Doc. no. DOC1107314

Operation Manual

PRODUCT NAME

Vacuum Gripper System

MODEL / Series / Product Number

ZGS-300180***-*******
ZGS-200120***-*******

SMC Corporation

Contents

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.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
etc.

Danger	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
Warning	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Caution	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

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. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

Safety Instructions

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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) Suction cups are excluded from this 1 year warranty.**
A suction cup 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 suction cup 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.

■Explanation of Symbols

Symbol	Definition
	Things you must not do. Instructions are provided as a drawing or sentence next to the symbol.
	Things you must do Instructions are provided as a drawing or sentence next to the symbol.

■Operator

1. This Operation Manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment.
   Only those persons are allowed to perform assembly, operation and maintenance.
2. Read and understand this Operation Manual carefully before assembling, operating or providing maintenance to the product.

■Safety Instructions

⚠Warning	
 Disassembly prohibited	Do not disassemble, modify (including the replacement of board) or repair other than instructed in this manual. Otherwise, an injury or failure can result.
 Do not	Do not operate the product outside of the specifications. Do not use for flammable or harmful fluids. Fire, malfunction, or damage to the product can result. Please check the specifications before use.
 Do not	Do not use in an atmosphere containing flammable or explosive gases. Fire or an explosion can result. The product is not designed to be explosion proof.
 Do not	Do not use the product in a place where static electricity is a problem. Otherwise failure or malfunction of the system can result.
 Do not	Do not cut off the power and compressed air supplied to this product while it is operating. Otherwise it can cause injury due to dropping of workpieces or damage to the system.
 Instruction	If using the product in an interlocking circuit - Provide a double interlocking system, for example a mechanical system. - Check the product for proper operation. Otherwise malfunction can result, causing an accident.
 Instruction	The following instructions must be followed during maintenance - Turn off the power supply - Stop the air supply, exhaust the residual pressure in piping and verify that the air is released before performing maintenance work. It may cause an injury.

⚠ Caution	
 Do not touch	Do not touch the terminals and connectors while the power is on. Otherwise electric shock, malfunction or damage to the switch can result.
 Instruction	Perform sufficient trial run. Otherwise, injury or damage to the system can result due to suction failure depending on the conditions of the suction of the workpiece. Perform sufficient verification before using this product.
 Instruction	After maintenance is complete, perform appropriate functional inspections and leak test. Stop operation if the equipment does not function properly or there is leakage of fluid. If there is leakage from parts other than the piping, the product might be broken. Cut off the power supply and stop the fluid supply. Do not supply fluid if there is leakage. Safety cannot be assured in the case of an unexpected malfunction.

■Precautions for Handling

Follow the instructions given below for selecting and handling of the vacuum gripper system.

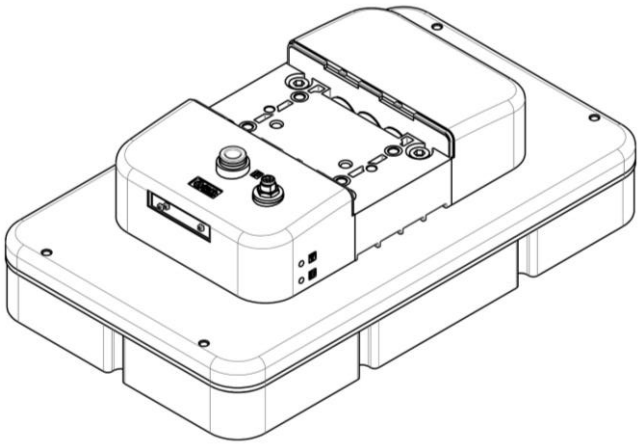
Product specifications

- Ensure to provide enough space for maintenance.
  Design the system allowing the required space for maintenance.
- Use the specified voltage. Otherwise, failure or malfunction can result.
- Design the product to prevent reverse current when the circuit is opened, or the product is forced to operate for operational check. Reverse current can cause malfunction or damage the product.

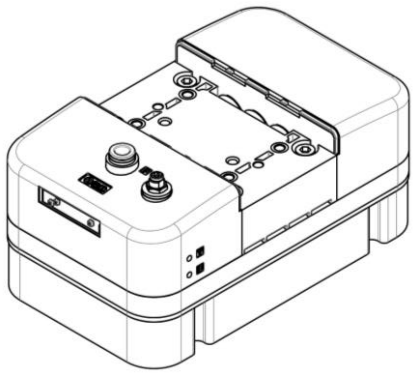
Operating environment

- Do not use the product in environments where the following atmospheres exist:
  1. Corrosive gases, chemicals, sea water, water, water stream, or where there is contact with any of these
  2. Flammable gases or explosive gases
  3. Oil or chemicals
  4. Thermal cycles other than normal temperature changes
  5. Direct sunlight (ultraviolet rays) or outdoor
  6. Ambient temperature exceeds the operating temperature range (refer to the specification table)
  7. A source of heat, causing radiant heat
- Do not use the product in an area where surges are generated.
  When there are machines or equipment that generate a large surge near the product (magnetic type lifter, high frequency inductive furnace, motor, etc.), this can result in deterioration and damage of the internal elements. Take measures against the surge sources and prevent the lines from coming into close contact.
- Do not use the product in an area where a strong magnetic field or strong electric field is generated; this can result in damage to internal parts and product malfunction.
- Do not allow oil, moisture, particles, dust, cutting chips, spatter, or other foreign objects to enter inside the product; this can result in deterioration in product performance or malfunction. Provide appropriate protection when using the product in an environment where contamination may occur.
- Do not apply vibration or impact to the product. Handle the product with care as vibration and impact may cause deterioration in product performance or malfunction.

1. Parts included in the package

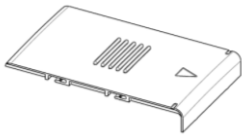


Size 300x180

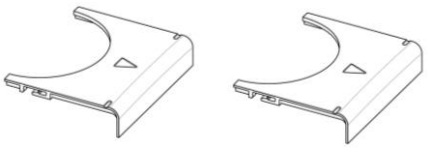


Size 200x120

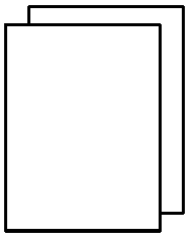
Vacuum Gripper System x 1



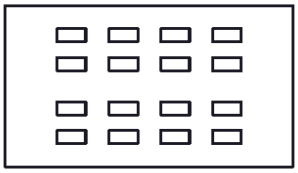
Flange cover x 1
(For offset flange)



Tool plate cover x 2
(For other than offset flange)



Operation manual x 1
(pressure switch)

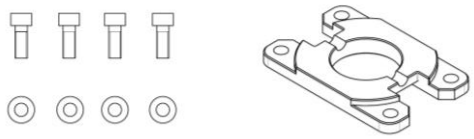


Unit label x 1
(Pressure switch: When “With unit switching function" is selected.)

Connector cable x 1
(When “With connector cable” is selected.)
Refer to how to order for an attached cable.

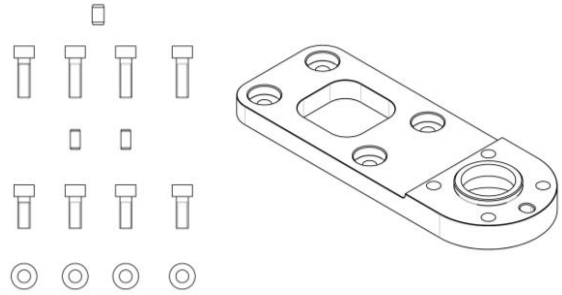
∗For other items included with robot mounting flange, please refer to the next page.

When model "Robot mounting flange : Tool plate only" is selected



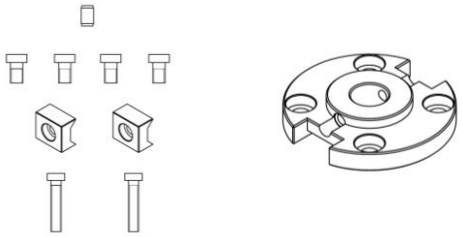
Tool plate x1
Hexagon socket head cap screw (M6x16) x4
Washer (M6) x4

When model "Robot mounting flange : Offset flange " is selected

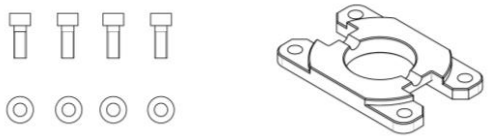


Offset flange x1
Hexagon socket head cap screw (M6x16) x4
Washer (M6) x4
Parallel pin (5x10) x2
Parallel pin (6x10) x1
Hexagon socket head cap screw (M6x20) x4

When model "Robot mounting flange : Tool plate and main plate" is selected



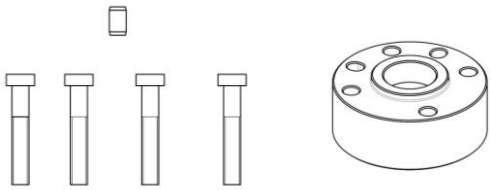
Main plate x1
Clamper x2
Hexagon thin socket head screw (M5x25) x2
Hexagon thin socket head screw (M6x10) x4
Parallel pin (6x10) x 1



Tool plate x1
Hexagon socket head cap screw (M6x16) x4
Washer (M6) x4

Additional Flanges

When model "Compatible robot: 043P/043N" is selected



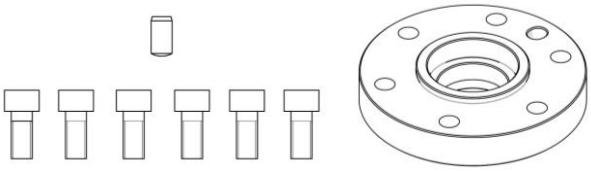
When offset flange is selected

Flange Y x1
Hexagon socket head cap screw (M6x45) x4
Parallel pin (6x10) x1

When "tool plate and main plate" is selected

Flange Y x1
Hexagon thin socket head screw (M6x35) x4
Parallel pin (6x10)

When model "Compatible robot: 012P" is selected



Flange U x1
Hexagon socket head cap screw (M8x18) x6
Parallel pin (8x15) x1

2. How to order

How to order

ZGS **NP** **K** - **300180** **B** **S** **2** - **R** **Y** **1** **C8**

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Compatible Robot

Symbol		Robot manufacturer	Supported model	Switch output	Valve polarity
Identification symbol	Output type				
N	P	-	General purpose	PNP	-COM
	N			NPN	+COM
	H			IO-Link compatible	
011	P	UNIVERSAL ROBOTS	UR3e	PNP	-COM
			UR5e		
			UR10e		
			UR16e		
012			UR20		
021	N	OMRON TECHMAN ROBOT	TM12(S)	NPN	+COM
			TM14(S)		
			TM16		
			TM20		
			TM25S		
043	P	YASKAWA Electric	MOTOMAN-HC10(S)DTP	PNP	-COM
			MOTOMAN-HC20(S)DTP		
	N		MOTOMAN-HC10(S)DTP	NPN	+COM
			MOTOMAN-HC20(S)DTP		
051	P	FANUC	CRX-5iA	PNP	-COM
			CRX-10iA(L)		
			CRX-20iA		
			CRX-25iA		

❷ Combination of supply valve and release valve

Symbol	Supply valve	Release valve
B	N.O.	N.C.
K	N.C.	N.C.
Nil	None	None

∗When "H" is selected in compatible robot, "Nil" cannot be selected.

❸ Foam size

300180	300mm×180mm
200120	200mm×120mm

❹ Foam

A	300180	Thickness 20mm (Number of holes: 39)
	200120	Thickness 20mm (Number of holes: 22)
B	300180	Thickness 30mm (Number of holes: 39)
	200120	Thickness 30mm (Number of holes: 22)

❺ Suction plate

S	Vacuum saving valve type
M	Fixed orifice type

Note) Vacuum saving valve type has stoppers and Fixed orifice type doesn't have a stopper.

❻ Number of Ejector assemblies

1	1pcs
2	2pcs
3*	3pcs

∗For size 200x120, 3 ejector assemblies cannot be selected.

❼ Connector cable for compatible robot

Nil*	With connector cable(For compatible models)
R	With connector cable(Discrete wire)
N	Without connector cable

∗When "Identification symbol: N(P,N)" is selected in ❶ compatible robot, "Nil: With connector cable (For compatible models)" cannot be selected. Also, when "Identification symbol: NH" is selected in compatible robot, only "N: Without connector cable" can be selected. (Please prepare a general-purpose IO-Link compatible M8 cable or M8-M12 conversion connector and M12 cable.)

❽ Pressure switch unit specifications

Symbol	Switch unit	Pressure detection location
W	With unit switching function	Pressure in base plate
X		Pressure in foam hole
Y	SI unit only	Pressure in base plate
Z		Pressure in foam hole

∗ Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan. (Only Symbol: Y or Z can be selected in Japan.)

❾ Robot mounting flange

Nil	Without robot mounting flange
1	Tool plate and Main plate
2	Offset flange
3	Tool plate only

∗1.The following two options are available for mounting the gripper on the robot:
- Offset flange
- Tool plate + Main plate.

Depending on compatible robots, an additional flange is included.
See the Robot Mounting Flange options for details.

Please check the link for details.

The lifting force may be limited when the tool plate and main plate are used.

Please check the link for details.

∗2.For compatible robot: 021 (OMRON TECHMAN ROBOT), symbol Nil or 2 can be selected.
∗3. 3: Tool plate only is available for users who already have the main plate (ZGS-PL3-7-A).

❿ Air pressure supply (P) port

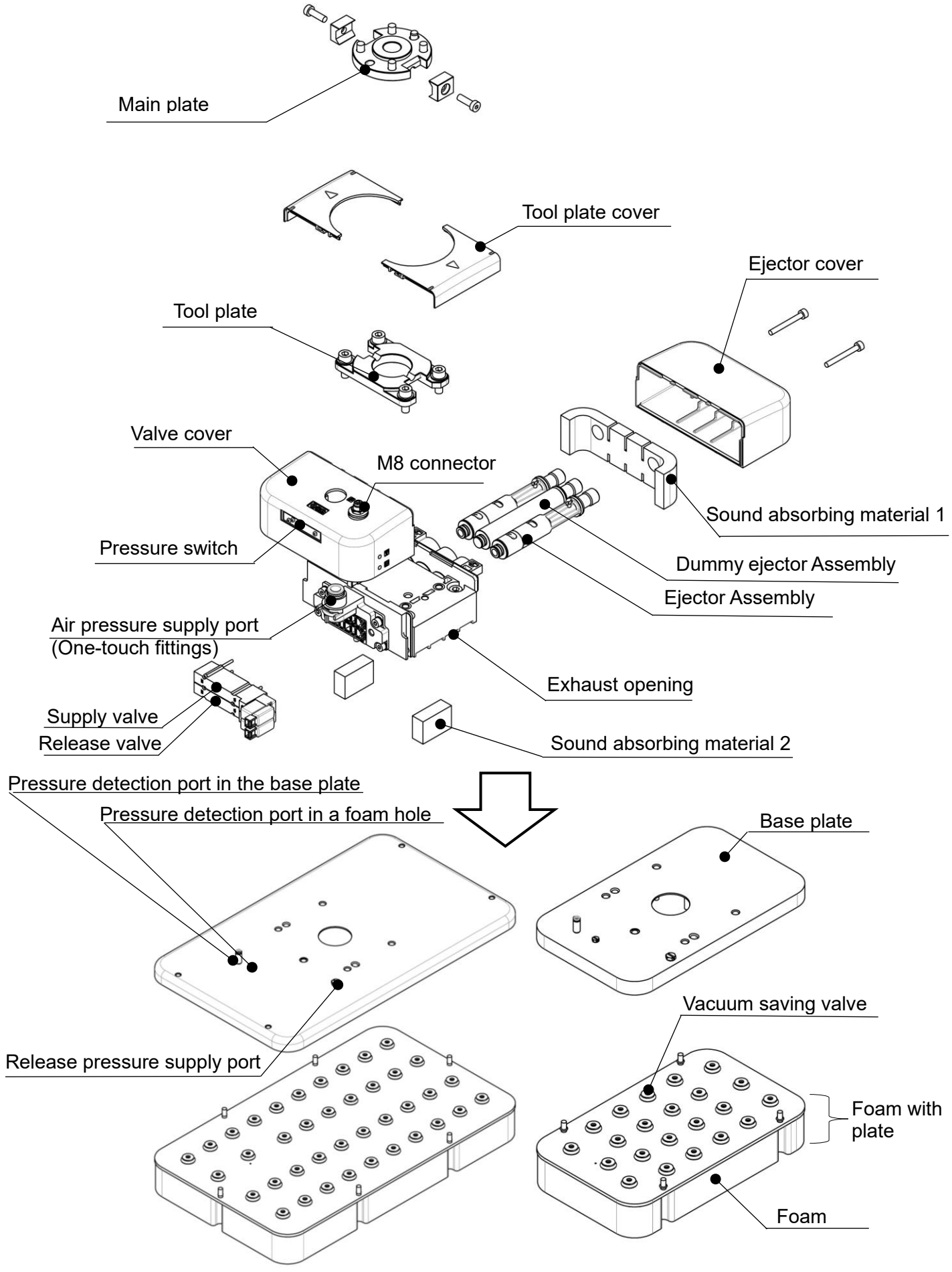
C8	Metric	Φ8 One-touch fitting
C10		Φ10 One-touch fitting
N9	Inch	Φ5/16" One-touch fitting
N11		Φ3/8" One-touch fitting

Table 1. ❾ Robot mounting flange part number correspondence table (with link)

Compatible Robot ❶	Robot mounting flange configuration❾	Dimensions		Flange part number					Assembly Procedure
		300x180	200x120	ZGS-PL3-3-A Tool plate	ZGS-PL3-7-A Main plate	ZGS-PL3-5-A Flange U	ZGS-PL3-6-A Flange Y	ZGS-PL3-6-1-A Flange Y	
N 011 051	1	■	■	■	■	–	–	–	■
	2	■	■	–	–	–	–	–	■
012	1	■	■	■	■	■	–	–	■
	2	■	■	–	–	■	–	–	■
043	1	■	■	■	■	–	■	–	■
	2	■	■	–	–	–	–	■	■
021	2	■	■	–	–	–	–	–	■
N 011 012 043 051	3	–	–	■	–	–	–	–	–
N 011 012 043 051 021	Nil	■	■	–	–	–	–	–	–

* The link destination for Dimensions and Flange part number is "Dimensions" described below.
The link destination for assembly procedure is "Mounting" described below.

3. Components of Product Parts

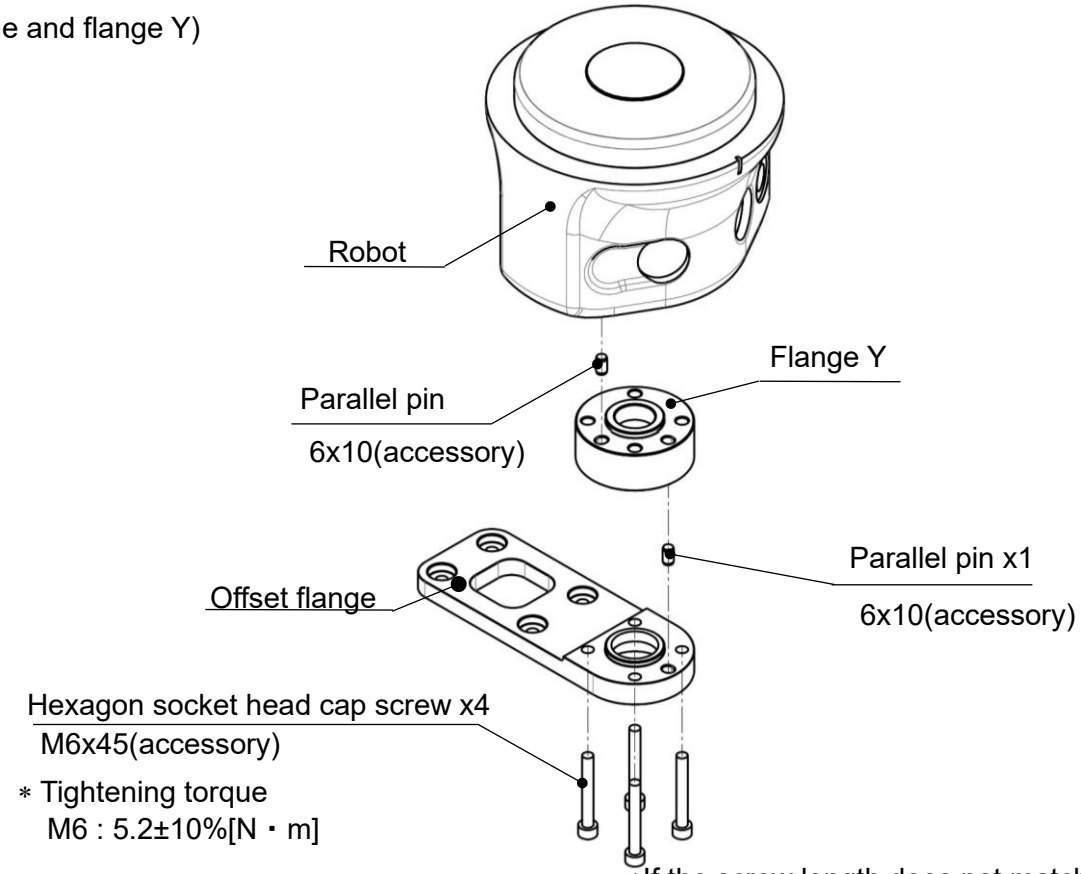


4. Mounting

■Mounting the vacuum gripper system on the robot

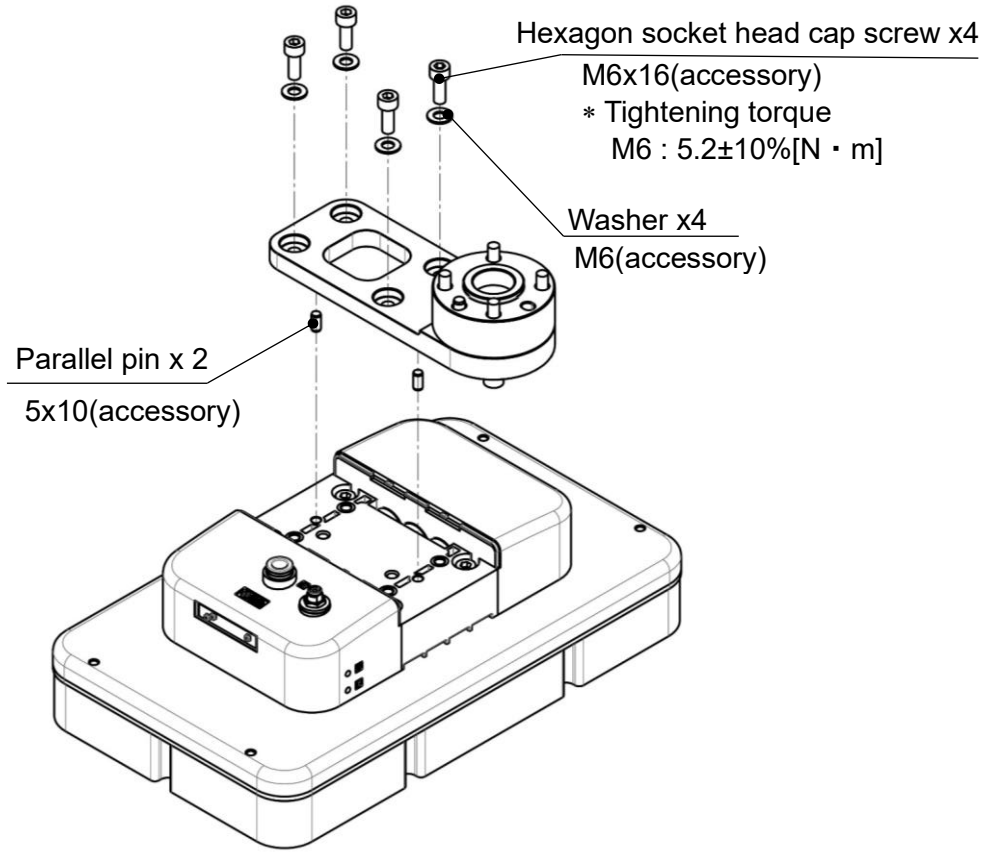
(Offset flange and flange Y)

Procedure 1



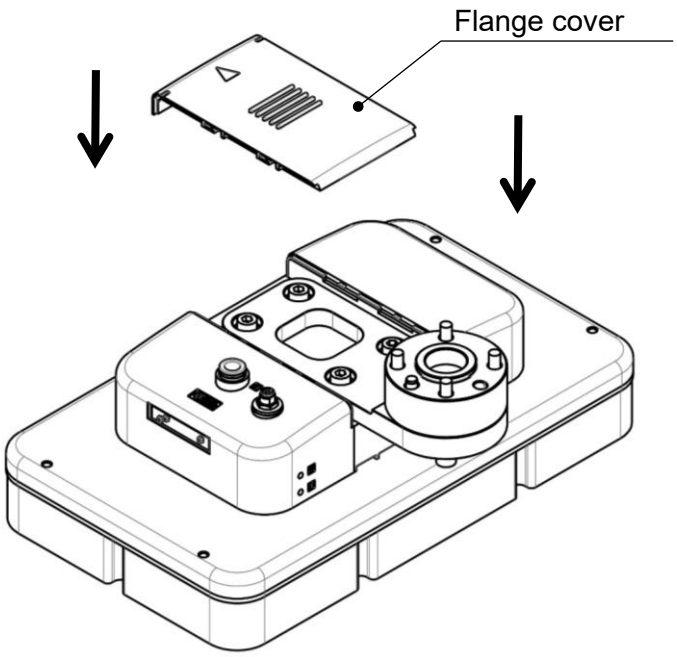
∗If the screw length does not match the robot, please prepare the screws yourself.

Procedure 2

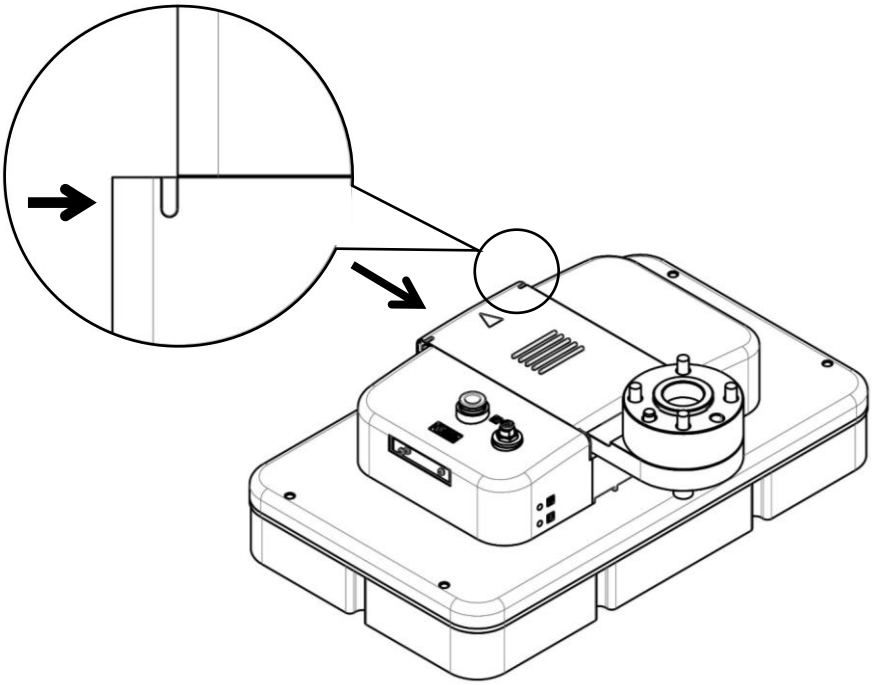


(Offset flange and flange Y)

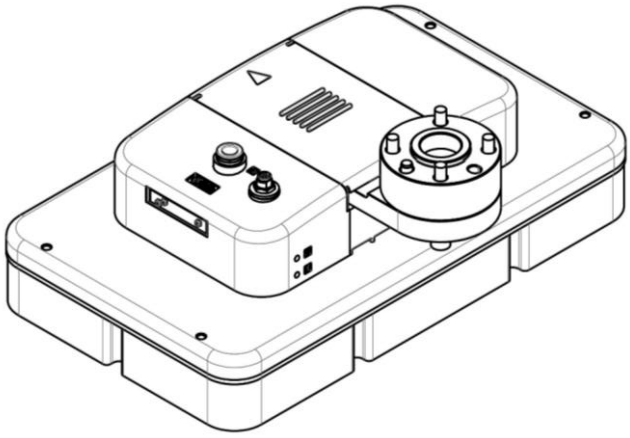
Procedure 3



Procedure 4



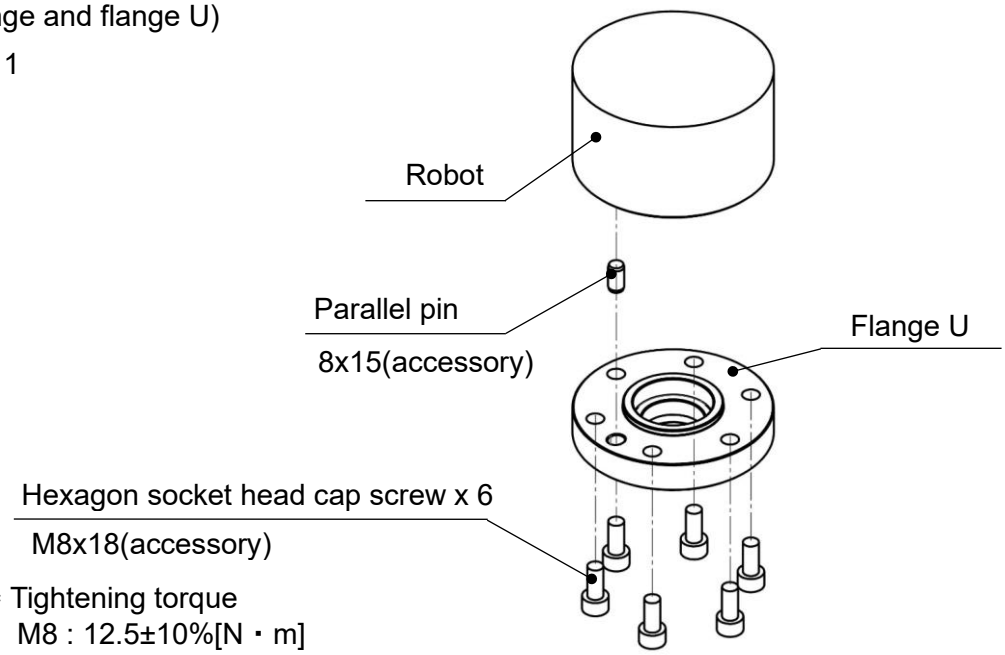
Procedure 5



■Mounting the vacuum gripper system on the robot

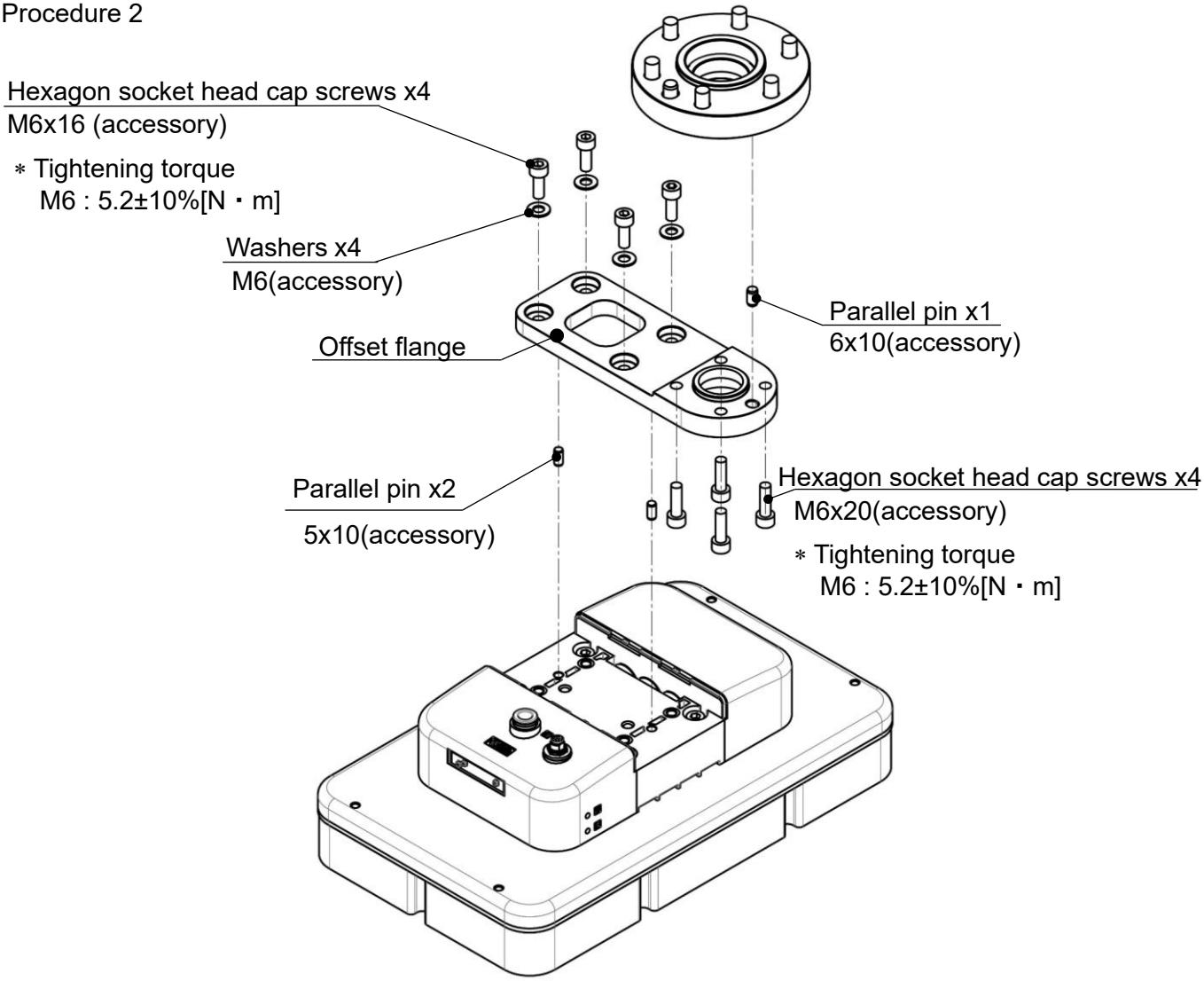
(Offset flange and flange U)

Procedure 1



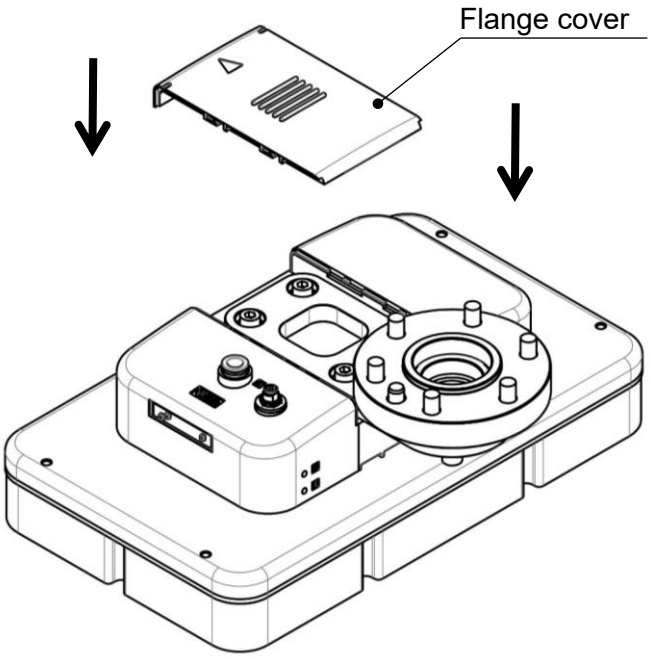
∗If the screw length does not match the robot, please prepare the screws yourself.

