PowerArm

PAW Series Standard specifications

● Bore size: ø80, ø100, ø125

Specifications

Item		PAW		
Bore size	mm	ø80	ø100	ø125
Working fluid		Compressed air		
Max. working pressure	MPa	0.7		
Min. working pressure	MPa	0.25 (when option L (with rotation lock) is selected: 0.35)		
Proof pressure	MPa	1.05		
Ambient temperature	°C	5 to 60		
Cushion		Rubber cushion		
Lubrication		Not available		
Load capacity (0.5MPa pressurized) *1	kg	32	53	83
Air consumption *2	ℓ/min (ANR)	8	14	25

*1: Load capacity varies with supply pressure. Refer to "Load capacity at pressure" on the next page.
Indicates the load capacity with the optional tip rotation mounted.
*2: Values are at air consumption 1 cycle/min. and working pressure 0.7MPa.

Movable range

• With single-axis

Model No.	Movable range Top and bottom (mm)
PAW-S-8 (ø80)	520
PAW-S-X (ø100)	580
PAW-S-Z (ø125)	650

• With multi-axis

Model No.	Movable range	
	Top and bottom (mm)	Horizontal (mm)
PAW-M-8S	520	1200
PAW-M-XS	580	1400
PAW-M-ZS	650	1600
PAW-M-8X	1100	1300
PAW-M-XZ	1230	1500
PAW-M-8XS	1100	2000
PAW-M-XZS	1230	2300
PAW-M-8XZ	1750	2100

Note:Horizontal movable range is the maximum value at the descending edge of the vertical movable range. See the external dimensions for more information on the movable range.

Weight

Model No.	Weight (kg)	Optional additional weight (kg)		
		L(Rotation lock mechanism)	R(Tip rotation mechanism)	LR
PAW-S-8	27	0.5	4	5
PAW-S-X	38	0.5	5.5	6.5
PAW-S-Z	71	0.5	7.5	8.5
PAW-M-8S	46	1	4	5.5
PAW-M-XS	77	1	5.5	7
PAW-M-ZS	123	1	7.5	9
PAW-M-8X	58	1	4	5.5
PAW-M-XZ	102	1	5.5	7
PAW-M-8XS	96	1.5	4	6
PAW-M-XZS	154	1.5	5.5	7.5
PAW-M-8XZ	121	1.5	4	6

How to order

PAW - **M** - **8X** - **R**

- PAW: Model No.
- M: ❶ Number of sections
- 8X: ❷ Combination contents
- R: ❸ Option

❷ Combination contents

Code		Description	❶ Number of sections: Single axis S	❶ Number of sections: multi-axis M
8	Single axis	ø80	●	
X	Single axis	ø100	●	
Z	Single axis	ø125	●	
8S	Multi-axis	ø80+SCARA arm		●
XS	Multi-axis	ø100+SCARA arm		●
ZS	Multi-axis	ø125+SCARA arm		●
8X	Multi-axis	ø80+ø100		●
XZ	Multi-axis	ø100+ø125		●
8XS	Multi-axis	ø80+ø100+SCARA arm		●
XZS	Multi-axis	ø100+ø125+SCARA arm		●
8XZ	Multi-axis	ø80+ø100+ø125		●

❸ Option

	Code	Description	❶ Number of sections: Single axis S	❶ Number of sections: multi-axis M
*1	L	Rotation lock mechanism*	●	●
	R	Tip rotation mechanism	●	●
	C	Bending direction (Refer to the figure at left)		●
	U	Piping leadout direction (Refer to the figure at left)	●	●

*1: Mechanism to retain force in the rotation direction.
It is not designed to stop the dynamic rotational force.

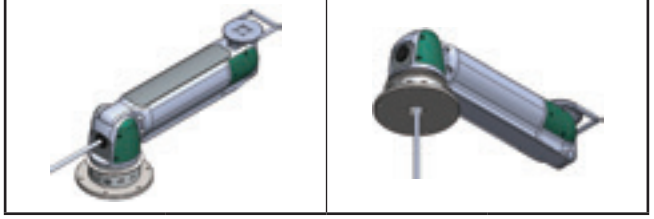
❸Option: Bending direction

Blank		C	
For 2-axis configuration	For 3-axis configuration	For 2-axis configuration	For 3-axis configuration

* C is not available for single axis (PAW-S).

