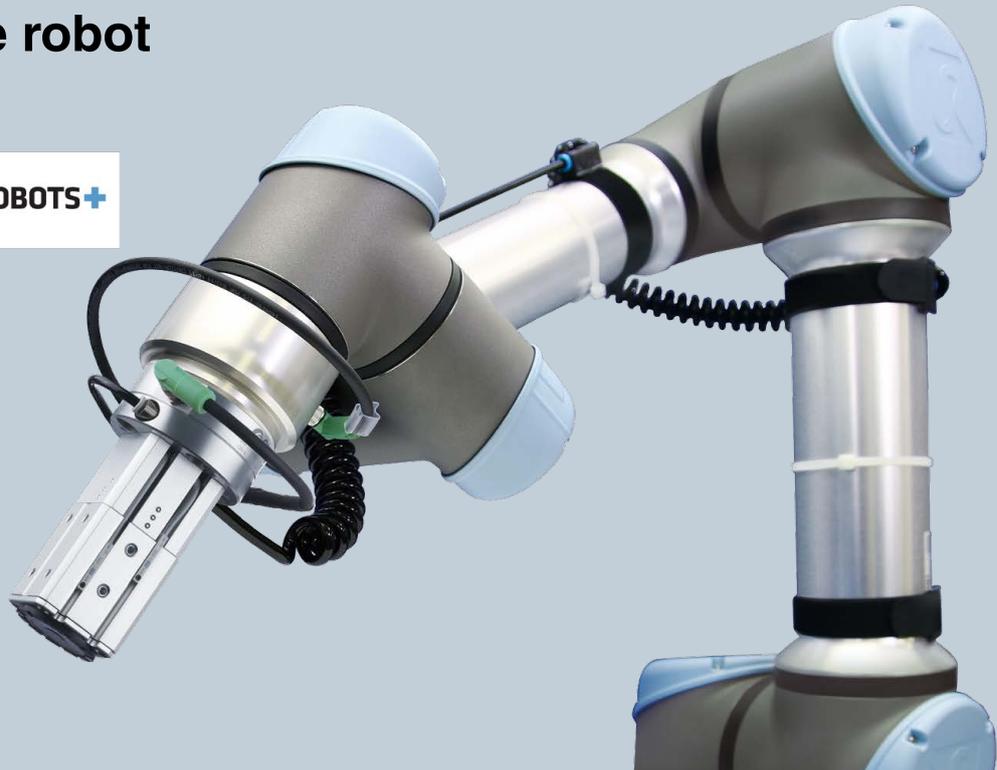


Grippers for Collaborative Robots

Compliant with the UR (e) Series
UNIVERSAL ROBOTS
collaborative robot



More information
can be viewed here.

Plug and Play^{*1}

*1 Excludes electric grippers

Vacuum Gripper
ZXP7□01-X1



Magnet Gripper
MHM-X7400A



Air Gripper
JMHZ2-X7400B



Electric Gripper
LEHF32EK2-64-□□-XA147



Grippers for Collaborative Robots

UNIVERSAL ROBOTS

UR□(e) series compliant products

For Adsorption

Vacuum Gripper p. 4 *ZXP7□01-X1*

- Operate by simply connecting 1 compressed air supply tube and an electrical wiring M8 connector.
- Integrated vacuum ejector, air supply/release valve, pressure sensor, and cups
- A wide variety of cup variations are available to support a wide range of workpieces.
- Standards: Conforming to ISO9409-1-50-4-M6

Max. work load [kg]	7
Max. vacuum pressure [kPa]	-84
Suction flow rate [L/min (ANR)]	17
Weight [g]	581* ¹

*1 Without cup mounting flange

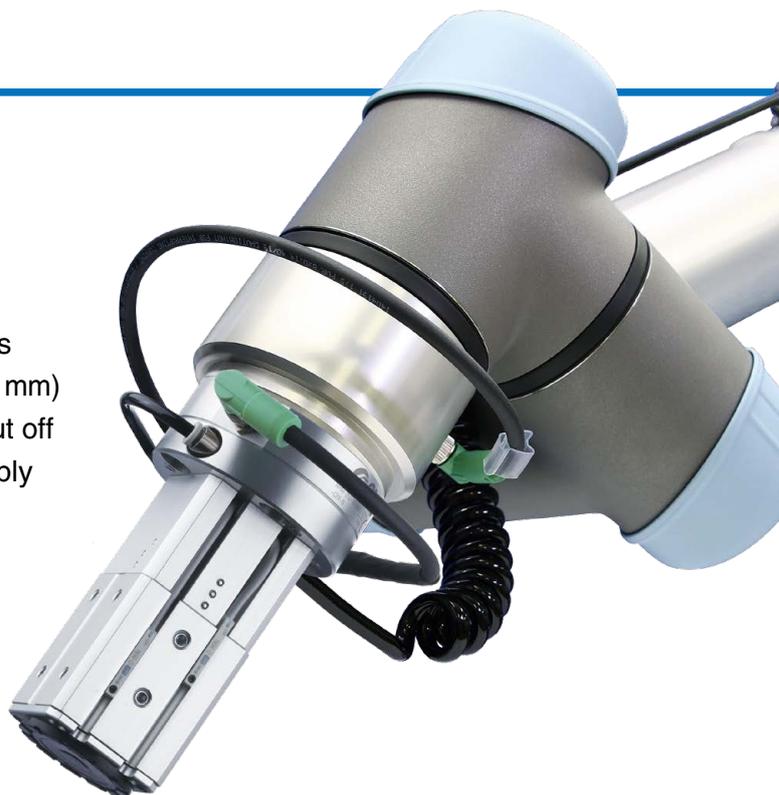


For Adsorption

Magnet Gripper p. 9 *MHM-X7400A*

- Attracts and holds heavy objects with a magnet
- Supports workpieces with holes and uneven surfaces
- Holding force: Max. 200 N (ø25, Workpiece thickness 6 mm)
- Continues to hold workpieces even when the air is shut off
- Operate by simply connecting 1 compressed air supply tube and an electrical wiring M8 connector.
- Integrated solenoid valve, auto switch, and piston speed adjustment mechanism
- Standards: Conforming to ISO9409-1-50-4-M6

Holding force [N]	Workpiece thickness: 2 mm	160
	Workpiece thickness: 6 mm	200
Weight [g]		590



Plug and Play



UNIVERSAL ROBOTS+
Certified

For Gripping

Air Gripper **p. 12** *JMHZ2-X7400B*

- Compact, lightweight product with high gripping force due to air operation
- With high-precision linear guide: Repeatability: ± 0.01 mm
- Operate by simply connecting 1 compressed air supply tube and an electrical wiring M8 connector.
- Integrated solenoid valve, speed adjustment mechanism, and auto switch
- Standards: Conforming to ISO9409-1-50-4-M6

Gripping force Effective value per finger [N]	External	32.7
	Internal	43.5
Opening/Closing stroke (Both sides) [mm]		10
Weight [g]		430

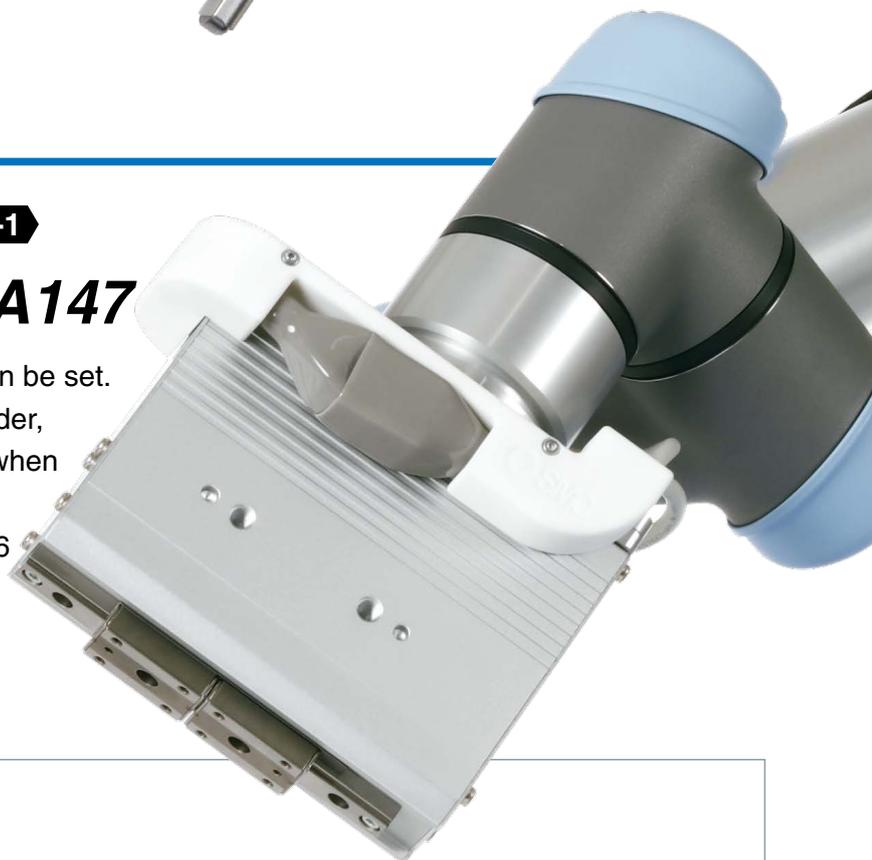


For Gripping

Electric Gripper **p. 14-1** *LEHF32EK2-64-□□-XA147*

- The positioning, speed, and gripping force can be set.
- Due to the built-in battery-less absolute encoder, a return to origin operation is not necessary when the power supply is recovered.
- Standards: Conforming to ISO9409-1-50-4-M6

Gripping force [N]	60 to 120
Opening/Closing stroke [mm]	64
Weight [g]	2410



URCap **p. 15**

Easy programming

- Using the dedicated software URCap, it is possible to intuitively and easily incorporate various operations and sensor signals with the teach pendant.
- Save a copy of the URCap software to a USB memory and insert it into the teaching pendant to easily install the software.