Procedure 2

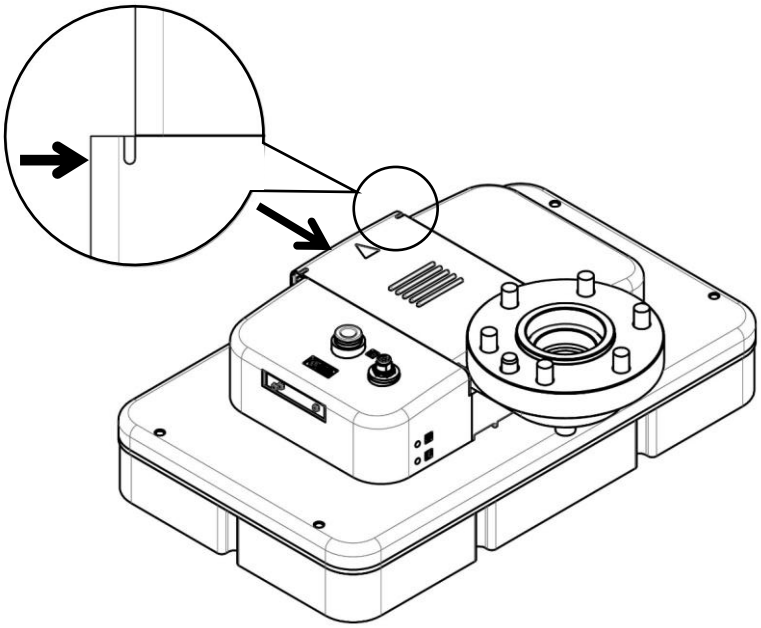


(Offset flange and flange U)

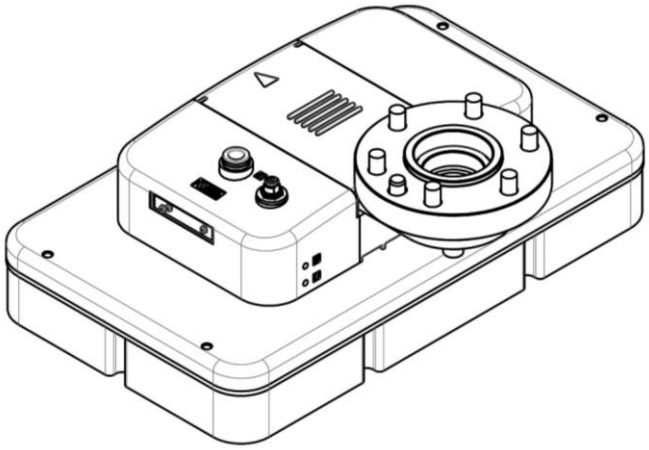
Procedure 3



Procedure 4



Procedure 5



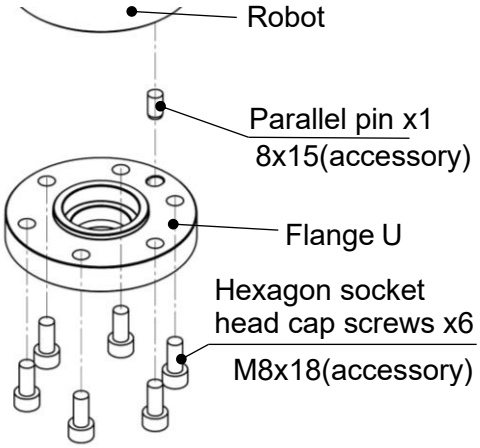
■Mounting the vacuum gripper system on the robot

(Tool plate and Main plate)

Procedure 1

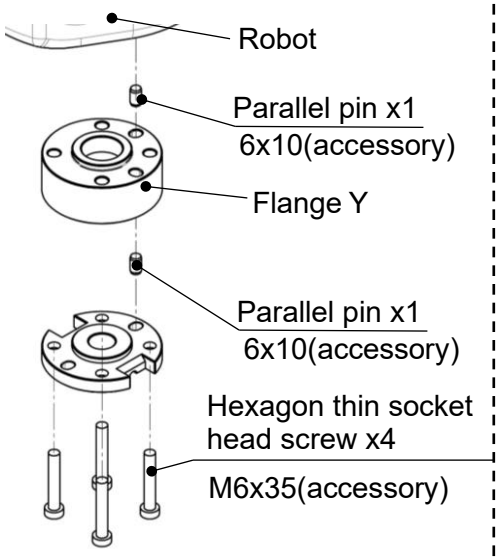
When flange U is included

・After mounting flange U on the robot, mount the main plate.

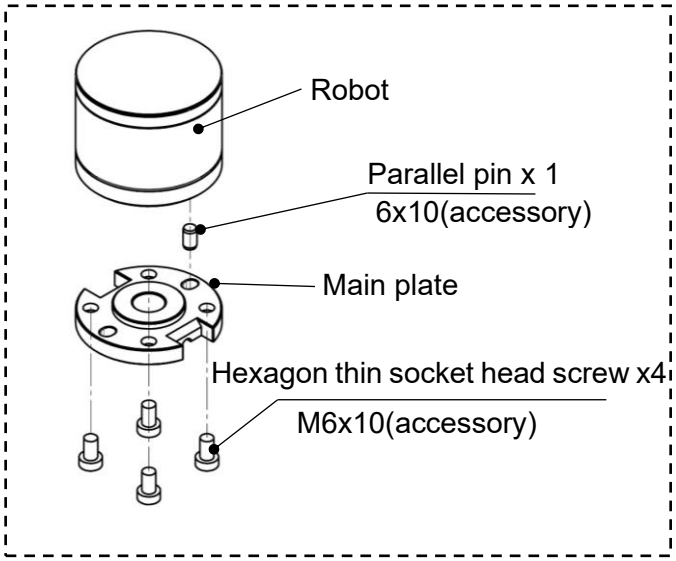


When flange Y is included

・After mounting flange Y on the robot, mount the main plate.

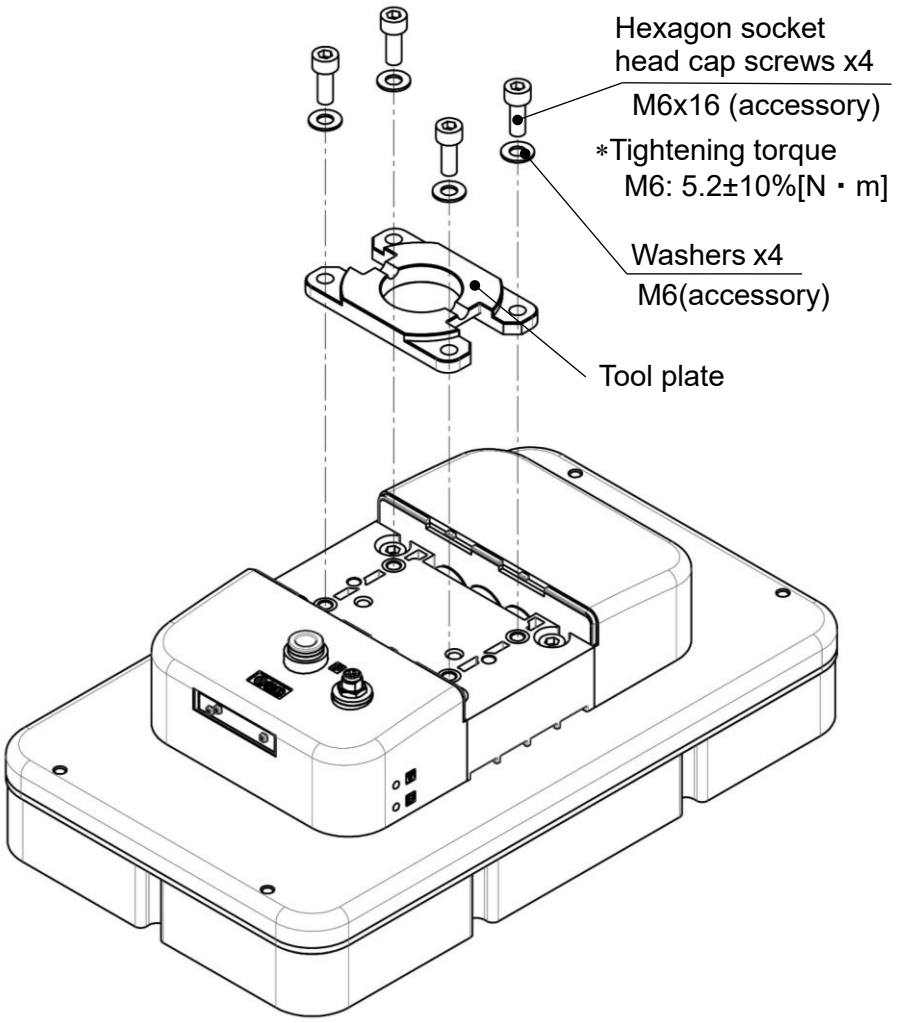


With additional flange



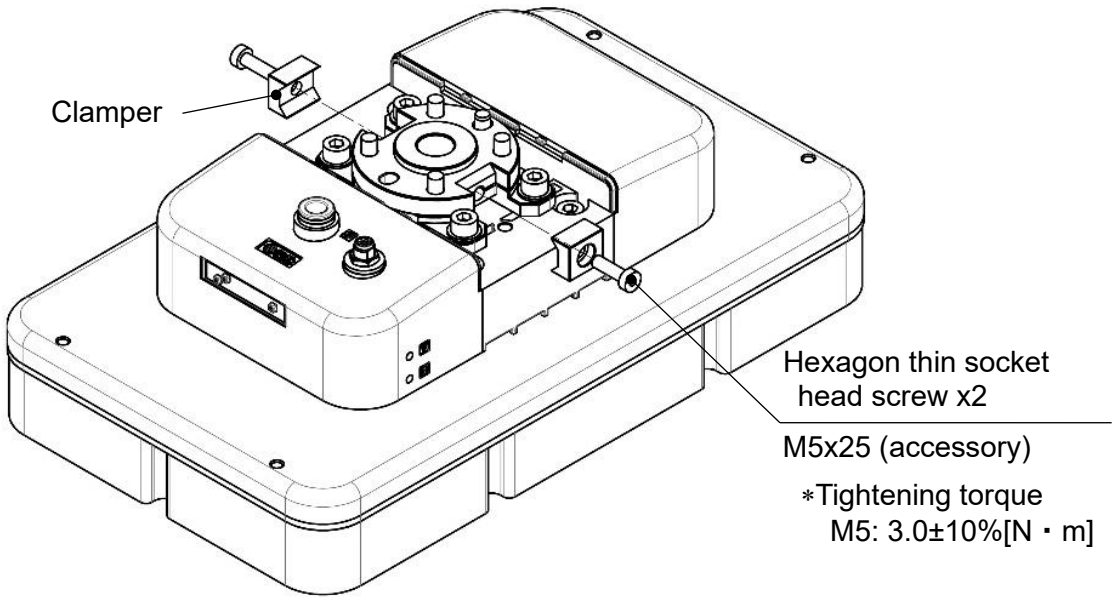
∗Tightening torque
M6 (4 PCS) : 5.2±10%[N・m]
M8 (6 PCS) : 12.5±10%[N・m]

∗ If the screw length does not match the robot, please prepare the screw yourself.

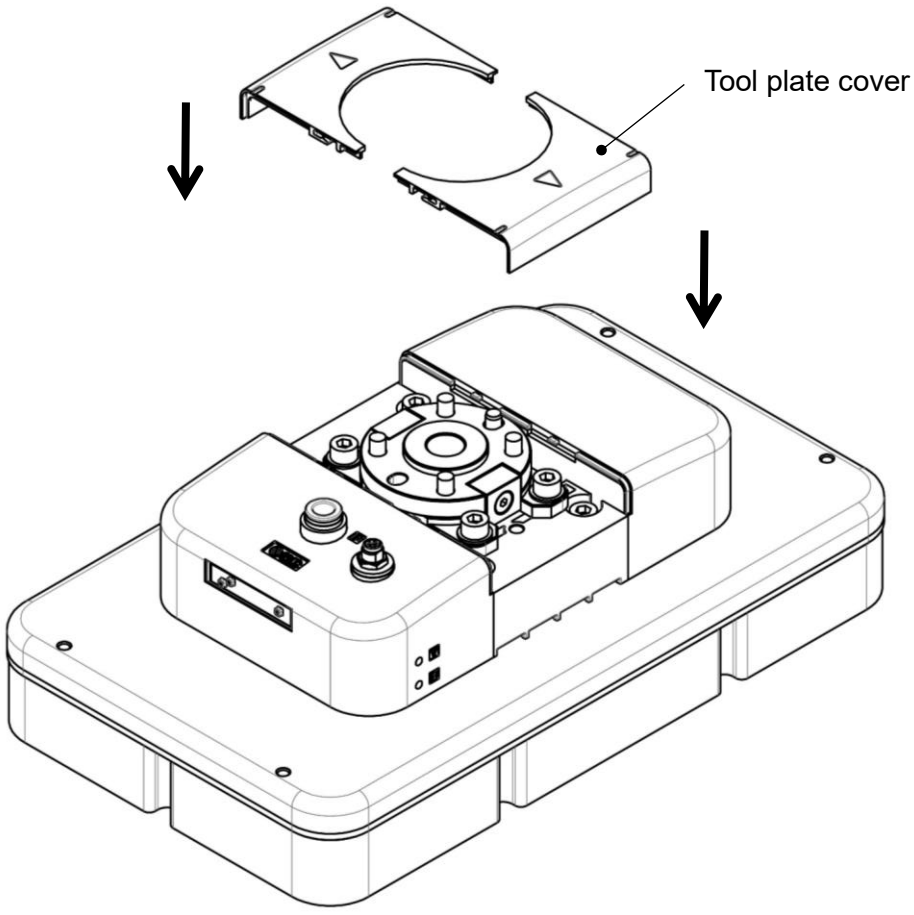


(Tool plate and Main plate)

Procedure 2

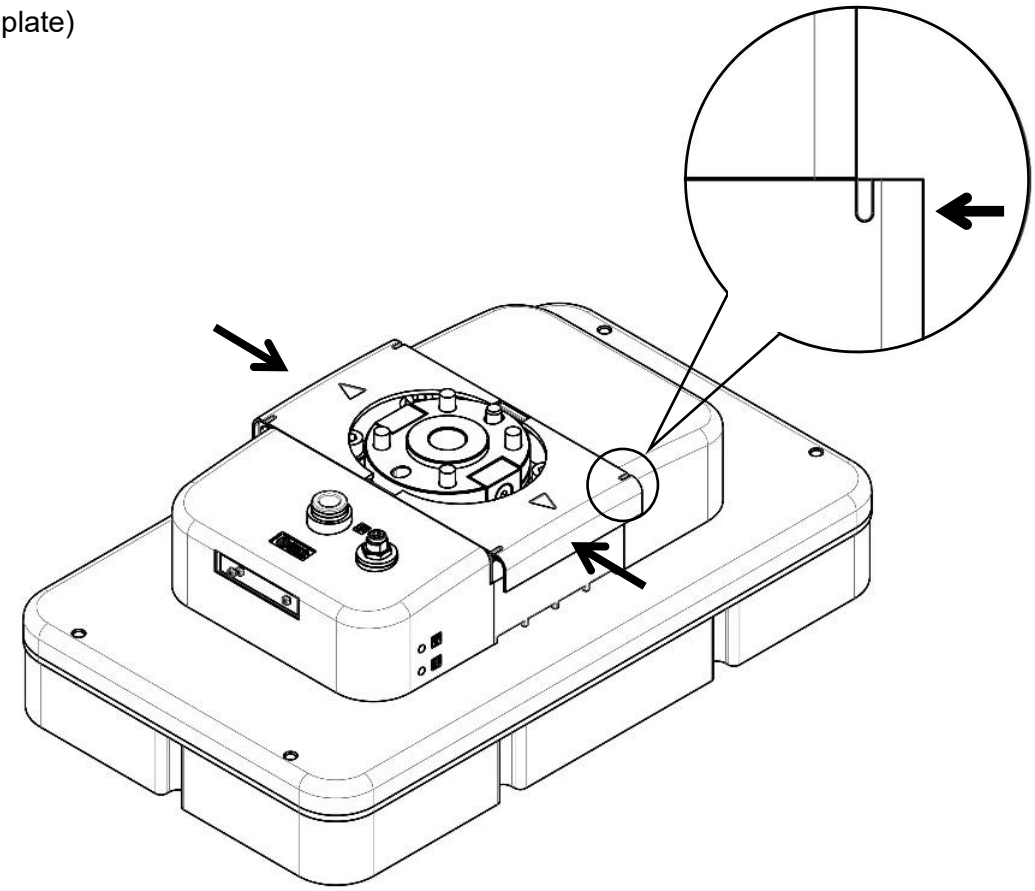


Procedure 3

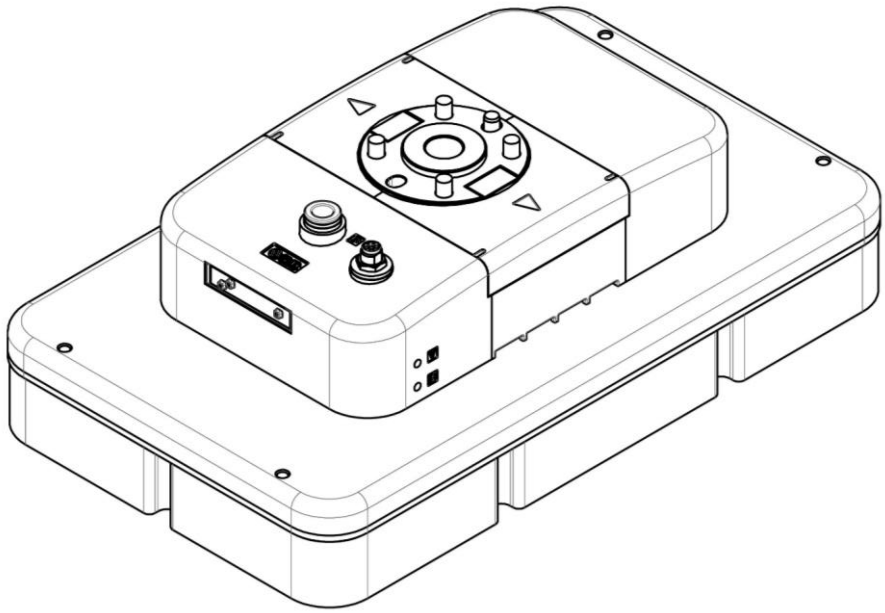


(Tool plate and Main plate)

Procedure 4



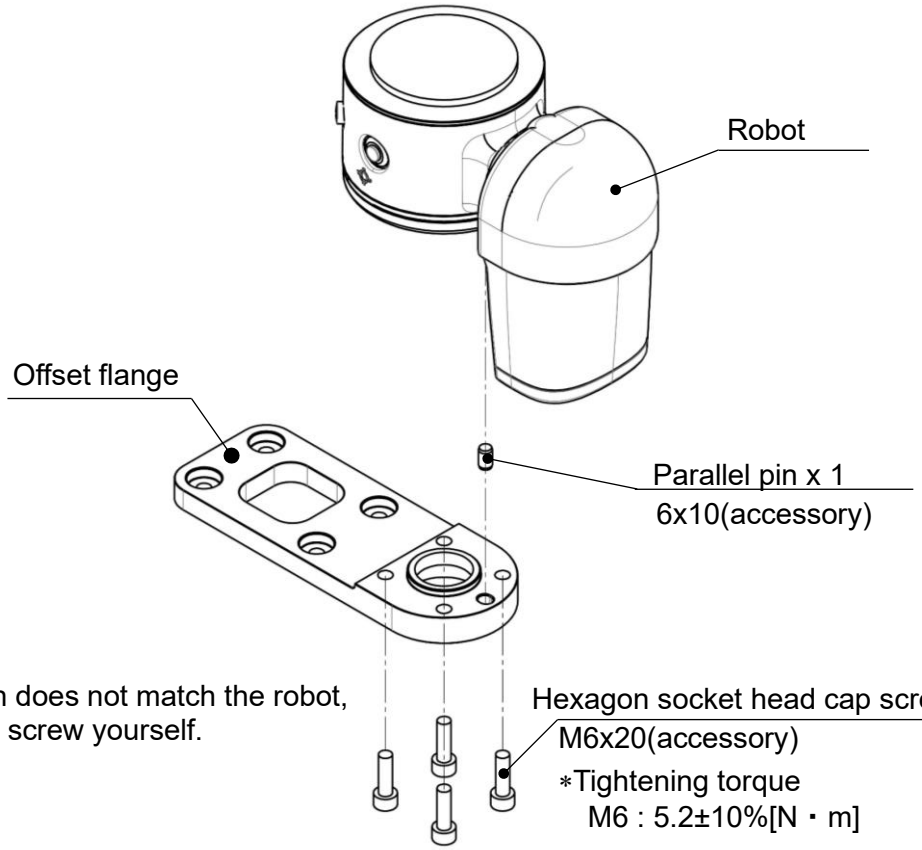
Procedure 5



■Mounting the vacuum gripper system on the robot

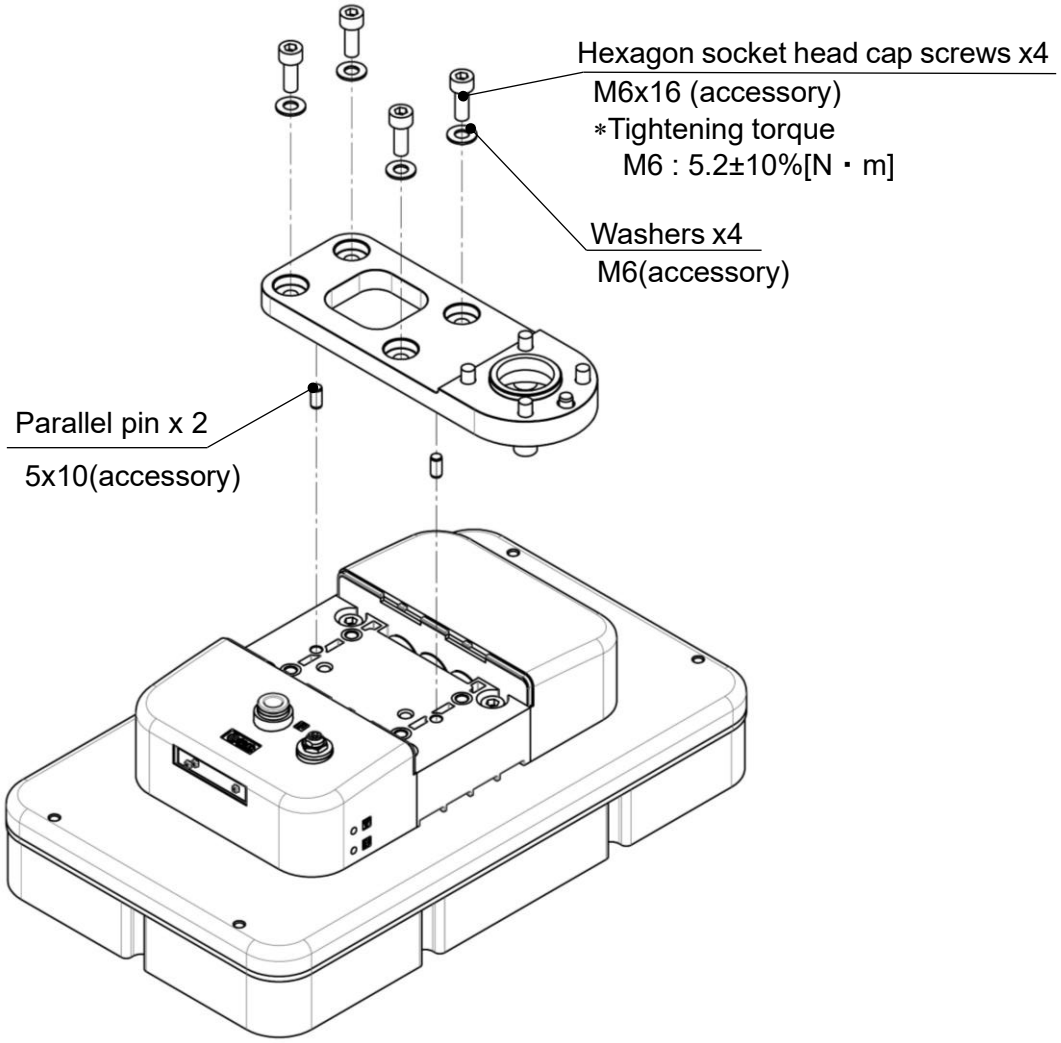
(Offset flange)

Procedure 1

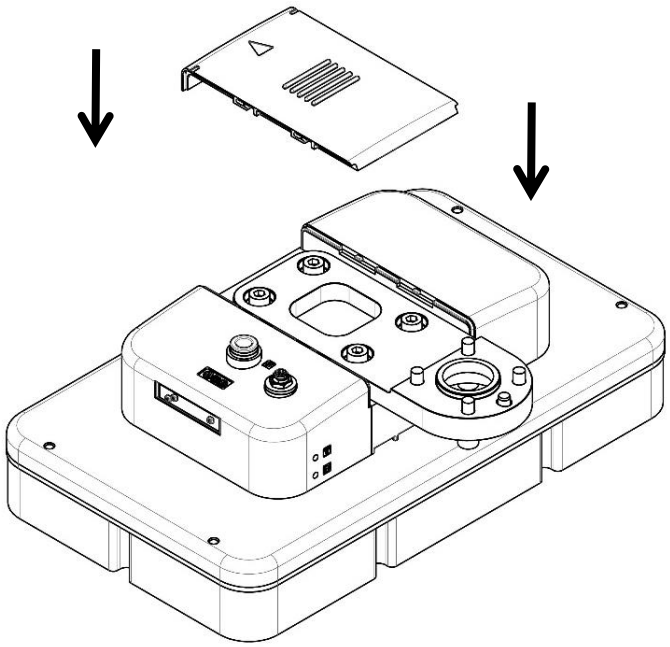


∗If the screw length does not match the robot, please prepare the screw yourself.

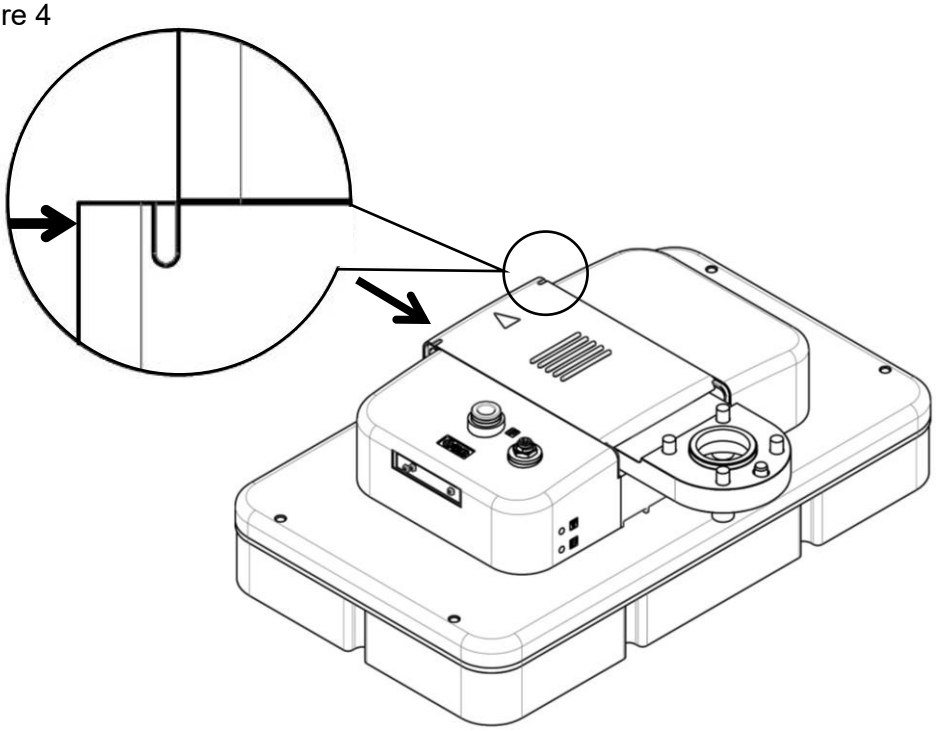
Procedure 2



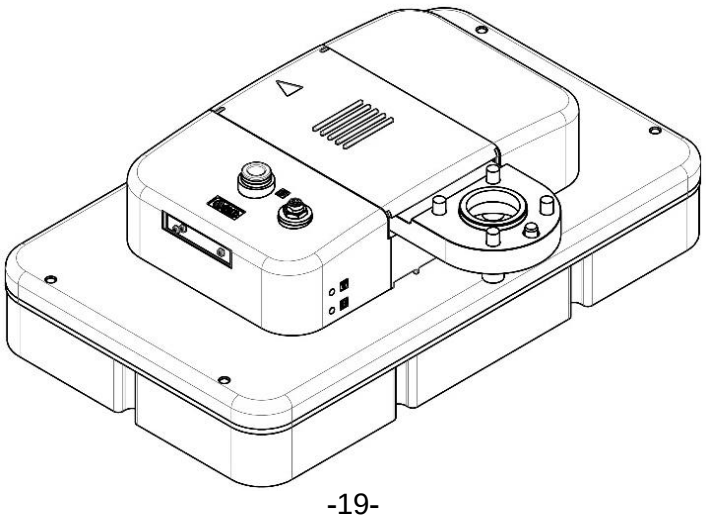
(Offset flange)
Procedure 3



Procedure 4



Procedure 5



5. Specifications

5.1. Specifications

Table 2.

