

Parallel Style Wide Opening Air Gripper

Series MHL2

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

MRHQ

Misc.

D-

20-

Parallel Style Wide Opening Air Gripper

Series MHL2

Size: 10, 16, 20, 25, 32, 40

How to Order

MHL 2-16 D 1-Y7BW S

Wide opening

Number of fingers

2 2 fingers

Bore size

10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm

Action

D Double acting

Opening/Closing stroke (mm)

Symbol	ø10	ø16	ø20	ø25	ø32	ø40
Nil	20	30	40	50	70	100
1	40	60	80	100	120	160
2	60	80	100	120	160	200

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch (Built-in magnet)
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* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 12-13-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *			Pre-wire connector	Applicable load		
							Electrical entry		0.5 (Nil)	3 (L)	5 (Z)				
					DC	AC	Perpendicular	In-line							
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V 12 V	—	Y69A	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7PV	Y7P	●	●	○	○		
				2-wire				12 V	Y69B	Y59B	●	●	○	○	
	Diagnosis (2-color indication)			3-wire (NPN)	5 V 12 V	Y7NWV	Y7NW	●	●	○	○	IC circuit			
				3-wire (PNP)		Y7PWV	Y7PW	●	●	○	○				
				Water resistant (2-color indication)		2-wire	12 V	Y7BWV	Y7BW	●	●	○	○	—	
	—				Y7BA			—	●	○	○				

* Lead wire length symbols: 0.5 m Nil (Example) Y59A
3 m L (Example) Y59AL
5 m Z (Example) Y59AZ

* Auto switches marked with a "○" symbol are produced upon receipt of order.

• Take note of hysteresis with 2-color indication type switches. Refer to "Auto Switch Hysteresis" on page 12-4-7.



Refer to page 12-13-25 for solid state switch with pre-wire connector.

Parallel Style Wide Opening Air Gripper **Series MHL2**

One unit can handle workpieces with various diameters

A large amount of gripping force is provided through the use of a double piston mechanism, while maintaining a compact design

Double end type oil impregnated resin bearings with a metal backing are used for all shafts

Fingers synchronized by a rack and pinion mechanism

Built-in dust-protection mechanism

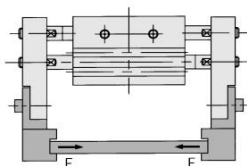
A high degree of freedom for mounting

Auto switch mountable



P. 12-4-7

JIS Symbol



Specifications

Bore size (mm)	10	16	20	25	32	40
Fluid	Air					
Action	Double acting					
Operating pressure (MPa)	0.15 to 0.6	0.1 to 0.6				
Ambient and fluid temperature	-10 to 60°C					
Repeatability	±0.1					
Lubrication	Not required					
Effective gripping force (N) at 0.5 MPa	14	45	74	131	228	396



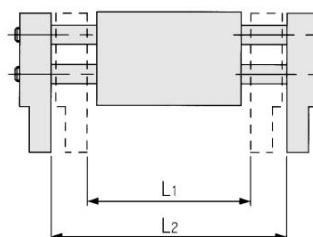
Note) Gripping point = Bore size 10, 16, 20, 25: 40 mm, Bore size 32, 40: 80 mm.

Model/Stroke

Model	Bore size (mm)	Max. operating frequency (c.p.m.)	Opening/Closing stroke (mm) L2 - L1	Width at closing (mm) L1	Width at opening (mm) L2	Weight (g)
MHL2-10D□	10	60	20	56	76	280
MHL2-10D1		40	40	78	118	345
MHL2-10D2			60	96	156	425
MHL2-16D□	16	60	30	68	98	585
MHL2-16D1		40	60	110	170	795
MHL2-16D2			80	130	210	935
MHL2-20D□	20	60	40	82	122	1025
MHL2-20D1		40	80	142	222	1495
MHL2-20D2			100	162	262	1690
MHL2-25D□	25	60	50	100	150	1690
MHL2-25D1		40	100	182	282	2560
MHL2-25D2			120	200	320	2775
MHL2-32D□	32	30	70	150	220	2905
MHL2-32D1		20	120	198	318	3820
MHL2-32D2			160	242	402	4655
MHL2-40D□	40	30	100	188	288	5270
MHL2-40D1		20	160	246	406	6830
MHL2-40D2			200	286	486	7905



Note) The open and close time spans represent the value when the exterior of the workpiece is being held.



⚠ Precautions

Be sure to read before handling.

Refer to pages 12-15-3 to 12-15-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 12-1-4 to 12-1-6 for Precautions on every series.

⚠ Warning

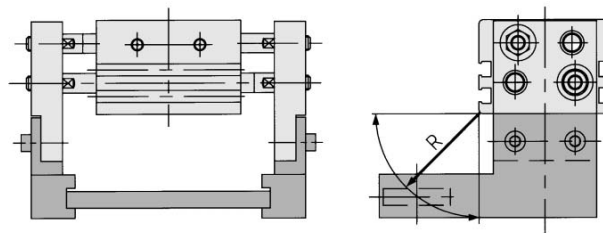
If a workpiece is hooked onto the attachment, make sure that excessive impact will not be created at the start and the end of the movement.

Failure to observe this precaution may result in shifting or dropping the workpiece, which could be dangerous.

Series MHL2

Gripping Point

- The workpiece gripping point distance should be within the gripping force ranges given for each pressure in the effective gripping force graphs below.
- If operated with the workpiece gripping point beyond the indicated ranges, the load that will be applied to the fingers or the guide will become excessively unbalanced. As a result, the fingers could become loosened and adversely affect the service life of the unit.



