



Operation Manual

PRODUCT NAME

**Vacuum Gripper System
(Foam Type)**

MODEL / Series / Product Number

ZGS-400240*(J/T)*-******

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

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

SMC Corporation

Contents

Safety Instructions.....	3
1. Parts included in the package.....	7
2. How to order.....	11
3. Summary of Product Parts.....	14
4. Mounting	16
■400mm x 240mm.....	16
4.1. Robot mounting flange: Basic type.....	16
4.2. Robot mounting flange: Basic type + Offset flange.....	18
■300mm x 180mm, 200mm x 120mm.....	21
4.3. Robot mounting flange: Tool plate + Main plate.....	21
4.4. Robot mounting flange: Offset flange.....	24
4.5. Robot mounting flange: Straight flange	27
5. Specifications	30
5.1. Specifications.....	30
5.2. Pneumatic Circuit.....	31
5.3. Wiring	33
5.4. Ejector flow characteristics.....	36
5.5. Ejector Exhaust characteristics	39
6. Dimensions.....	42
■400mm x 240mm.....	42
6.1. Robot mounting flange: Basic type.....	42
6.2. Robot mounting flange: Basic type (IO-Link type)	43
6.3. Robot mounting flange: Basic type + Offset flange.....	44
6.4. Robot mounting flange: Basic type + Offset flange (IO-Link type)	45
6.5. Robot mounting flange: Basic type + Offset flange + Flange U.....	46
6.6. Robot mounting flange: Without robot mounting flange	47
6.7. Robot mounting flange: Without robot mounting flange (IO-Link type).....	48
6.8. Basic type	49
6.9. Offset flange.....	50
6.10. Tool center point (T.C.P.), Center of gravity (C.O.G.) and Weight	51
■300mm x 180mm.....	55
6.11. Robot mounting flange: Tool plate + Main plate.....	55
6.12. Robot mounting flange: Tool plate + Main plate + Flange U	56
6.13. Robot mounting flange: Tool plate + Main plate + Flange Y.....	57
6.14. Robot mounting flange: Offset flange	58
6.15. Robot mounting flange: Offset flange + Flange U.....	59
6.16. Robot mounting flange: Offset flange + Flange Y	60
6.17. Robot mounting flange: Straight flange	61
6.18. Robot mounting flange: Straight flange + Flange U.....	62
6.19. Robot mounting flange: Without robot mounting flange	63
■200mm x 120mm.....	64
6.20. Robot mounting flange: Tool plate + Main plate.....	64
6.21. Robot mounting flange: Tool plate + Main plate + Flange U	65
6.22. Robot mounting flange: Tool plate + Main plate + Flange Y.....	66
6.23. Robot mounting flange: Offset flange	67
6.24. Robot mounting flange: Offset flange + Flange U.....	68
6.25. Robot mounting flange: Offset flange + Flange Y	69
6.26. Robot mounting flange: Straight flange	70
6.27. Robot mounting flange: Straight flange + Flange U.....	71
6.28. Robot mounting flange: Without robot mounting flange	72
6.29. Main plate	73
6.30. Tool plate	73
6.31. Flange U	74
6.32. Flange Y	74
6.33. Offset flange.....	75
6.34. Straight flange.....	75

6.35. Tool center point (T.C.P.), Center of gravity (C.O.G.) and Weight	76
7. Technical information	84
7.1. Suction plate selection guide	84
7.2. Max. allowable moment and load	90
7.3. LED light of supply valve and release valve	94
7.4. How to use the pressure switch to check gripping	95
8. Maintenance	98
8.1. Maintenance for Vacuum Gripper System	98
8.2. How to replace parts	99
8.2.1 Replacement parts	99
8.2.2 How to replace foam with plate (400mm x 240mm)	107
8.2.3 How to replace foam with plate (300mm x 180mm)	108
8.2.4 How to replace foam with plate (200mm x 120mm)	109
8.2.5 How to replace Vacuum saving valves	110
8.2.6 How to replace foam	111
8.2.7 How to replace Ejector unit	113
8.2.8 How to replace Connector cable assembly (Only for 400mm x 240mm)	116
8.2.9 How to switch from ZGP to ZGS	117
9. Precautions	121
10. Troubleshooting	122



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

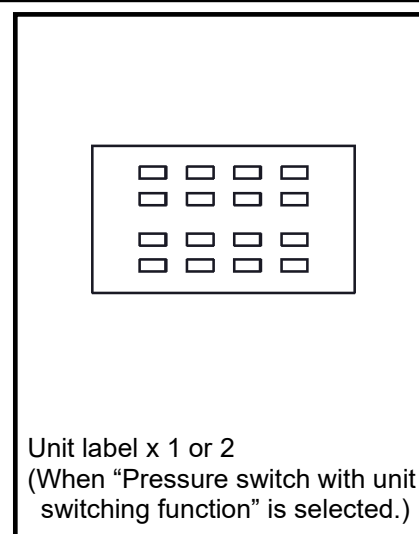
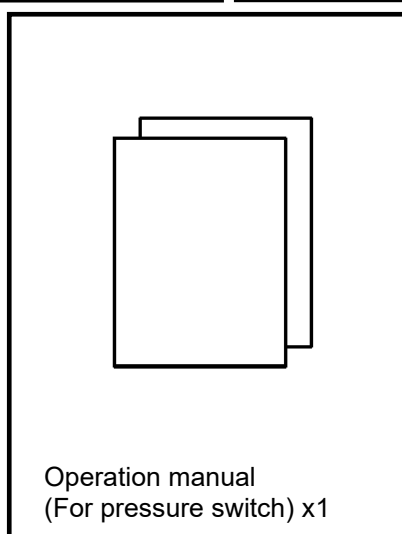
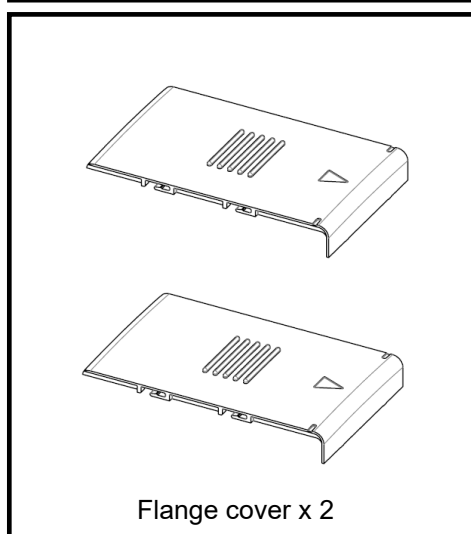
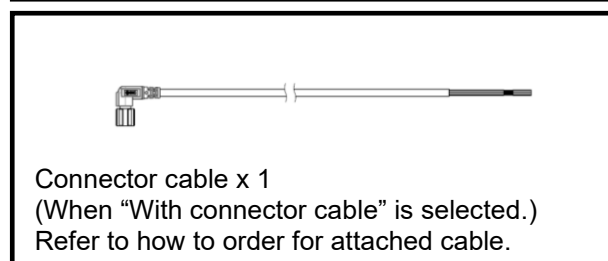
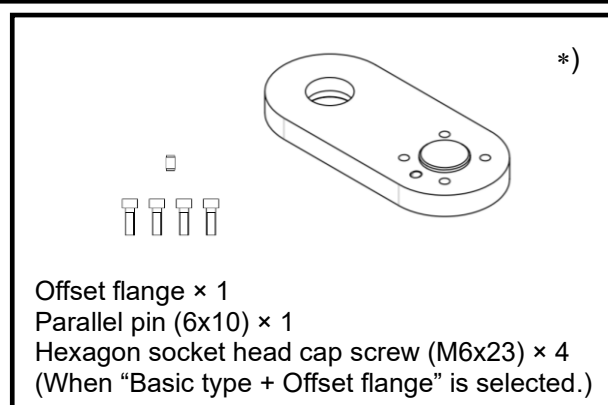
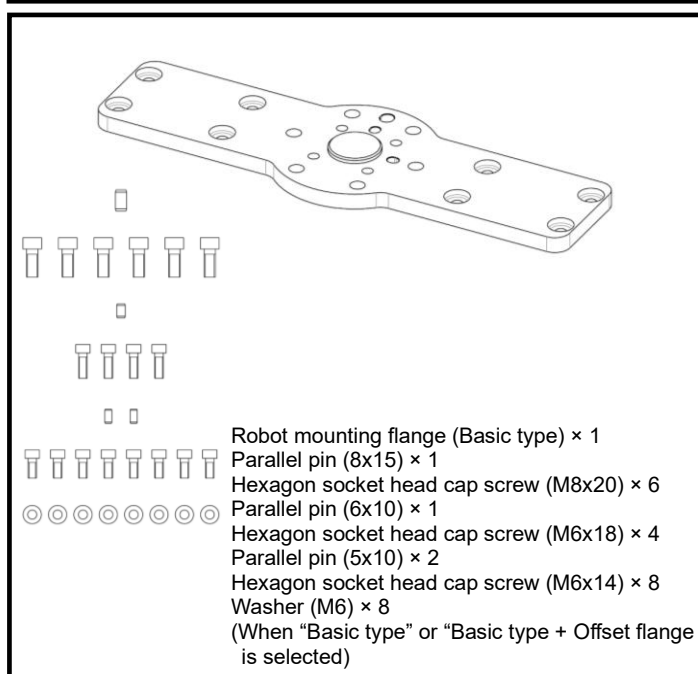
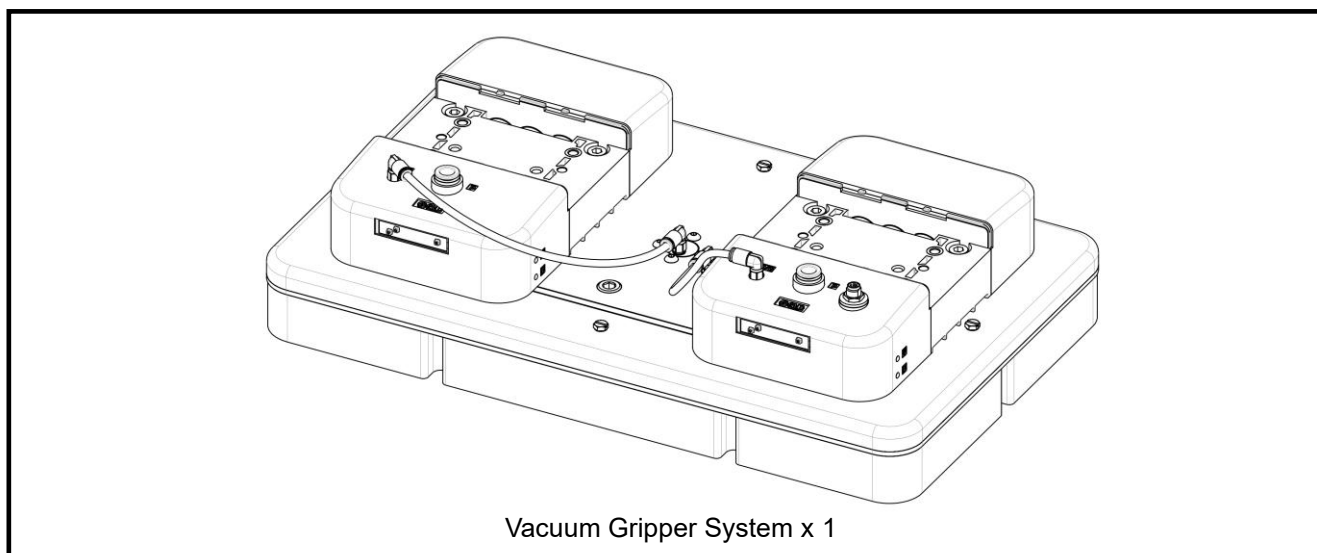
- Ensure to provide enough space for maintenance.
Design the system allowing the required space for maintenance.
- Use the specified voltage. Otherwise, failure or malfunction can result.
- Design the product to prevent reverse current when the circuit is opened, or the product is forced to operate for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

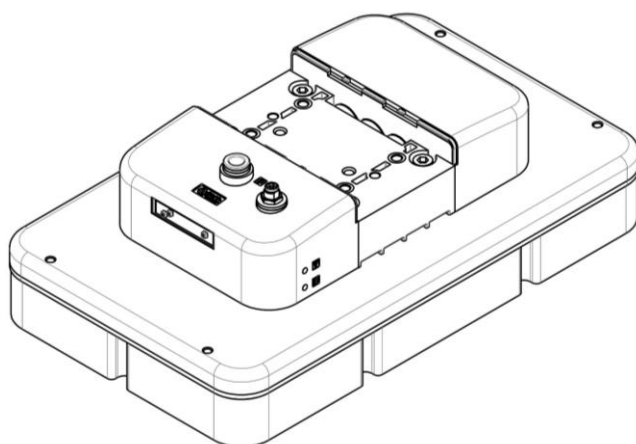
1. Parts included in the package

400mm x 240mm

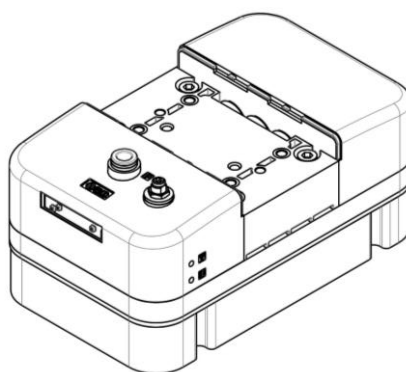


) When ordering ZGS012P-400240***-**2* (Robot mounting flange: Basic type + Offset flange) which is for UR20 and UR30, it comes with Flange U. For Flange U, refer to Page 10.

300mm x 180mm, 200mm x 120mm

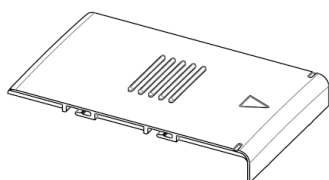


300mm x 180mm

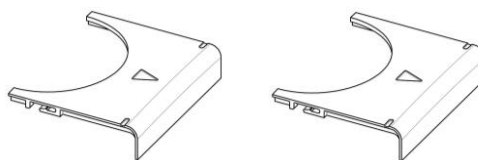


200mm x 120mm

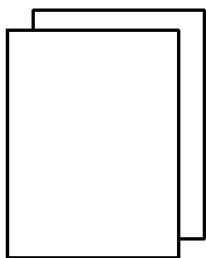
Vacuum Gripper System x 1



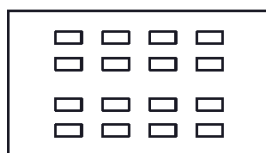
Flange cover x 1
(For offset flange)



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



Operation manual x 1
(For pressure switch)



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

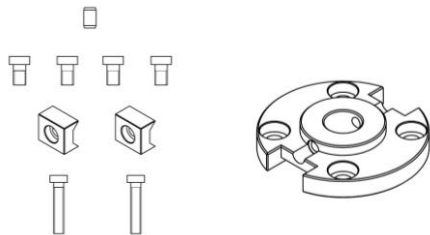


Connector cable x 1
(When "With connector cable" is selected.)
Refer to how to order for an attached cable.

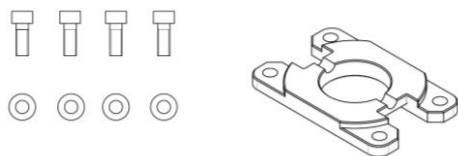
*) For other parts included with robot mounting flange, please refer to the next page.

Robot Mounting Flanges

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

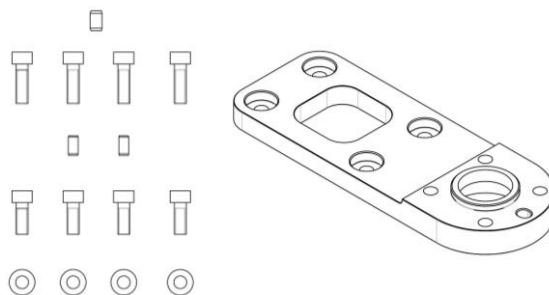


Main plate x 1
 Parallel pin (6x10) x 1
 Hexagon thin socket head screw (M6x10) x 4
 Clamper x 2
 Hexagon thin socket head screw (M5x25) x 2



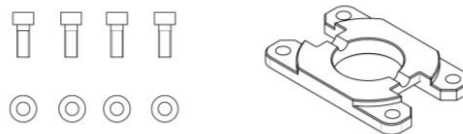
Tool plate x 1
 Hexagon socket head cap screw (M6x16) x 4
 Washer (M6) x 4

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



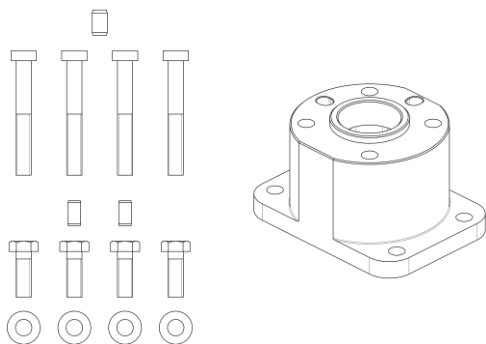
Offset flange x 1
 Parallel pin (6x10) x 1
 Hexagon socket head cap screw (M6x20) x 4
 Parallel pin (5x10) x 2
 Hexagon socket head cap screw (M6x16) x 4
 Washer (M6) x 4

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



Tool plate x 1
 Hexagon socket head cap screw (M6x16) x 4
 Washer (M6) x 4

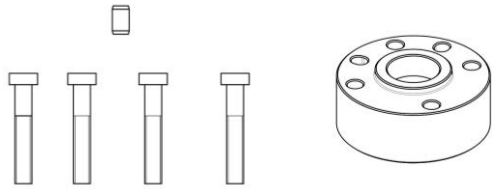
When model "Robot mounting flange : Straight flange" is selected



Straight flange x1
 Parallel pin (6x10) x1
 Hexagon thin socket head screw (M6x45) x 4
 Parallel pin (5x10) x2
 Hexagon head screw (M6x18) x 4
 Washer (M6) x4

Additional Flanges

When model “Compatible robot: 043P/043N” is selected



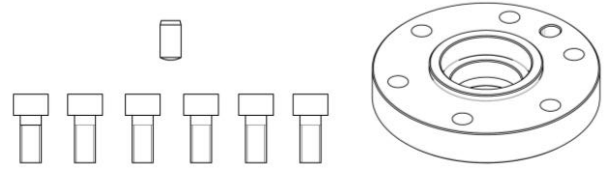
<When “Tool plate + Main plate” is selected>

Flange Y x 1
Hexagon thin socket head cap screw (M6x35) x 4
Parallel pin (6x10) x 1

<When “Offset flange” is selected>

Flange Y x 1
Hexagon socket head cap screw (M6x45) x 4
Parallel pin (6x10) x 1

When model “Compatible robot: 012P” is selected



Flange U x 1

Hexagon socket head cap screw (M8x18) x 6

Parallel pin (8x15) x 1

2. How to order

ZGS

N	P	K
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 -

400240	B	J	4
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 -

R	M	1	C8
---	---	---	----

1
2
3
4
5
6
7
8
9
10

●Compatible Robot

Symbol	Output type	Robot manufacturer	Supported model	Switch output	Valve polarity
N	P	—	General purpose	PNP	-COM
	N			NPN	+COM
	H			IO-Link compatible	
011	P	UNIVERSAL ROBOTS	UR3e, 7e, 12e, 16e	PNP	-COM
012			UR8Long, 15, 18		
			UR10g, 17g, 18g		
			UR20, 30		
021	N	OMRON / TECHMAN ROBOT	TMC□, TMC□S	NPN	+COM
043	P	YASKAWA Electric	MOTOMAN-HC10(S)DTP	PNP	-COM
	N		MOTOMAN-HC20(S)DTP	NPN	+COM
			MOTOMAN-HC30PL		
051	P	FANUC	CRX-5IA, CRX-10IA(L)	PNP	-COM
			CRX-20IA/L, CRX-30IA		

※Use robot of appropriate size depending on vacuum gripper system and weight of workpiece.

●Supply valve / release valve

Symbol	Supply valve	Release valve
B	N.O. (2-position single)	N.C.
K	N.C. (2-position single)	N.C.
W	2-position double	N.C.
Nil	None	None

※When output type "H" is selected for ●compatible robot, "W" and "Nil" cannot be selected.

●Foam size

Symbol	Foam size
400240	400mm x 240mm
300180	300mm x 180mm
200120	200mm x 120mm

●Foam

Symbol	Thickness	Number of holes		
		400 x 240	300 x 180	200 x 120
A	20 mm	91	39	22
B	30 mm			

●Suction plate

Symbol	Specifications
J	Vacuum saving valve, Center foam hole pressure detection port
T	Fixed orifice, Center foam hole pressure detection port

For sizes 300mm x 180mm, 200mm x 120mm

Symbol	Specifications
S	Vacuum saving valve
M	Fixed orifice

●Number of ejector assemblies

Symbol	Number of ejector assemblies
2	2 pcs.
4	4 pcs.
6	6 pcs.

For size 300mm x 180mm

Symbol	Number of ejector assemblies
1	1 pc.
2	2 pcs.
3	3 pcs.

For size 200mm x 120mm

Symbol	Number of ejector assemblies
1	1 pc.
2	2 pcs.

●Connector cable for compatible robot

Symbol	Connector cable for compatible robot
Nil	With cable (For compatible models)
R	With cable (Discrete wire)
N	Without cable

※When symbol "NP" or "NN" is selected for ○Compatible robot, "Nil: With cable (For compatible robot)" cannot be selected.
In addition, when symbol "NH" is selected for ○Compatible robot, only "N: Without cable" can be selected.

●Pressure switch unit specifications

For size 400mm x 240mm

Symbol	Number of pressure switches	Switch unit
C	2 switches	With unit switching function
M		SI unit only

※Under the New measurement Act, switches with the unit switching function are not permitted for use in Japan. (For use within Japan, only symbol "M" can be selected.)

※When output type "H" is selected for the ○Compatible robot, there will be 1 switch, located on the M8 connector side ejector unit.

For sizes 300mm x 180mm, 200mm x 120mm

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

※Under the New measurement Act, switches with the unit switching function are not permitted for use in Japan. (For use within Japan, only symbols "Y" or "Z" can be selected.)

●Robot mounting flange

For size 400mm x 240mm

Symbol	Robot mounting flange
Nil	Without robot mounting flange
1	Basic type (Conforming to ISO 9409-1-50-4-M6)
2	Basic type (Conforming to ISO 9409-1-50-4-M6) + Offset flange

※When symbol 021N (OMRON/TECHMAN ROBOT) is selected for ○Compatible robot, only "Nil" or "2" can be selected.

For sizes 300mm x 180mm, 200mm x 120mm

Symbol	Robot mounting flange ^{※1}
Nil	Without robot mounting flange ^{※2}
1	Tool plate + Main plate ^{※3}
2	Offset flange ^{※2}
3	Tool plate only ^{※4}
4	Straight flange

※1 Depending on ○Compatible robot, an additional flange is provided.

See the Robot Mounting Flange options for details.

※2 When symbol 021N (OMRON/TECHMAN ROBOT) is selected for ○Compatible robot, only "Nil" or "2" can be selected.

※3 When "Tool plate + Main plate" is selected, lifting force may be limited.

※4 Tool plate only is available for users who already have the main plate (ZGS-PL3-7-A).

●Air pressure supply (P) port

Symbol	Robot mounting flange		
C8	Metric	Straight	φ8 One-touch fitting
C10			φ10 One-touch fitting
N9	Inch	Straight	φ5/16" One-touch fitting
N11			φ3/8" One-touch fitting

■400mm x 240mm

Table 1-1. ⑨ Robot mounting flange part numbers (With link)

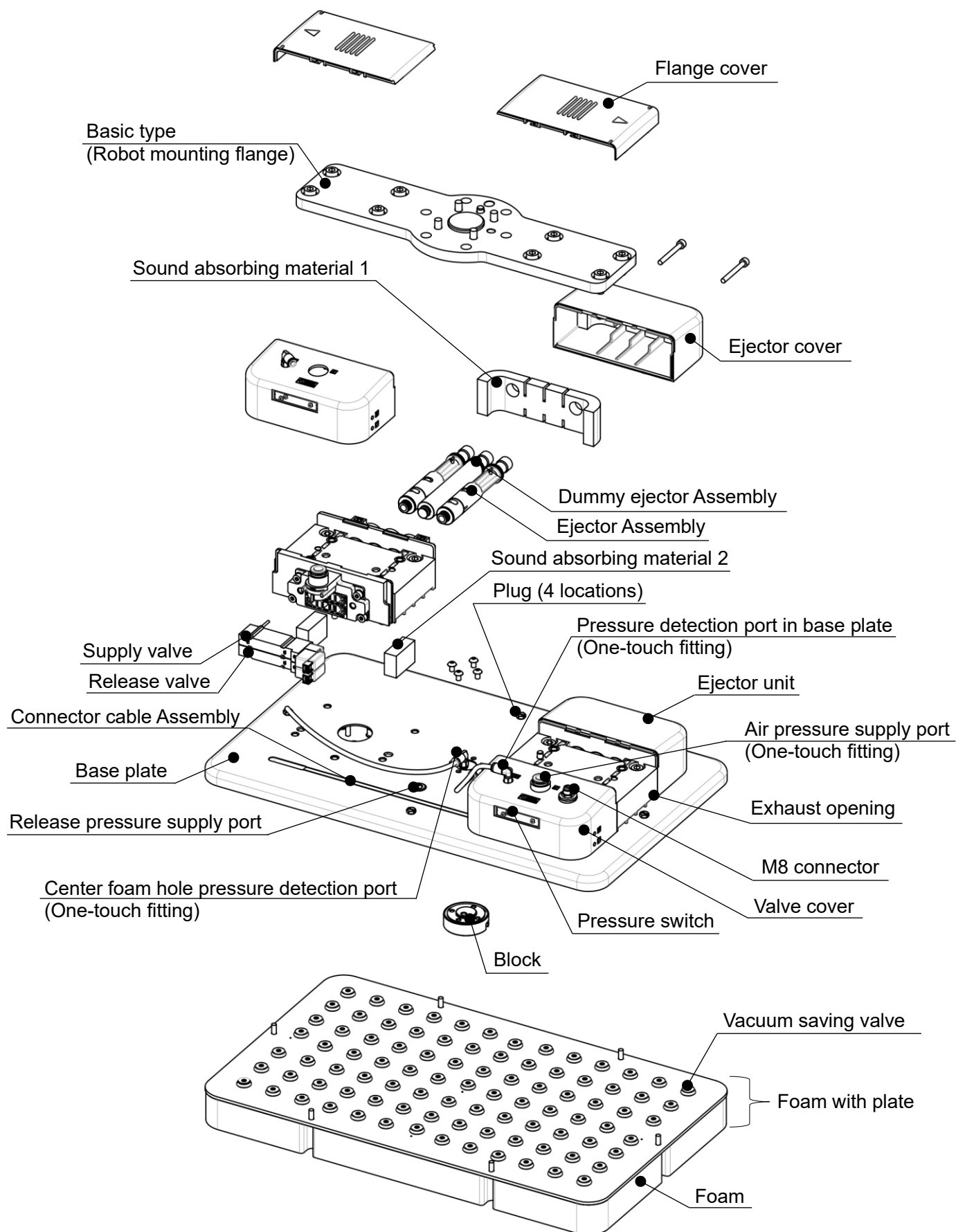
Compatible robot ①	Robot mounting flange ⑨	Dimensions	Flange part number			Assembly Procedure
			ZGS-PL3-1-A Basic type	ZGS-PL5-1-A Offset flange	ZGS-PL3-5-A Flange U	
N 011 043 051	1			—	—	
	2				—	
012	1			—	—	
	2					
021	2				—	
N 011 012 021 043 051	Nil		—	—	—	—

■ 300mm x 180mm, 200mm x 120mm

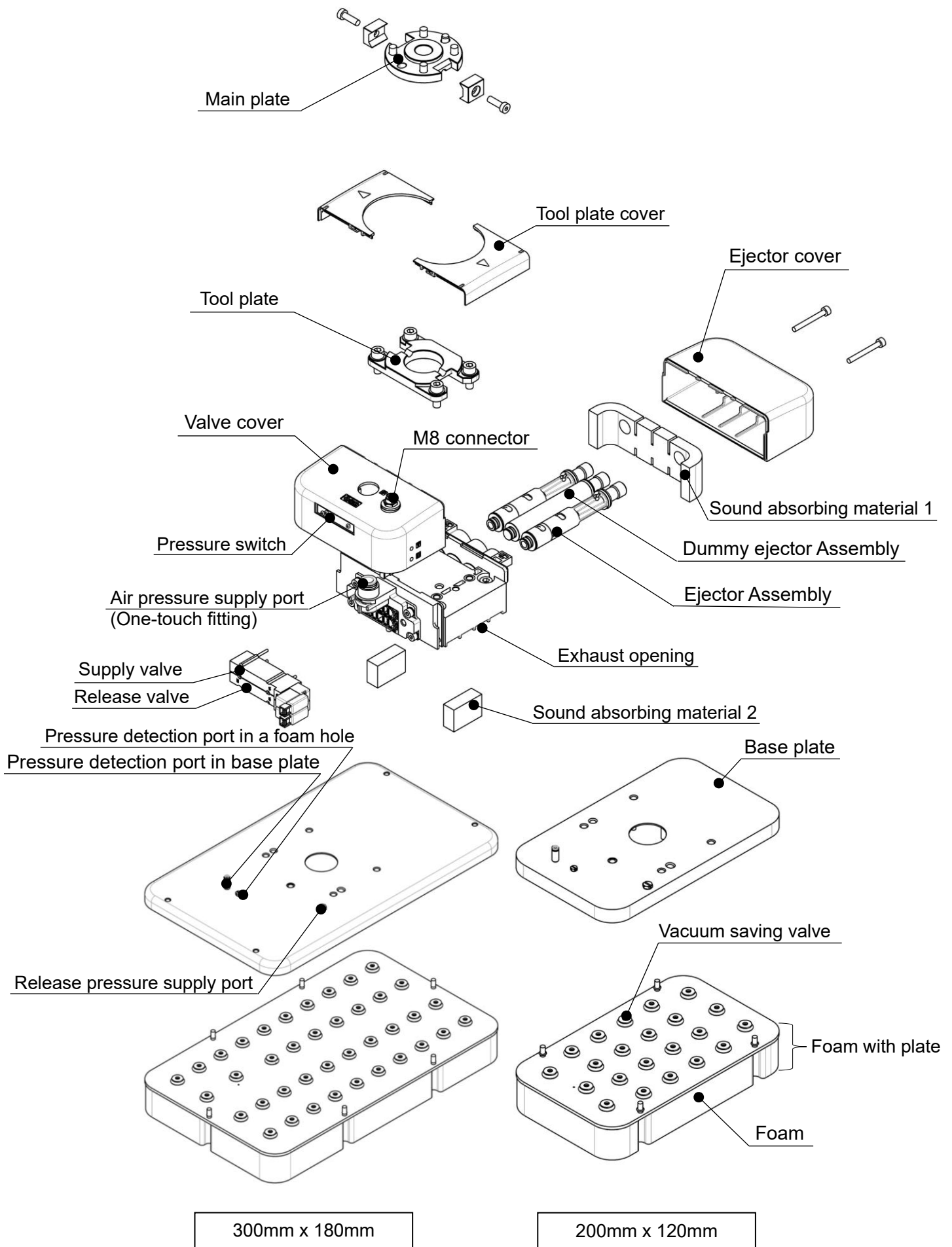
Table 1-2. ⑨ Robot mounting flange part numbers (With link)

Compatible robot ①	Robot mounting flange ⑨	Dimensions		Flange part number							Assembly Procedure
				ZGS-PL3-3-A Tool plate	ZGS-PL3-7-A Main plate	ZGS-PL3-4-A Offset flange	ZGS-PL3-5-A Flange U	ZGS-PL3-6-A Flange Y	ZGS-PL3-6-1-A Flange Y	ZGS-PL3-8-A Straight flange	
		300mm x 180mm	200mm x 120mm								
N 011 051	1					—	—	—	—	—	
	2			—	—		—	—	—	—	
012	1					—		—	—	—	
	2			—	—			—	—	—	
043	1					—	—		—	—	
	2			—	—		—	—		—	
021	2			—	—		—	—	—	—	
N 011 012 043 051	3	—	—		—	—	—	—	—	—	—
N 011 043 051	4			—	—	—	—	—	—		
012	4			—	—	—		—	—		
N 011 012 021 043 051	Nil			—	—	—	—	—	—	—	—

3. Summary of Product Parts



The above figure shows ZGS*(B,K)-400240* J4-N(C,M)1*.



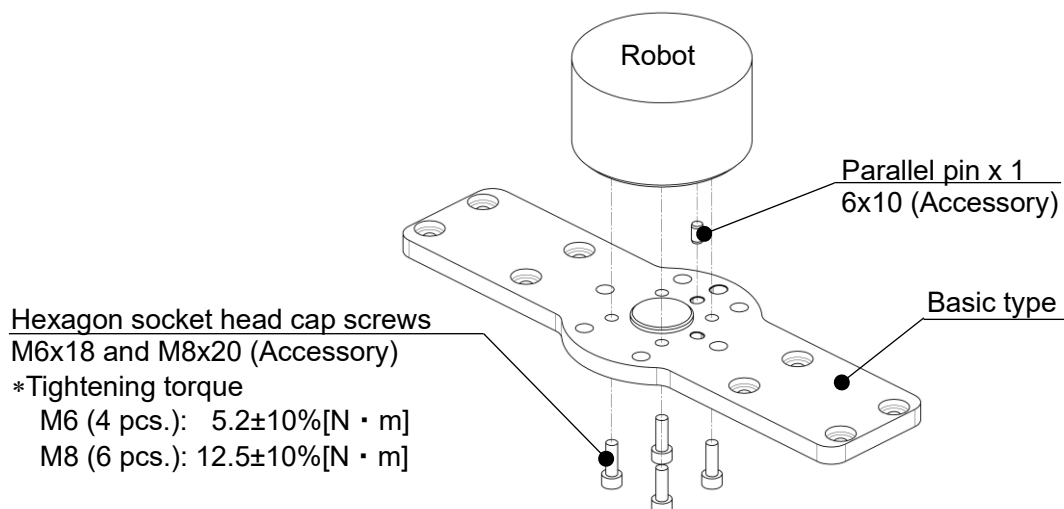
The above figure shows ZGS*(B,K)-(300180,200120)*S*-N(W,X,Y,Z)1*.

4. Mounting

■ 400mm x 240mm

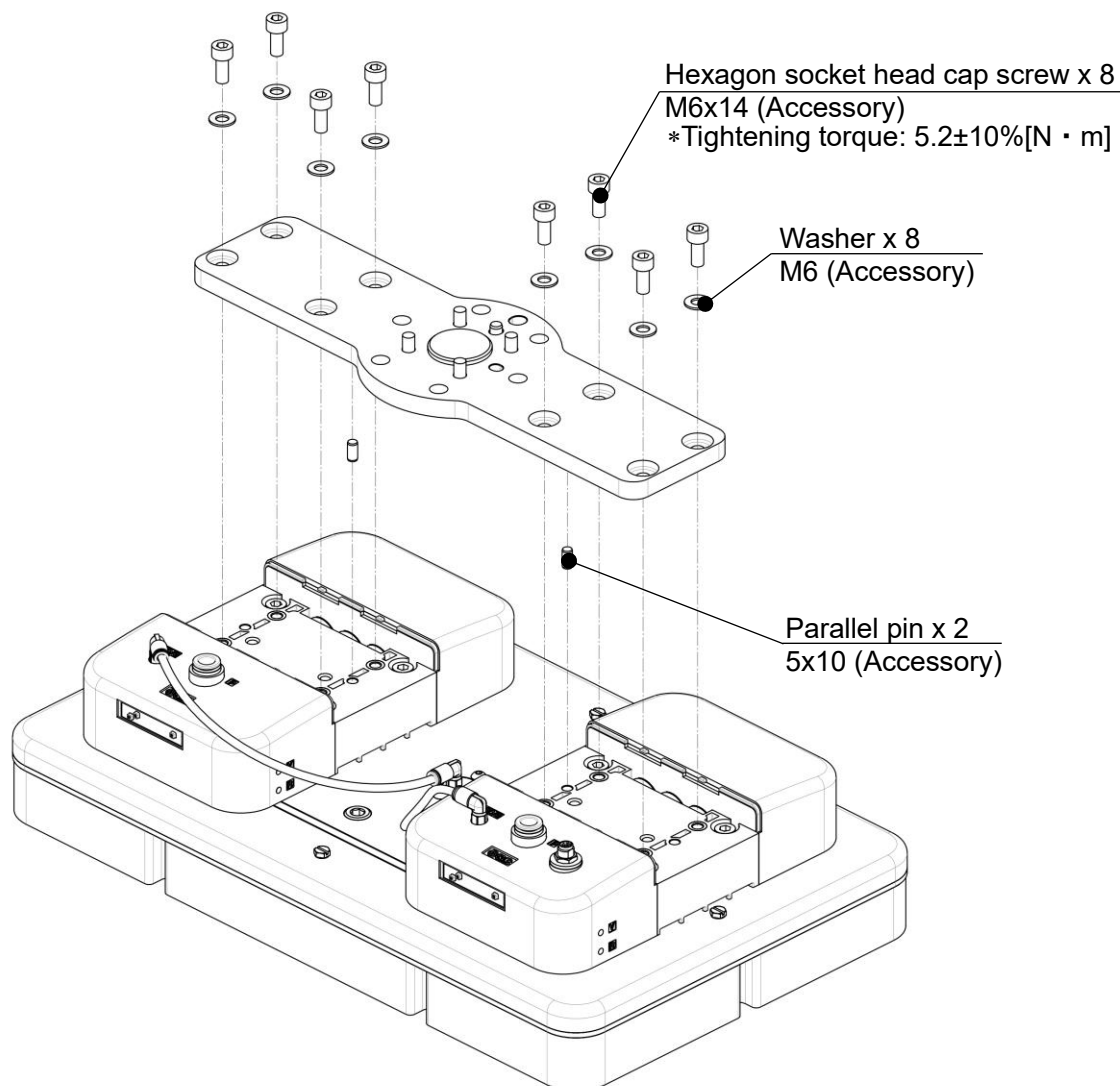
4.1. Robot mounting flange: Basic type

Step1

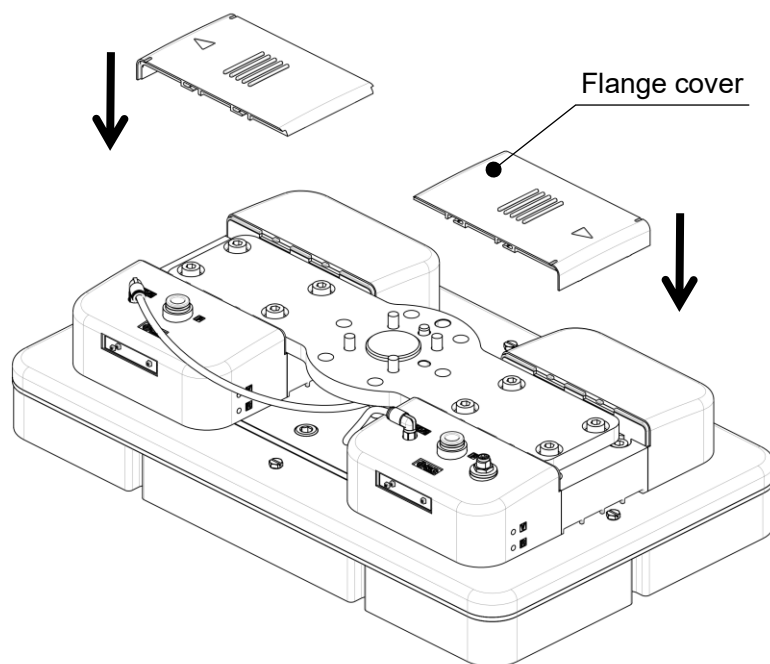


*) If the screw length does not match the robot, please prepare the screws yourself.

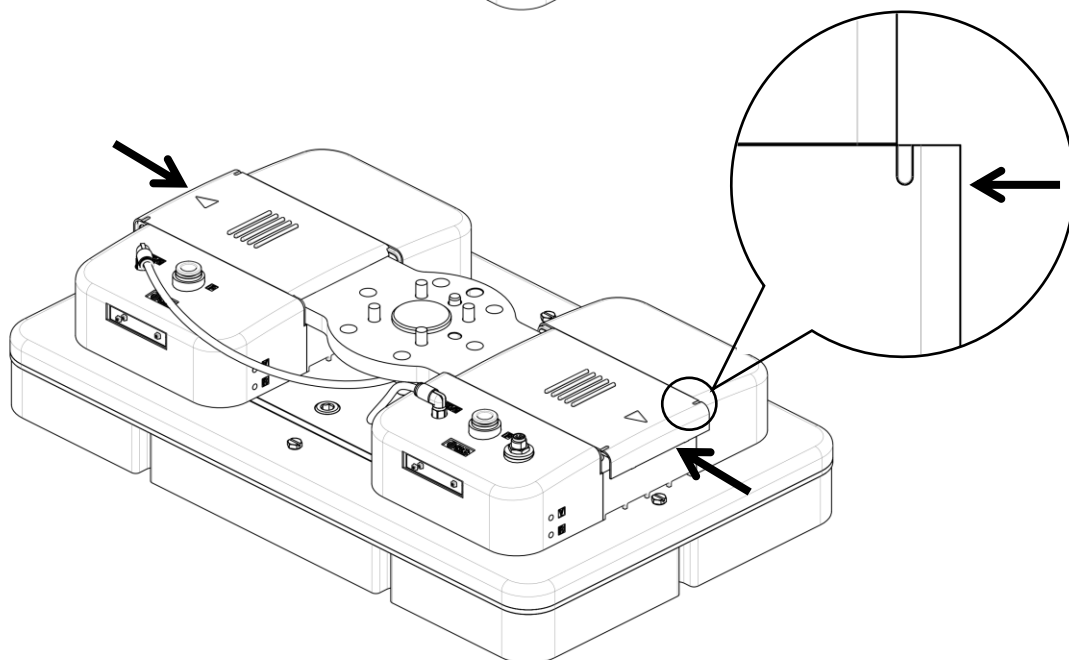
Step2



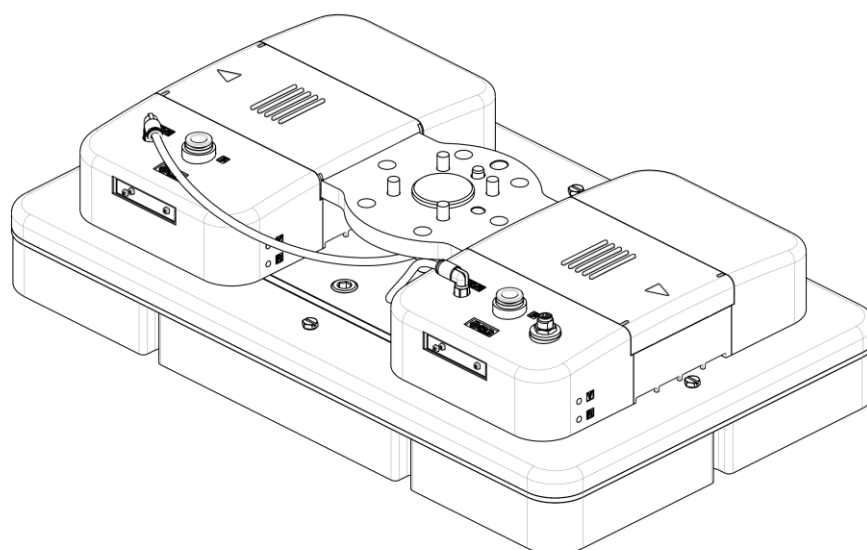
Step3



Step4



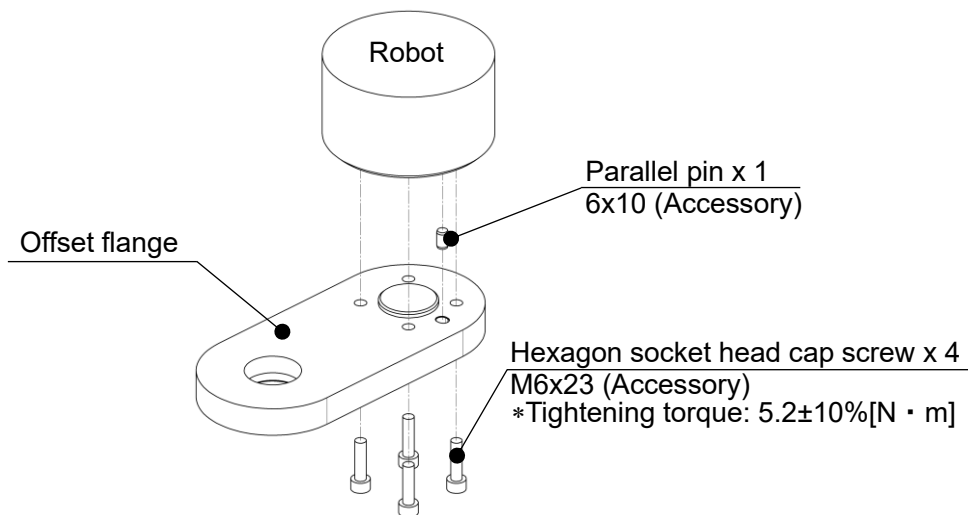
Step5



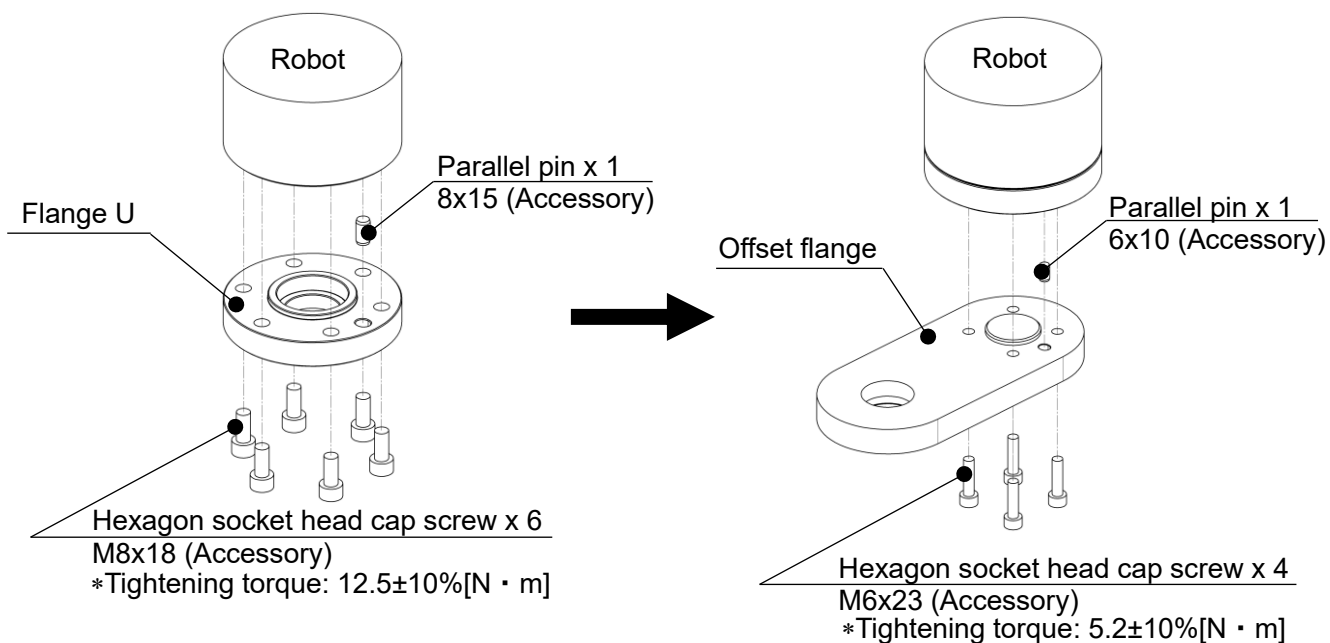
4.2. Robot mounting flange: Basic type + Offset flange

Step1

No additional flange

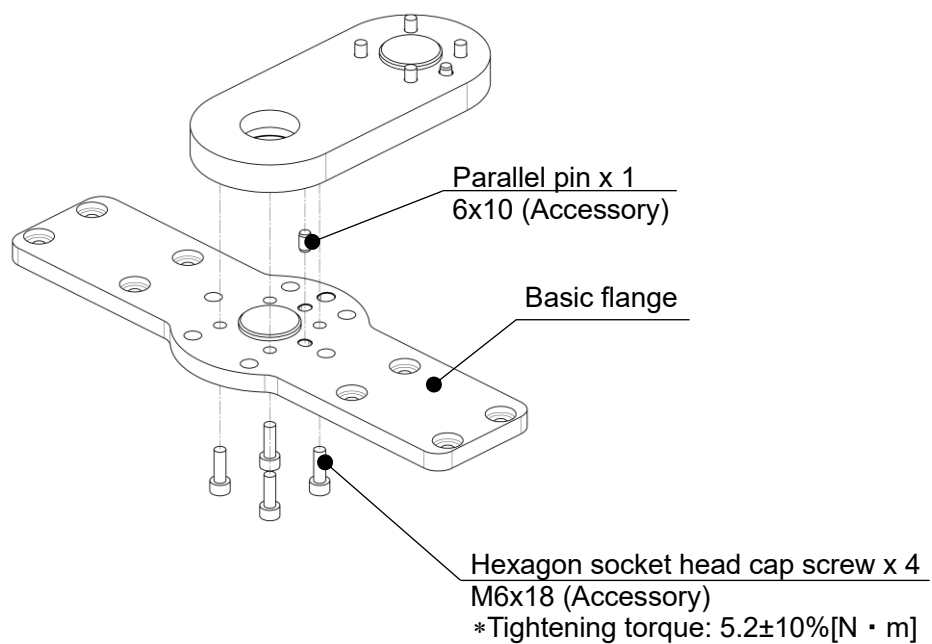


Flange U

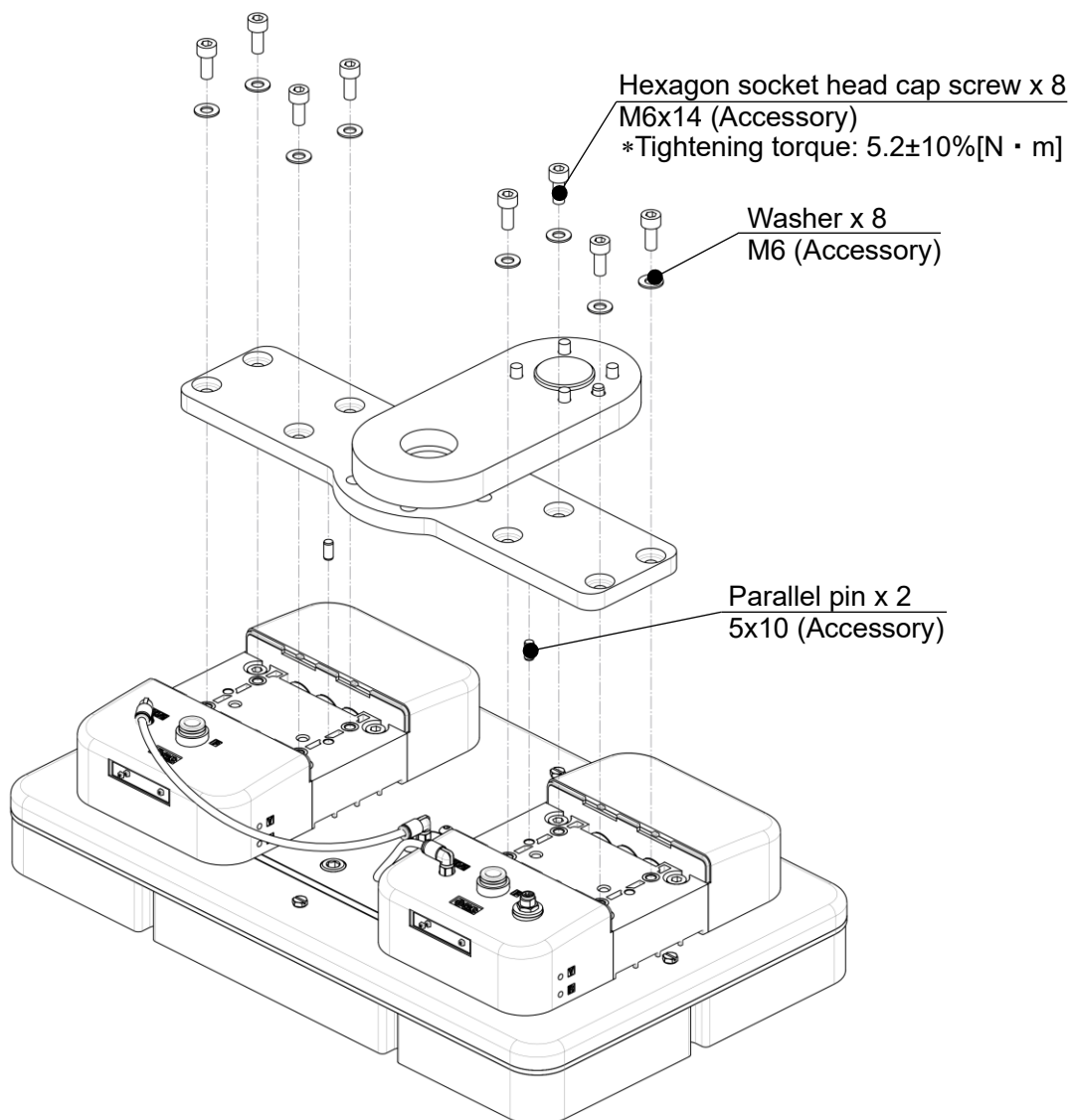


*) If the screw length does not match the robot, please prepare the screws yourself.