Number of ejector assemblies [pcs]		1	2	3
Fluid		Air		
Operating pressure range [MPa]		0.3～0.7		
Operating temperature range [°C]		5～50		
Standard supply pressure [MPa]*1)		0.45		
Max. vacuum pressure [kPa]		-63	-62	-60
Air consumption [L/min(ANR)]*2)		92	177	257
Weight [kg]	300x180*3)	1.8		
	200x120*4)	1.3		-
Power supply [V]		DC24±10%		
Power consumption [W]		1.4		
Supply valve Release valve *5)		JSY3140-5MOZ-∗ equivalent		
Pressure switch *6)		ZSE10-00-∗ equivalent		
standard		CE/UKCA MARKED		

∗1) Indicates the pressure right before the supply pressure P port when a vacuum is generated.
It is affected by air supply capacity, pipe size, air consumption of other equipment operating simultaneously, etc.
During vacuum generation, the pressure immediately before the P port may fall below the standard supply pressure.

∗2) Values are based on SMC test conditions at standard supply pressure and may vary depending on atmospheric pressure (weather, altitude, etc.) and measurement method.

∗3) In case of ZGSNPK-300180AM3-RY1C8

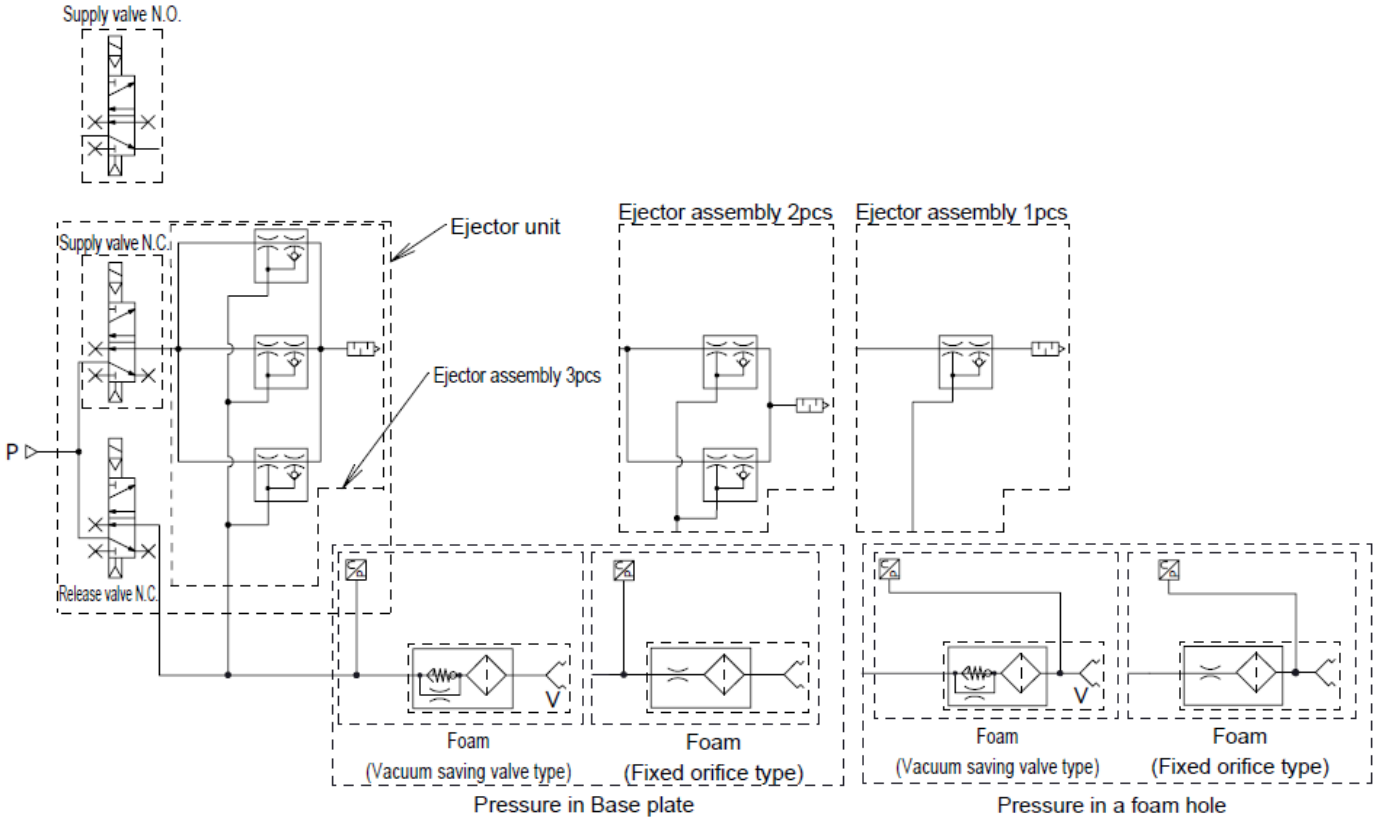
∗4) In case of ZGSNPK-200120AM2-RY1C8

∗5) Refer to the JSY3000 series catalogue and operation manual for the specifications of the supply valve and release valve.

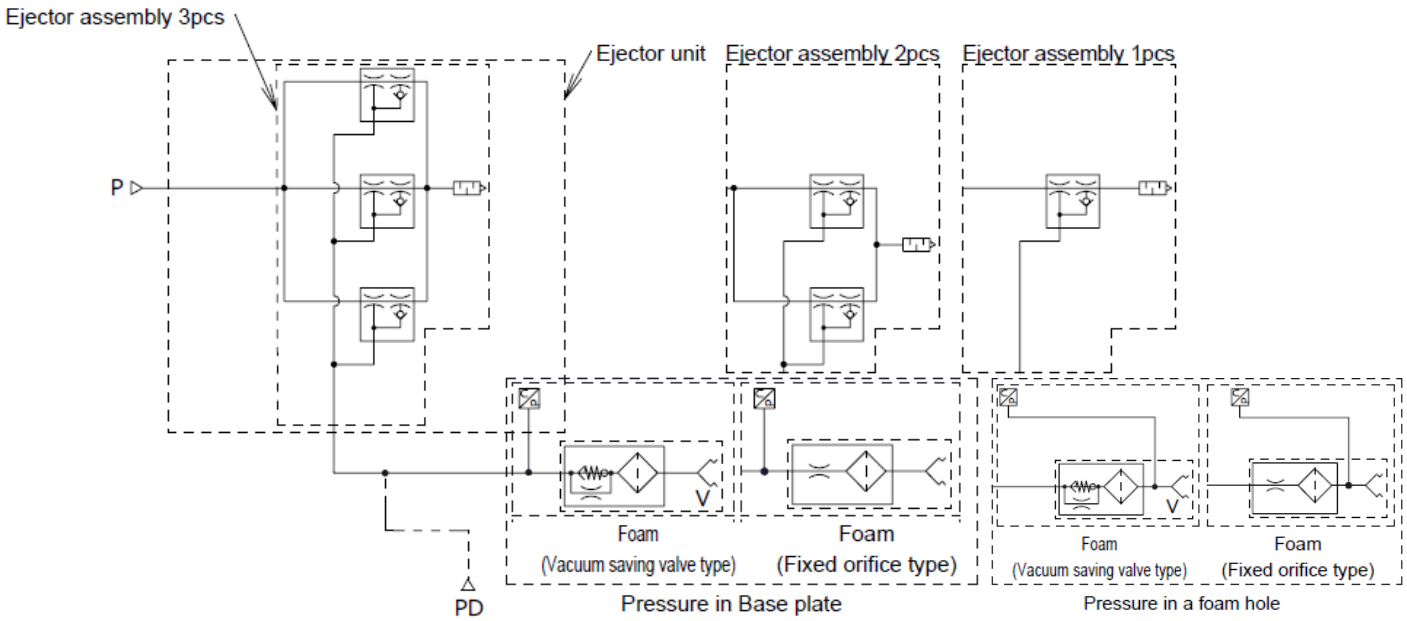
∗6) Refer to the ZSE10 series catalogue and operation manual for pressure switch specifications.
For the IO-LINK compatible pressure switch,
please refer to the operation manual of "Vacuum ejector pressure switch IO-Link compatible/ZGS-LD1-□(H/J)□-A".

5.2. Pneumatic Circuit

With valves



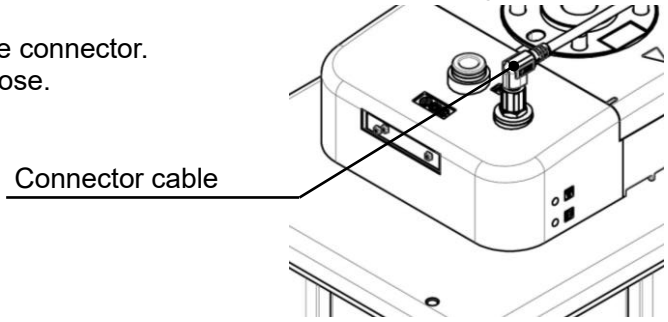
Without valve



5.3. Wiring

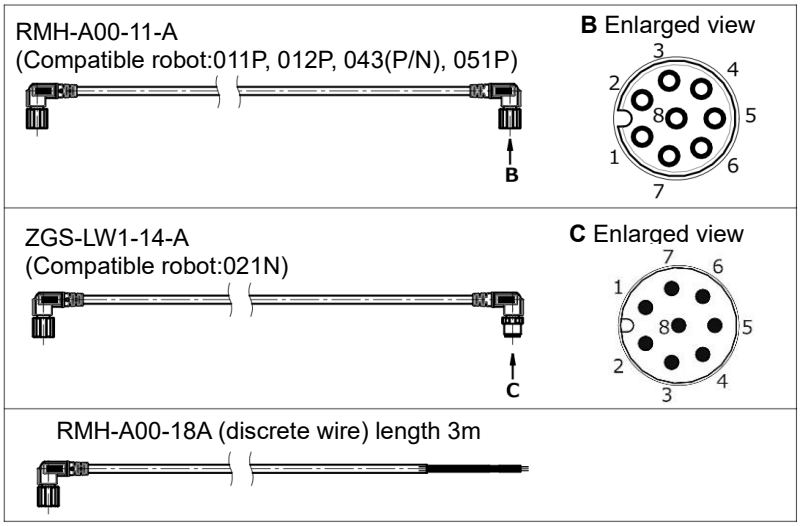
■Connect the M8 connector cable

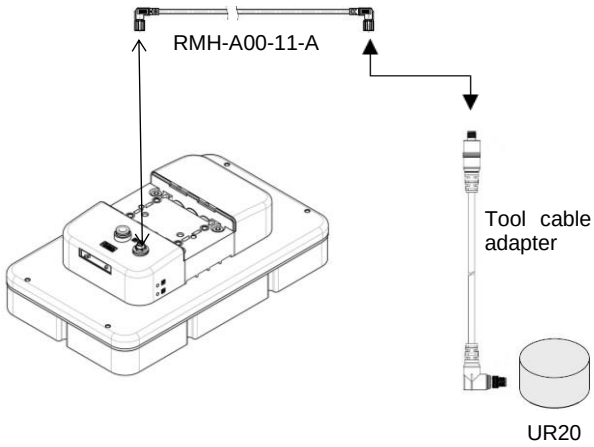
Connect the vacuum gripper system's M8 connector pin and the tool flange's tool I/O connector together with the M8 connector cable.
Do not energize while securing the connector.
Check that the connector is not loose.



■Connector cable

In the case of ZGS012P∗-∗∗∗∗-∗∗∗





Symbol	Robot manufacturer	Vacuum gripper system side	Robot side	Product number	Cable length [mm]
011P	UNIVERSAL ROBOTS	M8 8-pin connector (Socket)	M8 8-pin connector (Socket) or Discrete wire	RMH-A00-11-A or RMH-A00-18A	220 or 3000
012P ∗					
043P	YASKAWA Electric				
043N					
051P	FANUC				
NP	-		Discrete wire	RMH-A00-18A	3000
NN					
021N	OMRON TECHMAN ROBOT		M8 8-pin connector (Plug) or Discrete wire	ZGS-LW1-14-A or RMH-A00-18A	300 or 3000
NH	-	Please prepare a general-purpose IO-Link compatible M8 cable or an M8-M12 conversion connector and an M12 cable.			

∗ For the UR20, please use the tool cable adapter that comes with the robot to connect.

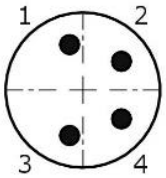
Table3-1. Connector pin assign “M8 8-pin”

Pin no.	Wire color	General purpose UNIVERSAL ROBOTS FANUC YASKAWA Electric	General purpose YASKAWA Electric	OMRON TECHMAN ROBOT
		PNP type	NPN type	
1	White	-	-	Power supply (DC24V) (+)
2	Brown	-	-	Pressure switch output (OUT1) 【Digital】（+）
3	Green	Pressure switch output (OUT2) 【Digital】（-）	Pressure switch output (OUT2) 【Digital】（+）	Pressure switch output (OUT2) 【Digital】（+）
4	Yellow	Pressure switch output (OUT1) 【Digital】（-）	Pressure switch output (OUT1) 【Digital】（+）	-
5	Gray	Power supply (DC24V) (+)	Power supply (DC24V) (+)	Supply valve (-) *1)
6	Black	Release valve (+) *1)	Release valve (-) *1)	Release valve (-) *1)
7	Blue	Supply valve (+) *1)	Supply valve (-) *1)	-
8	Red	Power supply (GND) (-)	Power supply (GND) (-)	Power supply (GND) (-)

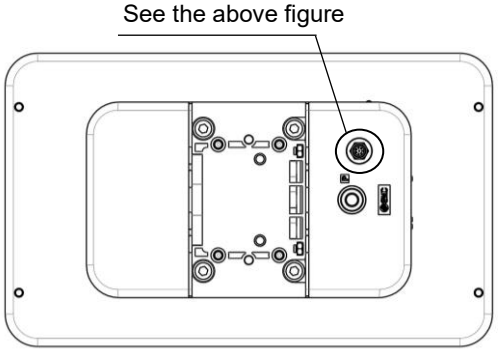
*1) In case of “without valve” type, it is not connected.
Regarding how to use the pressure switch, refer to operation manual for ZSE10 series.

Table3-2. Connector pin assign “M8 4-pin”

Pin no.	IO-Link type
1	Power supply (DC24V) (+)
2	-
3	Power supply (GND) (-)
4	IO-Link Communication data (C/Q)



M8 4-pin (Plug)



5.4. Ejector flow characteristics

∗Suction flow rates are measured under SMC test conditions and are not guaranteed.
The dotted lines in the graph below and the values in brackets in the table below are estimates based on measured values.

(Supply pressure:0.45MPa)

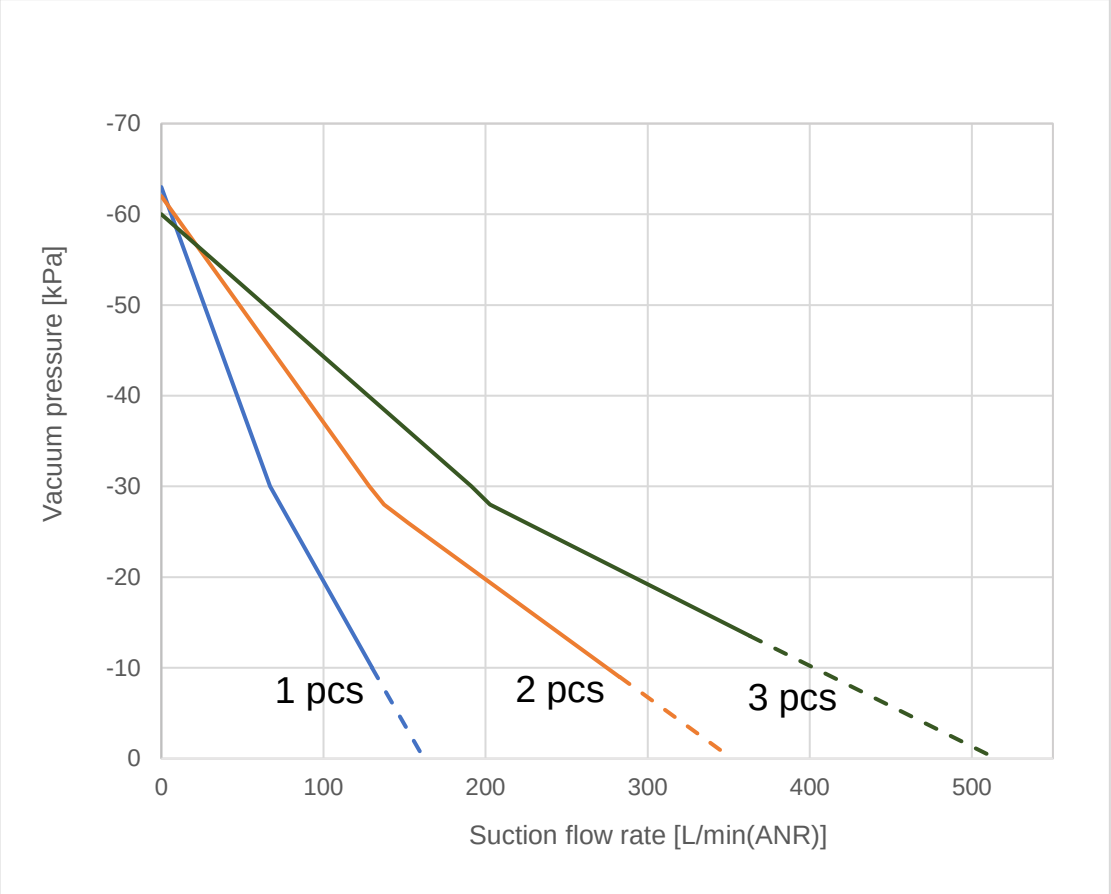


Table4. Suction flow rate for each number of ejector assemblies

Number of ejector assemblies [pcs]	Supply pressure [MPa]	Suction flow rate[L/min(ANR)] for each vacuum pressure [kPa]					
		0	-10	-20	-30	-40	-50
1	0.45	(162)	130	99	67	47	26
2		(352)	275	198	128	88	48
3		(515)	(407)	292	191	127	63

5.5. Sound level

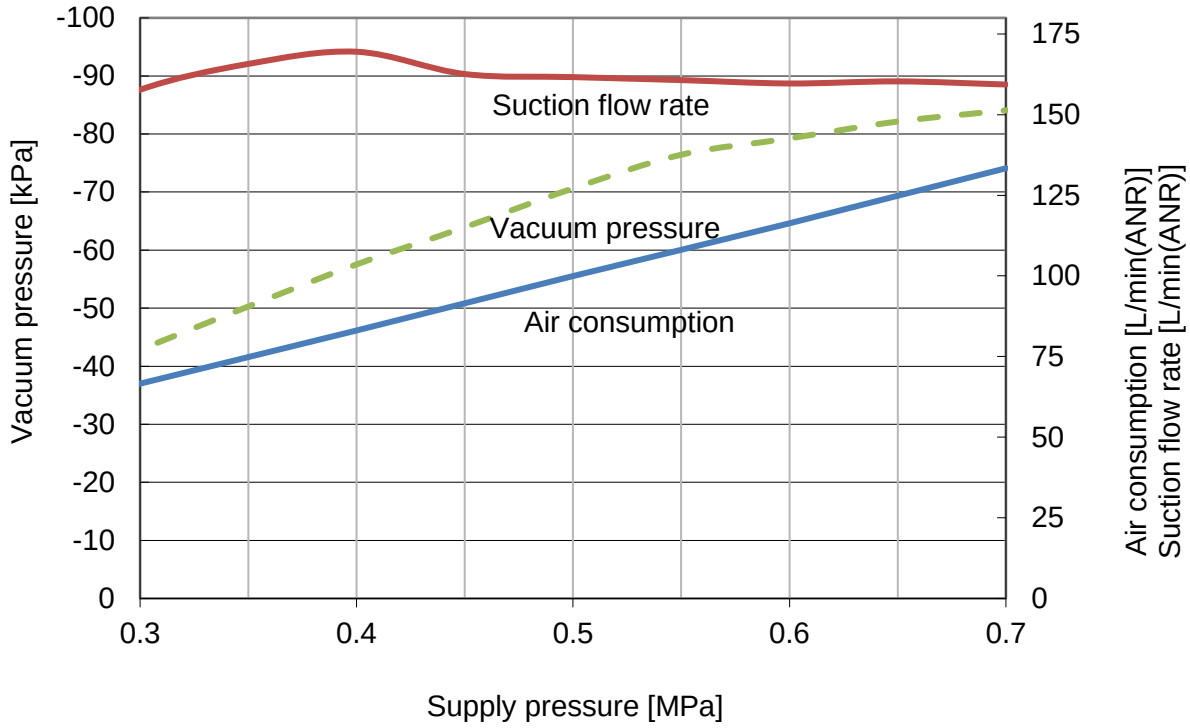
Sound level[dB(A)]	Size 300x180	64
	Size 200x120	60

∗Actual values measured under SMC test conditions (not guaranteed values).

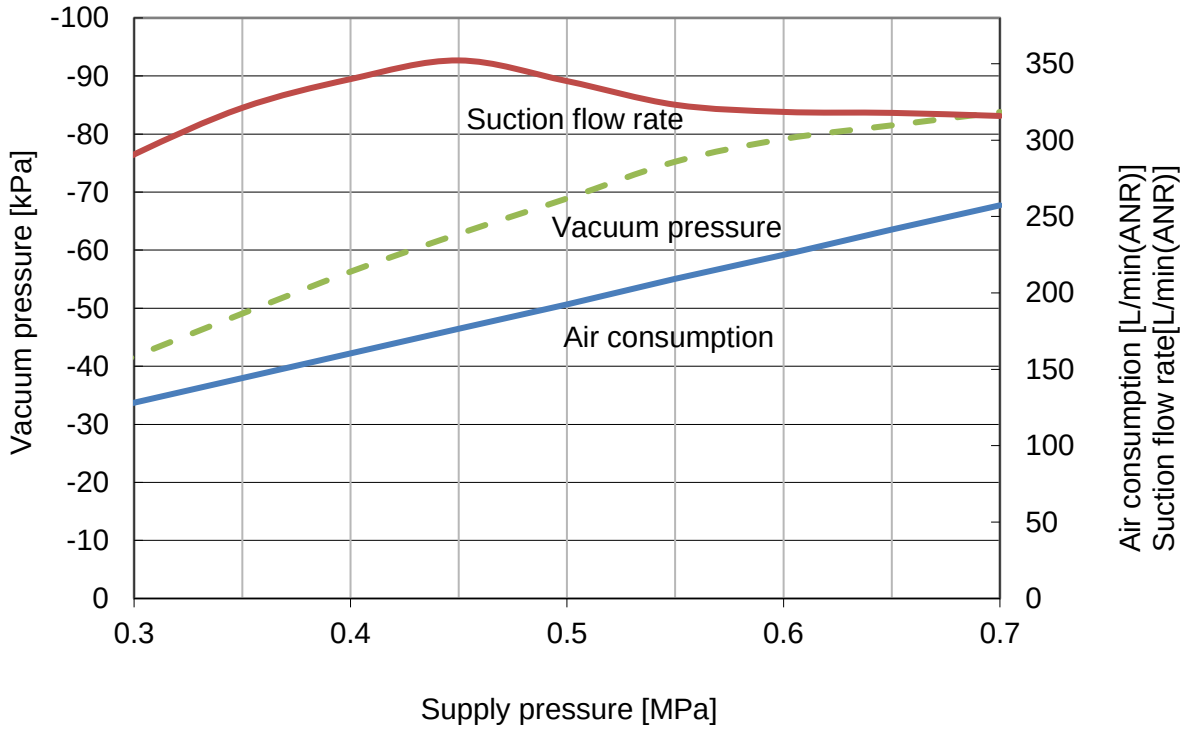
5.6. Ejector Exhaust characteristics

∗These are the measured values under SMC test conditions and not guaranteed.

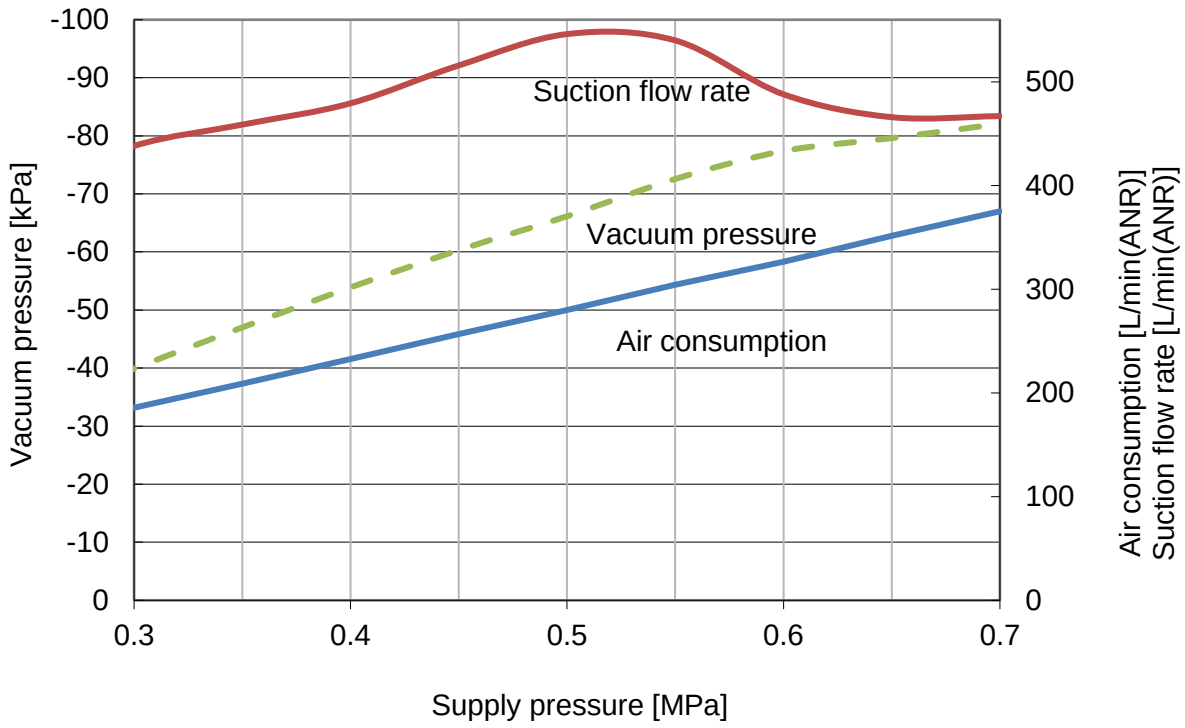
Ejector assembly:1 pcs



Ejectors assembly:2 pcs



Ejectors assembly:3 pcs



6. Dimensions

6.1. 300mm×180mm (Offset flange and flange U)

■Compatible robot：012P(UNIVERSAL ROBOTS)

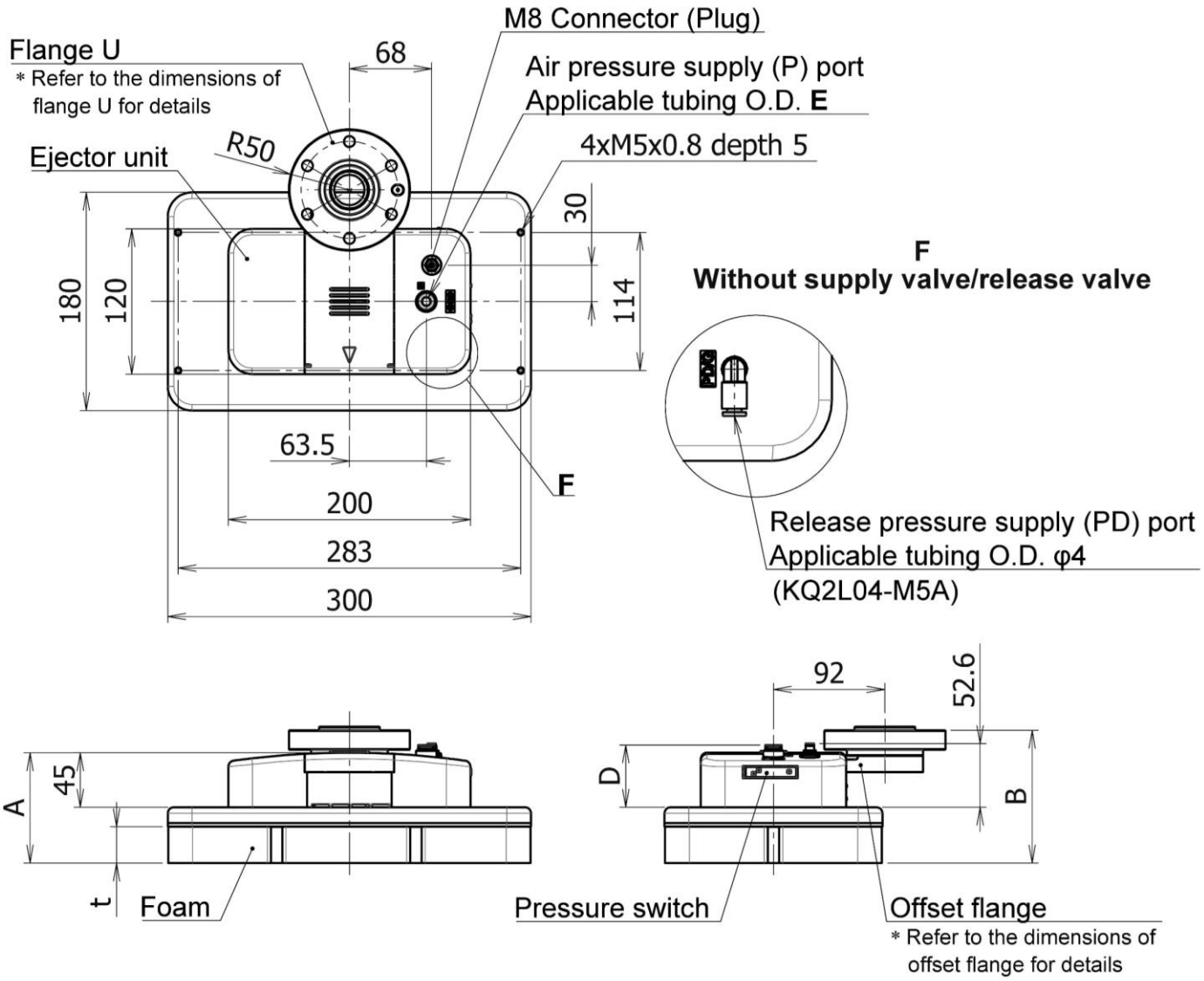


Table5-1. Dimensions

Part no.	t	A	B
ZGS012P∗-300180A∗∗-∗∗2∗	20	81	99.5
ZGS012P∗-300180B∗∗-∗∗2∗	30	91	109.5

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.2. 300mm×180mm (Offset flange and flange Y)

■Compatible robot：043P/N(YASKAWA Electric)