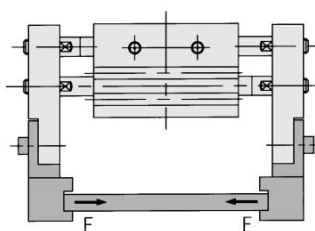
R: Gripping position (mm)

Effective Gripping Force

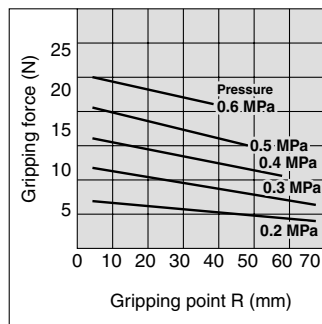
Indication of effective gripping force

The gripping force shown in the tables represents the gripping force of one finger when all fingers and attachments are in contact with the work.

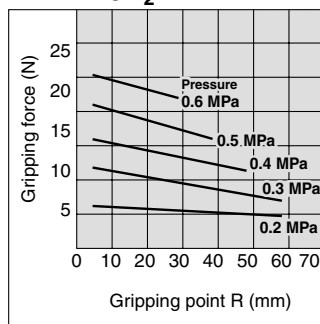
F = one finger thrust.



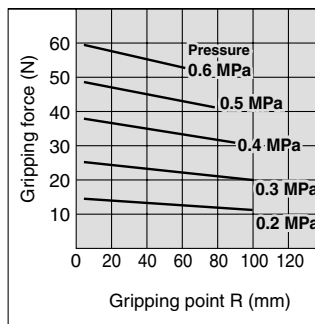
MHL2-10D



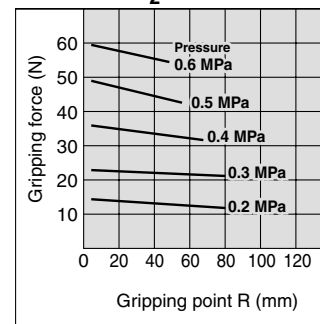
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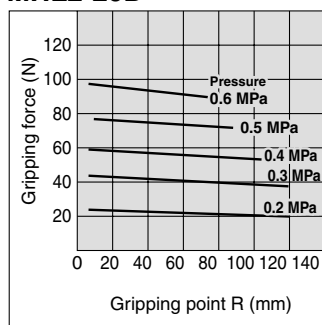
MHL2-16D



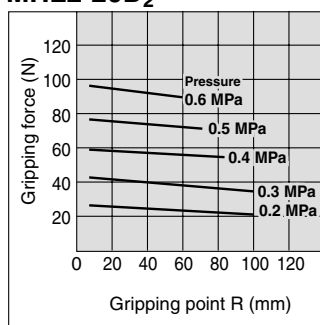
MHL2-16D₁



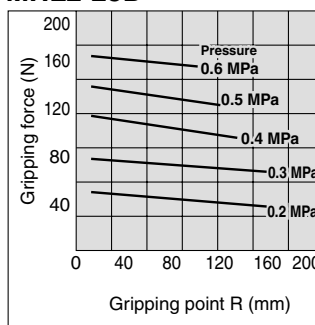
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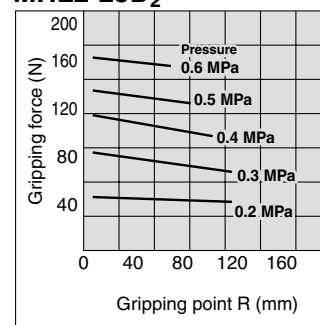
MHL2-20D₁