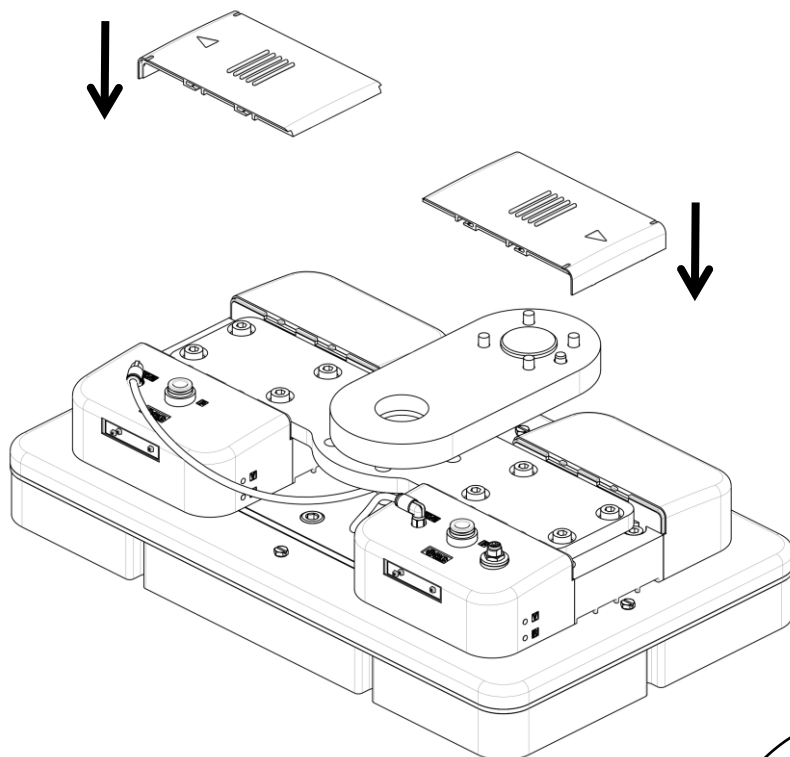
Step2



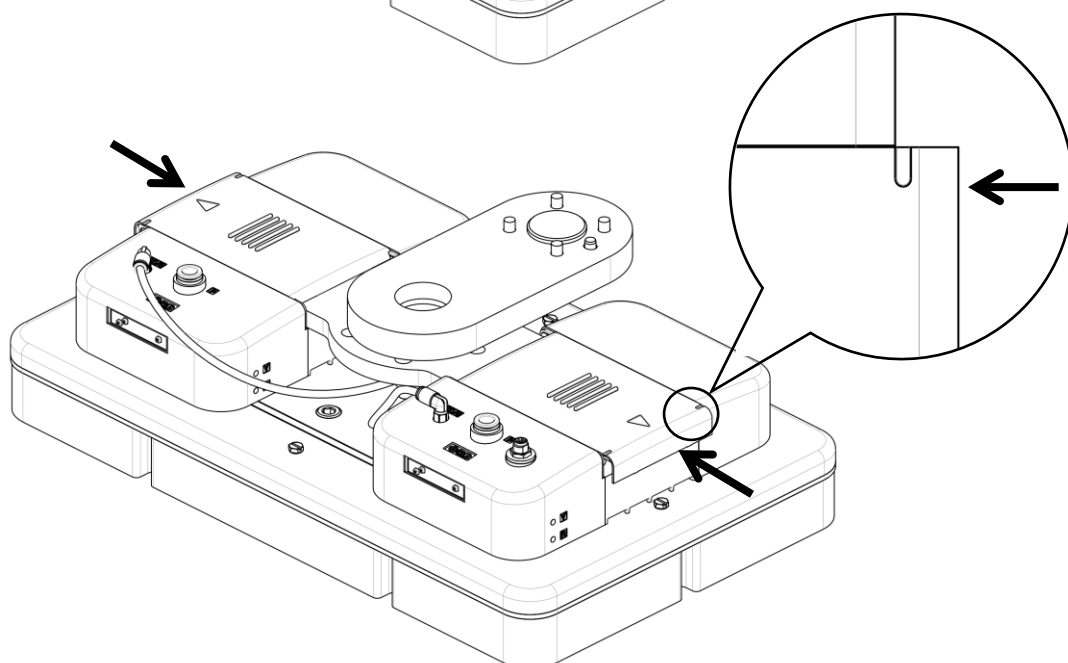
Step3



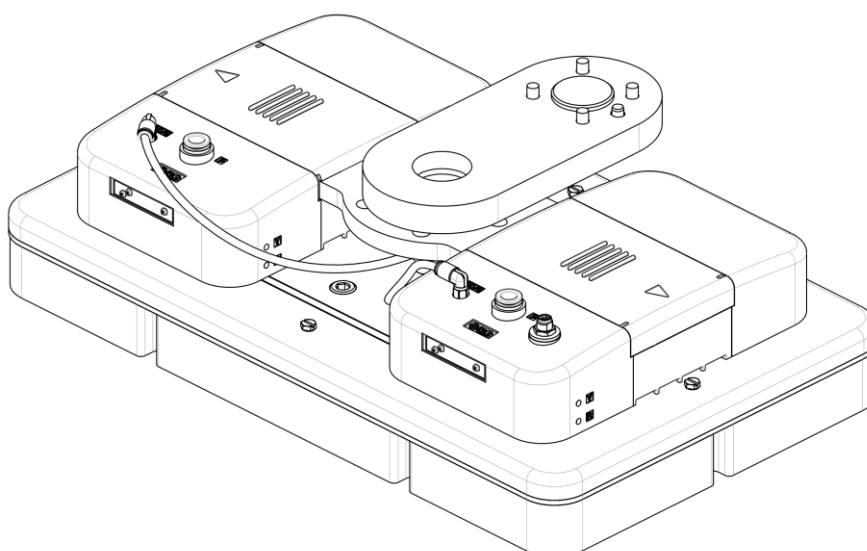
Step4



Step5



Step6

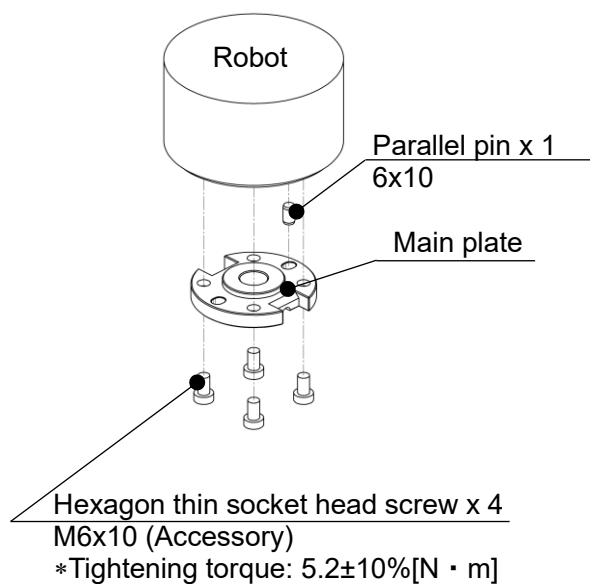


■300mm x 180mm, 200mm x 120mm

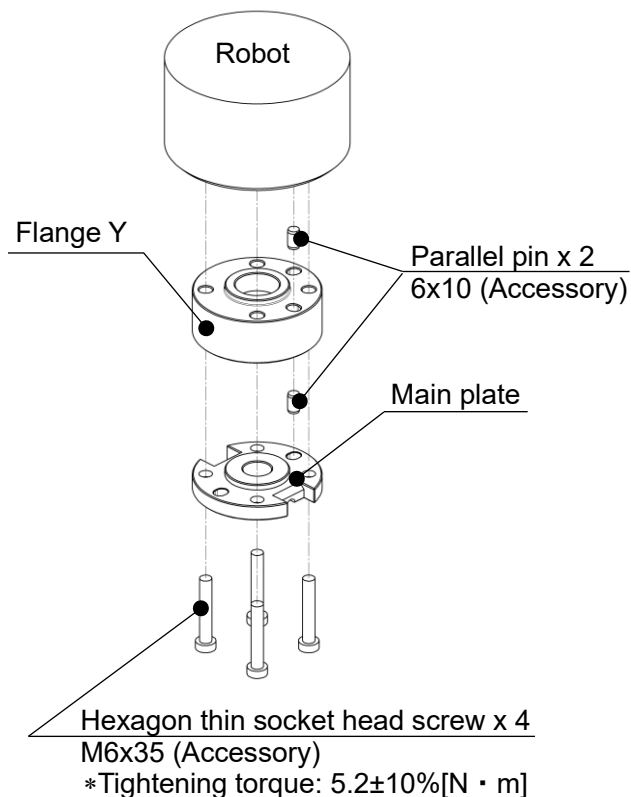
4.3. Robot mounting flange: Tool plate + Main plate

Step1

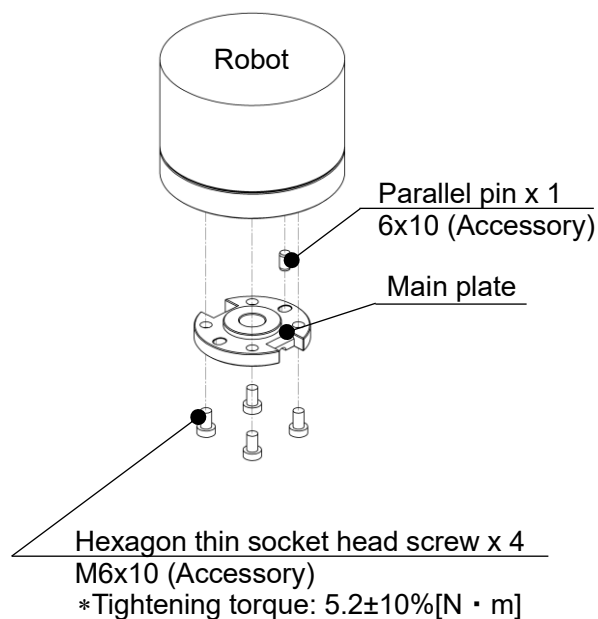
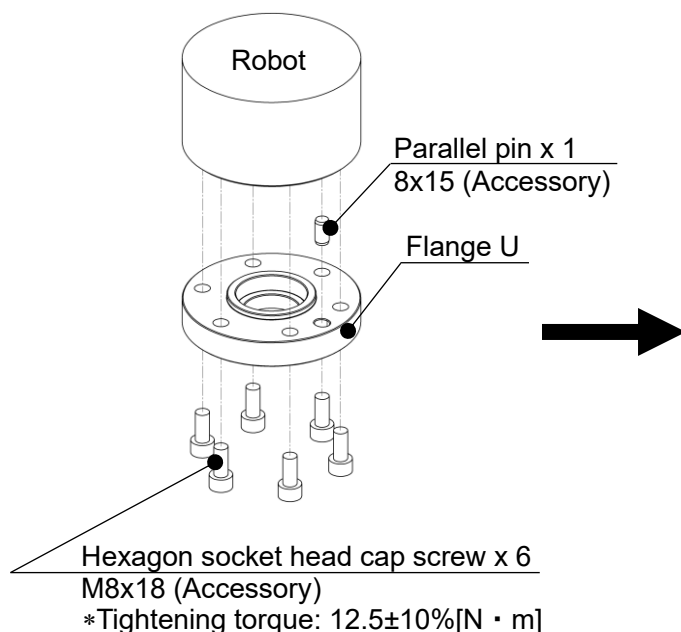
No additional flange



Flange Y

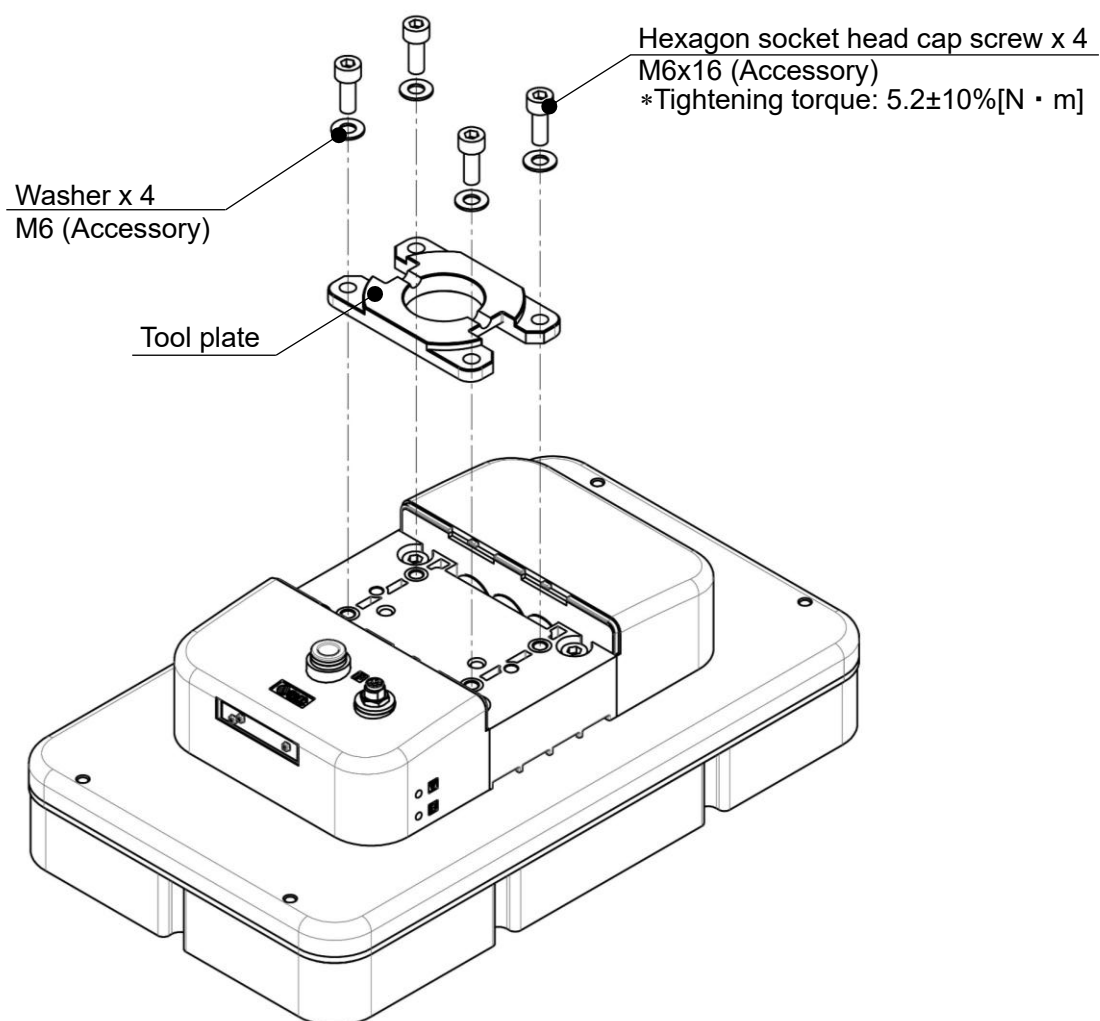


Flange U

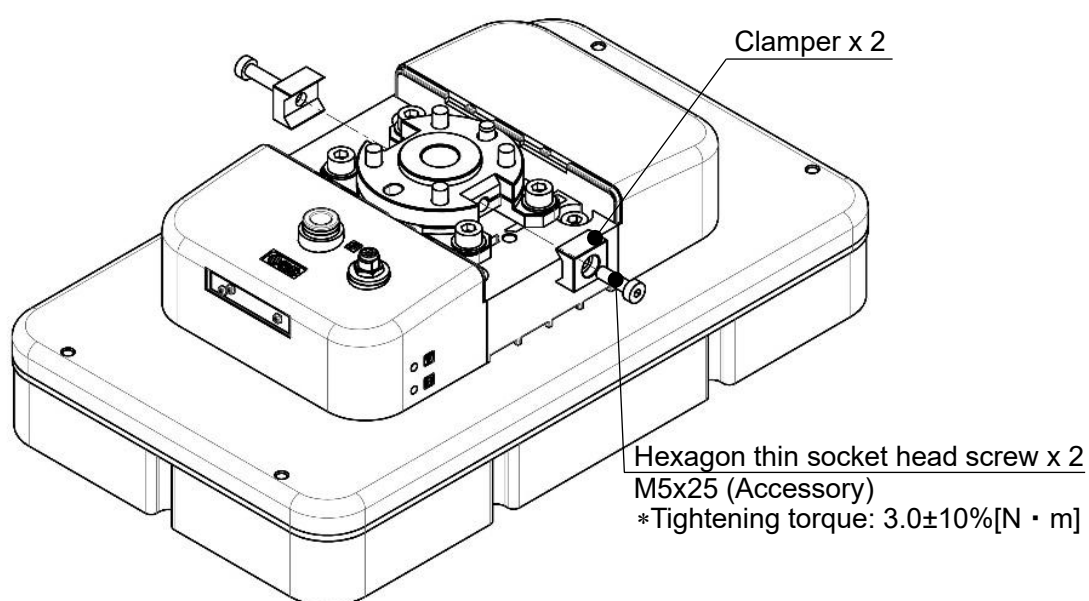


*) If the screw length does not match the robot, please prepare the screws yourself.

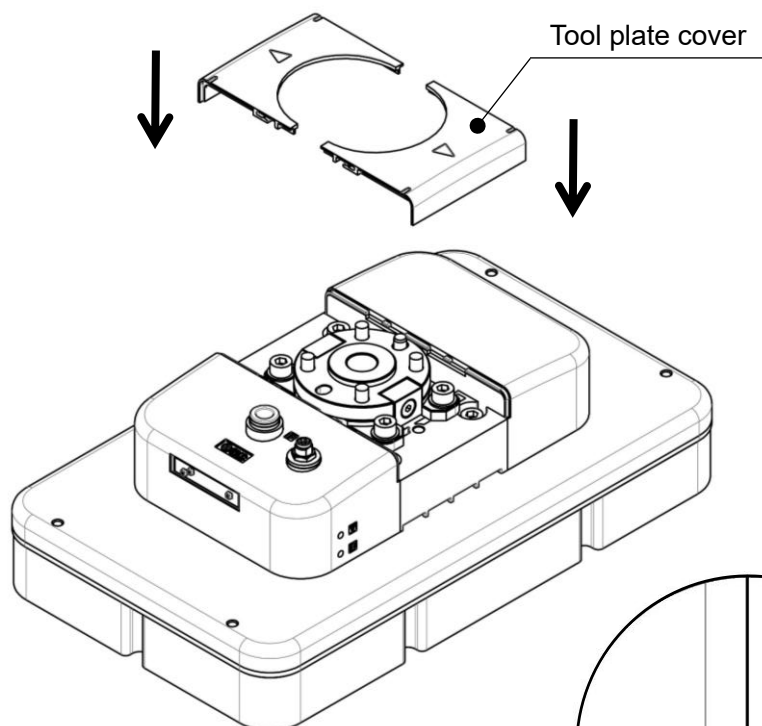
Step2



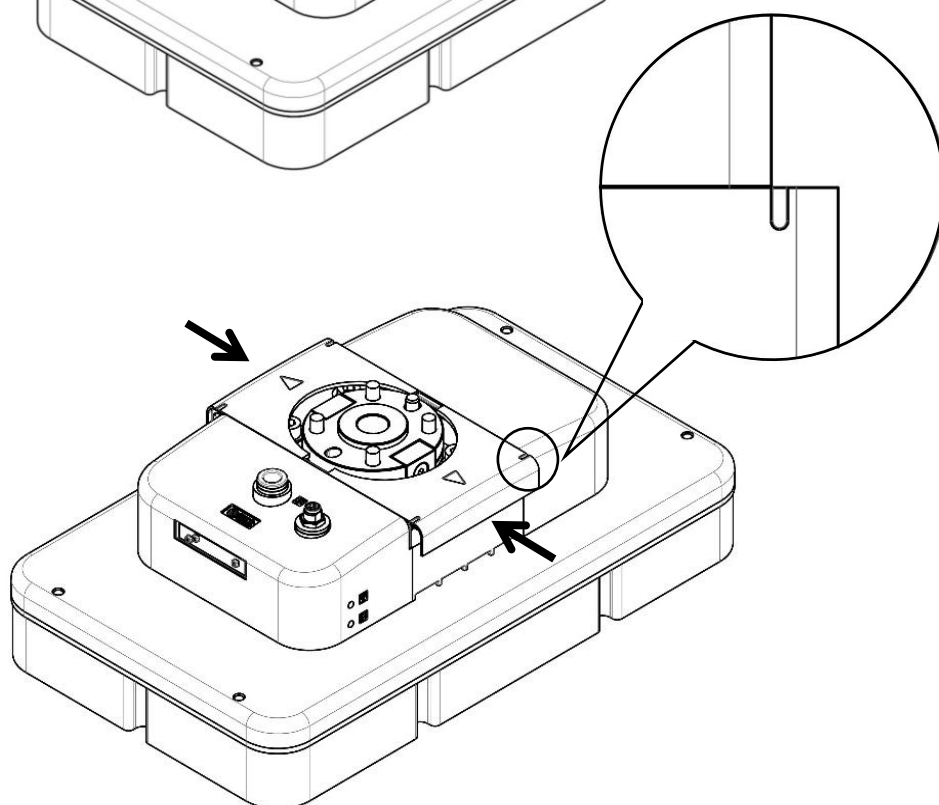
Step3



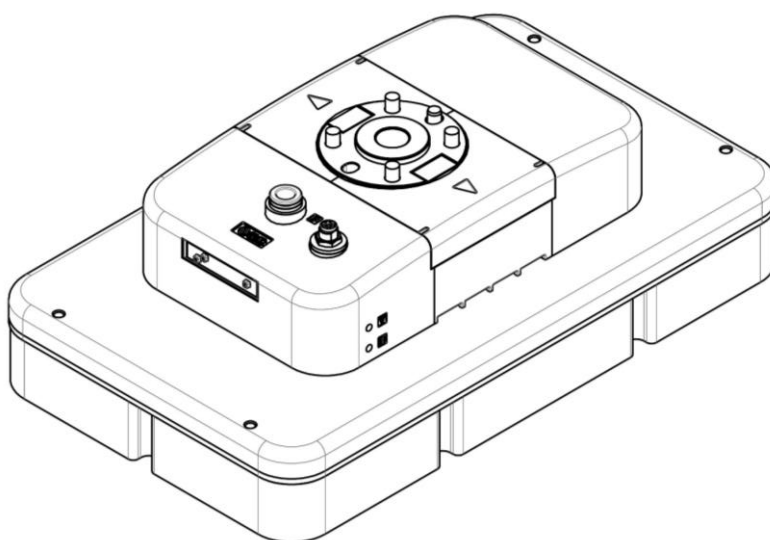
Step4



Step5



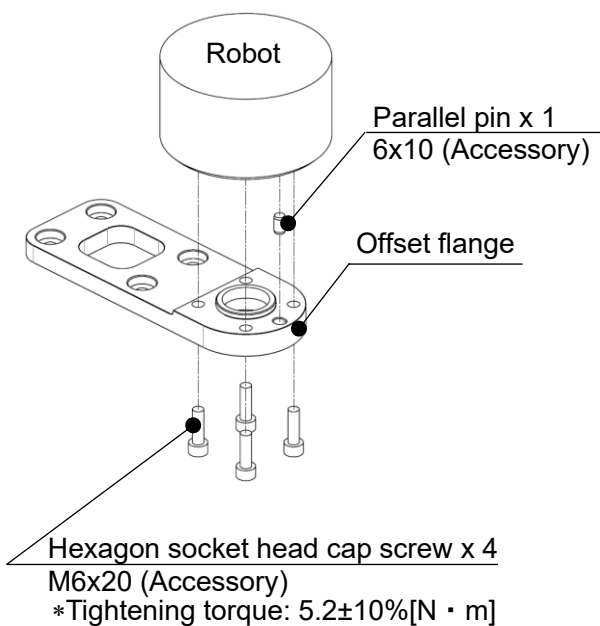
Step6



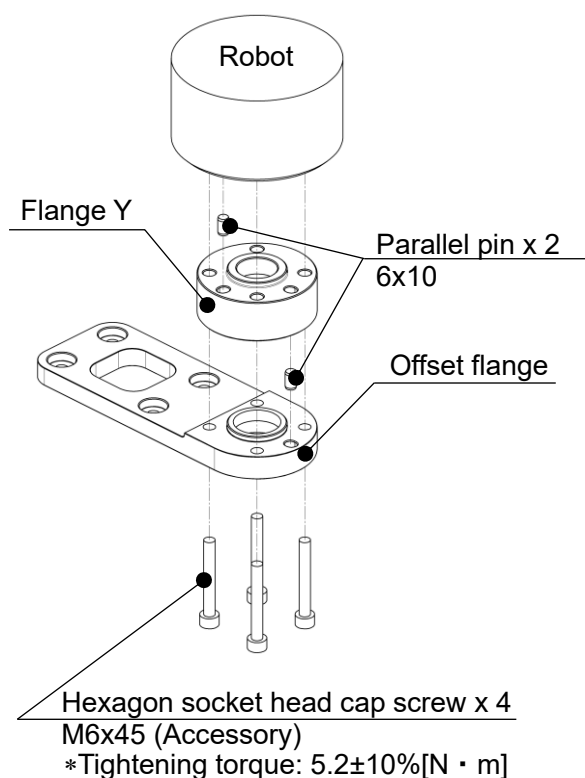
4.4. Robot mounting flange: Offset flange

Step1

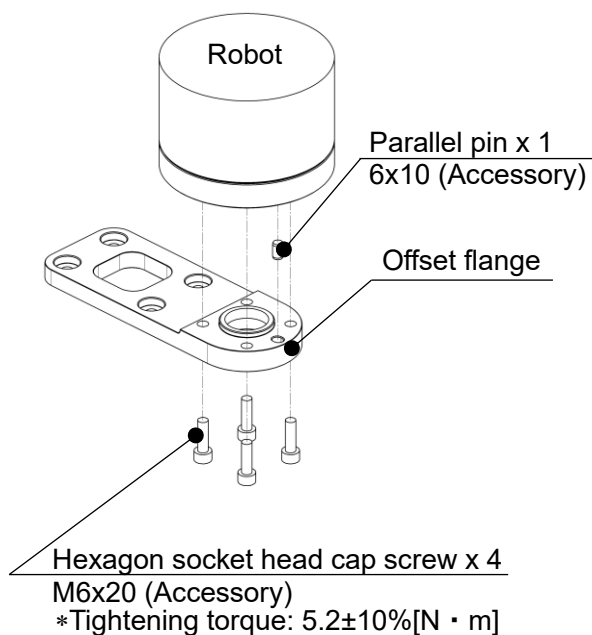
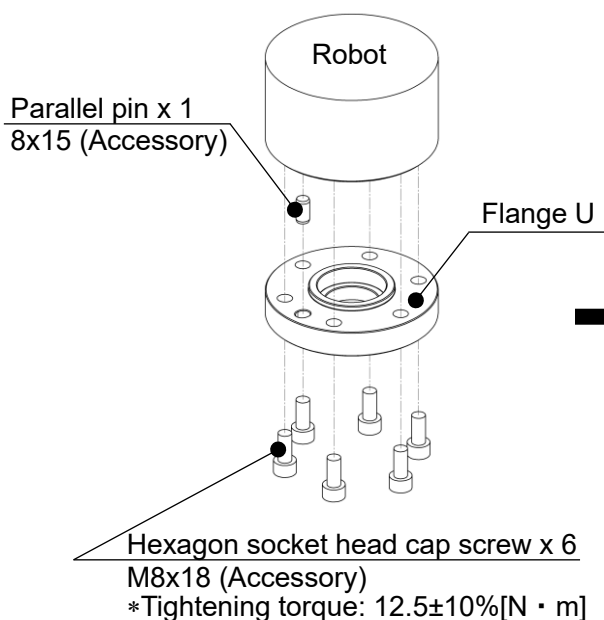
No additional flange



Flange Y

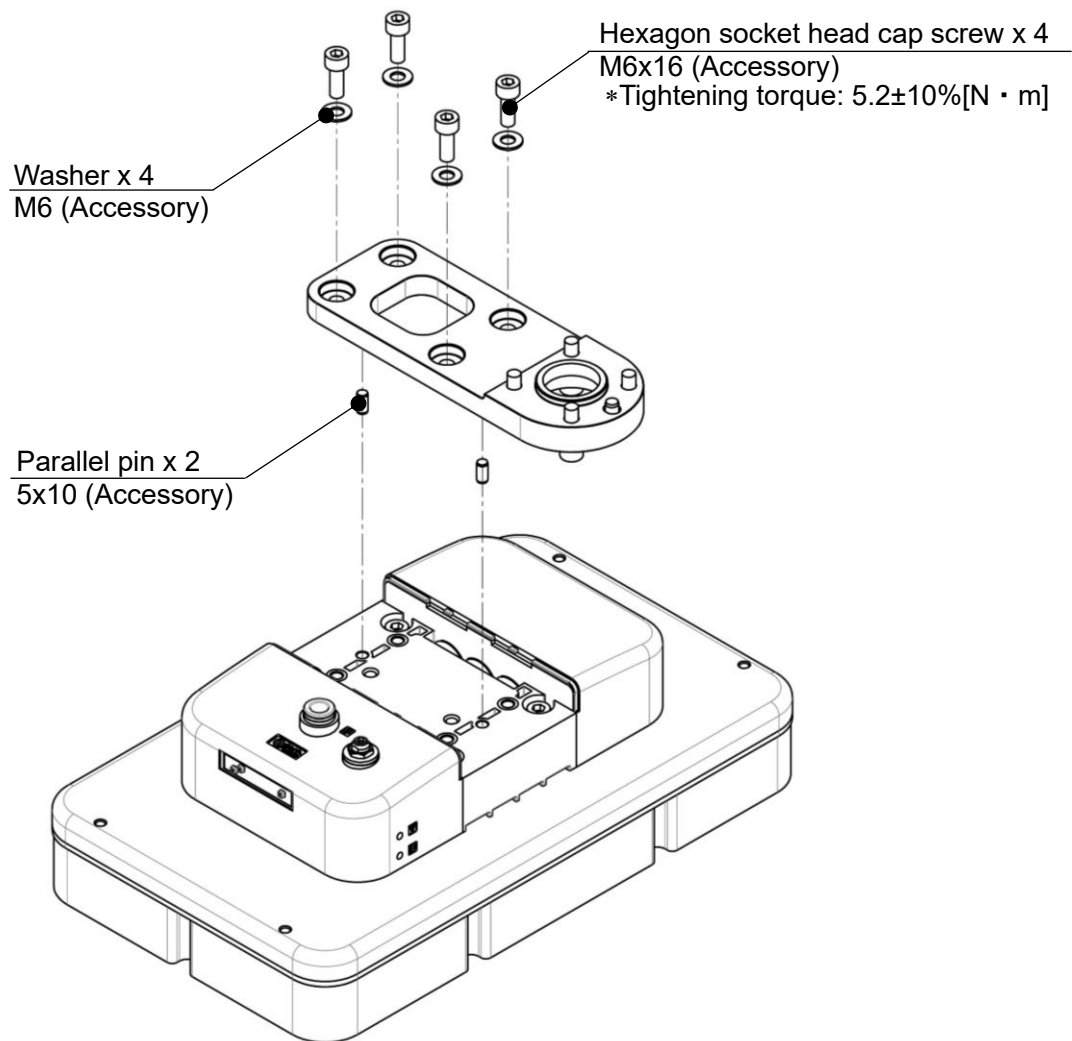


Flange U

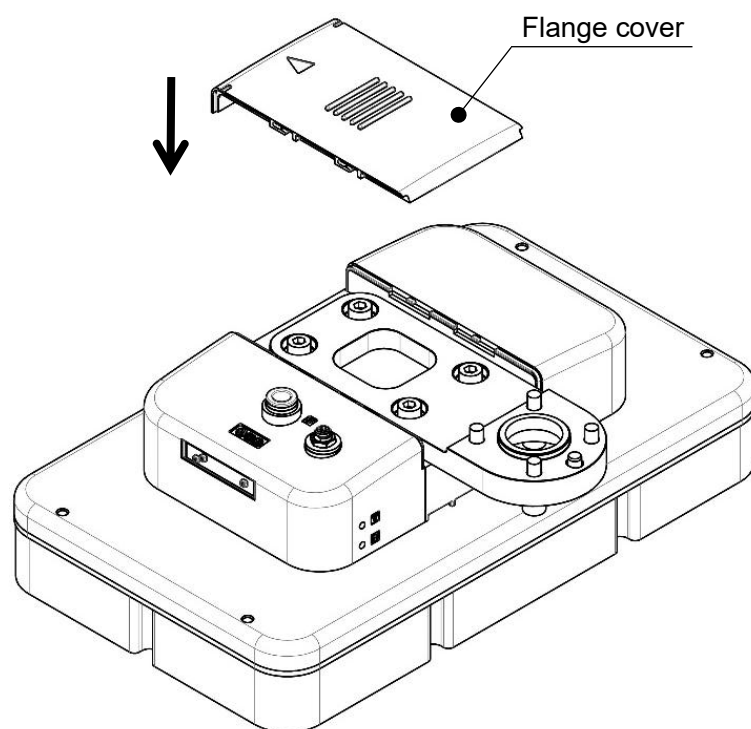


*) If the screw length does not match the robot, please prepare the screws yourself.

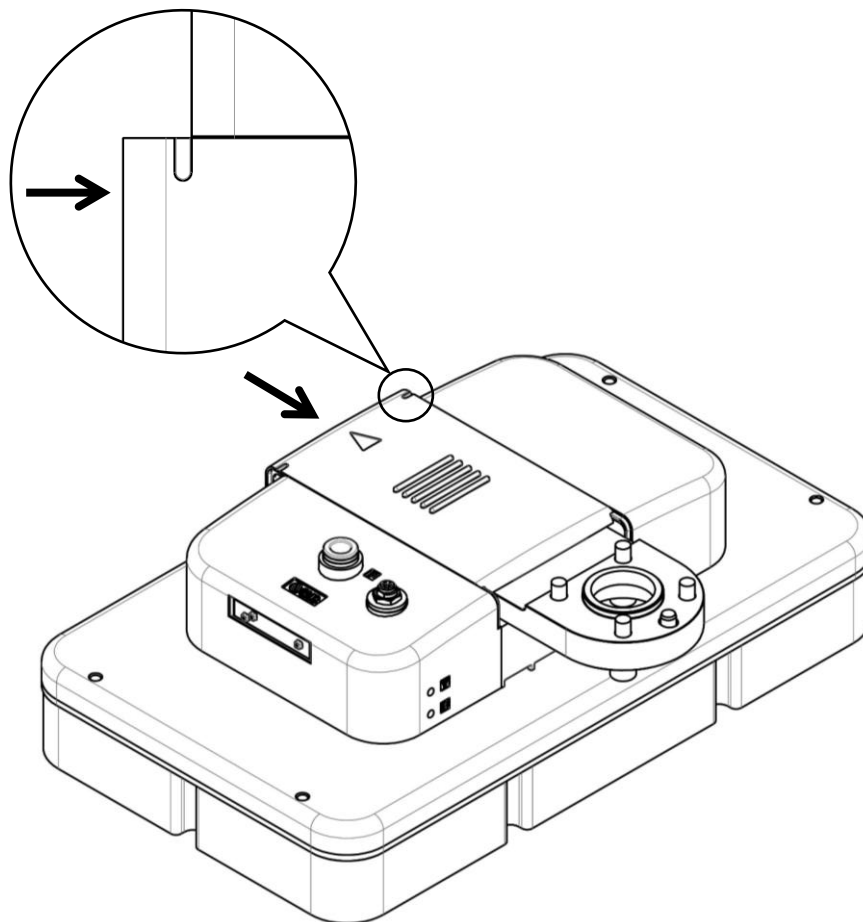
Step2



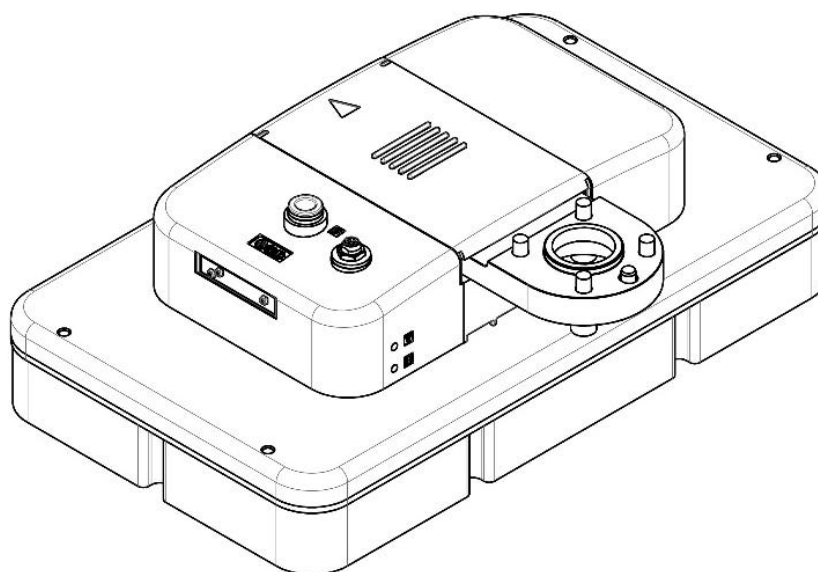
Step3



Step4



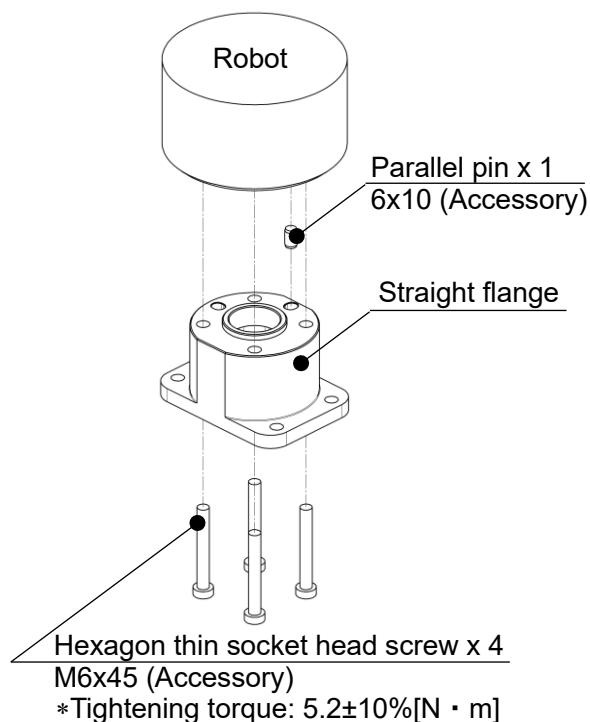
Step5



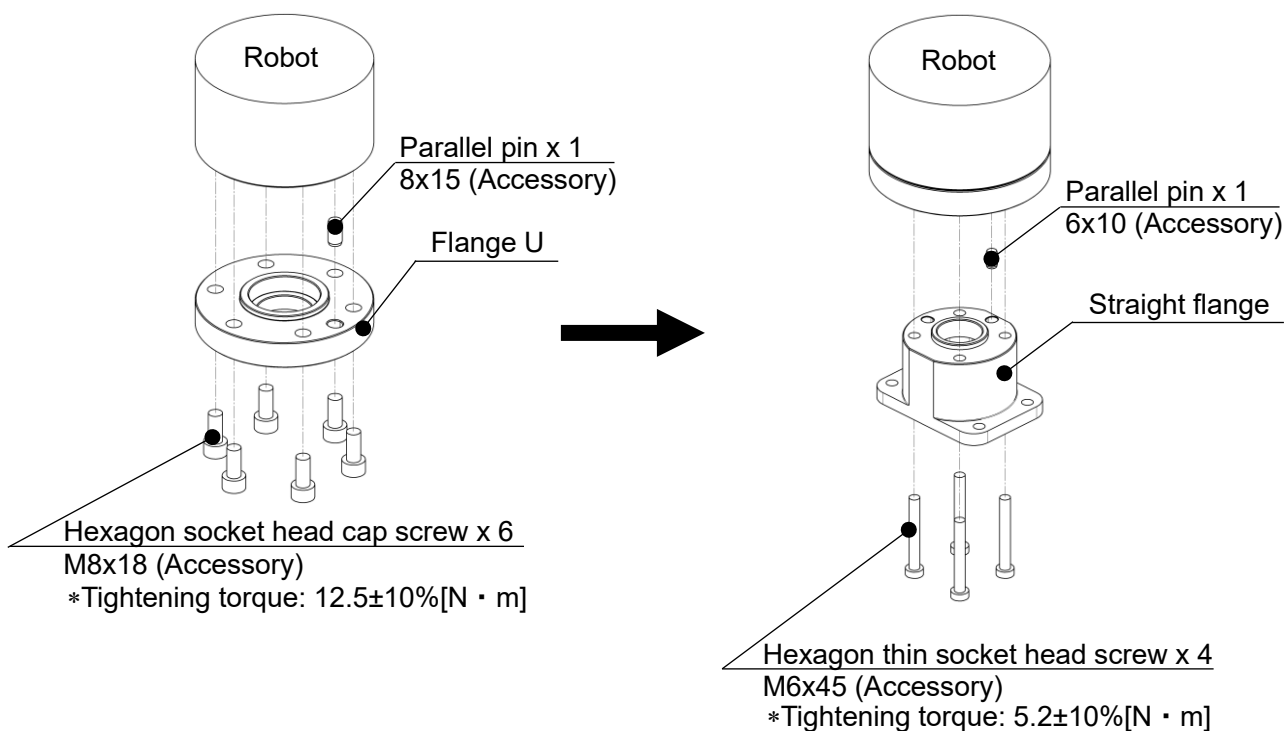
4.5. Robot mounting flange: Straight flange

Step1

No additional flange

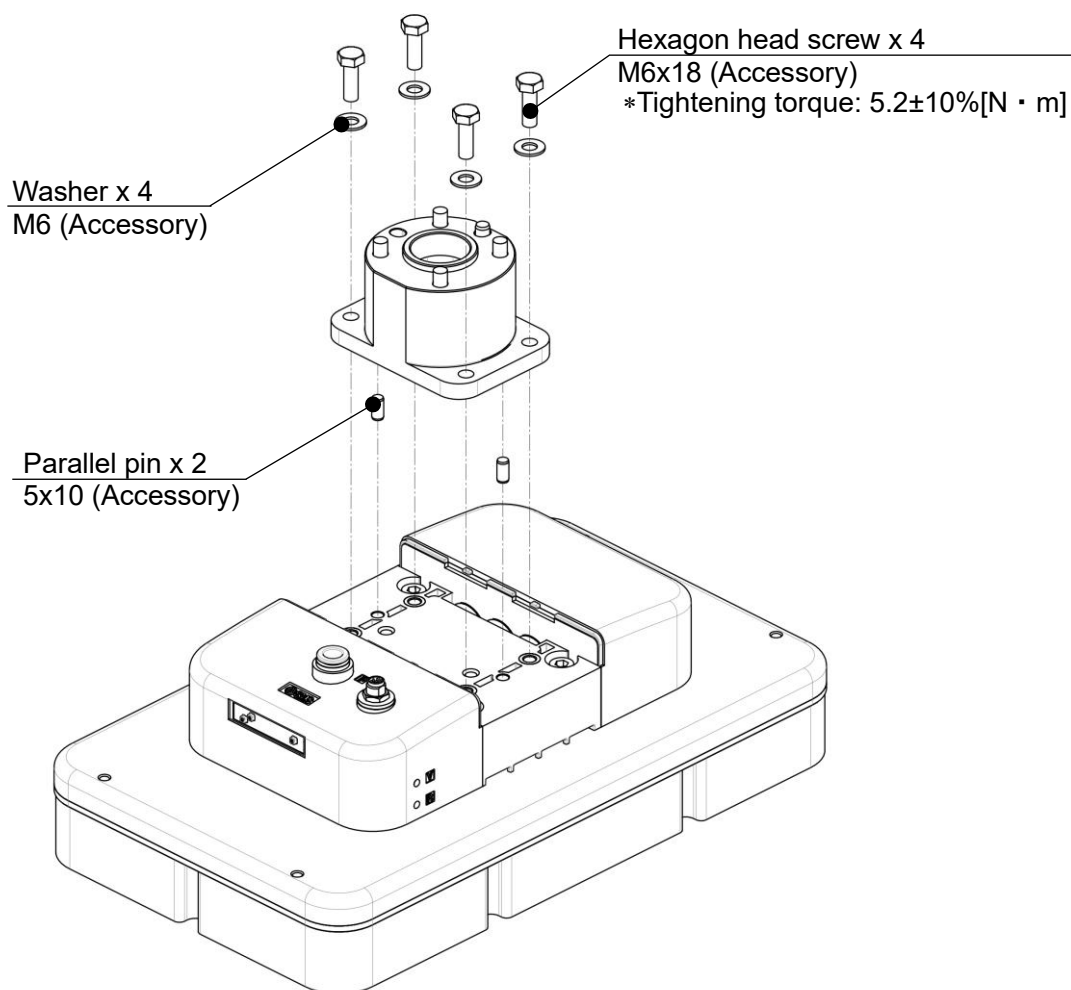


Flange U

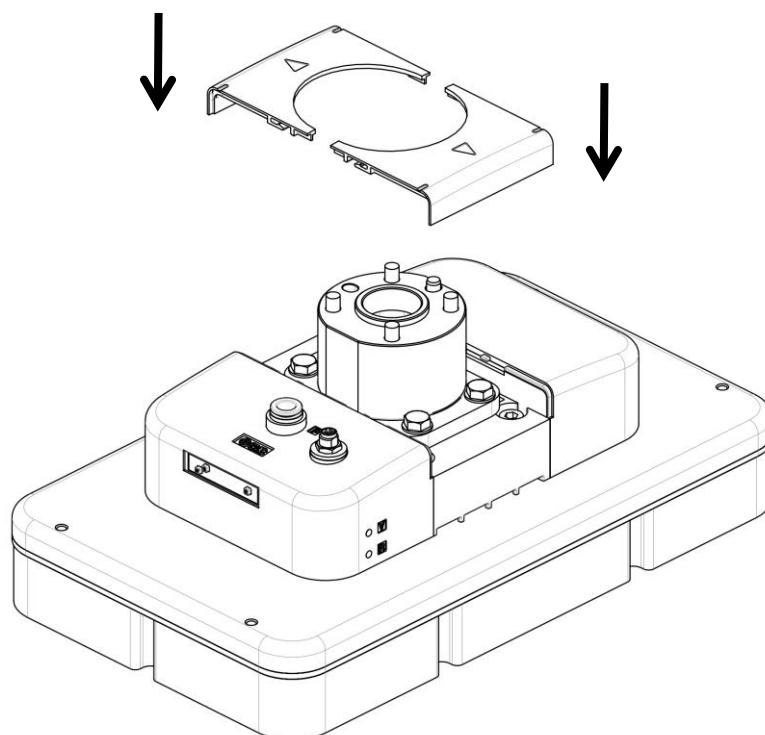


*) If the screw length does not match the robot, please prepare the screws yourself.

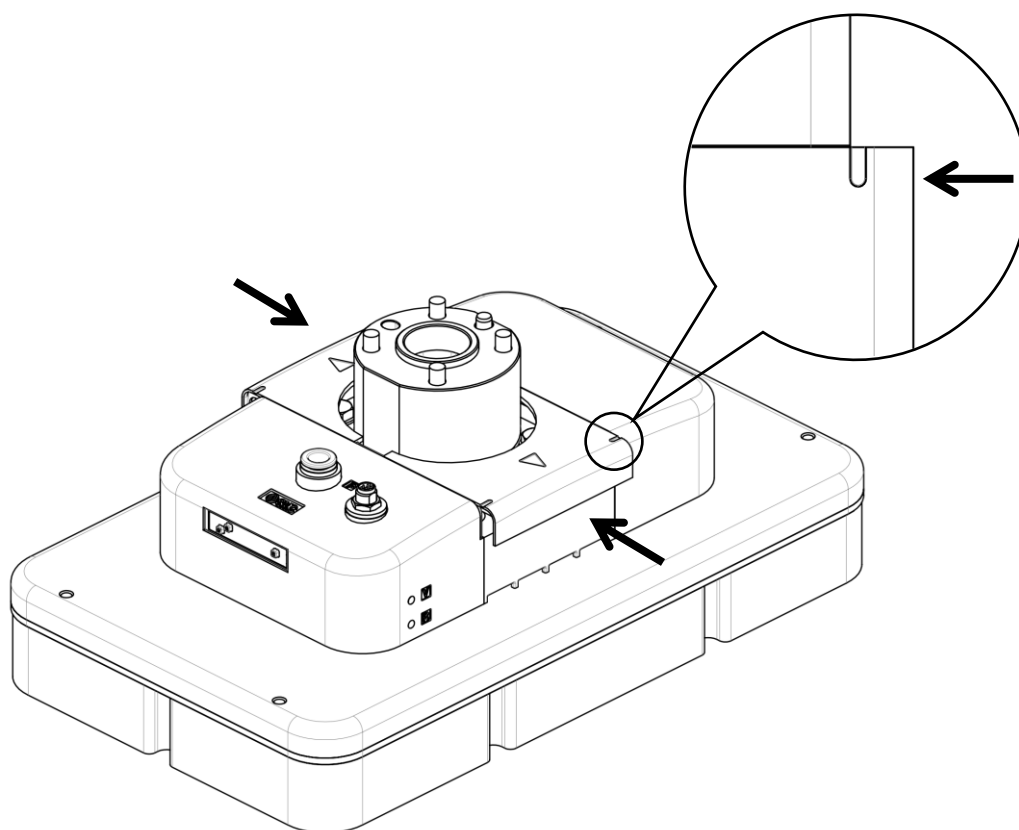
Step2



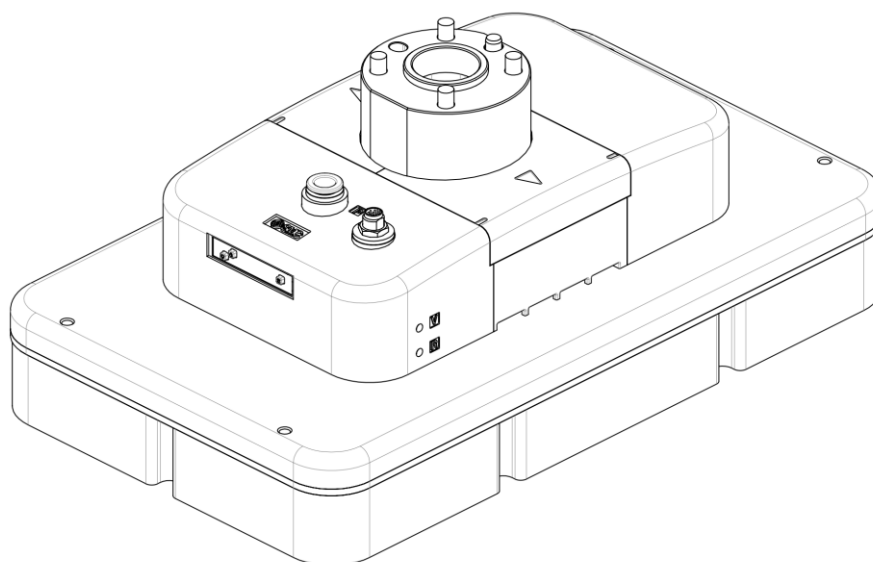
Step3



Step4



Step5



5. Specifications

5.1. Specifications

■General specifications

Fluid	Air	
Compressed air purity class	ISO 8573-1: 2010[2:4:3]	
Operating pressure range [MPa]	0.3 to 0.7	
Operating temperature range [°C]	5 to 50	
Power supply voltage [V]	DC24±10%	
Power consumption [W]	400mm x 240mm	2.7
	300mm x 180mm, 200mm x 120mm	1.4
Supply valve / Release valve ^{*1)}	JSY3□40-5MOZ-□ equivalent	
Pressure switch ^{*2)}	ZSE10-00-□ equivalent	
Standard	CE/UKCA MARKED	

^{*1)} Refer to JSY3000 series catalog and operation manual regarding specifications of supply valve and release valve.

^{*2)} Refer to ZSE10 series catalog and operation manual regarding specifications of pressure switch.
For IO-Link compatible pressure switch, refer to operation manual for “ZGS-LD1-□(H/J)□-A”.

■Ejector specifications (400mm x 240mm)

Number of ejector assemblies [pcs]	2	4	6
Standard supply pressure [MPa] ^{*1)}	0.58	0.6	0.6
Max. vacuum pressure [kPa] ^{*2)}	-75		
Air consumption [L/min(ANR)] ^{*2)}	228	454	661
Weight [kg] ^{*3)}	3.9		

^{*1)} This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper during suction. 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 air pressure supply (P) port of vacuum gripper system may fall below the standard supply pressure.

^{*2)} Values are based on our measurement conditions at standard supply pressure and may vary depending on atmospheric pressure (weather, altitude, etc.) and measurement method.

^{*3)} For ZGSNPK-400240BJ4-NM1C8

■Ejector specifications (300mm x 180mm, 200mm x 120mm)

Number of ejector assemblies [pcs]	1	2	3
Standard supply pressure [MPa] ^{*1)}	0.45		
Max. vacuum pressure [kPa] ^{*2)}	-63	-62	-60
Air consumption [L/min(ANR)] ^{*2)}	92	177	257
Weight [kg]	300mm x 180mm ^{*3)}	1.8	
	200mm x 120mm ^{*4)}	1.3	-

^{*1)} This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper during suction. 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 air pressure supply (P) port of vacuum gripper system may fall below the standard supply pressure.

^{*2)} Values are based on our measurement conditions at standard supply pressure and may vary depending on atmospheric pressure (weather, altitude, etc.) and measurement method.

^{*3)} For ZGSNPK-300180AM3-NY1C8.

^{*4)} For ZGSNPK-200120AM2-NY1C8.

■Exhaust Noise (Reference value)

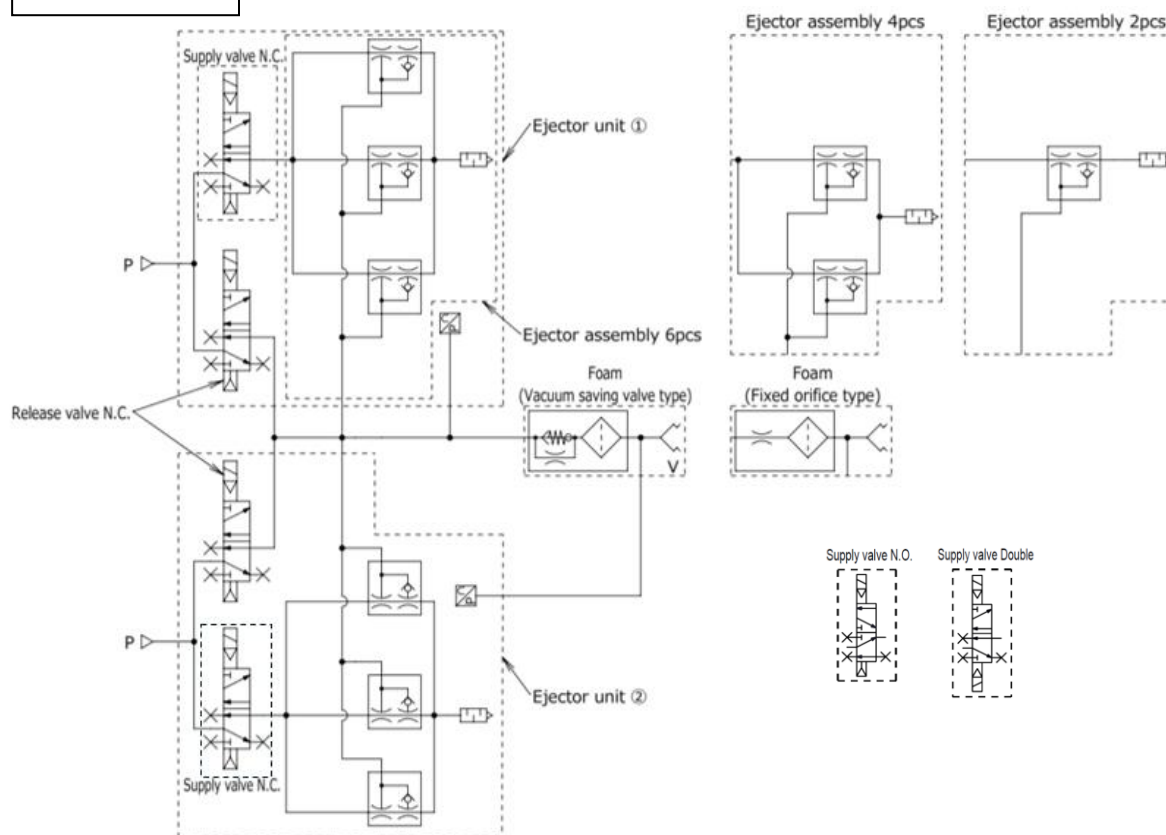
Exhaust Noise [dB(A)]	400mm x 240mm	70
	300mm x 180mm	64
	200mm x 120mm	60

*Actual values under SMC's measurement conditions (Not guaranteed values).