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Grippers for Collaborative Robots

UNIVERSAL ROBOTS
UR□(e) series compliant products



For Adsorption

Vacuum Gripper
ZXP7□01-X1

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For Gripping

Air Gripper
JMHZ2-X7400B

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For Adsorption

Magnet Gripper
MHM-X7400A

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For Gripping

Electric Gripper
LEHF32EK2-64-□□-XA147

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Plug and Play

Vacuum Gripper for Collaborative Robots

UNIVERSAL ROBOTS

UR3(e), UR5(e), UR10(e), UR16e compliant



Vacuum Gripper

Operate by simply connecting 1 compressed air supply tube and an electrical wiring M8 connector.

- Integrated vacuum ejector, air supply/release valve, pressure sensor, and cups
- Standards: Conforming to ISO9409-1-50-4-M6
- URCap (Refer to page 15.)

Specifications

	Standards	Conforming to ISO9409-1-50-4-M6
Common	Applicable fluid	Air
	Operating temperature range [°C]	5 to 50
	Weight [g]* ³	794 (581)
	Max. work load [kg]* ⁴	7
	Air pressure supply (P) port	One-touch fitting (ø6)
	Power supply voltage [V]	24 VDC ±10%
Vacuum Ejector	Connector type	M8 8-pin connector (Socket)
	Max. vacuum pressure [kPa]* ⁵	-84
	Suction flow rate [L/min (ANR)]* ⁵	17
	Air consumption [L/min (ANR)]* ⁵	57
	Supply pressure range [MPa]	0.3 to 0.55
	Standard supply pressure [MPa]* ⁶	0.5
Pressure sensor	Rated pressure range [kPa]	0 to -101
	Accuracy (Ambient temperature at 25°C)	±2% F.S.
	Linearity	±0.4% F.S.
	Repeatability	±0.2% F.S.

* Included parts: Robot mounting flange, Parallel pin, Mounting bolt, Cups with adapter*¹, Plug*², Piping tube (ø6 x 2 m)

*¹ Included only with cups

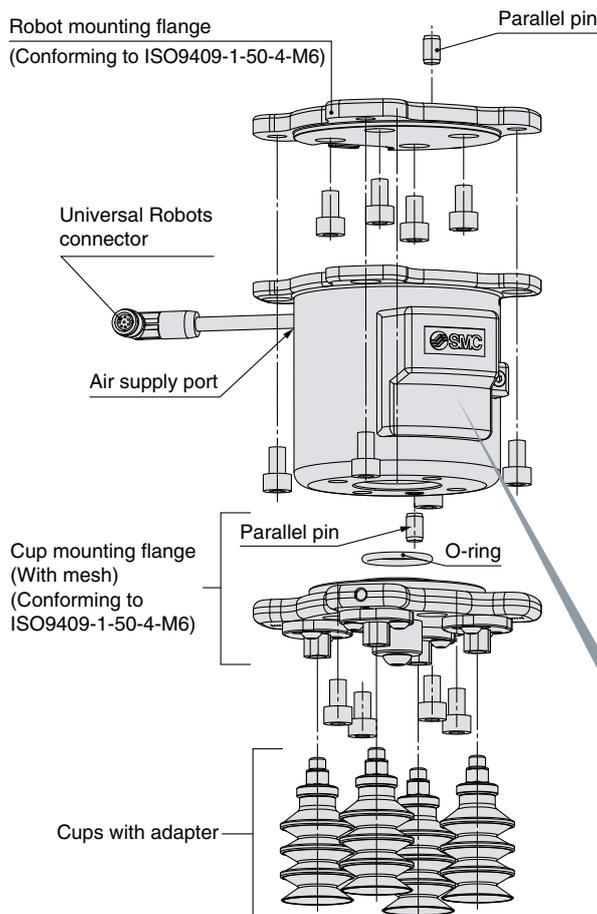
*² Included only for the ZXP7A

*³ The weight in brackets refers to the weight of the product without a cup mounting flange. Add the weight of the suction cups with adapter for the weight with cups. (Refer to the "Suction Cup Part Numbers and Weight" on page 6.)

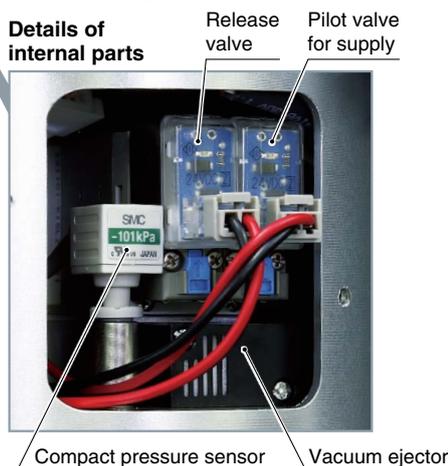
*⁴ May be restricted depending on the cup diameter, mounting orientation, or workpiece. Please use within the max. work load. Suction and transfer exceeding the max. work load may result in reduced vacuum pressure due to air leakage.

*⁵ Values are at the standard supply pressure and based on SMC's measurement standards. They depend on atmospheric pressure (weather, altitude, etc.) and the measurement method.

*⁶ This value indicates the pressure right before the air pressure supply pressure (P) port when vacuum is generated. The pressure right before the P port of the vacuum gripper when vacuum is generated may fall below 0.5 MPa due to the air supply capacity, piping size, and the amount of air being consumed by other devices being operated simultaneously.



Details of internal parts



Magnet Gripper

Air Gripper

URCap

Cup Variations

The number of cups can be changed. (Refer to the operation manual for details on changing the quantity.)



1 cup

2 cups

4 cups

The cup type can be changed. (For details on selectable cups, refer to "How to Order.")



Flat (ø8), Silicone rubber

Bellows (ø20), NBR

Thin flat (ø16), NBR

Flat (ø32), Silicone rubber

Flat (ø32), Urethane rubber



ø32, 2.5-stage, Silicone rubber

ø25, 5.5-stage, Silicone rubber

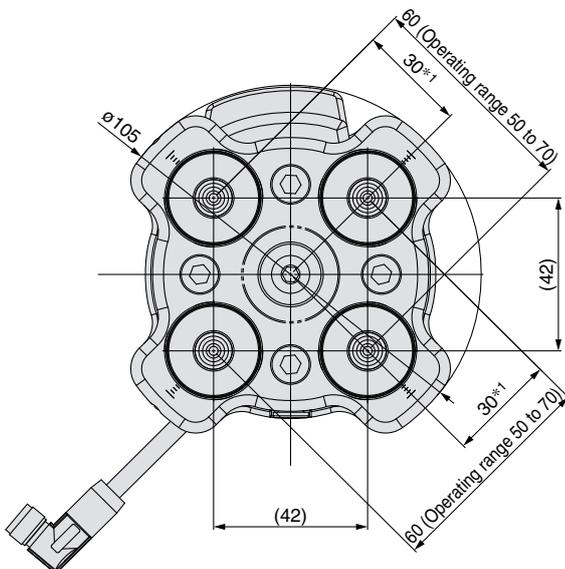
ø25, 5.5-stage, Silicone rubber
With vacuum saving valve



Vacuum saving valve
ZP2V series
(To be ordered separately)
Applicable part no.: **ZP2V-B6-05**

* The silicone material is compliant with the FDA (U.S. Food and Drug Administration) regulation 21CFR§177.

■ The cup pitch can be changed.



*1 Operating range: 25 to 35 (When a cup is mounted in the center)
As interference between cups may occur depending on the cup diameter, select the cup diameter according to the pitch to be used.

■ The cup with flange can be used separately

(if using an external vacuum source).

Vacuum port plug*2
(M5 thread hole depth 4)



One-touch fitting for vacuum pressure supply*2
(Port size: Rc1/8)

*2 When using a cup with flange, be sure to order a One-touch fitting for vacuum pressure supply (part number: KQ2L08-01NS) and a vacuum port plug (part number: M-5P) separately.

How to Order

Suction cup part*1

ZXP7A01-ZP20UN - X1

① ② ③ ④ ⑤ ⑥ ⑦ ⑧



*1 Refer to the table below for the applicable cups. For models with cups, 4 cups with adapters are included in the package.

1 Body size

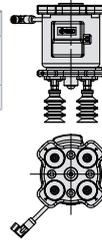
Symbol	Size
7	75 mm

2 Cup flange shape

Symbol	Shape
A	With flange (42 mm x 42 mm)
N	Without flange*2

With flange

Without flange



*2 Customers selecting the product without a cup mounting flange will be required to produce a flange that matches the mounting dimensions on their own.

3 Compatible manufacturer

Symbol	Robot manufacturer
01	UR: 3(e), 5(e), 10(e), 16e

4 Cup series

Symbol	Series
ZP	Basic
ZP3P	Bellows type for film packaging workpieces
Nil	Without cup

5 Cup diameter

Symbol	Cup diameter	Symbol	Cup diameter
08	ø8	25	ø25
10	ø10	B25	ø25
13	ø13	B30	ø30
16	ø16	32	ø32
20	ø20	Nil	Without cup

6 Cup form

Symbol	Type
U	Flat
C	Flat with rib
B	Bellows
UT	Thin flat
J	Multistage bellows
JT2	2.5-stage bellows
JT5	5.5-stage bellows
Nil	Without cup

7 Cup material

Symbol	Material
N	NBR
S	Silicone rubber (White)*3
U	Urethane rubber
F	FKM
SF	Silicone rubber (Blue)*3
Nil	Without cup

*3 The silicone material is compliant with the FDA (U.S. Food and Drug Administration) regulation 21CFR§177.

8 Attachment*4

Symbol	Attachment
Nil	With (guide) attachment
M	With mesh attachment

*4 Only applicable to cup form "JT□"
Note that "M" applies only to cup form: JT2.

*1

Suction Cup Part Numbers and Weight

Part No. **ZXP7(A,N)01** - □□□□ - X1

④ ⑤ ⑥ ⑦ ⑧

Cup part numbers

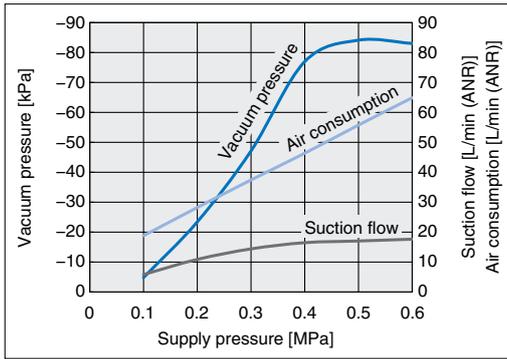
* Refer to the **Web Catalog** for details on suction cups.