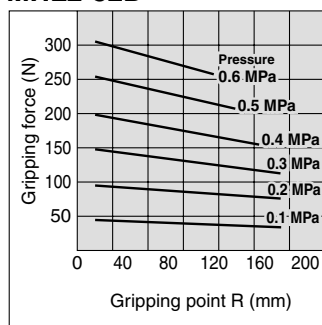
MHL2-25D



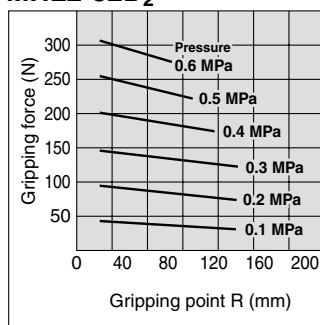
MHL2-25D₁



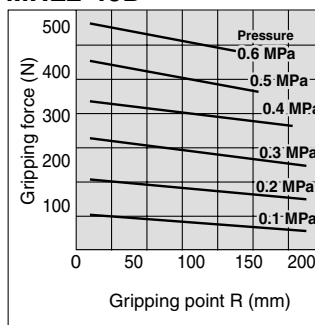
MHL2-32D



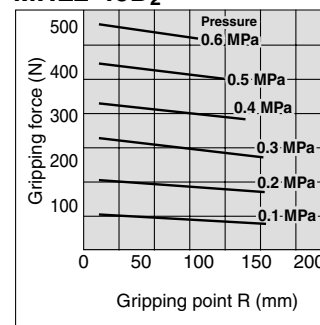
MHL2-32D₁



MHL2-40D

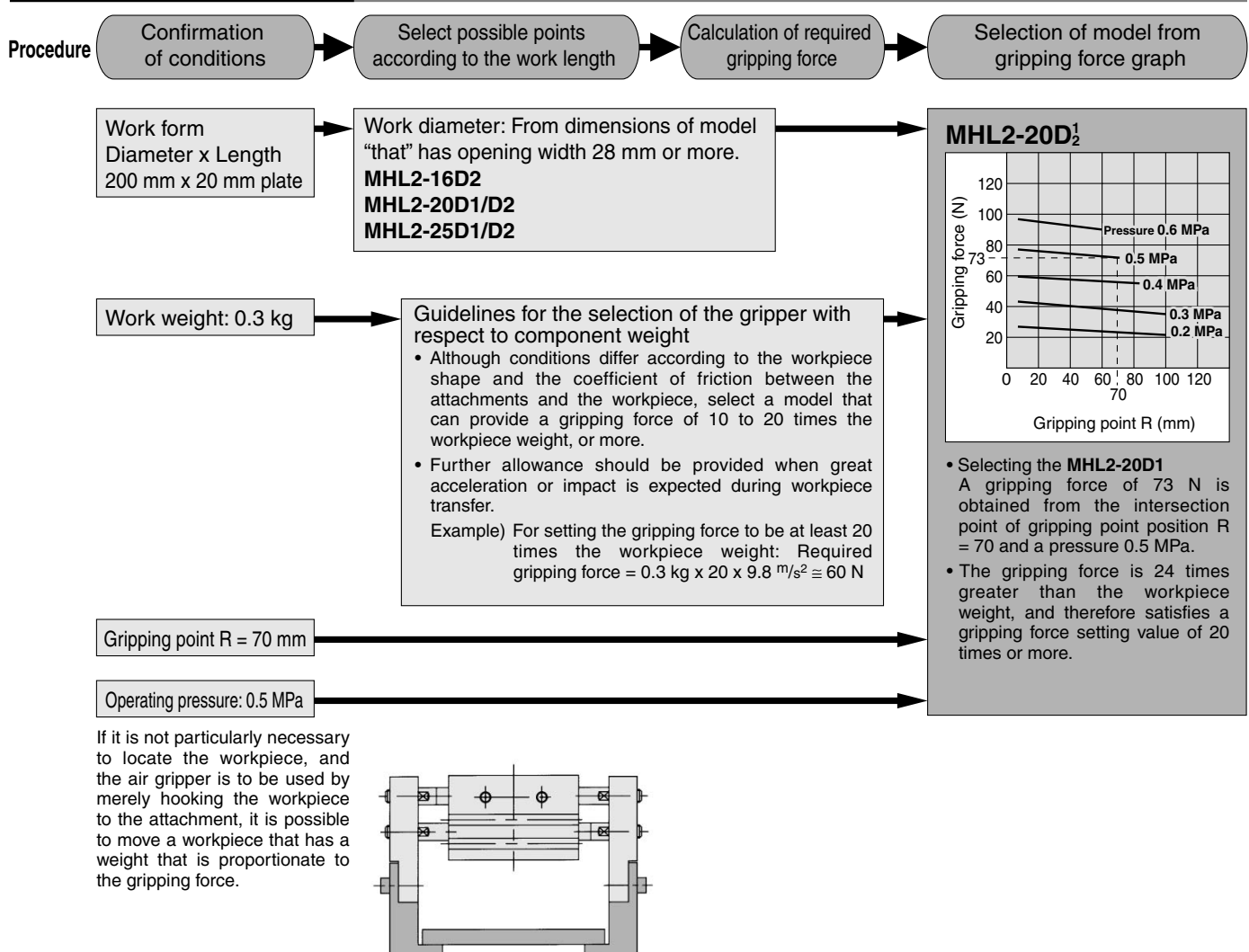


MHL2-40D₁



Parallel Style Wide Opening Air Gripper **Series MHL2**

Model Selection Example



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

MRHQ

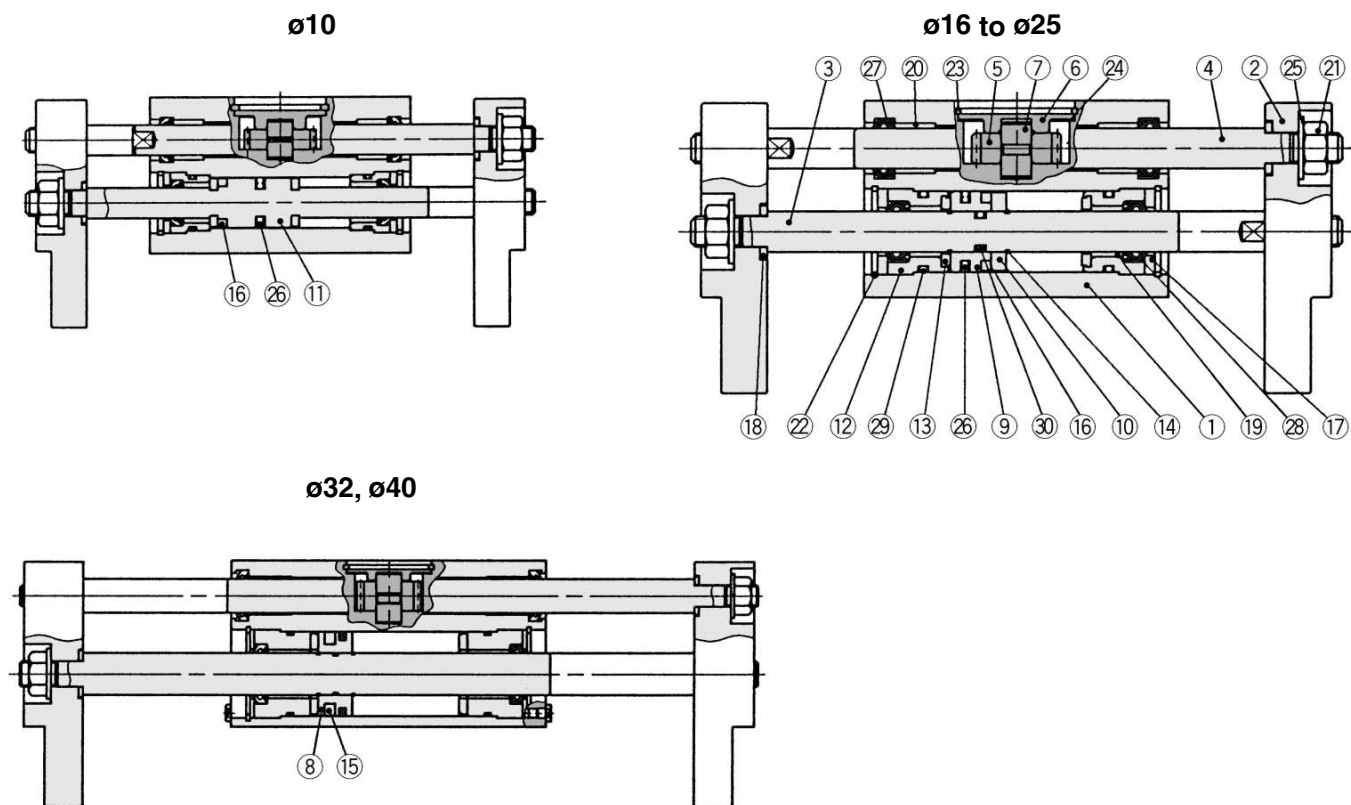
Misc.