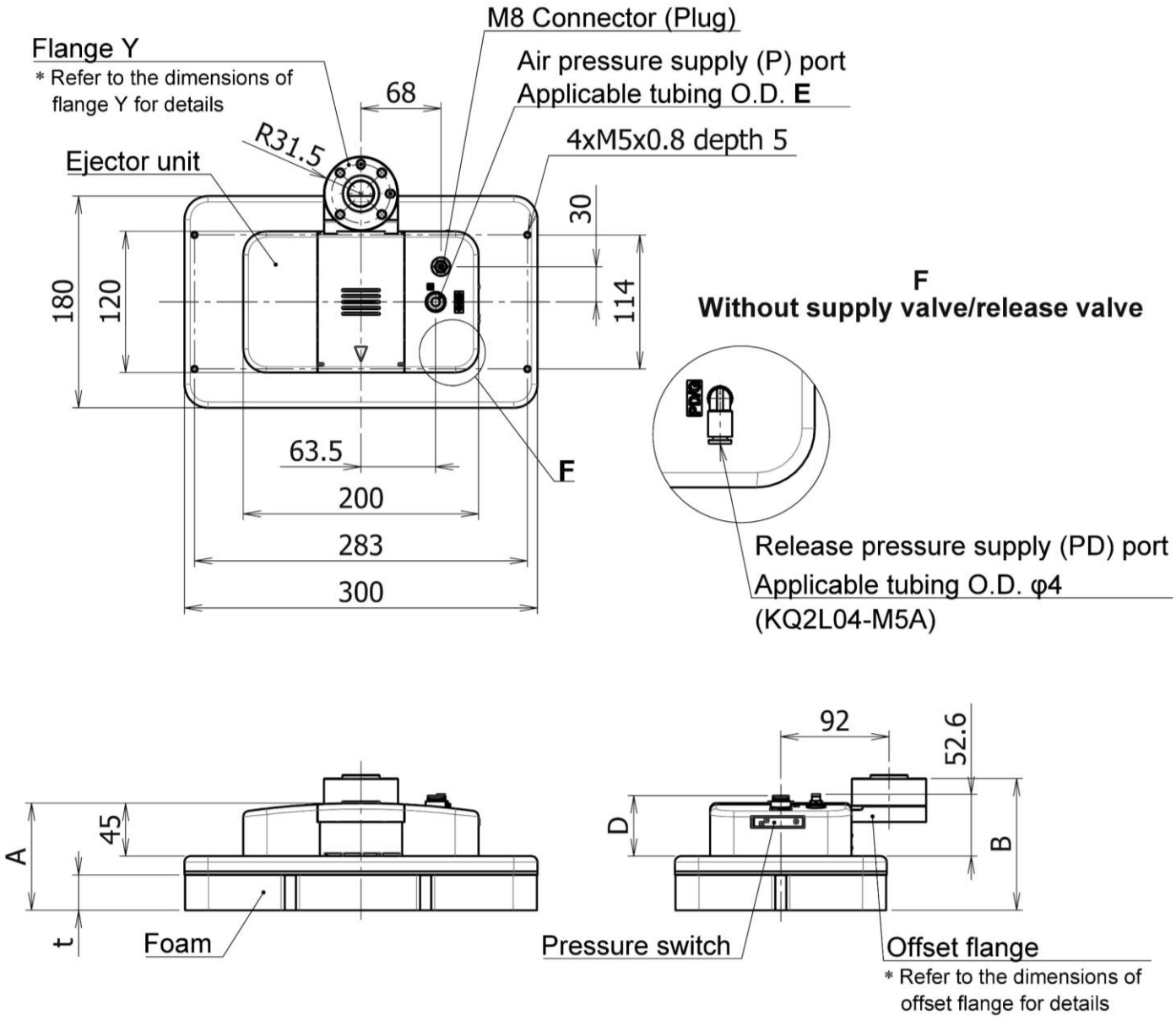


Table5-2. Dimensions

Part no.	t	A	B
ZGS043(P/N)∗-300180A∗∗-∗∗2∗	20	81	102
ZGS043(P/N)∗-300180B∗∗-∗∗2∗	30	91	112

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.3. 300mm×180mm (Tool plate and main plate)

■Compatible robot : NP/NN/NH(General purpose)
: 011P(UNIVERSAL ROBOTS)
: 051P(FANUC)

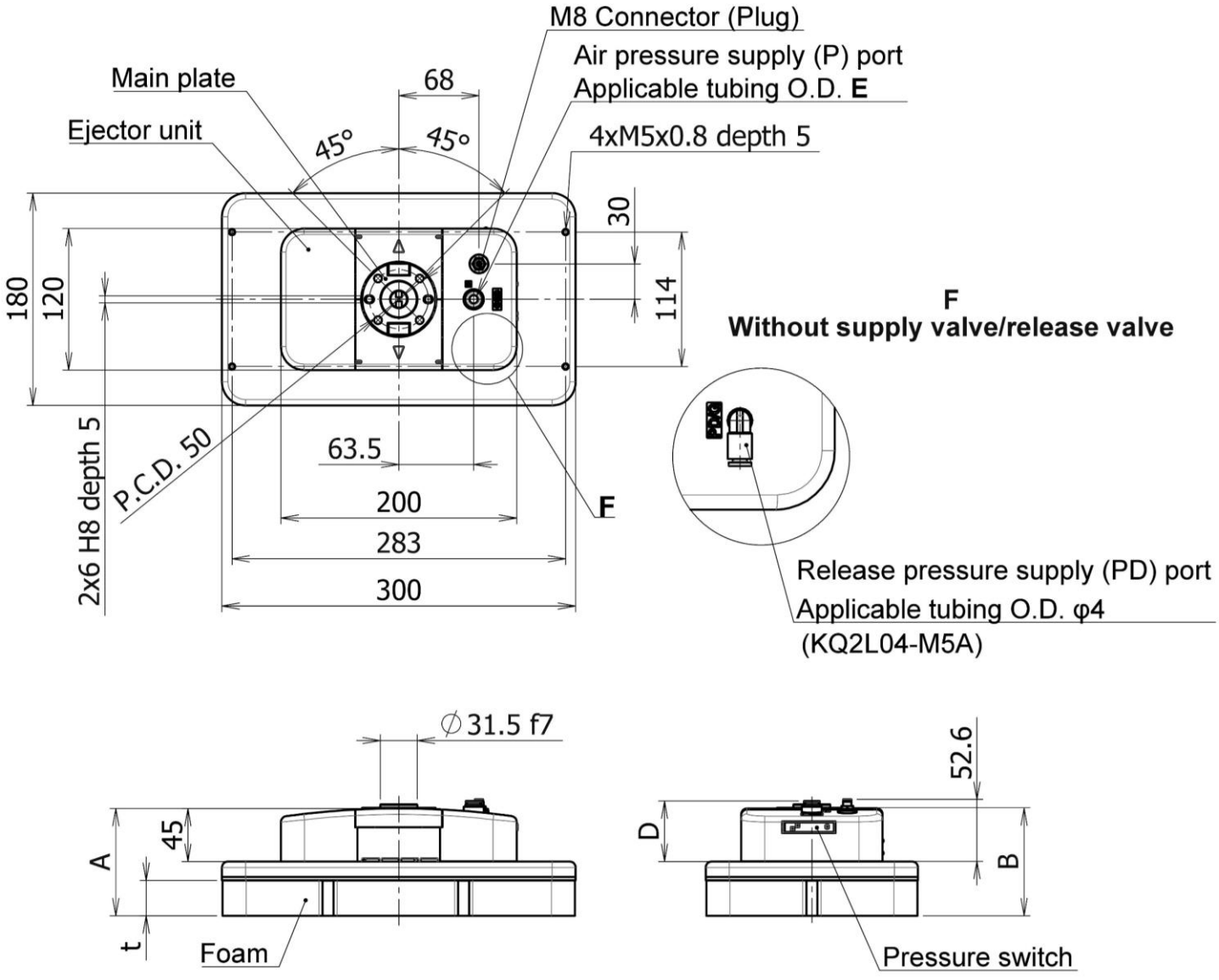


Table5-3. Dimensions

Part no.	t	A	B
ZGS∗∗∗-300180A∗∗-∗∗1∗	20	81	81.5
ZGS∗∗∗-300180B∗∗-∗∗1∗	30	91	91.5

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.4. 300mm×180mm (Tool plate, main plate and flange Y)

■Compatible robot：043P/N(YASKAWA Electric)

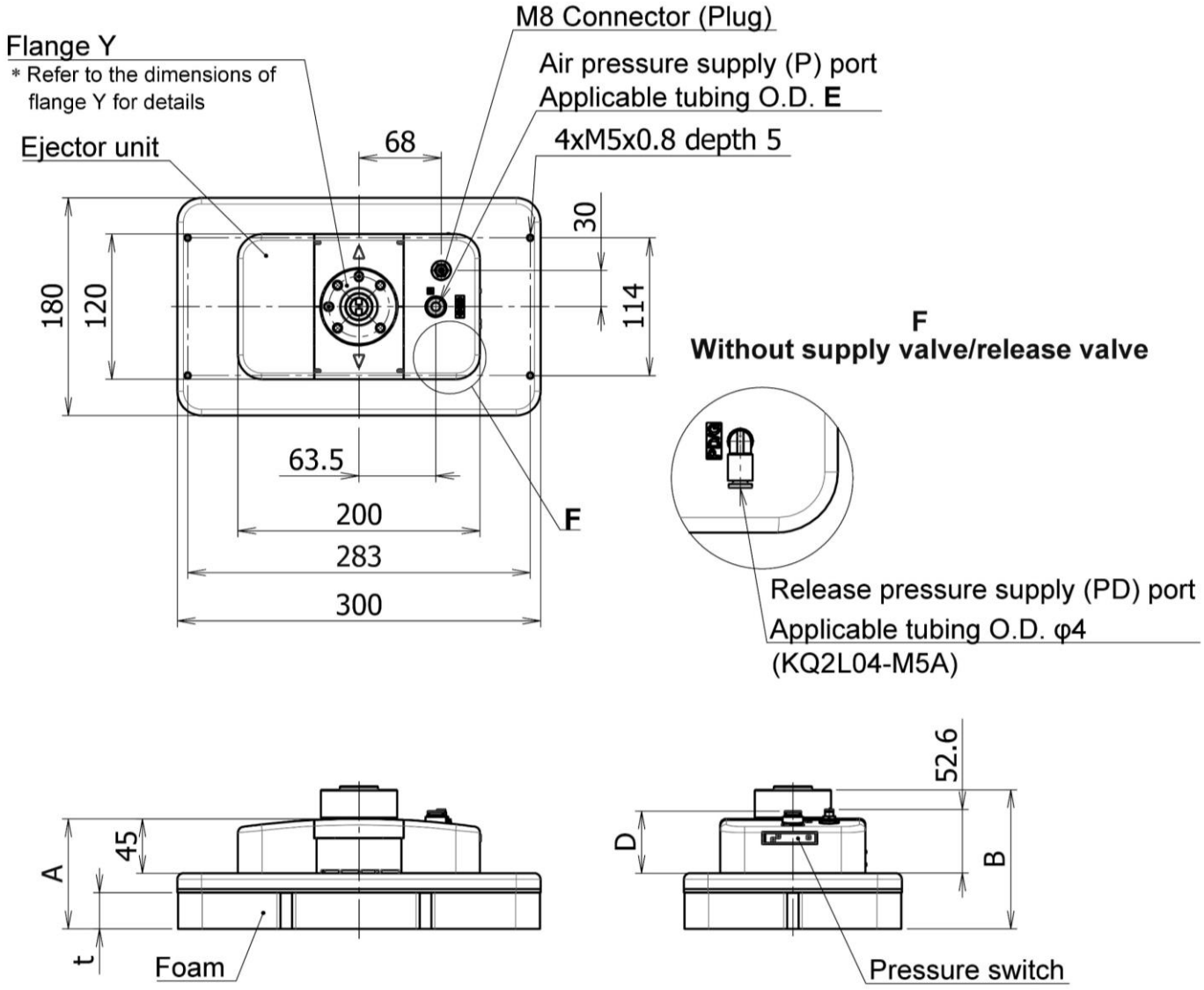


Table5-4. Dimensions

Part no.	t	A	B
ZGS043(P/N)∗-300180A∗∗-∗∗1∗	20	81	105
ZGS043(P/N)∗-300180B∗∗-∗∗1∗	30	91	115

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.5. 300mm×180mm (Tool plate, main plate and flange U)

■Compatible robot：012P(UNIVERSAL ROBOTS)

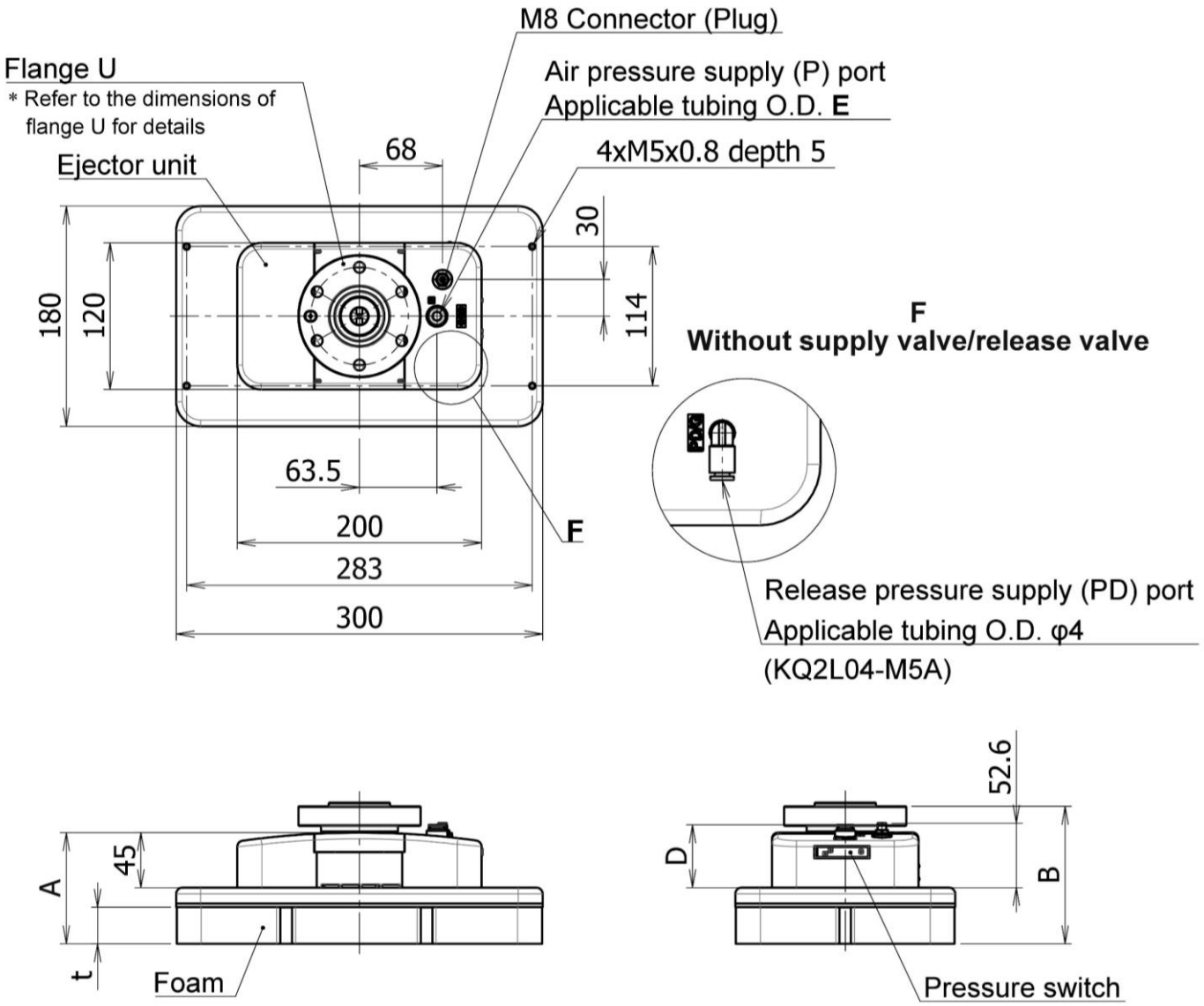


Table5-5. Dimensions

Part no.	t	A	B
ZGS012P∗-300180A∗∗-∗∗1∗	20	81	102.5
ZGS012P∗-300180B∗∗-∗∗1∗	30	91	112.5

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.6. 300mm×180mm (Offset flange)

■Compatible robot : NP/NN/NH(General purpose)
: 011P(UNIVERSAL ROBOTS)
: 051P(FANUC)
: 021N(OMRON /TECHMAN ROBOTS)

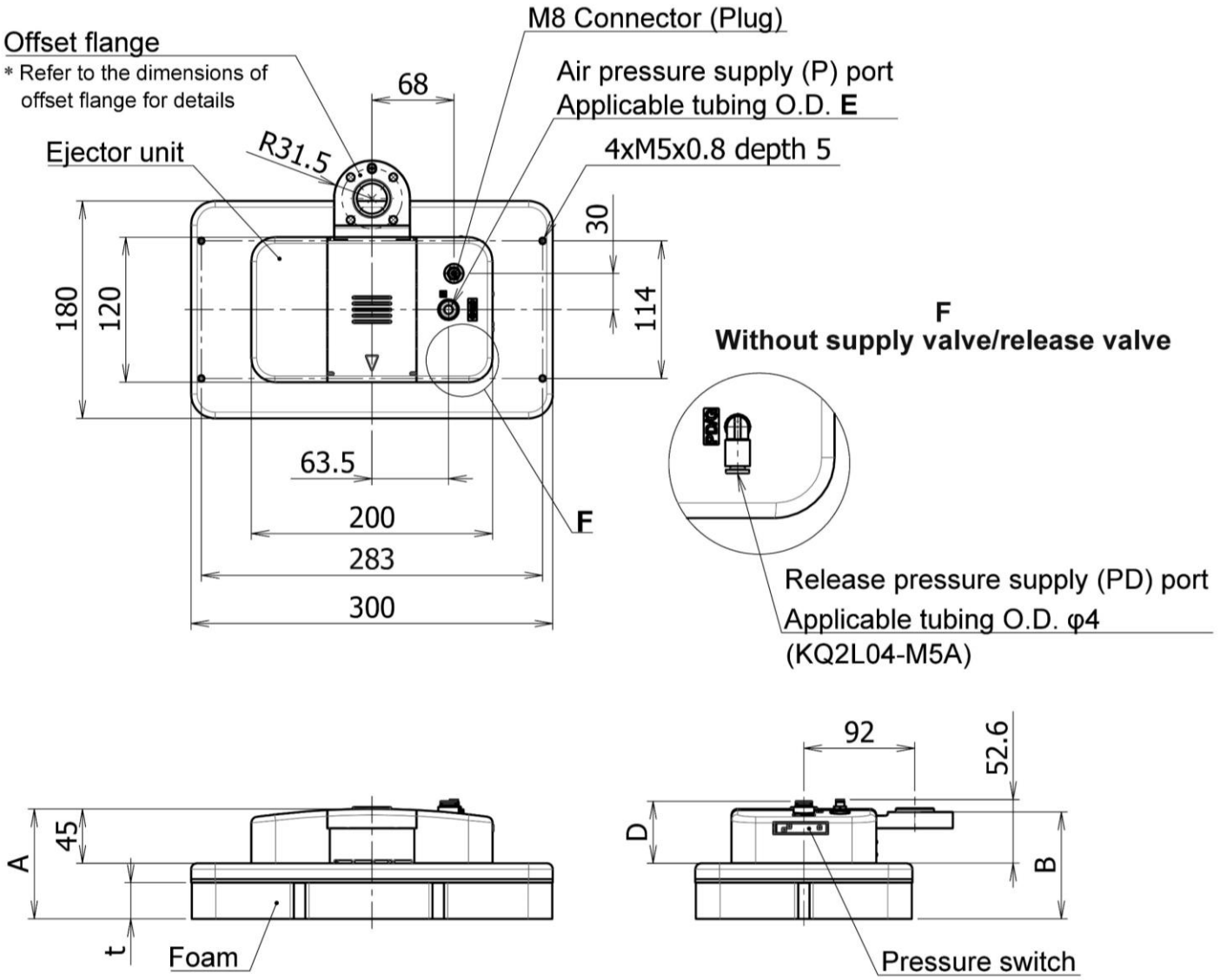


Table5-6. Dimensions

Part no.	t	A	B
ZGS∗∗∗-300180A∗∗-∗∗2∗	20	81	78.5
ZGS∗∗∗-300180B∗∗-∗∗2∗	30	91	88.5

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.7. 300mm×180mm (Without robot mounting flange)

■Compatible robot : NP/NN/NH(General purpose)
: 011P(UNIVERSAL ROBOTS)
: 012P(UNIVERSAL ROBOTS)
: 043P/N(YASKAWA Electric)
: 051P(FANUC)
: 021N(OMRON /TECHMAN ROBOT)

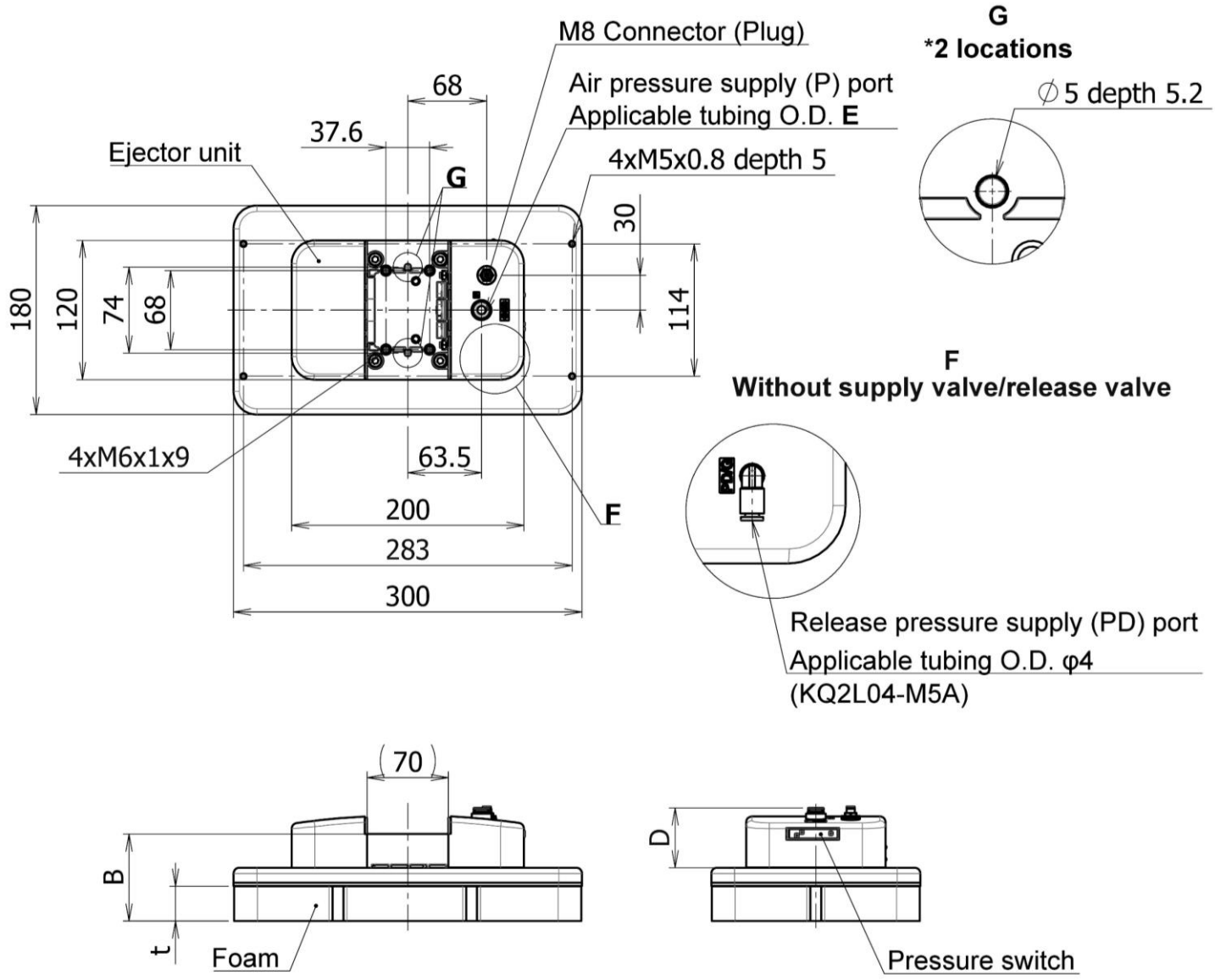


Table5-7. Dimensions

Part no.	t	B
ZGS∗∗∗-300180A∗∗-∗∗∗	20	65
ZGS∗∗∗-300180B∗∗-∗∗∗	30	75

Part no.	D	E
ZGS∗∗∗-300180∗∗∗-∗∗C8	51.4	ϕ8
ZGS∗∗∗-300180∗∗∗-∗∗C10	52	ϕ10
ZGS∗∗∗-300180∗∗∗-∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-300180∗∗∗-∗∗N11	51.9	ϕ3/8”

6.8. 200mm×120mm (Offset flange and flange U)

■Compatible robot：012P(UNIVERSAL ROBOTS)

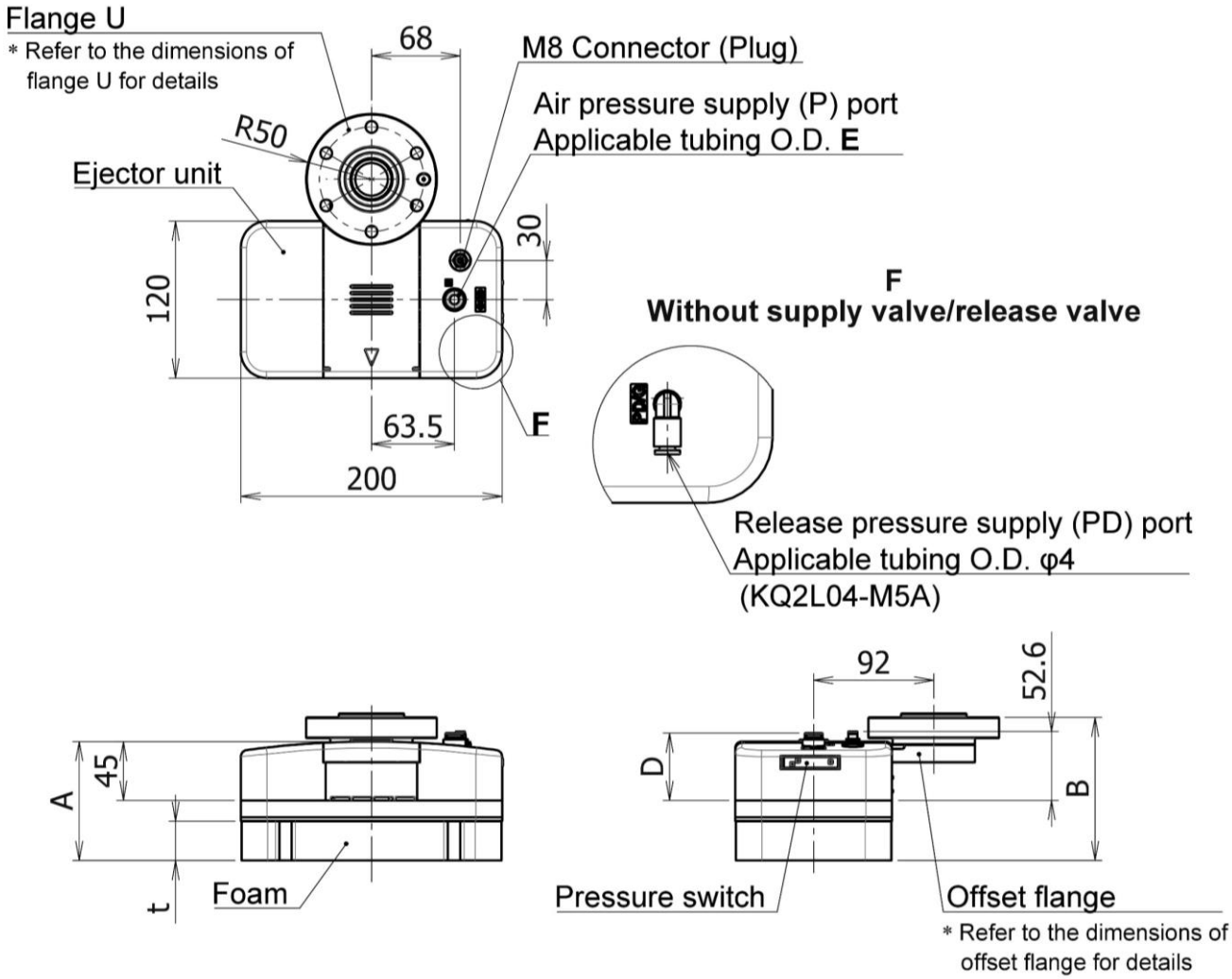


Table5-8. Dimensions

Part no.	t	A	B
ZGS012P∗-200120A∗∗-∗∗2∗	20	81	99.5
ZGS012P∗-200120B∗∗-∗∗2∗	30	91	109.5

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.9. 200mm×120mm (Offset flange and flange Y)

■Compatible robot：043P/N(YASKAWA Electric)

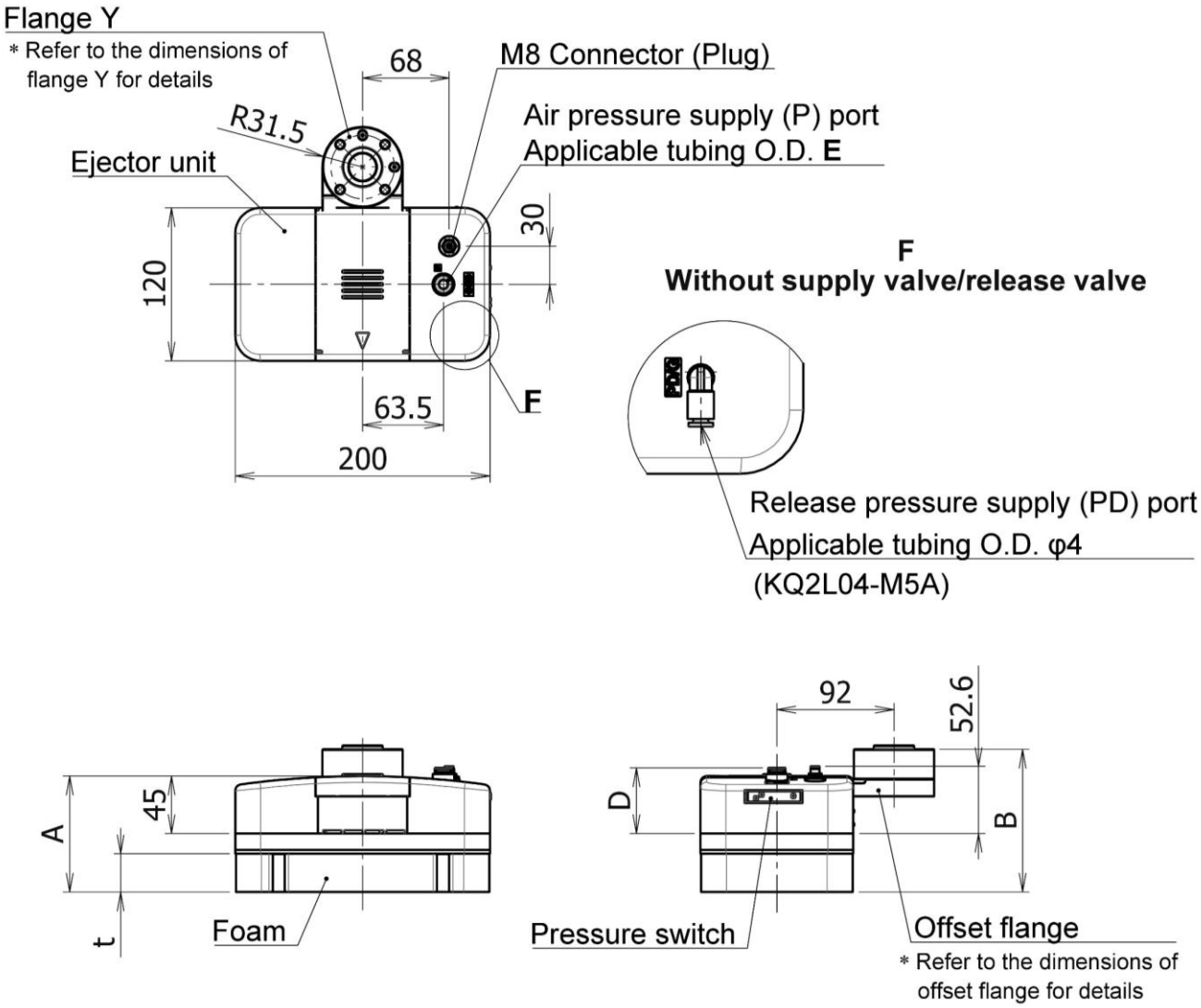


Table5-9. Dimensions

Part no.	t	A	B
ZGS043(P/N)∗-200120A∗∗-∗∗2∗	20	81	102
ZGS043(P/N)∗-200120B∗∗-∗∗2∗	30	91	112

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.10. 200mm×120mm (Tool plate and main plate)

■Compatible robot : NP/NN/NH(General purpose)
: 011P(UNIVERSAL ROBOTS)
: 051P(FANUC)