④ Cup series	⑤ Cup diameter	⑥ Cup form	⑦ Cup material	⑧ Attachment	Cup with adapter				Adapter unit (Vacuum inlet: Male thread M6 x 1)	Cup unit		
					Part no.	Weight by cup material (g/cup)						
					N (NBR)	S/SF (Silicone)	U (Urethane)	F (FKM)				
ZP	08	U	□		ZPT08U□-A6	4	4	4	4	ZPT1-A6	ZP08U□	
ZP	08	B	□		ZPT08B□-A6	4	4	4	4		ZP08B□	
ZP	10	UT	□		ZPT10UT□-A6	4	4	4	4		ZP10UT□	
ZP	13	UT	□		ZPT13UT□-A6	4	4	4	4		ZP13UT□	
ZP	16	UT	□		ZPT16UT□-A6	4	4	4	4	ZP16UT□		
ZP	10	U	□		ZPT10U□-AS6	7	7	7	7	ZPT2-AS6	ZP10U□	
ZP	13	U	□		ZPT13U□-AS6	7	7	7	8		ZP13U□	
ZP	16	U	□		ZPT16U□-AS6	7	7	7	8		ZP16U□	
ZP	20	U	□		ZPT20U□-AS6	9	10	10	10		ZP20U□	
ZP	25	U	□		ZPT25U□-AS6	10	10	10	11	ZPT3-AS6	ZP25U□	
ZP	32	U	□		ZPT32U□-AS6	10	11	11	12		ZP32U□	
ZP	10	C	□		ZPT10C□-AS6	7	7	7	7		ZP10C□	
ZP	13	C	□		ZPT13C□-AS6	7	7	7	7		ZP13C□	
ZP	16	C	□		ZPT16C□-AS6	7	7	7	8	ZP16C□		
ZP	20	C	□		ZPT20C□-AS6	9	10	10	11	ZPT2-AS6	ZP20C□	
ZP	25	C	□		ZPT25C□-AS6	10	10	10	11		ZP25C□	
ZP	32	C	□		ZPT32C□-AS6	10	11	11	12		ZP32C□	
ZP	10	B	□		ZPT10B□-AS6	7	7	7	8		ZP10B□	
ZP	13	B	□		ZPT13B□-AS6	7	8	8	8	ZPT2-AS6	ZP13B□	
ZP	16	B	□		ZPT16B□-AS6	8	8	8	9		ZP16B□	
ZP	20	B	□		ZPT20B□-AS6	11	11	11	13		ZP20B□	
ZP	25	B	□		ZPT25B□-AS6	11	12	12	14		ZP25B□	
ZP	32	B	□		ZPT32B□-AS6	14	15	15	18	ZPT3-AS6	ZP32B□	
ZP	20	UT	□		ZPG20UT□-7A-X2	4	4	4	4		ZPT1-A6	ZP2-20UT□
ZP	16	J	□		ZPG16J□-7A-X2	8	8	8	9		ZPT2-AS6	ZP2-16J□
ZP	B25	J	□		ZPGB25J□-7A-X2	14	15	15	18		ZPT3-AS6	ZP2-B25J□
ZP	B30	J	□		ZPGB30J□-7A-X2	18	19	19	25	ZP2-B30J□		
ZP3P	20	JT2	SF		ZP3PG20JT2SF-7A-X2	—	21	—	—	ZP3PA-T1JT-7A-X2	ZP3P-20JT2SF-W	
ZP3P	20	JT2	SF	M	ZP3PG20JT2SF-M-7A-X2	—	21	—	—		ZP3P-20JT2SF-WM	
ZP3P	32	JT2	SF		ZP3PG32JT2SF-7A-X2	—	48	—	—	ZP3PA-T2JT-7A-X2	ZP3P-32JT2SF-W	
ZP3P	32	JT2	SF	M	ZP3PG32JT2SF-M-7A-X2	—	48	—	—		ZP3P-32JT2SF-WM	
ZP3P	20	JT5	SF		ZP3PG20JT5SF-7A-X2	—	23	—	—	ZP3PA-T1JT-7A-X2	ZP3P-20JT5SF-WG	
ZP3P	25	JT5	SF		ZP3PG25JT5SF-7A-X2	—	25	—	—		ZP3P-25JT5SF-WG	
ZP3P	32	JT5	SF		ZP3PG32JT5SF-7A-X2	—	54	—	—		ZP3P-32JT5SF-WG	

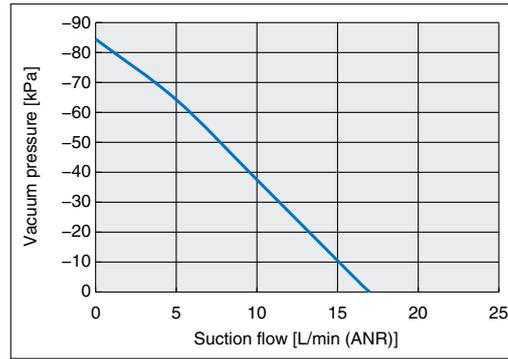
Input the material symbol ("N," "S," "U," or "F") into the □ in the part number.

Model Selection

Exhaust Characteristics*1

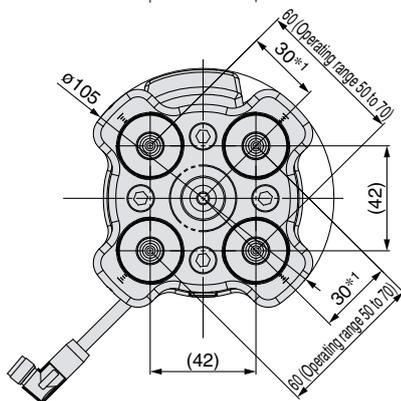
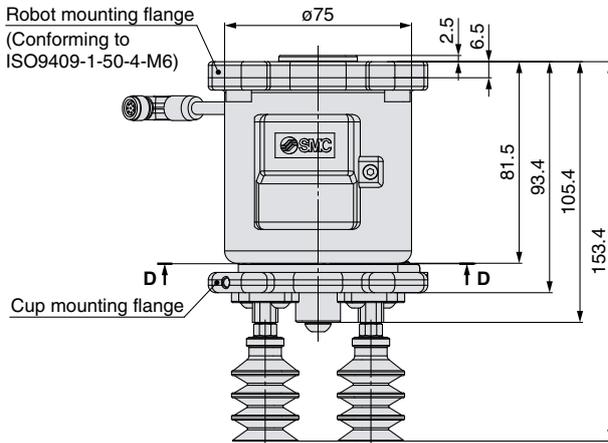
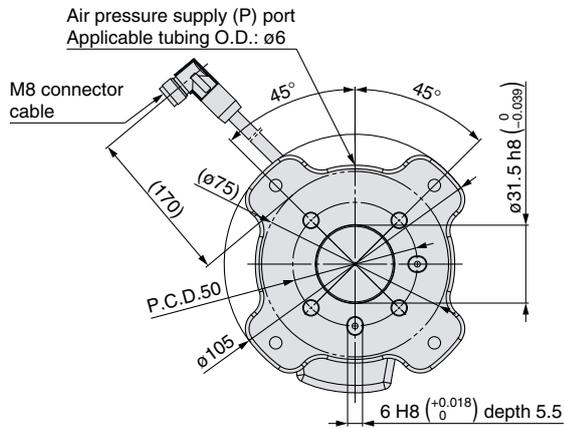


Flow Rate Characteristics



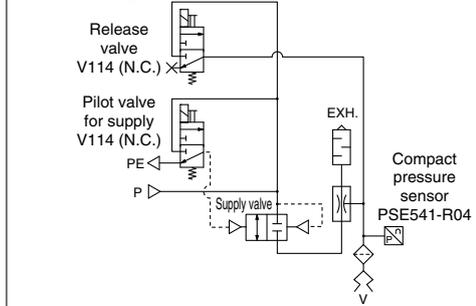
*1 The exhaust characteristics are different when the vacuum-saving valve (ZP2V-B6-05) is mounted.
For details, refer to "8.3 Suction cup precautions" in the operation manual.

Dimensions



*1 Operating range: 25 to 35 (When a cup is mounted in the center)
As interference between cups may occur depending on the cup diameter, select the cup diameter according to the pitch to be used.

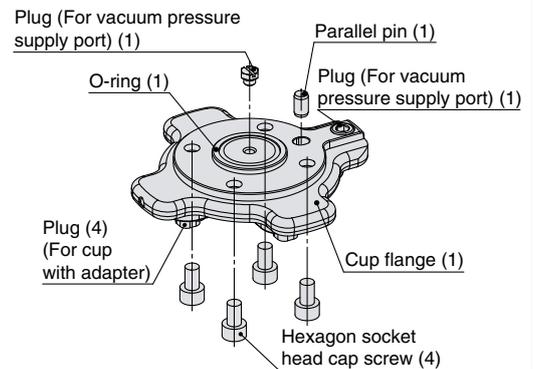
Circuit diagram



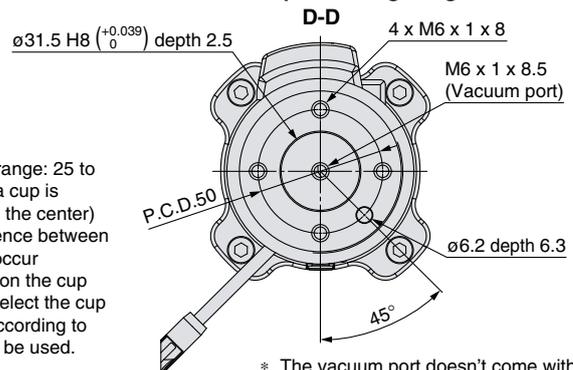
Cup mounting flange

Replacement part number: ZXP7-PFL1-A-X1

(Refer to the figure below for items. Quantities are shown in the parentheses.)