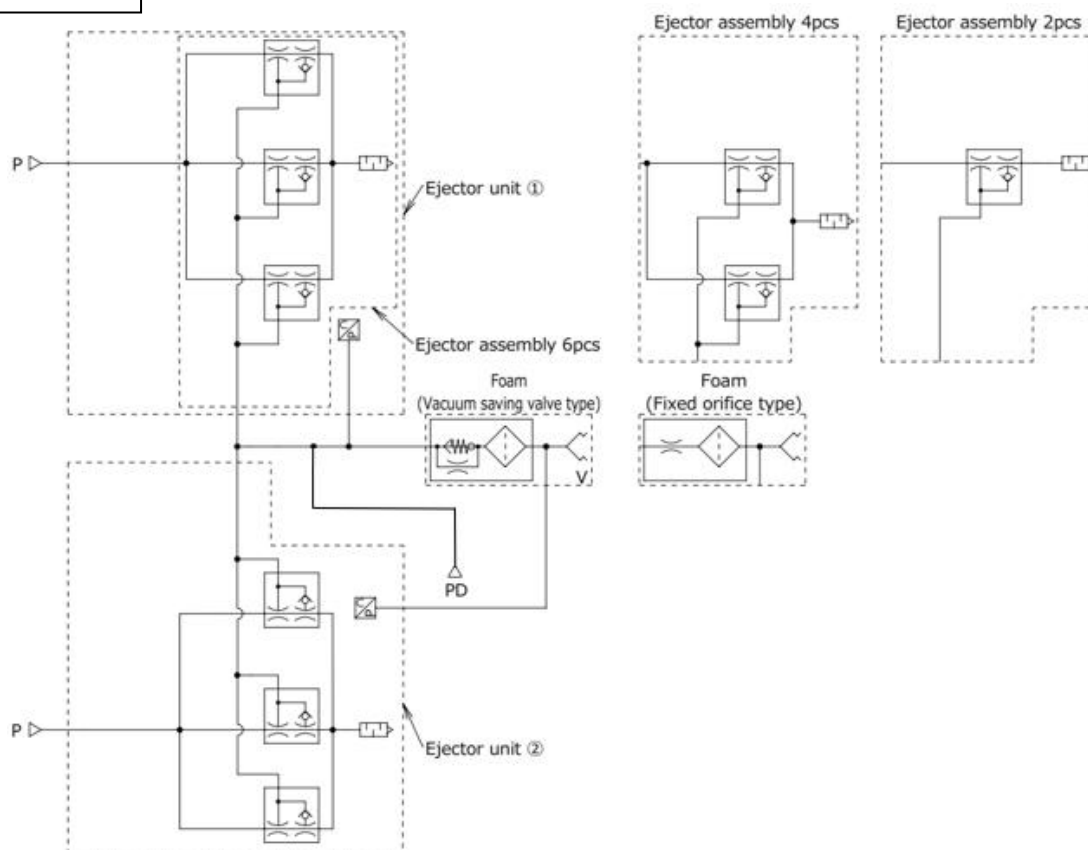
5.2. Pneumatic Circuit

■400mm x 240mm

With valve

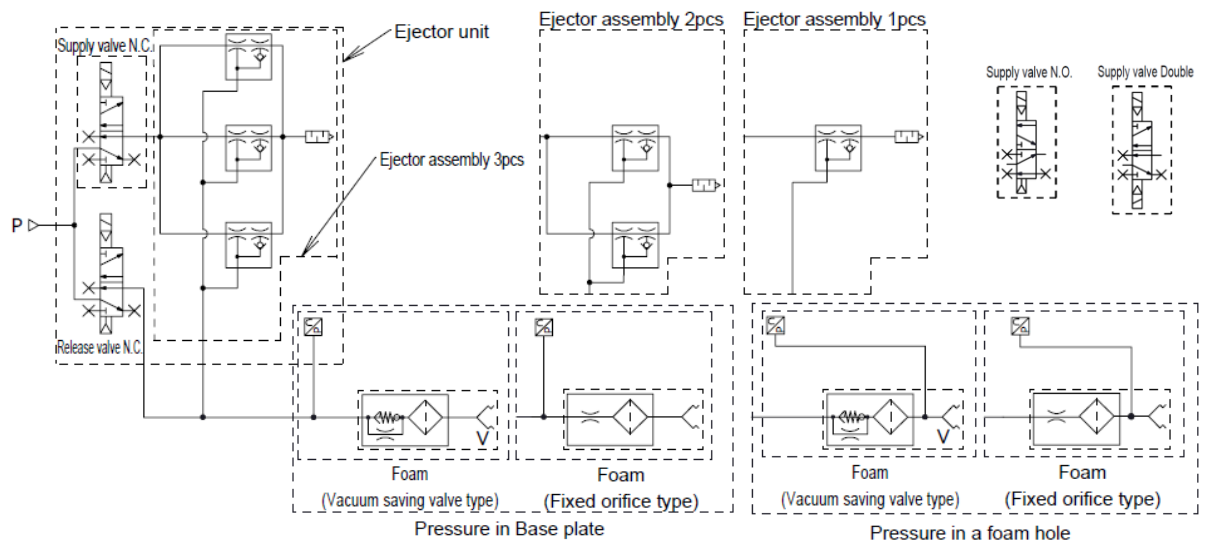


Without valve

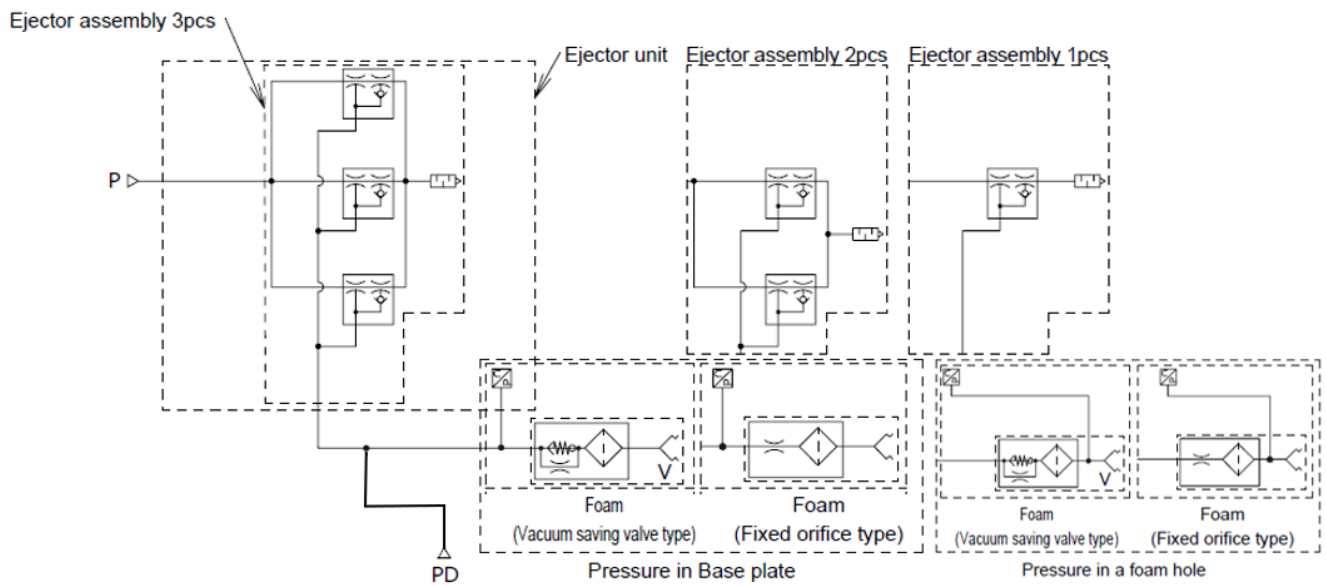


■ 300mm x 180mm, 200mm x 120mm

With valve



Without valve



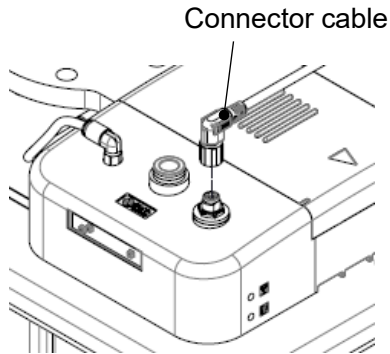
5.3. Wiring

■ Connect connector cable

Connect a connector cable to the M8 connector of the vacuum gripper system.

*1) Do not energize while connecting them.

*2) Ensure that the connector is secured (Not loose).



■ Connector cable

RMH-A00-11-A (Straight cable) (Compatible robot: 043(P/N), 051P)	B Enlarged view
RMH-A00-11-G (Cross cable) (Compatible robot: 011P, 012P)	C Enlarged view
ZGS-LW1-14-A (Straight cable) (Compatible robot: 021N)	D Enlarged view
RMH-A00-18A (Discrete wire / Straight cable): Length 3m 	

Symbol	Robot manufacturer	Vacuum gripper system side	Robot side	Part no.	Cable length [mm]
011P	UNIVERSAL ROBOTS	M8 8-pin connector (Socket)	M8 8-pin connector (Plug) or Discrete wire	RMH-A00-11-G *1) or RMH-A00-18A	220 or 3000
012P					
043P	YASKAWA Electric		M8 8-pin connector (Socket) or Discrete wire	RMH-A00-11-A or RMH-A00-18A	
043N					
051P	FANUC				
021N	OMRON/ TECHMAN ROBOT		M8 8-pin connector (Plug) or Discrete wire	ZGS-LW1-14-A or RMH-A00-18A	300 or 3000
NP	-		Discrete wire	RMH-A00-18A	3000
NN					
NH *2)		M8 4-pin connector (Socket)	-	-	-

*1) It's cross cable designated for UNIVERSAL ROBOTS. Can not be used for other robot manufacturers. Refer to the next page for pin assignment.

*2) Prepare a general-purpose IO-Link compatible M8 cable or prepare an M8-M12 conversion connector and an M12 cable.

■RMH-A00-11-G pin assignment

Vacuum gripper system side		Robot side	
Connector	Pin no.	Pin no.	Connector
M8 8-pin connector (Socket)	1	2	M8 8-pin connector (Plug)
	2	1	
	3	7	
	4	6	
	5	5	
	6	4	
	7	3	
	8	8	

■400mm x 240mm (Except for IO-Link type)

Table 2-1. 400mm x 240mm: Connector pin assignment "M8 8-pin" on vacuum gripper system side

Pin no.	Discrete wire color	General purpose UNIVERSAL ROBOTS FANUC YASKAWA Electric	General purpose YASKAWA Electric	OMRON/ TECHMAN ROBOT
		PNP	NPN	
1	White	-	-	Power supply DC24V (+)
2	Brown	-	-	Pressure switch 1 output OUT1【Digital】 ^{*2)} (+)
3	Green	Pressure switch 2 output OUT1【Digital】 ^{*2)} (-)	Pressure switch 2 output OUT1【Digital】 ^{*2)} (+)	Pressure switch 2 output OUT1【Digital】 ^{*2)} (+)
4	Yellow	Pressure switch 1 output OUT1【Digital】 ^{*2)} (-)	Pressure switch 1 output OUT1【Digital】 ^{*2)} (+)	-
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 the case of "Without supply valve and release valve" type, these are not connected.

*2) Regarding how to use the pressure switch, refer to operation manual for ZSE10 series.

■300mm x 180mm, 200mm x 120mm (Except for IO-Link type)

Table 2-2. 300mm x 180mm, 200mm x 120mm: Connector pin assignment "M8 8-pin" on vacuum gripper system side

Pin no.	Discrete wire color	General purpose UNIVERSAL ROBOTS FANUC YASKAWA Electric	General purpose YASKAWA Electric	OMRON/ TECHMAN ROBOT
		PNP	NPN	
1	White	-	-	Power supply DC24V (+)
2	Brown	-	-	Pressure switch output OUT1【Digital】 ^{*2)} (+)
3	Green	Pressure switch output OUT2【Digital】 ^{*2)} (-)	Pressure switch output OUT2【Digital】 ^{*2)} (+)	Pressure switch output OUT2【Digital】 ^{*2)} (+)
4	Yellow	Pressure switch output OUT1【Digital】 ^{*2)} (-)	Pressure switch output OUT1【Digital】 ^{*2)} (+)	-
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 (-)

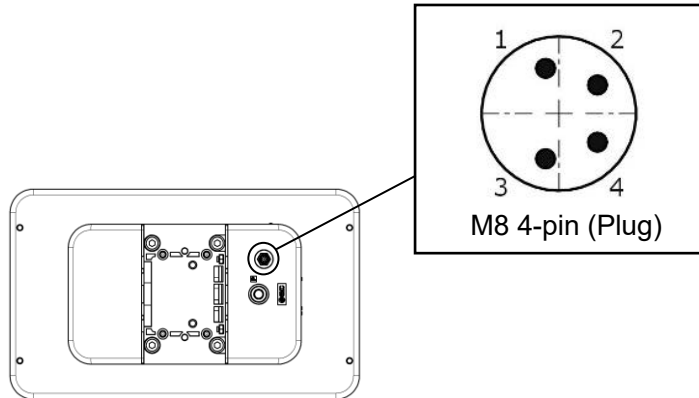
*1) In the case of "Without supply valve and release valve" type, these are not connected.

*2) Regarding how to use the pressure switch, refer to operation manual for ZSE10 series.

■400mm x 240mm, 300mm x 180mm, 200mm x 120mm (IO-Link type)

Table 2-3. IO-Link type: Connector pin assignment "M8 4-pin" on vacuum gripper system side

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



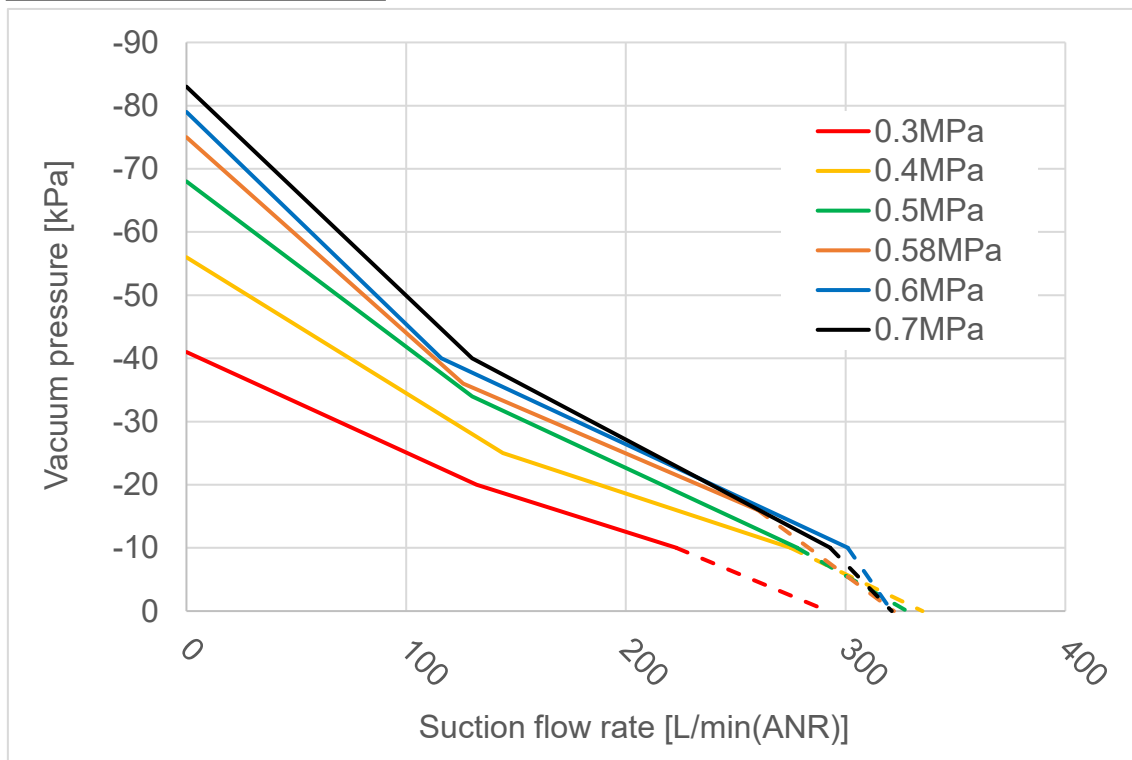
*) Regarding how to use the pressure switch, refer to operation manual for "ZGS-LD1-□(H/J)□-A".

5.4. Ejector flow characteristics

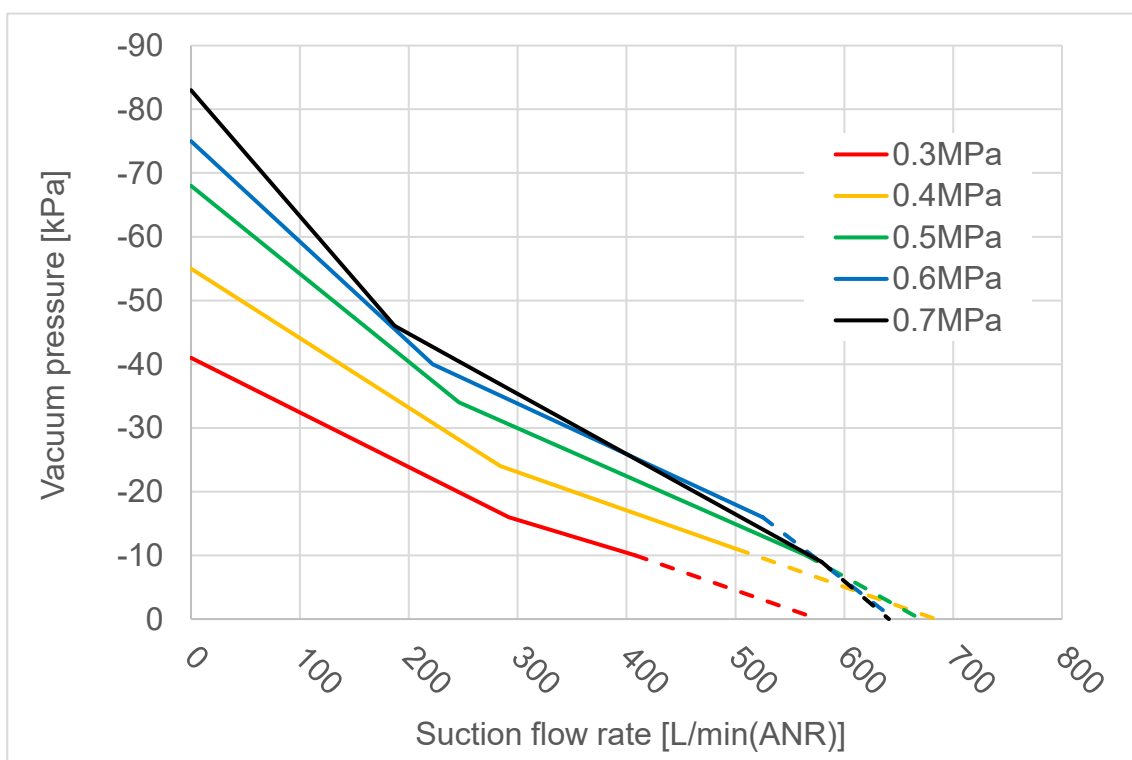
*) Suction flow rates are measured under SMC test conditions and are not guaranteed.
The dotted lines in the graph below are estimates based on measured values.

■400mm x 240mm

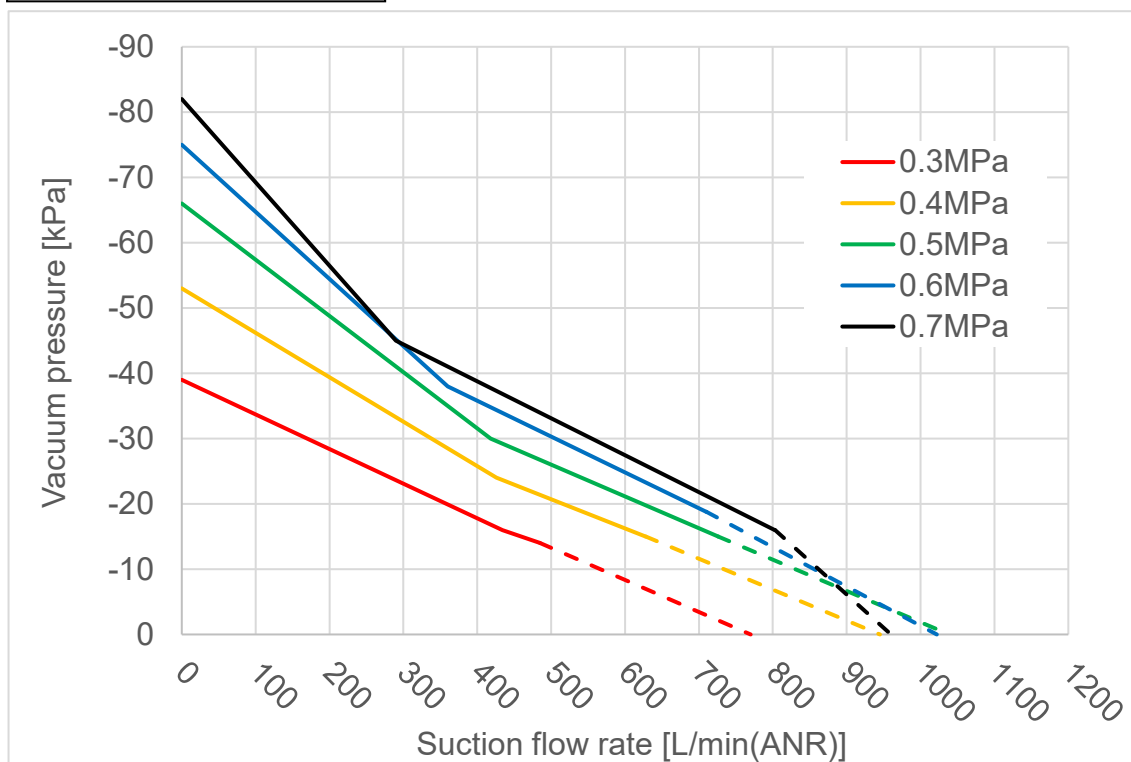
Ejector assembly: 2 pcs.



Ejector assembly: 4 pcs.

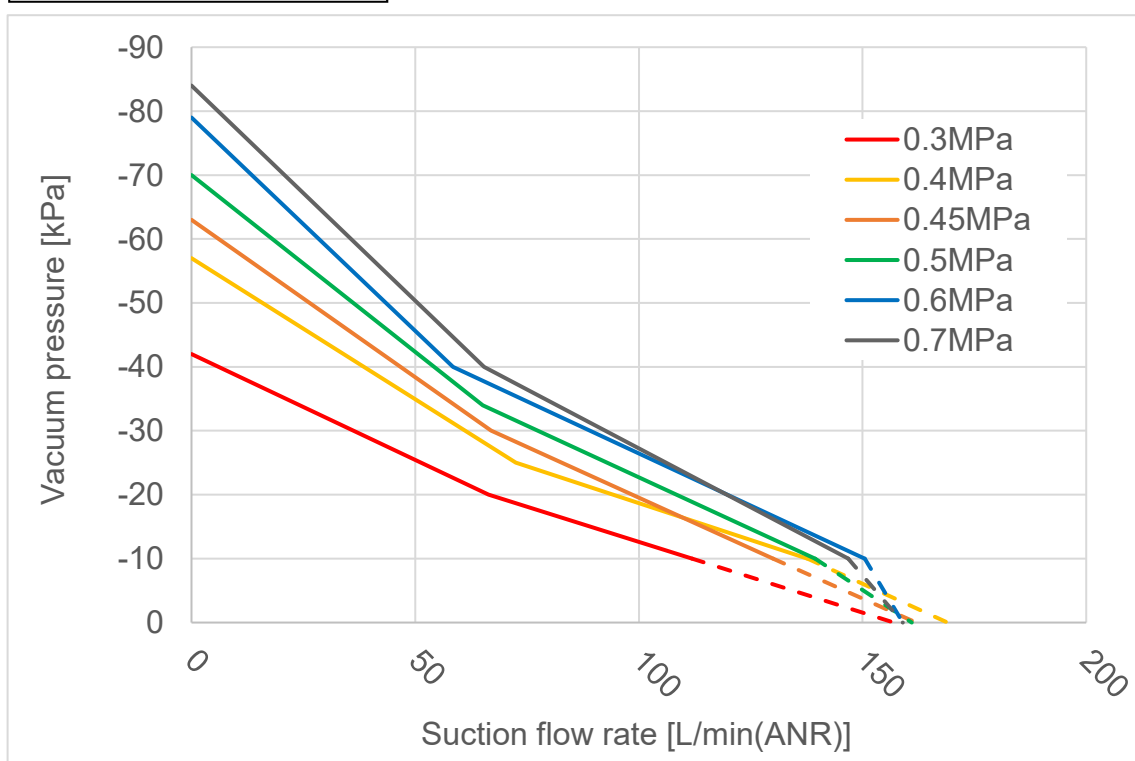


Ejector assembly: 6 pcs.

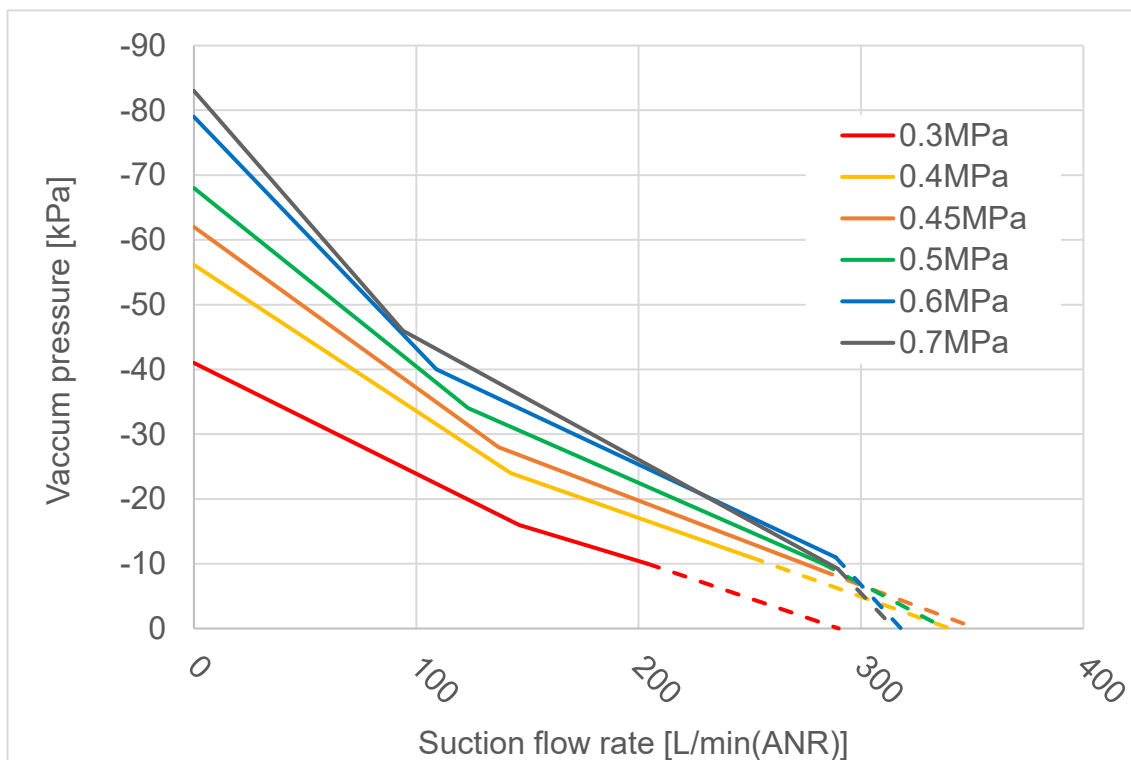


■ 300mm x 180mm, 200mm x 120mm

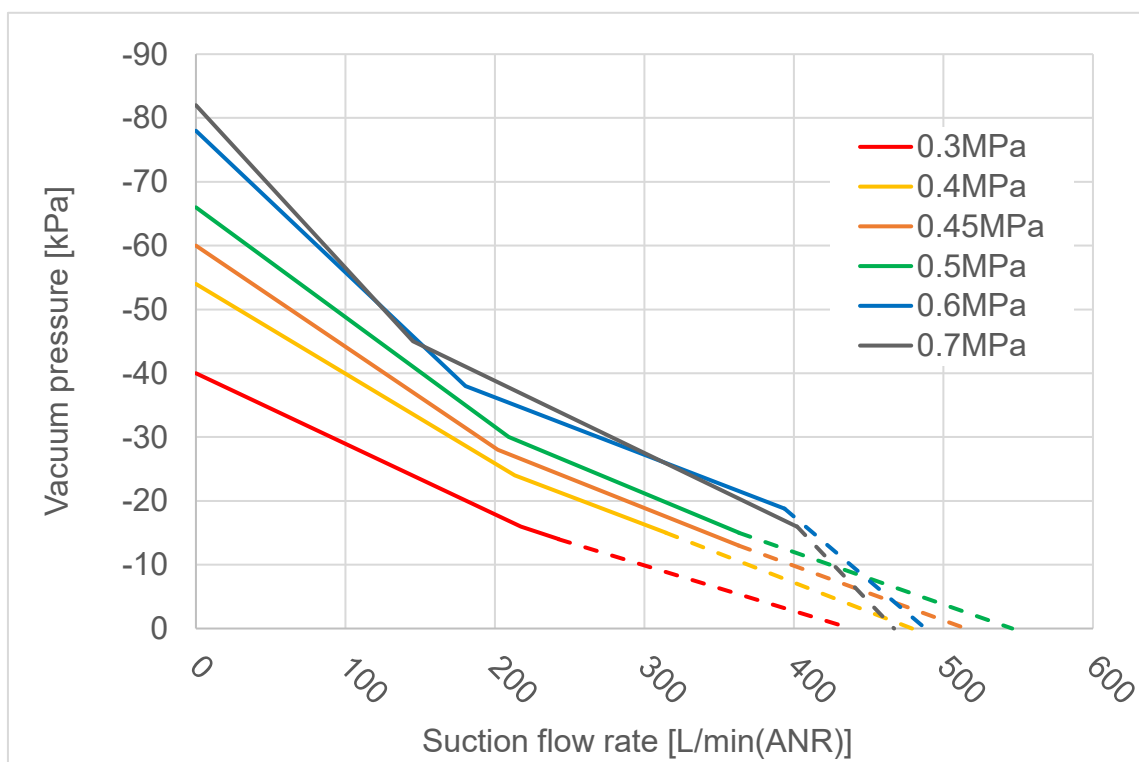
Ejector assembly: 1 pc.



Ejector assembly: 2 pcs.



Ejector assembly: 3 pcs.

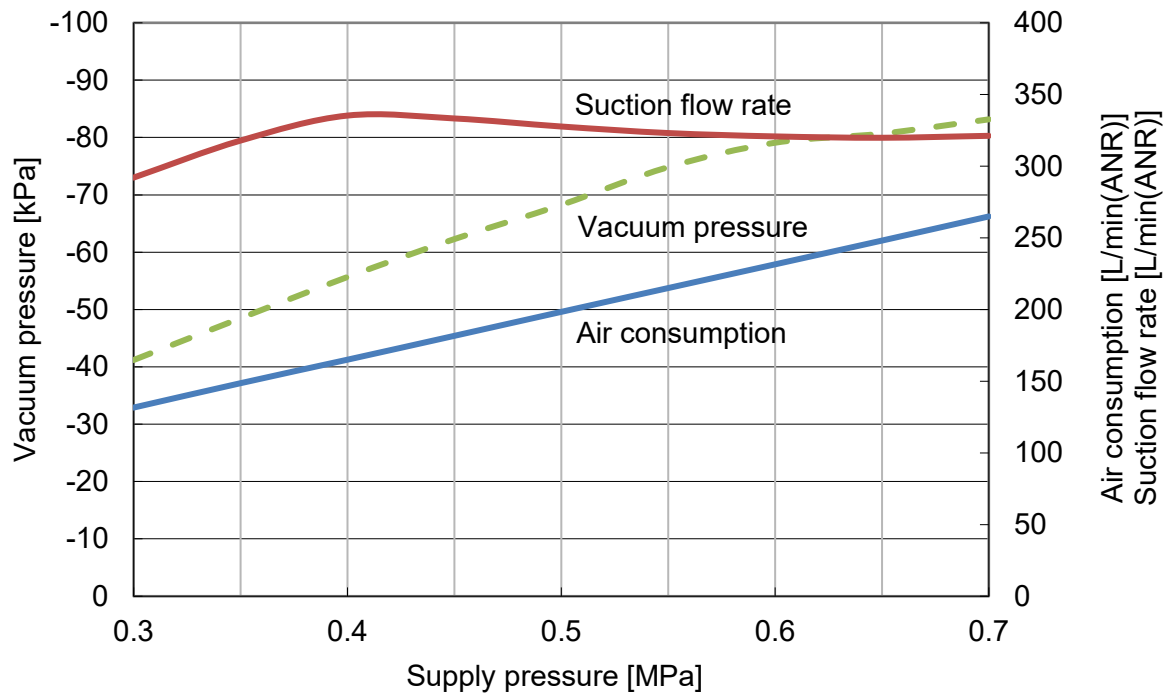


5.5. Ejector Exhaust characteristics

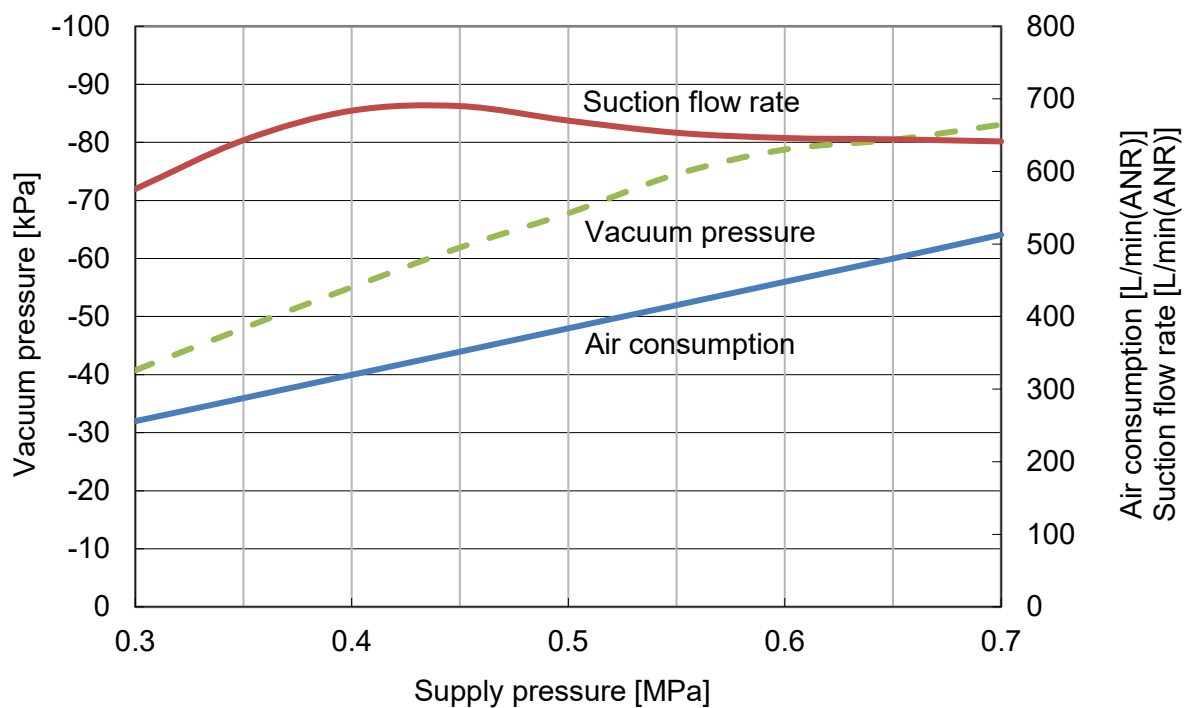
*) These values are measured under SMC test conditions and not guaranteed.

■400mm x 240mm

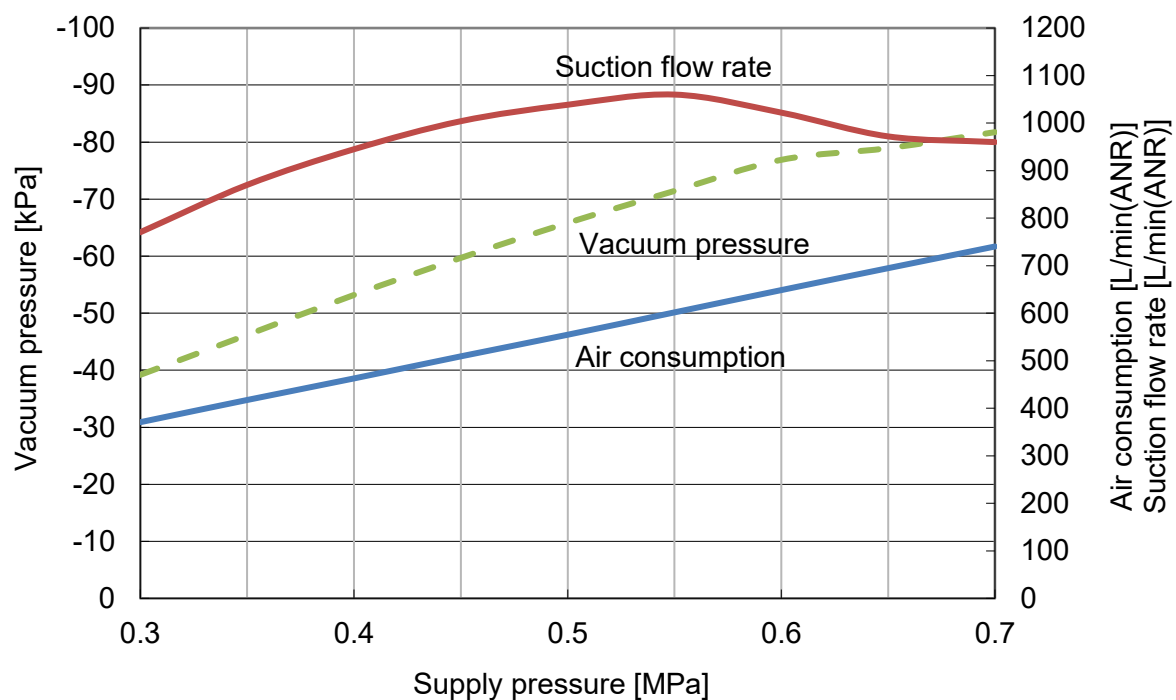
Ejector assembly: 2 pcs.



Ejector assembly: 4 pcs.

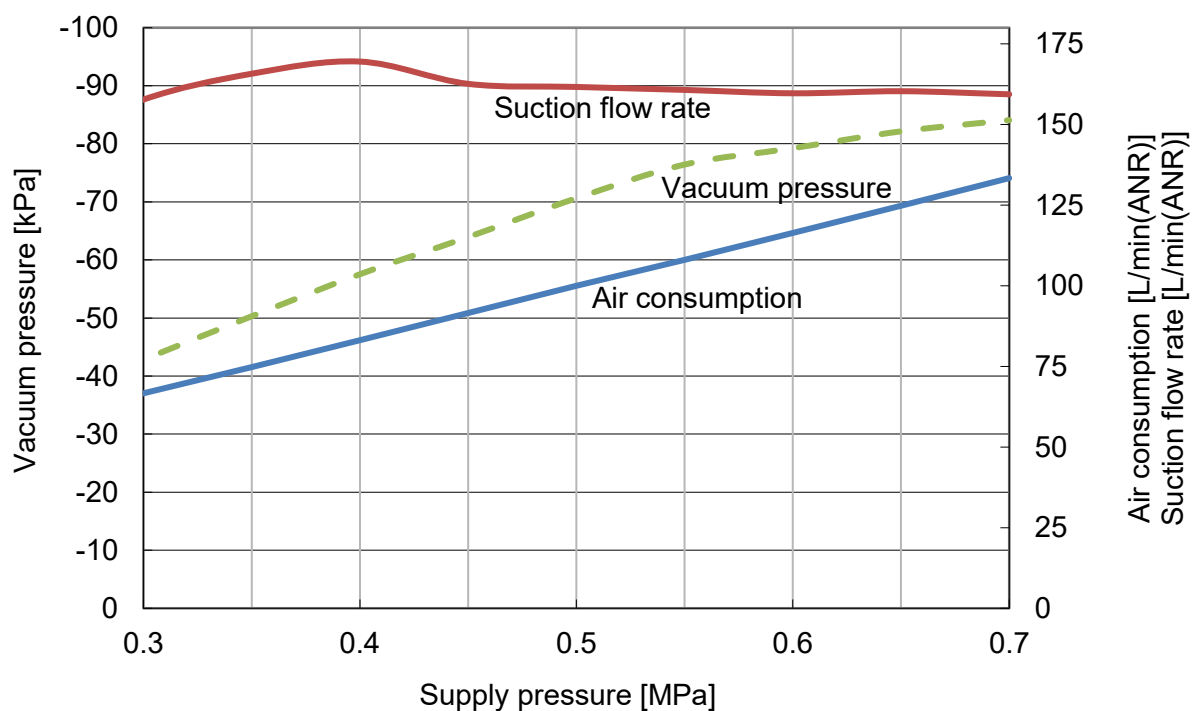


Ejector assembly: 6 pcs.

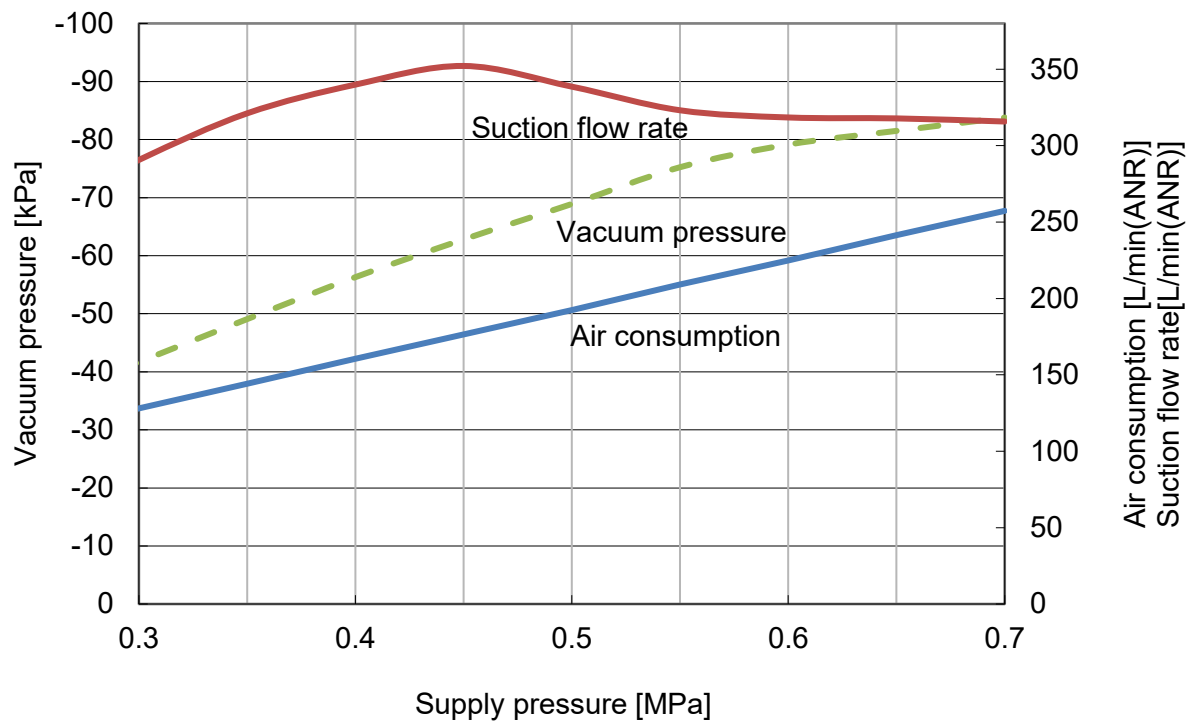


■ 300mm x 180mm, 200mm x 120mm

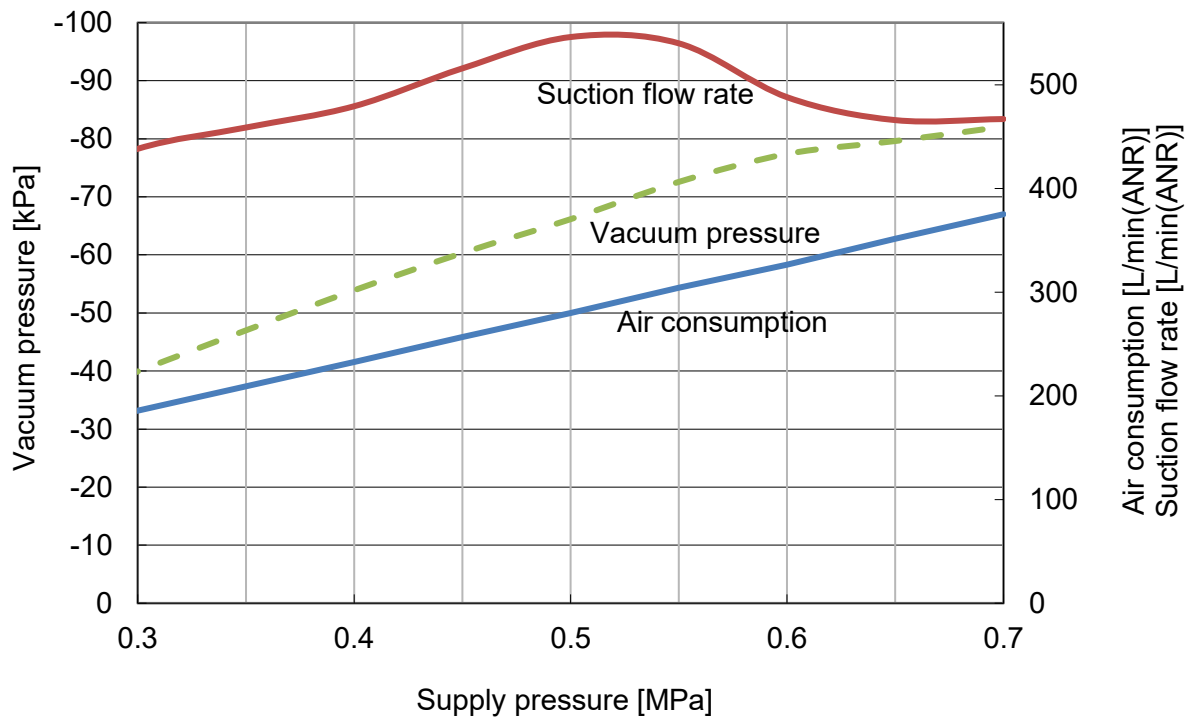
Ejector assembly: 1 pc.



Ejector assembly: 2 pcs.



Ejector assembly : 3 pcs.



6. Dimensions

■ 400mm x 240mm

6.1. Robot mounting flange: Basic type

- Compatible robot: NP/NN (General purpose)
 - : 011P/012P (UNIVERSAL ROBOTS)
 - : 043P/043N (YASKAWA Electric)
 - : 051P (FANUC)

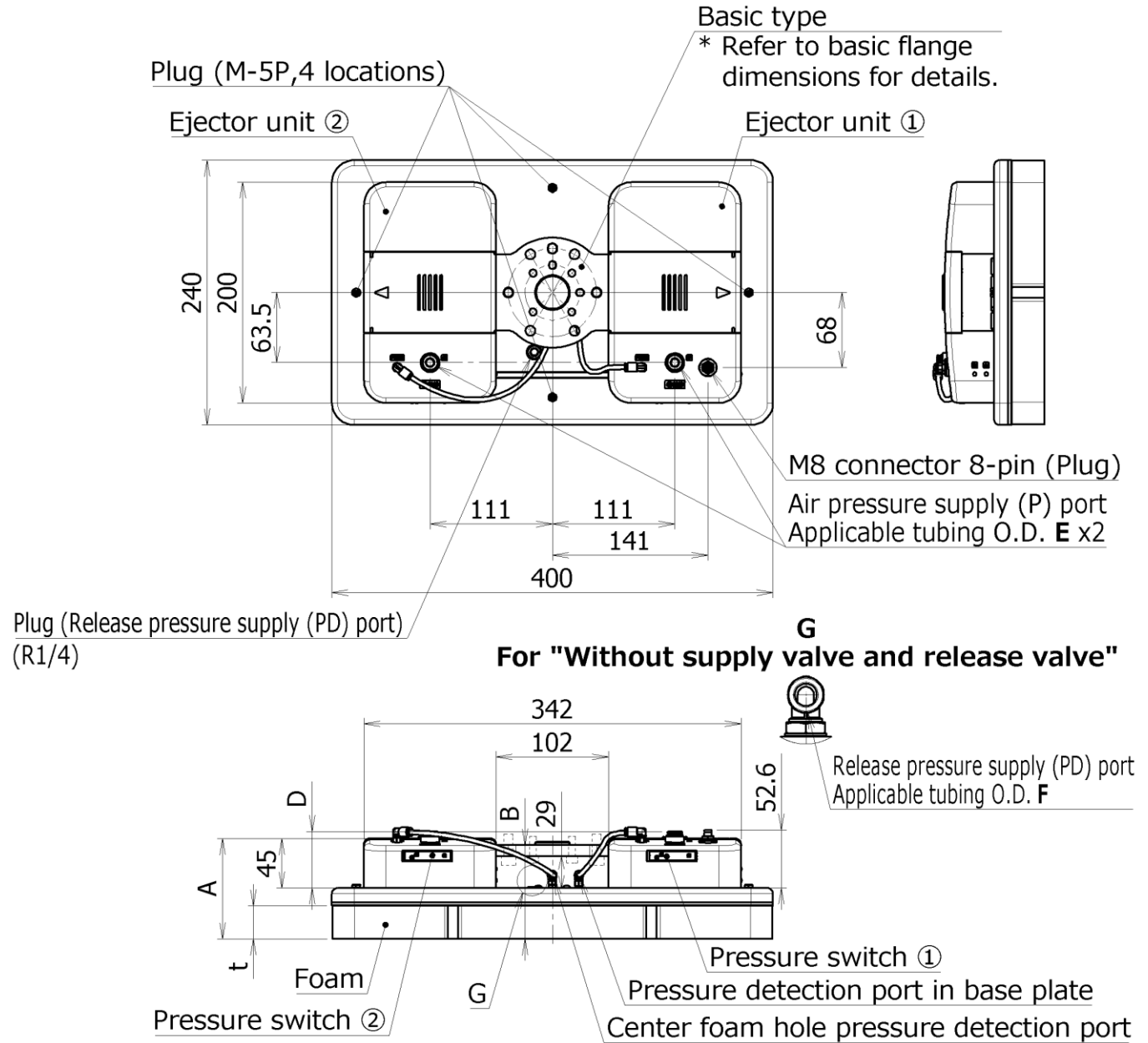


Table 4-1. Dimensions

Part no.	t	A	B
ZGS**-400240A**-**1*	20	81	75
ZGS**-400240B**-**1*	30	91	85

Part no.	D	E	F
ZGS**-400240***-***C8	51.4	φ8	φ8
ZGS**-400240***-***C10	52	φ10	
ZGS**-400240***-***N9	51.4	φ5/16"	φ3/8"
ZGS**-400240***-***N11	51.9	φ3/8"	

6.2. Robot mounting flange: Basic type (IO-Link type)

■ Compatible robot: NH (General purpose)

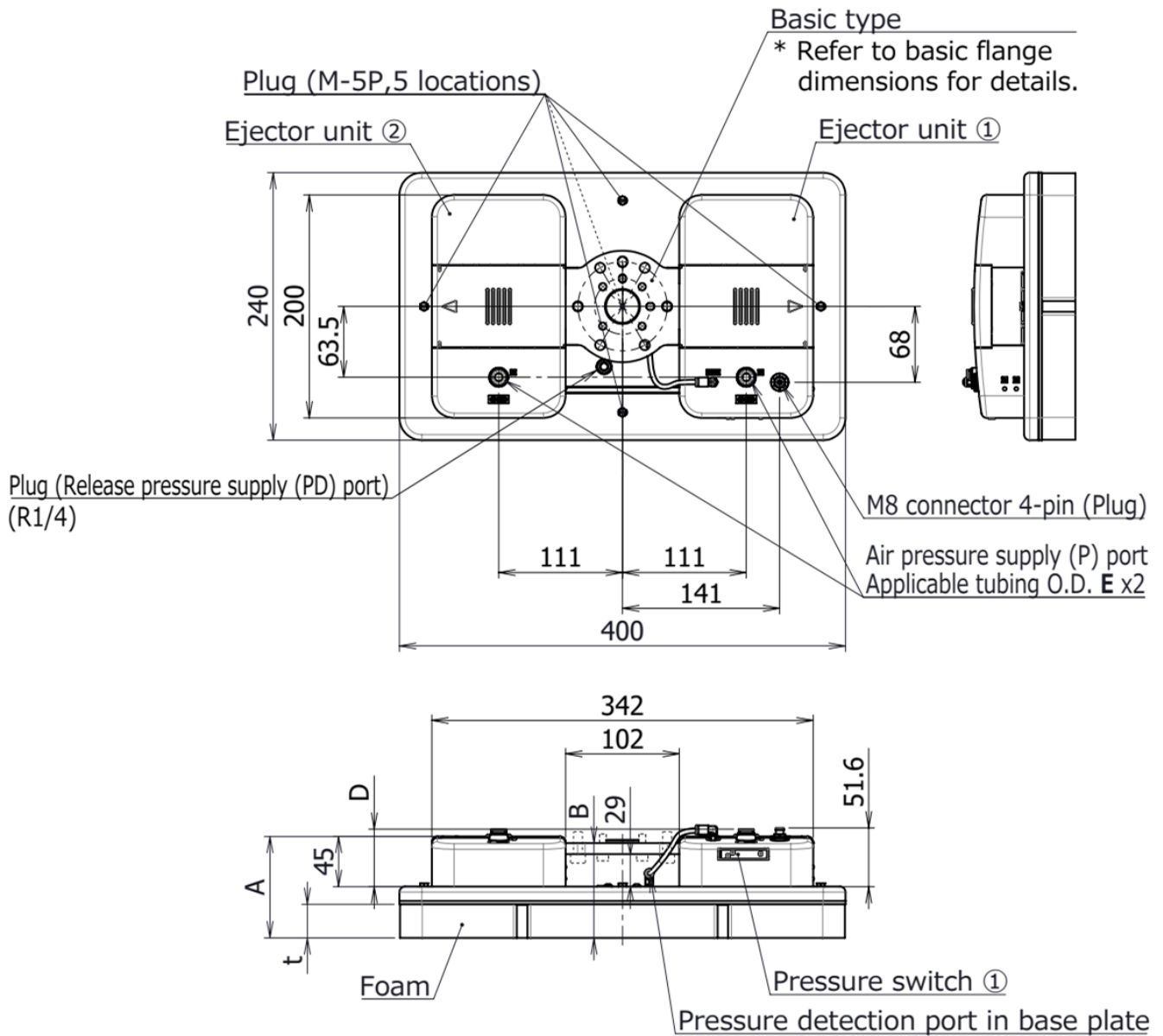


Table 4-2. Dimensions

Part no.	t	A	B
ZGSNH*-400240A**-**1*	20	81	75
ZGSNH*-400240B**-**1*	30	91	85

Part no.	D	E
ZGS**-400240***-***C8	51.4	$\phi 8$
ZGS**-400240***-***C10	52	$\phi 10$
ZGS**-400240***-***N9	51.4	$\phi 5/16"$
ZGS**-400240***-***N11	51.9	$\phi 3/8"$

6.3. Robot mounting flange: Basic type + Offset flange

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

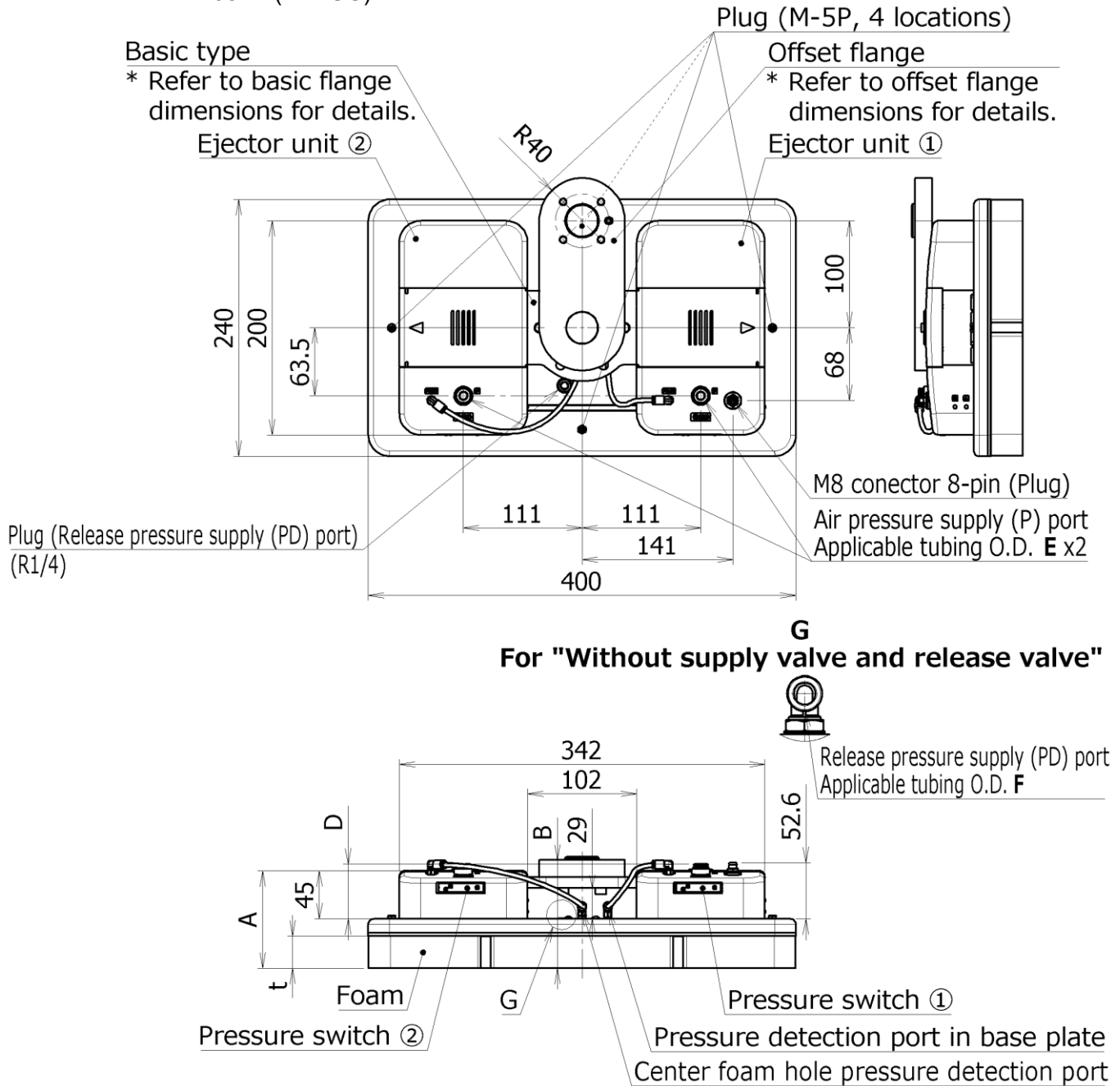


Table 4-3. Dimensions

Part no.	t	A	B
ZGS**-400240A**-**2*	20	81	91
ZGS**-400240B**-**2*	30	91	101

Part no.	D	E	F
ZGS**-400240***-***C8	51.4	φ8	φ8
ZGS**-400240***-***C10	52	φ10	
ZGS**-400240***-***N9	51.4	φ5/16"	φ3/8"
ZGS**-400240***-***N11	51.9	φ3/8"	

6.4. Robot mounting flange: Basic type + Offset flange (IO-Link type)

■ Compatible robot: NH (General purpose)