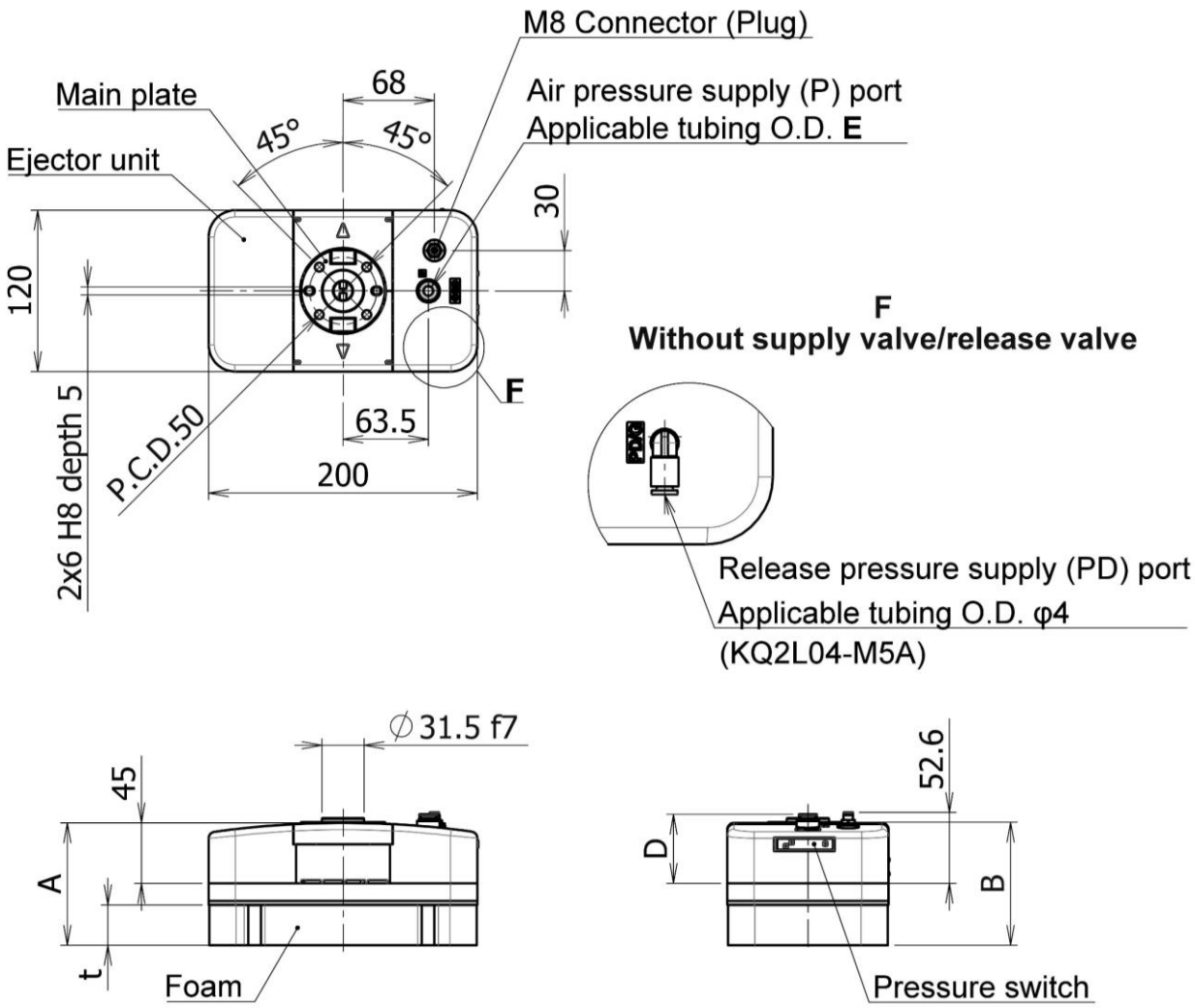


Table5-10. Dimensions

Part no.	t	A	B
ZGS∗∗∗-200120A∗∗-∗∗1∗	20	81	81.5
ZGS∗∗∗-200120B∗∗-∗∗1∗	30	91	91.5

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.11. 200mm×120mm (Tool plate, main plate and flange Y)

■Compatible robot：043P/N(YASKAWA Electric)

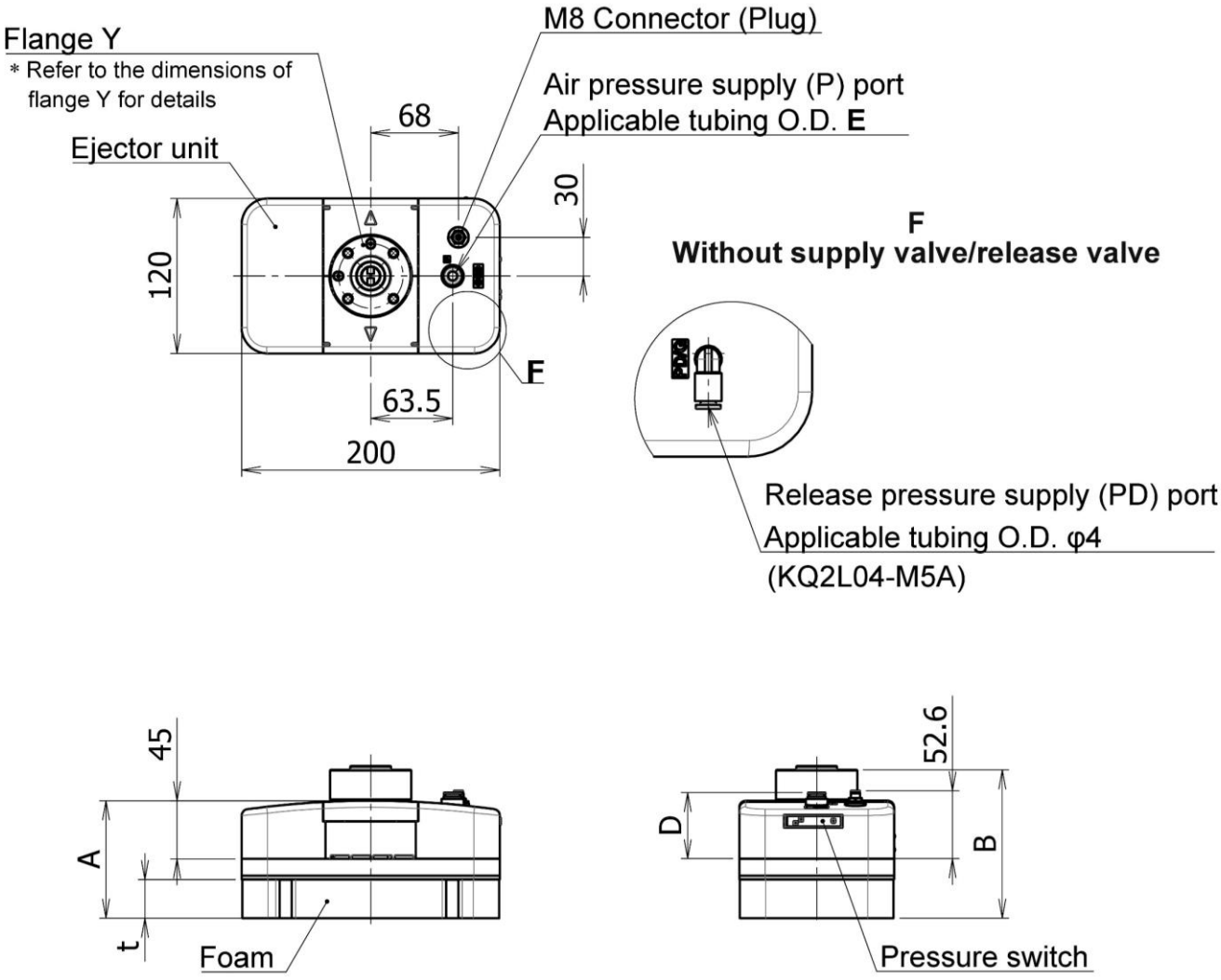


Table5-11. Dimensions

Part no.	t	A	B
ZGS043(P/N)∗-200120A∗∗-∗∗1∗	20	81	105
ZGS043(P/N)∗-200120B∗∗-∗∗1∗	30	91	115

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.12. 200mm×120mm (Tool plate, main plate and flange U)

■Compatible robot：012P(UNIVERSAL ROBOTS)

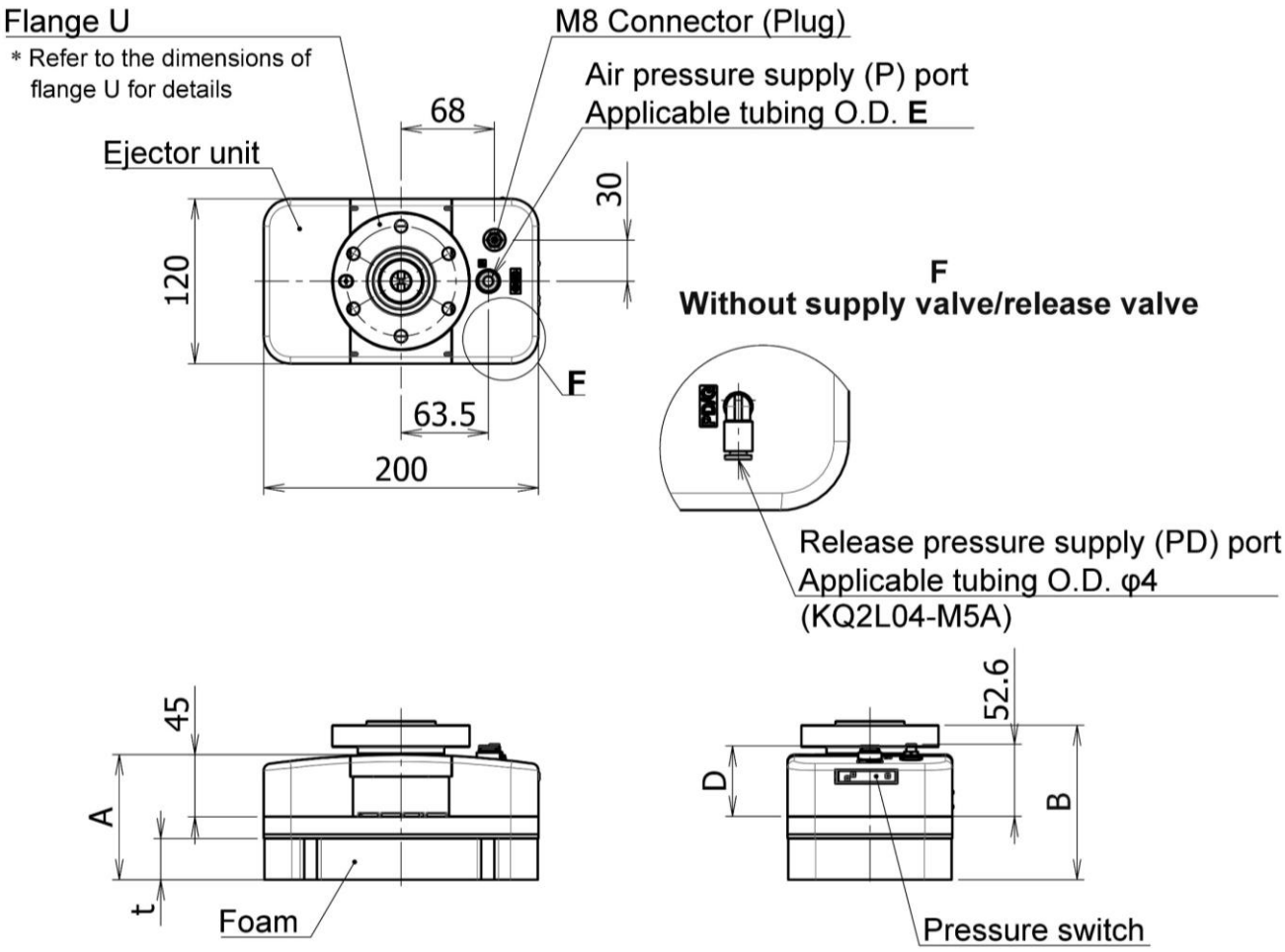


Table5-12. Dimensions

Part no.	t	A	B
ZGS012P∗-200120A∗∗-∗∗1∗	20	81	102.5
ZGS012P∗-200120B∗∗-∗∗1∗	30	91	112.5

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.13. 200mm×120mm (Offset flange)

■Compatible robot : NP/NN/NH(General purpose)
: 011P(UNIVERSAL ROBOTS)
: 051P(FANUC)
: 021N(OMRON /TECHMAN ROBOT)

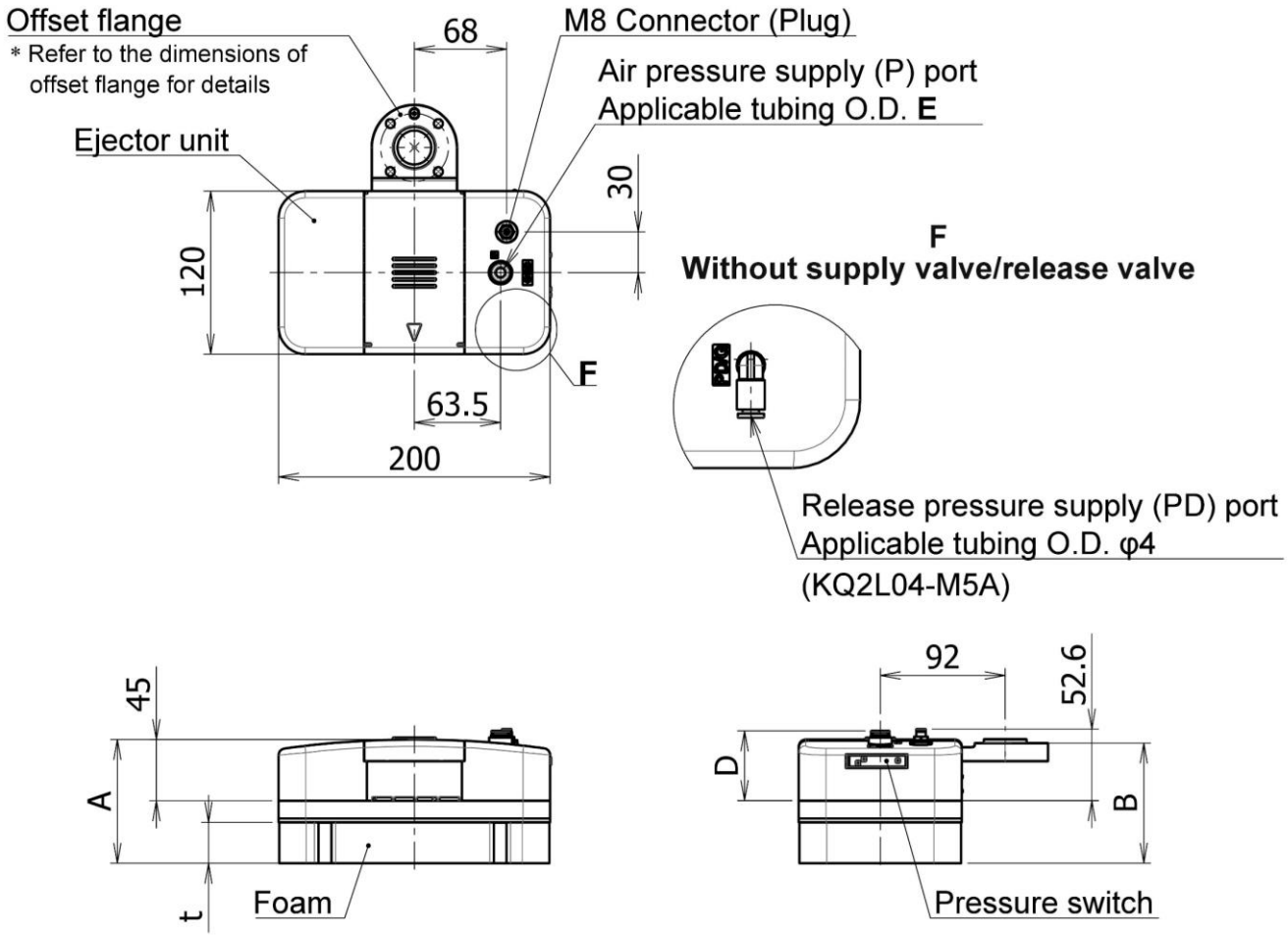


Table5-13. Dimensions

Part no.	t	A	B
ZGS∗∗∗-200120A∗∗-∗∗2∗	20	81	78.5
ZGS∗∗∗-200120B∗∗-∗∗2∗	30	91	88.5

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗∗N11	51.9	ϕ3/8”

6.14. 200mm×120mm (Without robot mounting flange)

■Compatible robot : NP/NN/NH(General purpose)
: 011P(UNIVERSAL ROBOTS)
: 012P(UNIVERSAL ROBOTS)
: 043P/N(YASKAWA Electric)
: 051P(FANUC)
: 021N(OMRON /TECHMAN ROBOT)

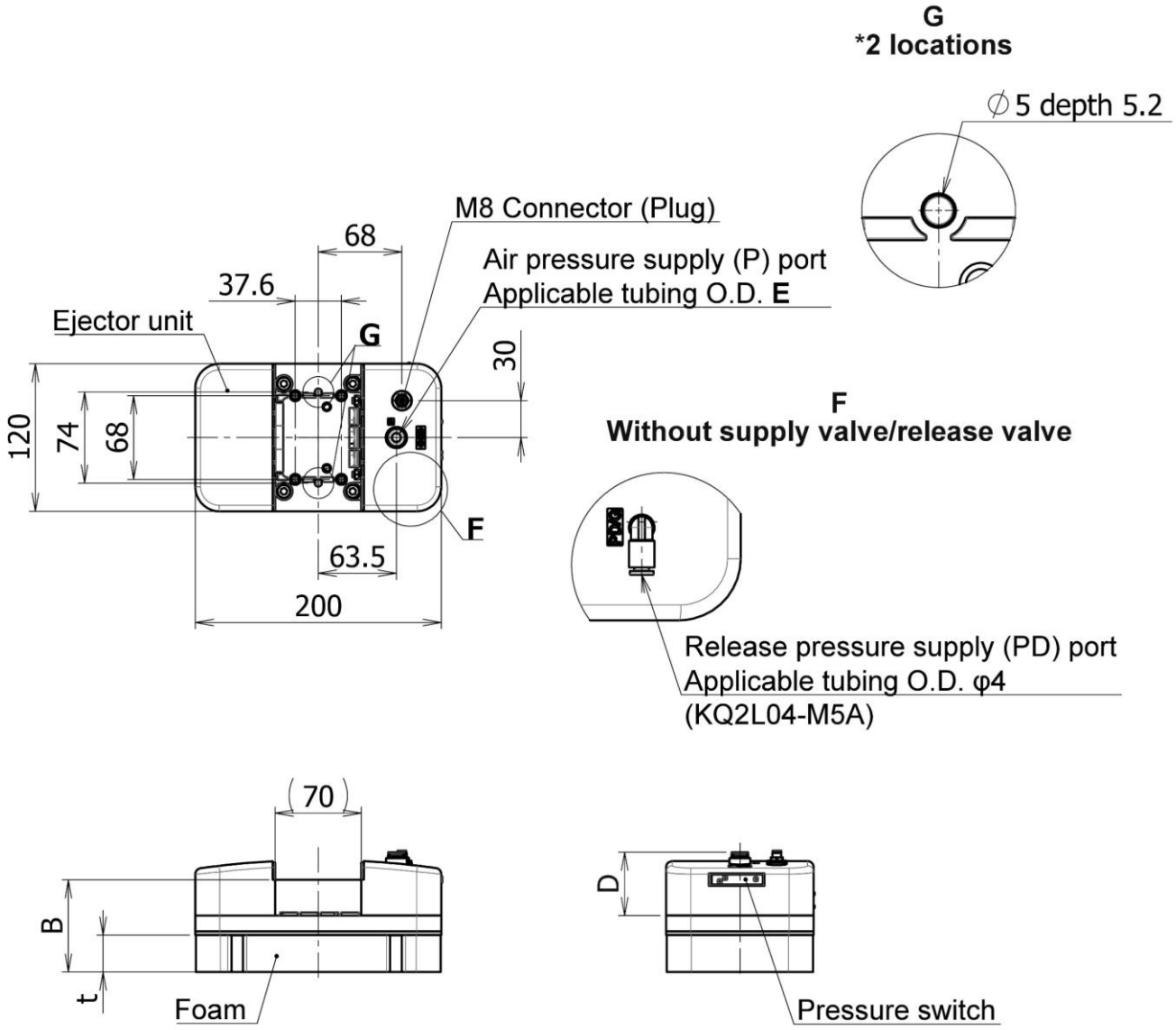


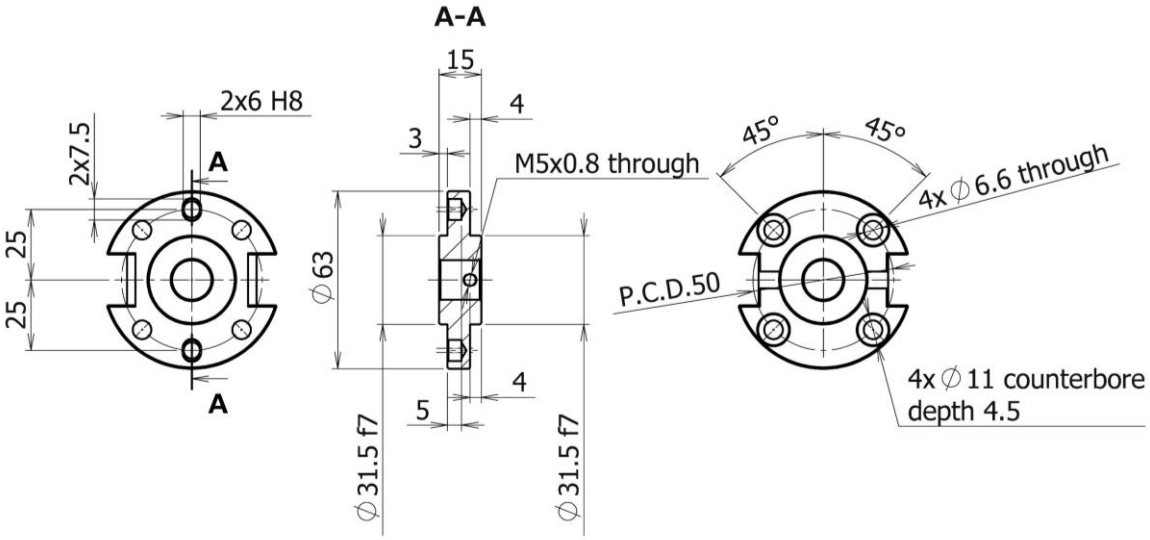
Table5-14. Dimensions

Part no.	t	B
ZGS∗∗∗-200120A∗∗-∗∗∗	20	65
ZGS∗∗∗-200120B∗∗-∗∗∗	30	75

Part no.	D	E
ZGS∗∗∗-200120∗∗∗-∗∗C8	51.4	ϕ8
ZGS∗∗∗-200120∗∗∗-∗∗C10	52	ϕ10
ZGS∗∗∗-200120∗∗∗-∗∗N9	51.4	ϕ5/16”
ZGS∗∗∗-200120∗∗∗-∗∗N11	51.9	ϕ3/8”

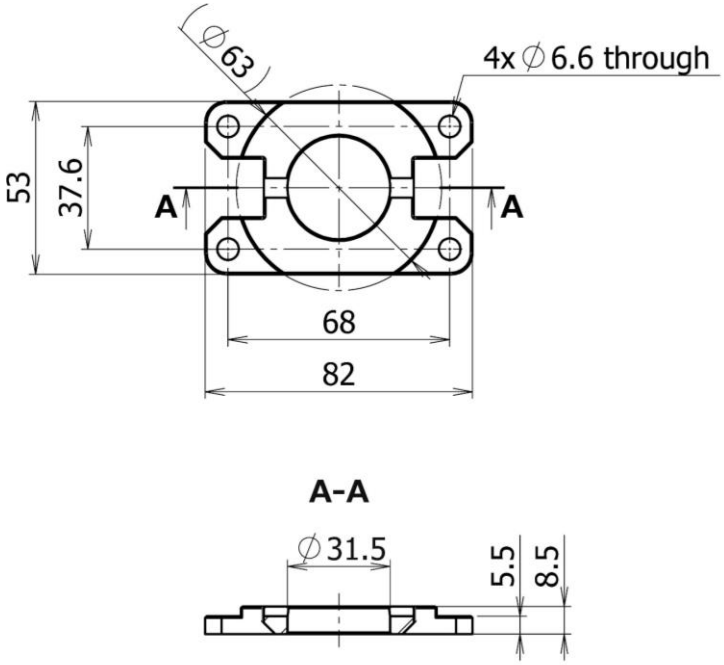
6.15. Main plate

■Regarding part number, refer to "Replacement part number" table below.



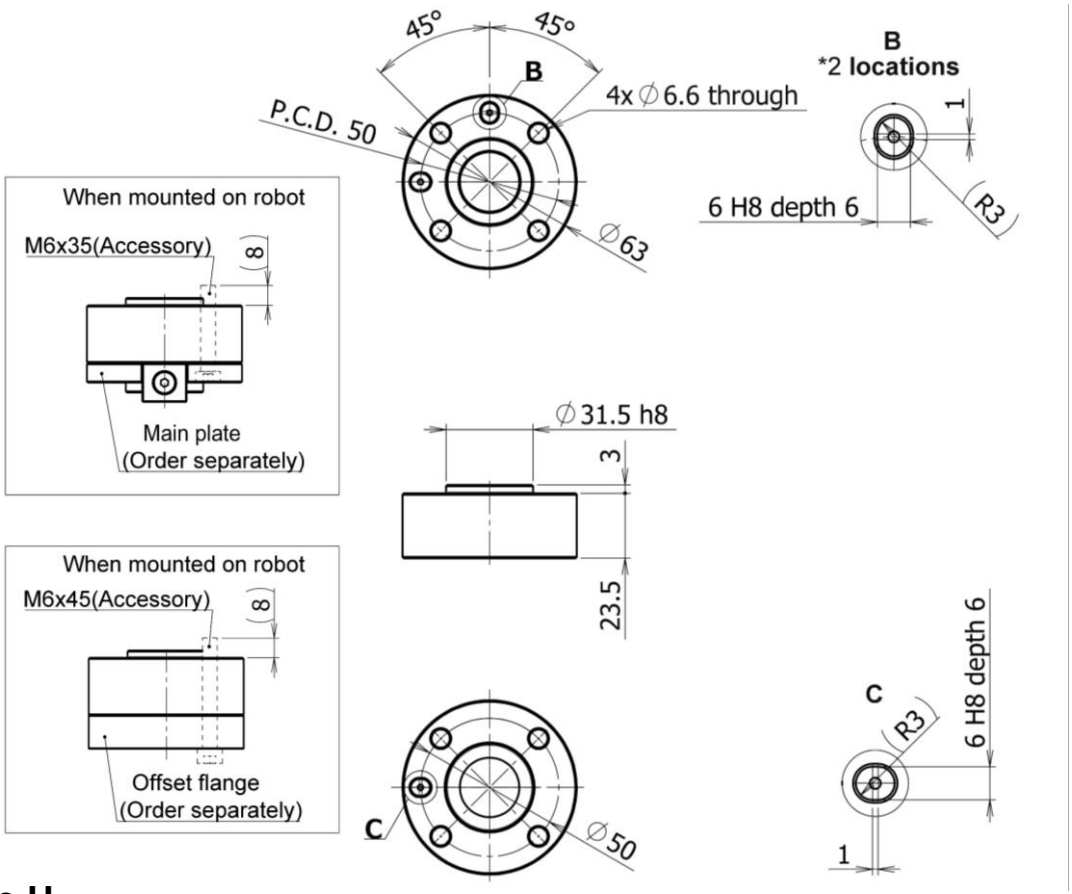
6.16. Tool plate

■Regarding part number, refer to "Replacement part number" table below.



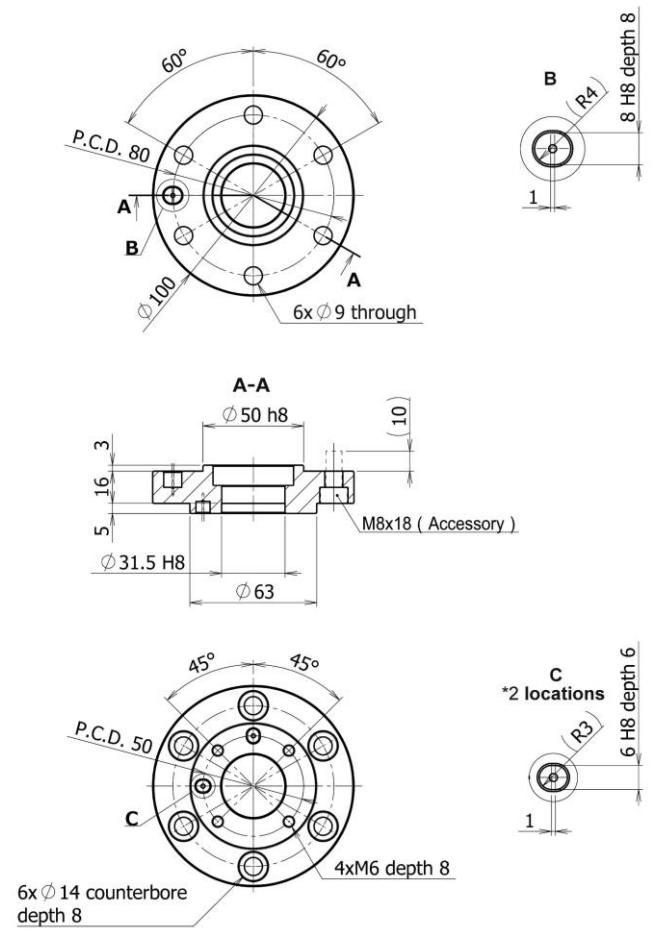
6.17. Flange Y

■Regarding part number, refer to "Replacement part number" table below.



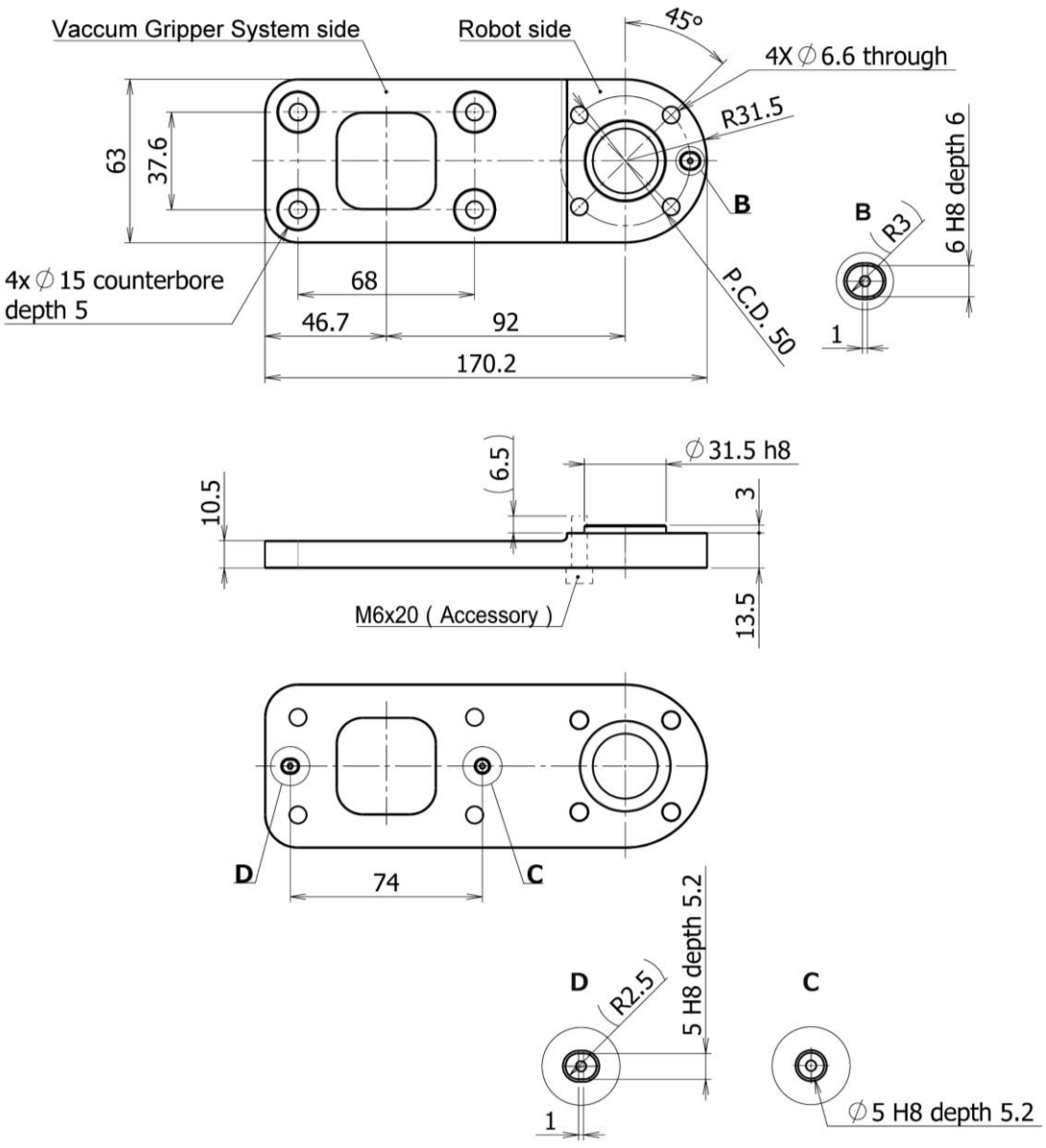
6.18. Flange U

■Regarding part number, refer to "Replacement part number" table below.