Without cup mounting flange



* The vacuum port doesn't come with mesh.

* The dimensions and mounting method described in this drawing (example) are for the following part number: ZXP7A01-ZPB25JS-X1



ZXP7□01-X1

Specific Product Precautions

Be sure to read this before handling the products. For safety instructions and vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

Handling

⚠ Caution

1. Strictly observe the precautions on vacuum equipment and safety when using the product. Additionally, select a cup size and material suitable to both the workpiece to be adsorbed and the atmosphere. Take safety measures so that any accident, such as the dropping of a workpiece, does not occur during adsorption transfer. For details, refer to the Web Catalog.
2. Use the product within the specification range. Use exceeding the compressed air pressure or voltage may result in serious damage due to reduced product performance.
3. Exhaust air is released from the opening in the product. Therefore, this exhaust air opening must not be blocked or restricted.

Mounting

⚠ Caution

1. For details on the mounting method, refer to the Operation Manual.
2. Tighten to the specified tightening torque. If the tightening torque is exceeded, the body and the mounting screws may break. However, insufficient torque may cause displacement of the body and loosening of the mounting screws.
3. Do not drop, strike, or apply excessive impact to this product.
Doing so may result in damage to the internal parts of the body, solenoid valve, or pressure sensor. In some cases, this damage may result in a malfunction.
4. Hold the body when handling the product. Do not pull excessively on the M8 connector cable or pinch the cable when lifting the body. Failure to do so may result in damage to the solenoid valve or pressure sensor. In some cases, this damage may result in a failure or malfunction.
5. The bolts may loosen due to the operating conditions and environment. Be sure to conduct maintenance such as tightening the bolts periodically.

Wiring

⚠ Caution

1. Avoid repeatedly bending or stretching the M8 connector cable as well as applying force to it.
2. Do not wire while energizing the product. Doing so may result in damage to the internal parts of the solenoid valve or pressure sensor. In some cases, this damage may result in a malfunction.
3. Do not disassemble the M8 connector cable or make any modifications, including additional machining. Doing so may cause human injury and/or an accident.

Piping

⚠ Caution

1. **Flushing of the inside of the pipes**
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil, and other debris from inside the pipe.
2. **Tube attachment**
 - Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2, 3, 5, or 6. Do not use pliers, nippers, scissors, etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tube pulling out after installation or air leakage. Allow some extra length in the tube.
 - Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.
 - After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.
3. **Tube detachment**
 - Push in the release button sufficiently, pushing its collar equally around the circumference.
 - Pull out the tube while holding down the release button so that it does not come out. If the release button is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to pull it out.
 - When the removed tube is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause trouble such as air leakage or difficulty in removing the tube.
4. **Other Tube Brands**
When using other than SMC brand tube, confirm that the following specifications are satisfied with respect to the tube outside diameter tolerance.

· Nylon tube	within ± 0.1 mm
· Soft nylon tube	within ± 0.1 mm
· Polyurethane tube	within $+0.15$ mm, within -0.2 mm

Do not use tube which do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.
5. **Piping**
 - Do not apply unnecessary forces, such as twisting, pulling, moment loads, vibration, impact, etc., on fittings or tubing. This will cause damage to fittings and will crush, burst, or release tubing.
 - Do not lift the product by the piping after the tube is connected. Doing so may result in damage to the One-touch fitting. For details, refer to the “Handling Precautions for SMC Products” on the SMC website: <https://www.smcworld.com>

Vacuum Gripper

Magnet Gripper

Air Gripper

URCap

Plug and Play

Magnet Gripper

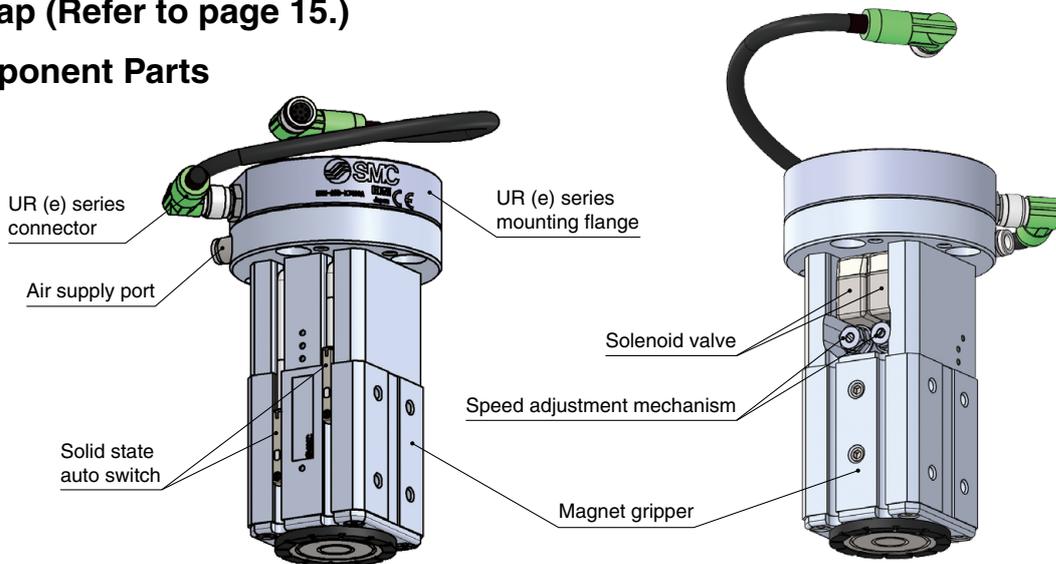
for Collaborative Robots

UNIVERSAL ROBOTS

UR3(e), UR5(e), UR10(e), UR16e compliant



- Attracts and holds heavy objects with a magnet
- Supports workpieces with holes and uneven surfaces
- Compact with high holding force
 - Holding force: Max. **200 N**
($\phi 25$, Workpiece thickness 6 mm)
- Continues to hold workpieces even when the air is shut off
- Operate by simply connecting 1 compressed air supply tube and an electrical wiring M8 connector.
- Integrated solenoid valve, auto switch, and piston speed adjustment mechanism
- UR Cap (Refer to page 15.)
- Component Parts



Learn more about the MHM series here.

How to Order



MHM-25D-X7400A

Specifications

Fluid	Air	
Action	Double acting	
Operating pressure [MPa]	0.2 to 0.6	
Proof pressure [MPa]	0.9	
Ambient and fluid temperatures [°C]	-10 to 50 (No freezing)	
Holding force [N]	Workpiece thickness: 2 mm	160
	Workpiece thickness: 6 mm	200
Residual holding force [N]	0.3 or less	
Lubrication	Non-lube	
Weight [g]	590	
Standards	ISO9409-1-50-4-M6	
Auto switch model	D-M9P	
Connector type	M8 8-pin connector (Socket)	

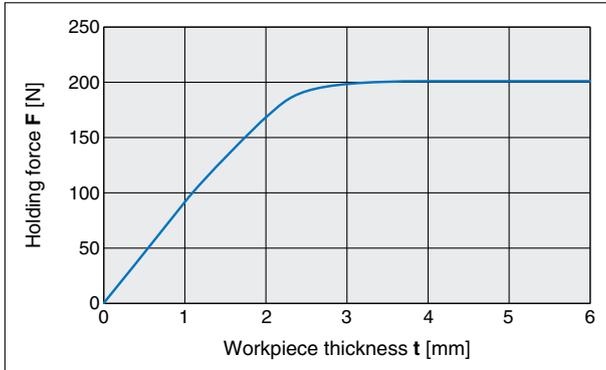
■ Included parts: Mounting bolt, Positioning pin, Piping tube ($\phi 4 \times 2$ m)

Characteristics

Holding force

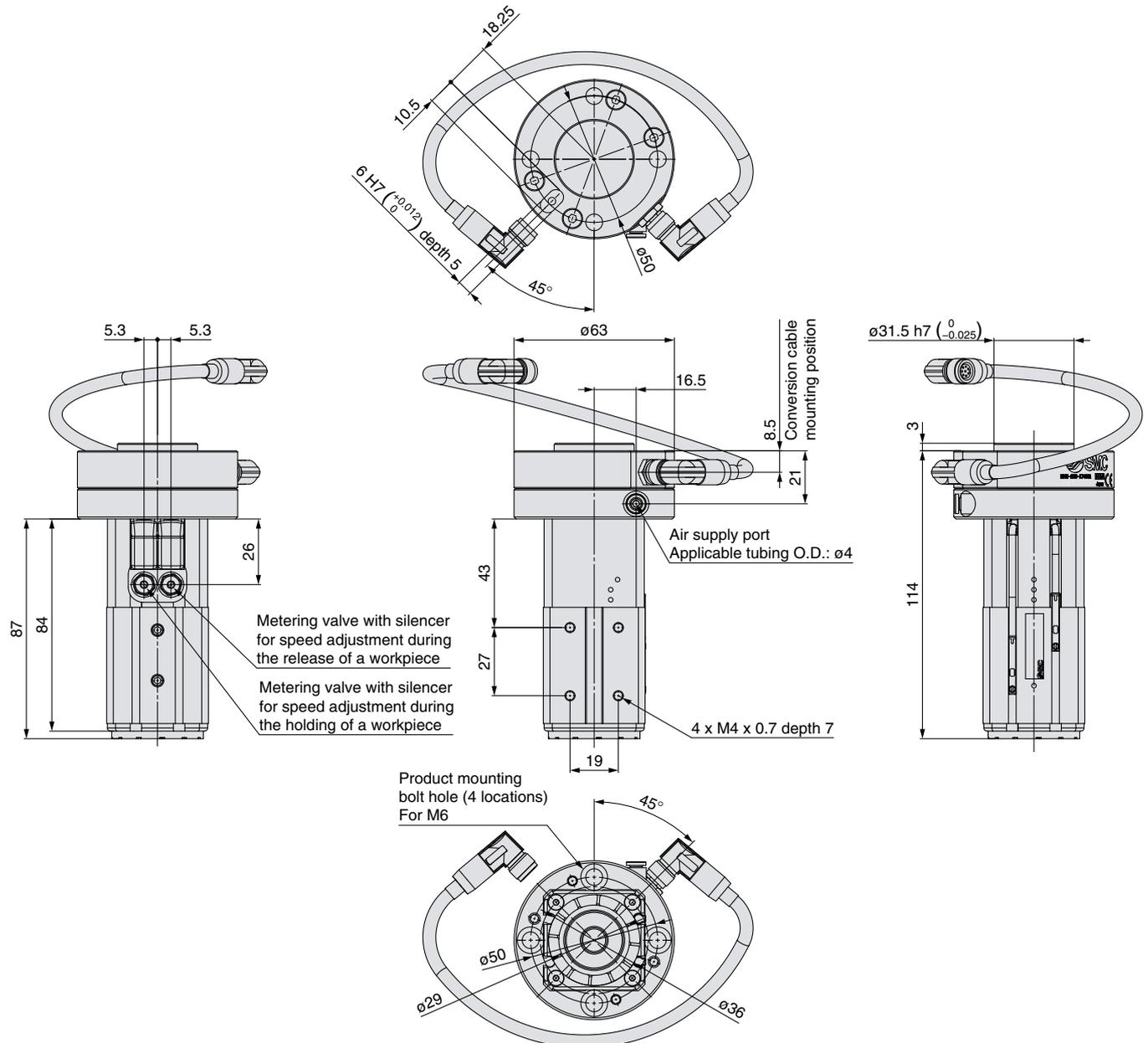
The holding force graph shows the theoretical value for low-carbon steel plates. Holding forces vary depending on the material and shape of the workpiece. Please perform a holding test while referring to the value selected based on the graph.

