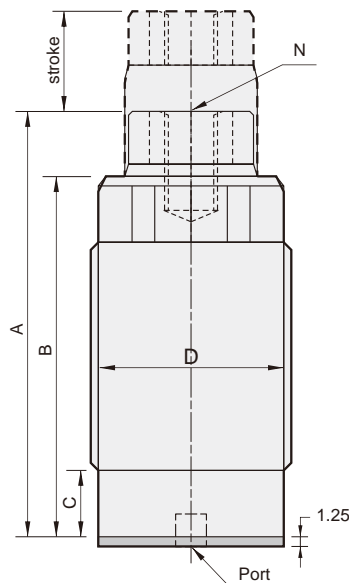
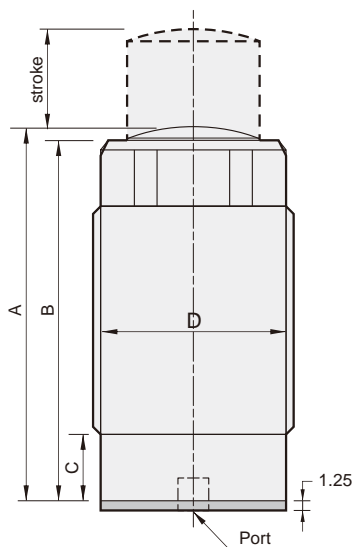
Features

- Simple construction, high strength unit ideal for pushing heavy loads.
- Threaded body design allows quick and easy installation.
- Additional mounting heads can be fitted to rod.
- Teflon packing ensures zero leakage.

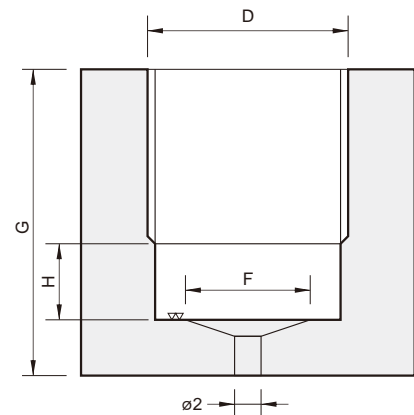


A series

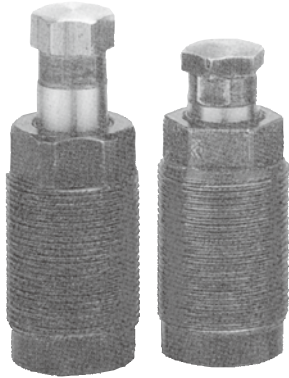
B series



Mounting diagram



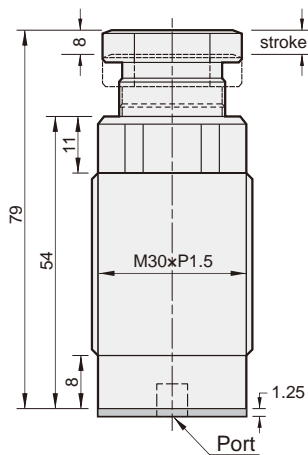
Model Item	MTC-12A	MTC-16A	MTC-20A	MTC-25A	MTC-12B	MTC-16B	MTC-20B	MTC-25B
Normal operating pressure	2~35 MPa							
Cylinder operating	Single acting							
Stroke (mm)	10	12	15	16	10	12	15	16
Piston \varnothing (mm)	12	16	20	25	12	16	20	25
Theoretical force (20 MPa)	200 kg	400 kg	620 kg	980 kg	200 kg	400 kg	620 kg	980 kg
A (mm)	38	46.5	56	57	45	52	64.5	67
B (mm)	36	44.5	54	55	36	44.5	54	55
C (mm)	7	8	8	11	7	8	8	11
D (mm)	M22x1.5	M26x1.5	M30x1.5	M38x1.5	M22x1.5	M26x1.5	M30x1.5	M38x1.5
N (mm)					M6x1.0	M6x1.0	M8x1.25	M8x1.25
F (mm)	12	16	20	25	12	16	20	25
G (min) (mm)	16	20	24	28	16	20	24	28
H (max) (mm)	8	9	9	11	8	9	9	11



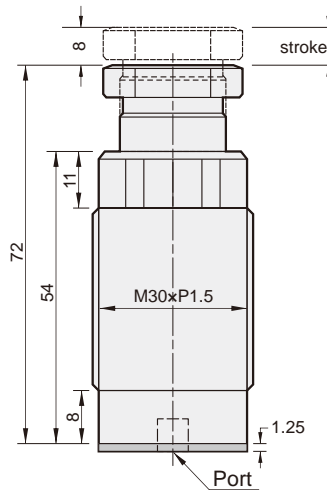
Features

- Hydraulic work support is used to both minimise vibration during machining and offer increased support.
- A type unit works on the outward stroke with a internal spring.
- B type unit works with oil pressure providing the motive force.

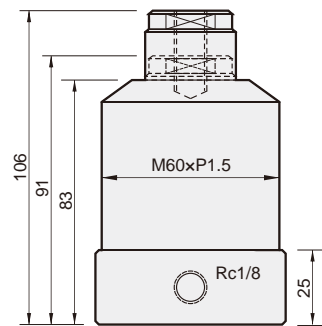
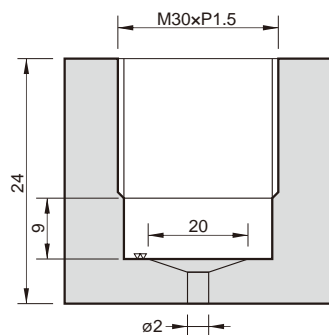
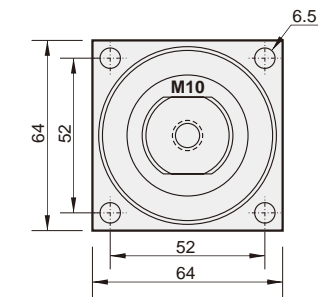
MSP-16A