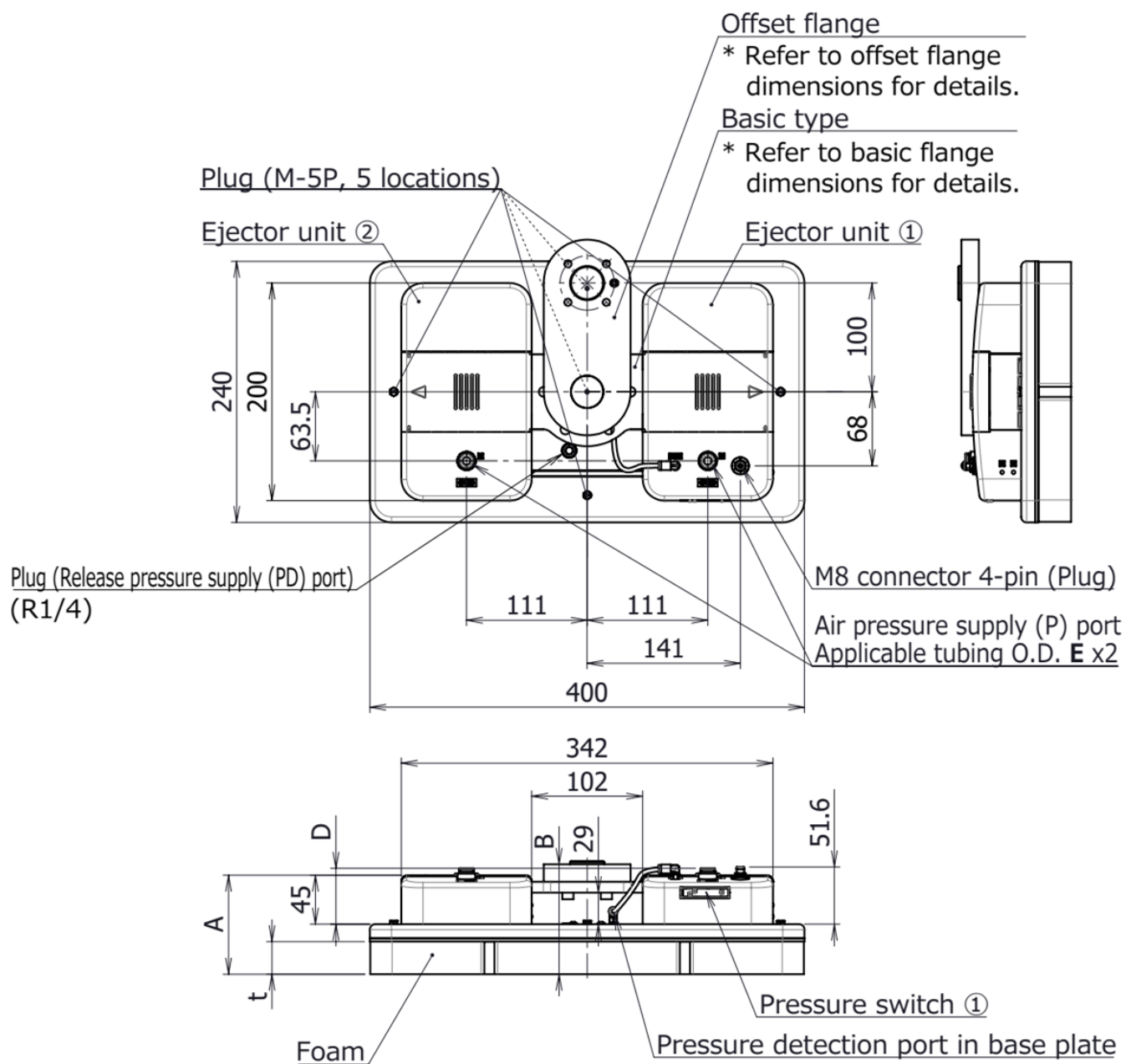


Table 4-4. Dimensions

Part no.	t	A	B
ZGSNH*-400240A**-*2*	20	81	91
ZGSNH*-400240B**-*2*	30	91	101

Part no.	D	E
ZGS**-400240***-***C8	51.4	φ8
ZGS**-400240***-***C10	52	φ10
ZGS**-400240***-***N9	51.4	φ5/16"
ZGS**-400240***-***N11	51.9	φ3/8"

6.5. Robot mounting flange: Basic type + Offset flange + Flange U

■ Compatible robot: 012P (UNIVERSAL ROBOTS)

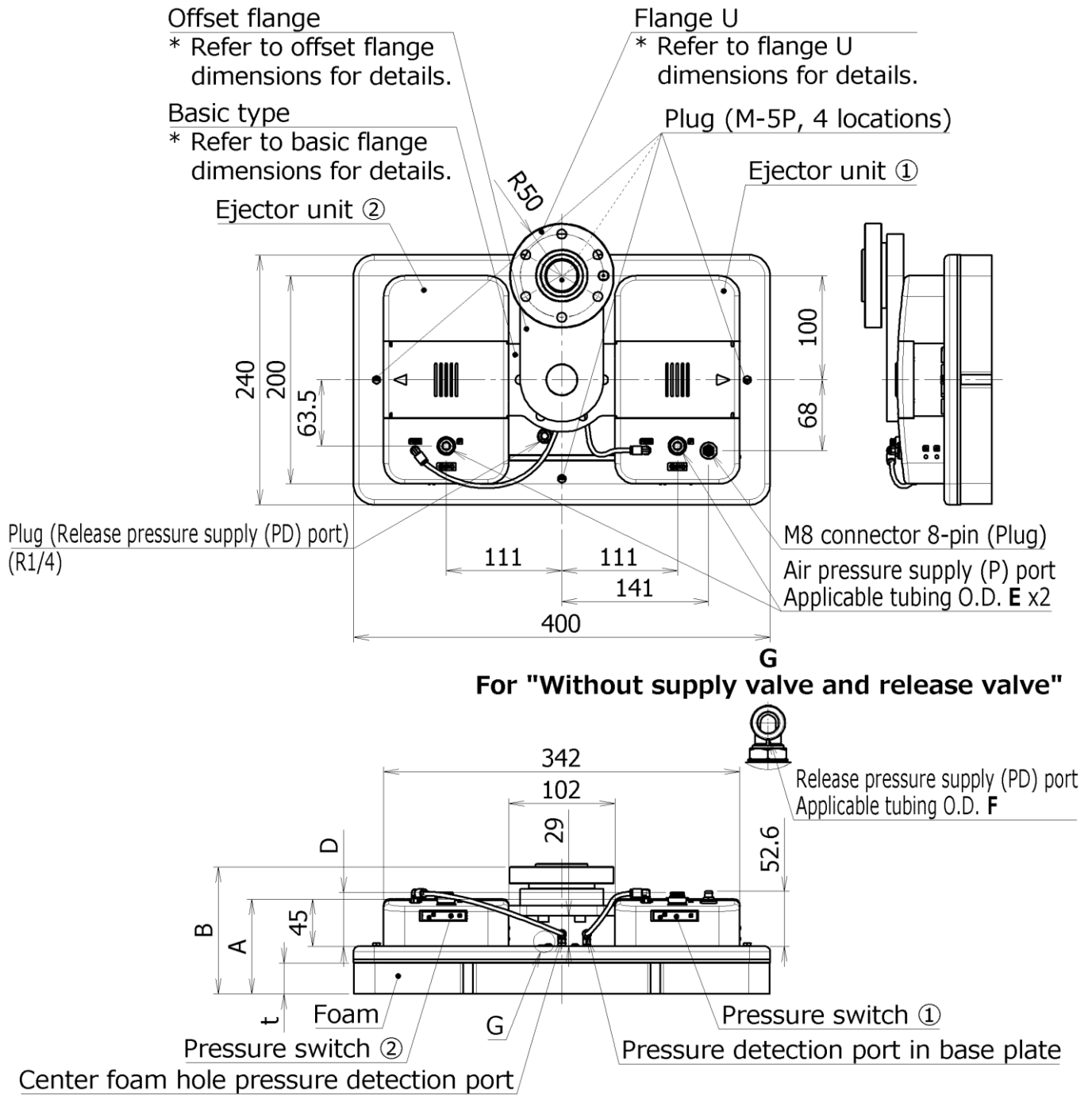


Table 4-5. Dimensions

Part no.	t	A	B
ZGS012P*-400240A**-**2*	20	81	112
ZGS012P*-400240B**-**2*	30	91	122

Part no.	D	E	F
ZGS**-400240***-***C8	51.4	φ8	φ8
ZGS**-400240***-***C10	52	φ10	
ZGS**-400240***-***N9	51.4	φ5/16"	φ3/8"
ZGS**-400240***-***N11	51.9	φ3/8"	

6.6. Robot mounting flange: Without robot mounting flange

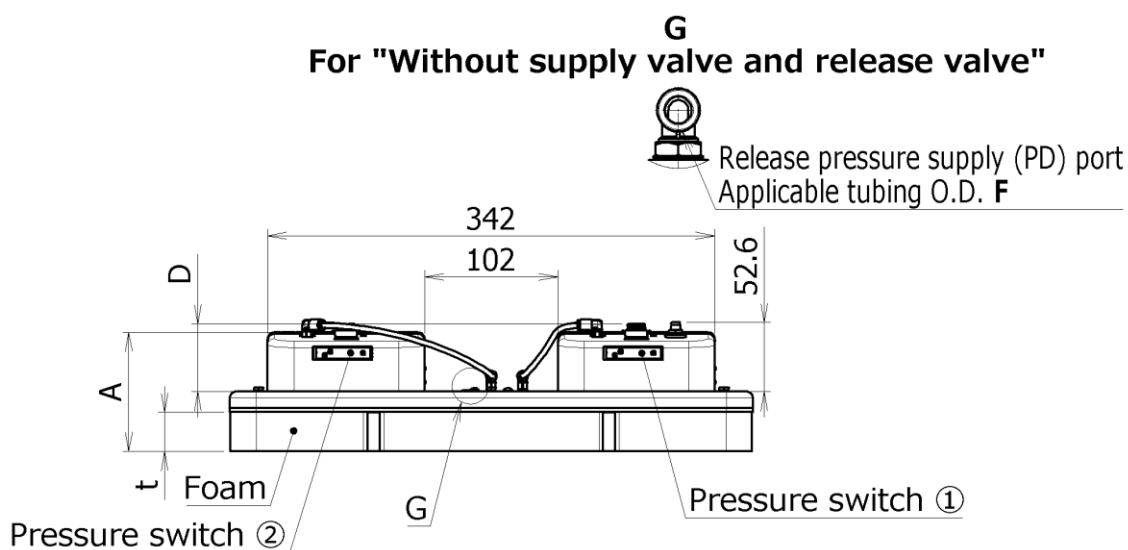
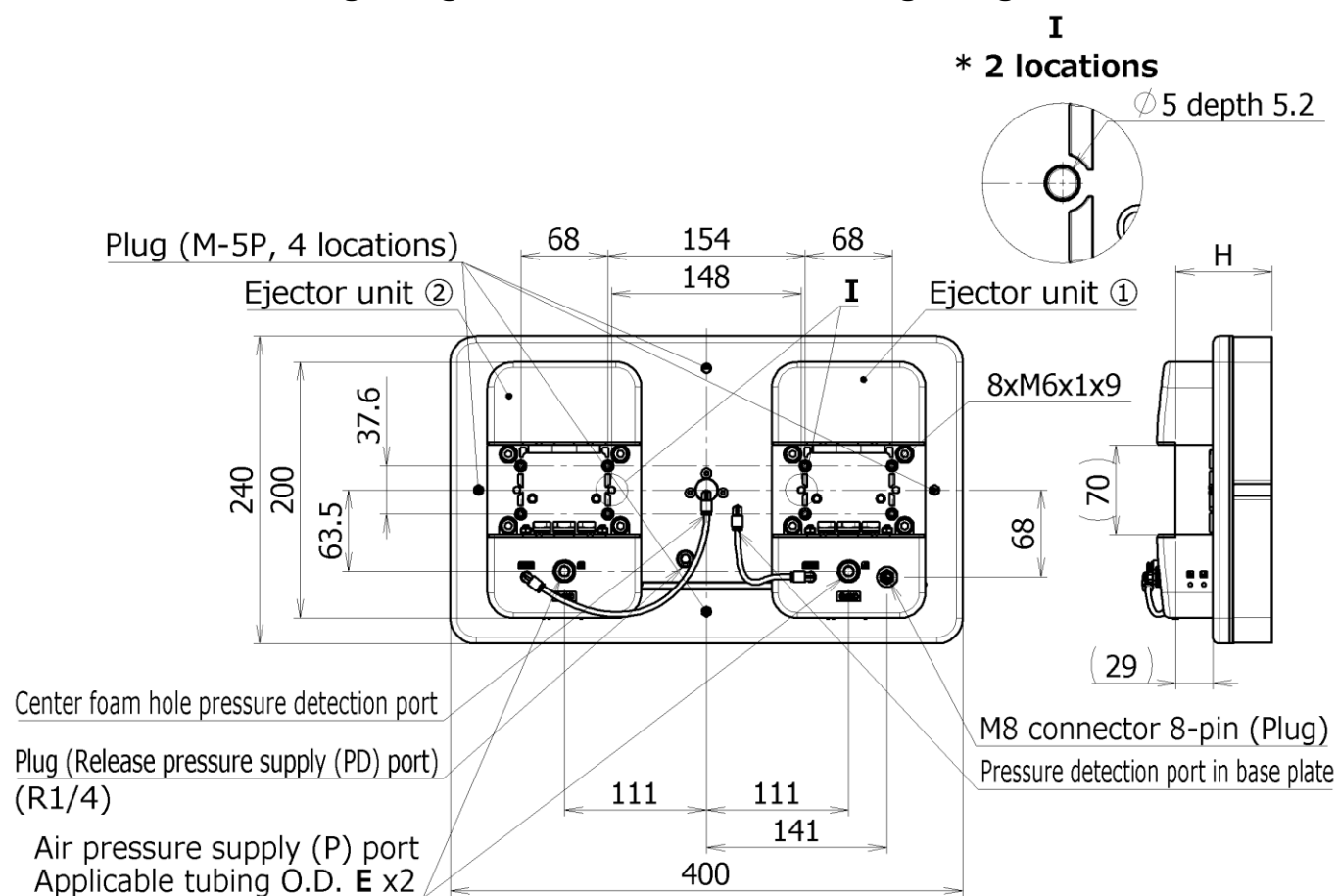


Table 4-6. Dimensions

Part no.	t	A	H
ZGS**-400240A**-** *	20	81	65
ZGS**-400240B**-** *	30	91	75

Part no.	D	E	F
ZGS**-400240***-**_C8	51.4	φ8	φ8
ZGS**-400240***-**_C10	52	φ10	
ZGS**-400240***-**_N9	51.4	φ5/16"	φ3/8"
ZGS**-400240***-**_N11	51.9	φ3/8"	

6.7. Robot mounting flange: Without robot mounting flange (IO-Link type)

■ Compatible robot: NH (General purpose)

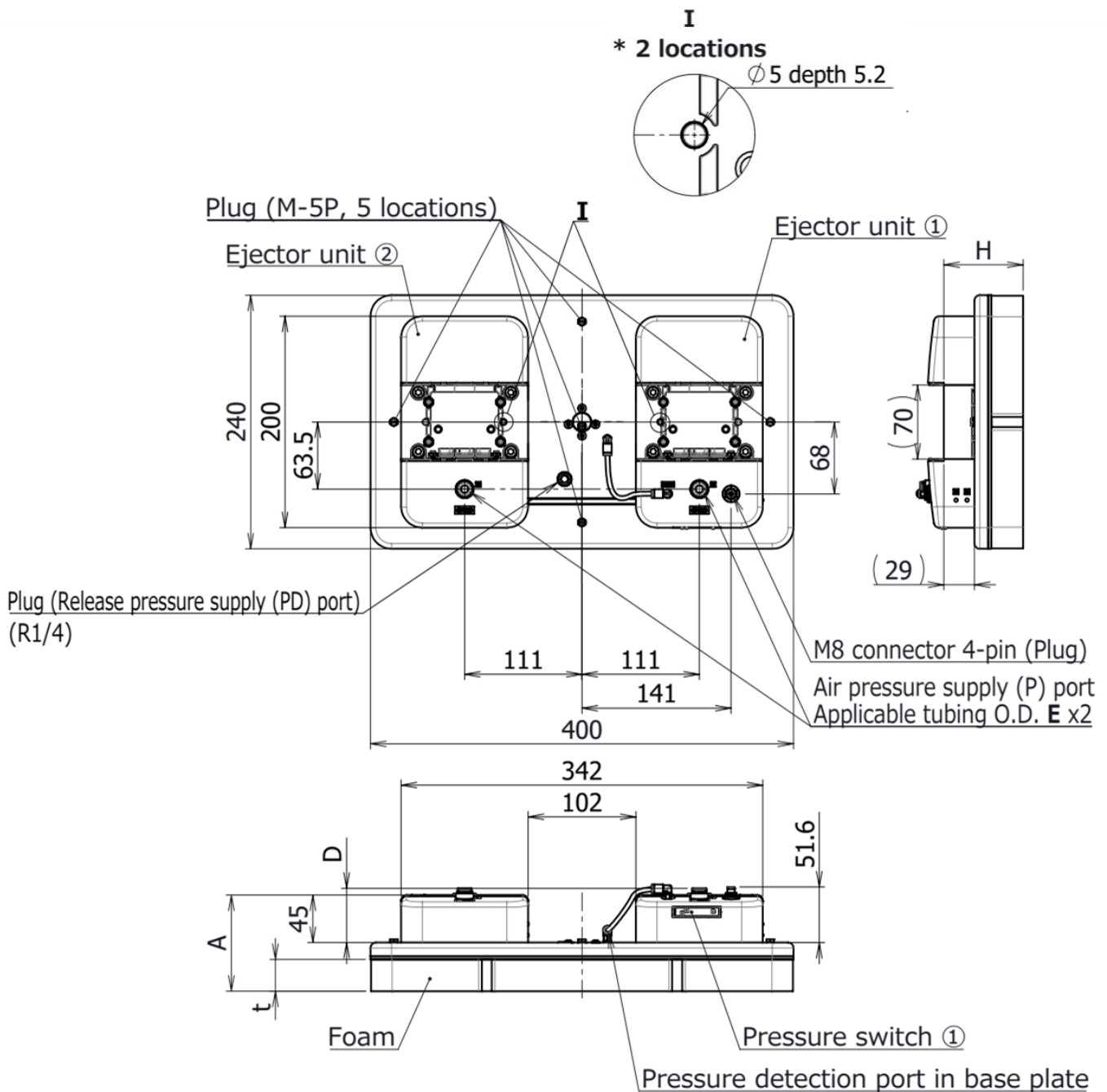
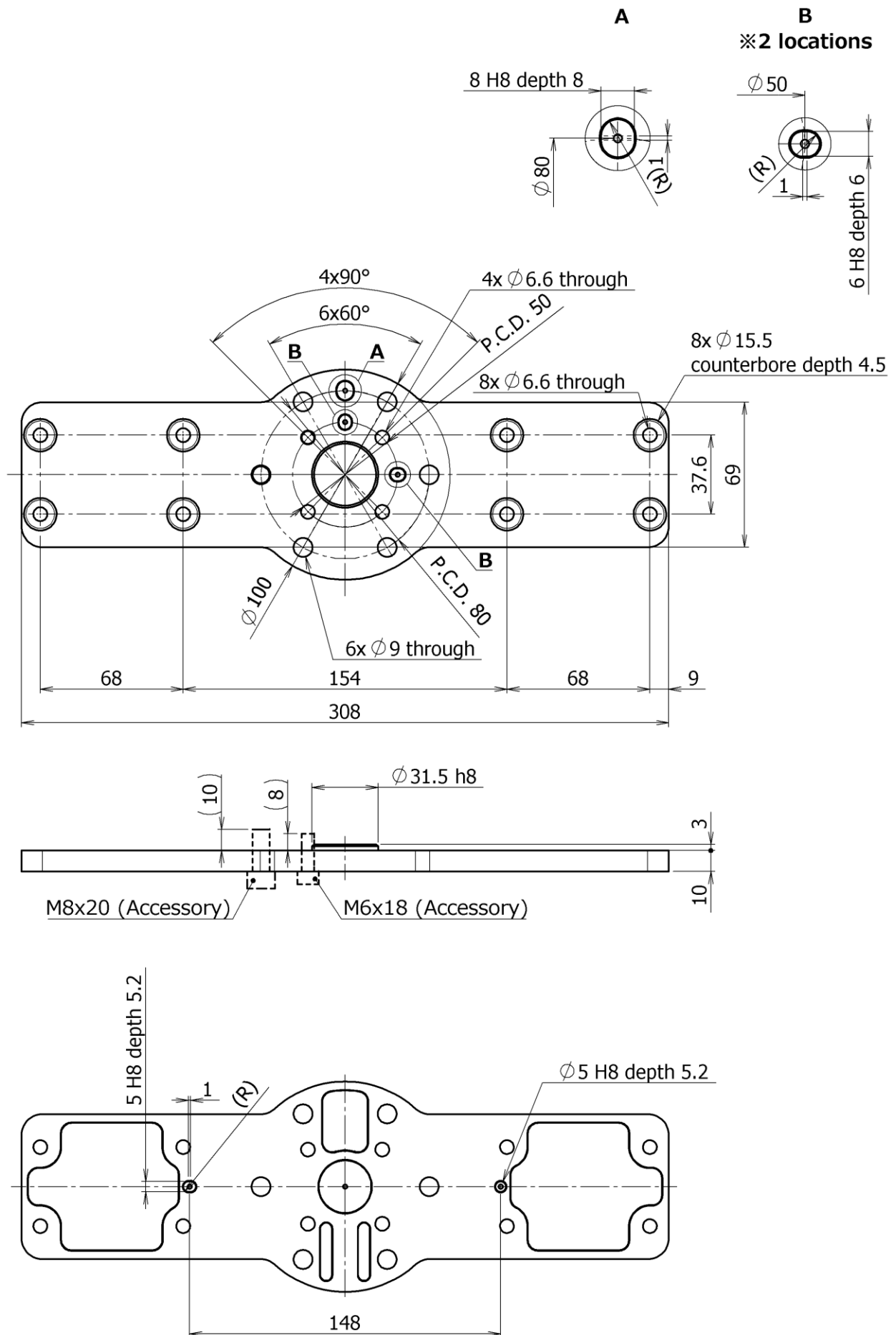


Table 4-7. Dimensions

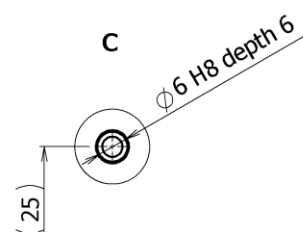
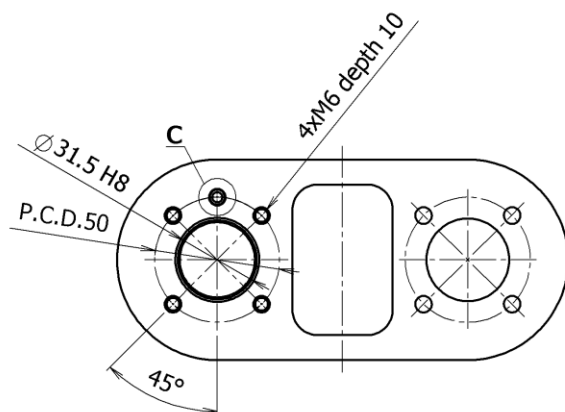
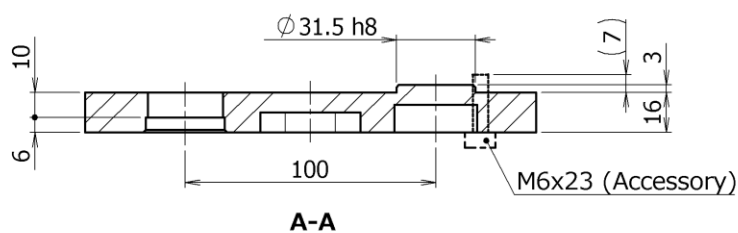
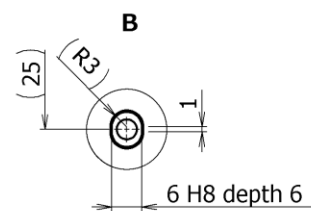
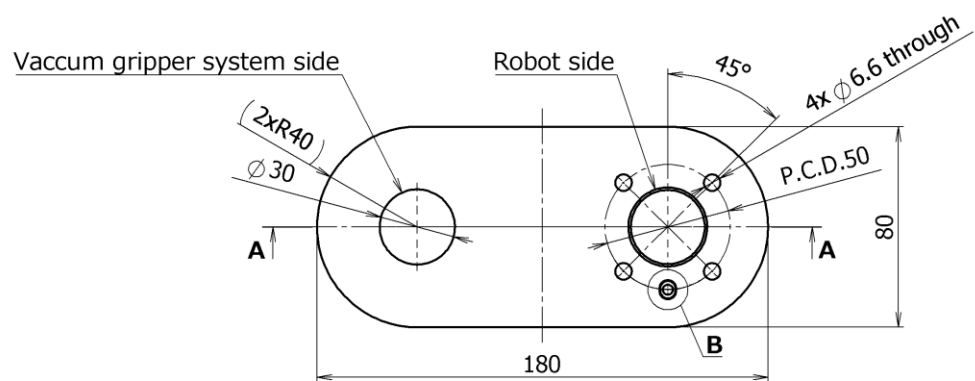
Part no.	t	A	H
ZGSNH*-400240A**-** *	20	81	65
ZGSNH*-400240B**-** *	30	91	75

Part no.	D	E
ZGS**-400240***-**-C8	51.4	$\phi 8$
ZGS**-400240***-**-C10	52	$\phi 10$
ZGS**-400240***-**-N9	51.4	$\phi 5/16"$
ZGS**-400240***-**-N11	51.9	$\phi 3/8"$

6.8. Basic type



6.9. Offset flange



6.10. Tool center point (T.C.P.), Center of gravity (C.O.G.) and Weight

■ Robot mounting flange: Basic type

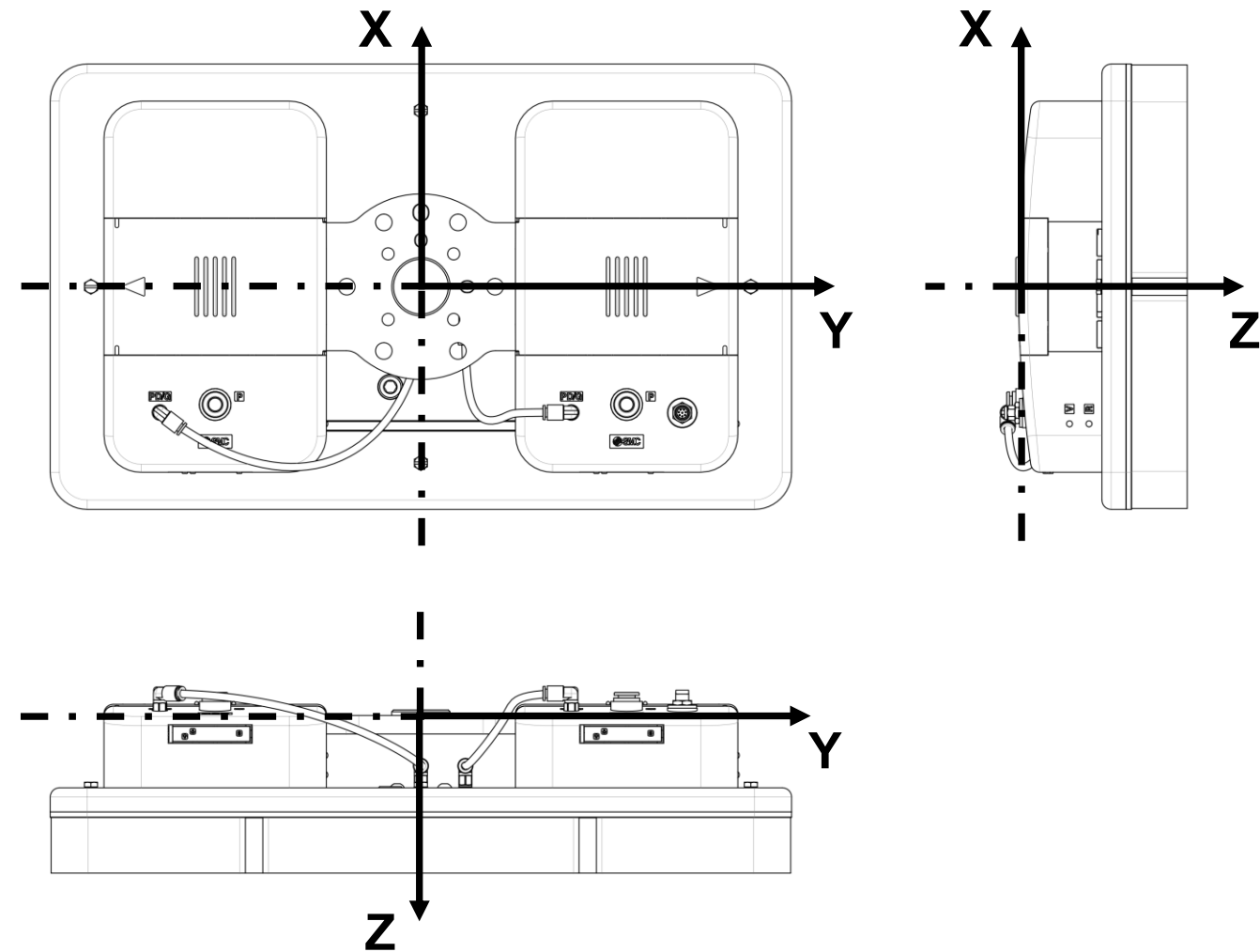


Table 5-1. T.C.P. and C.O.G. (mm)

	ZGS**—400240A**—**1* Foam thickness 20mm			ZGS**—400240B**—**1* Foam thickness 30mm		
	X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	0	0	75	0	0	85
Center of gravity (C.O.G.)	-3	1	33	-3	1	34

Table 5-2. Weight (kg)

	ZGS**—400240***—**1* With robot mounting flange (Basic type)
Weight	3.9

■ Robot mounting flange: Basic type + Offset flange

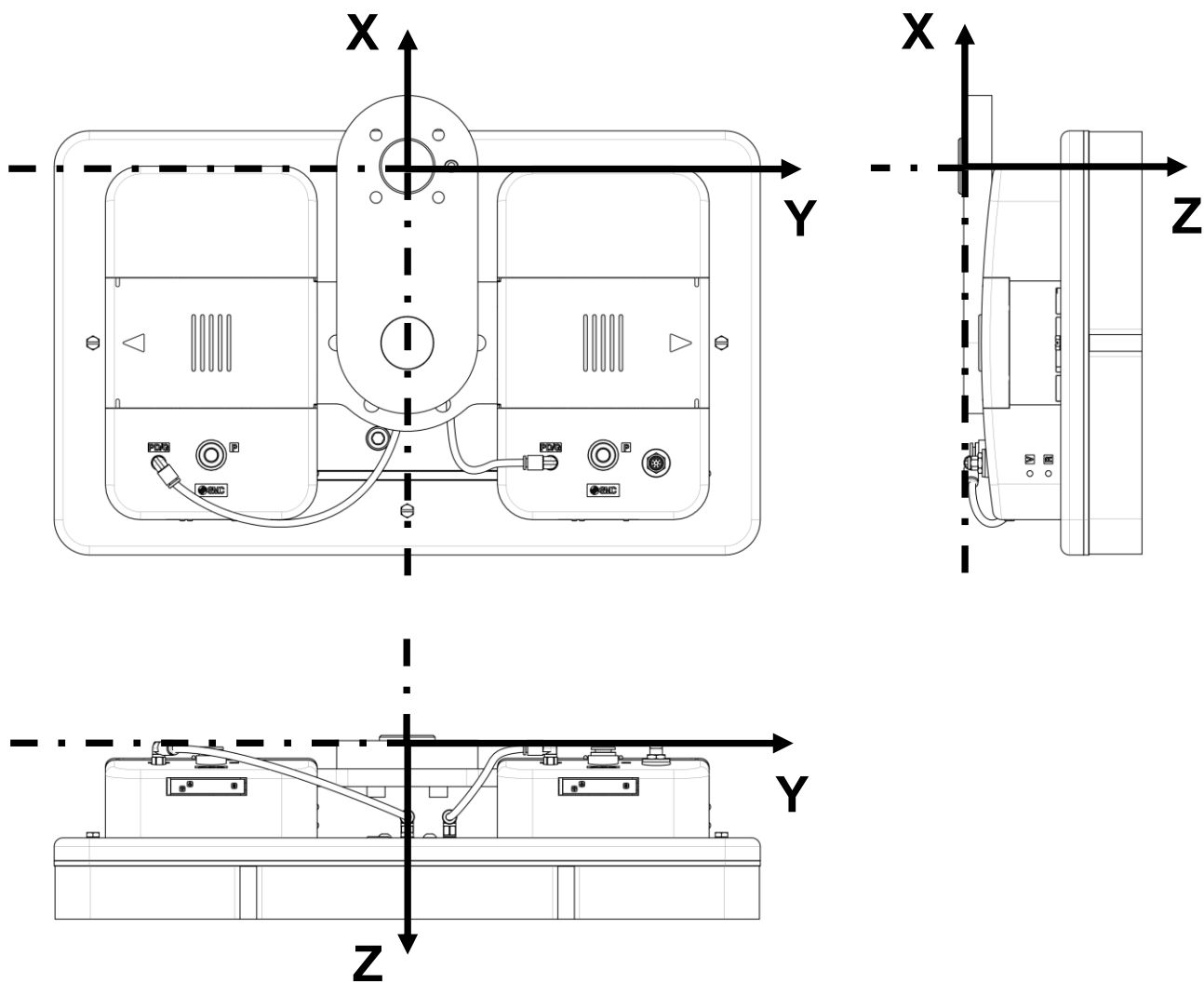


Table 5-3. T.C.P. and C.O.G.

(mm)

	ZGS**—400240 A **—** 2 *			ZGS**—400240 B **—** 2 *		
	Foam thickness 20mm			Foam thickness 30mm		
	X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	-100	0	91	-100	0	101
Center of gravity (C.O.G.)	-97	1	44	-97	1	45

Table 5-4. Weight

(kg)

	ZGS**—400240***—** 2 *
	With offset flange
Weight	4.4

■ Robot mounting flange: Basic type + Offset flange + Flange U

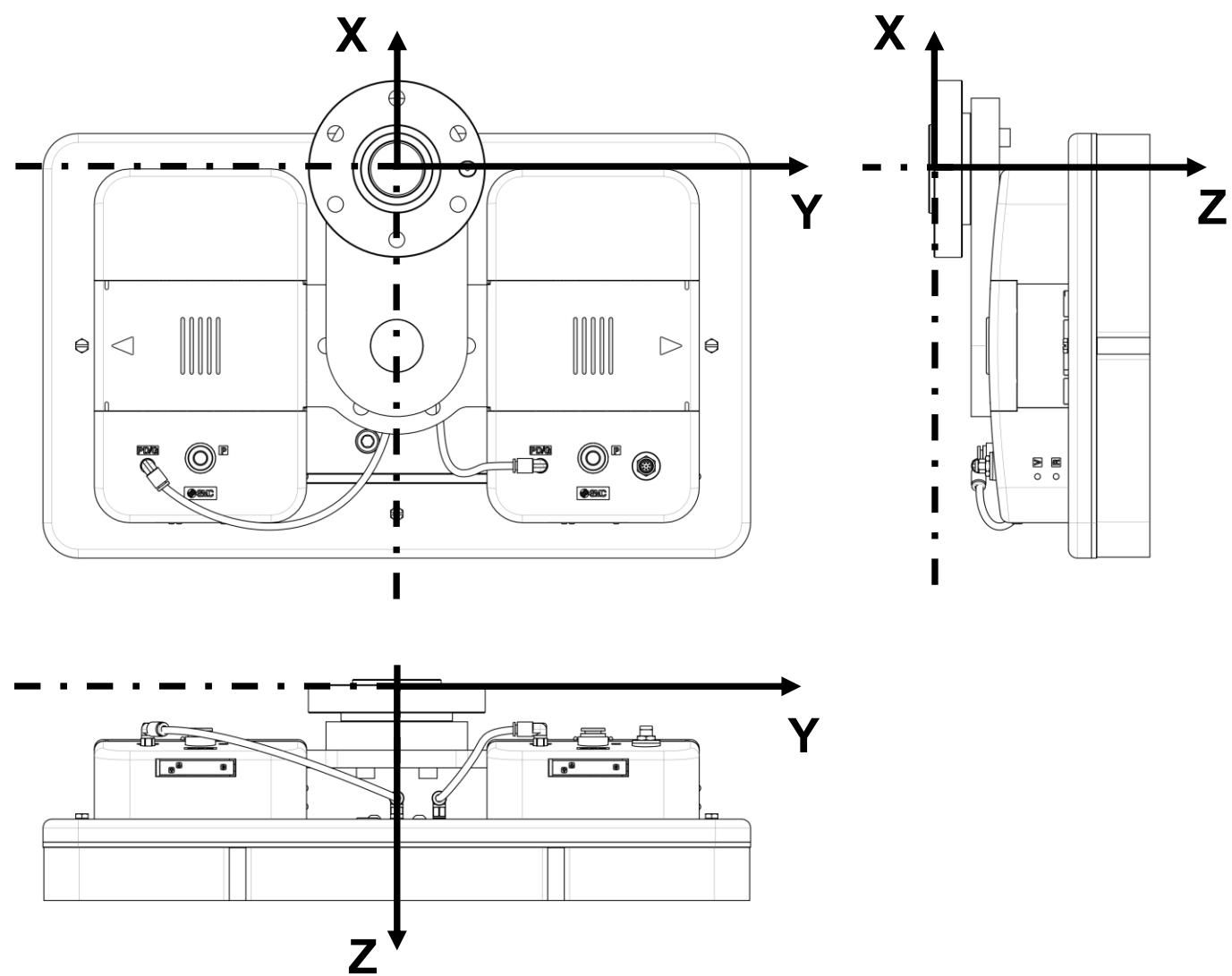


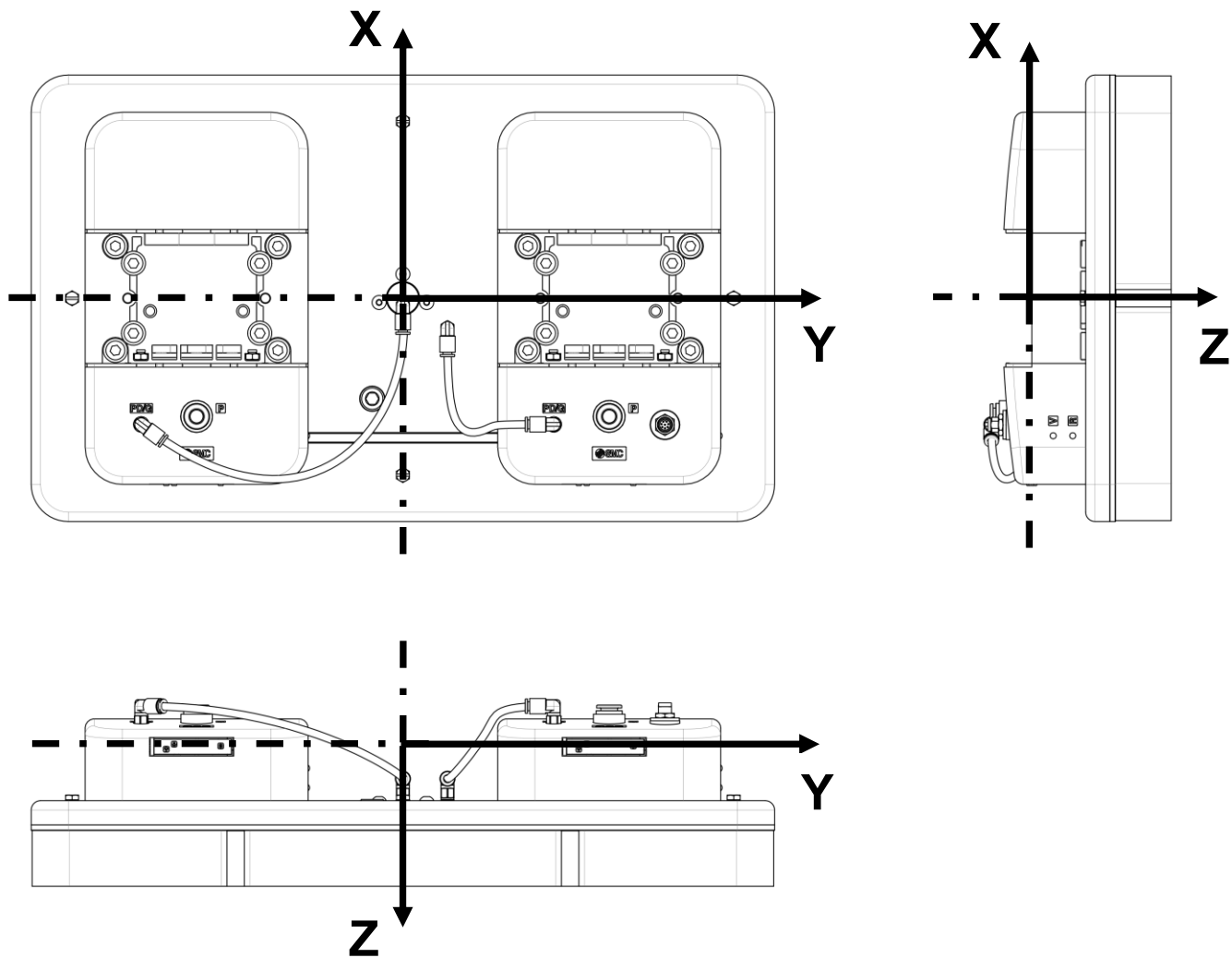
Table 5-5. T.C.P. and C.O.G. (mm)

	ZGS012P*—400240A**—**2*			ZGS012P*—400240B**—**2*		
	Foam thickness 20mm			Foam thickness 30mm		
	X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	-100	0	112	-100	0	122
Center of gravity (C.O.G.)	-91	1	61	-91	1	62

Table 5-6. Weight (kg)

	ZGS012P*—400240***—**2*
	Offset flange + Flange U
Weight	4.7

■ Robot mounting flange: Without robot mounting flange



When using a flange that you prepare yourself, calculate T.C.P., C.O.G and weight using the values in the tables below.

Table 5-7. T.C.P. and C.O.G. (mm)

	ZGS**—400240 A **—** * Foam thickness 20mm			ZGS**—400240 B **—** * Foam thickness 30mm		
	X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	0	0	65	0	0	75
Center of gravity (C.O.G.)	-4	1	28	-4	1	28

Table 5-8. Weight (kg)

	ZGS**—400240***—** * Without robot mounting flange
Weight	3.5

■300mm x 180mm

6.11. Robot mounting flange: Tool plate + Main plate

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

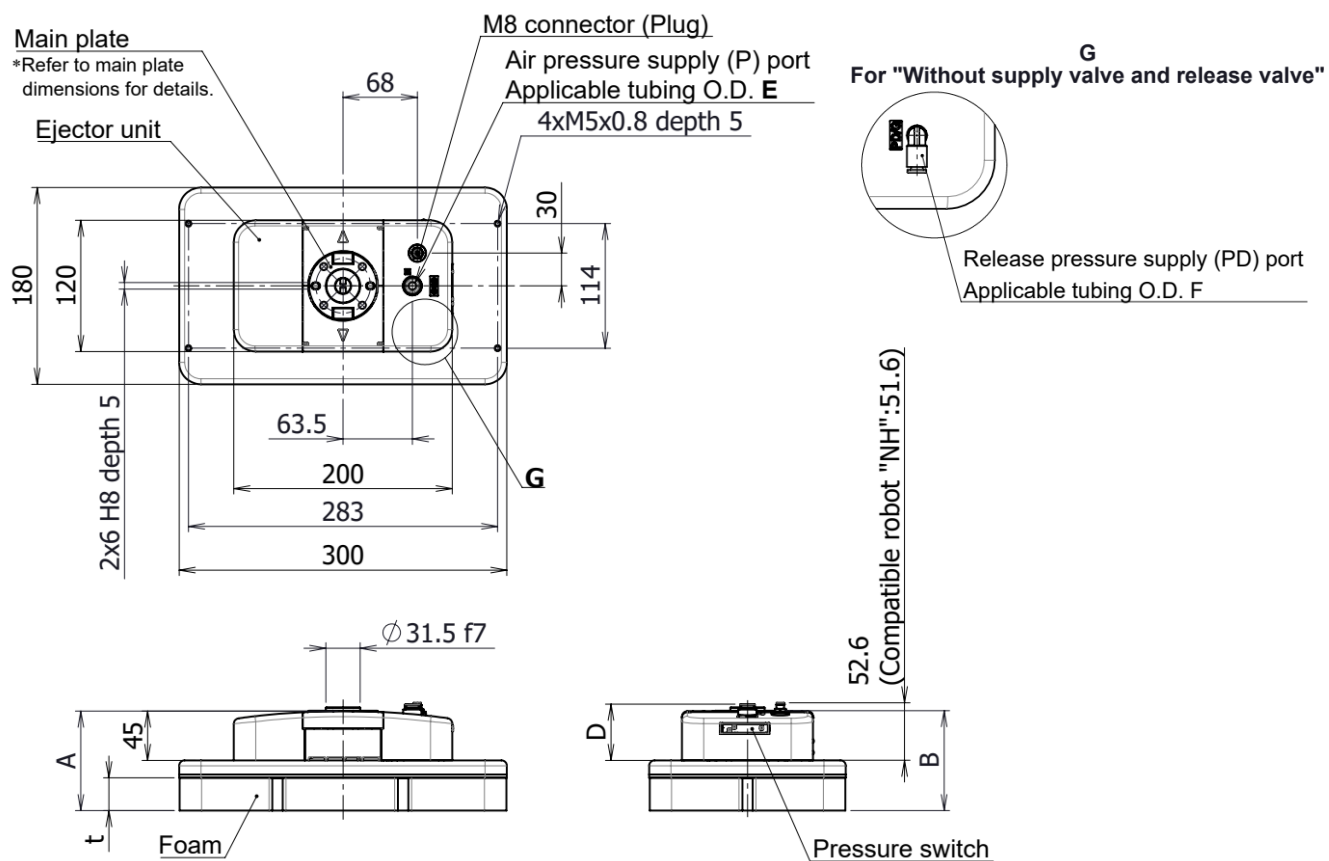
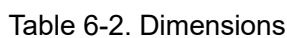


Table 6-1. Dimensions

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

Part no.	D	E	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

■ Compatible robot: 012P (UNIVERSAL ROBOTS)



Part no.	D	E	F
ZGS**-300180***_***C8	51.4	φ8	φ4
ZGS**-300180***_***C10	52	φ10	
ZGS**-300180***_***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***_***N11	51.9	φ3/8"	

6.13. Robot mounting flange: Tool plate + Main plate + Flange Y

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

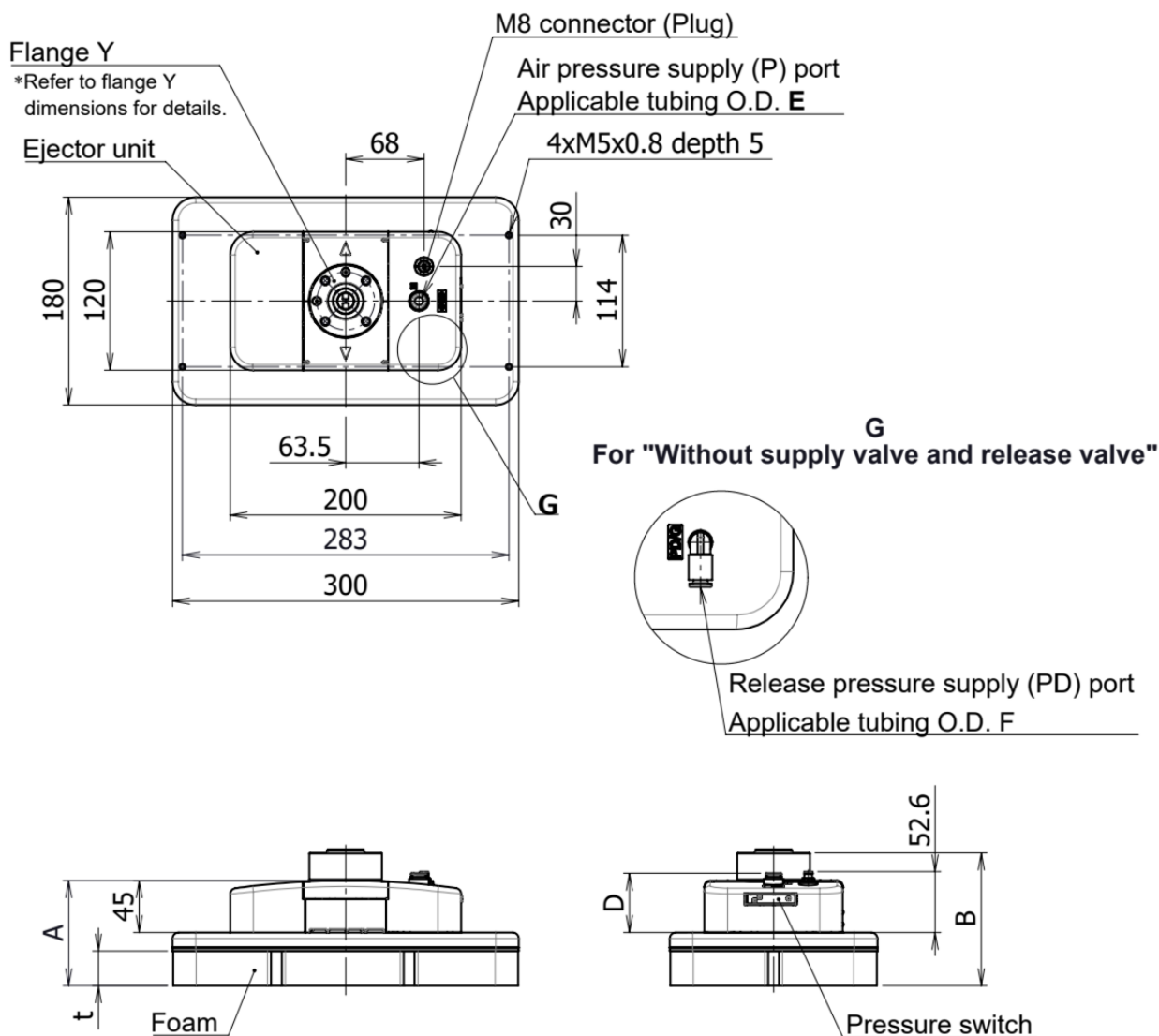


Table 6-3. Dimensions

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	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

6.14. Robot mounting flange: Offset flange

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

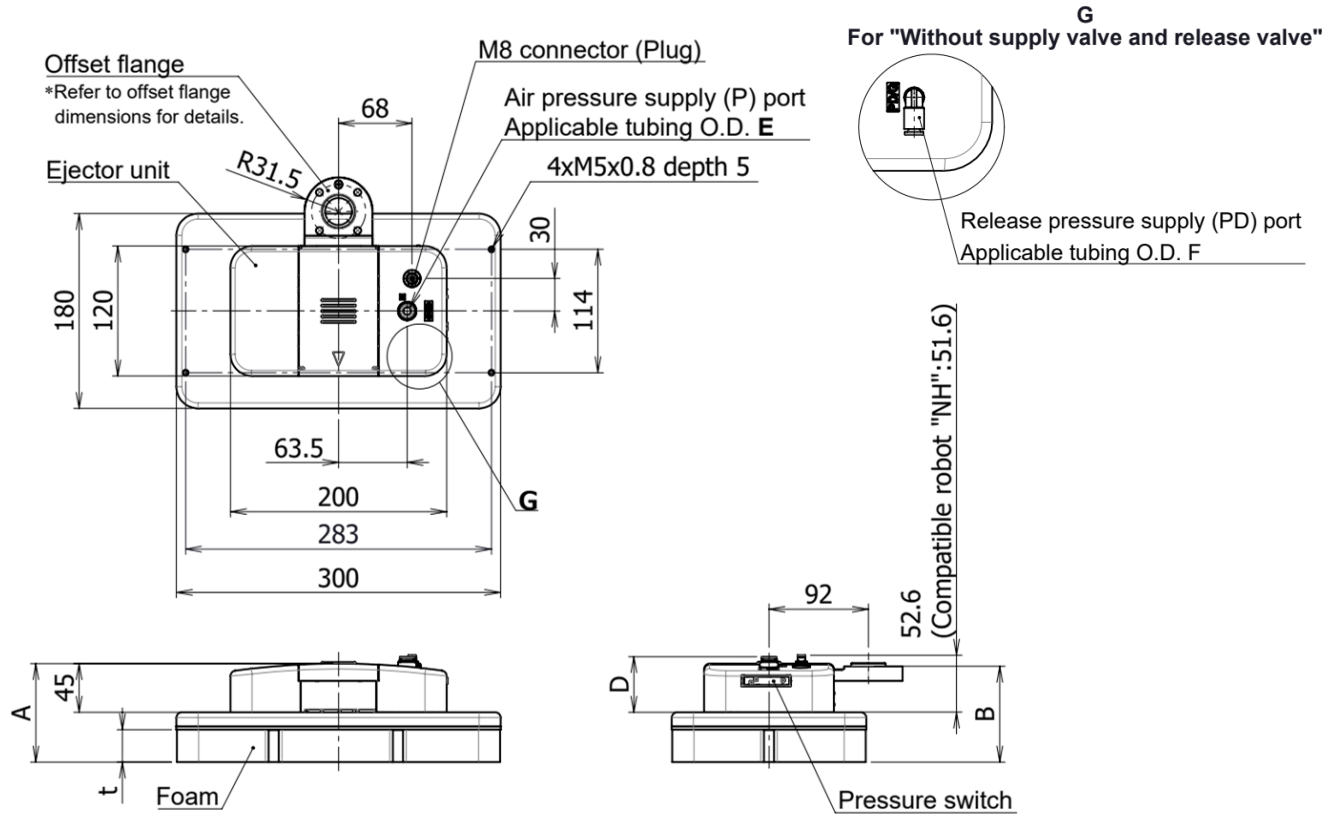


Table 6-4. Dimensions

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

Part no.	D	E	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

6.15. Robot mounting flange: Offset flange + Flange U

Compatible robot: 012P (UNIVERSAL ROBOTS)