MHM-25



Vacuum Gripper

Dimensions



Magnet Gripper

Air Gripper

URCap



MHM-X7400A

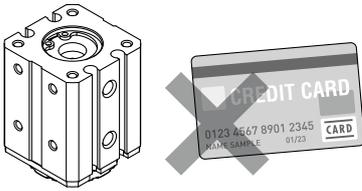
Specific Product Precautions

Be sure to read this before handling the products. For safety instructions, actuator precautions, magnet gripper specific product precautions, and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

Handling

⚠ Caution

1. If pressure is applied to the external magnet gripper parts, there is a possibility that air will get inside the cylinder from the rod seal section. (Example: inside a chamber, etc.)
2. As the body magnets are built-in, do not allow close contact with magnetic disks, magnetic cards, or magnetic tapes. Data may be erased.



Mounting

⚠ Caution

1. For details on the mounting method, refer to the Operation Manual.
2. Tighten to the specified tightening torque. If the tightening torque is exceeded, the body and the mounting screws may break. However, insufficient torque may cause displacement of the body and loosening of the mounting screws.
3. Do not drop, strike, or apply excessive impact to this product.
Doing so may result in damage to the internal parts of the body, solenoid valve, or auto switch. In some cases, this damage may result in a malfunction.
4. Hold the body when handling the product. Do not pull excessively on the M8 connector cable or pinch the cable when lifting the body. Failure to do so may result in damage to the solenoid valve or auto switch. In some cases, this damage may result in a failure or malfunction.
5. The bolts may loosen due to the operating conditions and environment. Be sure to conduct maintenance such as tightening the bolts periodically.

Wiring

⚠ Caution

1. Avoid repeatedly bending or stretching the M8 connector cable as well as applying force to it.
2. Do not wire while energizing the product. Doing so may result in damage to the internal parts of the solenoid valve or auto switch. In some cases, this damage may result in a malfunction.
3. Do not disassemble the M8 connector cable or make any modifications, including additional machining. Doing so may cause human injury and/or an accident.

Piping

⚠ Caution

1. **Flushing of the inside of the pipes**
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil, and other debris from inside the pipe.
2. **Tube attachment**
 - Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2, 3, 5, or 6. Do not use pliers, nippers, scissors, etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tube pulling out after installation or air leakage. Allow some extra length in the tube.
 - Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.
 - After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.
3. **Tube detachment**
 - Push in the release button sufficiently, pushing its collar equally around the circumference.
 - Pull out the tube while holding down the release button so that it does not come out. If the release button is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to pull it out.
 - When the removed tube is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause trouble such as air leakage or difficulty in removing the tube.
4. **Other Tube Brands**
When using other than SMC brand tube, confirm that the following specifications are satisfied with respect to the tube outside diameter tolerance.

· Nylon tube	within ± 0.1 mm
· Soft nylon tube	within ± 0.1 mm
· Polyurethane tube	within $+0.15$ mm, within -0.2 mm

 Do not use tube which do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.
5. **Piping**
 - Do not apply unnecessary forces, such as twisting, pulling, moment loads, vibration, impact, etc., on fittings or tubing. This will cause damage to fittings and will crush, burst, or release tubing.
 - Do not lift the product by the piping after the tube is connected. Doing so may result in damage to the One-touch fitting. For details, refer to the “Handling Precautions for SMC Products” on the SMC website: <https://www.smcworld.com>

Plug and Play

Air Gripper

for Collaborative Robots

UNIVERSAL ROBOTS

UR3(e), UR5(e), UR10(e), UR16e compliant



- Compact, lightweight product with high gripping force due to air operation
- An air gripper that realizes high rigidity and high precision due to its guide-integrated construction

With high-precision linear guide

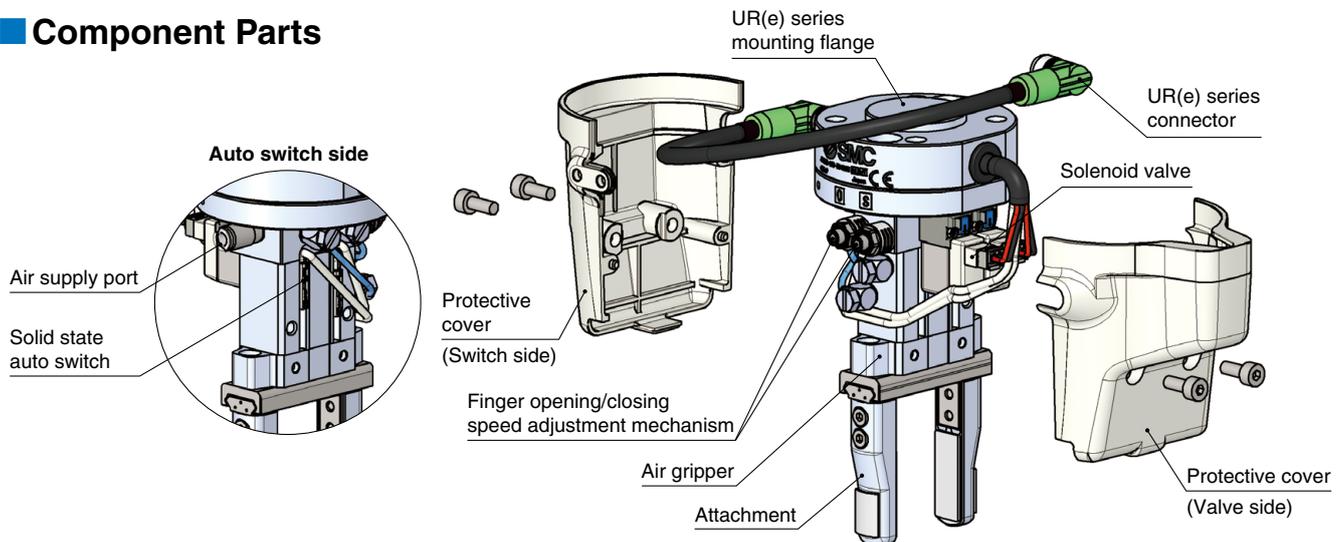
Repeatability: ± 0.01 mm

Linear guide of the higher rigidity and precision is used.

Higher rigidity (Compared with the same size of the existing MHZ2)

- Operate by simply connecting 1 compressed air supply tube and an electrical wiring M8 connector.
- Integrated solenoid valve, speed adjustment mechanism, and auto switch
- URCap (Refer to page 15.)
- A split protective cover for easy air gripper maintenance
Allows you to maintain the air gripper without removing the user-specific attachment

Component Parts



How to Order



JMHZ2-16D-X7400B

Specifications

Bore size [mm]	16	
Fluid	Air	
Action	Double acting	
Operating pressure [MPa]	0.1 to 0.7	
Repeatability [mm]	± 0.01	
Gripping force	External	32.7
Effective value per finger [N]	Internal	43.5
Opening/Closing (Both sides) [mm]	10	
Weight [g]	430	
Standards	ISO9409-1-50-4-M6	
Auto switch model	D-M9P-5	
Connector type	M8 8-pin connector (Socket)	

■ Included parts: Mounting bolt, Positioning pin, Piping tube ($\phi 4 \times 2$ m)

Vacuum Gripper

Magnet Gripper

Air Gripper

URCap

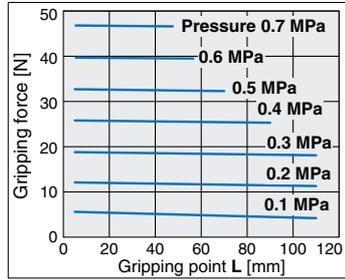
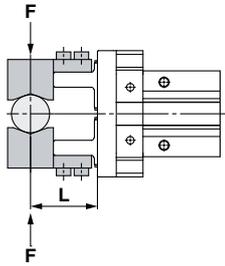
Characteristics

Gripping force

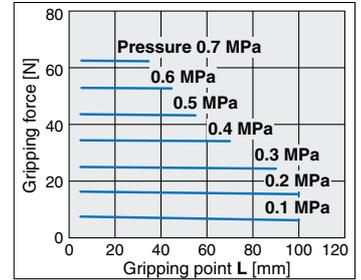
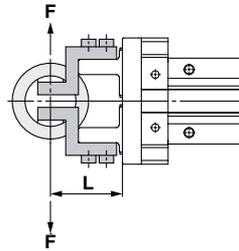
● Indication of effective gripping force

The gripping force shown in the graphs below represents the gripping force of one finger when all fingers and attachments are in contact with the workpiece. **F** = One finger thrust

External gripping force



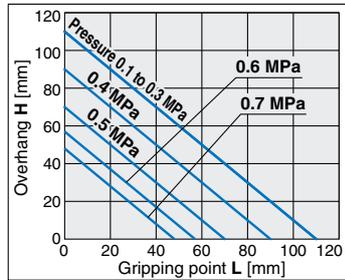
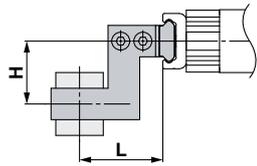
Internal gripping force



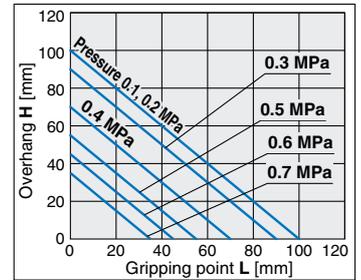
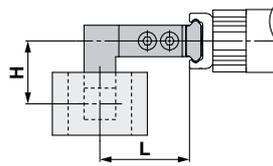
Gripping point

- 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 below.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life of the air gripper.