MSP-16B

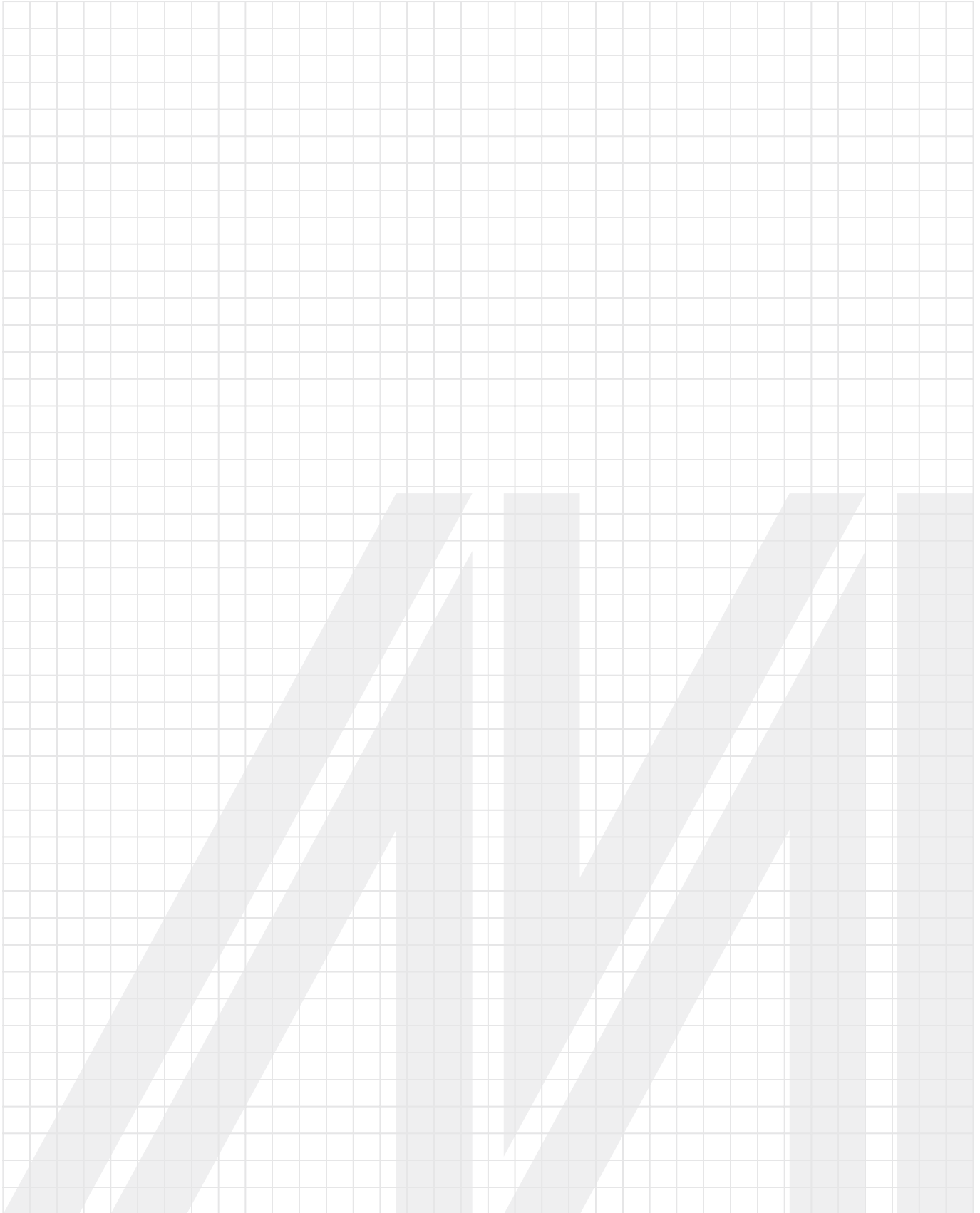


MSP-30A



Mounting diagram

Model Item	MSP-16A	MSP-16B	MSP-30A
Normal operating pressure	10~35 MPa		7.5~35 MPa
Cylinder operating	Single-acting		
Piston ϕ (mm)	16		30
Stroke (mm)	8		15
Theoretical force (20 MPa)	210 kg		750 kg



Product Code List

ALL SERIES (Vol.1~3)



Model no.	Description	Vol.	Page	Model no.	Description	Vol.	Page
A				MAD401	drain trap	1	4-54
ACT-3**	8A-3/2 mechanical valve	1	3-40	MAD401H	drain trap	1	4-55
ACT-4**	5/2 mechanical valve	1	3-40	MAD500	drain trap	1	4-56
E				MAD501	drain trap	1	4-57
E001	0.01u filter element	1	4-59	MADV400	auto drain trap	1	4-58
E03	0.3u filter element	1	4-59	MAER200	electro pneumatic regulator	1	4-83
E5	5u filter element	1	4-59	MAF200	filter	1	4-45
E20	20u filter element	1	4-59	MAF200L	filter	1	4-45
E40	40u filter element	1	4-59	MAF302	filter	1	4-46
EPA	6A-3/2 mechanical valve	1	3-40	MAF302D/M	mist / micro mist filter	1	4-103
F				MAF401	filter	1	4-48
FMRF300	auto drain valves	1	4-58	MAF401A/D/M	air / mist / micro mist filter	1	4-105
J				MAF403	filter	1	4-49
JSC	speed controller	1	7-18	MAF501	filter	1	4-50
L				MAF501D/M	mist / micro mist filter	1	4-110
LN01A	sensor switch	2	8-20	MAF900	filter	1	4-52
LN01G	sensor switch	3	5-15	MAF901	filter	1	4-53
LN01P	sensor switch	3	5-16	MAFF401AD/DM	mist / micro mist filter	1	4-107
LN02A	sensor switch	2	8-20	MAFR100	F.R. unit	1	4-33
LN02P	sensor switch	3	5-16	MAFR200	F.R. unit	1	4-34
LN03A	sensor switch	2	8-20	MAFR200L	F.R. unit	1	4-34
LN03P	sensor switch	3	5-16	MAFR302	F.R. unit	1	4-36
LN32H	sensor switch	3	5-17	MAFR401	F.R. unit	1	4-39
LN40R	sensor switch	3	5-18	MAFR403	F.R. unit	1	4-41
LN65	sensor switch	3	5-19	MAFR501	F.R. unit	1	4-43
M				MAFRF401	F.R. unit	1	4-108
M124C-MA	connector	1	6-18	MAHR200	pressure reducing valve	1	4-78
M124C-MD	connector	1	6-18	MAIR100	precision regulator	1	4-90
M124R-FA	cable with connector	1	6-15	MAIR200	precision regulator	1	4-92
M124R-MD	cable with connector	1	6-16	MAIR300	precision regulator	1	4-94
M124R-RJD	cable with connector	1	6-16	MAL200	L. unit	1	4-96
M125R-WB	cable with connector	1	6-14	MAL200L	L. unit	1	4-96
M83C-M	connector	1	6-17	MAL302	L. unit	1	4-97
M83R-F	cable with connector	1	6-13	MAL401	L. unit	1	4-98
	cable with connector	2	8-22	MAL403	L. unit	1	4-99
	cable with connector	3	5-21	MAL501	L. unit	1	4-100
M83*	cable with connector	2	8-21	MAL900	L. unit	1	4-101
	cable with connector	3	5-20	MAMG	water separator	1	4-116
M84*	cable with connector	2	8-21	MAMB	precision filter	1	4-118
	cable with connector	3	5-20	MAMD	precision filter	1	4-120
MA				MAMM	precision filter	1	4-122
MAC	shock absorber	2	8-33	MAMF	precision filter	1	4-124
MACP200	F.R.L. unit	1	4-11	MAR100	R. unit	1	4-64
MACP200L	F.R.L. unit	1	4-11	MAR200	R. unit	1	4-65
MACP302	F.R.L. unit	1	4-13	MAR201	R. unit	1	4-67
MACP401	F.R.L. unit	1	4-16	MAR300LK	hand-held regulator	1	4-79
MACP403	F.R.L. unit	1	4-19	MAR302	R. unit	1	4-69
MACP501	F.R.L. unit	1	4-21	MAR401	R. unit	1	4-71
MACT200	F.R.L. unit	1	4-23	MAR403	R. unit	1	4-73
MACT200L	F.R.L. unit	1	4-23	MAR501	R. unit	1	4-75
MACT302	F.R.L. unit	1	4-25	MAR900	R. unit	1	4-76
MACT401	F.R.L. unit	1	4-27	MAR901	R. unit	1	4-77
MACT403	F.R.L. unit	1	4-29	MAS	swing clamping cylinder	3	2-14
MACT501	F.R.L. unit	1	4-31	MASD	swing clamping cylinder	3	2-14
MAD	shock absorber	2	8-33	MATFR401	F.R. unit	1	4-109