6.19. Offset flange

■Regarding part number, refer to "Replacement part number" table below.



6.20. Tool center point, Center of gravity and Weight

■300x180

Fig1: Offset flange

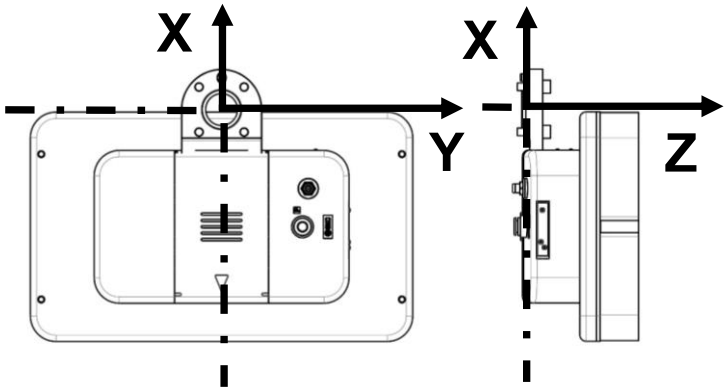


Fig2: Offset flange and flange U

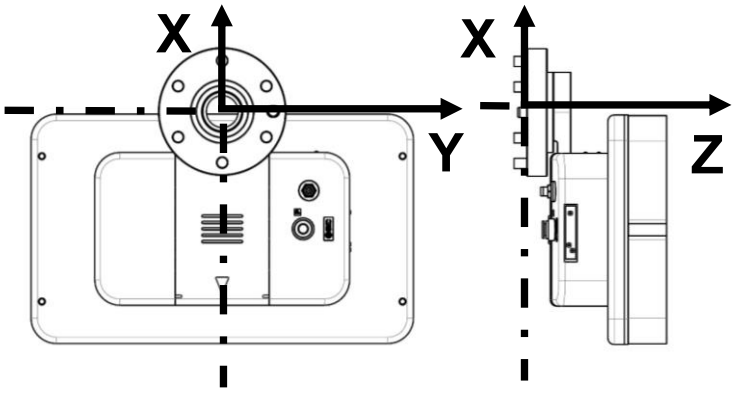


Fig3: Offset flange and flange Y

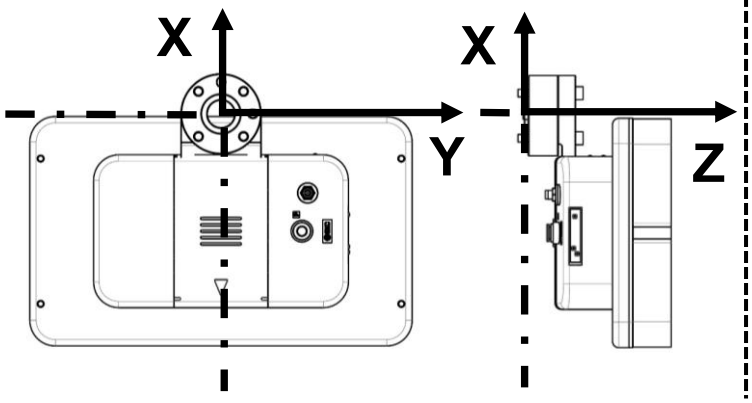


Table 6-1. (mm)

		ZGS***−300180**A**−**2* Foam thickness 20mm			ZGS***−300180**B**−**2* Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig1	-92	0	78.5	-92	0	88.5
	Fig2	-92	0	99.5	-92	0	109.5
	Fig3	-92	0	102	-92	0	112
Center of gravity (C.O.G.)	Fig1	-85	3	35	-85	3	36
	Fig2	-70	3	48	-70	3	49
	Fig3	-78	3	55	-78	3	56

Table 6-2. (kg)

		ZGS***−300180***−**2* With Offset flange	ZGS***−300180***−**_* Without flange
Weight	Fig1	2.0	1.7
	Fig2	2.4	
	Fig3	2.2	

■300x180

Fig4: Tool plate and main plate

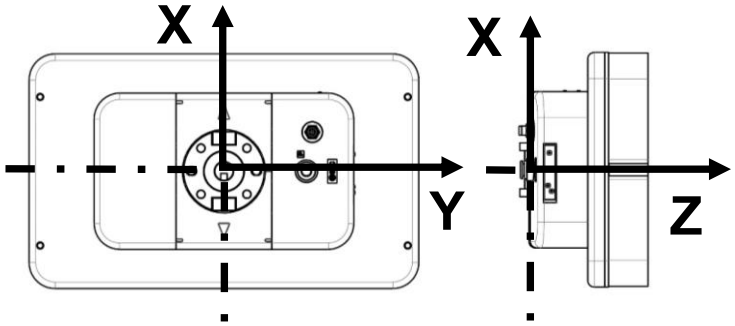


Fig5: Tool plate, main plate and flange U

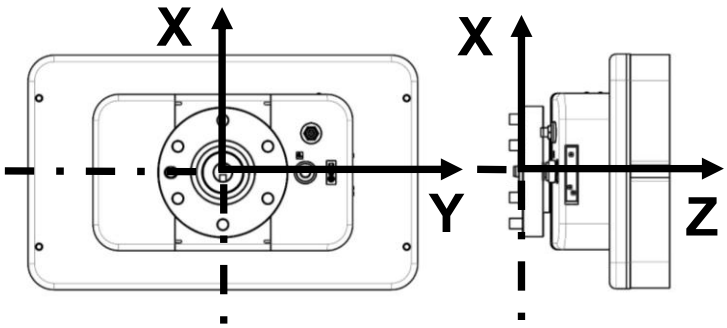


Fig6: Tool plate, main plate and flange Y

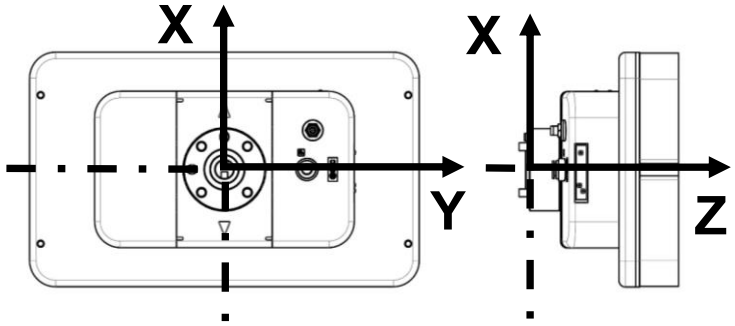


Table 6-3. (mm)

		ZGS***−300180**A****−****1* Foam thickness 20mm			ZGS***−300180**B****−****1* Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig4	0	0	81.5	0	0	91.5
	Fig5	0	0	102.5	0	0	112.5
	Fig6	0	0	105	0	0	115
Center of gravity (C.O.G.)	Fig4	0	3	40	0	3	41
	Fig5	0	2	51	0	2	52
	Fig6	0	3	58	0	3	59

Table 6-4. (kg)

		ZGS***−300180****−****1* With Tool plate and main plate	ZGS***−300180****−****3* With Tool plate only
Weight	Fig4	1.8	1.75
	Fig5	2.3	
	Fig6	2.1	

■200x120

Fig7: Offset flange

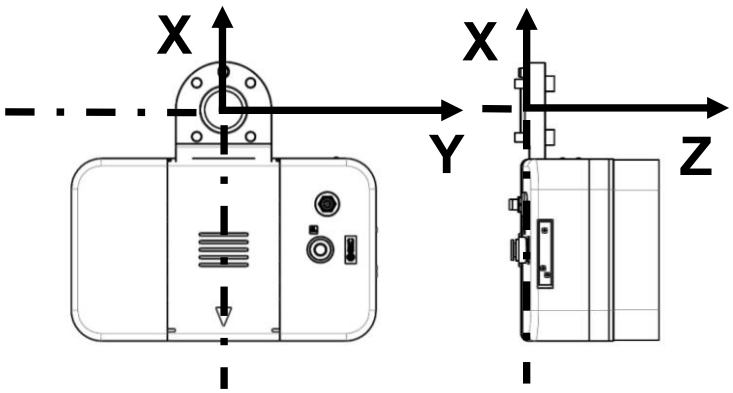


Fig8: Offset flange and flange U

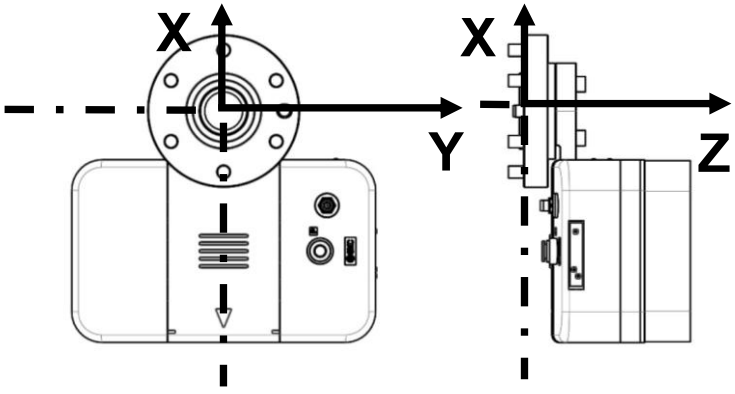


Fig9: Offset flange and flange U

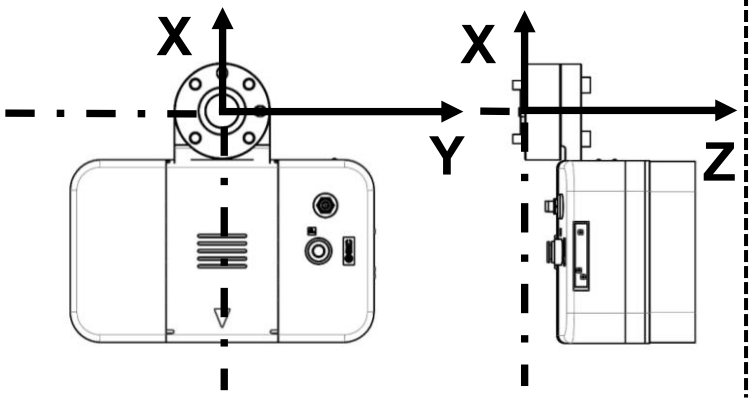


Table6-5. (mm)

		ZGS***−200120A**−**2* Foam thickness 20mm			ZGS***−200120B**−**2 Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig7	-92	0	78.5	-92	0	88.5
	Fig8	-92	0	99.5	-92	0	109.5
	Fig9	-92	0	102	-92	0	112
Center of gravity (C.O.G.)	Fig7	-83	4	29	-83	4	30
	Fig8	-65	3	40	-65	3	41
	Fig9	-74	4	47	-74	4	48

Table6-6. (kg)

		ZGS***−200120***−**2* With Offset flange	ZGS***−200120***−**_* Without flange
Weight	Fig7	1.5	1.2
	Fig8	1.9	
	Fig9	1.7	

■200x120

Fig10: Tool plate and main plate

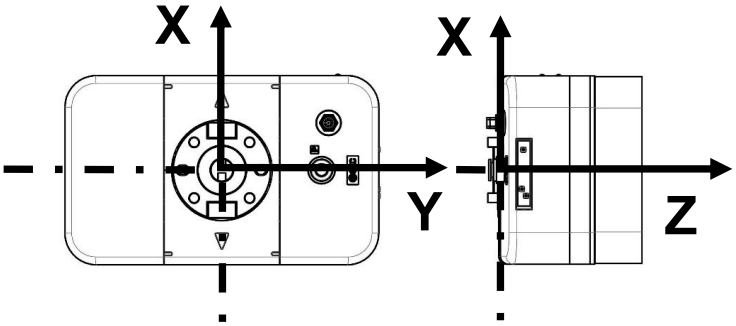


Fig11: Tool plate, main plate and flange U

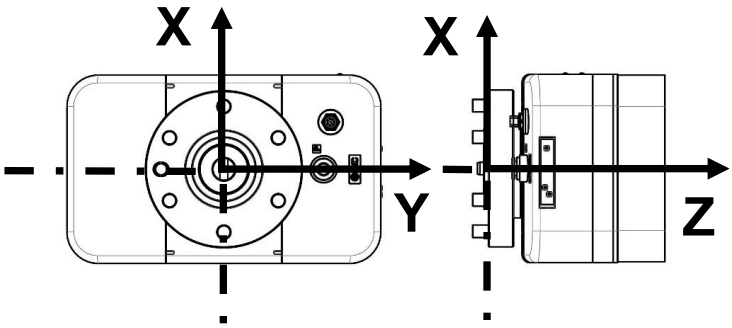


Fig12: Tool plate, main plate and flange Y

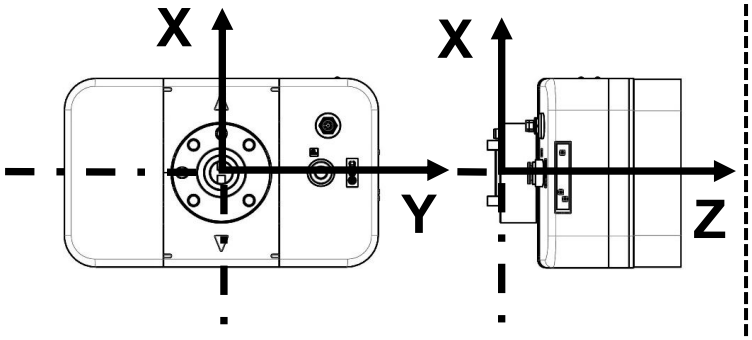


Table6-7. (mm)

		ZGS***−200120A**−**1* Foam thickness 20mm			ZGS***−200120B**−**1* Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig10	0	0	81.5	0	0	91.5
	Fig11	0	0	102.5	0	0	112.5
	Fig12	0	0	105	0	0	115
Center of gravity (C.O.G.)	Fig10	1	4	33	1	4	34
	Fig11	0	3	43	0	3	44
	Fig12	1	4	51	1	4	52

Table6-8. (kg)

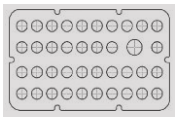
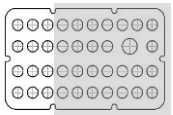
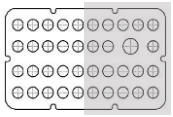
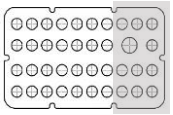
		ZGS***−200130***−**1* With Tool plate and main plate	ZGS***−200130***−**3* With Tool plate only
Weight	Fig10	1.3	1.25
	Fig11	1.8	
	Fig12	1.6	

7. Technical information

7.1. Lifting force for each suction area

Foam size	300mm×180mm

Vacuum saving valve type

Number of ejector assemblies[pcs]	Standard supply pressure [MPa]※3	Suction area [%]※4		100%	About 70%	About 50%	About 30%
		Number of suction holes [pcs]		39/39	27／39	19/39	11／39
		Workpiece：Acrylic plate					
1	0.45	Vacuum pressure [kPa]※1		-63.0	-51.2	-5.0	-3.3
		Lifting force[N]※2		880 (400)	503 (400)	-※5	-※5
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	220 (100)	125 (100)	-	-
			Vertical lifting (Safety factor:8)	110 (50)	62 (50)	-	-
2	0.45	Vacuum pressure [kPa]※1		-62.0	-55.9	-51.0	-10.2
		Lifting force[N]※2		880 (400)	558 (400)	350	-※5
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	220 (100)	139 (100)	87	-
			Vertical lifting (Safety factor:8)	110 (50)	69 (50)	43	-
3	0.45	Vacuum pressure [kPa]※1		-60.0	-56.3	-52.0	-51.1
		Lifting force[N]※2		880 (400)	565 (400)	357	174
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	220 (100)	141 (100)	89	43
			Vertical lifting (Safety factor:8)	110 (50)	70 (50)	44	21

∗1 The vacuum pressure is the actual measured value when non-leakage workpiece (acrylic plate) is suctioned at the standard supply pressure. It is not guaranteed values.

∗2 The lifting force is the actual measured value at the above vacuum pressure under SMC test conditions and it is not a guaranteed value. (The value in parentheses indicates the value when using the tool plate and main plate.)
It is necessary to judge the suitability for the workpiece with actual condition of use.

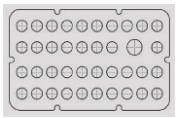
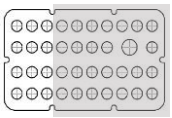
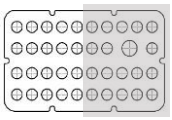
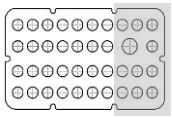
∗3 This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. Due to factors such as the air supply capacity, piping size, and air consumption of other equipment operating simultaneously, the pressure may fall below the pressure immediately before the air pressure supply (P) port of the vacuum gripper system when a vacuum is generated.

∗4 Vacuum saving valve may not be activated when suction area is small.

∗5 This indicates that vacuum saving valves don't work.

Foam size	300mm×180mm

Fixed orifice type

Number of ejector assemblies[pcs]	Standard supply pressure [MPa]※3	Suction area [%]		100%	About 70%	About 50%	About 30%
		Number of suction holes [pcs]		39/39	27／39	19/39	11／39
		Workpiece：Acrylic plate					
1	0.45	Vacuum pressure [kPa]※1		-63.0	-25.5	-15.4	-10.9
		Lifting force[N]※2		880 (400)	255	107	36
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	220 (100)	63	26	9
			Vertical lifting (Safety factor:8)	110 (50)	31	13	4
2	0.45	Vacuum pressure [kPa]※1		-62.0	-40.4	-27.7	-22.3
		Lifting force[N]※2		880 (400)	396	186	78
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	220 (100)	99	46	19
			Vertical lifting (Safety factor:8)	110 (50)	49	23	9
3	0.45	Vacuum pressure [kPa]※1		-60.0	-45.8	-36.8	-27.9
		Lifting force[N]※2		880 (400)	441 (400)	237	95
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	220 (100)	110	59	23
			Vertical lifting (Safety factor:8)	110 (50)	55	29	11

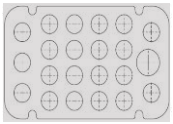
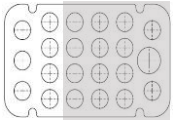
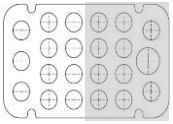
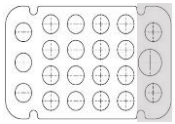
∗1 The vacuum pressure is the actual measured value when non-leakage workpiece (acrylic plate) is suctioned at the standard supply pressure. It is not guaranteed values.

∗2 The lifting force is the actual measured value at the above vacuum pressure under SMC test conditions and it is not a guaranteed value. (The value in parentheses indicates the value when using the tool plate and main plate.)
It is necessary to judge the suitability for the workpiece with actual condition of use.

∗3 This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. Due to factors such as the air supply capacity, piping size, and air consumption of other equipment operating simultaneously, the pressure may fall below the pressure immediately before the air pressure supply (P) port of the vacuum gripper system when a vacuum is generated.

Foam size	200mm×120mm

Vacuum saving valve type

Number of ejector assemblies[pcs]	Standard supply pressure [MPa]※3	Suction area [%]※4		100%	About 70%	About 50%	About 20%
		Number of suction holes [pcs]		22/22	15／22	11/22	3／22
		Workpiece：Acrylic plate					
1	0.45	Vacuum pressure [kPa]※1		-63.0	-56.3	-51.0	-6.3
		Lifting force[N]※2		440 (400)	288	190	-※5
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	110 (100)	72	47	-
			Vertical lifting (Safety factor:8)	55 (50)	36	23	-
2	0.45	Vacuum pressure [kPa]※1		-62.0	-59.1	-57.0	-52.7
		Lifting force[N]※2		440 (400)	314	210	40
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	110 (100)	78	52	10
			Vertical lifting (Safety factor:8)	55 (50)	39	26	5

∗1 The vacuum pressure is the actual measured value when non-leakage workpiece (acrylic plate) is suctioned at the standard supply pressure. It is not guaranteed values.

∗2 The lifting force is the actual measured value at the above vacuum pressure under SMC test conditions and it is not a guaranteed value. (The value in parentheses indicates the value when using the tool plate and main plate.)
It is necessary to judge the suitability for the workpiece with actual condition of use.

∗3 This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. Due to factors such as the air supply capacity, piping size, and air consumption of other equipment operating simultaneously, the pressure may fall below the pressure immediately before the air pressure supply (P) port of the vacuum gripper system when a vacuum is generated.

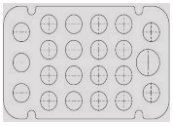
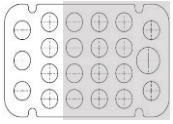
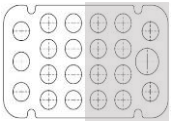
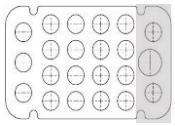
∗4 Vacuum saving valve may not be activated when suction area is small.

∗5 This indicates that vacuum saving valves don’t work.

∗6 The number of ejectors compatible with sponge size 200x120 is 1 or 2. If you modify it to 3, the suction assist valve may close more easily, which may result in reduced performance.

Foam size	200mm×120mm

Fixed orifice type

Number of ejector assemblies[pcs]	Standard supply pressure [MPa] ※3	Suction area [%]		100%	About 70%	About 50%	About 20%
		Number of suction holes [pcs]		22/22	15／22	11/22	3／22
		Workpiece：Acrylic plate					
1	0.45	Vacuum pressure [kPa]※1		-63.0	-36.8	-26.8	-17.3
		Lifting force[N]※2		440 (400)	164	80	8
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	110 (100)	41	20	2
			Vertical lifting (Safety factor:8)	55 (50)	20	10	1
2	0.45	Vacuum pressure [kPa]※1		-62.0	-49.0	-42.8	-28.6
		Lifting force[N]※2		440 (400)	228	140	14
		Lifting force considering safety factor[N]	Horizontal lifting (Safety factor:4)	110 (100)	57	35	3
			Vertical lifting (Safety factor:8)	55 (50)	28	17	1

∗1 The vacuum pressure is the actual measured value when non-leakage workpiece (acrylic plate) is suctioned at the standard supply pressure. It is not guaranteed values.

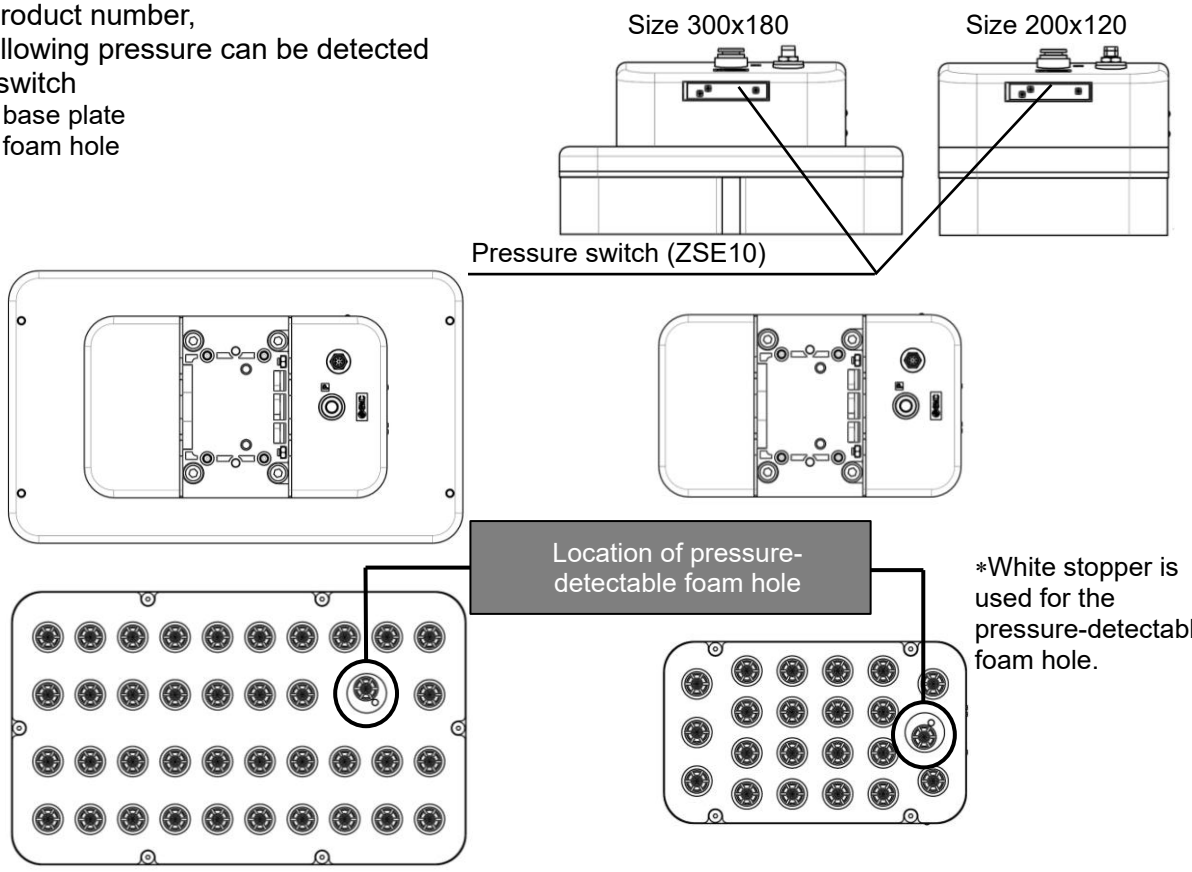
∗2 The lifting force is the actual measured value at the above vacuum pressure under SMC test conditions and it is not a guaranteed value. (The value in parentheses indicates the value when using the tool plate and main plate.)
It is necessary to judge the suitability for the workpiece with actual condition of use.

∗3 This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. Due to factors such as the air supply capacity, piping size, and air consumption of other equipment operating simultaneously, the pressure may fall below the pressure immediately before the air pressure supply (P) port of the vacuum gripper system when a vacuum is generated.

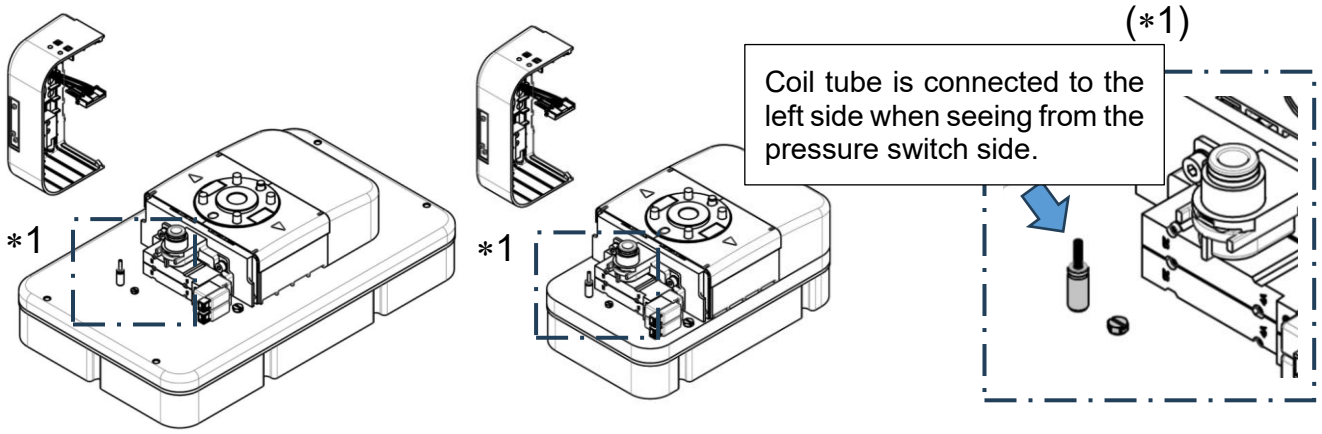
7.2. How to use the pressure switch to check gripping

According to product number,
either of the following pressure can be detected
with pressure switch

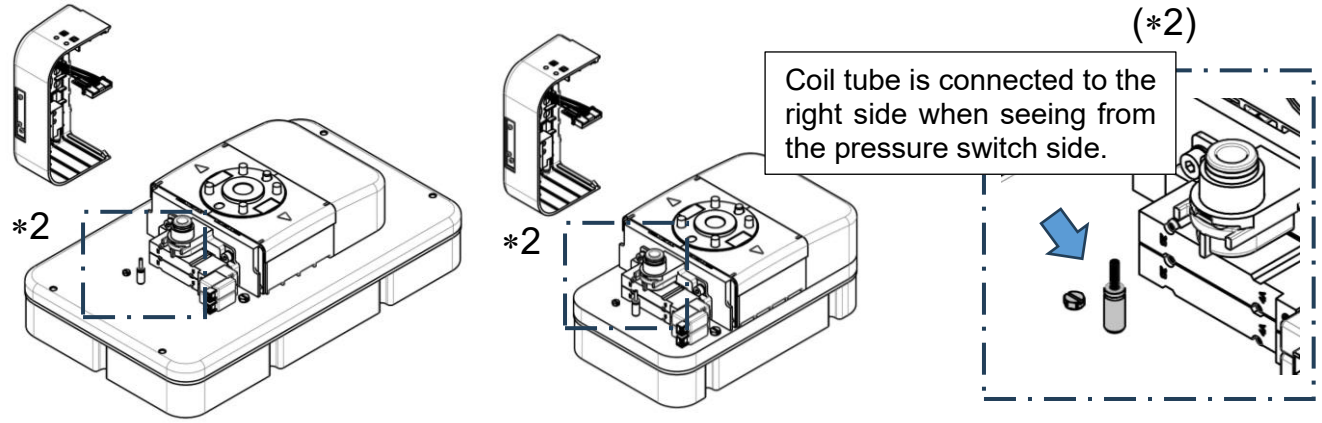
1. Pressure in base plate
2. Pressure in foam hole



■When "Pressure in base hole" type is selected in part number:

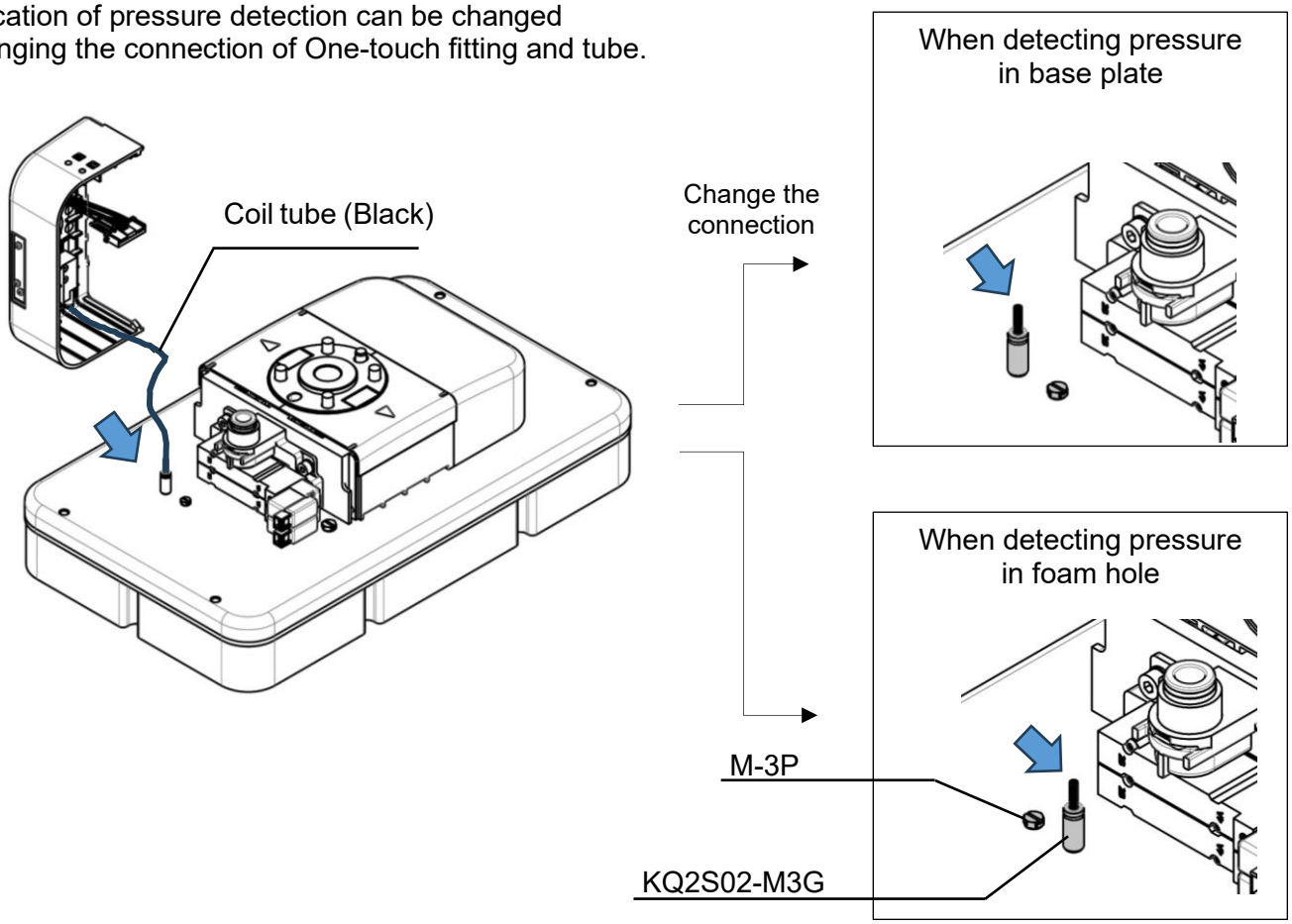


■When "Pressure in foam hole" type is selected in part number:



■How to change the location of pressure detection

The location of pressure detection can be changed
by changing the connection of One-touch fitting and tube.