D-

20-

Series MHL2

Construction



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Finger	Aluminum alloy	Hard anodized
③	Piston rod	Stainless steel	
④	Rack	Stainless steel	
⑤	Pinion	Carbon steel	
⑥	Pinion cover	Carbon steel	Electroless nickel plated
⑦	Pinion axis	Stainless steel	Nitrided
⑧	Piston	Brass	
⑨	Piston A	Brass	
⑩	Piston B	Brass	
⑪	Piston A	Stainless steel	
⑫	Rod cover	Aluminum alloy	Chromate treated
⑬	Bumper	Urethane rubber	
⑭	Clip	Stainless steel spring wire	
⑮	Rubber magnet	Synthetic rubber	

No.	Description	Material	Note
⑮	Magnet	Magnetic material	Nickel plated
⑰	Rod seal cover B	Cold rolled steel	Electroless nickel plated
⑱	Washer	Stainless steel	Nitrided
⑲	Bearing	Oil containing polyacetal with back metal	
⑳	Bearing	Oil containing polyacetal with back metal	
㉑	U nut	Carbon steel	Nickel plated
㉒	R-shape snap ring	Carbon steel	Nickel plated
㉓	Type C snap ring	Carbon steel	Nickel plated
㉔	Wave washer	Steel for spring	Phosphate coated
㉕	Conical spring washer	Carbon steel	Nickel plated

Replacement Parts

Description		MHL2-10□	MHL2-16□	MHL2-20□	MHL2-25□	MHL2-32□	MHL2-40□	Main parts
Seal kit		MHL10-PS	MHL16-PS	MHL20-PS	MHL25-PS	MHL32-PS	MHL40-PS	②⑥⑦⑨⑩⑫⑬⑭
Piston assembly	MHL2-□□□D	MHL-A1001	MHL-A1601	MHL-A2001	MHL-A2501	MHL-A3201	MHL-A4001	<ø10> ⑪⑬⑮⑯
	MHL2-□□□D1	MHL-A1002	MHL-A1602	MHL-A2002	MHL-A2502	MHL-A3202	MHL-A4002	<ø16 to ø25> ③⑨⑩⑫⑬⑭⑮⑯⑰
	MHL2-□□□D2	MHL-A1003	MHL-A1603	MHL-A2003	MHL-A2503	MHL-A3203	MHL-A4003	<ø32, ø40> ③⑧⑫⑬⑮⑯⑰⑱
Rack assembly	MHL2-□□□D	MHL-A1004	MHL-A1604	MHL-A2004	MHL-A2504	MHL-A3204	MHL-A4004	④⑩
	MHL2-□□□D1	MHL-A1005	MHL-A1605	MHL-A2005	MHL-A2505	MHL-A3205	MHL-A4005	
	MHL2-□□□D2	MHL-A1006	MHL-A1606	MHL-A2006	MHL-A2506	MHL-A3206	MHL-A4006	
Rod Cover assembly		MHL-A1007	MHL-A1607	MHL-A2007	MHL-A2507	MHL-A3207	MHL-A4007	<ø10> ⑫⑬⑭⑮⑯⑰⑱⑲ <ø16 to ø40> ⑫⑬⑭⑮⑯⑰⑱⑲
Finger assembly		MHL-A1008	MHL-A1608	MHL-A2008	MHL-A2508	MHL-A3208	MHL-A4008	②⑮⑯⑰⑱
Pinion assembly		MHL-A1009	MHL-A1609	MHL-A2009	MHL-A2509	MHL-A3209	MHL-A4009	⑤⑥⑦⑮⑱⑲

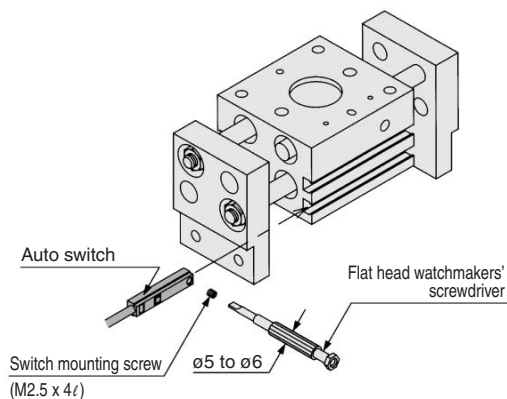
* Order 1 pinion assembly per one unit.

* As for finger assembly, piston assembly, rack assembly, order 2 pieces per one unit.

Parallel Style Wide Opening Air Gripper **Series MHL2**

Mounting of Auto Switch

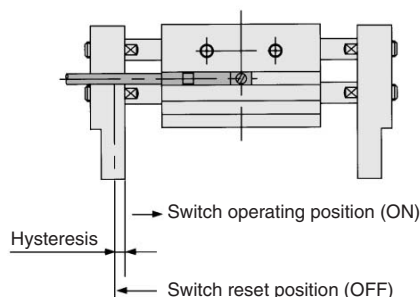
To set the auto switch, insert the auto switch into the installation groove of the gripper from the direction indicated in the following drawing. After setting the position, tighten the attached switch mounting set screw with a flat head watchmakers' screwdriver.



Note) Use a watchmakers' screwdriver with a grip diameter of 5 to 6 mm to tighten the auto switch set screw. Use a tightening torque of 0.05 to 0.1 N·m. As a rough guide, tighten the screw an additional 90° after feeling a tight resistance. As a rule, it should be turned about 90° beyond the point at which tightening can be felt.