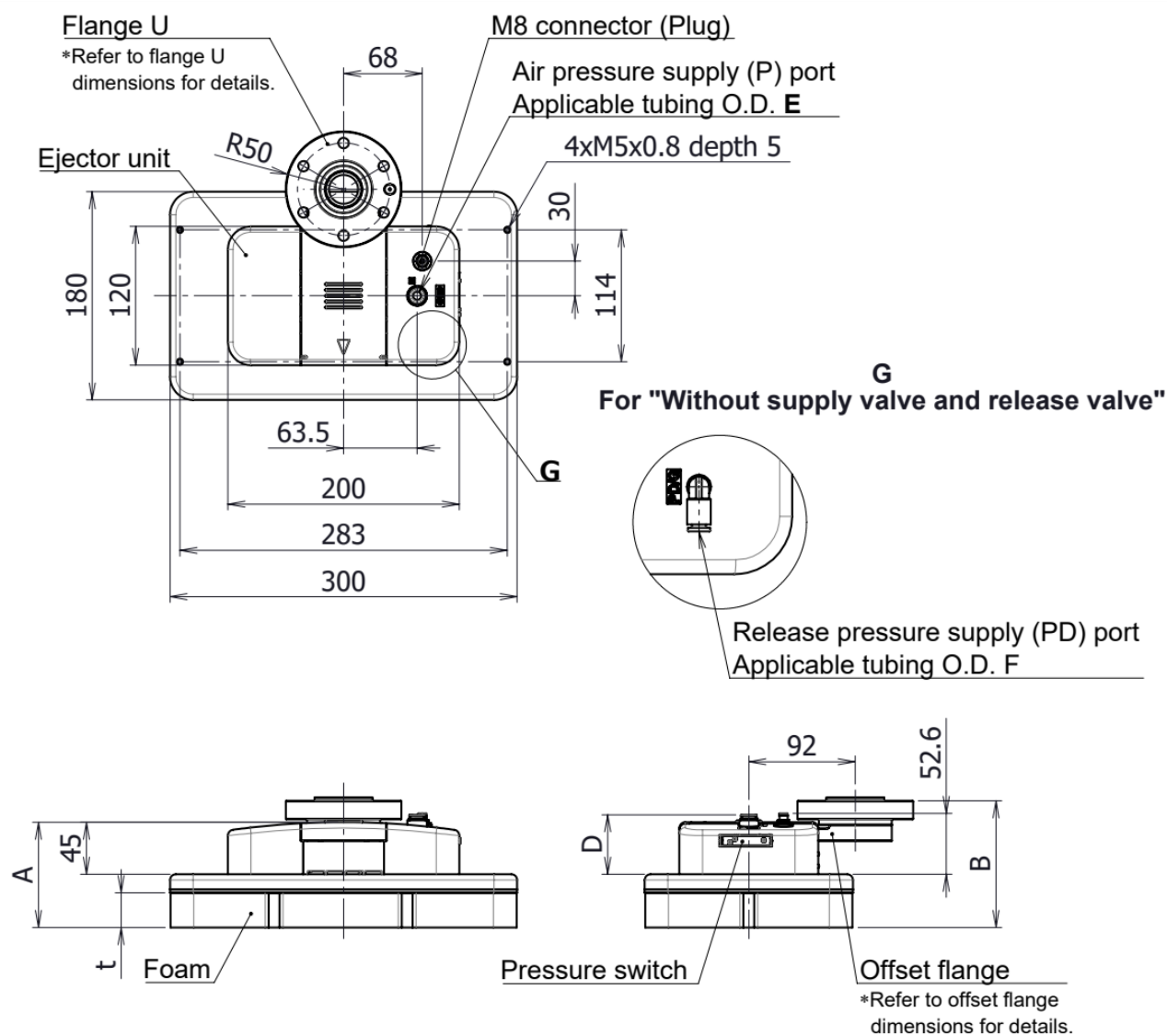


Table 6-5. Dimensions

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

Part no.	D	E	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

6.16. Robot mounting flange: Offset flange + Flange Y

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

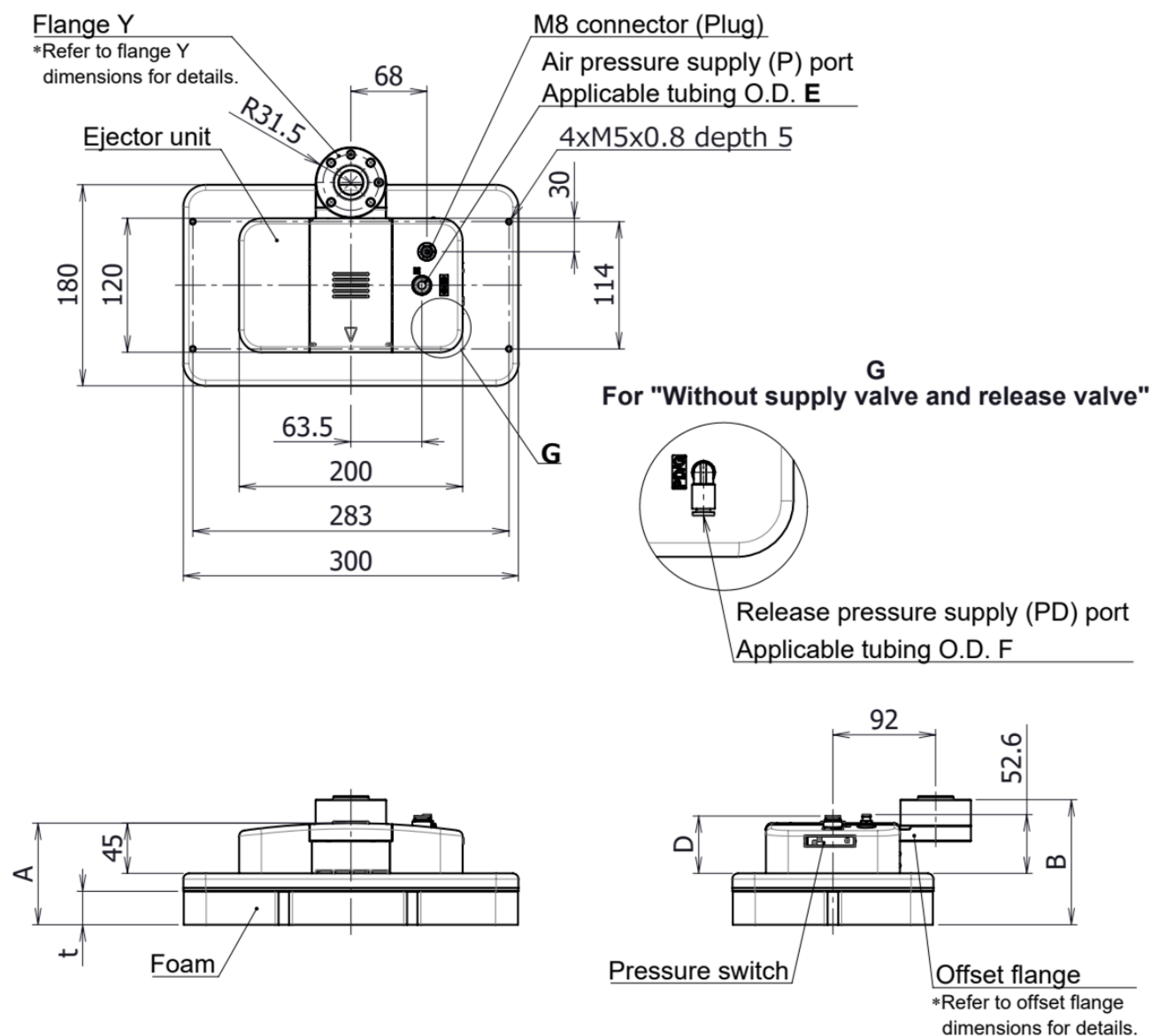


Table 6-6. Dimensions

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	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

6.17. Robot mounting flange: Straight flange

- Compatible robot: NP/NN/NH (General purpose)
 - : 011P (UNIVERSAL ROBOTS)
 - : 043P/043N (YASKAWA Electric)
 - : 051P (FANUC)

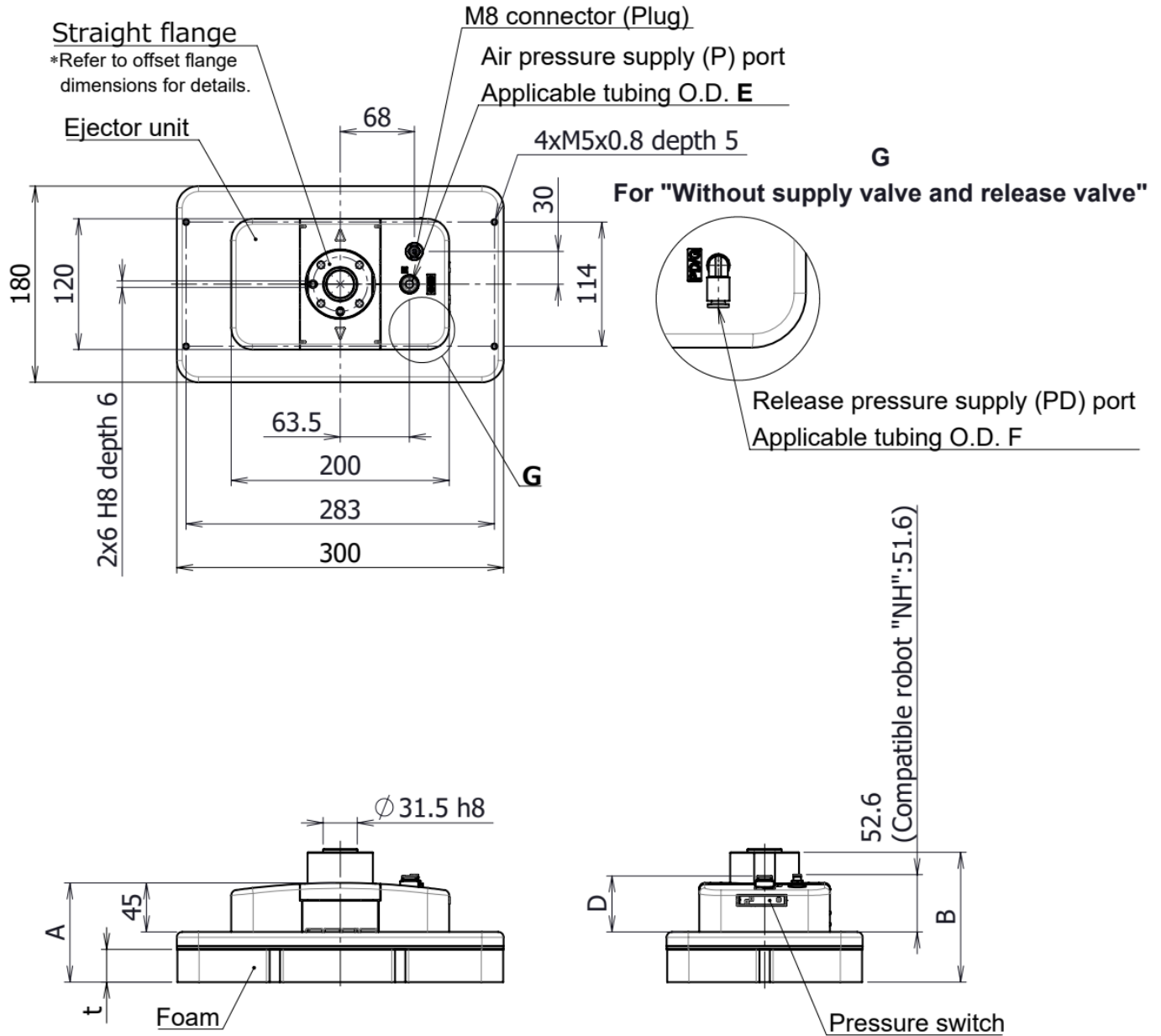


Table 6-7. Dimensions

Part no.	t	A	B
ZGS**-300180A**-**4*	20	81	109
ZGS**-300180B**-**4*	30	91	119

Part no.	D	E	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

6.18. Robot mounting flange: Straight flange + Flange U

Compatible robot: 012P (UNIVERSAL ROBOTS)

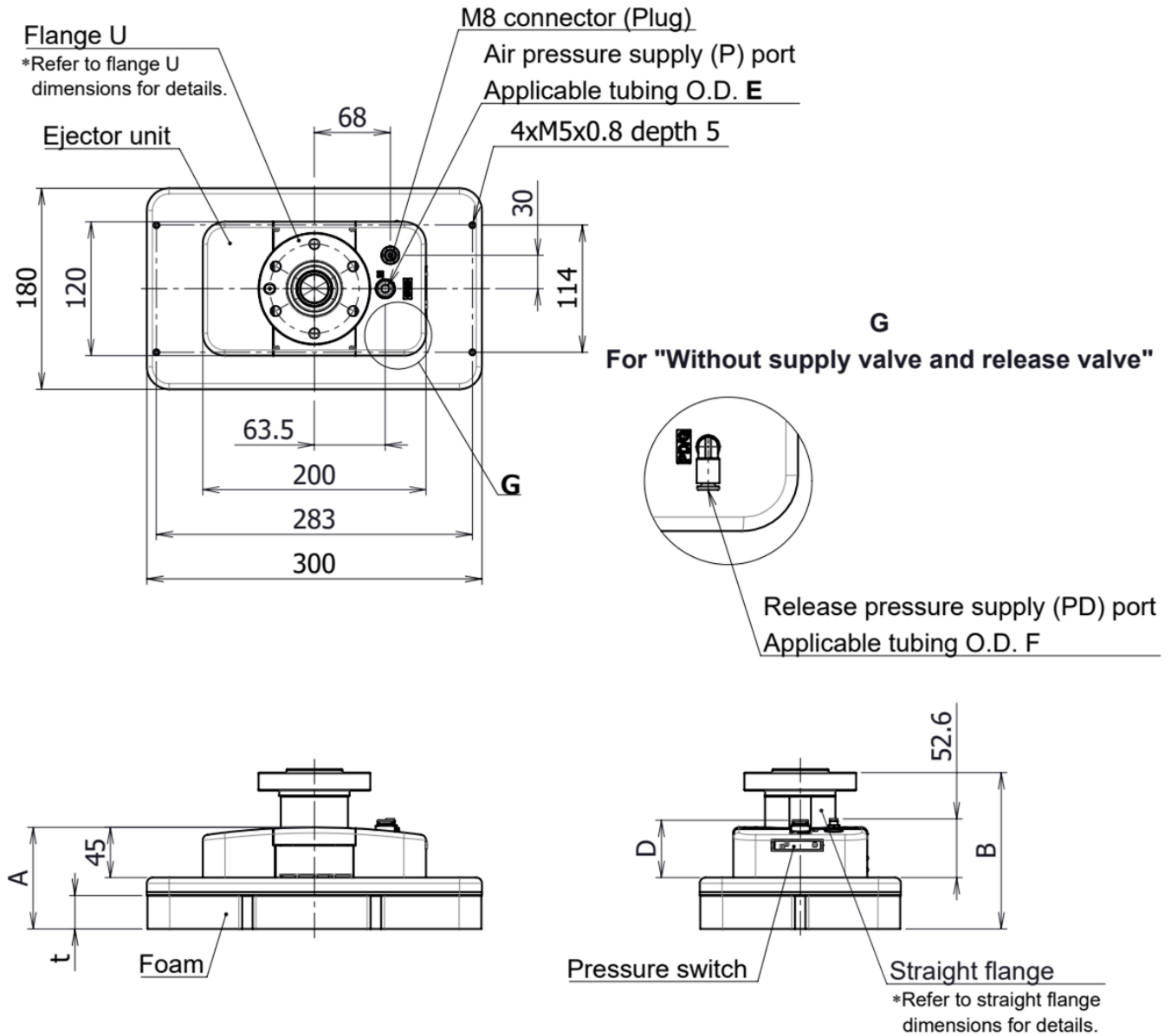


Table 6-8. Dimensions

Part no.	t	A	B
ZGS012P*-300180A**-**4*	20	81	130
ZGS012P*-300180B**-**4*	30	91	140

Part no.	D	E	F
ZGS**-300180***-***C8	51.4	φ8	φ4
ZGS**-300180***-***C10	52	φ10	
ZGS**-300180***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-***N11	51.9	φ3/8"	

6.19. Robot mounting flange: Without robot mounting flange

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

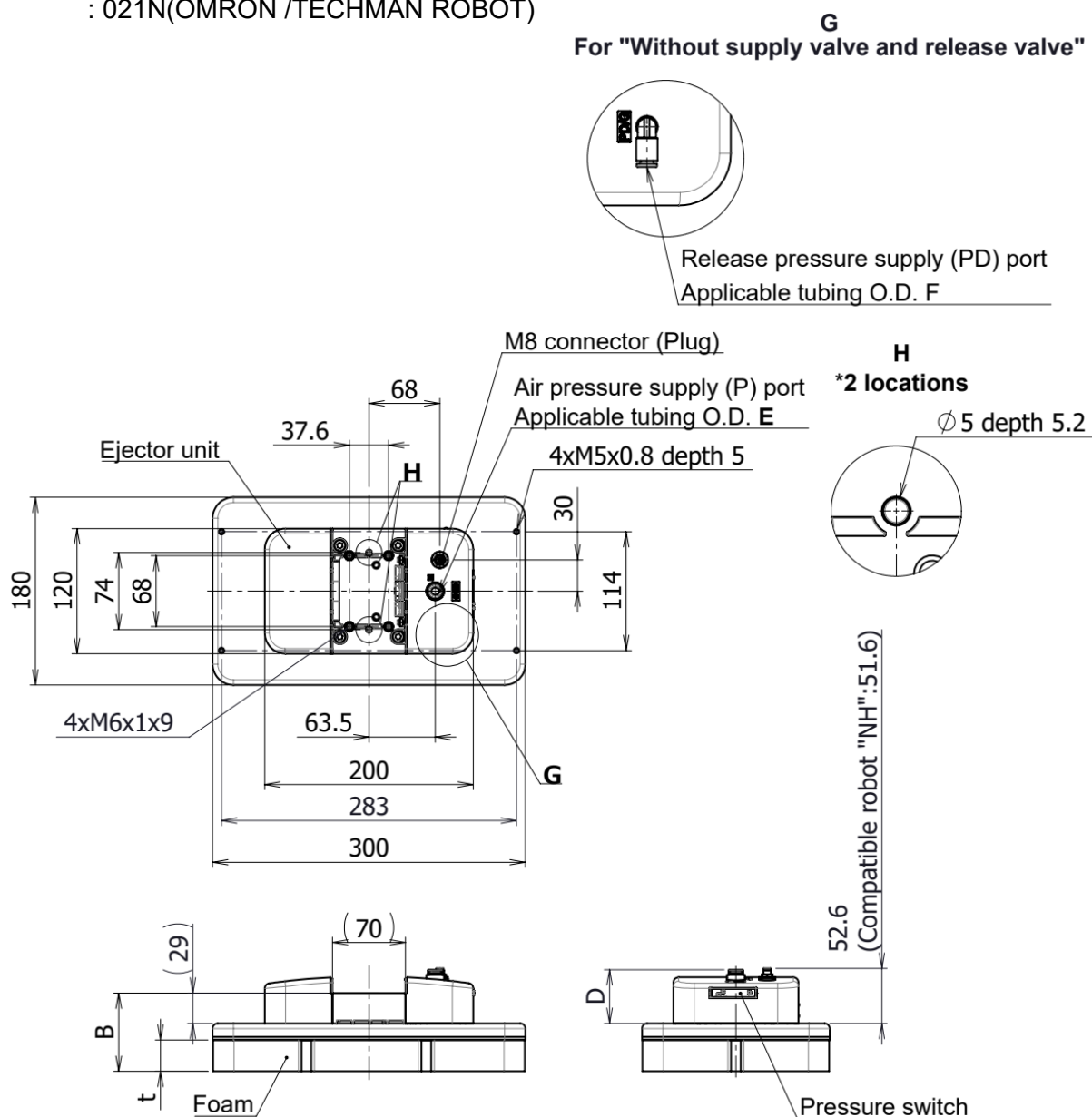


Table 6-9. Dimensions

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

Part no.	D	E	F
ZGS**-300180***-**_C8	51.4	φ8	φ4
ZGS**-300180***-**_C10	52	φ10	
ZGS**-300180***-**_N9	51.4	φ5/16"	φ1/8"
ZGS**-300180***-**_N11	51.9	φ3/8"	

■200mm x 120mm

6.20. Robot mounting flange: Tool plate + Main plate

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

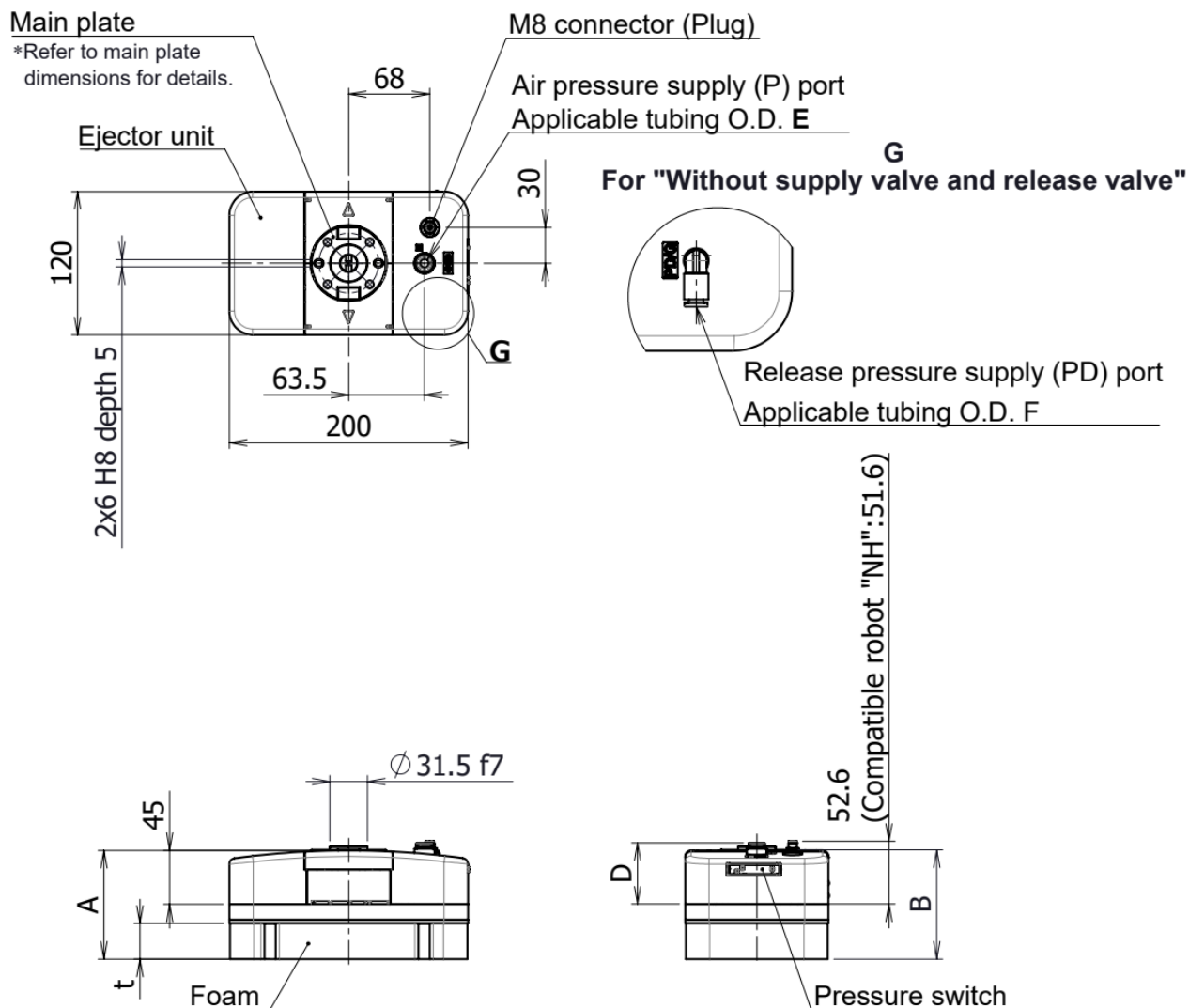


Table 6-10. Dimensions

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

Part no.	D	E	F
ZGS**-200120***-***C8	51.4	$\phi 8$	$\phi 4$
ZGS**-200120***-***C10	52	$\phi 10$	
ZGS**-200120***-***N9	51.4	$\phi 5/16"$	$\phi 1/8"$
ZGS**-200120***-***N11	51.9	$\phi 3/8"$	

6.21. Robot mounting flange: Tool plate + Main plate + Flange U

Compatible robot: 012P (UNIVERSAL ROBOTS)

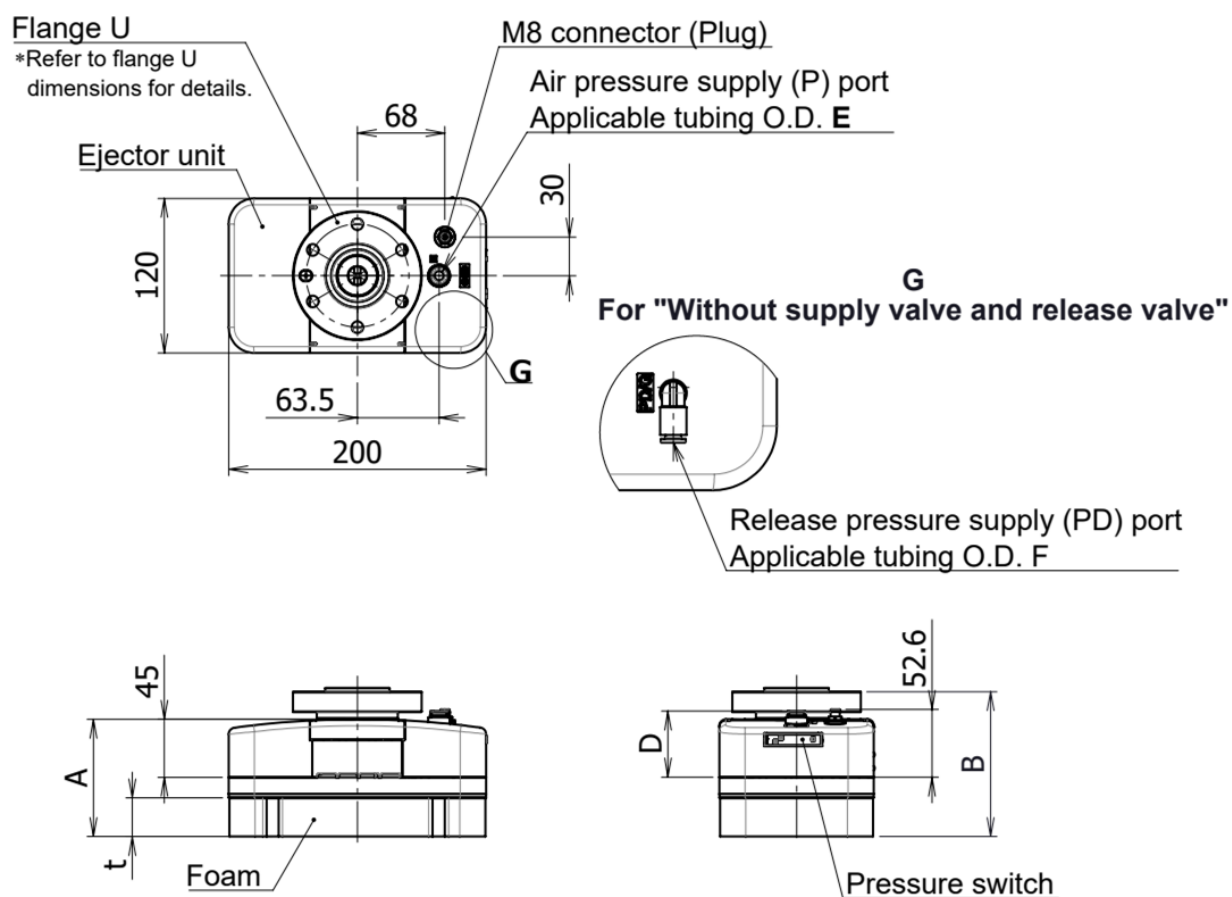


Table 6-11. Dimensions

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

Part no.	D	E	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

6.22. Robot mounting flange: Tool plate + Main plate + Flange Y

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

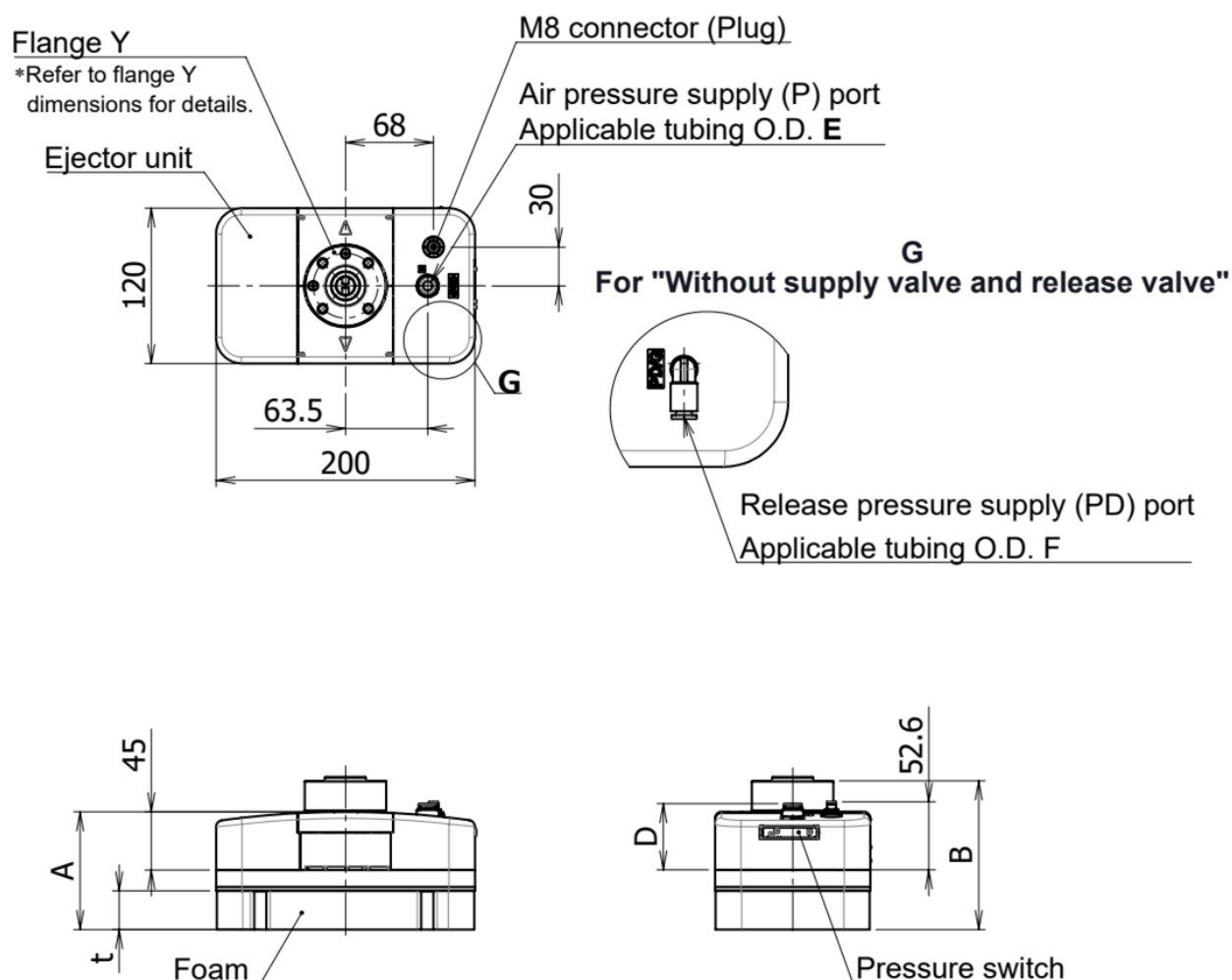


Table 6-12. Dimensions

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	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

6.23. Robot mounting flange: Offset flange

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

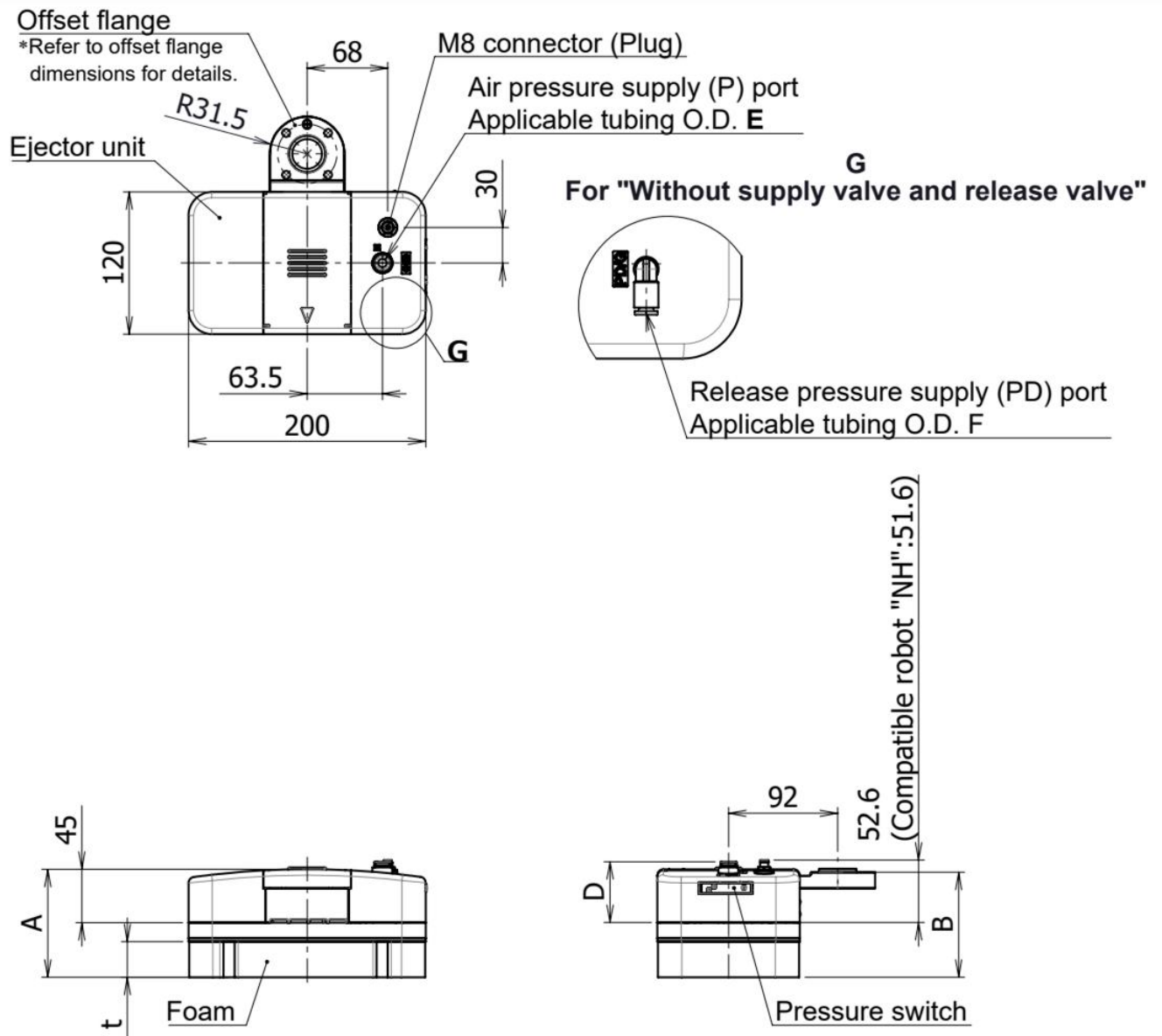


Table 6-13. Dimensions

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

Part no.	D	E	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

6.24. Robot mounting flange: Offset flange + Flange U

■ Compatible robot: 012P (UNIVERSAL ROBOTS)

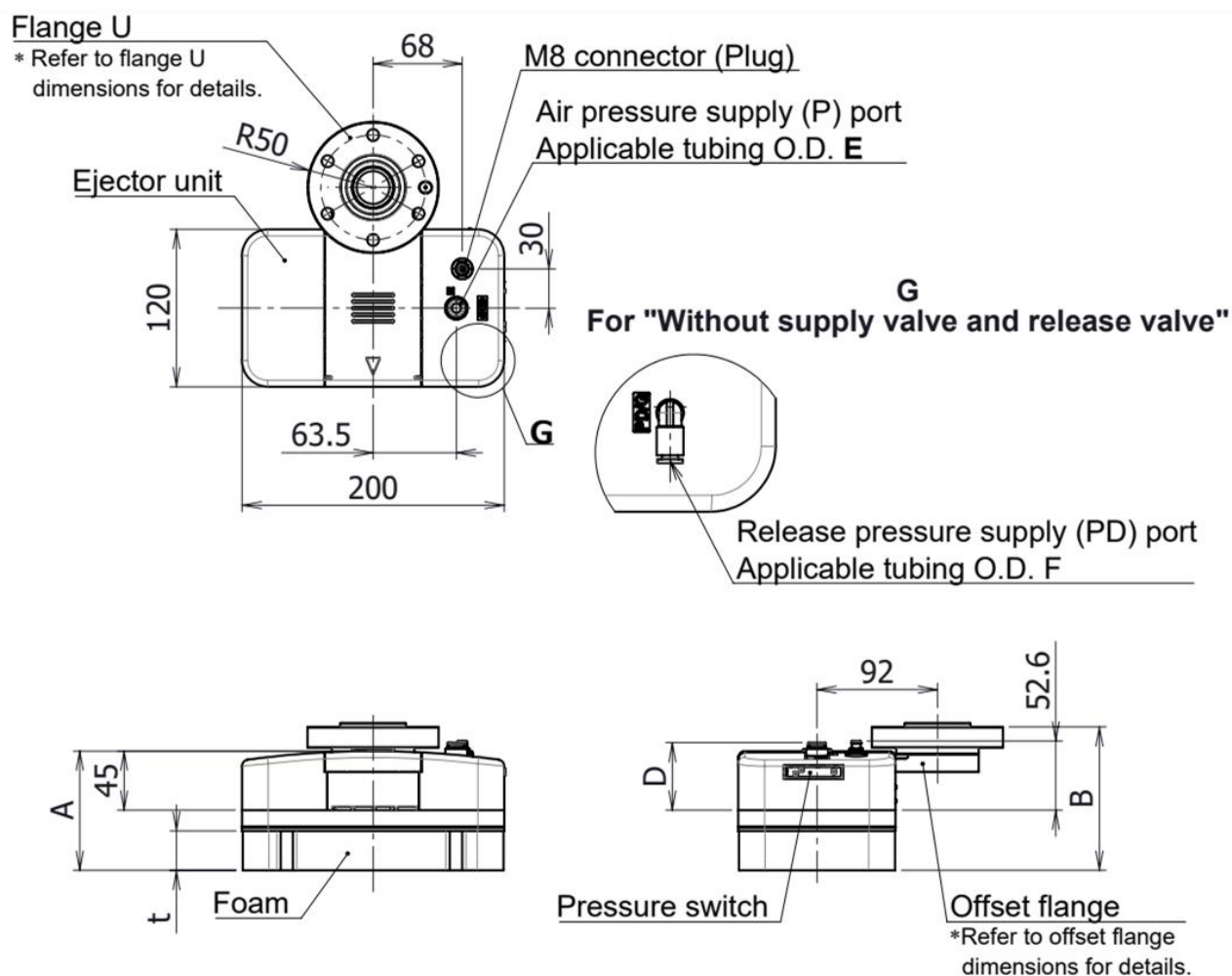


Table 6-14. Dimensions

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

Part no.	D	E	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

6.25. Robot mounting flange: Offset flange + Flange Y

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

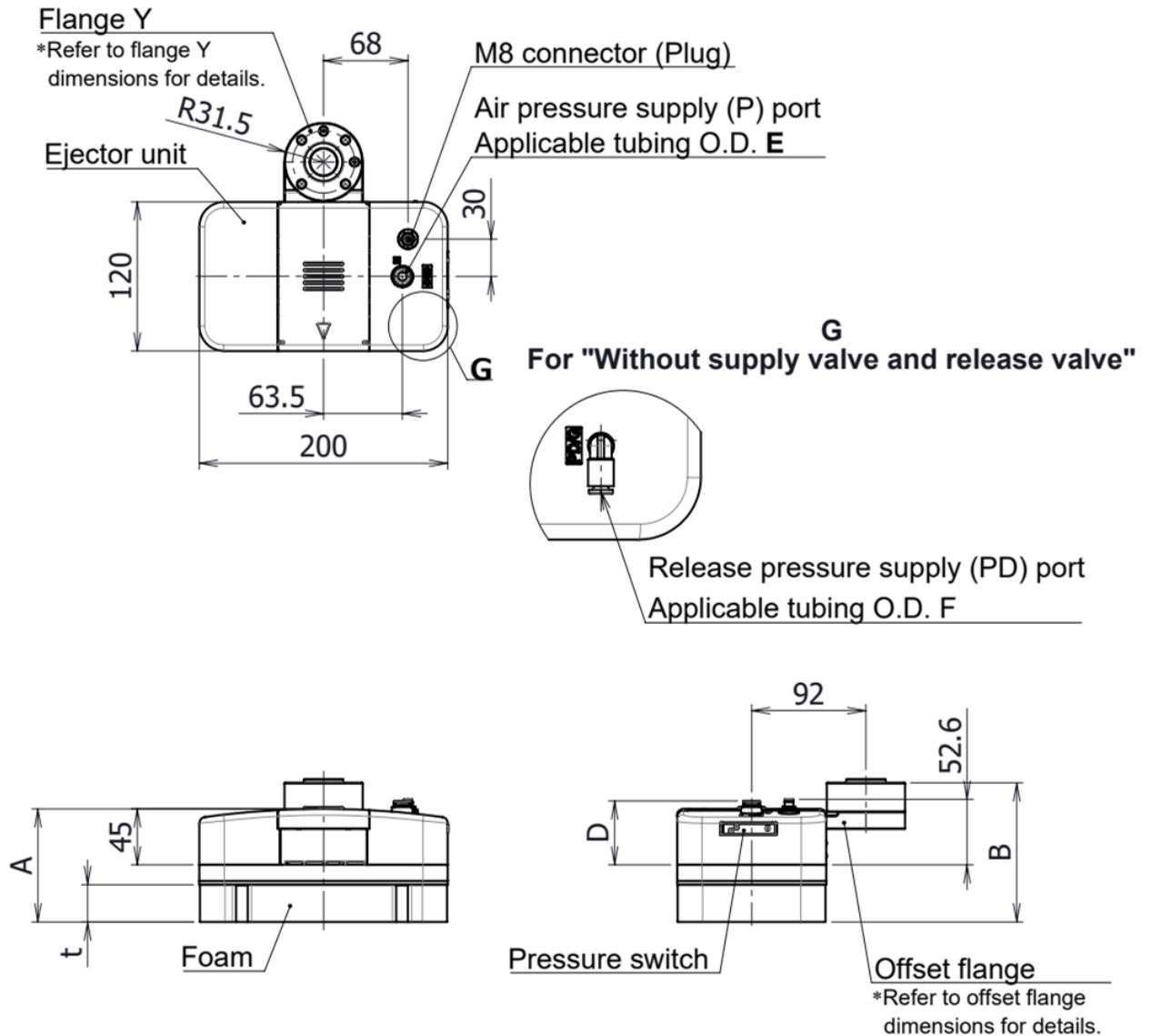
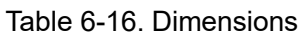


Table 6-15. Dimensions

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	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

- Compatible robot: NP/NN/NH (General purpose)
 - : 011P (UNIVERSAL ROBOTS)
 - : 043P/043N (YASKAWA Electric)
 - : 051P (FANUC)



Part no.	D	E	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

6.27. Robot mounting flange: Straight flange + Flange U

■ Compatible robot: 012P (UNIVERSAL ROBOTS)

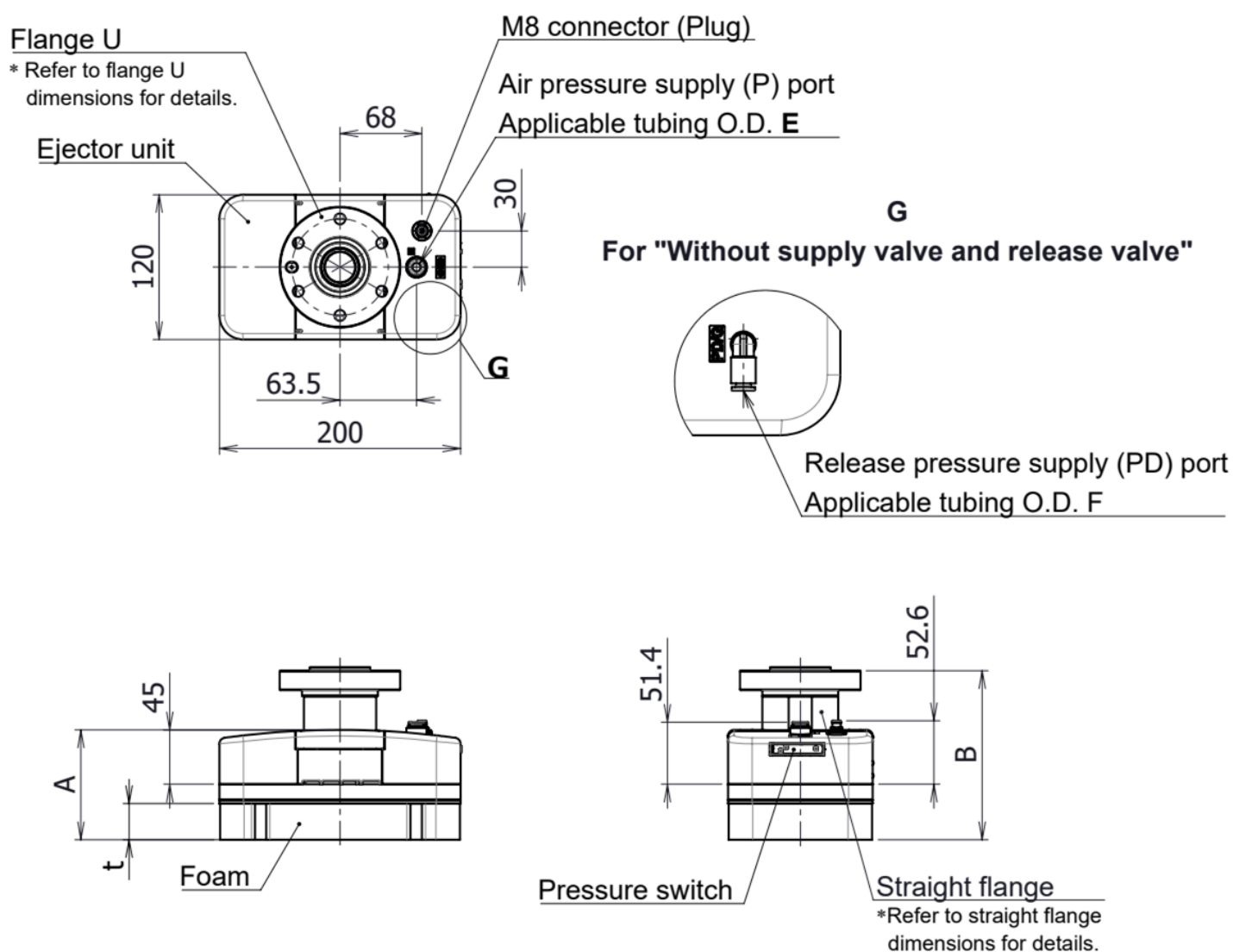


Table 6-17. Dimensions

Part no.	t	A	B
ZGS012P*-200120A**-**4*	20	81	130
ZGS012P*-200120B**-**4*	30	91	140

Part no.	D	E	F
ZGS**-200120***-***C8	51.4	φ8	φ4
ZGS**-200120***-***C10	52	φ10	
ZGS**-200120***-***N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-***N11	51.9	φ3/8"	

6.28. Robot mounting flange: Without robot mounting flange

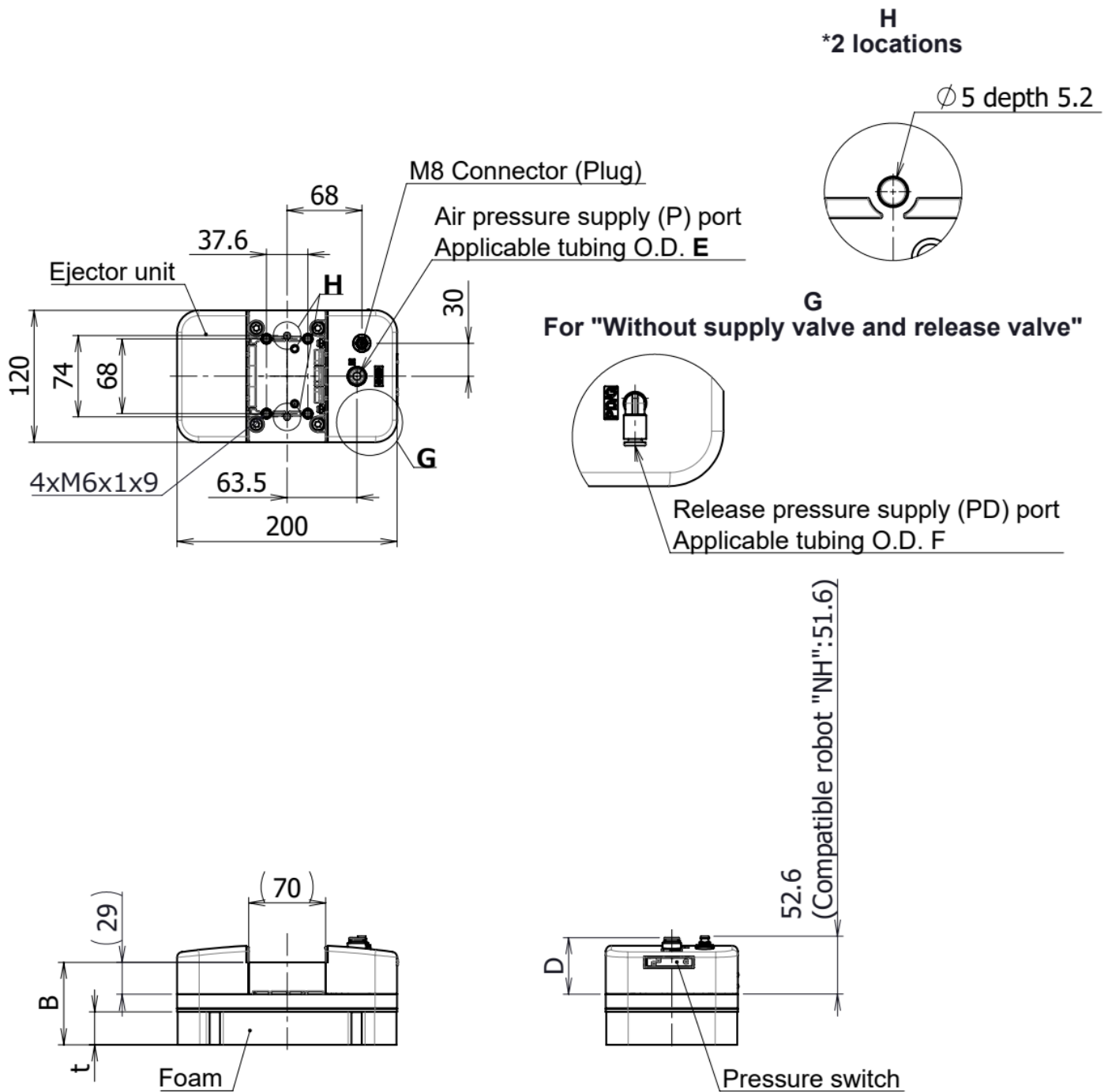


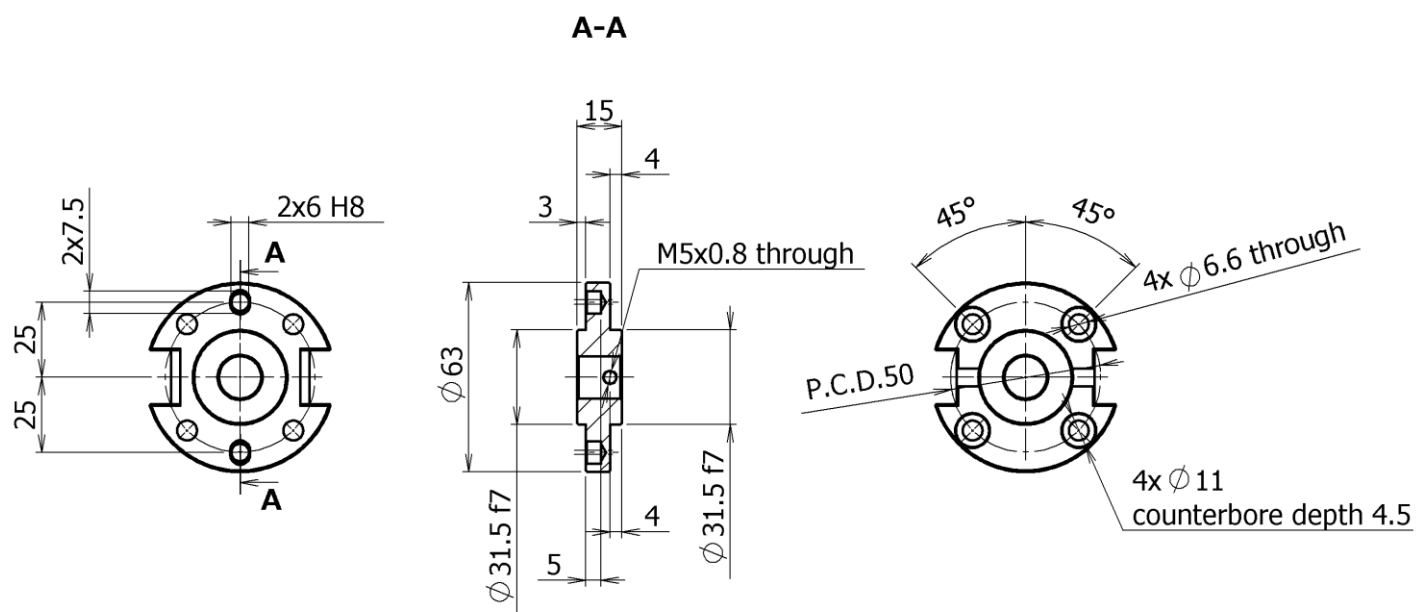
Table 6-18. Dimensions

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

Part no.	D	E	F
ZGS**-200120***-**_C8	51.4	φ8	φ4
ZGS**-200120***-**_C10	52	φ10	
ZGS**-200120***-**_N9	51.4	φ5/16"	φ1/8"
ZGS**-200120***-**_N11	51.9	φ3/8"	

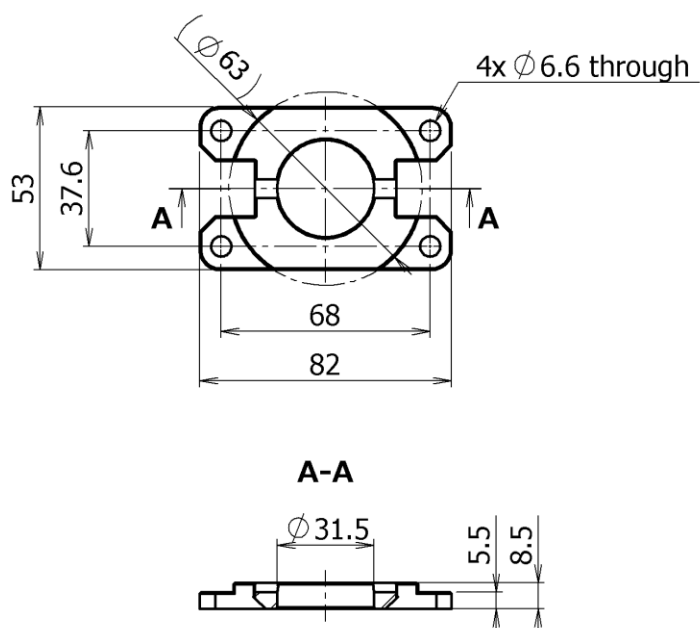
6.29. Main plate

■ Regarding part number, refer to “Replacement part number” table below.



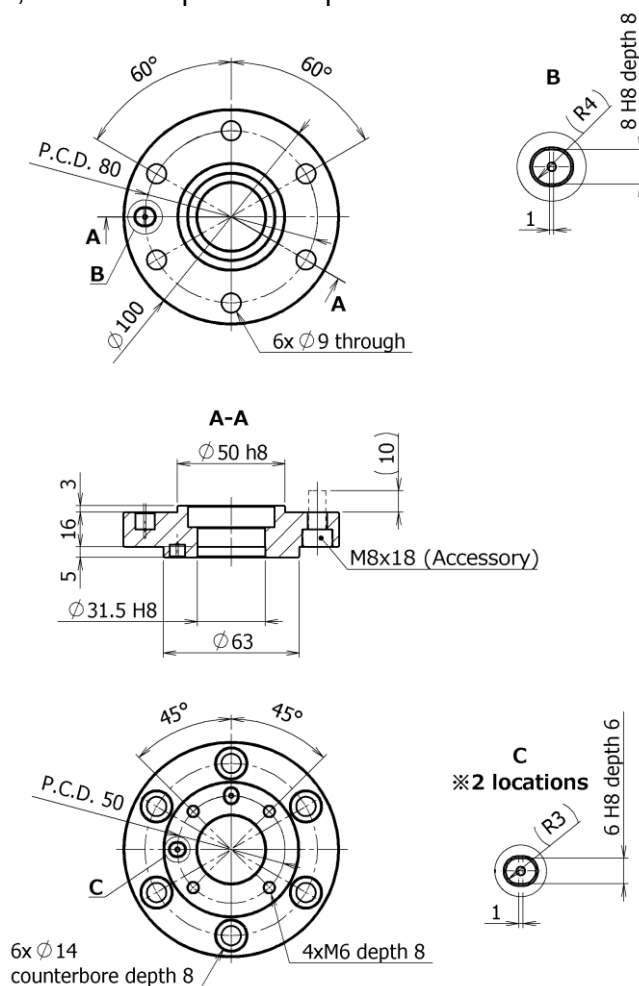
6.30. Tool plate

■ Regarding part number, refer to “Replacement part number” table below.



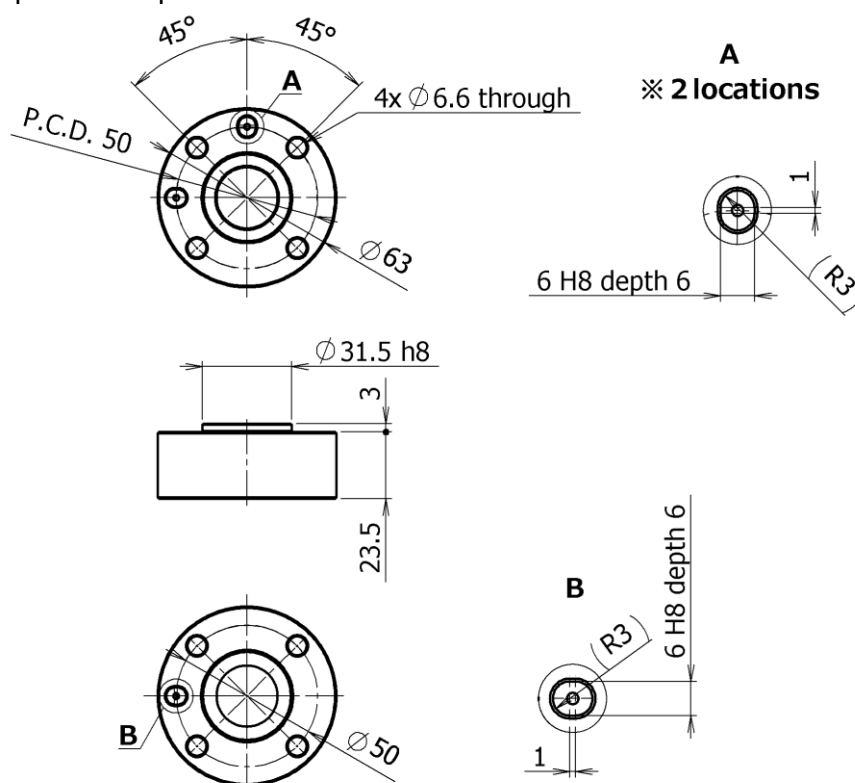
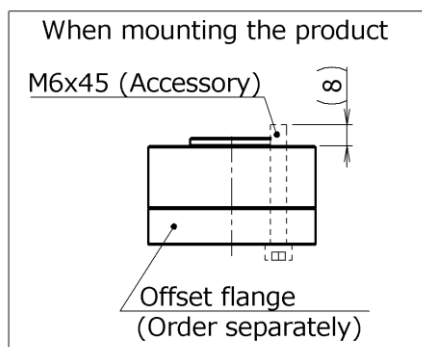
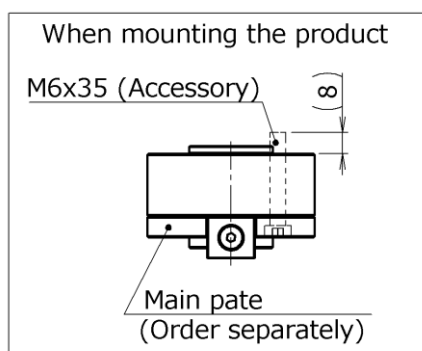
6.31. Flange U

■ Regarding part number, refer to “Replacement part number” table below.