・Tightening torque

M-3P

After tightening by hand, use a tool to tighten an additional 1/4 turn.
A reference value for the tightening torque is 0.4 to 0.5N·m.

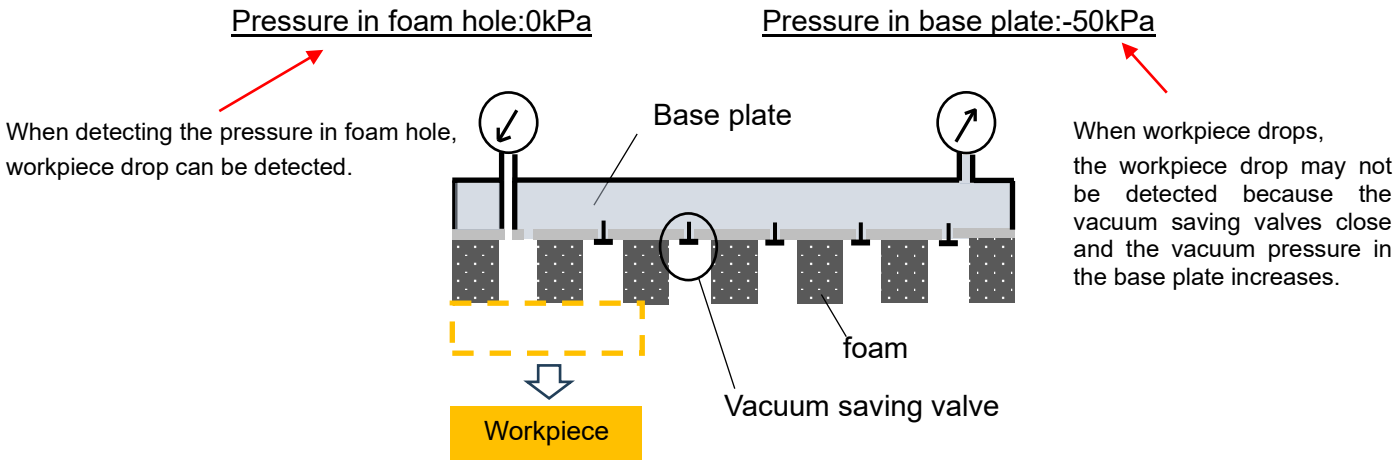
⚠ Caution

Please plug (M-3P) the unused port.
If the plug is missing, it could cause vacuum pressure failure.

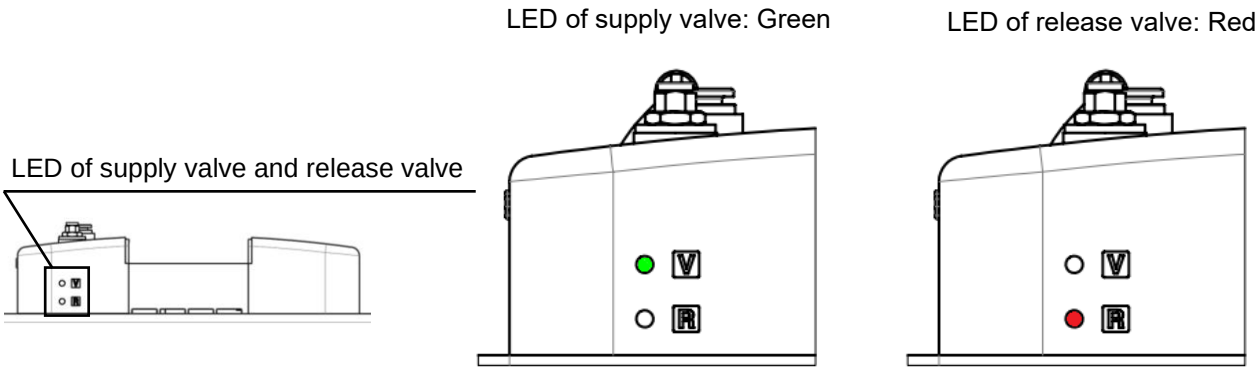
KQ2S02-M3G

After tightening by hand, use a tool to tighten an additional 1/4 turn.
A reference value for the tightening torque is 0.4 to 0.5N·m.

＜Example of pressure detection in foam hole＞



7.3. LED of supply valve and release valve



	LED	N.C. Applicable part no. ZGS**K−300180***−**** ZGS**K−200120***−****	N.O. Applicable part no. ZGS**B−300180***−**** ZGS**B−200120***−****
Supply valve	Lighting(Green)	Suction ON	Suction OFF
	Off	Suction OFF	Suction ON

	LED	N.C.
Release valve	Lighting(Red)	Blow-off ON
	Off	Blow-off OFF

8. Maintenance

■ Perform the maintenance and inspection shown below in order to use the electric vacuum gripper in a safe and appropriate manner for a long time.

8.1. Maintenance for Vacuum Gripper System

⚠ Caution

1) Inspection before and after maintenance

When removing the product from the equipment, ensure that the power supply is turned off and the vacuum pressure inside the product is released. When returning the product to the equipment after maintenance, connect to the power.

2) Inspect the vacuum gripper system regularly.

- Regularly inspect the vacuum gripper system to ensure that there are no cracks or wear in the foam. Replace the foam as necessary.
- Regularly inspect the mesh fitted to the foam or vacuum saving valve, the silencer element to ensure that they are not clogged. Clean or replace them as necessary. To check for clogging, use the pressure detection port in the base plate and measure the pressure during suction without a workpiece to grip. (If the suction assist valve or fixed orifice becomes clogged, the degree of vacuum during suction will increase. Also, if the pressure inside the base plate decreases, air leakage may occur.)

3) Regularly tighten connections which may be loosened by the use for a long period.

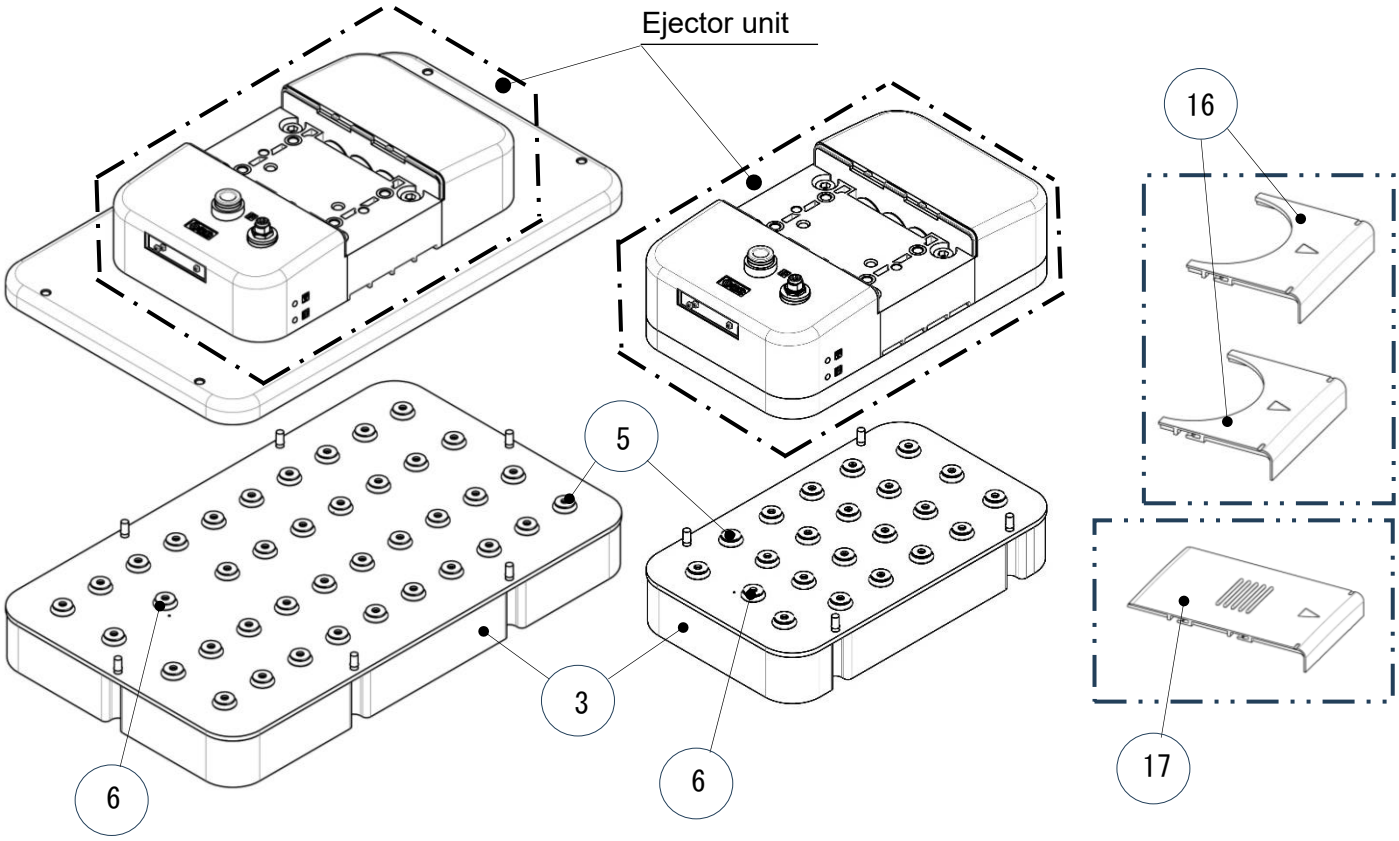
The part connections may be loosened by vibration or impact when the gripper system is operated for a long time. Tighten the connections regularly to ensure that parts do not fall off and the gripper system is properly installed on the equipment.

4) Do not disassemble or modify the product, other than replacement of the parts specified in this manual.

8.2. How to replace parts

8.2.1 Parts and parts numbers

Foam and Vacuum saving valve



Ejector unit

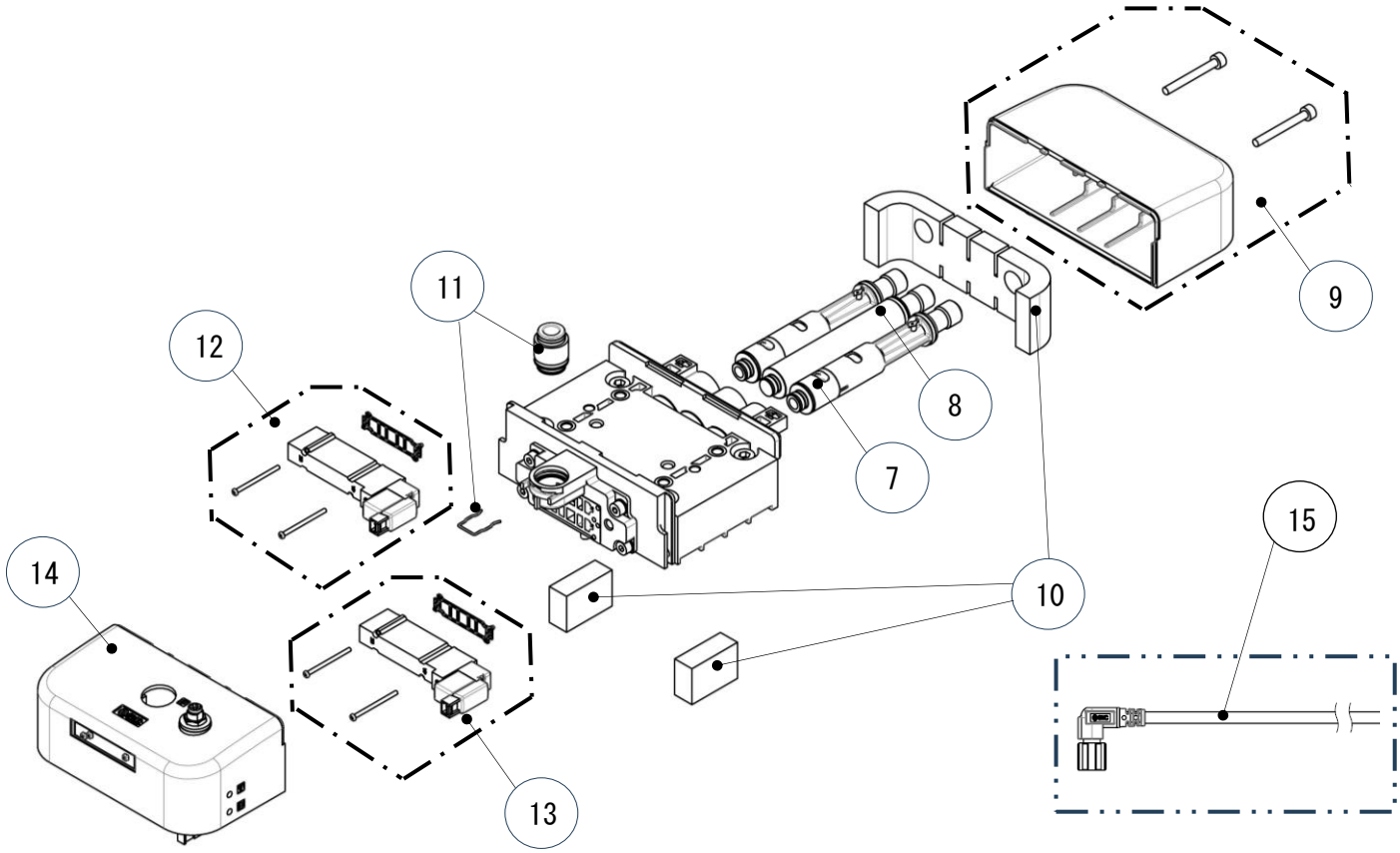


Table7. Spare part numbers

No	Description	Part No	Replacement procedure	Remarks
1	Foam with plate (For vacuum saving valve type)	ZGS-FM2-300180T20P-A		Refer to table8 and table9
		ZGS-FM2-300180T30P-A		
		ZGS-FM3-200120T20P-A		
		ZGS-FM3-200120T30P-A		
2	Foam with plate (For fixed orifice type)	ZGS-FM2-300180T20MP-A		
		ZGS-FM2-300180T30MP-A		
		ZGS-FM3-200120T20MP-A		
		ZGS-FM3-200120T30MP-A		
3	Foam (For vacuum saving valve type)	ZGS-FM2-300180T20-A		Foam thickness 20mm
		ZGS-FM2-300180T30-A		Foam thickness 30mm
		ZGS-FM3-200120T20-A		Foam thickness 20mm
		ZGS-FM3-200120T30-A		Foam thickness 30mm
4	Foam with mesh (For fixed orifice type)	ZGS-FM2-300180T20M-A		Foam thickness 20mm
		ZGS-FM2-300180T30M-A		Foam thickness 30mm
		ZGS-FM3-200120T20M-A		Foam thickness 20mm
		ZGS-FM3-200120T30M-A		Foam thickness 30mm
5	Vacuum saving valve	ZGS-BD2A-1-A		Stopper : Black, Valve : White
6	Vacuum saving valve	ZGS-BD2A-2-A		Stopper : White, Valve : Red
7	Ejector assembly	ZGS-EJ1-V-A	Procedure.1→2→3	
8	Dummy ejector assembly	ZGS-EJ1-D-A	Procedure.1→2→3	
9	Ejector cover set	ZGS-LD2-A		With mounting screws
10	Sound absorbing material set	ZGS-SE1-A	Procedure.1→2→4→5	
11	One-touch fitting set	ZGS-PR1-∗-A		With clip Refer to next page about part no.
12	Supply valve set	ZGS-JSY3V-A	Procedure.4→6→7	With gasket and mounting screws
13	Release valve set	ZGS-JSY3R-A	Procedure.4→6→7	With gasket and mounting screws
14	Valve cover assembly	ZGS-LD1-∗∗∗-A	Procedure.4→6→7	Refer to next page about part no..
15	Connector cable	RMH-A00-11-A		
		RMH-A00-18A		
		ZGS-LW1-14-A		
16	Tool plate cover	ZGS-LD4-A		Quantity:2
17	Flange cover	ZGS-LD3-A		Quantity:1
18	Plug	M-5P		
19	Plug	M-3P		
20	One-touch fitting	KQ2L04-M5A		
21	One-touch fitting	KQ2S02-M3G		
22	Tool plate	ZGS-PL3-3-A		Refer to parts included in the package
23	Offset flange	ZGS-PL3-4-A		Refer to parts included in the package
24	Flange U	ZGS-PL3-5-A		Refer to parts included in the package
25	Flange Y	ZGS-PL3-6-A		Refer to parts included in the Package (When using main plate)
26		ZGS-PL3-6-1-A		Refer to parts included in the Package (When using offset flange)
27	Main plate	ZGS-PL3-7-A		Refer to parts included in the package

11 One-touch fittings set

ZGS-PR1- * -A

(1)

(1) Air pressure supply (P) port

Symbol	Air pressure supply (P) port
C8	ϕ8
C10	ϕ10
N9	ϕ5/16”
N11	ϕ3/8”

14 Valve cover assembly

ZGS-LD1- * * * -A

(1) (2) (3)

(1)PD port

Symbol	Supply valve and release valve
1	With supply valve and release valve
5	Without supply valve and release valve

(2)Pressure switch output specifications

Symbol	Specifications
P	PNP (N.C./N.O.)
N	NPN (N.C./N.O.)
T	NPN (N.C./N.O.) OMRON TM ROBOT
H	IO-LINK (N.C.)
J	IO-LINK (N.O.)

(3)Pressure switch unit specifications

Symbol	Switch unit
X	With unit switching function
Z	SI unit only

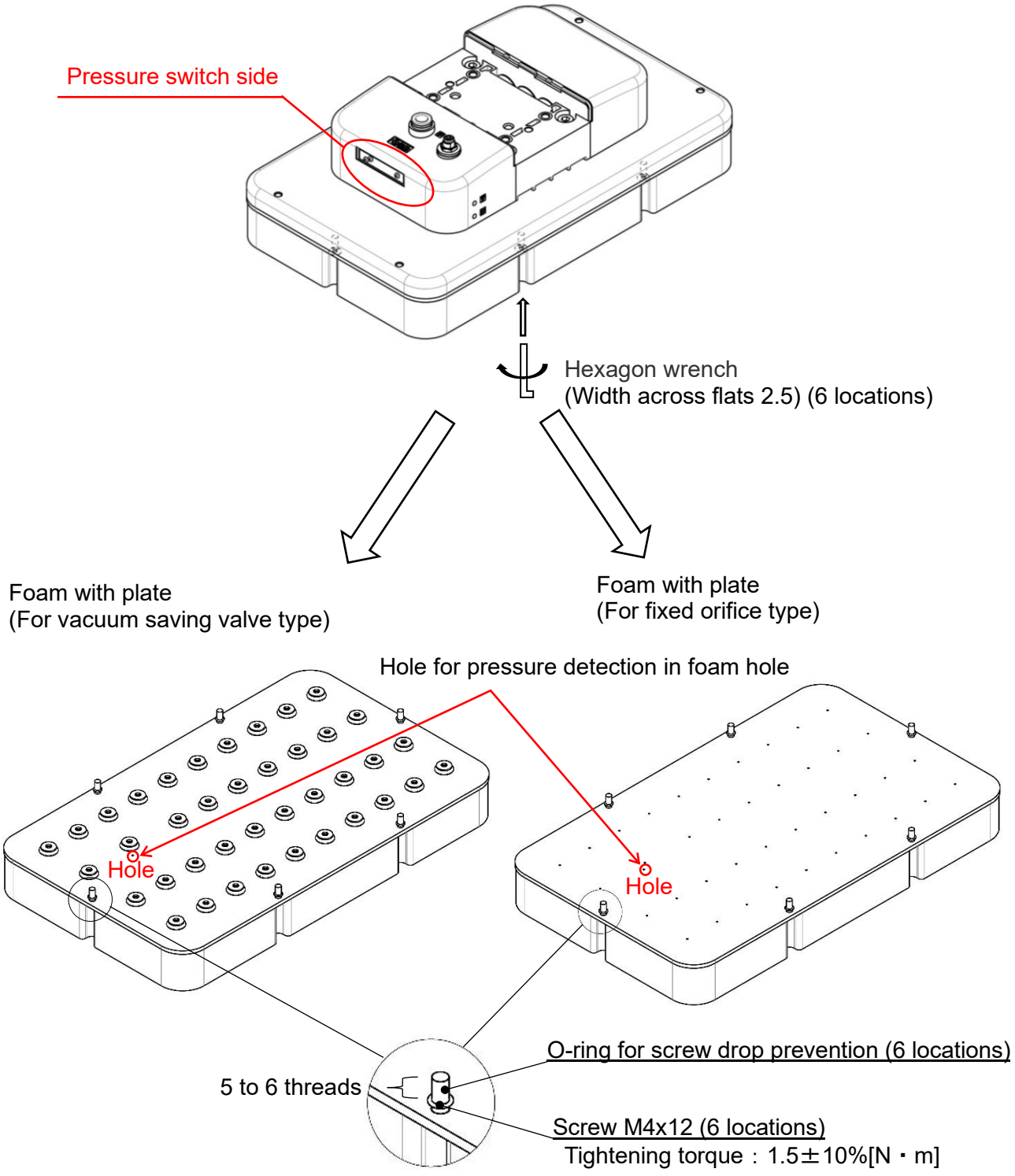
Table.8 Spare part number and applicable product part number

Spare part		For vacuum saving valve type	For fixed orifice type
Type	Thickness [mm]		
Form with plate	20	ZGS-FM2-300180T20P-A	ZGS-FM2-300180T20MP-A
	30	ZGS-FM2-300180T30P-A	ZGS-FM2-300180T30MP-A
Form only	20	ZGS-FM2-300180T20-A	ZGS-FM2-300180T20M-A
	30	ZGS-FM2-300180T30-A	ZGS-FM2-300180T30M-A
(Applicable product part number)		ZGS＊＊＊－300180＊**S**＊－＊＊＊＊	ZGS＊＊＊－300180＊**M**＊－＊＊＊＊

Table.9 Spare part number and applicable product part number

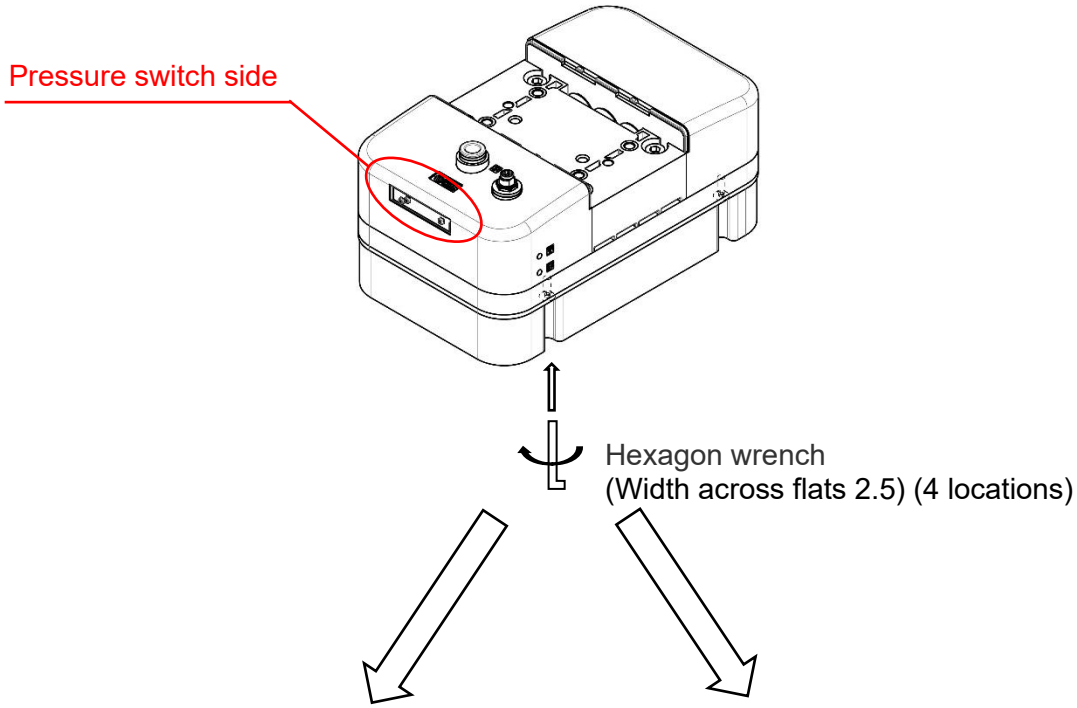
Spare part		For vacuum saving valve type	For fixed orifice type
Type	Thickness [mm]		
Form with plate	20	ZGS-FM3-200120T20P-A	ZGS-FM3-200120T20MP-A
	30	ZGS-FM3-200120T30P-A	ZGS-FM3-200120T30MP-A
Form only	20	ZGS-FM3-200120T20-A	ZGS-FM3-200120T20M-A
	30	ZGS-FM3-200120T30-A	ZGS-FM3-200120T30M-A
(Applicable product part number)		ZGS＊＊＊－200120＊**S**＊－＊＊＊＊	ZGS＊＊＊－200120＊**M**＊－＊＊＊＊

8.2.2 How to replace foam with plate (300x180)



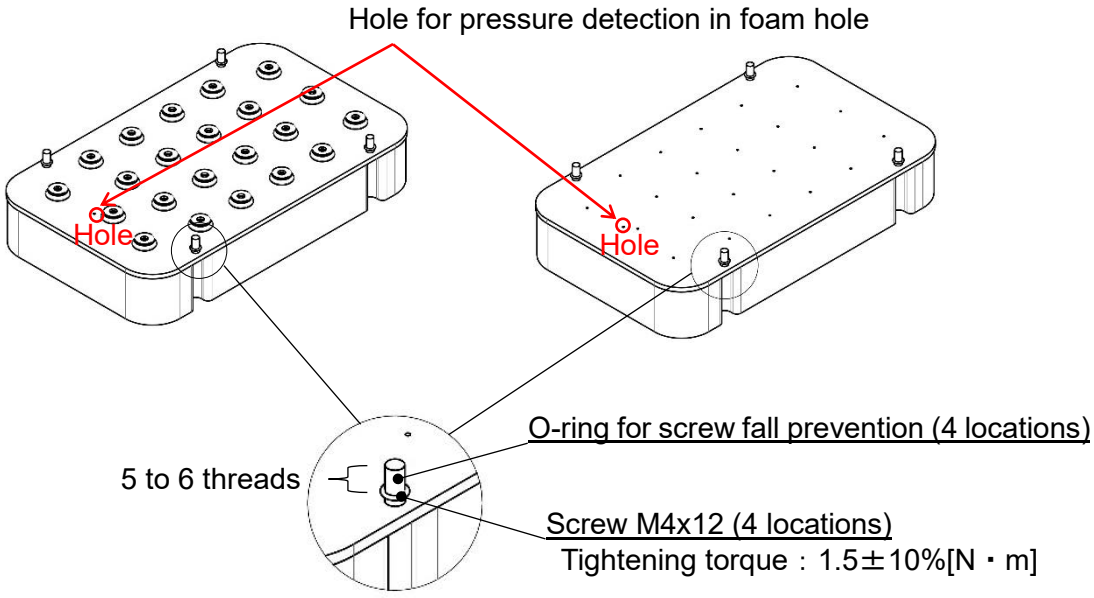
∗The foam with plate has an orientation.
The hole for pressure detection in foam hole must be placed on the pressure switch side.

8.2.3 How to replace foam with plate (200x120)



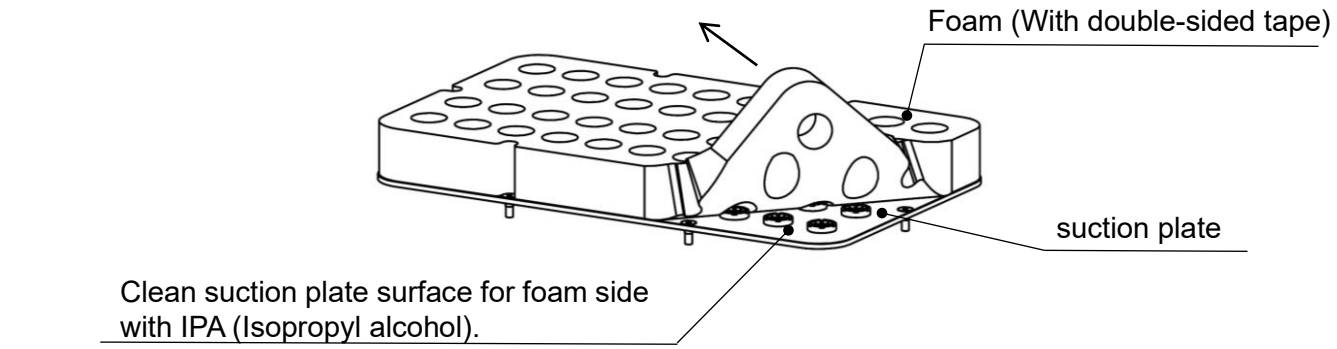
Foam with plate
(For vacuum saving valve type)

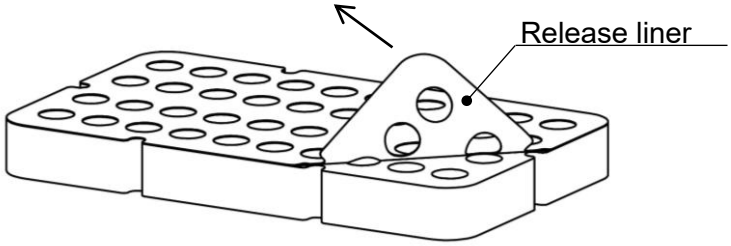
Foam with plate
(For fixed orifice type)

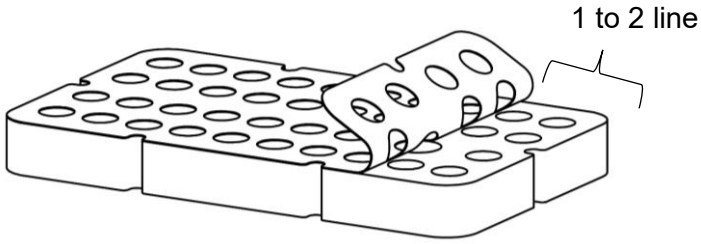


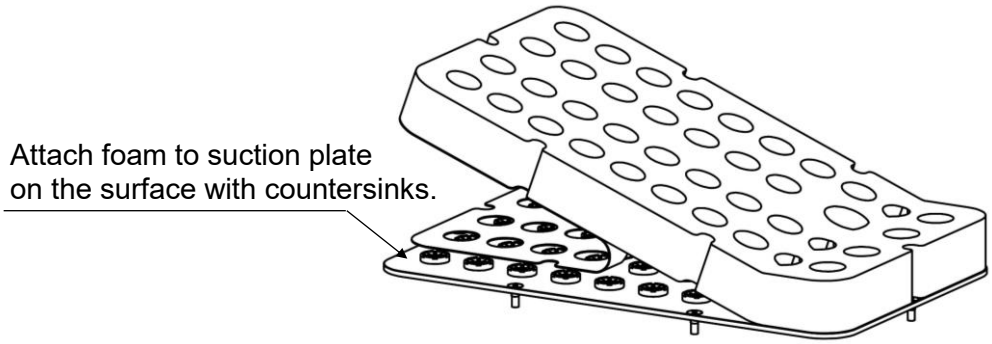
∗ The foam with plate has an orientation.
The hole for pressure detection in foam hole must be placed on the pressure switch side.