Auto Switch Hysteresis

Auto switch hysteresis is as follows. Please refer to the table as a guide when setting auto switch positions.



Air gripper model	Auto switch model		
	D-Y59□, D-Y7P□, D-Y69□, D-Y7PV□	D-Y7□W□, D-Y7□WV□	D-Y7BAL
MHL2-10D□	0.8	0.6	0.5
MHL2-16D□	0.5	0.3	0.2
MHL2-20D□	0.5	0.2	0.2
MHL2-25D□	0.2	0.2	0.1
MHL2-32D□	0.4	0.7	0.4
MHL2-40D□	0.2	0.7	0.4

(mm)

Made to Order Specifications:



1 Oil Resistant Specifications -X5

MHL2- **Bore size** D **Stroke symbol** - **Solid state switch** -X5

The packing class has been revised to adopt oil resistant materials for using it in an environment with splashing of cut liquid splashing etc.

Specifications

Type	Oil resistant type
Bore size (mm)	10, 16, 20, 25, 32, 40
Action	Double acting
Fluid	Air
Material	Seal, Gasket—Fluoro rubber
Applicable auto switch	D-Y7BAL



Note 1) Some liquid may make the use of an air gripper or auto switch impossible. Confirm the kind of the questionable liquid, and please consult with SMC for the use.

Note 2) Dimensions are the same as the standard type.

2 Heat Resistant Specifications -X4

MHL2- **Bore size** D **Stroke symbol** -X4

The packing class has been revised to adopt heat resistant materials for using it at a high temperature of up to 100°C.

Specifications

Type	Heat resistant type
Bore size (mm)	10, 16, 20, 25, 32, 40
Action	Double acting
Fluid	Air
Material	Seal, Gasket—Fluoro rubber

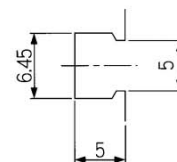
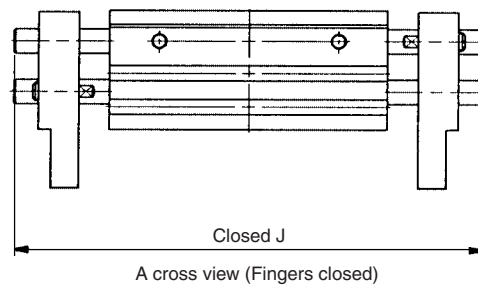
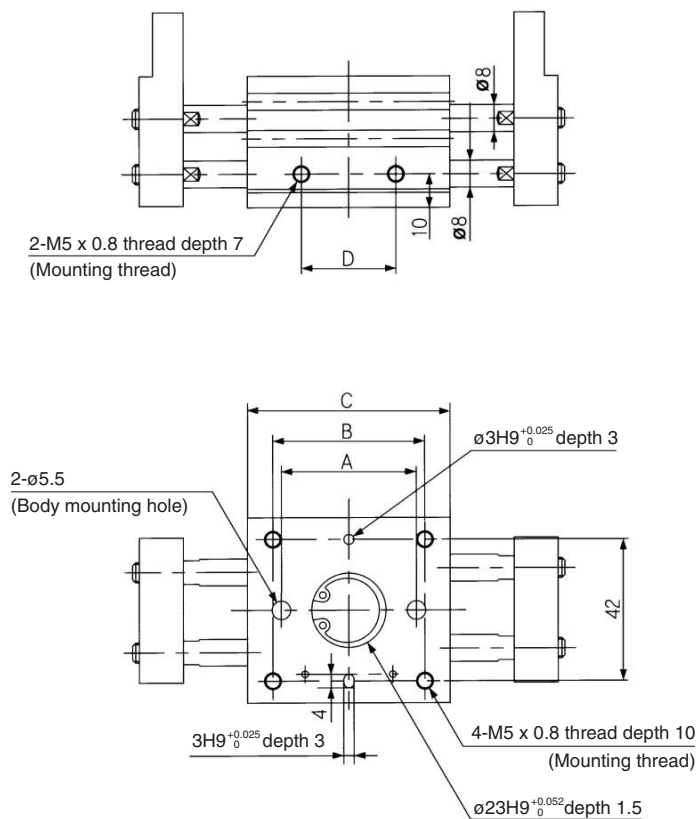


Note 1) Not available with auto switches.

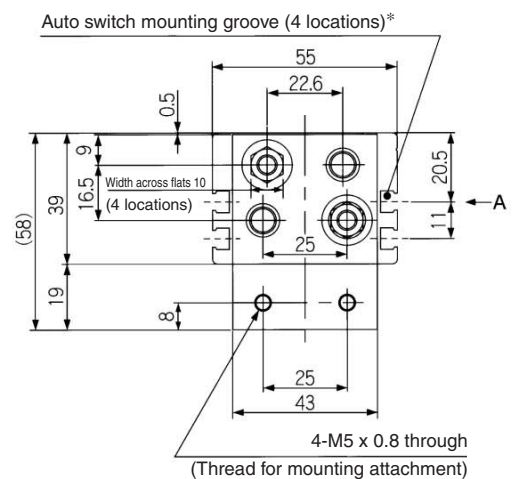
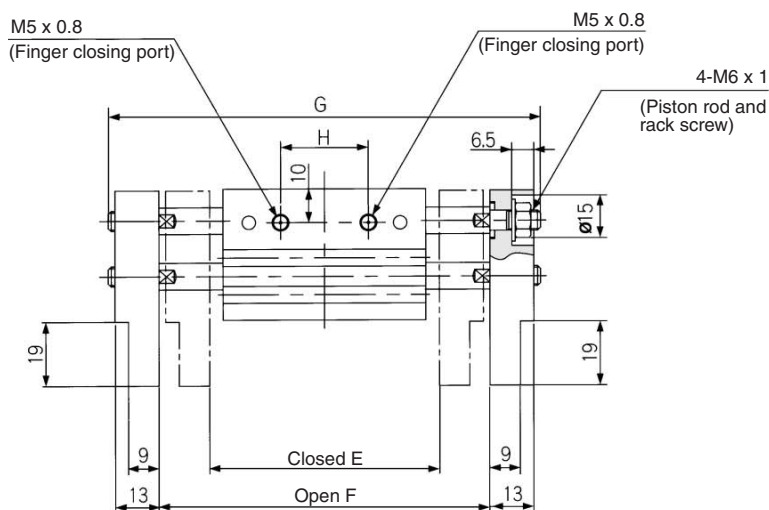
Note 2) Dimensions are the same as the standard type.