Product Code List



ALL SERIES (Vol.1 ~3)

mindman

Model no.	Description	Vol.	Page	Model no.	Description	Vol.	Page
MATS	swing clamping cylinder	3	2-14	MCMIS	ISO-6432 miniature cylinder (SUS)	2	3-52
MATSD	swing clamping cylinder	3	2-14	MCMJ	pen cylinder	2	3-62
MAVS	soft start-up valve	1	4-128	MCMJ1	pen cylinder	2	3-75
MB				MCMJJP	pen cylinder	2	3-76
MBD-**-T	digital condensation removal timer	1	4-134	MCMJPB	pen cylinder	2	3-81
MBS	2/2 solenoid valve	1	2-5	MCMJPS	pen cylinder	2	3-81
MBS-**-T	digital condensation removal timer	1	4-134	MCQA	standard cylinder	2	1-2
MC				MCQA-AH	air / oil converter	2	1-21
MCB	locking unit	2	1-81	MCQI2	ISO-VDMA standard profile cylinder	2	1-58
MCBBI	rod locking cylinder	2	1-77	MCQI3	ISO-VDMA standard profile cylinder	2	1-69
MCBQI2	rod locking cylinder	2	1-77	MCQN	standard cylinder	2	1-24
MCBQI3	rod locking cylinder	2	1-77	MCQV	ISO-VDMA standard cylinder	2	1-30
MCBQV	rod locking cylinder	2	1-77	MCQV2	ISO-VDMA standard cylinder	2	1-30
MCBQV2	rod locking cylinder	2	1-77	MCQV2L	end lock cylinder	2	1-54
MCBQV3	rod locking cylinder	2	1-77	MCQV3	ISO-VDMA standard cylinder	2	1-48
MCCG	round cylinder	2	3-83	MCRA	rotary actuator	3	1-4
MCCH	high speed cylinder	2	3-99	MCRC	rotary actuator	3	1-11
MCCN	round cylinder	2	3-92	MCRJ-S	mini-rotary actuator	3	1-8
MCDA	dual-rod cylinder	2	4-53	MCRQ	rotary actuator	3	1-14
MCDJ	dual-rod cylinder	2	4-58	MCRQ-S	rotary actuator	3	1-21
MCFA	multi mount cylinder	2	2-68	MCRPL	rodless cylinder	2	6-2
MCFB	multi mount cylinder	2	2-74	MCRPLF	rodless cylinder	2	6-2
MCG3	triple-guide cylinder	2	4-48	MCRPLK	rodless cylinder with linear guide	2	6-10
MCGA	twin-guide cylinder	2	4-3	MCRPLS	rodless cylinder	2	6-14
MCGD	twin-guide slide cylinder	2	4-45	MCRPM	magnetically coupled rodless cylinder	2	6-17
MCGI	compact twin-guide cylinder	2	4-26	MCRPMD	magnetically coupled rodless cylinder	2	6-19
MCGJ	twin-guide cylinder	2	4-29	MCRPMS	magnetically coupled rodless cylinder	2	6-23
MCGS	twin-guide cylinder	2	4-12	MCS	2/2 solenoid valve	1	2-6
MCHA	30° angular gripper	3	3-64	MCS-**-T	digital condensation removal timer	1	4-134
MCHB	parallel gripper (2 finger)	3	3-3	MCSF	low profile slide cylinder	2	5-33
MCHC	parallel gripper (2 finger)	3	3-8	MCSH	compact slide cylinder	2	5-39
MCHD	parallel gripper (2 finger)	3	3-22	MCSQ	slide cylinder	2	5-26
MCHG2	parallel gripper (3 finger)	3	3-52	MCSS	slide cylinder	2	5-2
MCHH	parallel gripper (2 finger)	3	3-31	MD			
MCHJ	parallel gripper (3 finger)	3	3-58	MDFC	shock absorbers	2	8-23
MCHS	parallel gripper (2 finger)	3	3-38	MDHB	hydraulic cylinder	3	6-2
MCHU	parallel gripper (2 finger)	3	3-35	MDHD	hydraulic cylinder	3	6-2
MCHX	parallel gripper (2 finger)	3	3-47	MDHN	hydraulic cylinder	3	6-2
MCHY	180° angular gripper	3	3-68	MDMB	hydraulic cylinder (with magnet)	3	6-2
MCJA	compact cylinder	2	2-2	MDMD	hydraulic cylinder (with magnet)	3	6-2
MCJI	ISO-21287 compact cylinder	2	2-52	MDMN	hydraulic cylinder (with magnet)	3	6-2
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MVSC-460	15A-3/2, 5/2, 5/3 solenoid valve	1	1-23	RDB	sensor switch	2	8-9
MVSC1-150	M5-5/2 solenoid valve	1	1-17		sensor switch	3	5-4
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	sensor switch	3	5-6				
RNFE	sensor switch	1	6-12				
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	sensor switch	3	5-11				
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	sensor switch	3	5-12				
RNI	sensor switch	2	8-13				
	sensor switch	3	5-8				
RNKD	sensor switch	3	5-14				
RNM	sensor switch	2	8-15				
RNME	sensor switch	2	8-15				
RPA	sensor switch	2	8-7				
	sensor switch	3	5-2				
RPAE	sensor switch	2	8-7				
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RPB	sensor switch	2	8-9				
	sensor switch	3	5-4				
RPBE	sensor switch	2	8-9				
	sensor switch	3	5-4				
RPD	sensor switch	2	8-10				
	sensor switch	3	5-5				
RPDE	sensor switch	2	8-10				
	sensor switch	3	5-5				
RPE	sensor switch	2	8-11				
	sensor switch	3	5-6				
RPE1E	sensor switch	2	8-12				



PLEASE READ BEFORE USING

Before selecting model and servicing of the product, read throughly this CAUTIONS for SAFETY for the proper usage.

- The following cautions are for the purpose of preventing your personnel from suffering injury, by following the proper usage of the products.
- Items are classified in three categories, DANGER, WARNING, and CAUTION. All items are crucial for the safety and need to be followed without exception.