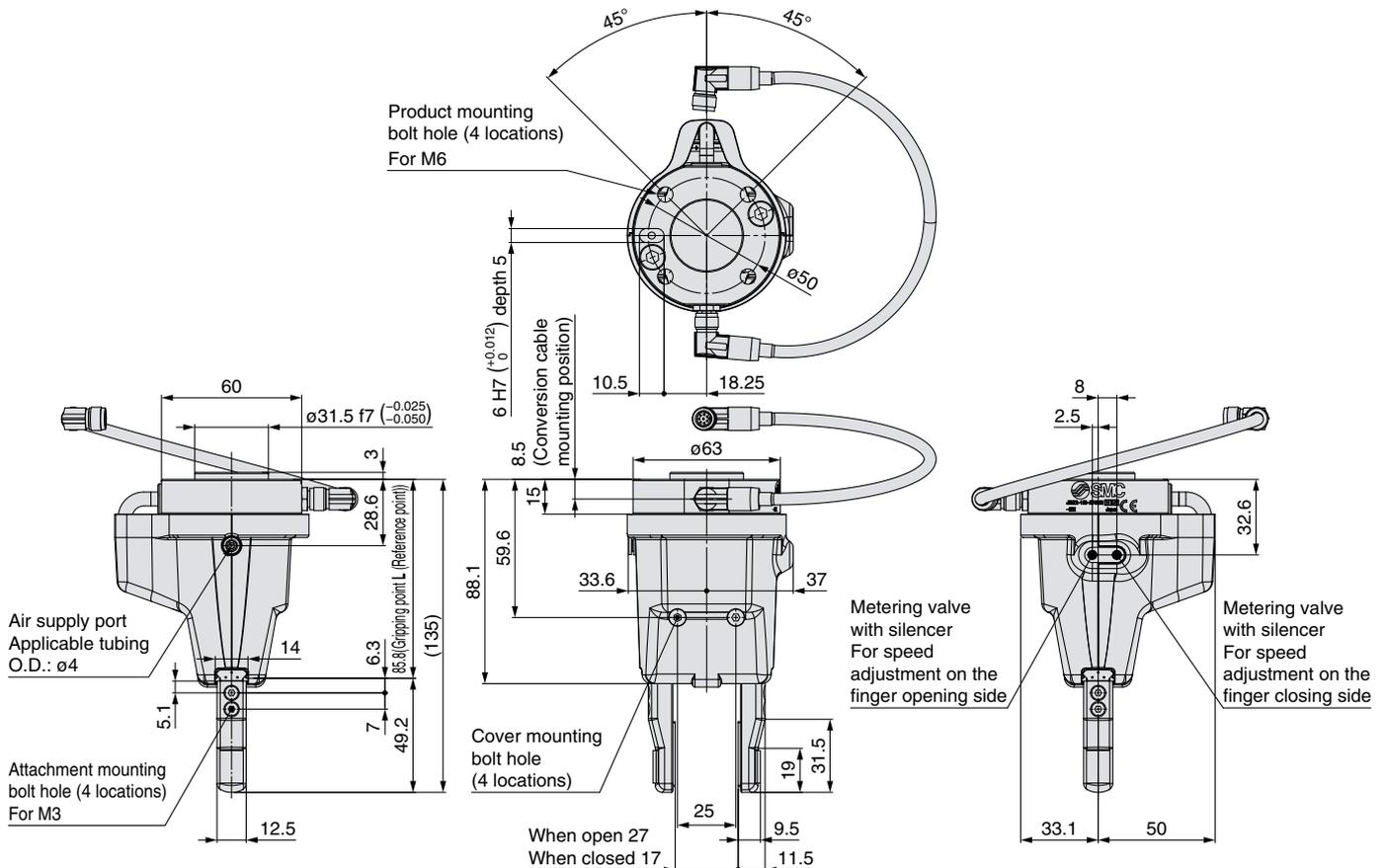
External grip



Internal grip



Dimensions



JMHZ2-X7400B

Specific Product Precautions

Be sure to read this before handling the products. For safety instructions, air gripper precautions, air gripper specific product precautions, and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>



Handling

Caution

1. Martensitic stainless steel is used for the finger guide. However, the anti-corrosiveness of this steel is inferior to that of austenitic stainless steel. In particular, rust may be generated in environments where waterdrops are likely to adhere to the product due to condensation, etc.
2. Finite orbit type guide is used in the actuator finger part. By using this, when there are inertial force which cause by movements or rotation to the actuator, steel ball will move to one side and this will cause a large resistance and degrade the accuracy. When there are inertial force which cause by movements or rotation to the actuator, operate the finger to full stroke.
3. When mounting or removing the attachment, use the following tightening torque: 0.59 N. The weight of the attachment is generally about 70 g per side of a finger.

Mounting

Caution

1. For details on the mounting method, refer to the Operation Manual.
2. Tighten to the specified tightening torque. If the tightening torque is exceeded, the body and the mounting screws may break. However, insufficient torque may cause displacement of the body and loosening of the mounting screws.
3. Do not drop, strike, or apply excessive impact to this product.
Doing so may result in damage to the internal parts of the body, solenoid valve, or auto switch. In some cases, this damage may result in a malfunction.
4. Hold the body when handling the product. Do not pull excessively on the M8 connector cable or pinch the cable when lifting the body. Failure to do so may result in damage to the solenoid valve or auto switch. In some cases, this damage may result in a failure or malfunction.
5. The bolts may loosen due to the operating conditions and environment. Be sure to conduct maintenance such as tightening the bolts periodically.

Wiring

Caution

1. Avoid repeatedly bending or stretching the M8 connector cable as well as applying force to it.
2. Do not wire while energizing the product. Doing so may result in damage to the internal parts of the solenoid valve or auto switch. In some cases, this damage may result in a malfunction.
3. Do not disassemble the M8 connector cable or make any modifications, including additional machining. Doing so may cause human injury and/or an accident.

Piping

Caution

1. **Flushing of the inside of the pipes**
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil, and other debris from inside the pipe.
2. **Tube attachment**
 - Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2, 3, 5, or 6. Do not use pliers, nippers, scissors, etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tube pulling out after installation or air leakage. Allow some extra length in the tube.
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3. **Tube detachment**
 - Push in the release button sufficiently, pushing its collar equally around the circumference.
 - Pull out the tube while holding down the release button so that it does not come out. If the release button is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to pull it out.
 - When the removed tube is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause trouble such as air leakage or difficulty in removing the tube.
4. **Other Tube Brands**
When using other than SMC brand tube, confirm that the following specifications are satisfied with respect to the tube outside diameter tolerance.
 - Nylon tube within ± 0.1 mm
 - Soft nylon tube within ± 0.1 mm
 - Polyurethane tube within $+0.15$ mm, within -0.2 mmDo not use tube which do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.
5. **Piping**
 - Do not apply unnecessary forces, such as twisting, pulling, moment loads, vibration, impact, etc., on fittings or tubing. This will cause damage to fittings and will crush, burst, or release tubing.
 - Do not lift the product by the piping after the tube is connected. Doing so may result in damage to the One-touch fitting. For details, refer to the “Handling Precautions for SMC Products” on the SMC website: <https://www.smcworld.com>

Vacuum Gripper

Magnet Gripper

Air Gripper

URCap

Electric Gripper for Collaborative Robots

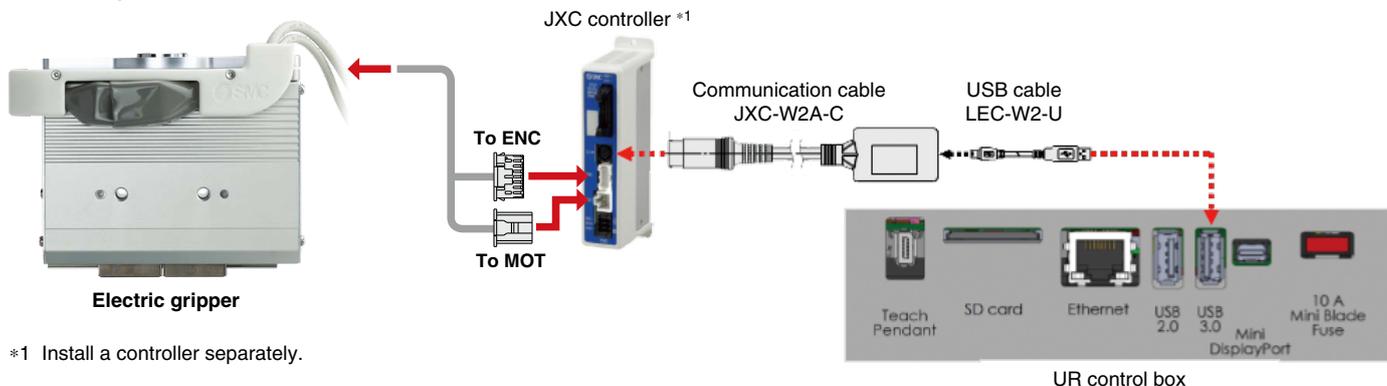
UNIVERSAL ROBOTS

UR5(e), UR10(e), UR16e compliant



- The positioning, speed, and gripping force can be set.
- Due to the built-in battery-less absolute encoder, a return to origin operation is not necessary when the power supply is recovered.