Dimensions

MHL2-16D ☐



* Dimensions of auto switch mounting groove (Enlarged view)



	(mm)								
Model	A	B	C	D	E	F	G	H	J
MHL2-16D	40	45	60	28	68	98	128	26	98
MHL2-16D1	70	75	90	58	110	170	200	50	152
MHL2-16D2	90	95	110	78	130	210	240	70	192



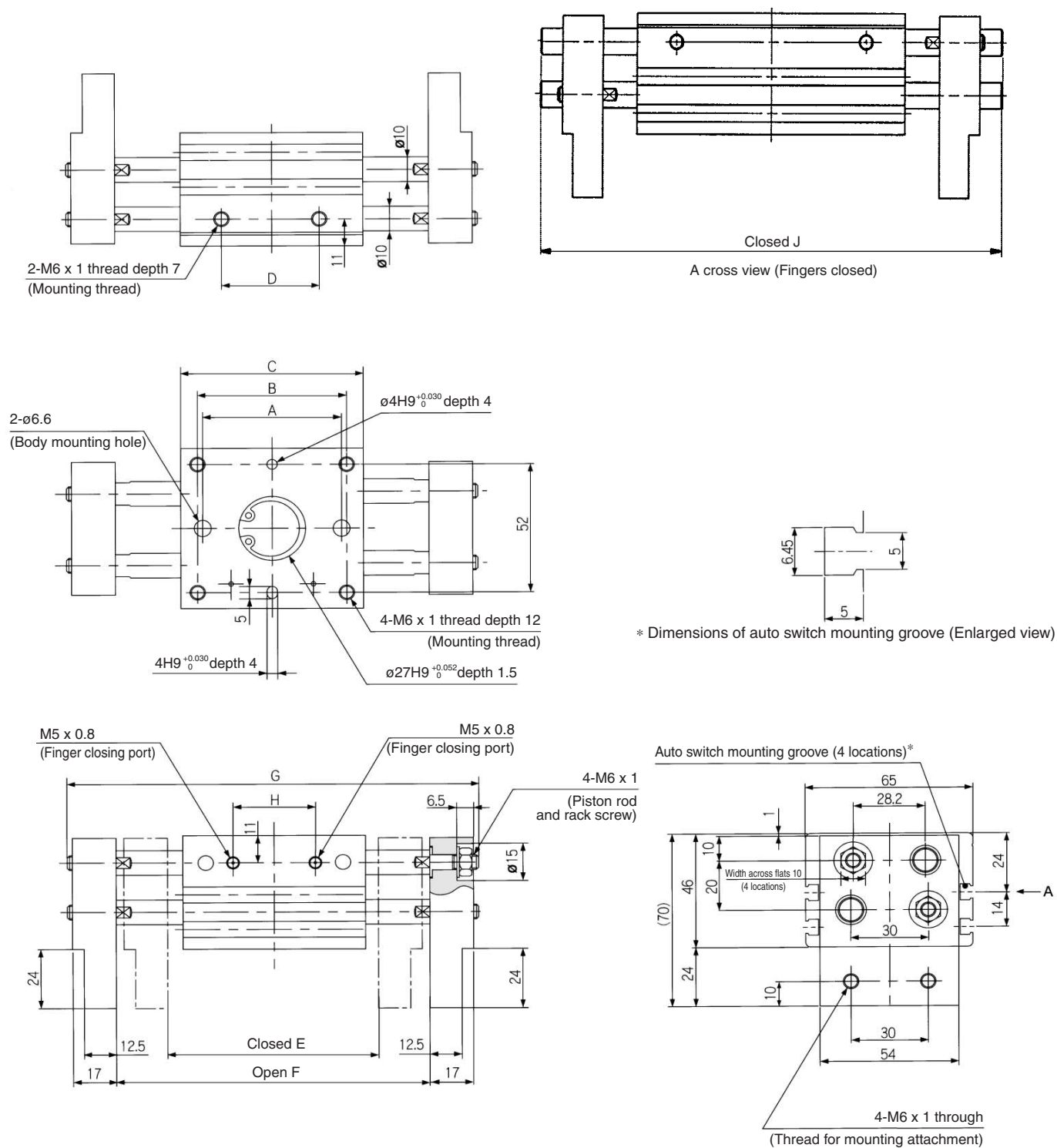
Note 1) J dimension is at fully closed.

Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

Series MHL2

Dimensions

MHL2-20D□



(mm)

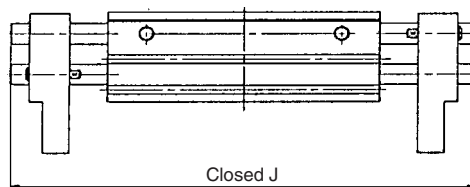
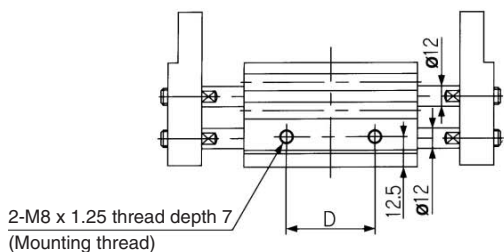
Model	A	B	C	D	E	F	G	H	J
MHL2-20D	54	58	71	38	82	122	160	32	120
MHL2-20D1	96	100	113	80	142	222	260	68	195
MHL2-20D2	116	120	133	100	162	262	300	88	235