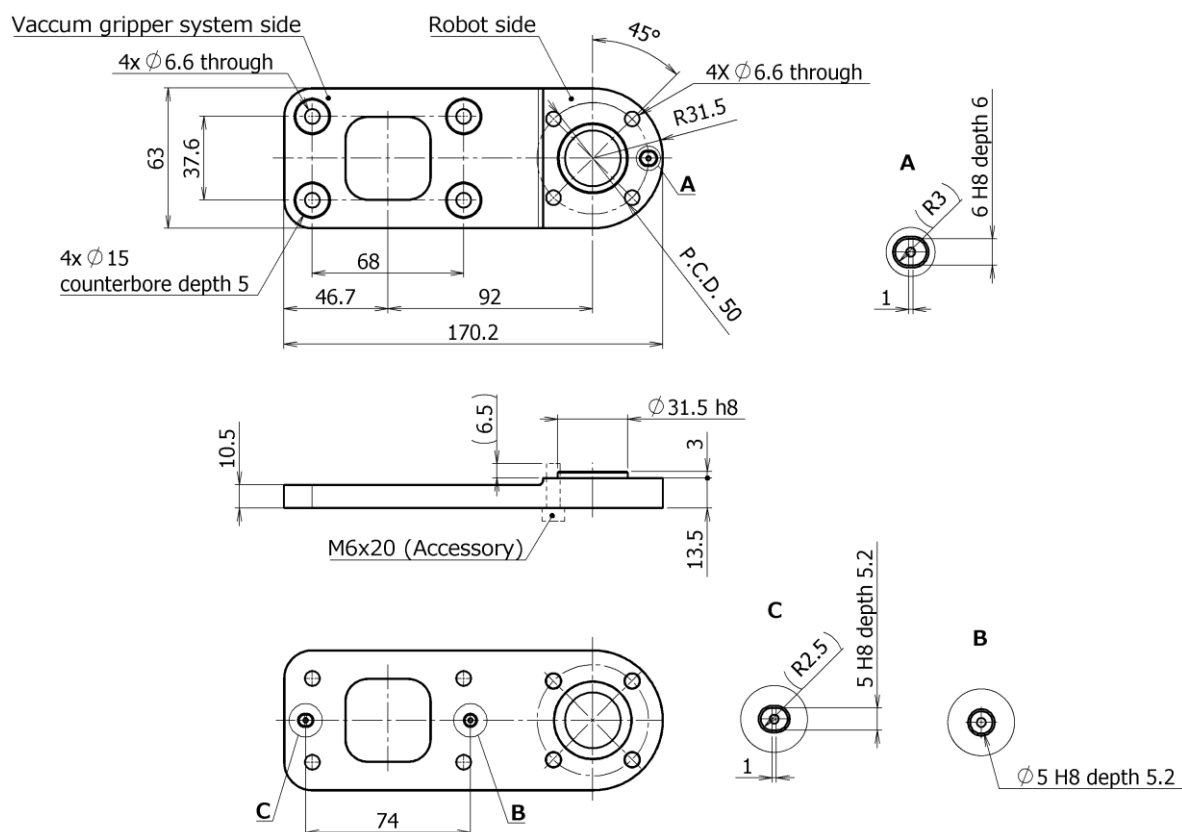
6.32. Flange Y

■ Regarding part number, refer to “Replacement part number” table below.



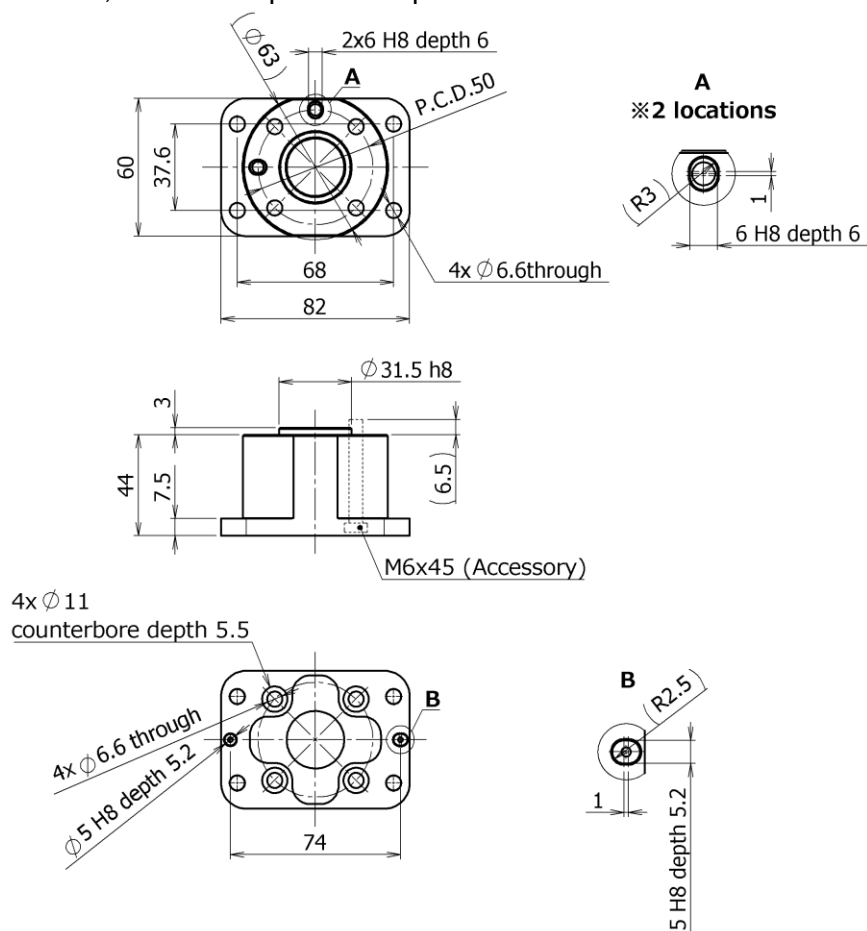
6.33. Offset flange

■ Regarding part number, refer to “Replacement part number” table below.



6.34. Straight flange

■ Regarding part number, refer to “Replacement part number” table below.



6.35. Tool center point (T.C.P.), Center of gravity (C.O.G.) and Weight

■300mm x 180mm

■Robot mounting flange: Tool plate + Main plate

Fig 1. Tool plate + Main plate

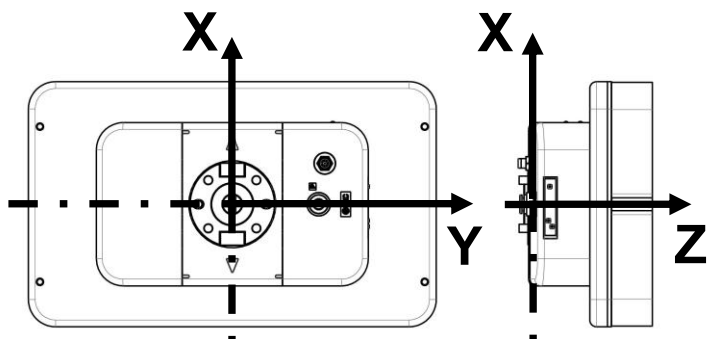


Fig 2. Tool plate + Main plate + Flange U

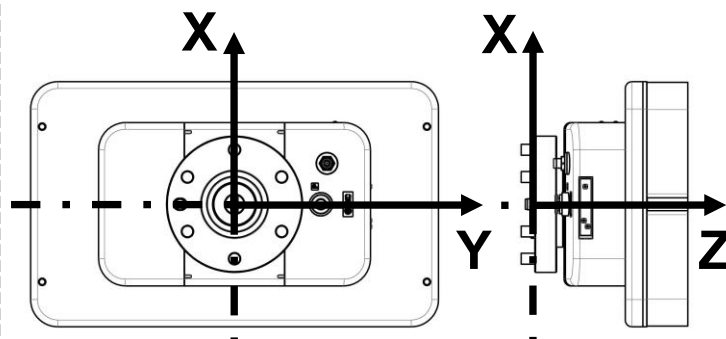


Fig 3. Tool plate + Main plate + Flange Y

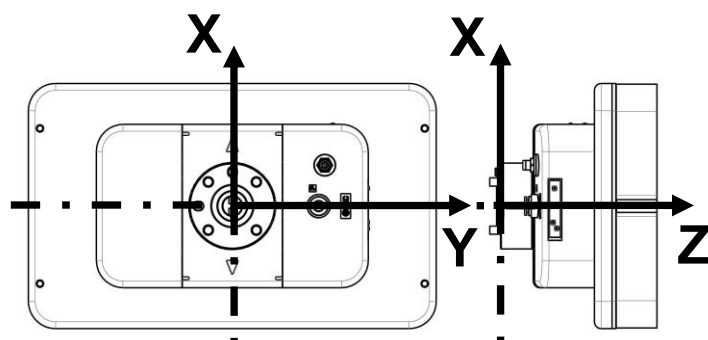


Table 7-1. T.C.P. and C.O.G.

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

Table 7-2. Weight

		(kg)	
		ZGS**—300180***—**1*	ZGS**—300180***—**3*
		With Tool plate and main plate	Tool plate
Weight	Fig 1	1.8	1.75
	Fig 2	2.3	
	Fig 3	2.1	

■ Robot mounting flange: Offset flange

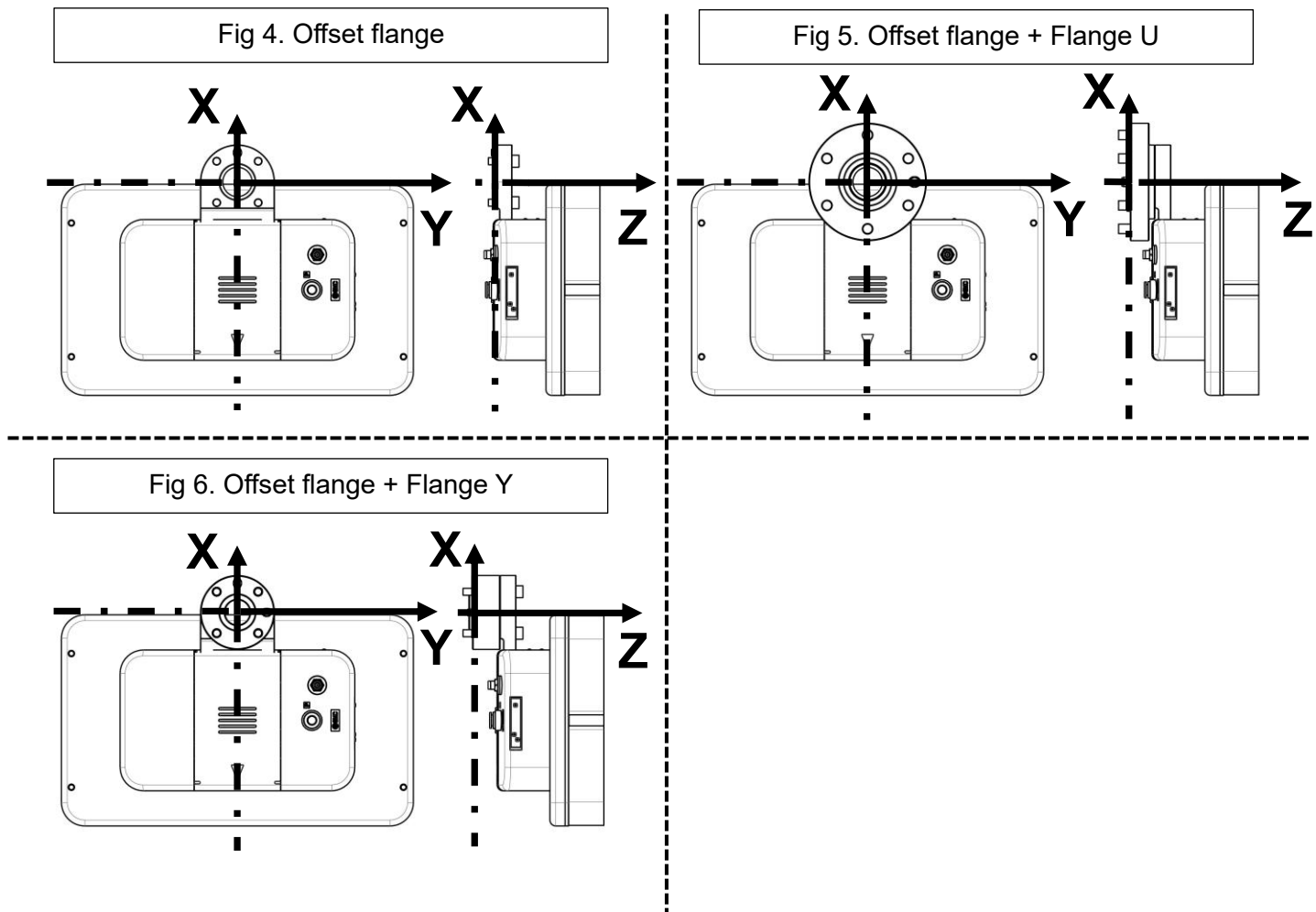


Table 7-3. T.C.P. and C.O.G.

		(mm)					
		ZGS**—300180A**—**2* Foam thickness 20mm			ZGS**—300180B**—**2* Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 4	-92	0	78.5	-92	0	88.5
	Fig 5	-92	0	99.5	-92	0	109.5
	Fig 6	-92	0	102	-92	0	112
Center of gravity (C.O.G.)	Fig 4	-85	3	35	-85	3	36
	Fig 5	-70	3	48	-70	3	49
	Fig 6	-78	3	55	-78	3	56

Table 7-4. Weight

		(kg)
		ZGS**—300180***—**2* With Offset flange
Weight	Fig 4	2.0
	Fig 5	2.4
	Fig 6	2.2

■ Robot mounting flange: Straight flange

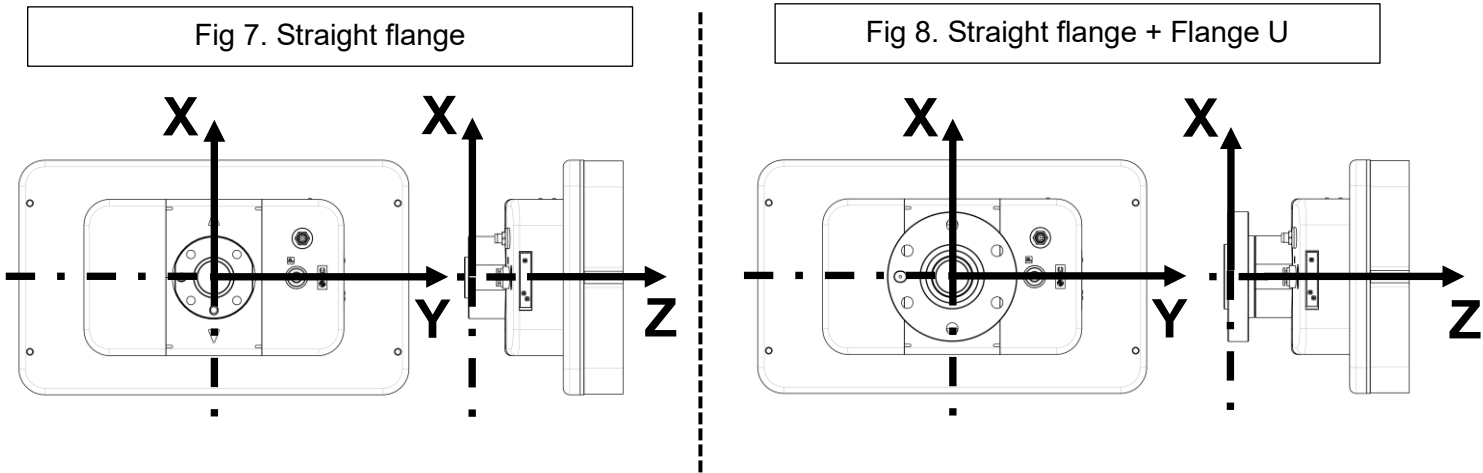


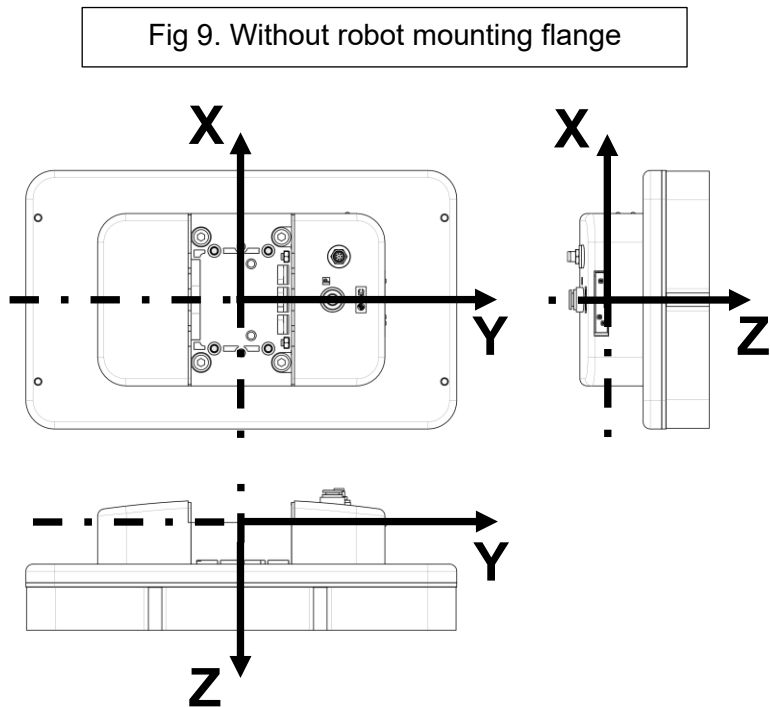
Table 7-5. T.C.P. and C.O.G. (mm)

		ZGS**—300180 ^{A**—**4*} Foam thickness 20mm			ZGS**—300180 ^{B**—**4*} Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 7	0	0	109	0	0	119
	Fig 8	0	0	130	0	0	140
Center of gravity (C.O.G.)	Fig 7	0	3	64	0	3	65
	Fig 8	0	2	72	0	2	73

Table 7-6. Weight (kg)

		ZGS**—300180***—**4* With Straight flange
Weight	Fig 7	1.9
	Fig 8	2.3

■ Robot mounting flange: Without robot mounting flange



When using a flange that you prepare yourself, calculate T.C.P., C.O.G and weight using the values in the tables below.

Table 7-7. T.C.P. and C.O.G. (mm)

		ZGS**—300180A**—** * Foam thickness 20mm			ZGS**—300180B**—** * Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 9	0	0	65	0	0	75
Center of gravity (C.O.G.)	Fig 9	1	3	28	1	3	29

Table 7-8. Weight (kg)

		ZGS**—300180***—** * Without robot mounting flange
Weight	Fig 9	1.7

■200mm x 120mm

■Robot mounting flange: Tool plate + Main plate

Fig 10. Tool plate + Main plate

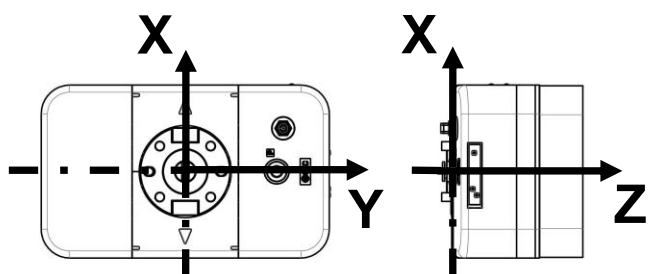


Fig 11. Tool plate + Main plate + Flange U

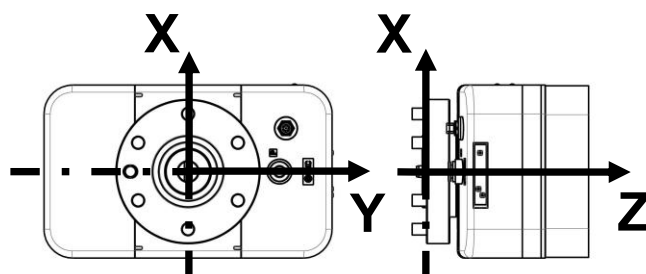


Fig 12. Tool plate + Main plate + Flange Y

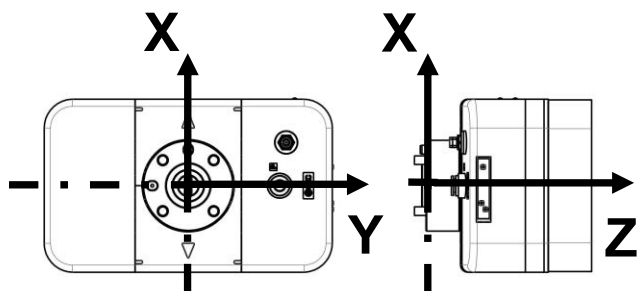


Table 7-9. T.C.P. and C.O.G.

(mm)

		ZGS**—200120 A **—** 1 *			ZGS**—200120 B **—** 1 *		
		Foam thickness 20mm			Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 10	0	0	81.5	0	0	91.5
	Fig 11	0	0	102.5	0	0	112.5
	Fig 12	0	0	105	0	0	115
Center of gravity (C.O.G.)	Fig 10	1	4	33	1	4	34
	Fig 11	0	3	43	0	3	44
	Fig 12	1	4	51	1	4	52

Table 7-10. Weight

(kg)

		ZGS**—200120***—** 1 *	ZGS**—200120***—** 3 *
		With Tool plate and main plate	Tool plate
Weight	Fig 10	1.3	1.25
	Fig 11	1.8	
	Fig 12	1.6	

■ Robot mounting flange: Offset flange

Fig 13. Offset flange

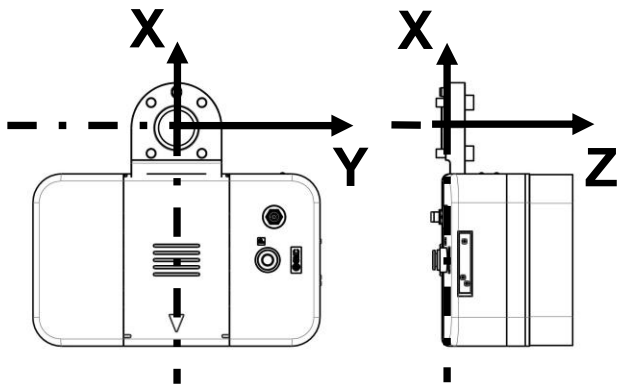


Fig 14. Offset flange + Flange U

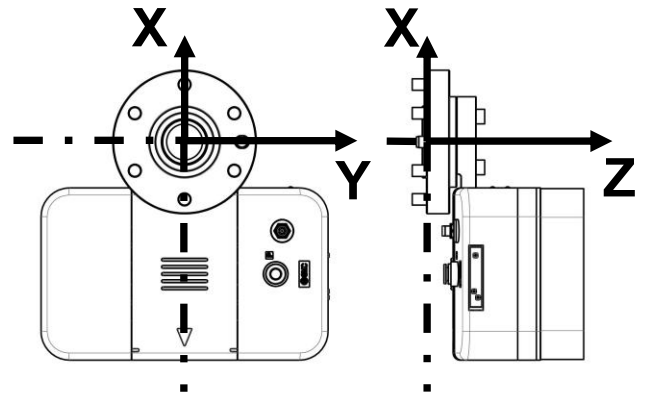


Fig 15. Offset flange + Flange Y

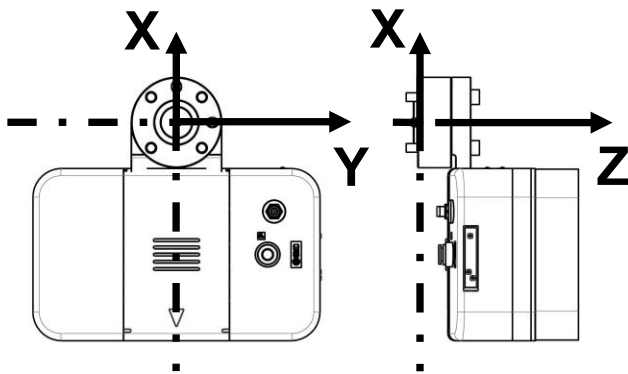


Table 7-11. T.C.P. and C.O.G.

(mm)

		ZGS**—200120 A **—** 2 *			ZGS**—200120 B **—** 2 *		
		Foam thickness 20mm			Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 13	-92	0	78.5	-92	0	88.5
	Fig 14	-92	0	99.5	-92	0	109.5
	Fig 15	-92	0	102	-92	0	112
Center of gravity (C.O.G.)	Fig 13	-83	4	29	-83	4	30
	Fig 14	-65	3	40	-65	3	41
	Fig 15	-74	4	47	-74	4	48

Table 7-12. Weight

(kg)

		ZGS**—200120***—** 2 *
		With Offset flange
Weight	Fig 13	1.5
	Fig 14	1.9
	Fig 15	1.7

■ Robot mounting flange: Straight flange

Fig 16. Straight flange

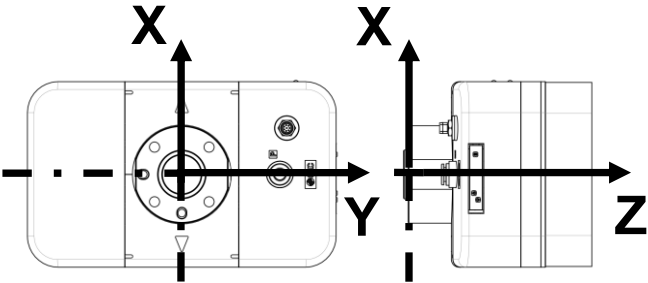


Fig 17. Straight flange + Flange U

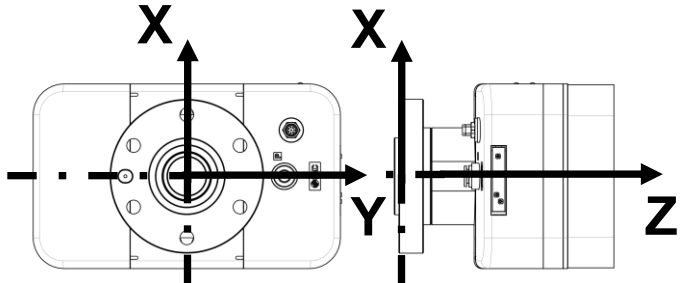


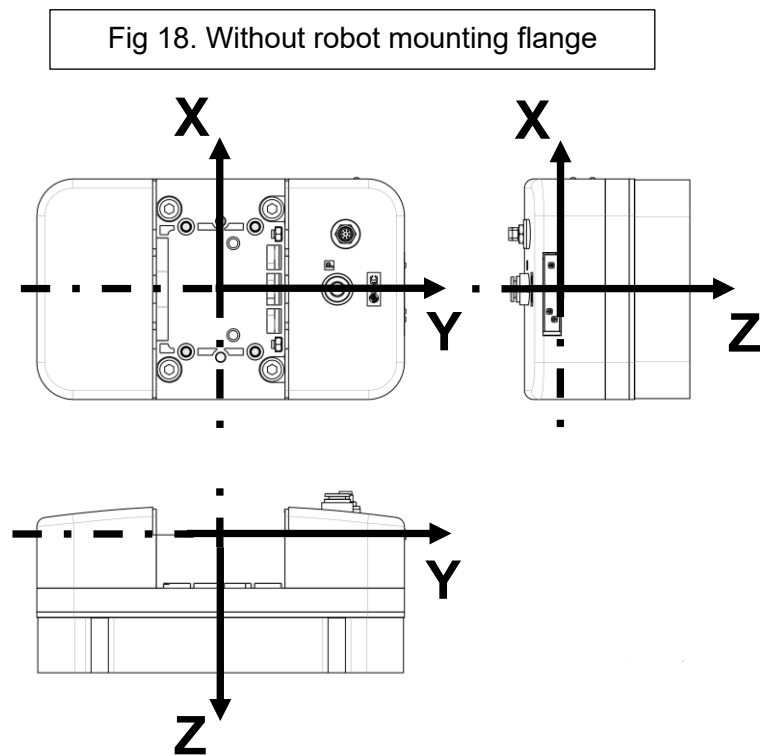
Table 7-13. T.C.P. and C.O.G. (mm)

		ZGS**—200120A**—**4*			ZGS**—200120B**—**4*		
		Foam thickness 20mm			Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 16	0	0	109	0	0	119
	Fig 17	0	0	130	0	0	140
Center of gravity (C.O.G.)	Fig 16	1	4	57	1	4	58
	Fig 17	1	3	62	1	3	63

Table 7-14. Weight (kg)

		ZGS**—200120***—**4*
		With Straight flange
Weight	Fig 16	1.4
	Fig 17	1.8

■Robot mounting flange: Without robot mounting flange



When using a flange that you prepare yourself, calculate T.C.P., C.O.G and weight using the values in the tables below.

Table 7-15. T.C.P. and C.O.G. (mm)

		ZGS**—200120A**—** * Foam thickness 20mm			ZGS**—200120B**—** * Foam thickness 30mm		
		X	Y	Z	X	Y	Z
Tool center point (T.C.P.)	Fig 18	0	0	65	0	0	75
Center of gravity (C.O.G.)	Fig 18	1	5	22	1	4	23

Table 7-16. Weight (kg)

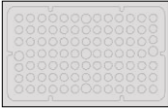
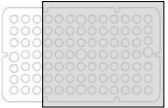
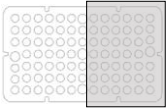
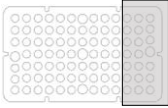
		ZGS**—200120***—** * Without robot mounting flange
Weight	Fig 18	1.2

7. Technical information

7.1. Suction plate selection guide

Foam size	400mm x 240mm
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Vacuum saving valve type

Number of ejector assemblies [pcs]	Standard supply pressure [MPa] ^{*4)}	Suction area [%] ^{*5)}		100%	About 75%	About 50%	About 25%
		Number of suction holes [pcs]		91/91	70/91	42/91	21/91
		Workpiece : Acrylic plate					
2	0.58	Vacuum pressure [kPa] ^{*1)}		-75.0	-59.4	-3.6	-1.9
		Lifting force[N] ^{*2)}		2144	1306	- ^{*6)}	- ^{*6)}
		Lifting force considering safety factor [N]	Horizontal lifting (Safety factor : 4)	536	326	-	-
			Vertical lifting (Safety factor : 8)	268	163	-	-
4	0.6	Vacuum pressure [kPa] ^{*1)}		-75.0	-70.9	-57.0	-6.1
		Lifting force[N] ^{*2)}		2144	1559	752	- ^{*6)}
		Lifting force considering safety factor [N]	Horizontal lifting (Safety factor : 4)	536	389	188	-
			Vertical lifting (Safety factor : 8)	268	194	94	-
6	0.6	Vacuum pressure [kPa] ^{*1)}		-75.0	-71.9	-61.2	-56.8
		Lifting force[N] ^{*2)}		2144	1581	808	375
		Lifting force considering safety factor [N]	Horizontal lifting (Safety factor : 4)	536	395	201	93
			Vertical lifting (Safety factor : 8)	268	197	100	46

*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 an actual value measured by SMC at the above vacuum pressure and is not a guaranteed value. It is necessary to judge the suitability for the workpiece with actual condition of use.

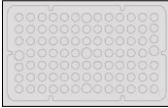
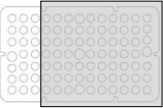
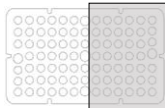
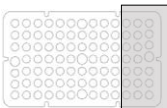
*3) Make sure the load factor is 1 or less during pick and place.
For details, refer to the section "[7.2. Max. allowable moment and load](#)".

*4) This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. 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 air pressure supply (P) port of the vacuum gripper system may fall below the standard supply pressure.

*5) Vacuum saving valve may not be activated when suction area is small.

*6) This indicates that vacuum saving valves don't work.

Fixed orifice type

Number of ejector assemblies [pcs]	Standard supply pressure [MPa] ^{*4)}	Suction area [%]		100%	About 75%	About 50%	About 25%
		Number of suction holes [pcs]		91/91	70/91	42/91	21/91
		Workpiece : Acrylic plate					
2	0.58	Vacuum pressure [kPa] ^{*1)}		-75.0	-30.1	-11.1	-6.3
		Lifting force[N] ^{*2)}		2144	662	146	42
		Lifting force considering safety factor [N]	Horizontal lifting (Safety factor : 4)	536	165	36	10
			Vertical lifting (Safety factor : 8)	268	82	18	5
4	0.6	Vacuum pressure [kPa] ^{*1)1)}		-75.0	-48.9	-27.6	-19.7
		Lifting force[N] ^{*2)}		2144	1075	364	130
		Lifting force considering safety factor [N]	Horizontal lifting (Safety factor : 4)	536	268	91	32
			Vertical lifting (Safety factor : 8)	268	134	45	16
6	0.6	Vacuum pressure [kPa] ^{*1)}		-75.0	-55.8	-33.6	-26.6
		Lifting force[N] ^{*2)}		2144	1227	443	175
		Lifting force considering safety factor [N]	Horizontal lifting (Safety factor : 4)	536	306	110	43
			Vertical lifting (Safety factor : 8)	268	153	55	21

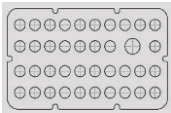
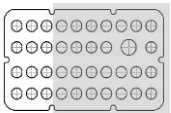
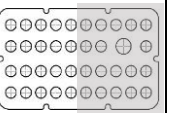
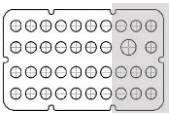
*1) The vacuum pressure is the actual measured value when non-leakage workpiece (acrylic plate) is suctioned at the standard supply pressure. It is not guaranteed values.

*2) The lifting force is an actual value measured by SMC at the above vacuum pressure and is not a guaranteed value. It is necessary to judge the suitability for the workpiece with actual condition of use.

*3) Make sure the load factor is 1 or less during pick and place.
For details, refer to the section "[7.2. Max. allowable moment and load](#)".

*4) This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. 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 air pressure supply (P) port of the vacuum gripper system may fall below the standard supply pressure.

Vacuum saving valve type

Number of ejector assemblies [pcs]	Standard supply pressure [MPa] ^{*4)}	Suction area [%] ^{*5)}		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)	- ^{*6)}	- ^{*6)}
		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	- ^{*6)}
		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) Make sure the load factor is 1 or less during pick and place.

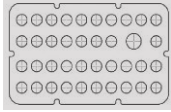
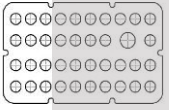
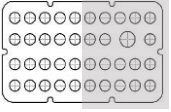
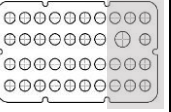
For details, refer to the section "[7.2. Max. allowable moment and load](#)".

*4) This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. 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 air pressure supply (P) port of the vacuum gripper system may fall below the standard supply pressure.

*5) Vacuum saving valve may not be activated when suction area is small.

*6) This indicates that vacuum saving valves don't work.

Fixed orifice type

Number of ejector assemblies [pcs]	Standard supply pressure [MPa] ^{*4)}	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)	63	26	9
			Vertical lifting (Safety factor : 8)	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)	99	46	19
			Vertical lifting (Safety factor : 8)	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)	110 (100)	59	23
			Vertical lifting (Safety factor : 8)	55 (50)	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.)

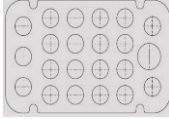
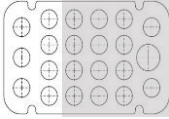
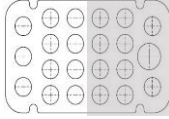
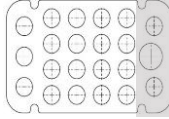
It is necessary to judge the suitability for the workpiece with actual condition of use.

*3) Make sure the load factor is 1 or less during pick and place.

For details, refer to the section "[7.2. Max. allowable moment and load](#)".

*4) This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. 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 air pressure supply (P) port of the vacuum gripper system may fall below the standard supply pressure.

Vacuum saving valve type

Number of ejector assemblies [pcs]	Standard supply pressure [MPa] ^{*4)}	Suction area [%] ^{*5)}		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	- ^{*6)}
		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) Make sure the load factor is 1 or less during pick and place.

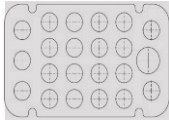
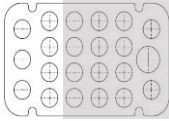
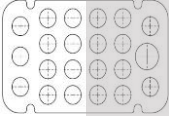
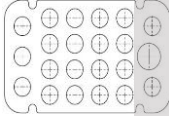
For details, refer to the section "[7.2. Max. allowable moment and load](#)".

*4) This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. 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 air pressure supply (P) port of the vacuum gripper system may fall below the standard supply pressure.

*5) Vacuum saving valve may not be activated when suction area is small.

*6) This indicates that vacuum saving valves don't work.

Fixed orifice type

Number of ejector assemblies [pcs]	Standard supply pressure [MPa] ^{*4)}	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)	41	20	2
			Vertical lifting (Safety factor : 8)	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)	57	35	3
			Vertical lifting (Safety factor : 8)	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) Make sure the load factor is 1 or less during pick and place.

For details, refer to the section "[7.2. Max. allowable moment and load](#)".

*4) This is the pressure immediately before the air pressure supply (P) port of the vacuum gripper system during suction. 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 air pressure supply (P) port of the vacuum gripper system may fall below the standard supply pressure.

7.2. Max. allowable moment and load

- *1) The values below are the allowable moment and the load capacity of the product. It is necessary to judge the suitability for the workpiece with actual condition of use.
- *2) When the product is used for pick and place, consider the rate of acceleration.
- *3) Ensure moments and loads are the allowable values or less.
- *4) When combining a vertical load and moment, make sure the load factor is 1 or less according to the equation below.

$$F/F_{vmax} + M_p/M_{pmax} + M_y/M_{ymix} + M_r/M_{rmax} \leq 1 \text{ (Load factor)}$$

- *5) If moments and loads other than the below are applied due to robot motion, a sufficient safety factor must be provided.
- *6) These are the allowable values when used at an acceleration of 19.6 m/s² or less.
- *7) For Flange U and Y, use the allowable values below for calculations as well as the other flanges.

■400mm x 240mm

Robot mounting flange: Basic type

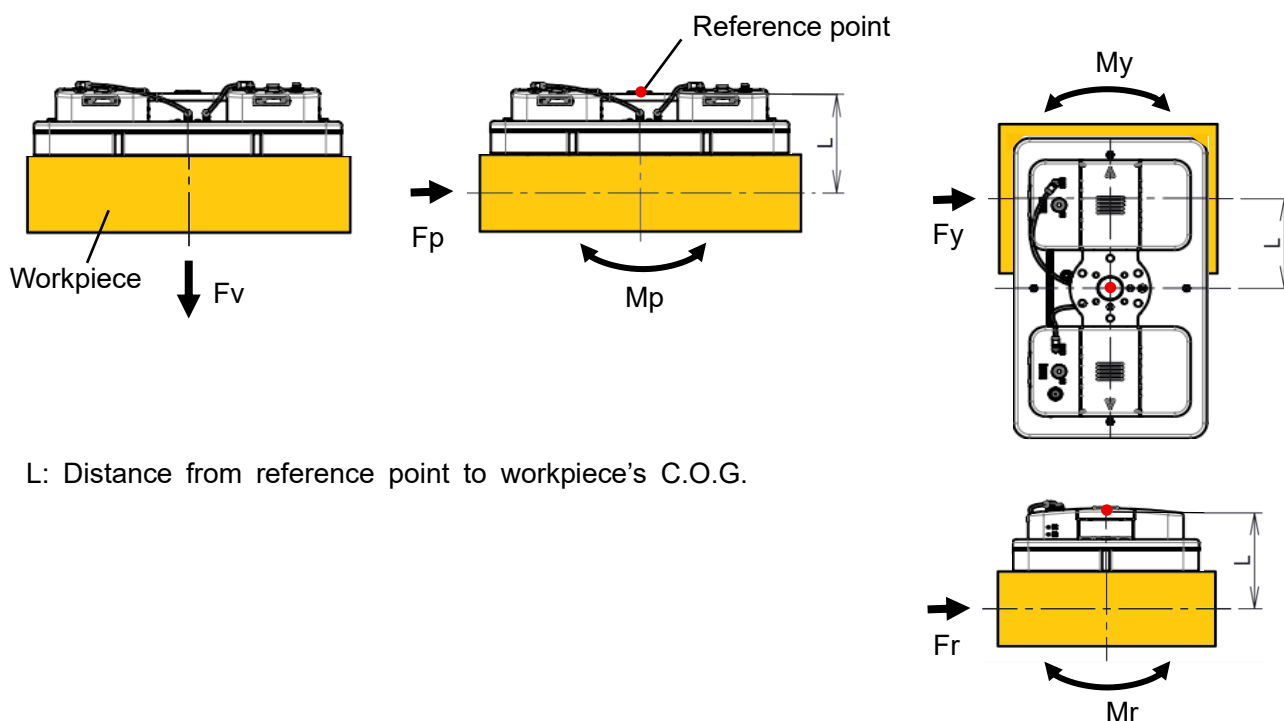
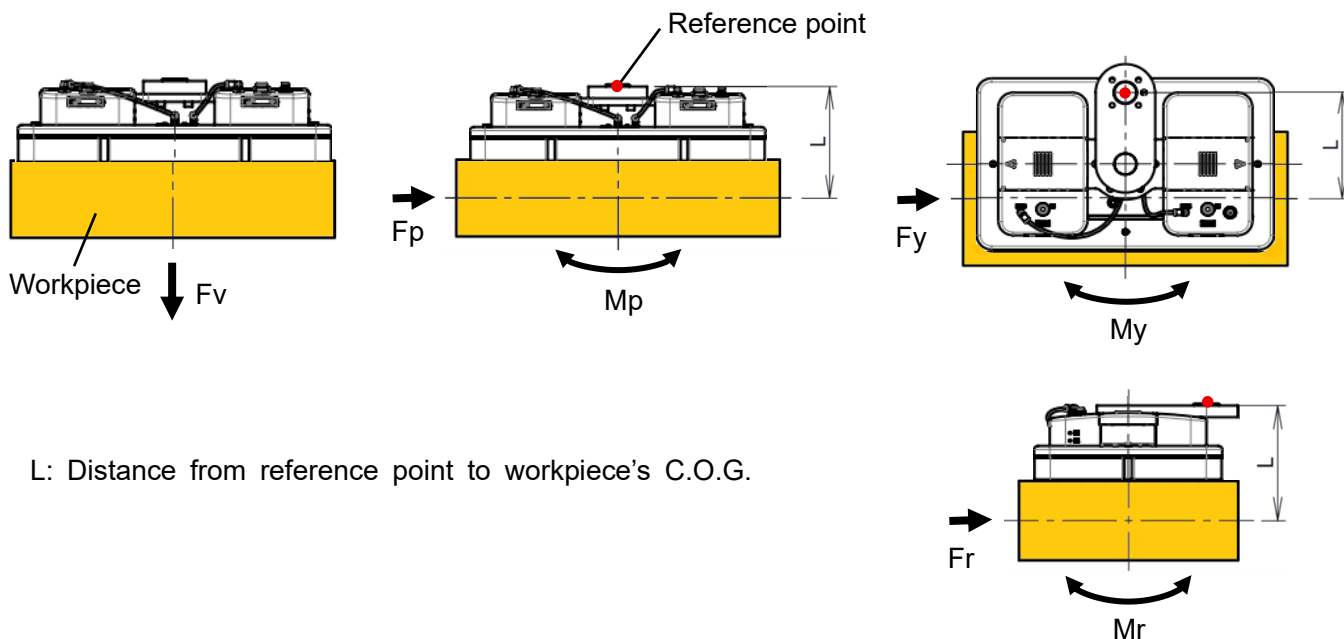


Table 8-1. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-400240***-**1*	2144	85.4	94.5	47.1

Robot mounting flange: Basic type + Offset flange

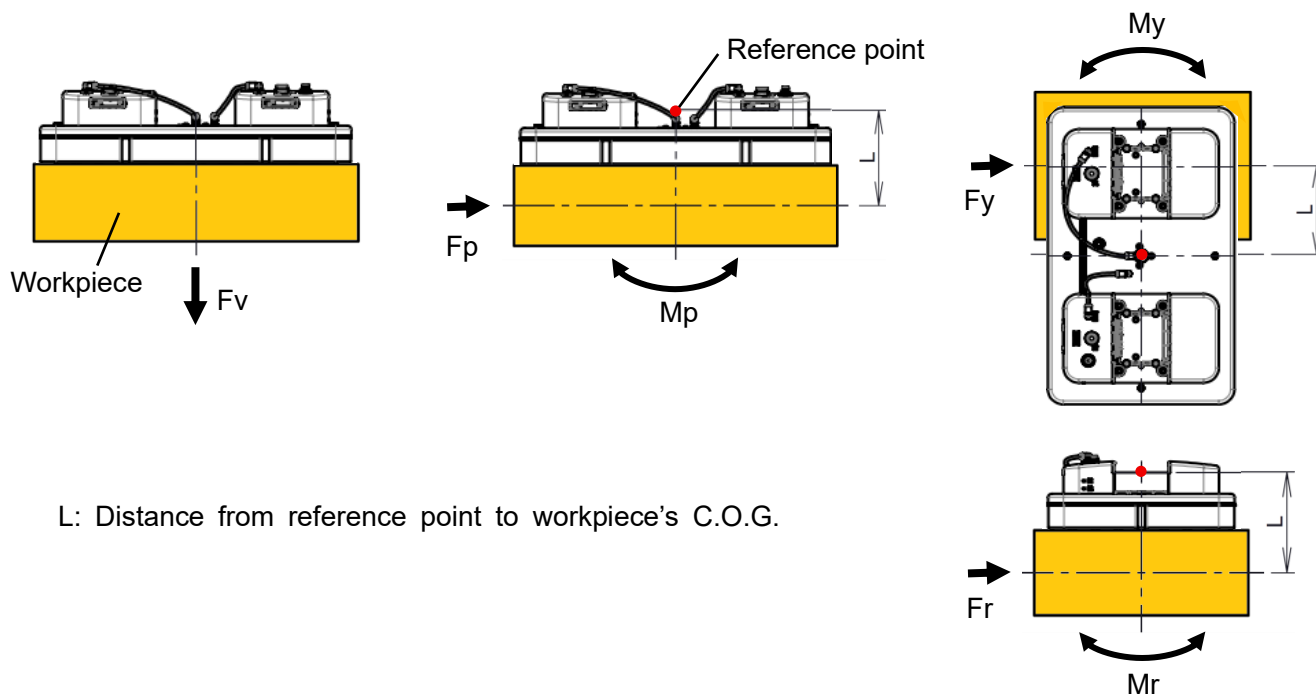


L: Distance from reference point to workpiece's C.O.G.

Table 8-2. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-400240***-**2*	2144	38.8	81.9	45.5

Robot mounting flange: Without robot mounting flange



L: Distance from reference point to workpiece's C.O.G.

Table 8-3. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-400240***-** *	2144	73.5	94.4	40.7

■300mm x 180mm, 200mm x 120mm

Robot mounting flange: Tool plate + Main plate

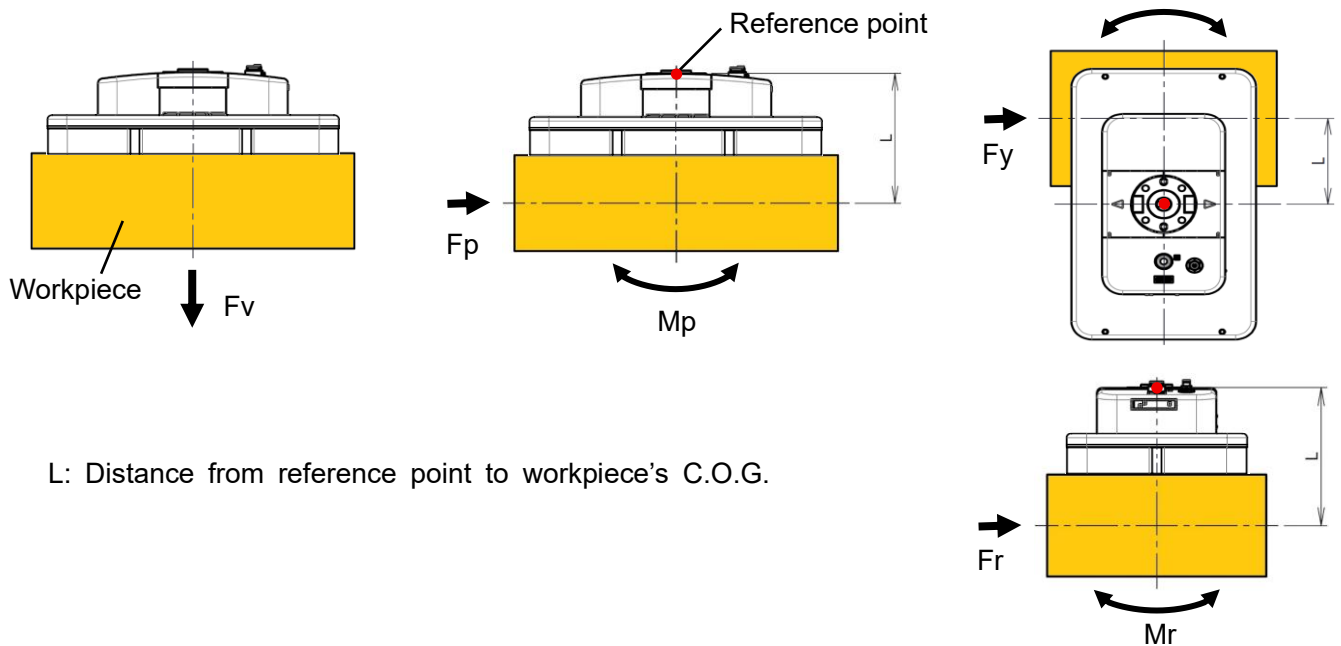


Table 8-4. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-300180***-**1*	400	8.1	16.6	11.0
ZGS**-200120***-**1*	400	9.1	16.6	12.0

Robot mounting flange: Offset flange

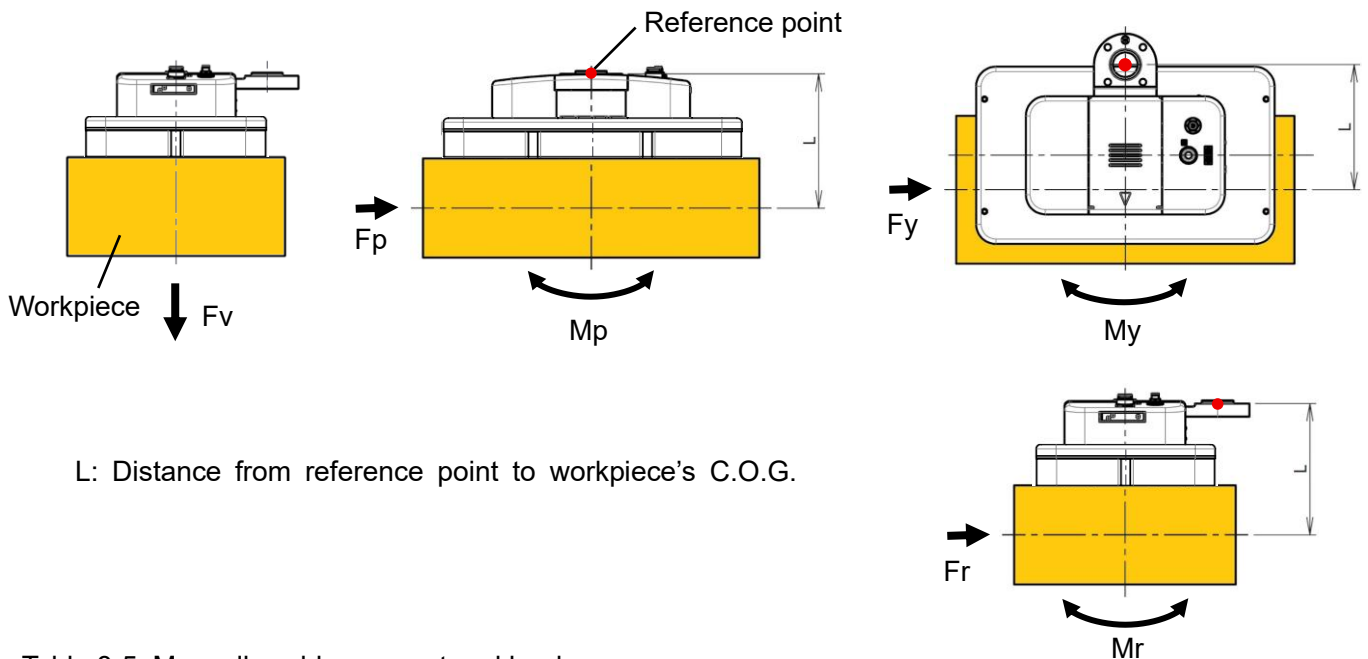


Table 8-5. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-300180***-**2*	880	20.0	54.4	26.2
ZGS**-200120***-**2*	440	21.0	54.4	27.2

Robot mounting flange: Straight flange

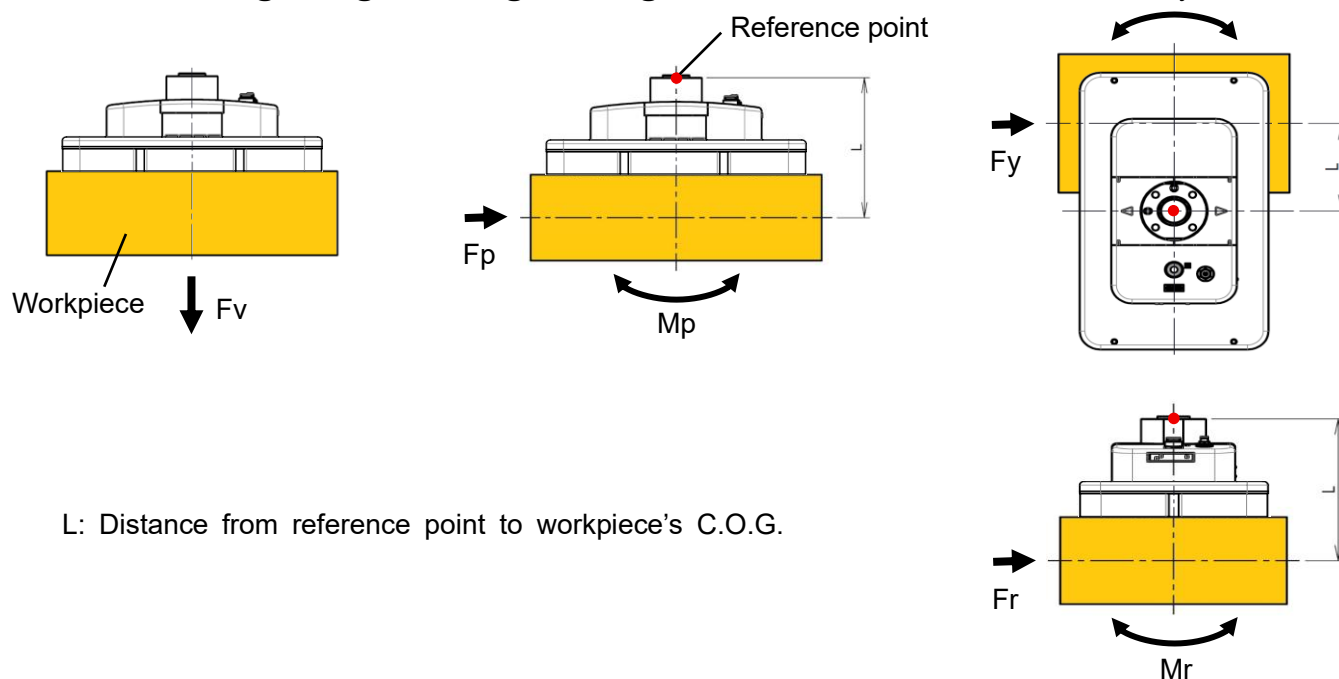


Table 8-6. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-300180***-**4*	880	27.9	42.5	36.6
ZGS**-200120***-**4*	440	29.3	42.5	38.0

Robot mounting flange: Without robot mounting flange

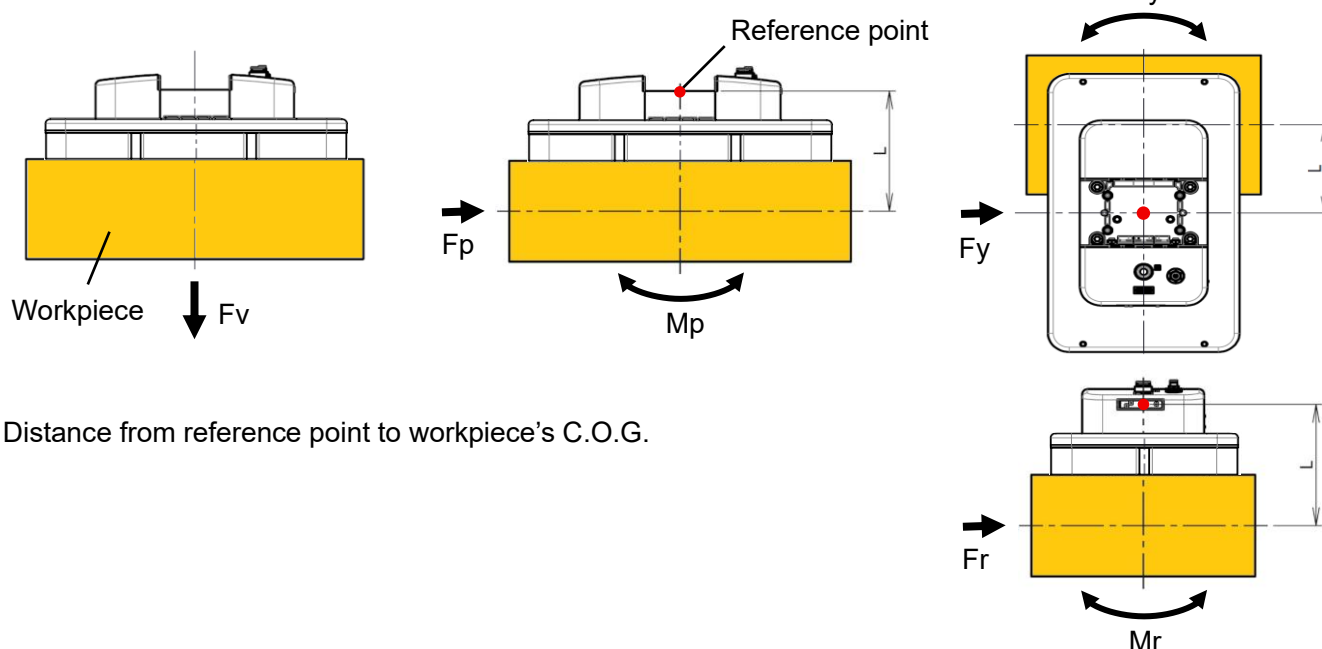


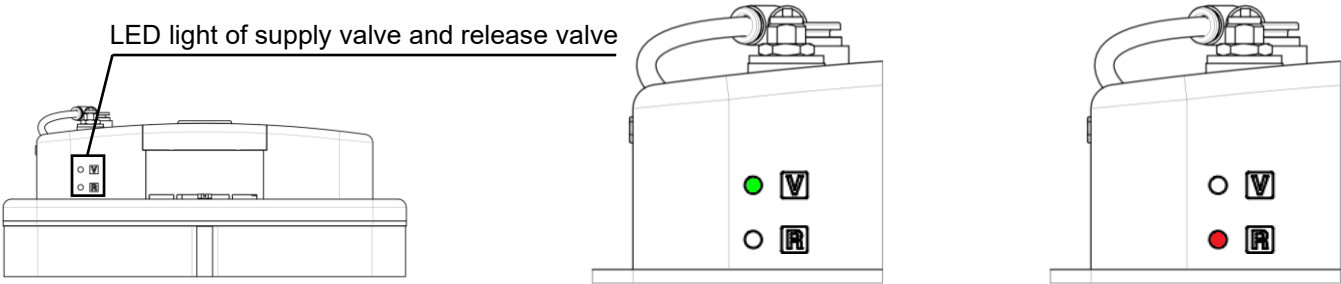
Table 8-7. Max. allowable moment and load

Part no.	Vertical load F_{vmax} (N)	Pitch moment M_{pmax} (N·m)	Yaw moment M_{ymax} (N·m)	Roll moment M_{rmax} (N·m)
ZGS**-300180***-**-*	880	16.5	42.5	21.6
ZGS**-200120***-**-*	440	17.3	42.5	22.4

7.3. LED light of supply valve and release valve

LED light of supply valve: Green

LED light of release valve: Red



LED light	“Supply valve / Release valve” type			
	Symbol “K” N.C. (2-position single)	Symbol “B” N.O. (2-position single)	Symbol “W” 2-position double	
Supply valve	Green	Suction ON	Suction OFF	Suction ON
	OFF	Suction OFF	Suction ON	Suction ON *) or Suction OFF
Release valve	Red	Blow-off ON	Blow-off ON	Stop suction and Blow-off ON
	OFF	Blow-off OFF	Blow-off OFF	Blow-off OFF

*) It depends on operations. After energizing supply valve, suction keeps ON. After energizing release valve, suction turns OFF.