DANGER 	Obviously dangerous, which may cause death or serious injury of personnel, and damage or destruction of property.
WARNING 	Not immediately subject to danger, however not avoiding the displayed danger when mishandling the product may cause death or serious injury of personnel and damage or destruction of property.
CAUTION 	Not immediately subject to danger, however not avoiding the displayed danger when mishandling the product may cause injury of personnel and damage or destruction of property.

For the correct handling, please read the instruction manual before installing and servicing of the product.

DANGER

(Applies to all products on the catalogue)

- 1 Do not use any of our products for the purpose of maintenance and care of human life or body.
- 2 Do not use any product in the condition or the environment other than stipulated in the specification or where the hazardous stuff exists.
- 3 When installing a product, refer to the instruction manual for mounting style and fix securely (including the work carrier). Otherwise products may topple, fall, and operates out of control causing the injury of personnel.
- 4 Disassembling and reassembling of products should be made by the personnel who has enough knowledge and experience.
- 5 Depressurize products before disassembling or reassembling.
- 6 Do not remodel the products.

WARNING

(Applies to all products on the catalogue)

- 1 When servicing, keep within the working pressure range and voltage.
- 2 At a place where water or oil drops and where is much dust, cover the equipment. Otherwise damage and trouble will be caused.
- 3 Do not operate if the fluid or atmosphere contains the substance which may cause corrosion. Otherwise damage and trouble will be caused.
- 4 Do not touch the terminal part or switches, etc. when the product is energized. It may cause the inaccurate operation and the electric shock from the short circuit and the circuit trouble.
- 5 Do not stand on, use as a footing, or put things on the product. You may miss your step and fall, and the falling product may cause the injury of personnel. Also the product may get damaged causing the inaccurate operation and hazardous moves out of control.

(Pneumatic Actuator)

- 1 When starting operation, pay the full attention to the cylinder's moving direction.
- 2 Do not put hands where the cylinder moves.
- 3 Please use a speed control valve to adjust the piston speed within the limited value in our catalogue.
- 4 The value of dividing operation time into cylinder stroke is the average speed rather than max speed.

The max. speed of cushion pad type cylinders occur at the end of the stroke.

The max. speed of air cushion type cylinders occur at the start point of cushioning structure.
- 5 The max. speed of cylinders usually uses the value of average speed times 1.4~1.5.
- 6 When the load on cylinder is large, we suggest to use ourter shock absorber - even the max speed is within the limited value.
- 7 Cords such as the sensor switch's lead wire should not be damaged. Damaging, forcing, twisting tugging, winding, putting on a heavy object, and pinching will cause fire, electric shock abnormal operation by short circuit or circuit error.

(Pneumatic Valve. Pneumatic Accessories. Sensor Switch)

- 1 Cords such as the pressure switch's lead wire, solenoid valve's power supply cord should not be damaged. Damaging, forcing, twisting, tugging, winding, putting heavy object on, and pinching will cause fire, electric shock, abnormal operation by short circuit or circuit error.
- 2 Do not use filter or lubricator without a case guard.
- 3 For filter and lubricator, do not use a flawed or stained case.

Caution for safety

 PLEASE READ BEFORE USING

CAUTION

(Applies to all products on the catalogue)

- 1 If necessary, use protection glove, protection glasses, and safety shoes to secure the safety when operating products.
- 2 For the easy maintenance, enough space around the product should be provided.
- 3 When mounting, flush inside thoroughly to remove chips from piping, and seal tape, rust and dusts, in order to prevent troubles such as air leak.
- 4 When screwing in the fittings, fasten with the tie torque of proper size to the connection size.
- 5 Use clean air. Equip an air filter near the equipment to remove drain, dusts and etc. Periodically remove drain from the filter.
- 6 Spindle oil and machine oil must not be used for lubrication, or the swelled packings will cause operation troubles.
- 7 Operation below the temperature 5°C must be paid the full attention since it may cause the freezing of drain.
- 8 Magnetic products such as disk card, tape, and tester must be kept away from the magnet-equipped cylinder and solenoid valve's solenoid part.
- 9 When the product is no longer available for operation or needed, discard in a proper way as an industrial waste.
- 10 Do not throw the product into fire. The product may explode or the toxic gas may be generated.

(Pneumatic Actuator)

- 1 Products should be mounted on the plane face. Mounting on the warped face causes poor accuracy, air leak and troubles.
- 2 Flaw or dent on the mounting part of the cylinder may make the uneven face.
- 3 The chafing parts of piston rod and guide rod must be free from flaw or dent. Otherwise packings got damaged and air will leak.
- 4 When the cylinder draws, be careful not to put yourself between the cylinder and the link bar at the top (Twin guide cylinder).
- 5 Products do not need lubrication since they are initially lubricated. For lubrication, use turbine oil first class (ISO VG32) or the equivalent.
- 6 Sensor switch which senses the cylinder position must not be operated in the magnetically disturbed area. It will react to the magnetism and the sensing accuracy will be disturbed.
- 7 If the two switch-equipped cylinders are mounted close in parallel, a switch may react to the another cylinder's moving magnet, and effects on the sensing accuracy.
- 8 Avoid the load over the switch's allowable maximum load.

(Pneumatic Valve. Pneumatic Accessories. Sensor Switch)

- 1 Flaw or dent on the mounting part of the cylinder may make the uneven face.
- 2 Do not use solenoid valve, pressure switch, flow switch, on foot switch in the environment where the large electric current or the strong magnetism exist.
- 3 As for solenoid valve, check in the instruction manual whether the lubrication is needed. If needed, use turbine oil first class ISO VG32 on the equivalent.
- 4 In the case of double solenoid valve, do not energize both solenoids.
- 5 Avoid the load over the switch's allowable maximum load.

Warranty period

- This warranty is effective for a period of
- 18 months (one and a half years) after shipment from Taiwan factory, or
- One year after installation or
- 2,500 hours of actual operation whichever comes first.

Exceptions to the warranty

This warranty will not apply in the following cases

- Fatigue arising due to the passage of time, natural wear and tear occurring during operation (natural fading of painted or plated surfaces, deterioration of parts subject to wear).
- Minor natural phenomena which do not effect the capabilities of the robot (noise from computers, motors, etc.).
- Damage due to earthquakes, storms, floods thunderbolt, fire or any other natural or man-made calamities.
- Troubles caused by procedures prohibited in this manual.
- Modifications to the robot not approved by sales representatives.
- Use of any other than genuine parts and specified lubricant and grease.
- Insufficiency or errors in maintenance and inspection.
- Repairs by other than authorized dealers.

In addition, we response for the failure of our own goods repair, but are not responsible for other losses caused due to.

Services coveragte

We provide customers with the following services

- Guide to installation and trial operation.
- Guide to maintenance.
- Guide to wiring technical operation and training.
- Guide to technical programming.