- Note 1) J dimension is at fully closed.
- Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

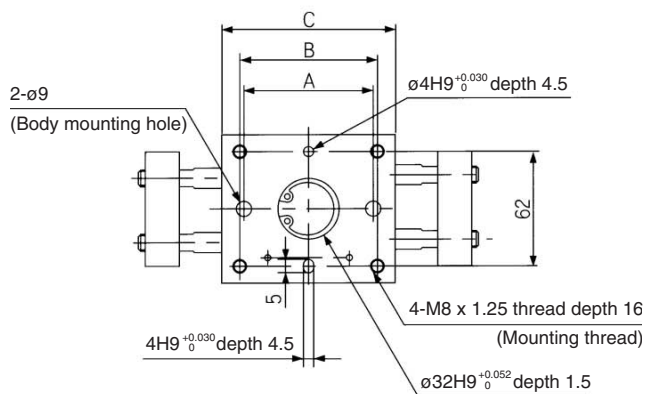
Parallel Style Wide Opening Air Gripper **Series MHL2**

Dimensions

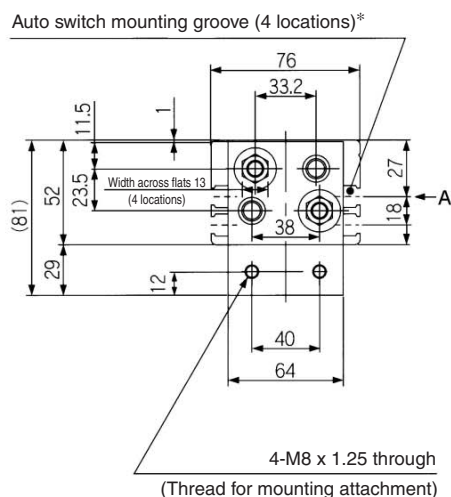
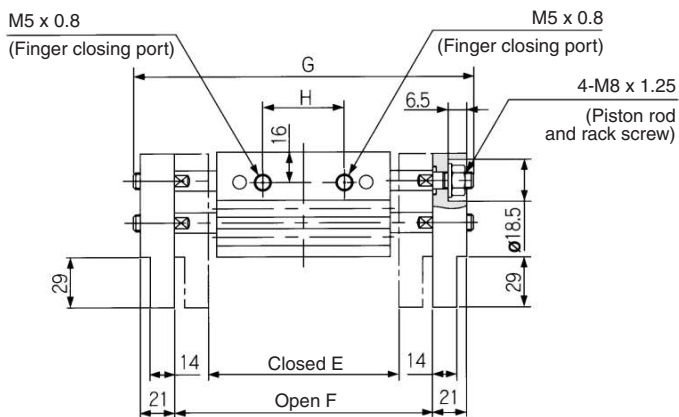
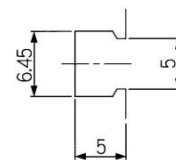
MHL2-25D□



A cross view (Fingers closed)



* Dimensions of auto switch mounting groove (Enlarged view)



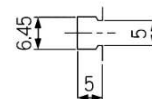
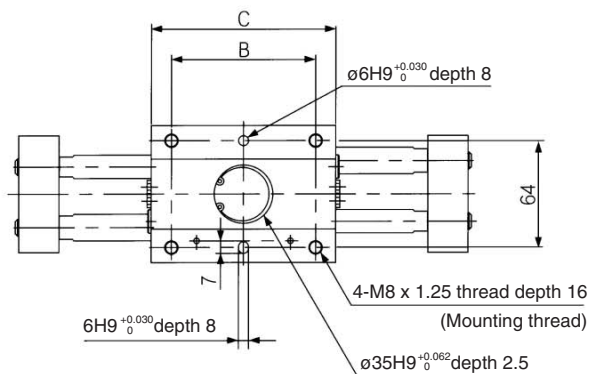
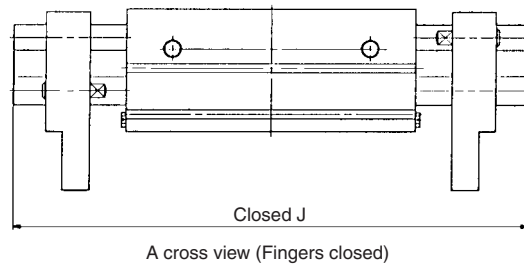
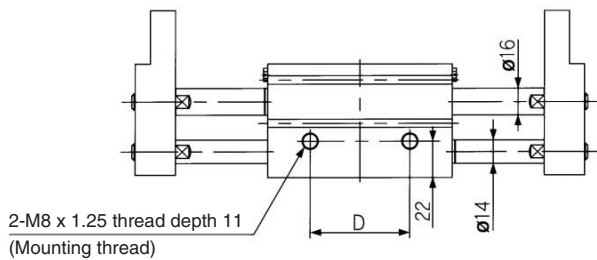
Model	A	B	C	D	E	F	G	H	J
MHL2-25D	66	70	88	48	100	150	196	38	146
MHL2-25D1	120	124	142	102	182	282	328	86	244
MHL2-25D2	138	142	160	120	200	320	366	104	282

Note 1) J dimension is at fully closed.
 Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