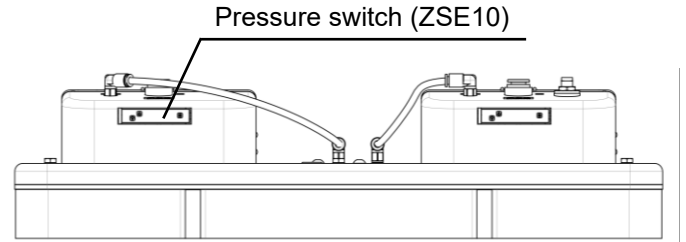
7.4. How to use the pressure switch to check gripping

■400mm x 240mm

The built-in pressure switch detects pressure of the following two locations.

At the time of shipment from the factory

1. Pressure in Base plate
2. Pressure in a foam hole



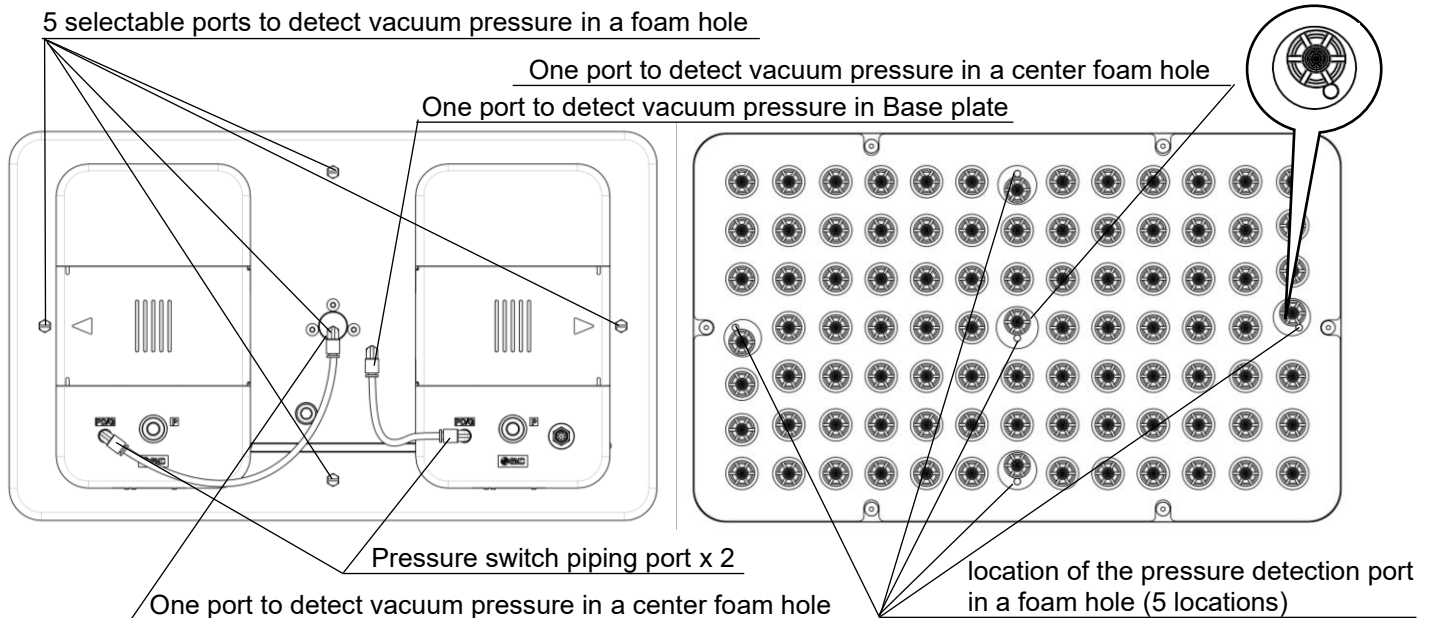
By changing the piping connection points, pressure detection port can be changed at any to points.

- Pressure in Base plate(1 point) + Pressure in a foam hole (1 point)
- or
- Pressure in two foam holes

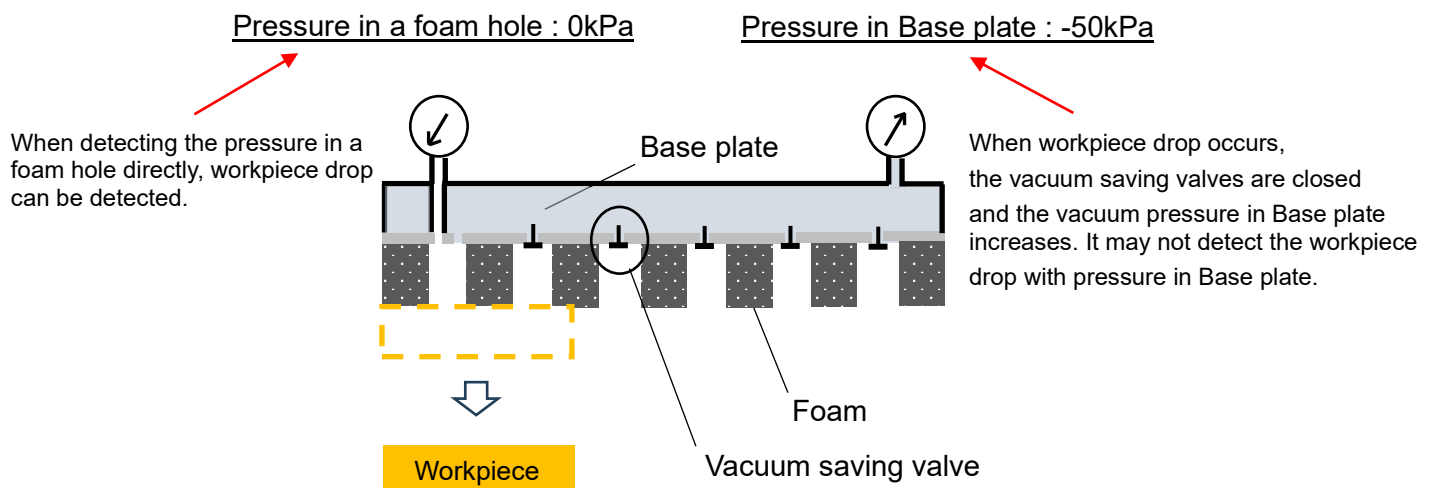
For the compatible robot symbol “NH,” only one switch is used, so it is possible to detect either the pressure in Base plate (one location) or the pressure in a foam hole (one location).

At the time of shipment from the factory, the pressure in Base plate is detected.

⚠ If the pressure detection port in Base plate is not used, the port needs to plug.
If not plugged, air leakage will occur, and the vacuum pressure cannot generate when gripping.



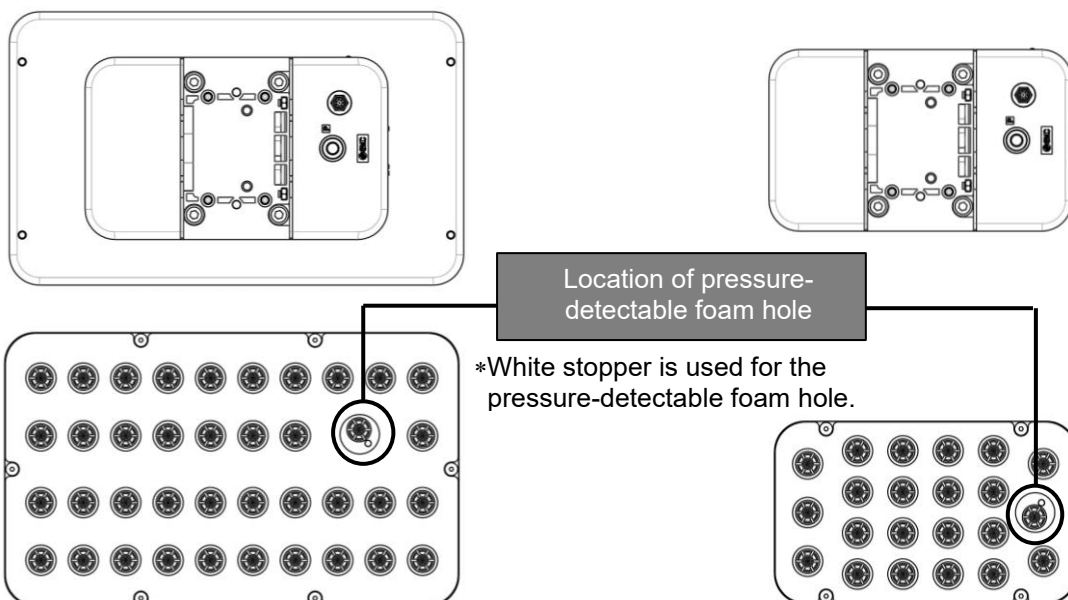
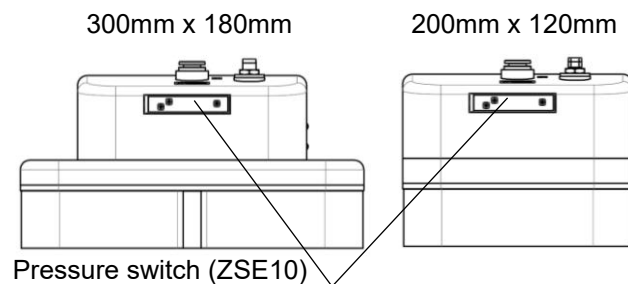
< Usage example of the pressure detection port in a foam hole >



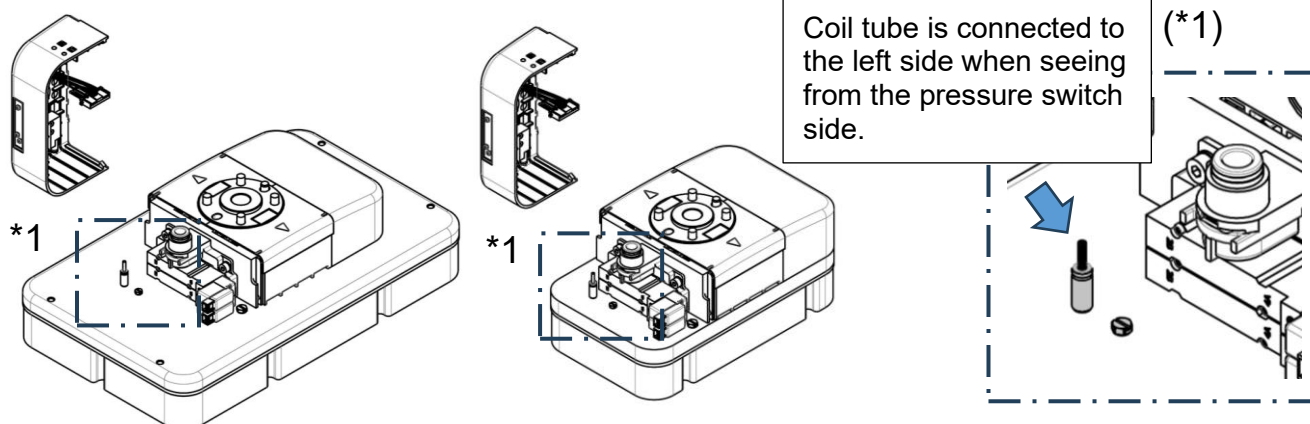
■300mm x 180mm, 200mm x 120mm

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

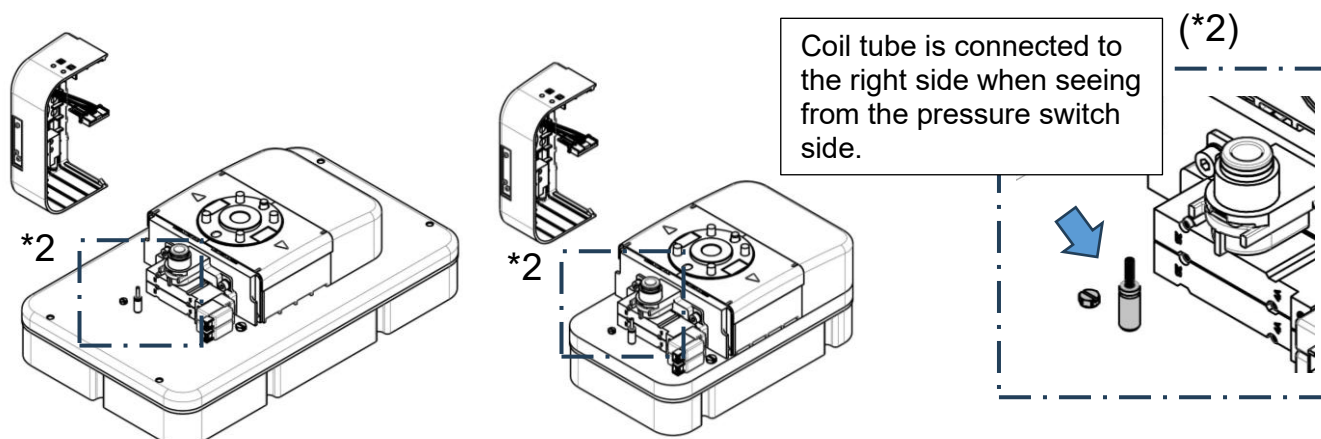
1. Pressure in base plate
2. Pressure in foam hole



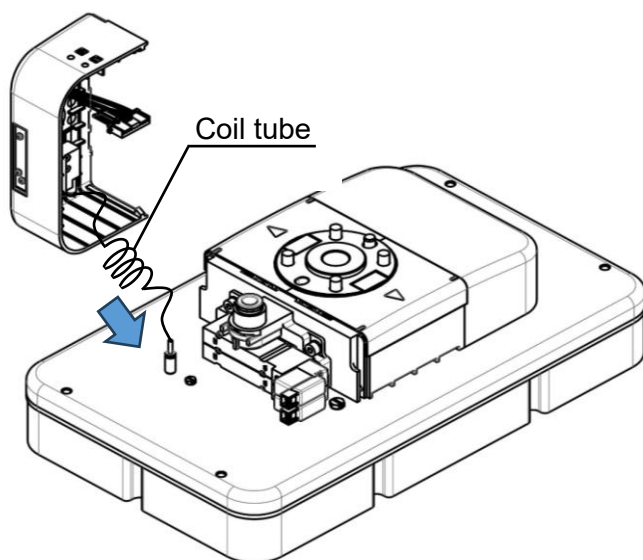
■When “Pressure in base hole” type is selected in part number:



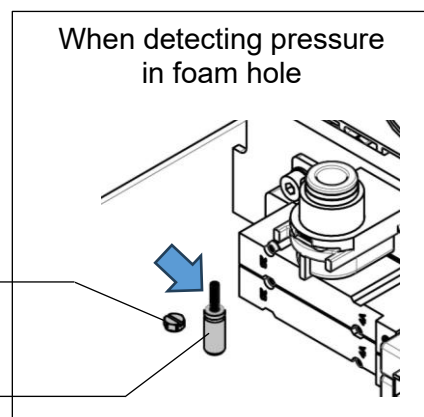
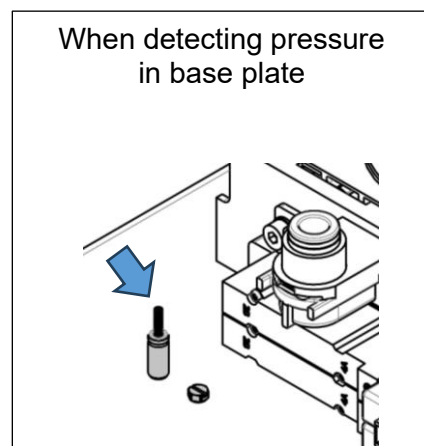
■When “Pressure in foam hole” type is selected in part number:



- 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.



Change the connection



- 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 0.5 [N·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 0.5 [N·m].

After changing the pipe connection points, confirm that the coil tube is inserted completely into the fitting.

8. Maintenance

- Perform the maintenance and inspection shown below in order to use the vacuum gripper system 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 picking up a workpiece.

An increase in vacuum pressure without a workpiece indicates clogging. On the other hand, a decrease in vacuum pressure without a workpiece may indicate air leakage.

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

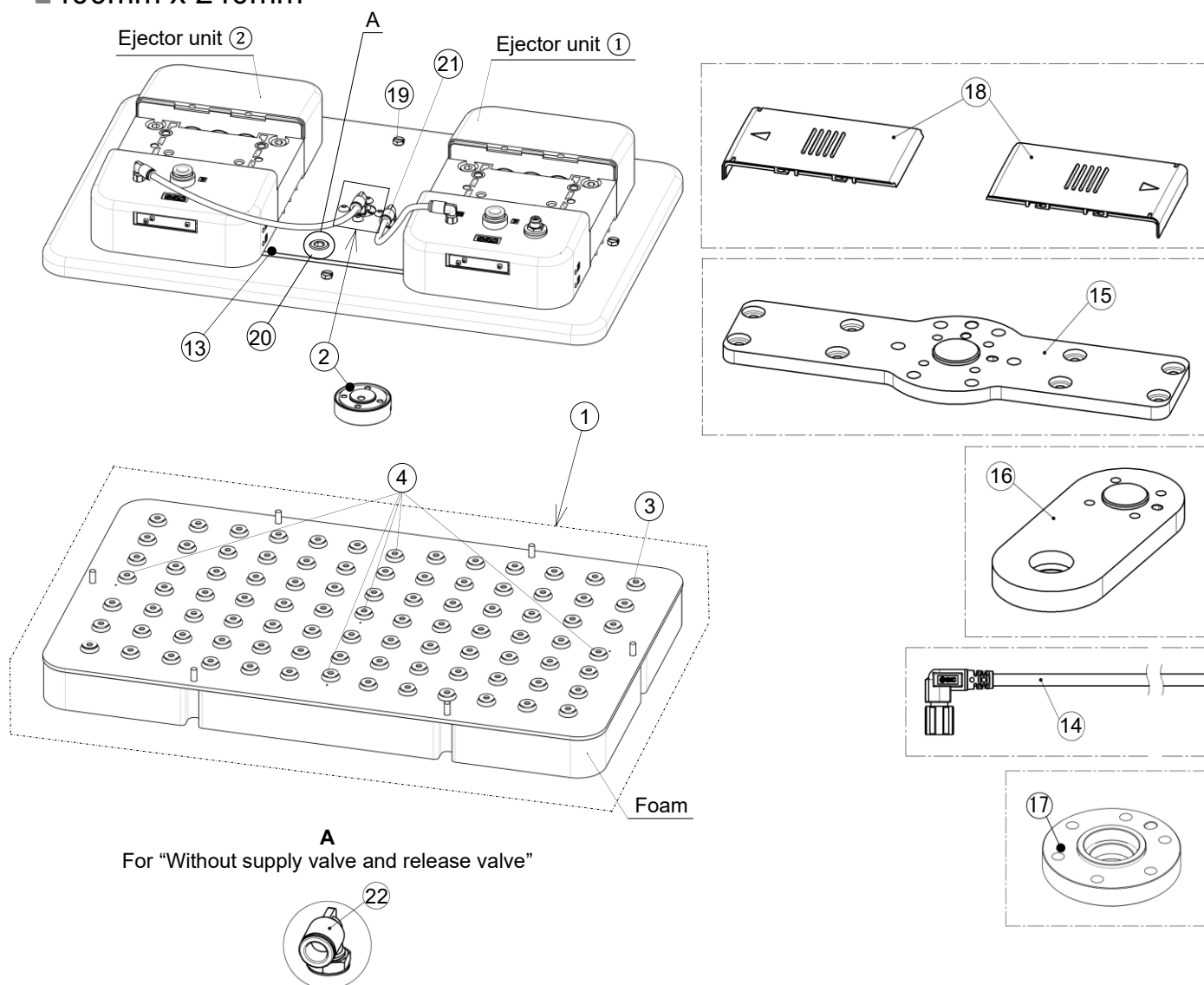
Connections may be loosened by vibration or impact when the gripper system is operated for a long time. Tighten the connections regularly so that any parts will not come off and the gripper system will remain properly installed on the equipment.

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 Replacement parts

■400mm x 240mm



Ejector unit

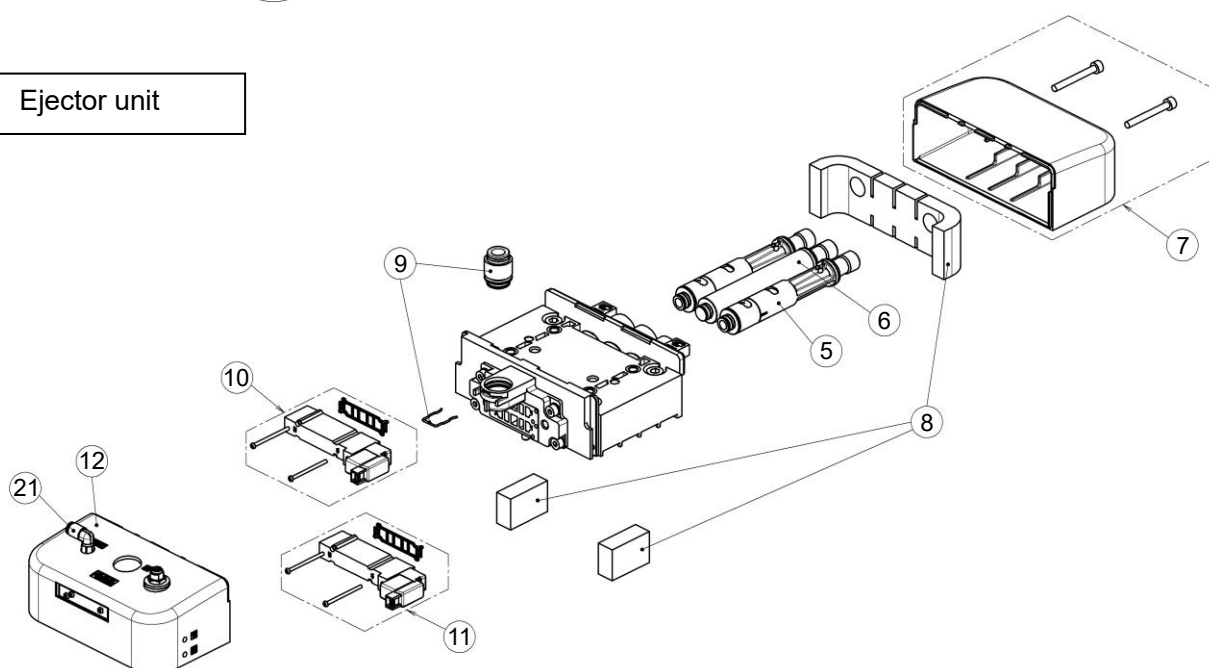


Table 9-1. Replacement parts

No.	Replacement parts	Part no.	Replacement procedure	Remarks
1	Foam with plate (For vacuum saving valve type)	ZGS-FM4-400240T20JP*-A		Refer to table9-2
		ZGS-FM4-400240T30JP*-A		
	Foam with plate (For fixed orifice type)	ZGS-FM4-400240T20TP*-A		
		ZGS-FM4-400240T30TP*-A		
	Foam (For vacuum saving valve type)	ZGS-FM4-400240T20J-A		Foam thickness 20mm
		ZGS-FM4-400240T30J-A		Foam thickness 30mm
	Foam with mesh (For fixed orifice type)	ZGS-FM1-400240T20M-A		Foam thickness 20mm
ZGS-FM1-400240T30M-A		Foam thickness 30mm		
2	Block	ZGS-BD6-1-1-P-A		With O-ring, mounting screws and plug
3	Vacuum saving valve	ZGS-BD2B-1-A		Stopper : Black, Valve : White
4	Vacuum saving valve	ZGS-BD2A-2-A		Stopper : White, Valve : Red
5	Ejector assembly	ZGS-EJ1-V-A		
6	Dummy ejector assembly	ZGS-EJ1-D-A		
7	Ejector cover set	ZGS-LD2-A		With mounting screws
8	Sound absorbing material set	ZGS-SE1-A		
9	One-touch fitting set	ZGS-PR1-*-A		With clip Refer to part no. below
10	Supply valve set	ZGS-JSY3V-A		For 2-position single With gasket and mounting screws
		ZGS-JSY3W-A		For 2-position double With gasket and mounting screws
11	Release valve set	ZGS-JSY3R-A		With gasket and mounting screws
12	Valve cover assembly	ZGS-LD1-****-A		Refer to part no. below
13	Connector cable assembly	ZGS-LW1-8-A		For PNP except for “2-position double” valve
		ZGS-LW1-6-A		For NPN except for “2-position double” valve
		ZGS-LW1-12-A		For PNP with “2-position double” valve
		ZGS-LW1-19-A		For NPN with “2-position double” valve
		ZGS-LW1-17-A		For IO-Link
14	Connector cable	RMH-A00-11-A	-	
		RMH-A00-11-G		Refer to “5.3. Wiring”
		RMH-A00-18A		
		ZGS-LW1-14-A		
15	Basic type (Robot mounting flange)	ZGS-PL3-1-A	-	With mounting screws, washers and parallel pins
16	Offset flange (Robot mounting flange)	ZGS-PL5-1-A	-	With mounting screws and parallel pin
17	Flange U	ZGS-PL3-5-A	-	With mounting screws and parallel pin
18	Flange cover	ZGS-LD3-A	-	Qty. : 1 pc.
19	Plug	M-5P	-	
20	Plug	TB00132	-	
21	One-touch fitting	KQ2L04-M5A	-	Metric
		KQ2L01-M5A		Inch
22	One-touch fitting	KQ2L08-U02A	-	Metric
		KQ2L11-U02A		Inch

9. One-touch fitting set

ZGS - PR1 - * - A
 └─┬─
 (1)

(1) Air supply pressure (P) port

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

12. Valve cover assembly

For Ejector unit (1)

ZGS - LD1 - 1 * * * - A
 └─┬─┬─┬─
 (1) (2) (3)

(1) Supply valve and Switch output

Symbol	Supply valve	Switch output
P	N.C. (2-position single)	PNP
	N.O. (2-position single)	
	None	
N	N.C. (2-position single)	NPN
	N.O. (2-position single)	
	None	
T	N.C. (2-position single)	NPN (OMRON / TECHMAN ROBOT)
	N.O. (2-position single)	
	None	
A	2-position double	PNP
B	2-position double	NPN
C	2-position double	NPN (OMRON / TECHMAN ROBOT)
H	N.C.	IO-Link
J	N.O.	IO-Link

(2) Switch unit

Symbol	Switch unit
C	With unit switching function
M	SI unit only

(3) Port size

Symbol	Port size
Nil	φ4 (Metric)
4	φ1/8" (Inch)

For Ejector unit (2) for two-pressure switch type

ZGS - LD1 - 2 * * * - A
 (1) (2) (3)

(1) Supply valve type and Switch output

Symbol	Supply valve	Switch output
P	N.C. (2-position single)	PNP
	N.O. (2-position single)	
	None	
N	N.C. (2-position single)	NPN
	N.O. (2-position single)	
	None	
T	N.C. (2-position single)	NPN (OMRON / TECHMAN ROBOT)
	N.O. (2-position single)	
	None	
A	2-position double	PNP
B	2-position double	NPN
C	2-position double	NPN (OMRON / TECHMAN ROBOT)

(2) Switch unit

Symbol	Switch unit
C	With unit switching function
M	SI unit only

(3) Port size

Symbol	Port size
Nil	φ4 (Metric)
4	φ1/8" (Inch)

For Ejector unit (2) for one-pressure switch type (Including IO-Link type)

ZGS - LD1 - 4 * - A
 (1)

(1) Supply valve or Switch type

Symbol	Supply valve / Pressure switch
Nil	None
P	N.C. (2-position single)
	N.O. (2-position single)
A	2-position double
H	IO-Link

Table.9-2 Spare part number and applicable product number

Spare part		For vacuum saving valve type	For fixed orifice type
Type	Thickness [mm]		
Foam with plate	20	ZGS-FM4-400240T20JP-A	ZGS-FM4-400240T20TP-A
	30	ZGS-FM4-400240T30JP-A	ZGS-FM4-400240T30TP-A
Foam with plate (comes with block)	20	ZGS-FM4-400240T20JP-P-A	ZGS-FM4-400240T20TP-P-A
	30	ZGS-FM4-400240T30JP-P-A	ZGS-FM4-400240T30TP-P-A
Foam	20	ZGS-FM4-400240T20J-A	ZGS-FM1-400240T20M-A
	30	ZGS-FM4-400240T30J-A	ZGS-FM1-400240T30M-A
(Applicable product part number)		ZGS**-400240* J *-****	ZGS**-400240* T *-****

Caution:

Prepare replacement parts that match the symbol of the product's suction plate.
 (Replacement parts are not compatible with suction plates with symbol "S" or "M".)

Regarding the applicable product model numbers ZGS**-400240*(S/M)*-****, please refer to operation manual for ZGS**-400240*(S/M)*-****(DOC1075924).

■ 300mm x 180mm, 200mm x 120mm

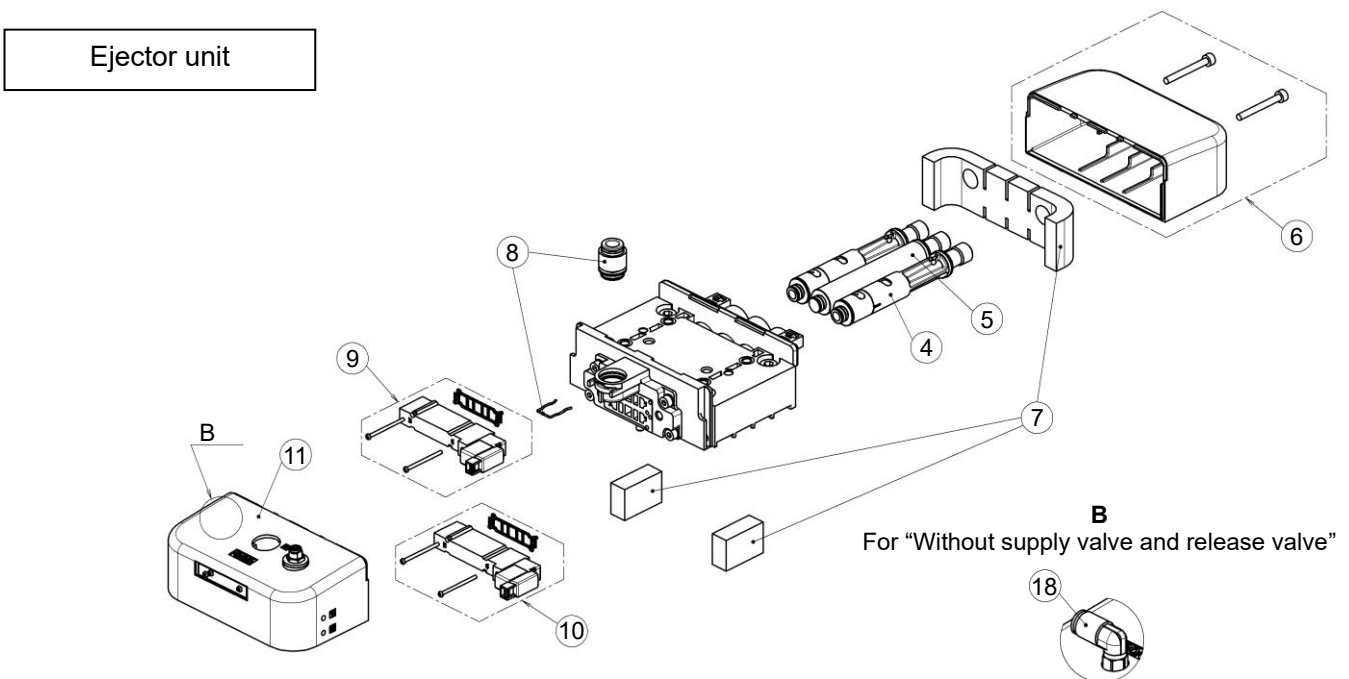
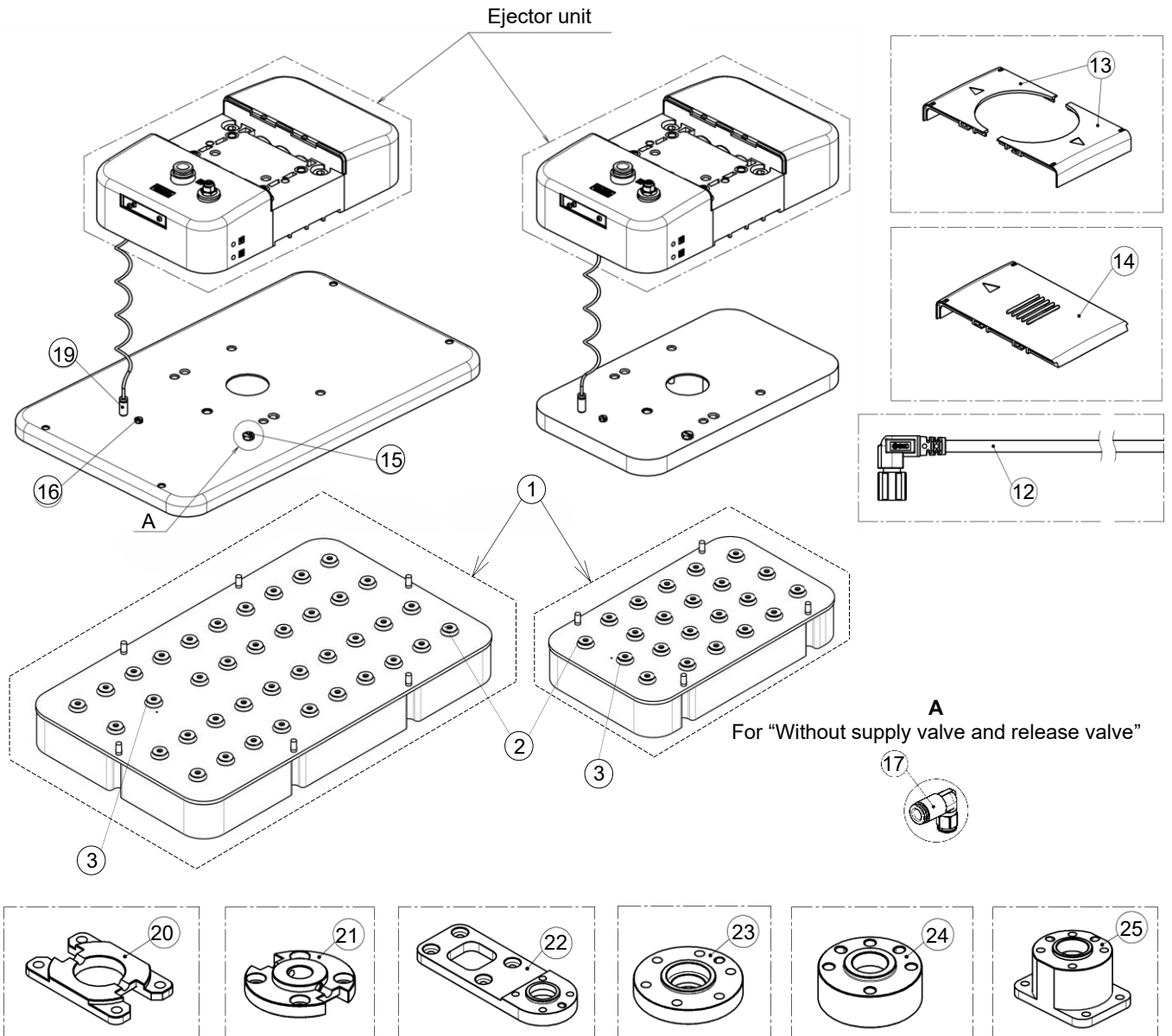


Table 9-3. Replacement parts

No.	Replacement parts	Part no.	Replacement procedure	Remarks
1	Foam with plate (For vacuum saving valve type)	ZGS-FM2-300180T20P-A	■	Refer to table 9-4 and table 9-5
		ZGS-FM2-300180T30P-A		
		ZGS-FM3-200120T20P-A	■	
		ZGS-FM3-200120T30P-A		
	Foam with plate (For fixed orifice type)	ZGS-FM2-300180T20MP-A	■	
		ZGS-FM2-300180T30MP-A		
		ZGS-FM3-200120T20MP-A	■	
		ZGS-FM3-200120T30MP-A		
	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
2	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
3	Vacuum saving valve	ZGS-BD2A-1-A	■	Stopper : Black, Valve : White
4	Vacuum saving valve	ZGS-BD2A-2-A		Stopper : White, Valve : Red
5	Ejector assembly	ZGS-EJ1-V-A	■	
6	Dummy ejector assembly	ZGS-EJ1-D-A	■	
7	Ejector cover set	ZGS-LD2-A	■	With mounting screws
8	Sound absorbing material set	ZGS-SE1-A	■	
9	One-touch fitting set	ZGS-PR1-*-A	■	With clip Refer to part no. below
10	Supply valve set	ZGS-JSY3V-A	■	For 2-position single With gasket and mounting screws
		ZGS-JSY3W-A		For 2-position double With gasket and mounting screws
11	Release valve set	ZGS-JSY3R-A	■	With gasket and mounting screws
12	Valve cover assembly	ZGS-LD1-****-A	■	Refer to part no. below
13	Connector cable	RMH-A00-11-A	-	Refer to "5.3. Wiring"
		RMH-A00-11-G		
		RMH-A00-18A		
		ZGS-LW1-14-A		
14	Tool plate cover	ZGS-LD4-A	-	Qty. : 2 pcs.
15	Flange cover	ZGS-LD3-A	-	Qty. : 1 pc.
16	Plug	M-5P	-	
17	Plug	M-3P	-	
18	One-touch fitting	KQ2L04-M5A	-	Metric
19	One-touch fitting	KQ2L01-M5A	-	Inch
20	One-touch fitting	KQ2S02-M3G	-	
21	Tool plate	ZGS-PL3-3-A	-	With mounting screws and washers
22	Main plate	ZGS-PL3-7-A	-	With mounting screws, parallel pin and clampers
23	Offset flange	ZGS-PL3-4-A	-	With mounting screws, washers and parallel pins
24	Flange U	ZGS-PL3-5-A	-	With mounting screws and parallel pin
25	Flange Y	ZGS-PL3-6-A	-	For using with main plate With mounting screws and parallel pin
		ZGS-PL3-6-1-A	-	For using with offset flange With mounting screws and parallel pin
26	Straight flange	ZGS-PL3-8-A	-	With mounting screws, washers and parallel pins

8. One-touch fitting set

ZGS - PR1 - * - A
 └─┬─┘
 (1)

(1) Air supply pressure (P) port

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

11. Valve cover assembly

For "with" valve type

ZGS - LD1 - 5 * * - A
 └─┬─┬─┘
 (1) (2)

(1) Supply valve and Switch output

Symbol	Supply valve	Switch output
P	N.C. (2-position single)	PNP
	N.O. (2-position single)	
N	N.C. (2-position single)	NPN
	N.O. (2-position single)	
T	N.C. (2-position single)	NPN (OMRON / TECHMAN ROBOT)
	N.O. (2-position single)	
A	2-position double	PNP
B	2-position double	NPN
C	2-position double	NPN (OMRON / TECHMAN ROBOT)
H	N.C.	IO-Link
J	N.O.	IO-Link

(2) Switch unit

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

For "without" valve type

ZGS - LD1 - 1 * * * - A
 (1) (2) (3)

(1) Switch output

Symbol	Switch output
P	PNP
N	NPN
T	NPN (OMRON / TECHMAN ROBOT)

(2) Switch unit

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

(3) Port size

Symbol	Port size
Nil	φ4 (Metric)
4	φ1/8" (Inch)

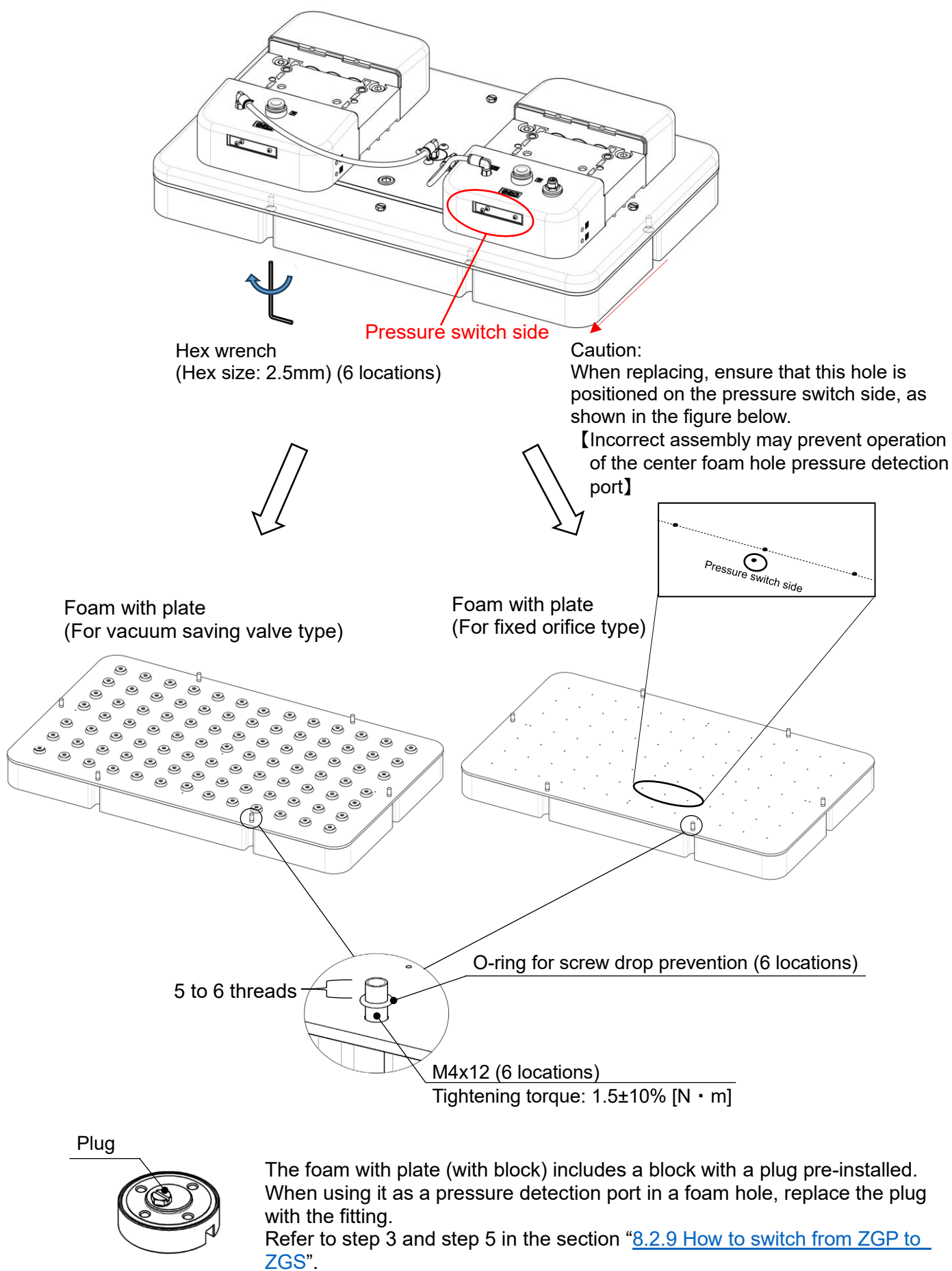
Table 9-4. Spare part number and applicable product part number

Spare part		For vacuum saving valve type	For fixed orifice type
Type	Thickness [mm]		
Foam with plate	20	ZGS-FM2-300180T20P-A	ZGS-FM2-300180T20MP-A
	30	ZGS-FM2-300180T30P-A	ZGS-FM2-300180T30MP-A
Foam	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*-****

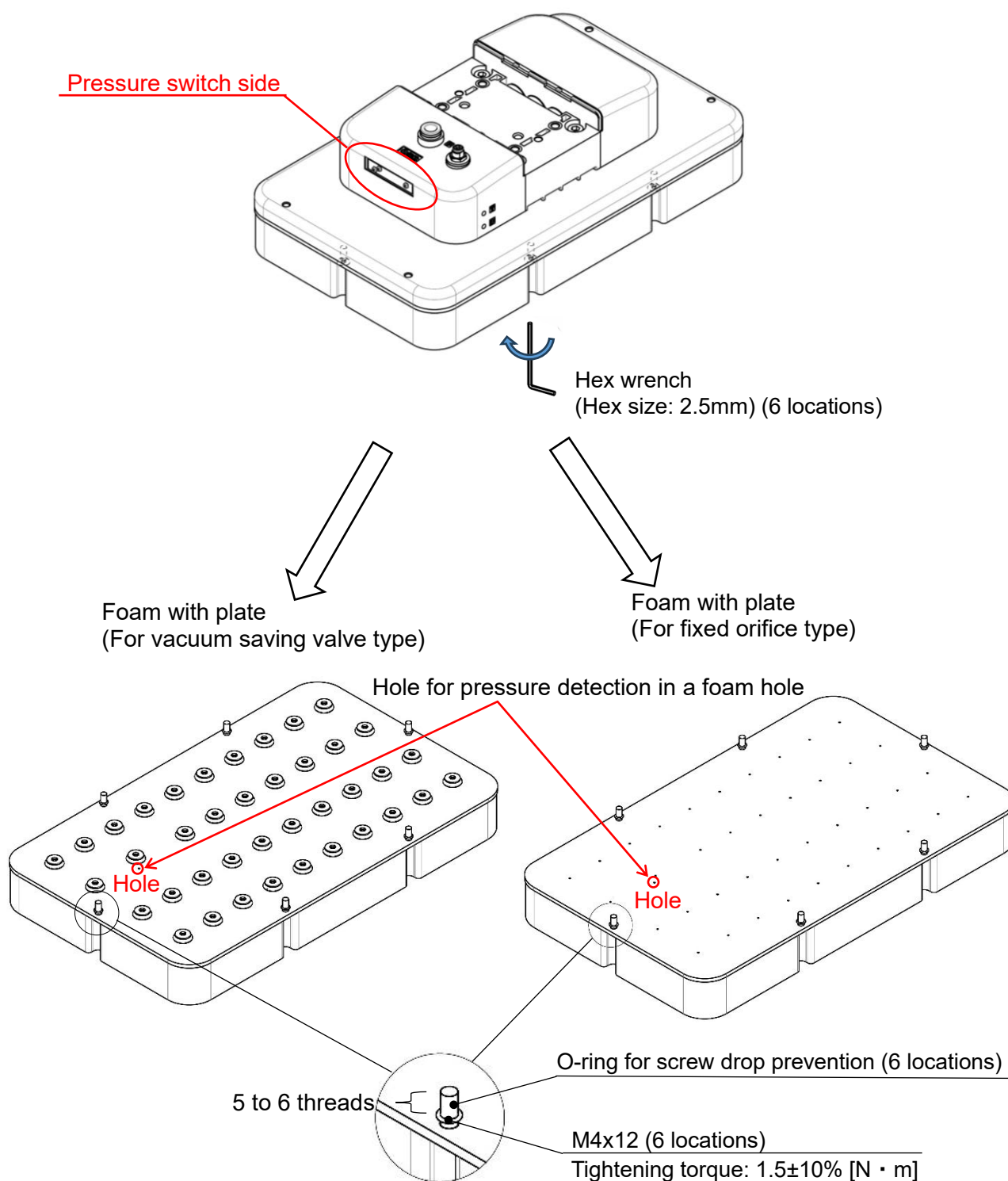
Table 9-5. Spare part number and applicable product part number

Spare part		For vacuum saving valve type	For fixed orifice type
Type	Thickness [mm]		
Foam with plate	20	ZGS-FM3-200120T20P-A	ZGS-FM3-200120T20MP-A
	30	ZGS-FM3-200120T30P-A	ZGS-FM3-200120T30MP-A
Foam	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 (400mm x 240mm)



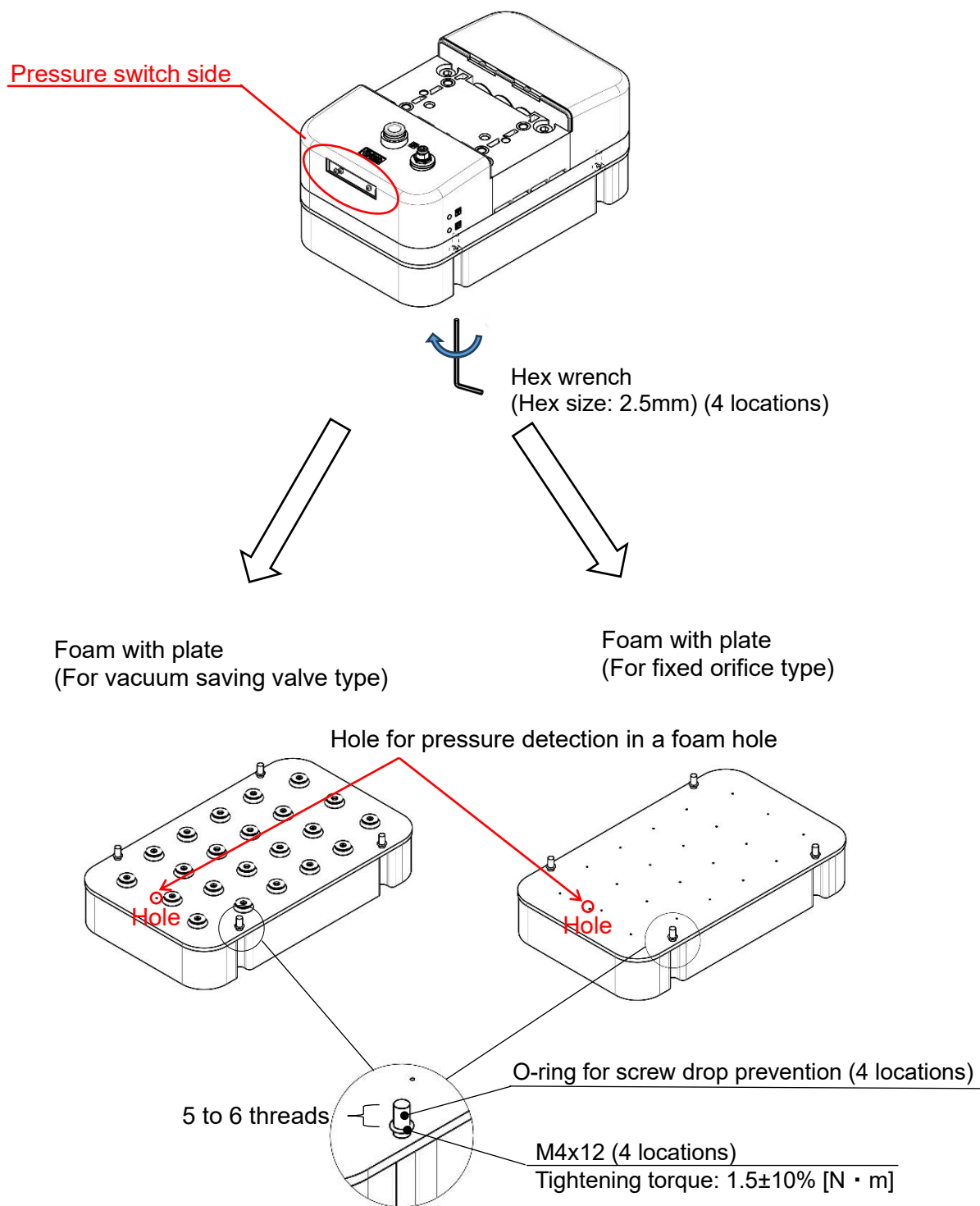
8.2.3 How to replace foam with plate (300mm x 180mm)



*The foam with plate has an orientation.