Product safety information

To ensure correct and safe use of industrial robots, carefully read this manual and make yourself well acquainted with the contents. FOLLOW THE WARNINGS, CAUTIONS AND INSTRUCTIONS INCLUDED IN THIS MANUAL. Warning information in this manual is shown classified into the following items.

1. Safety records

Industrial robots are highly mechanical devices that provide a large degree of freedom when performing various manipulative tasks. Failure to take necessary safety measures or mishandling due to not following the instructions in this manual may result in trouble or damage to the robot and injury to personnel (robot operator or service personnel) including fatal accidents.

DANGER

Failure to follow DANGER instructions will result in severe injury or death to the robot operator, bystanders or persons inspecting or repairing the robot.

WARNING

Failure to follow WARNING instructions could result in severe injury or death to the robot operator, bystanders or persons inspecting or repairing the robot.

CAUTION

Failure to follow CAUTION instructions may result in injury to the robot operator, bystanders or persons inspecting or repairing the robot, or damage to the robot and or robot controller.

POINTS

Key points of the sequence of operations of the Electric Slide.

Note

It is not possible to list all safety items in detail within the limited space of this manual. So it is essential that the user have a full knowledge of basic safety rules and also that the operator makes correct judgments on safety procedures during operation. This manual and warning labels supplied with or affixed to the robot are written in English. If the robot operator or service personnel does not understand English, do not permit that person to handle the robot.

2. Essential caution items

Particularly important cautions for handling or operating the robot are described below. In addition, safety information about installation, operation, inspection and maintenance is provided in each chapter. Be sure to comply with these instructions to ensure safe use of the robot.

I. Observe the following cautions during automatic operation

- Install a safeguard (protective enclosure) to keep any person from entering within the movement range of the robot and suffering injury due to being struck by moving parts.
- Install a safety interlock that triggers emergency stop when the door or panel is opened.
- Install safeguards so that no one can enter inside except from doors or panels equipped with safety interlocks.

DANGER

Serious injury or death will result from impact with moving robot.

- Keep outside of guard during operation.
- Lock out power before approaching robot.

II. Attention to hand sandwiched

Use caution to prevent hands or fingers from being pinched or crushed.

WARNING

- Moving parts can pinch or crush.
- Keep hands away from robot arms.

III. Follow the instructions on listed on warning labels and in this manual

- Be sure to read the warning labels and this manual carefully and make sure you thoroughly understand their contents before attempting installation and operation of the robot.
- Before starting robot operation, be sure to reread the procedures and cautions relating to your work as well as descriptions in this chapter ("product Safety Information").
- Never install, adjust, inspect or service the robot in any manner that does not comply with the instructions in this manual.

WARNING

- Improper installation or operation can result in serious injury or death.
- Read the owner's manual and all warning labels before operation.

IV. Do not use the robot in environments containing inflammable gas, etc.

WARNING

- This robot was not designed for operation in environments where inflammable or explosive substances are present.
- Do not use the robot in environments containing inflammable gas, dust or liquids. Explosions or fire might otherwise result.

V. Do not use the robot in locations possibly subject to electromagnetic interference, etc.

WARNING

- Avoid using the robot in locations subject to electromagnetic interference, electrostatic discharge or radio frequency interference. Malfunctions might otherwise occur.

VI. Use caution when releasing the brake of a vertical use robot

WARNING

The vertical axis will slide down when the brake is released, causing a hazardous situation.

- Press the emergency stop button and prop up the vertical axis with a support stand before releasing the brake.
- Be careful not to let your body get caught between the vertical axis and installation base when releasing the brake to perform direct teach.

VII. Provide safety measures for end effector (gripper, etc)

WARNING

- End effectors must be designed and manufactured so that they create no hazards (for example, a workpiece that comes loose) even if power (electricity, air pressure, etc.) is shut off or power fluctuations occur.
- If there is a possible danger that the object gripped by the end effector may fly off or drop, then provide appropriate safety protection taking into account the object size, weight, temperature and chemical properties.

VIII. Use caution when removing the motor. (Vertical use robots)

 **WARNING**

The vertical axis will slide down when the motor is released, causing a hazardous situation.

- Turn off the robot controller and prop up the vertical axis with a support stand before removing the motor.
- Be careful not to let your body get caught between the vertical axis parts and installation base.

IX. Take the following safety precautions during inspection of controller.

 **WARNING**

- When you need to touch the terminals or connectors on the outside of the controller during inspection, always first turn off the controller power switch and also the power source in order to prevent possible electrical shock.
- Never touch any internal parts of the controller.

X. Consult us for corrective action when the robot is damaged or malfunctions occur.

 **WARNING**

If any part of the robot is damaged or any malfunction occurs, continuing the operation may be very dangerous. Please consult your sales office or dealer for corrective action.

XI. Be careful not to touch the motor or speed reduction gear casing when hot

 **WARNING**

The motor and speed reduction gear casing are extremely hot after automatic operation, so burns may occur if these are touched. Before handling these parts during inspection or servicing, turn off the controller, wait for a while and check that the part has cooled.

XII. Do not remove, alter or stain the warning labels.

 **WARNING**

- Do not remove, alter or stain the warning labels on the robot.
- Do not allow the warning labels to be hidden by devices installed onto the robot by the user.
- Provide proper lighting so that the symbols and instructions on the warning labels can be clearly seen even from outside the safeguard enclosure.

XIII. Protective bonding.

 **WARNING**

Be sure to ground the robot and controller to prevent electrical.

XIV. Be sure to make correct parameter settings.

 **WARNING**

The robot must be operated with correct tolerable moment of inertia and acceleration coefficients according to the manipulator tip mass and moment of inertia. If there are not correct, drive unit service life may end prematurely, and damage to robot parts or residual vibration during positioning may result.

3. Robot safety functions

I. Overload detection

This function detects an overload applied to the motor and shuts off the servo power.

II. Soft limits

Soft limits can be set on each axis to limit the working envelope in manual operation after return-to-origin and during automatic operation. Note: The working envelope is the area limited by soft limits.

III. Mechanical stoppers

If the servo power is suddenly shut off during high-speed operation by emergency stop or safety functions, these mechanical stoppers prevent the axis from exceeding the movement range.

No mechanical stopper is provided on the rotating axis.

Note: The movement range is the area limited by mechanical stoppers.

WARNING

Axis movement will not stop immediately after the servo power supply is shut off by emergency stop or other safety functions.

IV. Vertical axis brake

An electromagnetic brake is installed on the vertical use robot to prevent the vertical axis from sliding down when servo power is turned off. This brake is working when the controller is off or the vertical axis servo power is off even when the controller is on. The vertical axis brake can be released by means of the programming unit or by a command in the program when the controller is on.

WARNING

The vertical axis will slide down when the brake is released, creating a hazardous situation.

- Press the emergency stop button and prop the vertical axis with a support stand before releasing the brake.
- Use caution not to let your body get caught between the vertical axis and installation base when releasing the brake to perform direct teach.