Component Parts



*1 Install a controller separately.

How to Order

LEHF32EK2-64-R1 C517-XA147



1 Actuator cable type/length

Robotic cable [m]			
Nil	None	R8	8*1
R1	1.5	RA	10*1
R3	3	RB	15*1
R5	5	RC	20*1

2 Controller

Nil	Without controller
C□□□□	With controller

C 5 1 7

Interface (Communication protocol/Input/Output)

Symbol	Type	Number of axes, Special specification Standard With STO sub-function
5*3	Parallel input (NPN)	●
6*3	Parallel input (PNP)	●

Mounting

7	Screw mounting
8*2	DIN rail

Number of axes, Special specification

Symbol	Number of axes	Specification
1	Single axis	Standard

*1 Produced upon receipt of order

*2 The DIN rail is not included. It must be ordered separately.

*3 This product does not use parallel wiring.

Depending on the circuit used in your area, select symbol "5" (NPN) or symbol "6" (PNP).

Specifications

Model		LEHF32E
Actuator specifications	Open and close stroke/both sides [mm]	64
	Lead [mm]	70/16 (4.375)
	Gripping force [N]*1, *3	60 to 120
	Open and close speed/Pushing speed [mm/s]*2, *3	5 to 100/5 to 30
	Drive method	Slide screw + Belt
	Finger guide type	Linear guide (No circulation)
	Repeated length measurement accuracy [mm]*4	±0.05
	Finger backlash/one side [mm]*5	0.5 or less
	Repeatability [mm]*6	±0.05
	Positioning repeatability/one side [mm]	±0.1
	Lost motion/one side [mm]*7	0.3 or less
	Impact/Vibration resistance [m/s ²]*8	150/30
	Max. operating frequency [C.P.M]	60
	Operating temperature range [°C]	5 to 40
	Operating humidity range [%RH]	90 or less (No condensation)
Weight [g]	2410	
Electric specifications	Motor size	□42
	Encoder	Battery-less absolute
	Power supply voltage [V]	24 VDC ±10%
	Power [W]*9	Max. power 57

- *1 Gripping force should be from 5 to 10 times the workpiece weight. Gripping force accuracy should be ±20% (F.S.) for LEHF32. Gripping with heavy attachment and fast pushing speed, may not reach the product specification. In this case, decrease the weight and lower the pushing speed.
- *2 Pushing speed should be set within the range during pushing (gripping) operations. Otherwise, it may cause a malfunction. The open/close speed and pushing speed are for both fingers. The speed for one finger is half this value.
- *3 The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)
- *4 Repeated length measurement accuracy means dispersion (value on the controller monitor) when the workpiece is repeatedly held in the same position.
- *5 There will be no influence of backlash during pushing (gripping) operations.
Make the stroke longer for the amount of backlash when opening.
- *6 Repeatability means the variation of the gripping position (workpiece position) when gripping operations are repeatedly performed by the same sequence for the same workpiece.
- *7 A reference value for correcting an error in reciprocal operation which occurs during positioning operations
- *8 Impact resistance: No malfunction occurred when the gripper was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the gripper in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the gripper in the initial state.)
- *9 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.

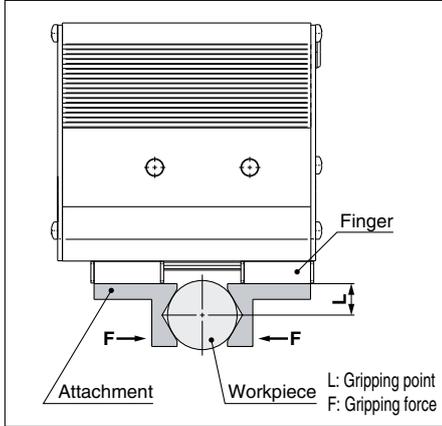


Gripping force

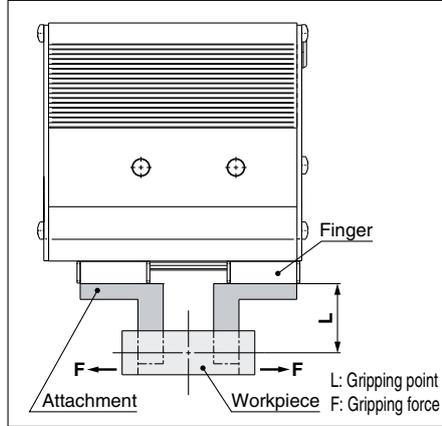
● **Indication of effective gripping force**

The gripping force shown in the graphs below represents the gripping force of one finger when all fingers and attachments are in contact with the workpiece. F = One finger thrust

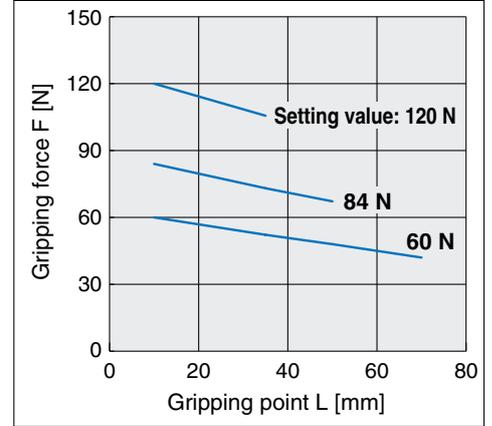
External Gripping State



Internal Gripping State



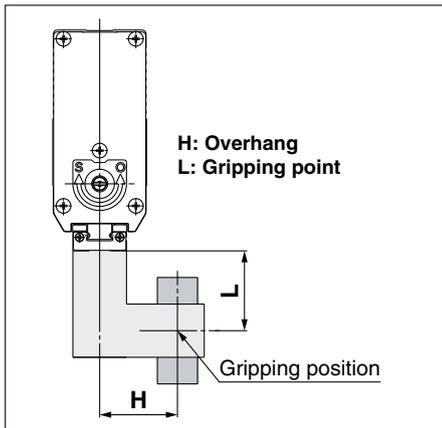
LEHF32



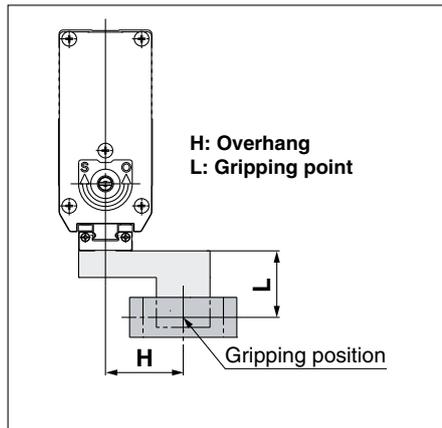
Gripping point

- Decide the gripping position of the workpiece so that the amount of overhang "H" stays within the range shown in the figure below.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life of the electric gripper.

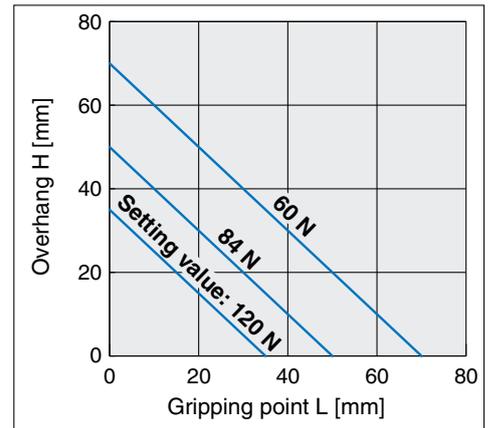
External Gripping State



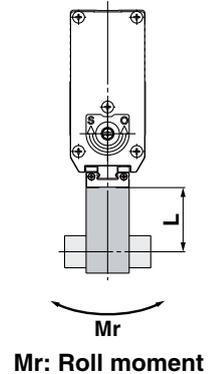
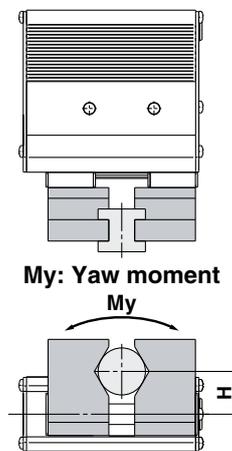
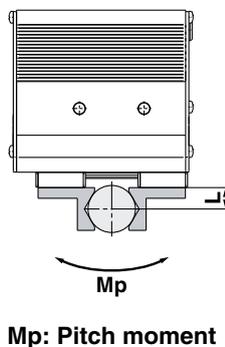
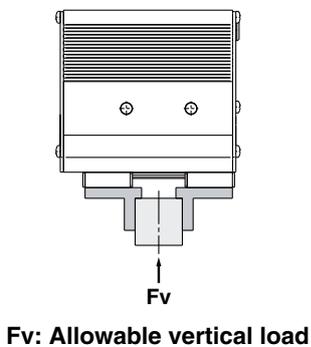
Internal Gripping State