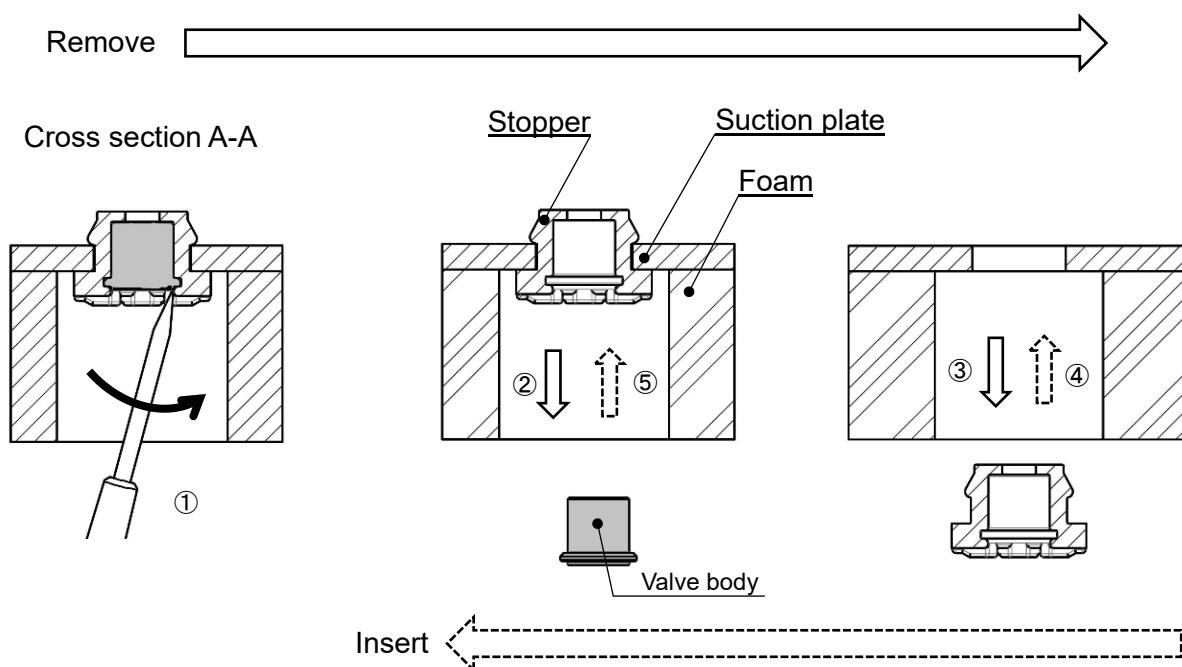
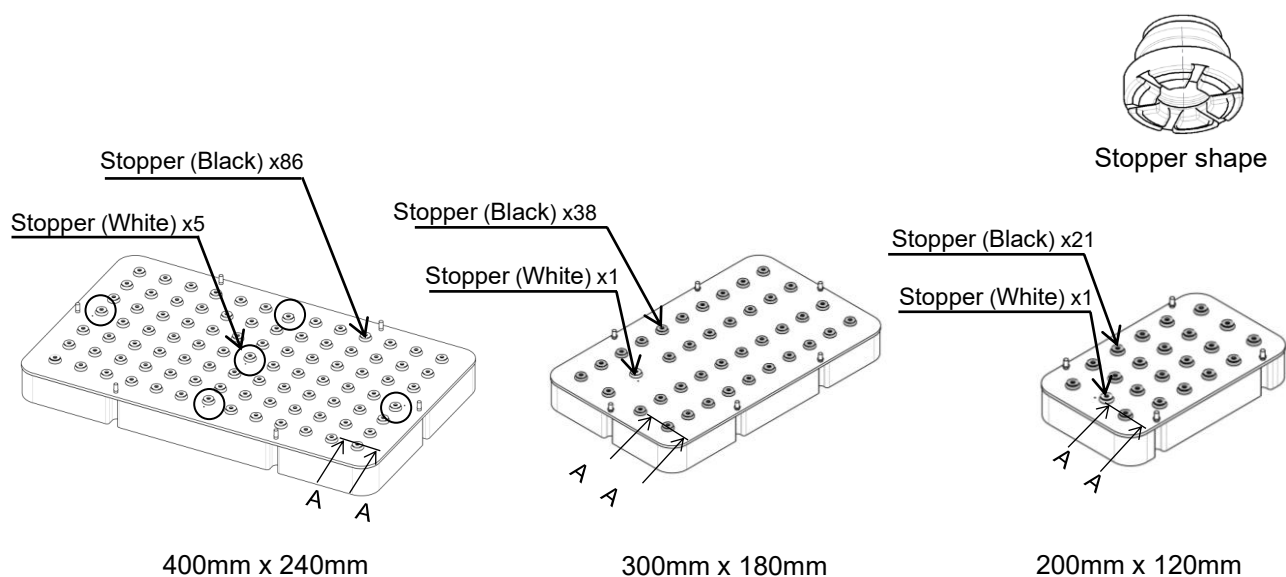
The hole for pressure detection in a foam hole must be placed on the pressure switch side.

8.2.4 How to replace foam with plate (200mm x 120mm)

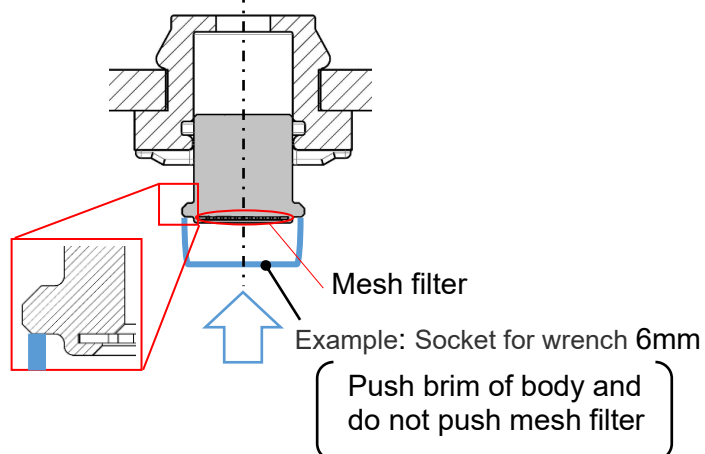


*The foam with plate has an orientation.
The hole for pressure detection in a foam hole must be placed on the pressure switch side.

8.2.5 How to replace Vacuum saving valves

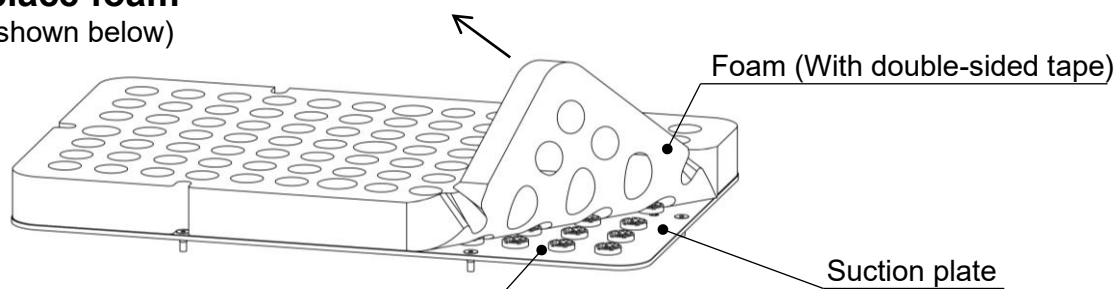


* If it is hard to insert valve body,
thinly apply fluorine grease to inside of stopper.

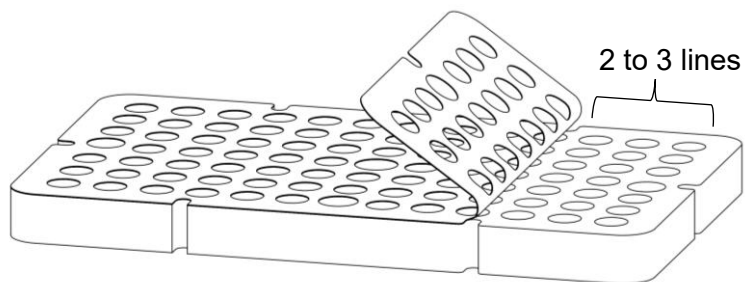
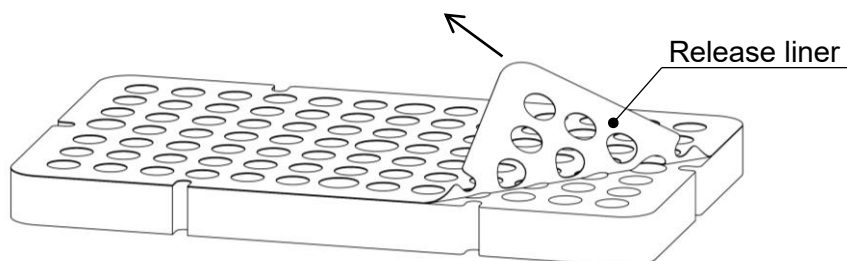


8.2.6 How to replace foam

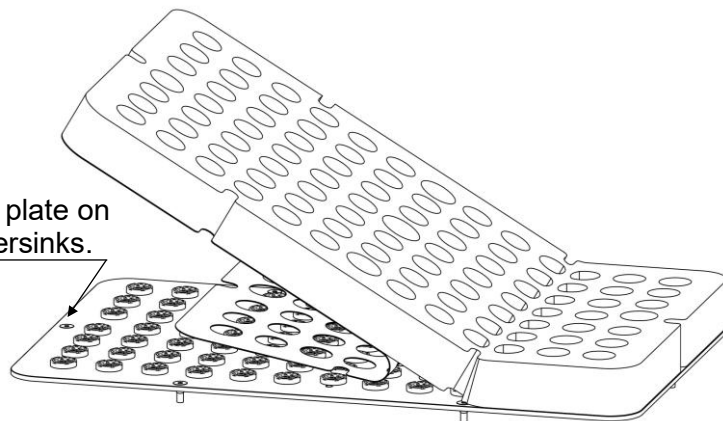
(400mm x 240mm is shown below)



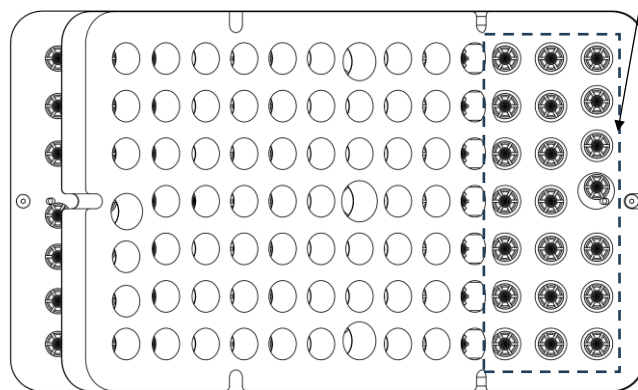
Clean suction plate surface for foam side with IPA (Isopropyl alcohol).

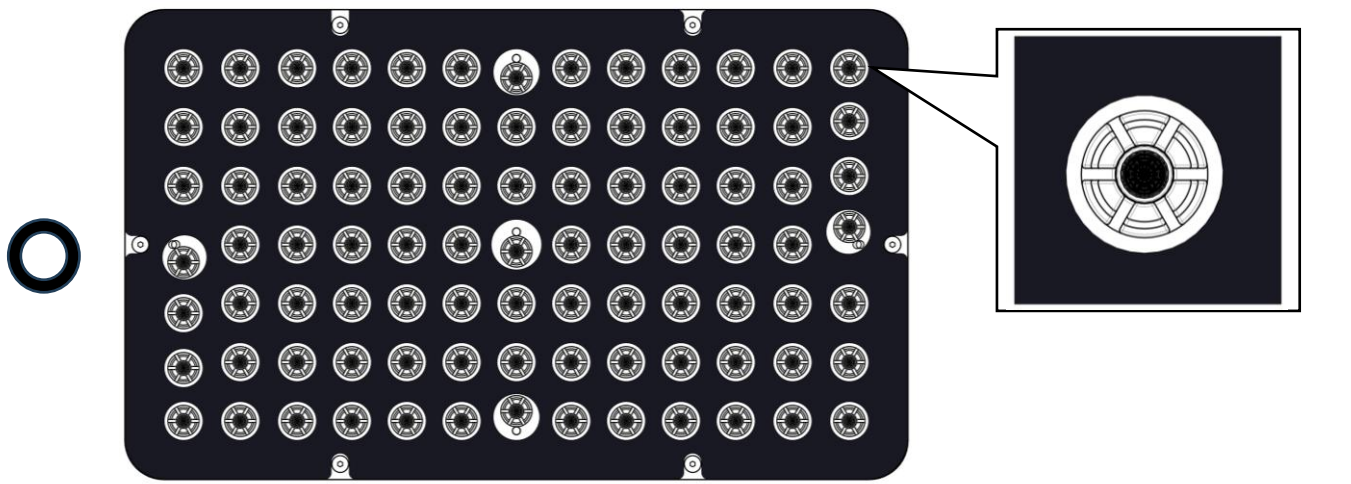


Attach foam to suction plate on the surface with countersinks.

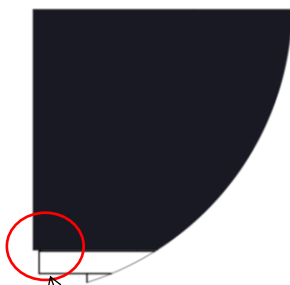
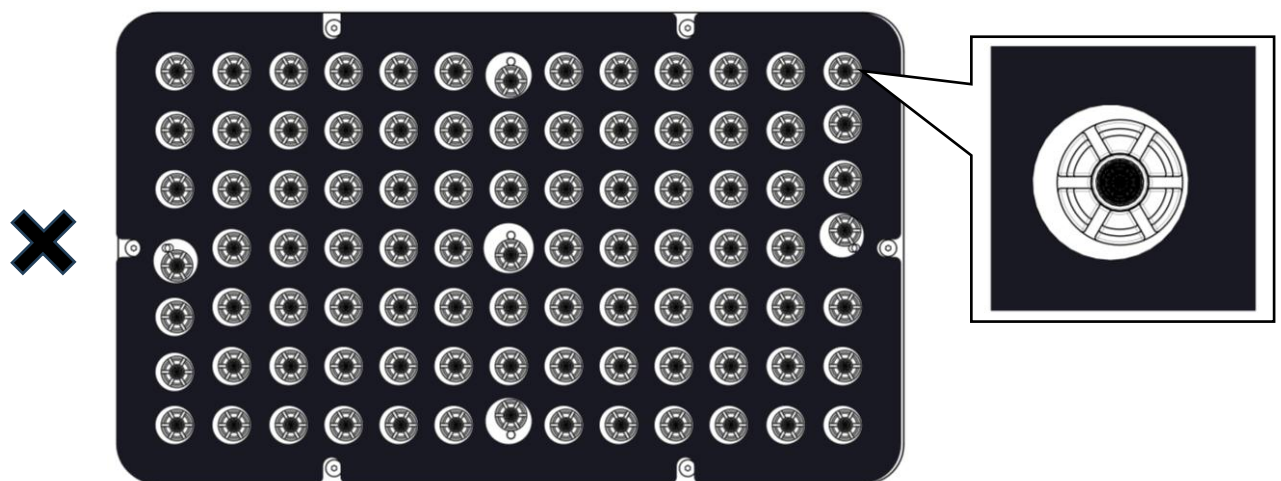
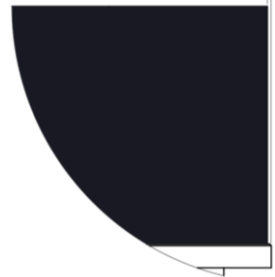


Align foam holes with suction plate.





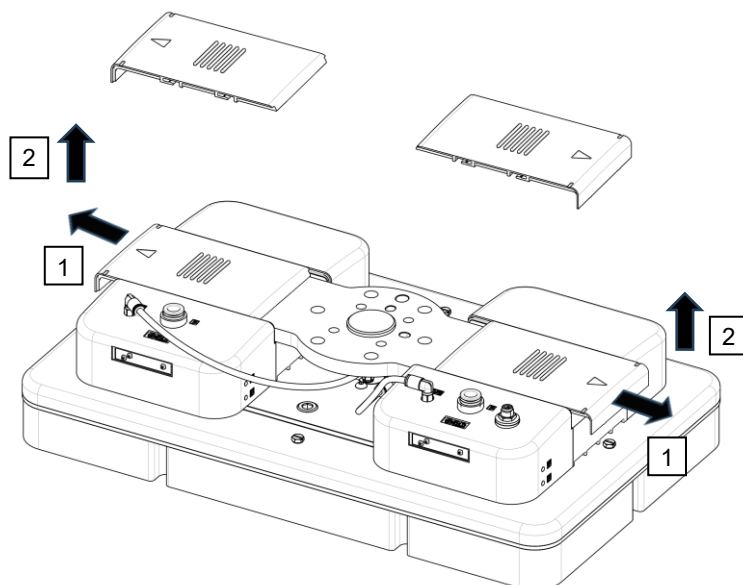
0.5mm
(Reference value)



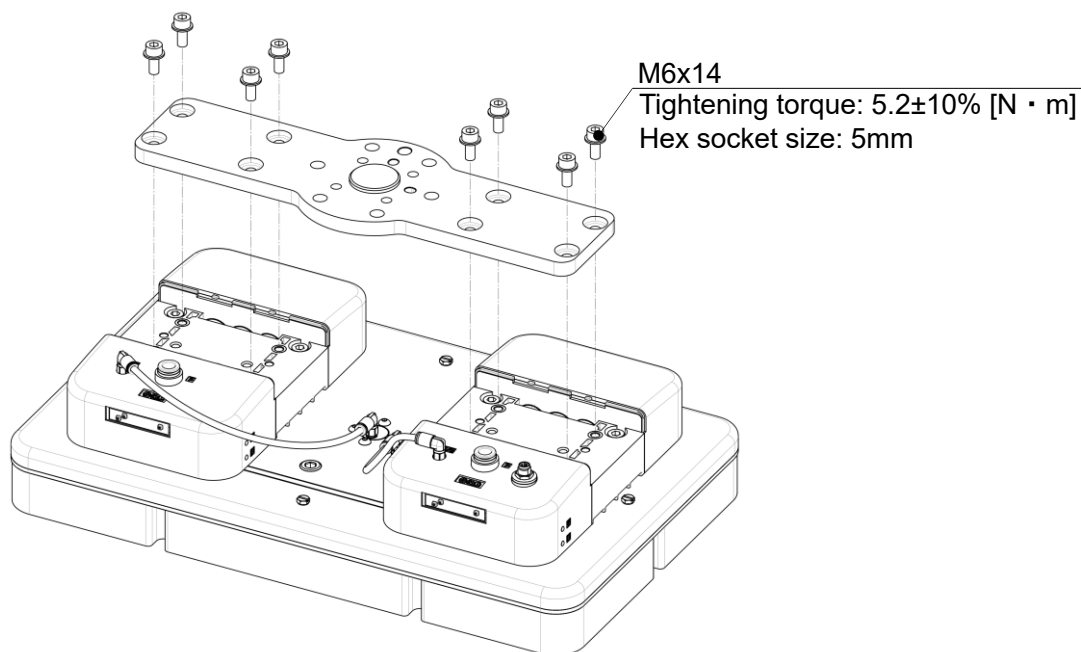
Foam sticks out of suction plate.

8.2.7 How to replace Ejector unit

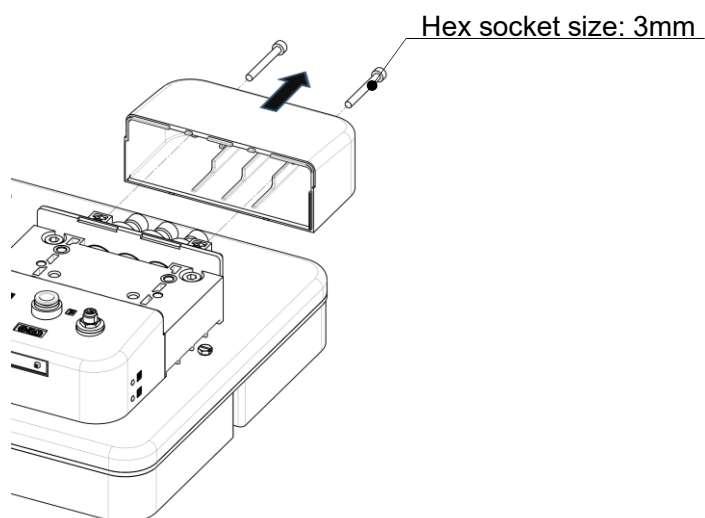
Step 1



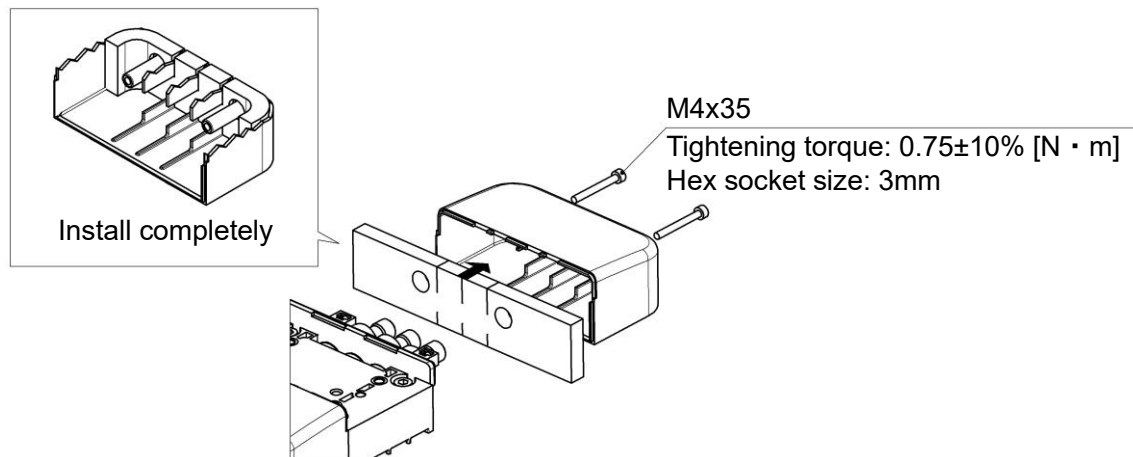
Step 2



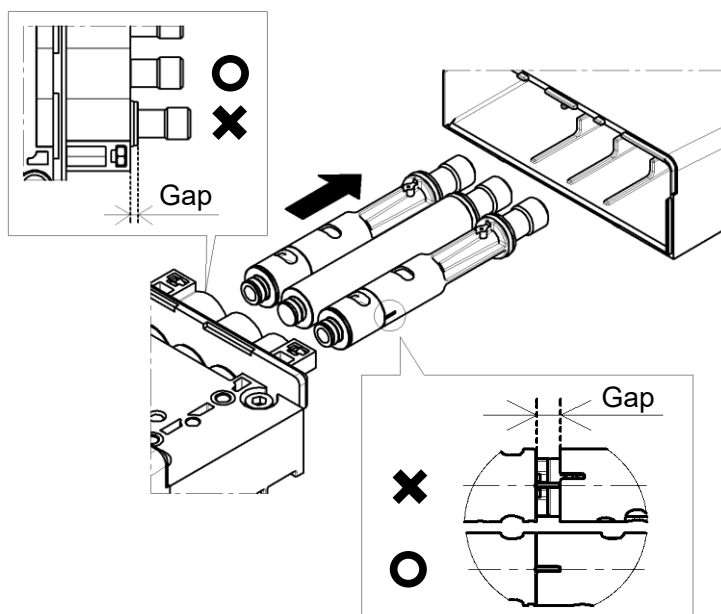
Step 3



Step 4



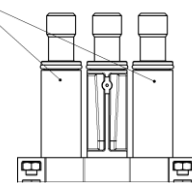
Step 5



Ejector assembly arrangement

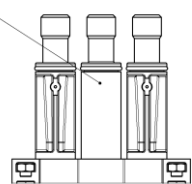
For 1 ejector assembly

Dummy ejector assembly



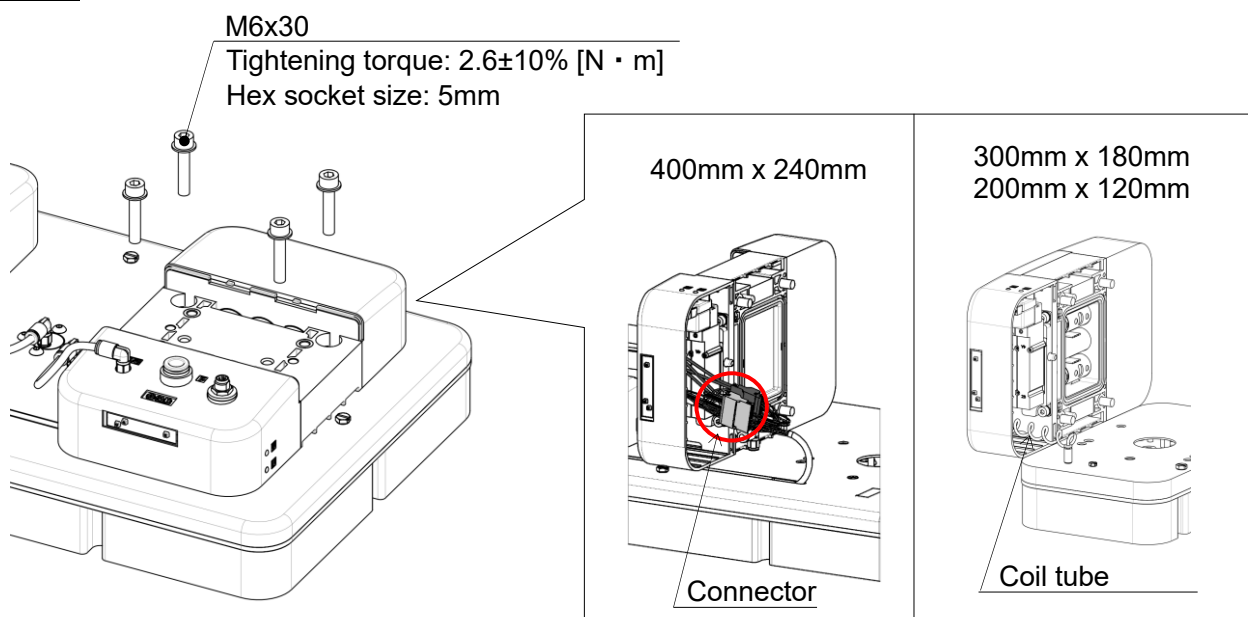
For 2 ejector assemblies

Dummy ejector assembly

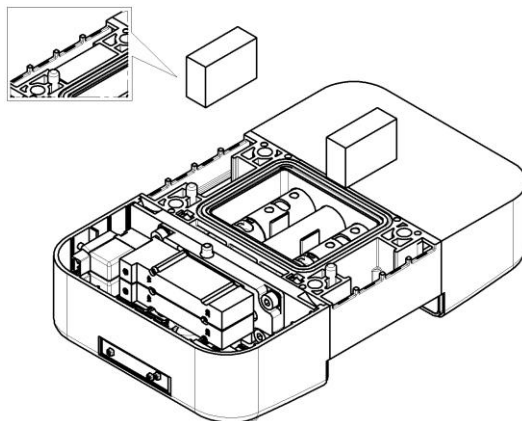


For 200mm x 120mm, the number of ejector assembly is 1 or 2.
3 ejector assemblies may unexpectedly close the suction assist valves and it may result in failures.

Step 6

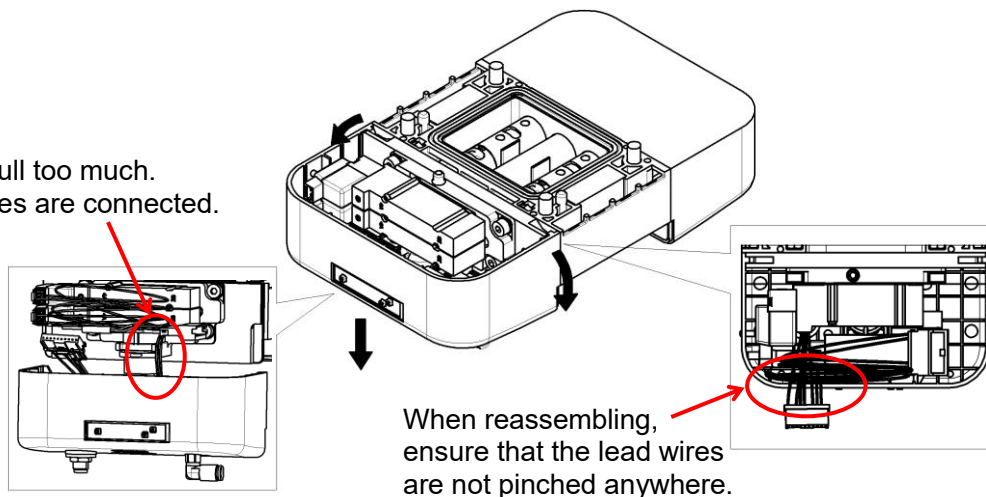


Step 7

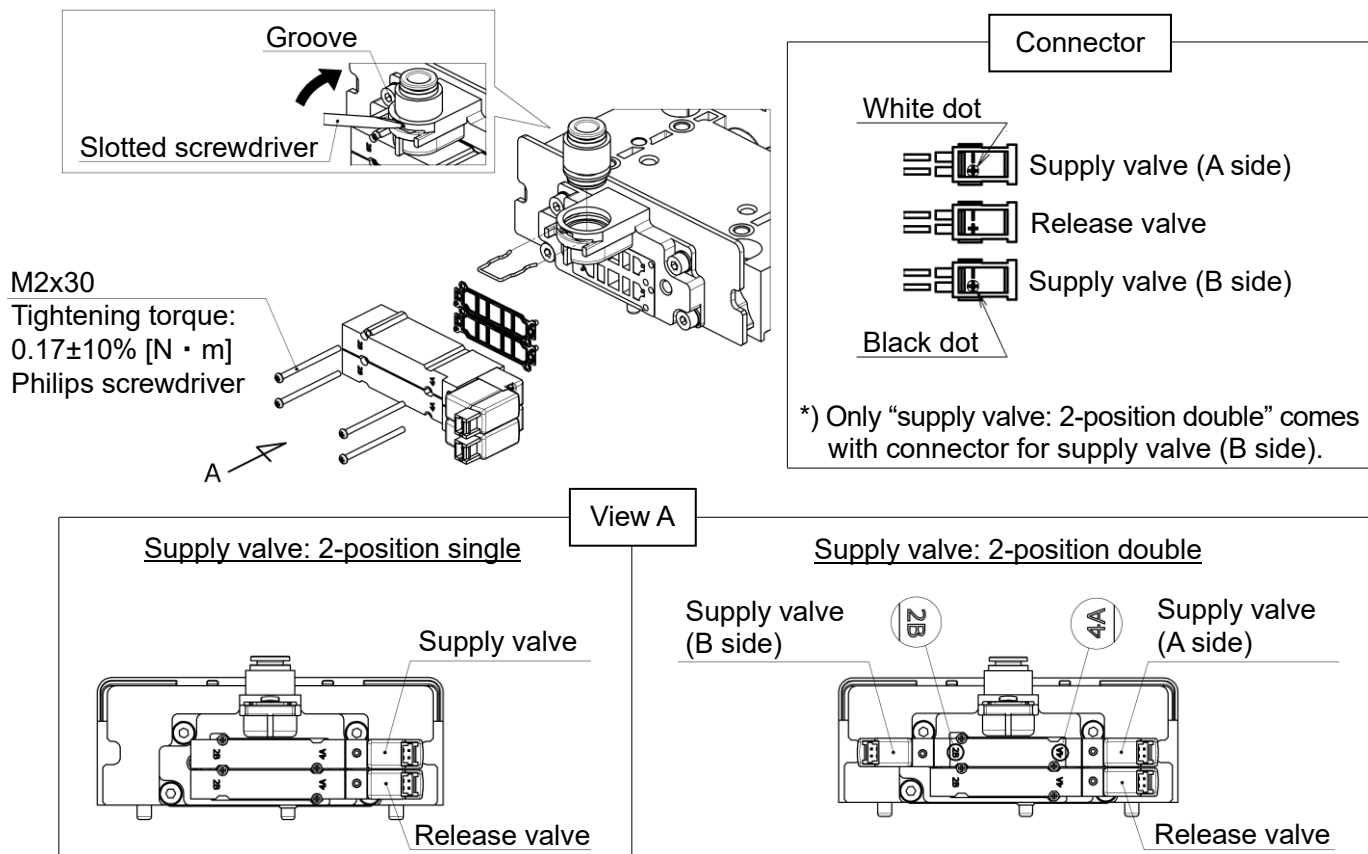


Step 8

Do not pull too much.
Lead wires are connected.

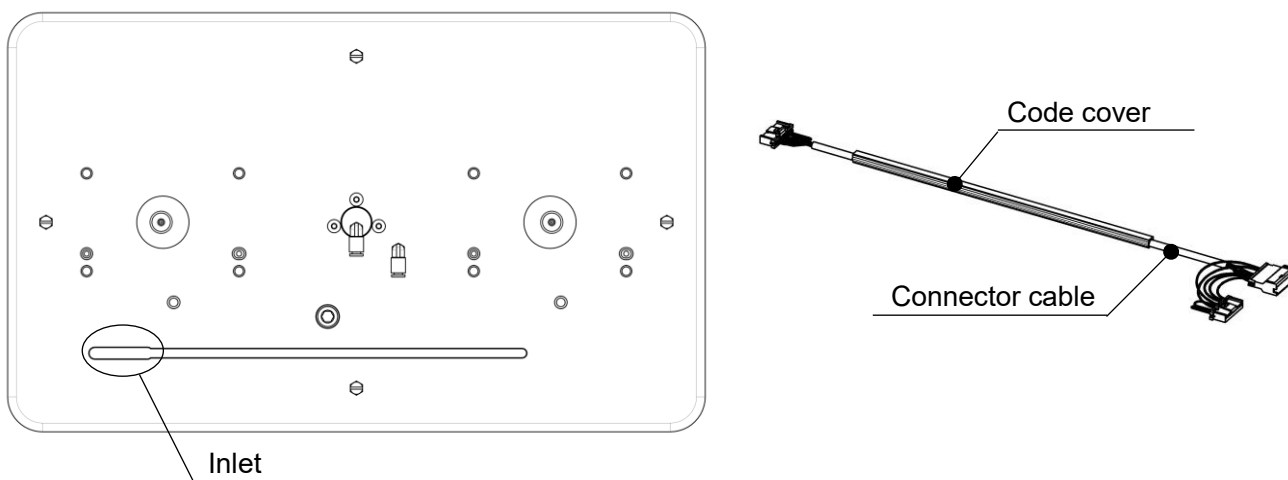


Step 9

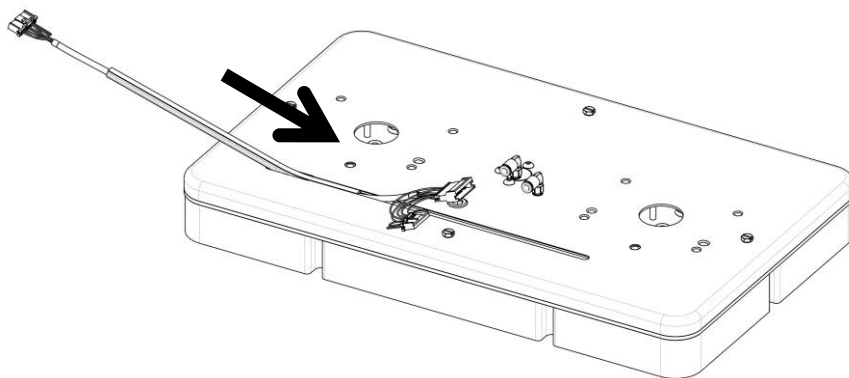


*) Assemble supply valve and release valve in the correct orientation and correctly wire connectors as shown in the above figure. Wrong orientation and wiring may cause malfunction.

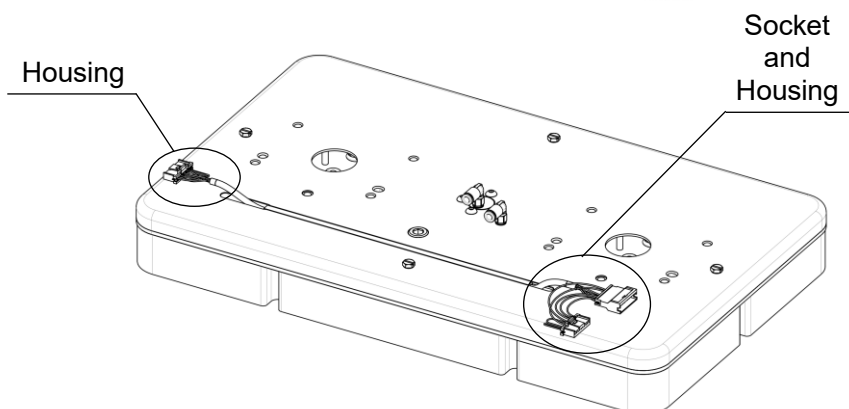
8.2.8 How to replace Connector cable assembly (Only for 400mm x 240mm)



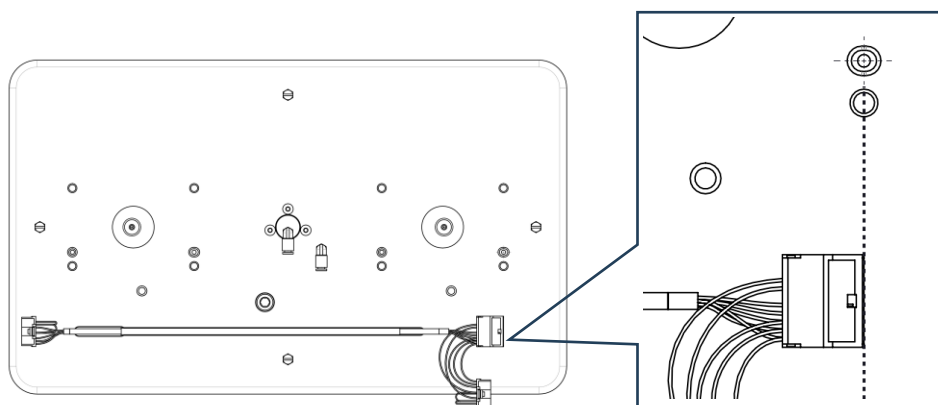
Step 1



Step 2



Step 3



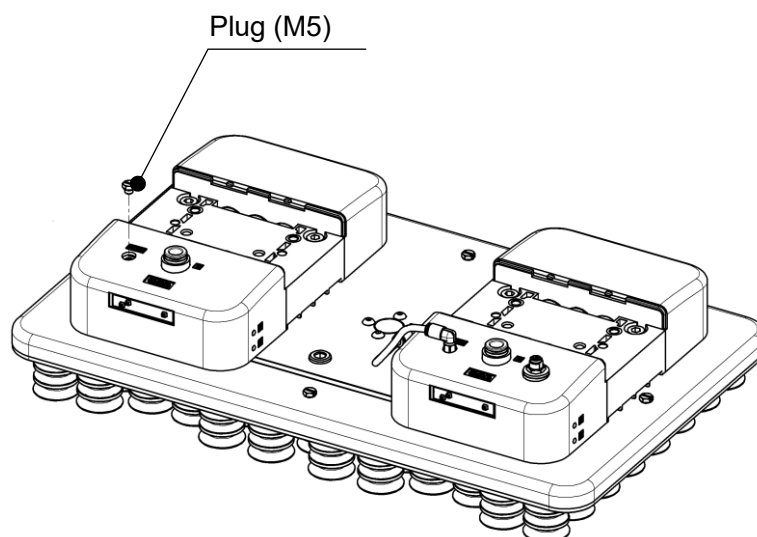
Align socket with hole as the above figure.

8.2.9 How to switch from ZGP to ZGS

■ 400mm x 240mm

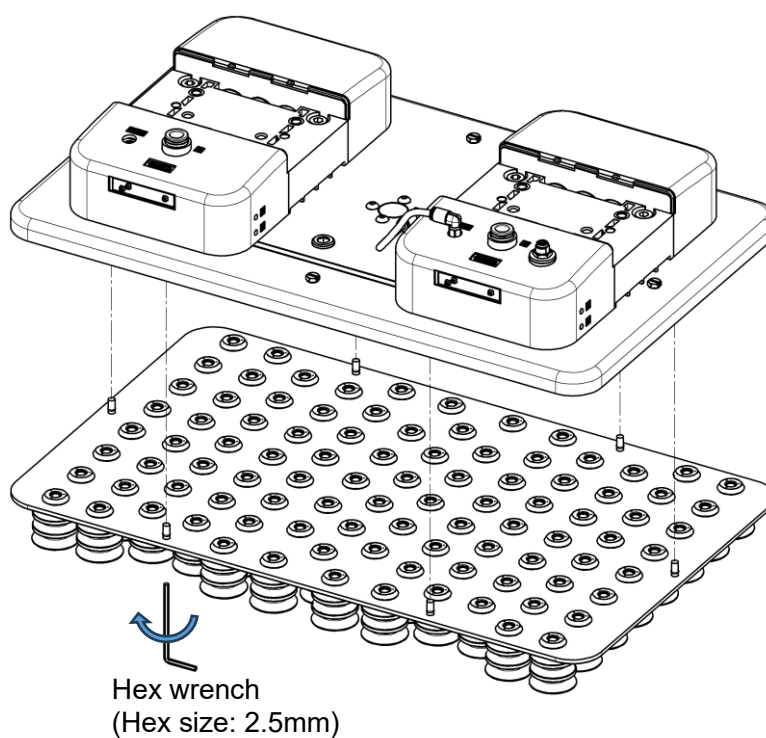
Step 1:

Remove plug(s).



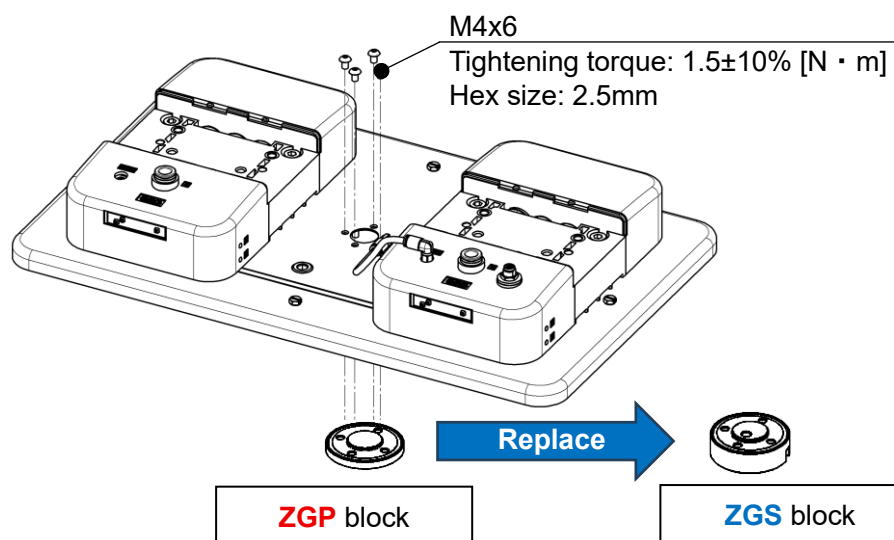
Step 2:

Remove plate with suction cups or plate with plugs.



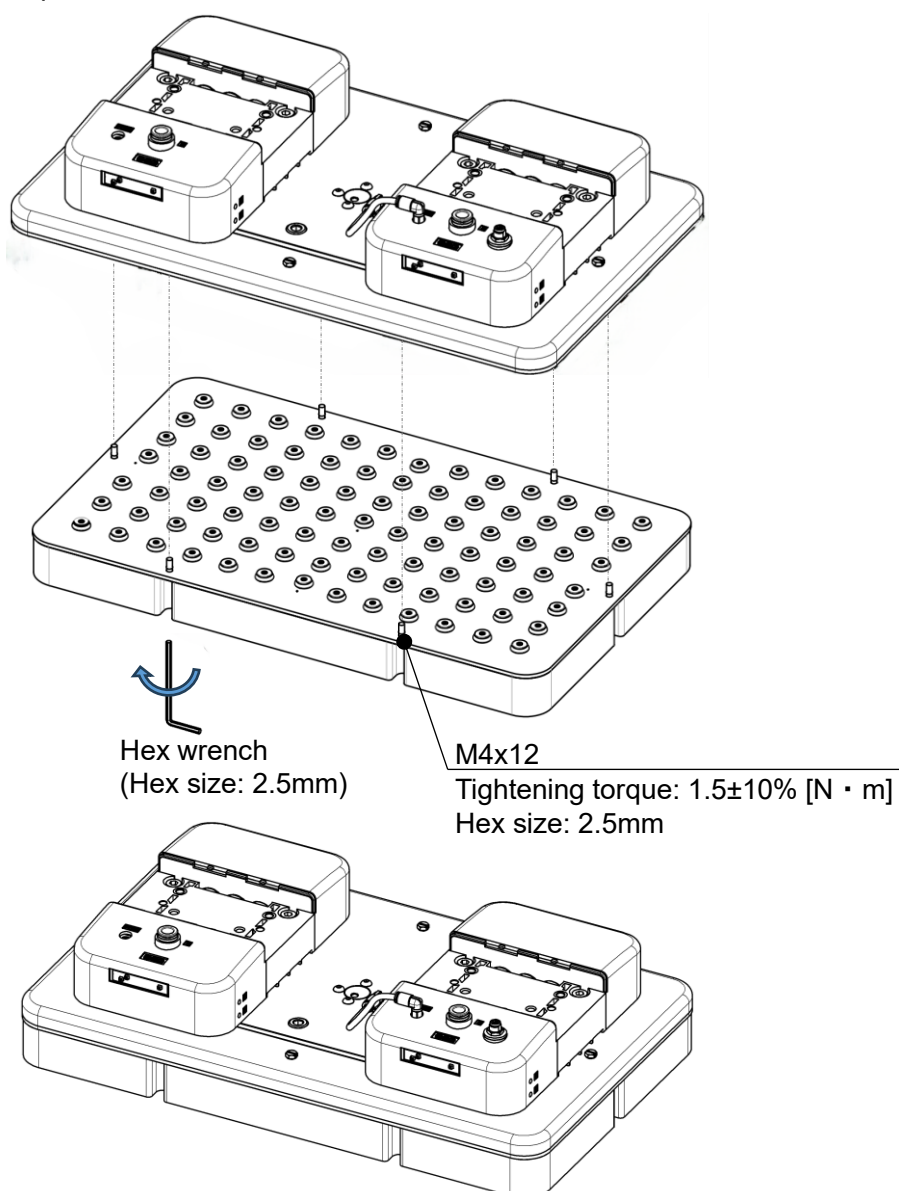
Step 3:

Remove ZGP block and replace with ZGS block.



Step 4:

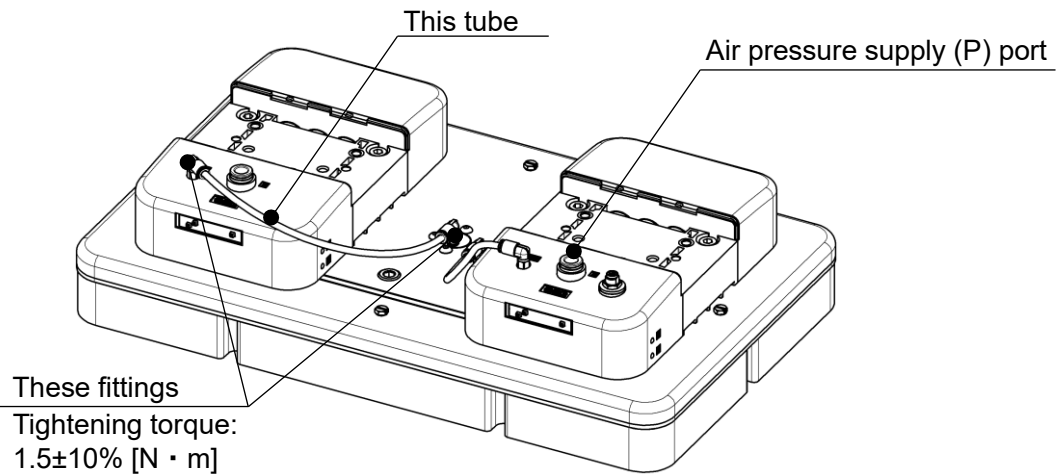
Assemble foam with plate.



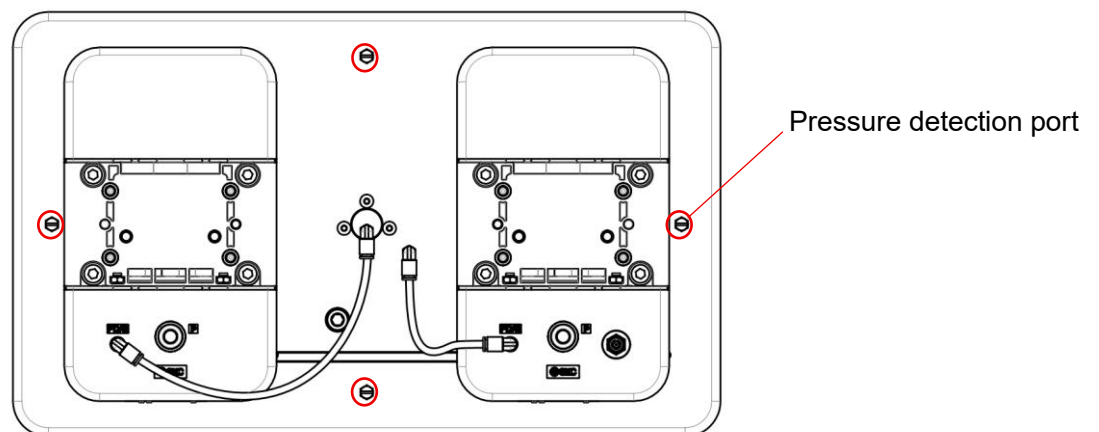
Step 5:

Assemble tube and fittings. (Prepare the fittings and a tube yourself.)

Ensure that the 4 pressure detection ports are plugged as shown in the figure below.



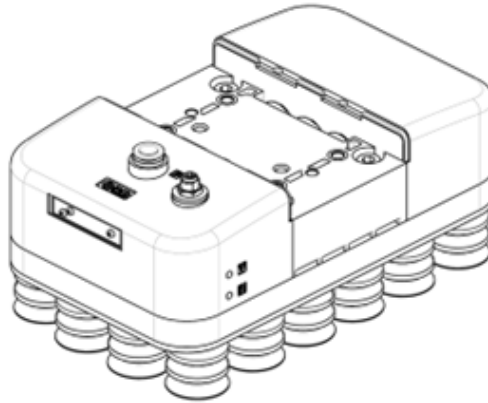
Air pressure supply (P) port	Fitting	Tube
Metric	KQ2L04-M5A	O.D.φ4mm x I.D.φ2.5mm, length 200mm
Inch	KQ2L01-M5A	O.D.φ3.18mm(φ1/8") x I.D.φ2mm, length 200mm



■ 300mm x 180mm, 200mm x 120mm

Step 1:

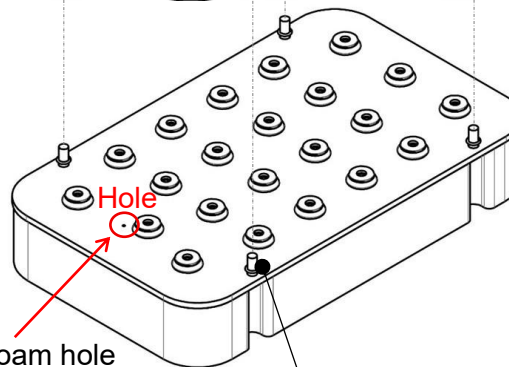
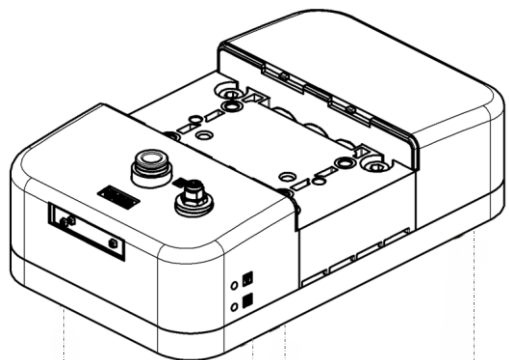
Remove plate with suction cups or plate with plugs.



Hex wrench
(Hex size: 2.5mm)

Step 2:

Assemble foam with plate.



Hole for pressure detection in a foam hole

M4x12

Tightening torque: $1.5 \pm 10\%$ [N · m]

Hex size: 2.5mm



Hex wrench
(Hex size: 2.5mm)

*The foam with plate has an orientation.

The hole for pressure detection in a foam hole must be placed on the pressure switch side.

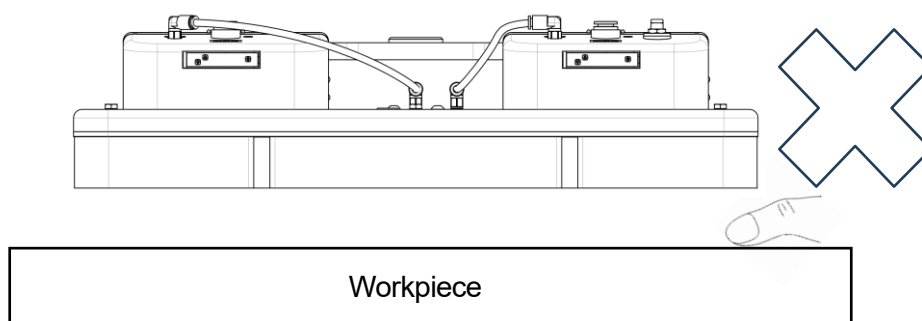
If pressure detection in a foam hole is required, refer to the section "[7.4 How to use the pressure switch to confirm gripping 300mm x 180mm, 200mm x 120mm](#)". (If pressure detection in Base plate is required, no additional work is required.)

9. Precautions



Warning

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

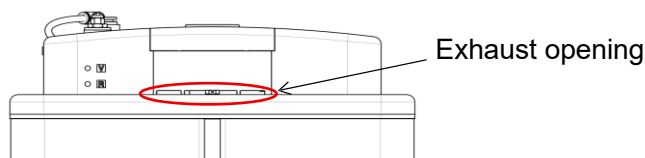


Caution

- 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:
 - Due to manufacturing variations, there may be differences in foam thickness and airtightness.
 - Porous workpieces such as cardboard cause more air leakage than other workpieces, resulting in a decrease 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 decrease, resulting in serious damage or injury.
- 4) Do not block the exhaust opening of the product and restrict air exhaust from it.



- 5) Start generating vacuum, after pressing the foam onto the workpieces so that its surface aligns with the workpiece's uneven surface. Recommended: Approximately 50% of its original thickness.
If starting to generate vacuum before foam contact workpieces for suction assist valve specification, it may cause suction failure because vacuum saving valves close.
- 6) Do not pressurize the product without the ejector cover. Ejector assemblies could jump out.
- 7) Use this product avoiding resonance. Too much load may apply to the product due to resonance, resulting in product damage.
- 8) Premature clogging may occur if the product is used in a dusty environment or used to pick up dusty workpieces. Perform maintenance of the product regularly, including replacement of foam.
- 9) 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	Power supply voltage drop	1)
			Electrical wire failure	2)
			Supply pressure is outside the operating pressure range	3)
	Vacuum pressure decreased.	Clogging by foreign matter or particles		4), 5)
		Clogging of the filters		5)
		Clogging of the sound absorbing materials		4), 5)
		Air leak due to deterioration or wear of the adsorbing parts		6)
		Incorrect assembly during maintenance (Incorrect assembly of gaskets or O-rings)		7)
		Insufficient supply pressure		8)
		Simultaneous operation of supply valve and release valve		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 adsorbing by vacuum and vacuum pressure slightly fluctuates.	Vibration of fluid when vacuum pressure is generated		11)
Vacuum release failure	Blow-off air is not output.	Release valve does not operate	Power supply voltage drop	1)
			Electrical wire failure	2)
			Supply pressure is outside the operating pressure range.	3)
	Workpiece is not released smoothly.	Decrease in blow-off air		12)
		Simultaneous operation 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)	Ensure that each wire is correctly connected including power supply and cable for the vacuum gripper system.
3)	If the supply pressure is lower than the operating pressure range, it may cause operation failure of the valves. If the supply pressure is higher than the operating pressure range, it may cause operation failure due to premature wear of sealing. Adjust the supply pressure appropriately. 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 cause clogging if they go into the ejector. This may cause operation failure. Blow the piping with air to eliminate particles. It is recommended installing the mist separator and air filter to clean the 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 adhering to the surface of the workpiece may enter into the ejector, causing clogging. Perform regular maintenance for the foam with mesh and the mesh filters of the vacuum saving valves and the sound adsorbing materials.
6)	Replace the foam or foam with plate. If premature wear occurs, check operating conditions such as vacuum pressure, suitability between the foam and the workpiece and as needed, change operating conditions.
7)	If the gaskets or O-rings are lost or pinched after disassembling for maintenance, vacuum leak or air leak occurs there. In this case, disassemble again and correctly assemble the gaskets and O-rings.
8)	If the supply pressure decreases during the operation of the ejector, the generated vacuum pressure decreases. Supply adequate flow rate so that the supply pressure will not decrease when other air equipment operates simultaneously.
9)	Vacuum pressure and release flow decrease if the supply valve and release valve are open simultaneously. Check the control program and wiring.
10)	In the following cases, the vacuum pressure does not increase adequately. Replace the ejector assembly. (1) The check valve in the ejector assembly is deteriorated by use for a long period. (2) Particles are attached on the sealing surface of the check valve in 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 pressure switch. The noise can be eliminated by changing the supply pressure. Adjust the supply pressure while checking the exhaust noise and vacuum pressure until the noise disappears. Ejector may generate noise due to the increase of exhaust resistance. When the sound absorbing materials become dirty, the replacement of them may improve the fluctuation and noise.
12)	If the foam with mesh and the mesh filters of the vacuum saving valves are clogged, blow-off air decreases. Regularly perform maintenance.

Revision history
Rev A: Completely revised due to change of compatible robots

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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