4. Safety measures for the system

Since the robot is commonly used in conjunction with an automated system, dangerous situations are more likely to occur from the automated system than from the robot itself. Accordingly, appropriate safety measures must be taken on the part of the system manufacturer according to the individual system. The system manufacturer should provide a proper instruction manual for safe, correct operation and servicing of the system.

5. Trial operation

After making installations, adjustments, inspections, or maintenance or repairs to the robot, make a trial run using the following procedures.

I. If a safeguard enclosure has not yet been provided right after installation of the robot

Rope off or chain off around the movement area of the manipulator in place of the safeguard, and observe the following points.

- ① Use sturdy, stable posts which will not fall over easily.
- ② The rope or chain should be easily visible by everyone around the robot.
- ③ Place a sign to keep the operator or other personnel from entering the movement range of the manipulator.

II. Check the following points before turning on the controller

- ① Is the robot securely and correctly installed?
- ② Are the electrical connections to the robot correct?
- ③ Are items such as air pressure correctly supplied?
- ④ Is the robot correctly connected to peripheral equipment?
- ⑤ Have safety measures (safeguard enclosure, etc.) been taken?
- ⑥ Does the installation environment meet the specified standards.

III. After the controller is turned on, check the following points from outside the safeguard enclosure

- ❶ Does the robot start and stop as intended? Can the operation mode be selected correctly?
- ❷ Does each axis move as intended within the soft limits?
- ❸ Does the end effector move as intended?
- ❹ Are the signal transmissions to the end effector and peripheral equipment correct?
- ❺ Does emergency stop work?
- ❻ Are the teaching and playback functions normal?
- ❼ Are the safeguard enclosure and interlock working as intended?
- ❽ Does the robot move correctly during automatic operation?

6. Work within the safeguard enclosure

I. Work within the safeguard enclosure

When work is required inside the safeguard enclosure, always turn off the controller and place a sign indicating that the robot is being adjusted or serviced in order to keep any other person from touching the controller switch or operation panel, except for the following cases.

- ❶ Soft limit settings
- ❷ Teaching
For item 1, follow the precautions and procedure for each section.
To perform item 2, refer to the description in II. below.

II. Teaching

When performing teaching within the safeguard enclosure, comply with the instructions listed below.
Check or perform the following points from outside the safeguard enclosure.

- ❶ Make sure that no hazards are present within the safeguard enclosure by a visual check.
- ❷ Check that the programming unit MPB or DPB operates correctly.
- ❸ Check that no failures are found in the robot.
- ❹ Check that emergency stop works correctly.
- ❺ Select teaching mode and prohibit automatic operation.

Never enter the movement range of the manipulator while within the safeguard enclosure.

7. Automatic operation

I. Automatic operation described here includes all operations in AUTO mode

Check the following before starting automatic operation. No one is within the safeguard enclosure.
The programming unit and tools are in their specified locations.
The alarm or error lamps on the robot and peripheral equipment do not flash.
The safeguard enclosure is securely installed with safety interlocks actuated.

II. Observe the following during automatic operation or in cases where an error occurs

- ❶ After automatic operation has started, check the operation status and warning lamp to ensure that the robot is in automatic operation.
- ❷ Never enter the safeguard enclosure during automatic operation.
- ❸ If an error occurs in the robot or peripheral equipment, observe the following procedure before entering the safeguard enclosure.
 - a. Press the emergency stop button to set the robot to emergency stop.
 - b. Place a sign on the start switch, indicating that the robot is being inspected in order to keep any other person from touching the start switch and restarting the robot.

8. Adjustment and inspection

Do not attempt any installation, adjustment, inspection or maintenance unless it is described in this manual.

9. Repair and modification

Do not attempt any repair, parts replacement and modification unless described in this manual. These works require technical knowledge and skill, and may also involve work hazards.

Caution for safety

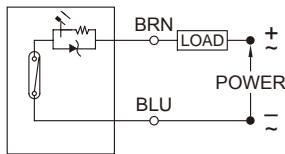
⚠️ SENSOR SWITCH

Technical information

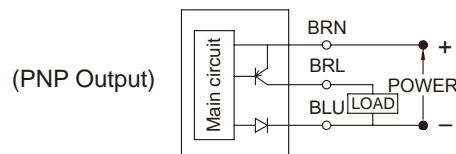
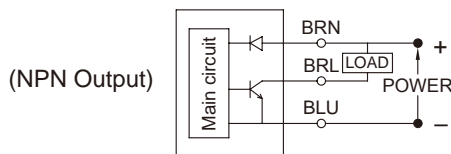
⚠️ WARNING

(Do not exceed specification, permanent damage to the sensor may occur.)

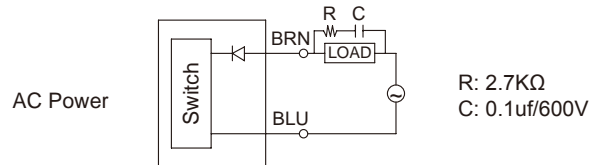
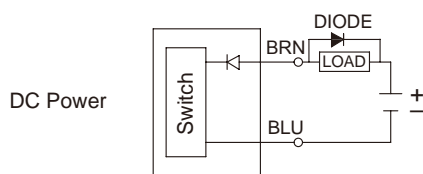
- For reed switch type sensors, polarity must also be observed for the proper functioning of LED. Connect the brown wire in series with load positive (+) and the blue wire to negative (-) of power source. If the polarity is reversed, reed switch remains functional but LED will remain in "OFF" state.



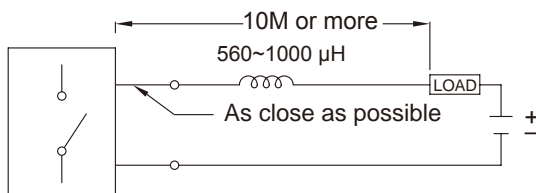
- For solid-state type sensors, polarity must also be observed. Connect brown wire to the positive (+) and the blue to the negative (-) of DC power source. The black wire must connect to the load only. If the black wire is accidentally connected to the power source, permanent damage to the sensor may occur.



- An external protection circuit may be required if the reed switch is used with inductive load, such as relay or solenoid. For DC inductive load, attach an external diode parallel to the load and use R-C circuit parallel with AC inductive load as illustrated below.



- Keep sensors away from stray magnetic field to prevent malfunctions.
- When using reed switch with capacitive load or if the lead wire length exceed 10-meter, an inductor must be installed in series with the sensor to prevent damage (Sticking effect).



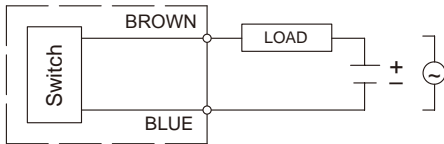
Caution for safety

⚠️ SENSOR SWITCH

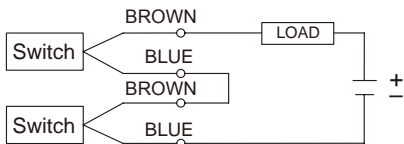
Connection method

2 wire S.W. connection

► General connection

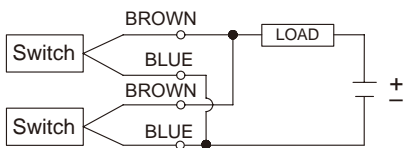


► Series connection (AND)



- ❶ When connecting 2-wire switches in series (AND), don't exceed more than two switches due to the internal voltage drop (Typical V drop=2.5~4V per switch). Excessive Voltage drop will cause non-operation of the load.