LEHF32



External force on fingers

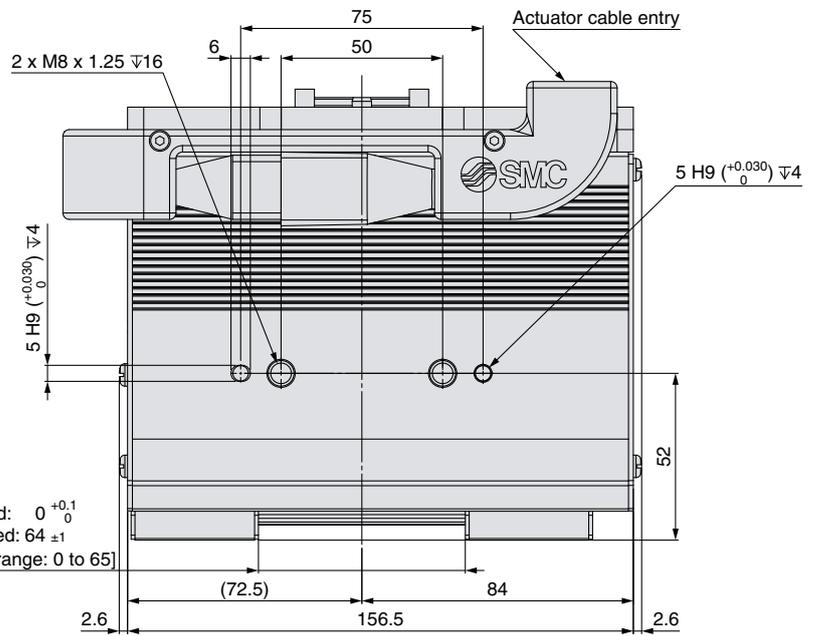
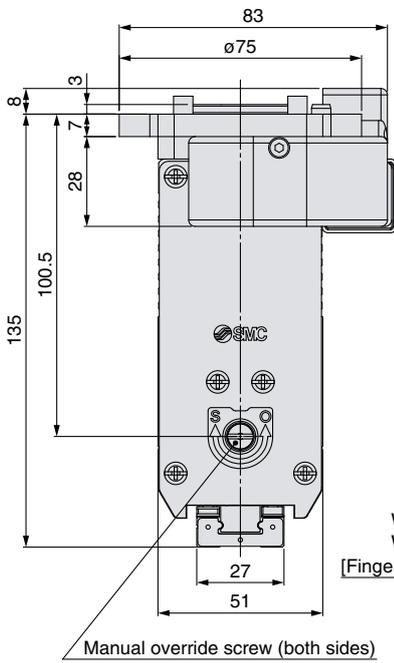
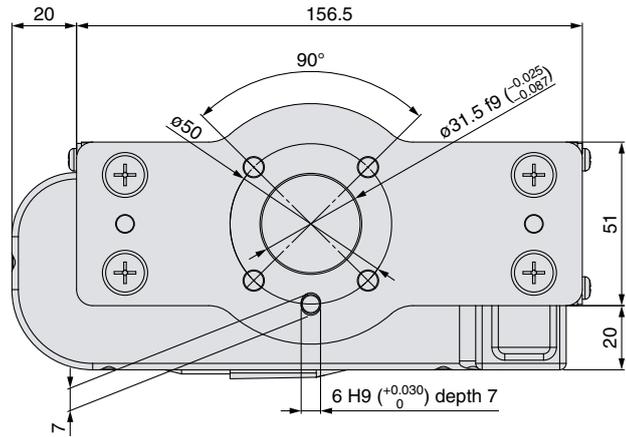


H, L: Distance to the point at which the load is applied [mm]

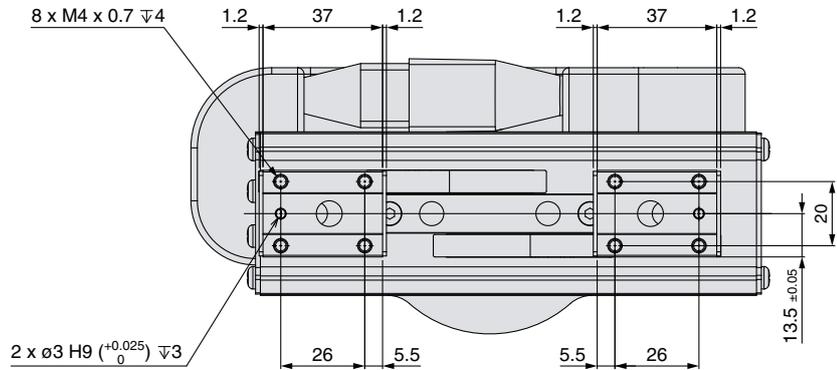
Model	Allowable vertical load Fv [N]	Static allowable moment		
		Pitch moment : Mp [N·m]	Yaw moment : My [N·m]	Roll moment : Mr [N·m]
LEHF32EK2-□	176	1.4	1.4	2.8

* Values for load in the table indicate static values.

Dimensions



When closed: $0^{+0.1}_0$
 When opened: 64 ± 1
 [Finger operating range: 0 to 65]





Specific Product Precautions

Be sure to read this before handling the products. For safety instructions and electric actuators precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

Handling

⚠ Caution

1. Martensitic stainless steel is used for the finger guide. However, the anti-corrosiveness of this steel is inferior to that of austenitic stainless steel. In particular, rust may be generated in environments where waterdrops are likely to adhere to the product due to condensation, etc.
2. Finite orbit type guide is used in the actuator finger part. By using this, when there are inertial force which cause by movements or rotation to the actuator, steel ball will move to one side and this will cause a large resistance and degrade the accuracy. When there are inertial force which cause by movements or rotation to the actuator, operate the finger to full stroke.

3. If there is a chance that the product will pose a hazard to humans, install a protective cover.

If the moving portion of the product will pose a hazard to humans or will damage machinery or equipment, provide a construction that prevents direct contact with those areas.

4. **Absolute encoder ID mismatch error at the first connection**

In the following cases, an “ID mismatch error” alarm occurs after the power is turned ON. Perform a return to origin operation after resetting the alarm before use.

- When an electric actuator is connected and the power is turned ON for the first time after purchase*1
- When the actuator or motor is replaced
- When the controller is replaced

*1 If you have purchased an electric actuator and controller with the set part number, the pairing may have already been completed and the alarm may not be generated.

“ID mismatch error”

Operation is enabled by matching the encoder ID on the electric actuator side with the ID registered in the controller. This alarm occurs when the encoder ID is different from the registered contents of the controller. By resetting this alarm, the encoder ID is registered (paired) to the controller again.

When a controller is changed after pairing is completed				
	Encoder ID no. (* Numbers below are examples.)			
Actuator	17623	17623	17623	17623
Controller	17623	17699	17699	17623
ID mismatch error occurred?	No	Yes	Error reset ⇒ No	

5. **In environments where strong magnetic fields are present, use may be limited.**

A magnetic sensor is used in the encoder. Therefore, if the actuator motor is used in an environment where strong magnetic fields are present, malfunction or failure may occur.

Do not expose the actuator motor to magnetic fields with a magnetic flux density of 1 mT or more.

When installing an electric actuator and an air cylinder with an auto switch (ex. CDQ2 series) or multiple electric actuators side by side, maintain a space of 40 mm or more around the motor. Refer to the construction drawing of the actuator motor.

Mounting

⚠ Caution

1. For details on the mounting method, refer to the Operation Manual.
2. Tighten to the specified tightening torque. If the tightening torque is exceeded, the body and the mounting screws may break. However, insufficient torque may cause displacement of the body and loosening of the mounting screws.
3. Do not drop, strike, or apply excessive impact to this product.
4. The bolts may loosen due to the operating conditions and environment. Be sure to conduct maintenance such as tightening the bolts periodically.

Wiring

⚠ Caution

1. When repeated bending of the actuator cable is required, avoid putting the cable into a flexible moving tube with a radius smaller than the specified value (50 mm or longer).
2. The speed and force may change depending on the cable length, load, and mounting conditions.
Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for every additional 5 m. (At 15 m: Reduced by up to 20%)

Vacuum Gripper/ZXP7□01-X1 Magnet Gripper/MHM-X7400A Air Gripper/JMHZ2-X7400B

More information on the URCap software can be viewed here.



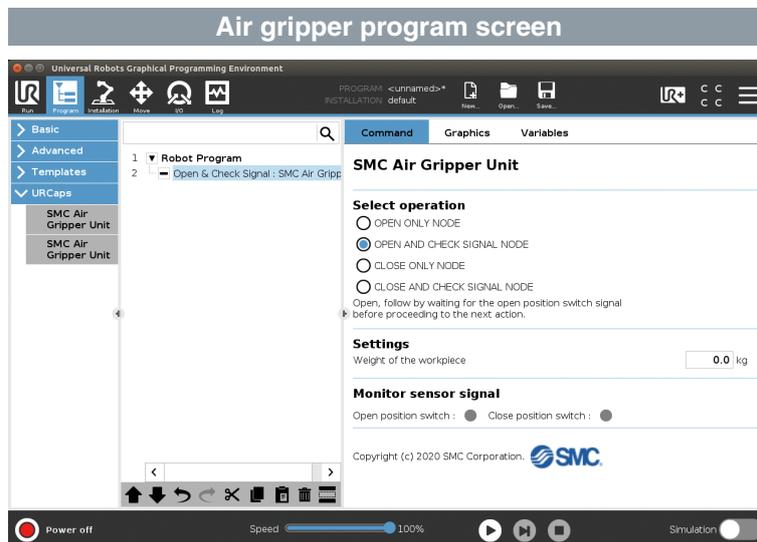
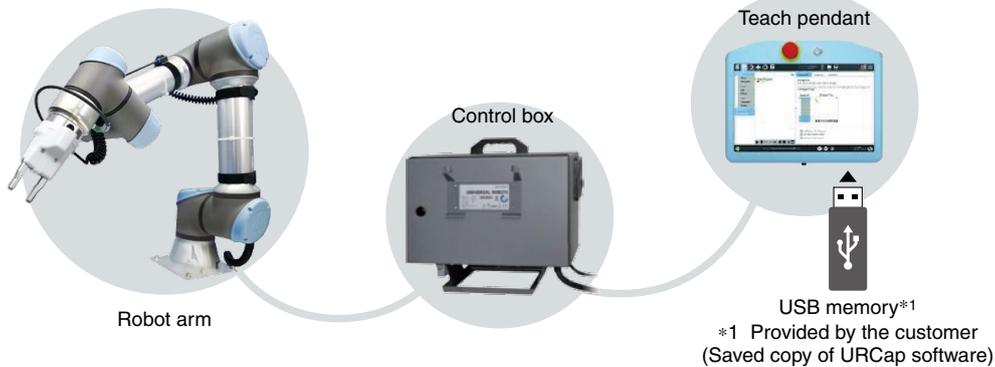
URCap

Easy programming

By using the dedicated software certified for Universal Robots, URCap, the teaching pendant can conduct various operations of SMC grippers intuitively, allowing for sensor signals to be easily incorporated.

Save a copy of the URCap software to a USB memory and insert it into the teaching pendant to easily install the software.

* Please download the URCap software from the website, and save it to a USB memory.



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.