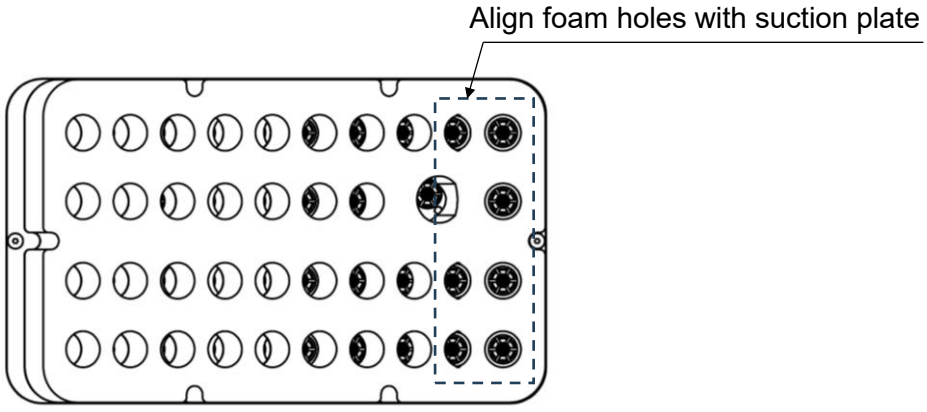
8.2.4 How to replace foam

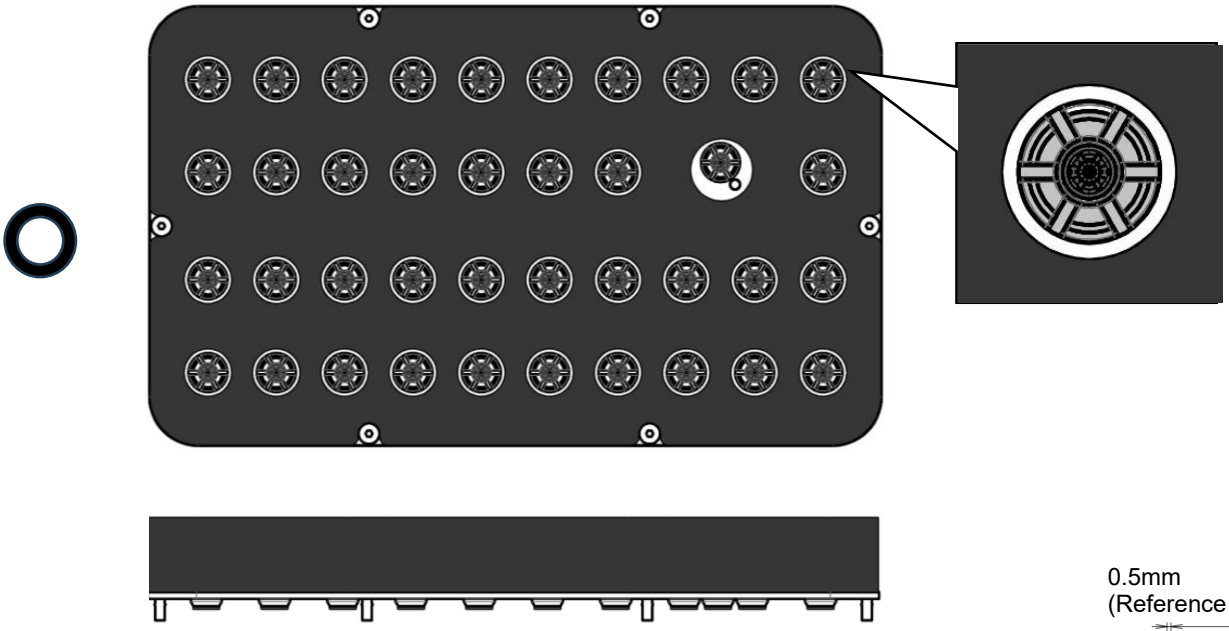




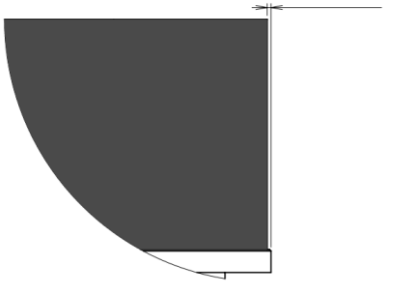


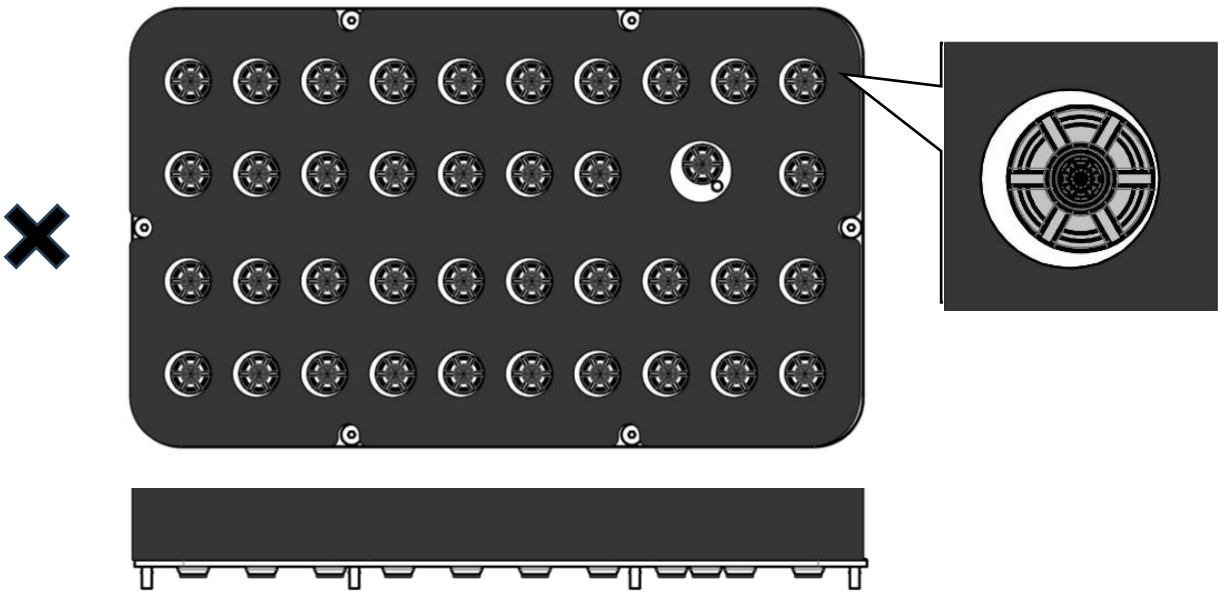






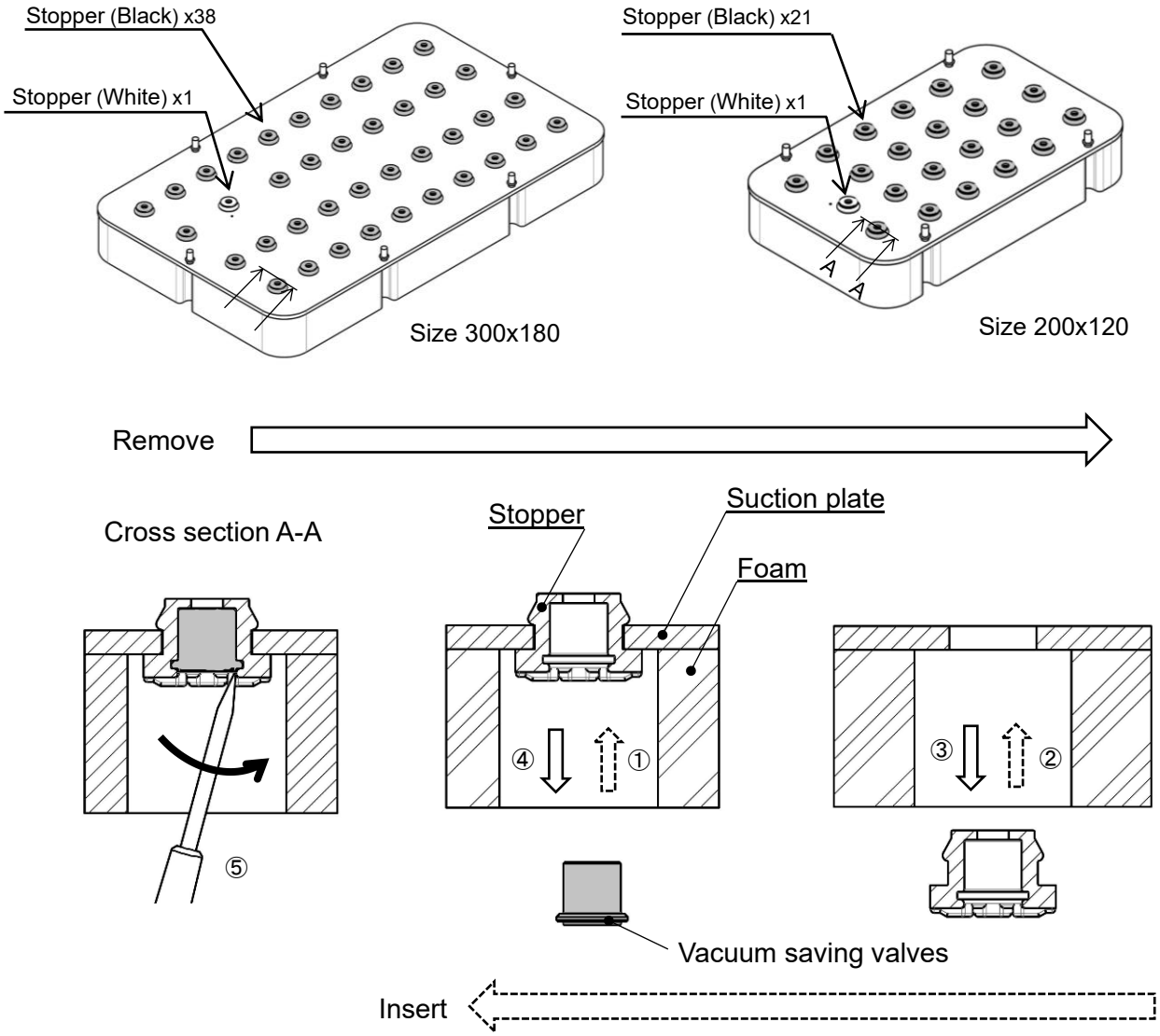
0.5mm
(Reference value)



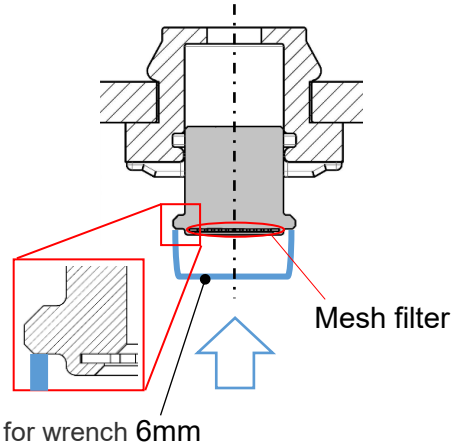


Foam sticks out of suction plate

8.2.5 How to replace Vacuum saving valves



∗ If it is hard to insert vacuum saving valve,
thinly apply fluorine grease to inside of stopper.



Example: Socket for wrench 6mm

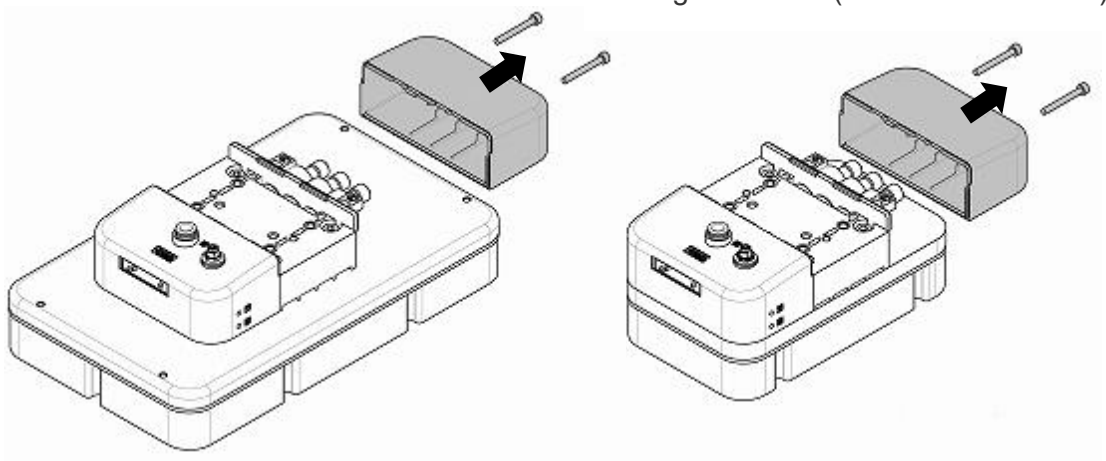
Push brim of body and
do not push mesh filter

8.2.6 How to replace Ejector unit

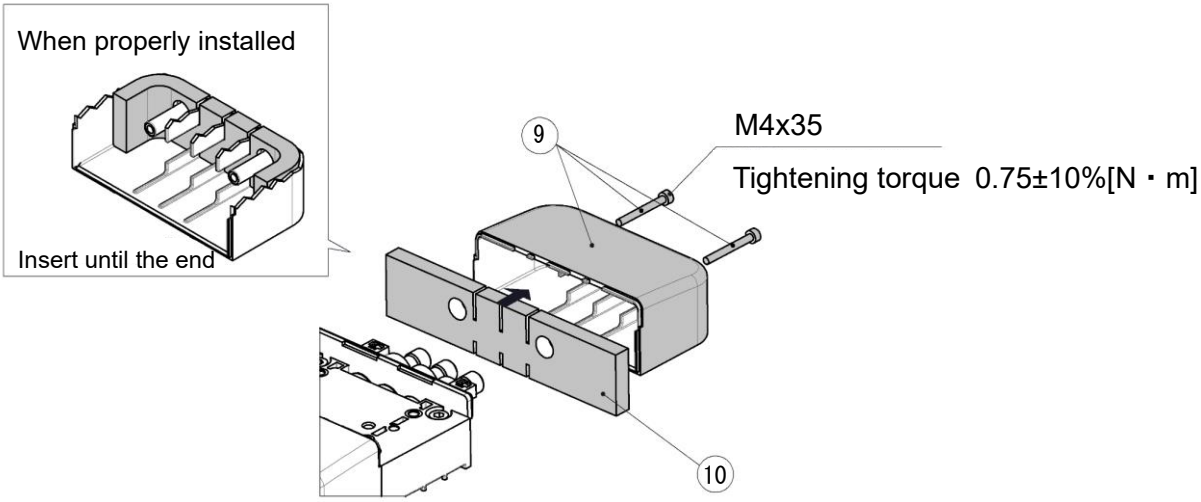
(Please refer to the replacement procedure in the "Replacement Parts Order Number Table" above.)

Procedure 1

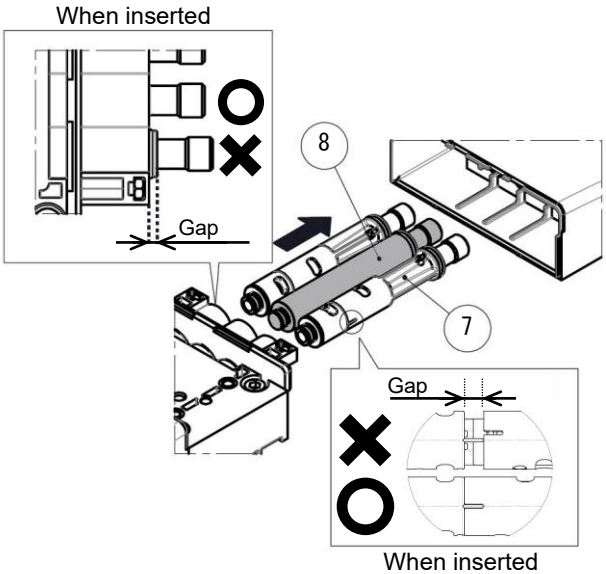
Hexagon wrench (Width across flats 3)



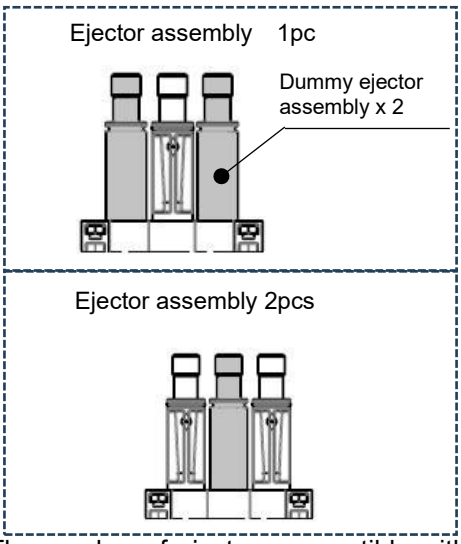
Procedure 2



Procedure 3

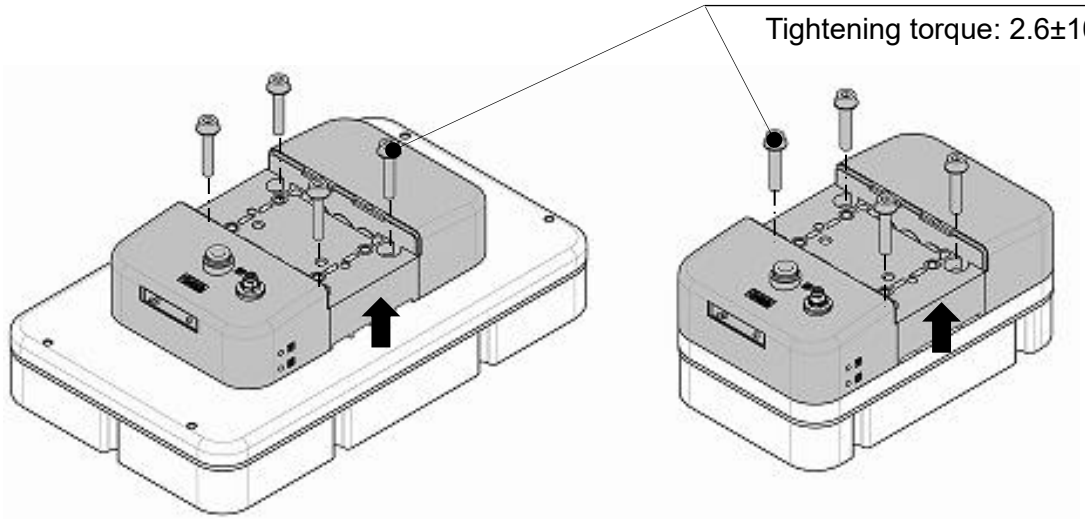


Ejector assembly arrangement

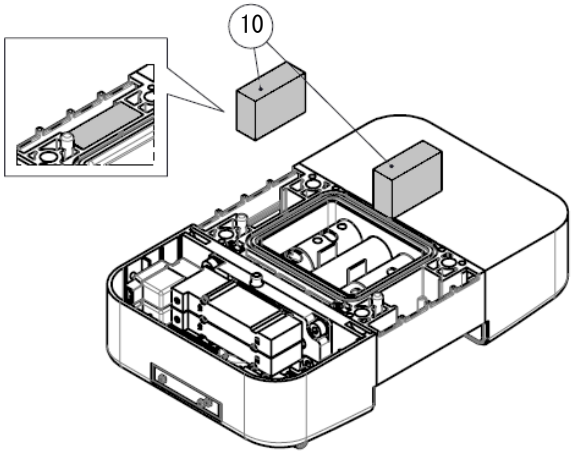


The number of ejectors compatible with sponge size 200x120 is 1 or 2.
If you modify it to 3, the suction assist valve may close more easily, which may result in reduced performance.

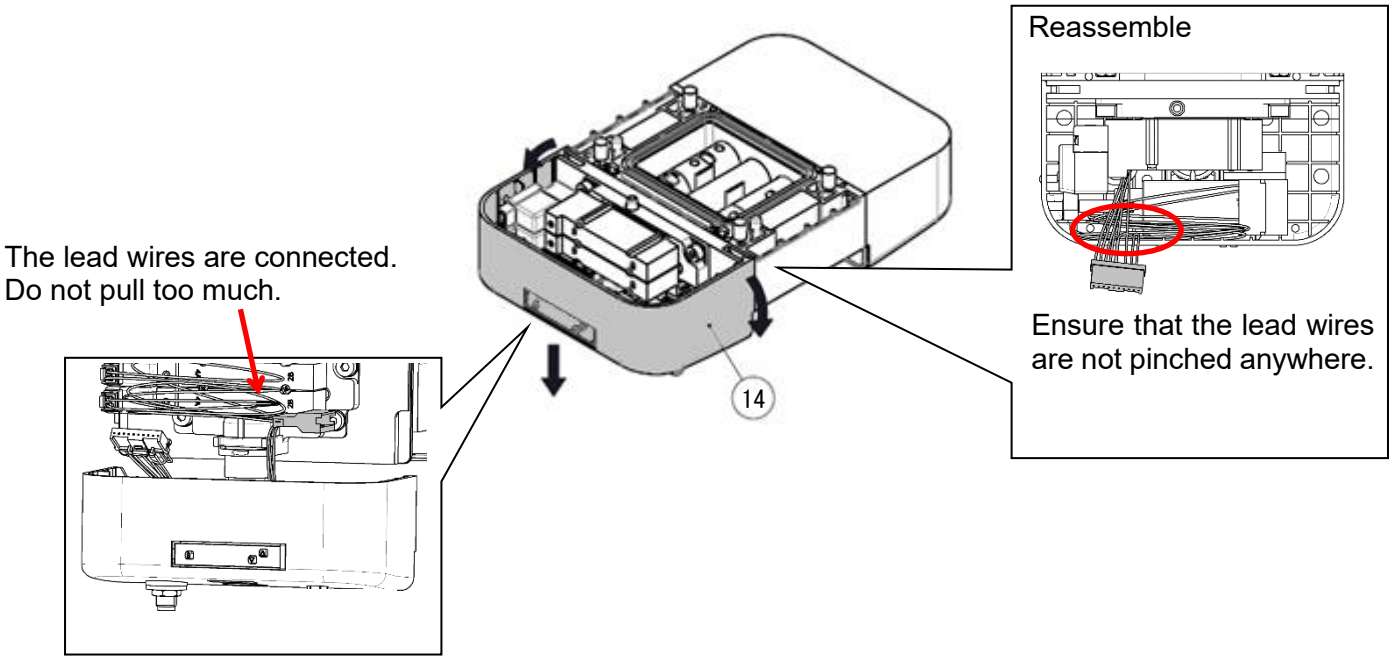
Procedure 4



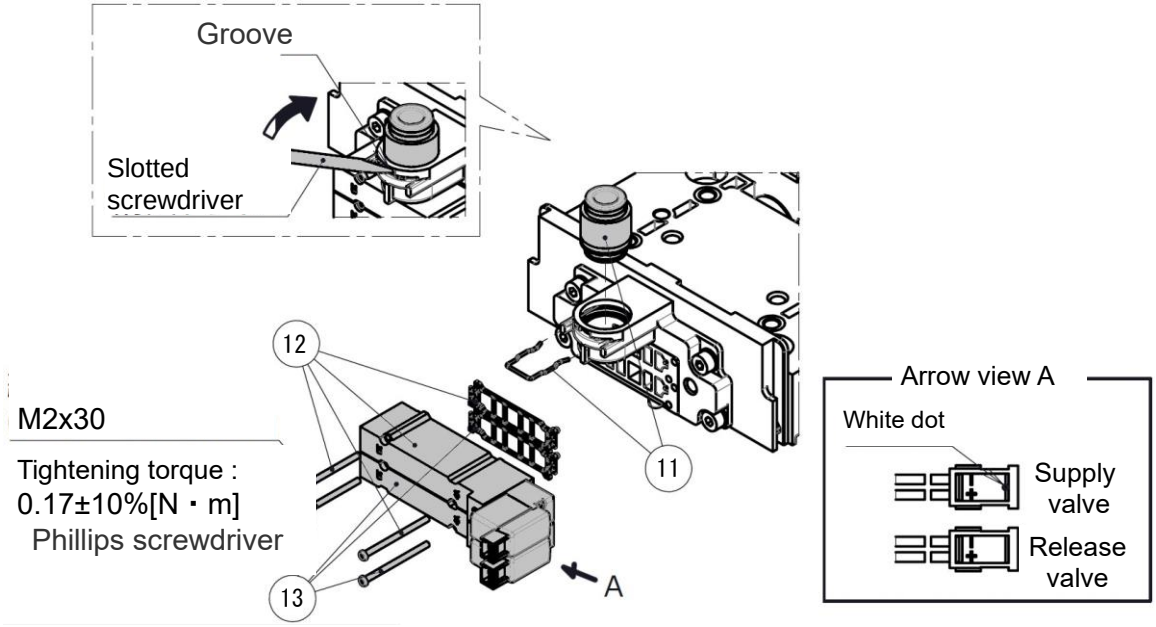
Procedure 5



Procedure 6



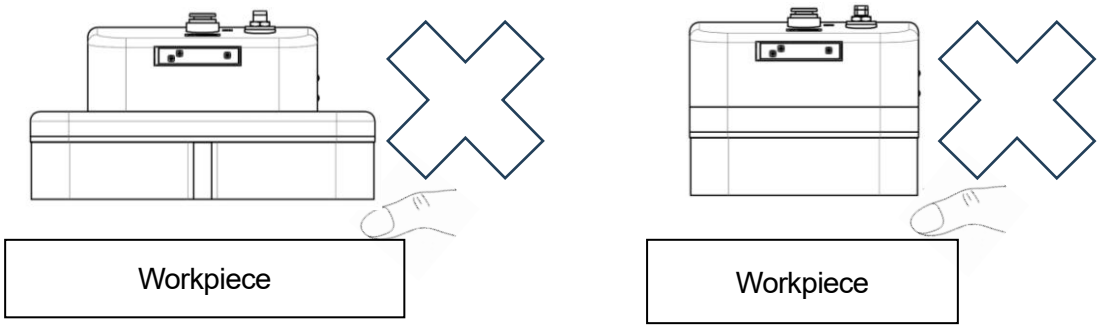
Procedure 7


Groove
Slotted
screwdriver
12
11
13
A
M2x30
Tightening torque :
0.17±10%[N・m]
Phillips screwdriver
Arrow view A
White dot
Supply
valve
Release
valve

9. Precautions

⚠ Warning

Do not put a finger between the foam and the workpiece; It will be pinched during suction.



⚠ Caution

1) Test the product before use by installing it on the equipment and operating it in your operating environment or conditions to ensure that it meets required functionality, taking into account the following:

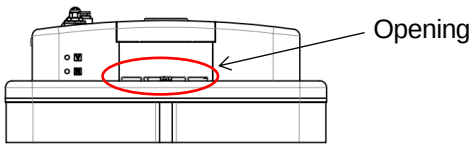
- The foam's thickness and airtightness vary due to production reasons.
- Porous workpieces such as cardboard cause more air leakage than other workpieces, resulting in a reduction in lifting force.

In addition, take safety measures before use to prevent accidents, such as workpieces being dropped during transport.

2) Design the equipment with safety in mind, taking into account a vacuum pressure drop caused by a power or air supply failure. Provide preventive measures against the fall of workpieces where this may cause danger.

3) Use this product within its specifications.
If it is used outside the specifications, its performance will be decreased, resulting in serious damage or injury.

4) Do not block the opening of the product and restrict air exhaust from it.



5) Before suction, press the foam onto the workpiece so that the foam adapts to the unevenness of the workpiece surface. It is recommended that the foam is compressed to approximately 50% of its original thickness.

6) Do not pressurize the product with the ejector cover removed;ejector assembly may jump out.

7) Premature clogging may occur if the product is used in a dusty environment or with dusty workpieces. Service the product regularly, including replacement of the foam.

8) The presence of oil or water on the product or workpiece can adversely affect the product, causing a decrease in performance.

■Storage

⚠ Warning

1) Do not store the product in a place where it is exposed to rain, water, harmful gases or liquids.
2) Store the product out of direct sunlight and within the product's operating temperature range.
3) Do not apply vibration or impact to the product during storage.

10. Troubleshooting

When any failure occurs to the product, perform the following trouble shooting.

Failure phenomenon		Possible causes		Countermeasure No.
Vacuum absorption failure	Vacuum is not generated	Supply valve does not operate	Decline in the power supply voltage	1)
			Electrical wire failure	2)
			The supply pressure exceeds the operating pressure range.	3)
	Vacuum pressure decreased	Clogging by foreign matter or particles		4)、5)
		Clogging of the filter		5)
		Clogging of the sound absorbing material.		4)、5)
		Deterioration of the adsorbing part and air leakage due to wearing.		6)
		Incorrect assembly during maintenance (incorrect mounting of the gasket or O-ring)		7)
		Insufficient supply pressure		8)
		Supply valve and release valve operate simultaneously		9)
		Sealing failure due to the deterioration of the check valve		10)
Fluctuation of vacuum pressure	Noise is generated intermittently when air is exhausted when absorbing by vacuum and vacuum pressure slightly fluctuates.	Vibration of fluid when vacuum pressure is generated		11)
Vacuum release failure	Release air is not output	Release valve does not operate,	Decline in the power supply voltage	1)
			Electrical wire failure	2)
			The supply pressure exceeds the operating pressure range.	3)
	Workpiece is not released smoothly.	Decrease of release flow		12)
		Interlocking of supply valve and release valve		9)

No	Countermeasure
1)	Adjust the rated voltage so that the supply voltage for the solenoid valve is within -10% of the rated voltage while the simultaneously energized equipment is ON.
2)	Check the correct connection of the power supply and wiring of plug connectors.
3)	If the supply pressure is lower than the operating pressure range, it may cause operation failure of the solenoid valve. If the supply pressure is higher than the operating pressure range, it may cause operation failure because of early defect due to wear of seals. Adjust the supply pressure appropriate. Ensure that the supply pressure is within the operating range, when the ejector is operating.
4)	Oil mist in the supply air or particles in the piping may be cause clogging if they enter into the ejector. This may cause operation failure. Blow the air piping with air to eliminate particles. It is recommended installing the mist separator and air filter for cleaner supply air. Perform regular maintenance for mist separator and filter. Refer to the product catalogue or operation manual for details of the maintenance.
5)	Substances adhere to the surface of the workpiece may enter into the ejector, causing clogging. Perform regular maintenance for the foam with mesh, vacuum saving valve.
6)	Replace the foam or foam with plate. Revise the absorbing condition based on the relation between the vacuum pressure and workpiece.
7)	If the gasket or O-ring come out or get caught during maintenance, leakage of vacuum or air occurs from there. In this case, disassemble the parts and reassemble the gasket and O-ring correctly.
8)	If the supply pressure during the operation of the ejector decreases, the generated vacuum pressure decrease. Apply adequate flow rate so that the supply pressure is adequate when other air equipment operate simultaneously.
9)	Vacuum pressure and release flow decrease if the supply valve and release valve are operated simultaneously. Check the control program and wiring.
10)	In the following cases, the vacuum pressure does not increase adequately. (1) The check valve in the ejector assembly is deteriorated by long-term use. (2) Dirt adhered to the sealing surface. Replace the ejector assembly.
11)	When the ejector vacuums the workpiece, high speed air coming out of the nozzle collides into the diffuser I.D. and bounces back, generating vibration in the exhaust air. Because of this, the vacuum pressure fluctuates slightly and is not stabilized. There should be no functional problem with the ejector. The phenomenon causes noise or could be a problem for the setting of vacuum switch. The noise can be eliminated by changing the supply pressure. Adjust the pressure regulating valve for supply pressure while checking the exhaust noise and vacuum pressure until the noise disappear. Ejector may generate noise due to the increase of exhaust resistance. When the silencer becomes dirty, the replacement of the silencer element may improve the condition.
12)	If clogging occurs in the mesh fitted to the foam, and the mesh filter of the vacuum saving valve, resulting in release air decrease. Regular maintenance is necessary.

Revision history

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