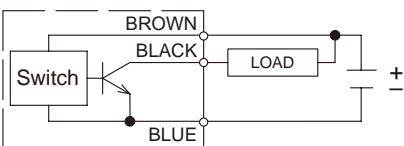
► Parallel connection (OR)



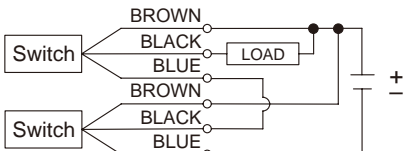
- ❶ When connecting non-contact 2-wire switches in parallel (OR), leakage current will increase and cause improper load operation.
- ❷ When connecting 2-wire reed switches in parallel(OR), possible concurrent operation will cause dim LED illumination due to lower current distribution.

3 wire NPN connection

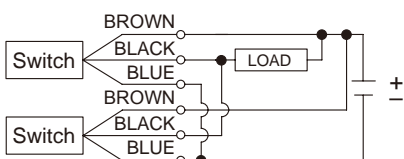
► General connection



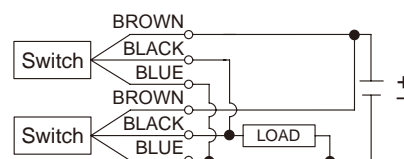
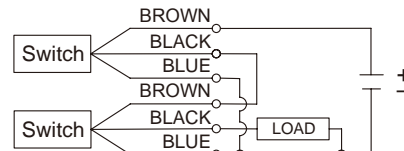
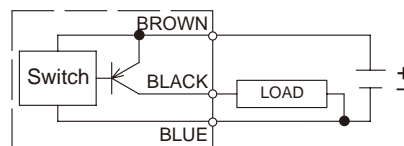
► Series connection (AND)