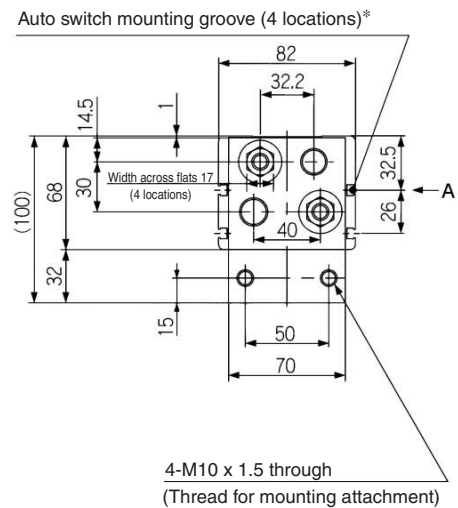
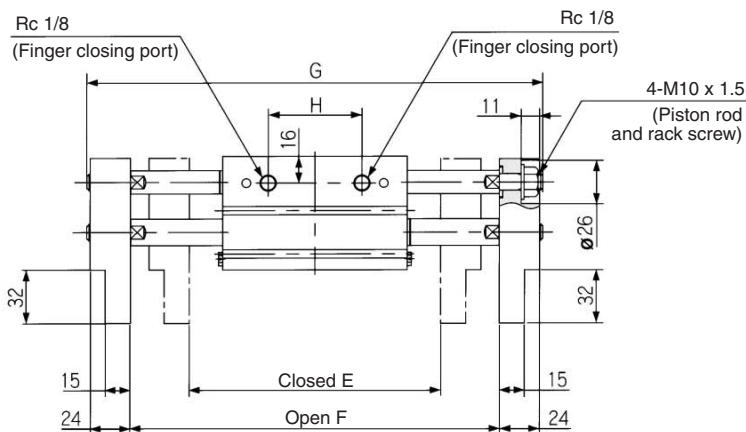
Series MHL2

Dimensions

MHL2-32D□



* Dimensions of auto switch mounting groove (Enlarged view)



(mm)

Model	B	C	D	E	F	G	H	J
MHL2-32D	86	110	60	150	220	272	56	202
MHL2-32D1	134	158	108	198	318	370	104	282
MHL2-32D2	178	202	152	242	402	454	148	366



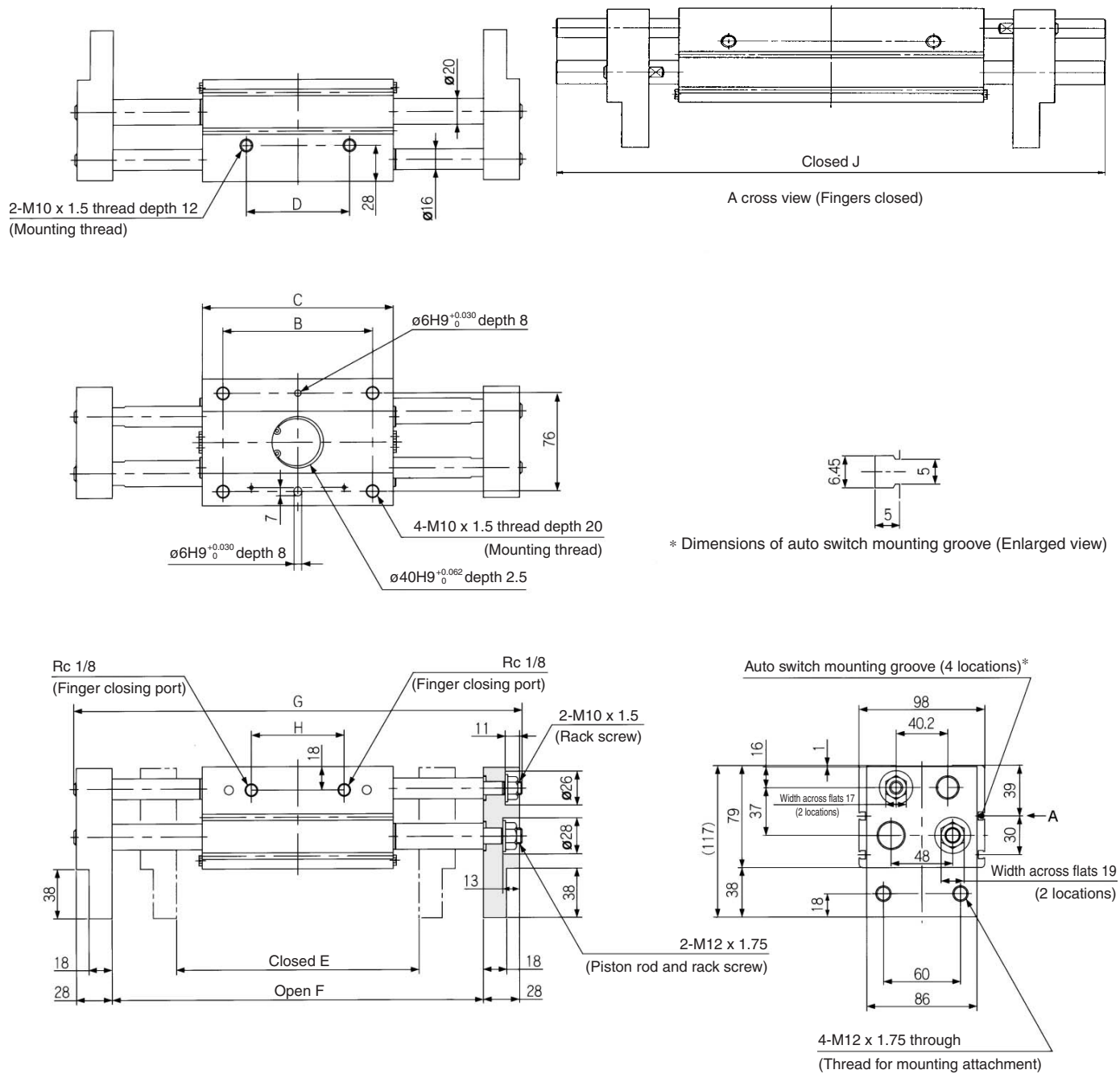
Note 1) J dimension is at fully closed.

Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

Parallel Style Wide Opening Air Gripper **Series MHL2**

Dimensions

MHL2-40D□



(mm)

Model	B	C	D	E	F	G	H	J
MHL2-40D	116	148	80	188	288	348	72	252
MHL2-40D1	174	206	138	246	406	466	130	336
MHL2-40D2	214	246	178	286	486	546	170	450



Note 1) J dimension is at fully closed.

Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

MRHQ

Misc.

D-

20-