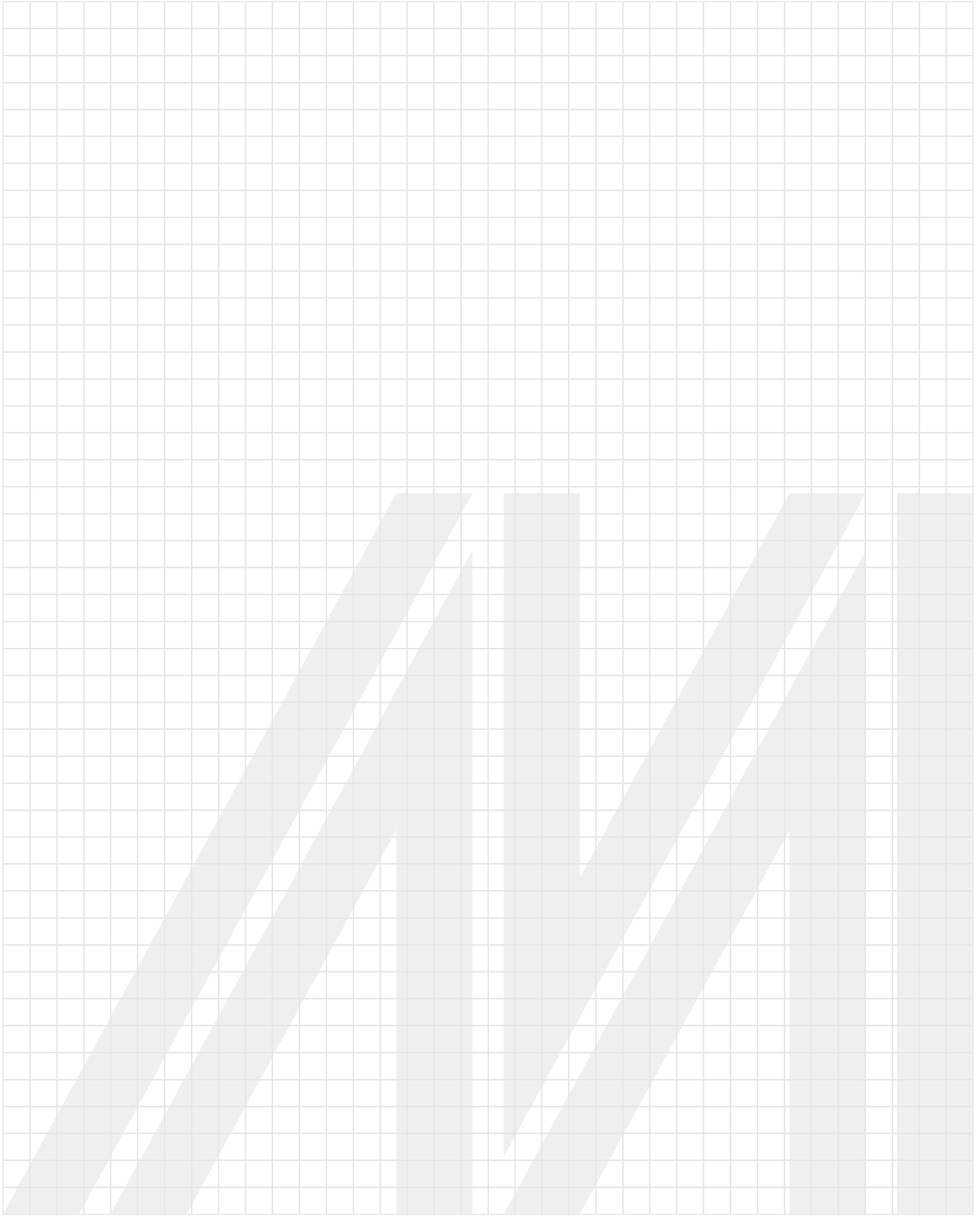


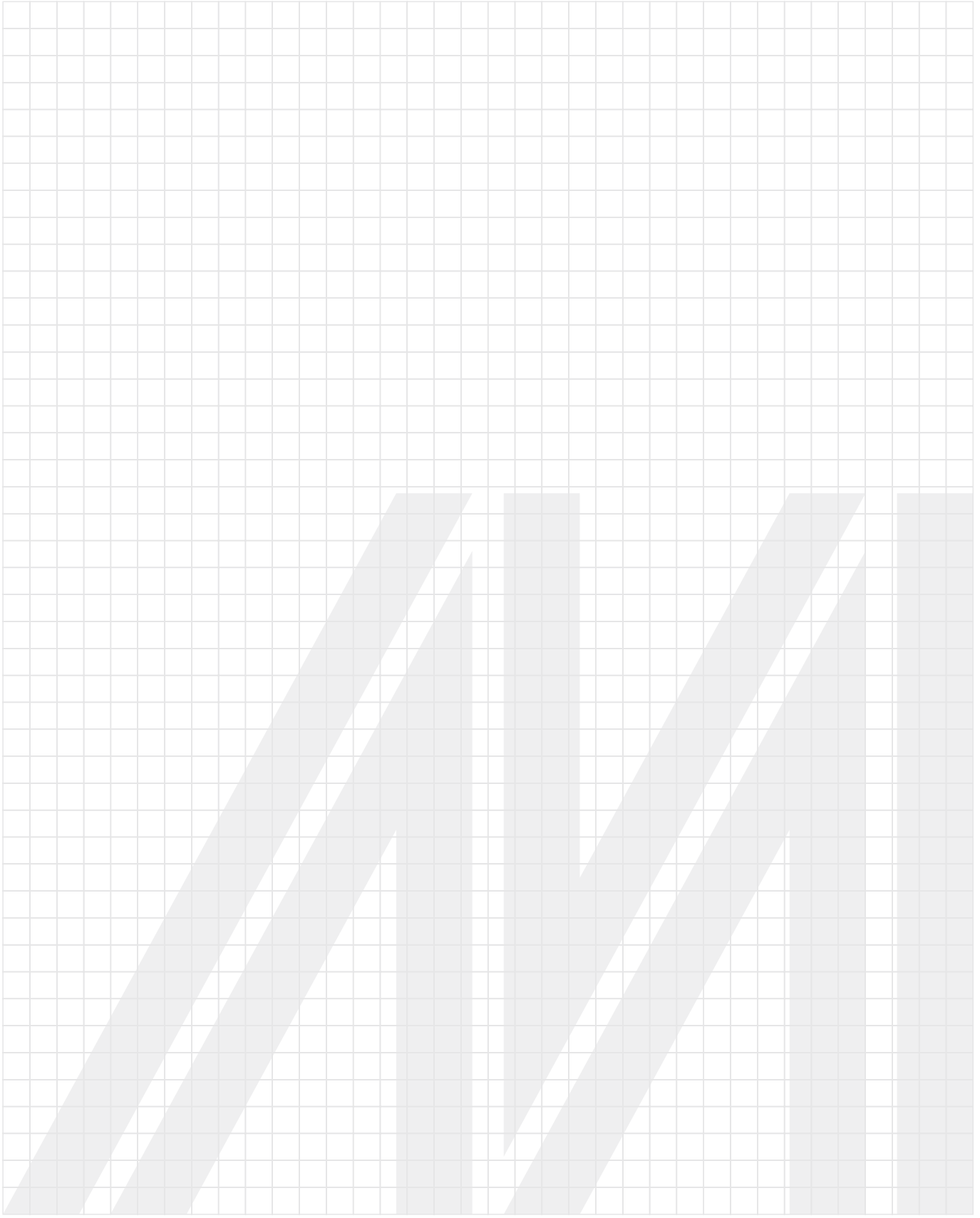
► Parallel connection (OR)

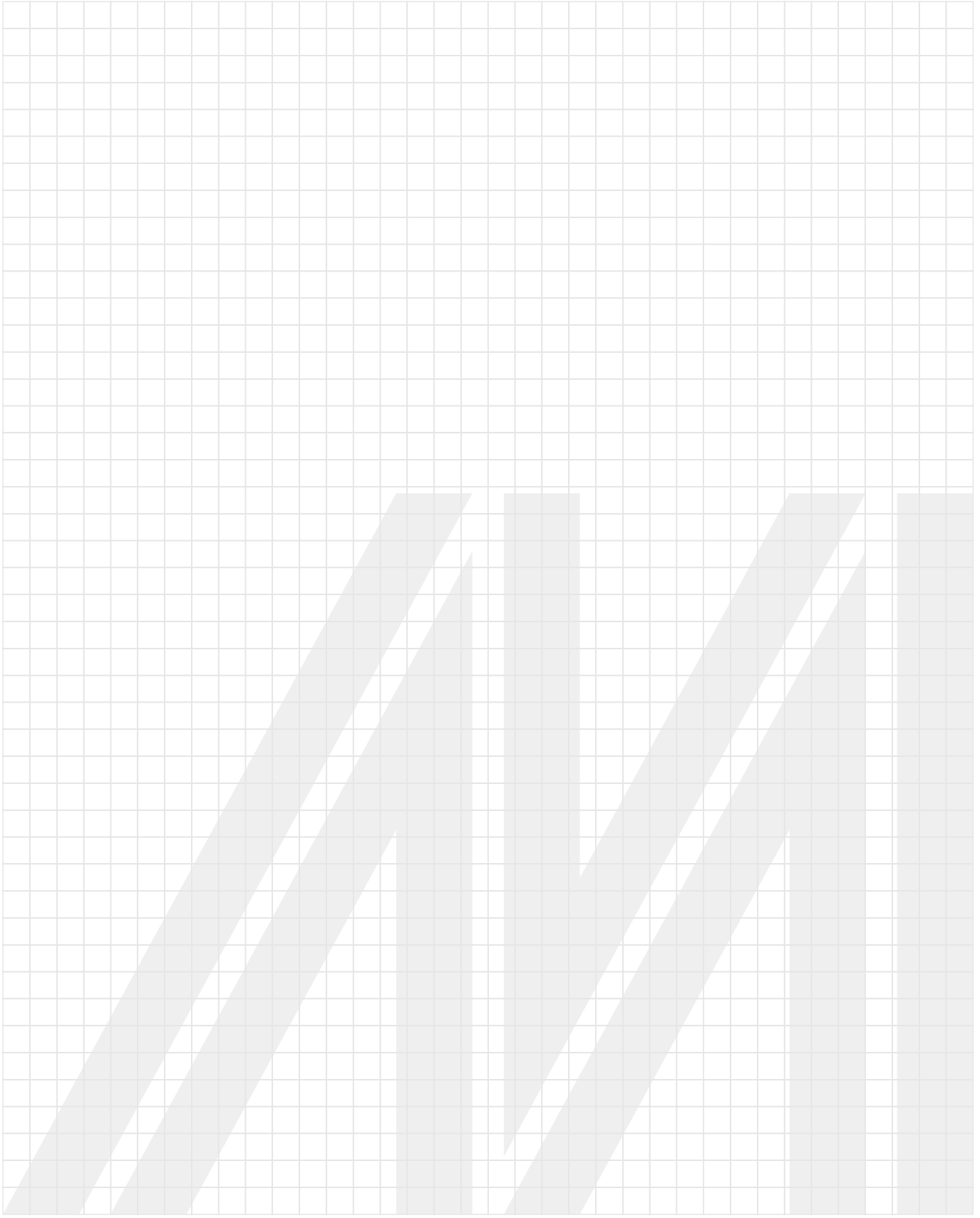


3 wire PNP connection













The
specifications
are subject to
change without
advance notice.

CAT. NO.: MD2006-E3

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