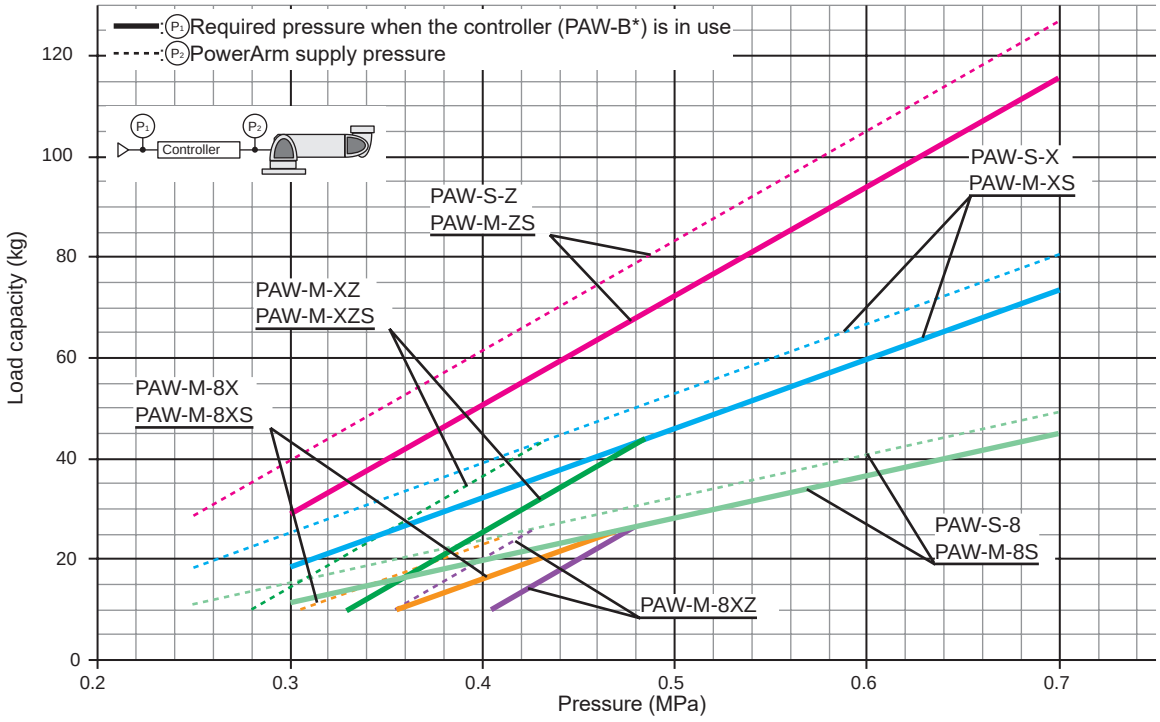
❸Option: Piping leadout direction

Blank	U



* Piping holes at the mounting surface center are required for U.

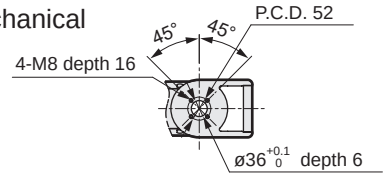
Load capacity with respect to pressure



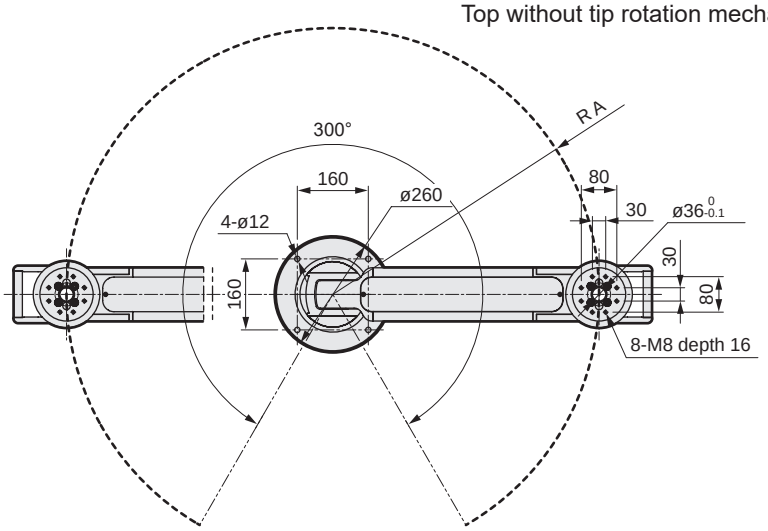
*1: Indicates the load capacity with the optional tip rotation mechanism mounted.
*2: Pressure supplied to the controller should be increased, depending on the operating frequency and speed.
*3: Attachment weight is not included.
*4: While the load capacity has properties such that it alters slightly according to the arm rise angle, this graph shows the lower limit values.

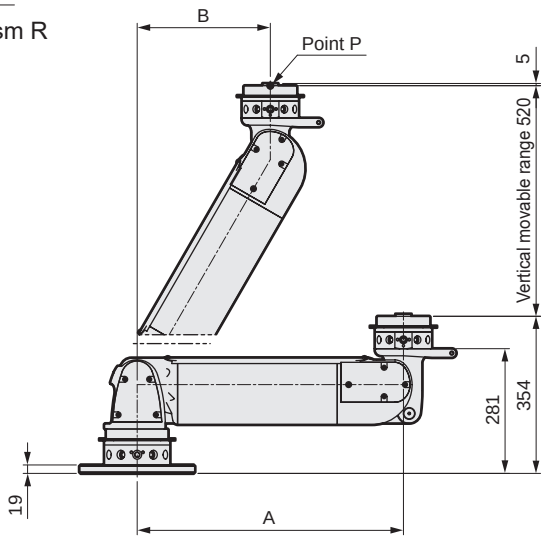
Dimensions (single-axis)

- PAW-S-8-R (ø80 single-axis)
- PAW-SB-8-R (ø80 single axis mechanical lock specifications)



Top without tip rotation mechanism R

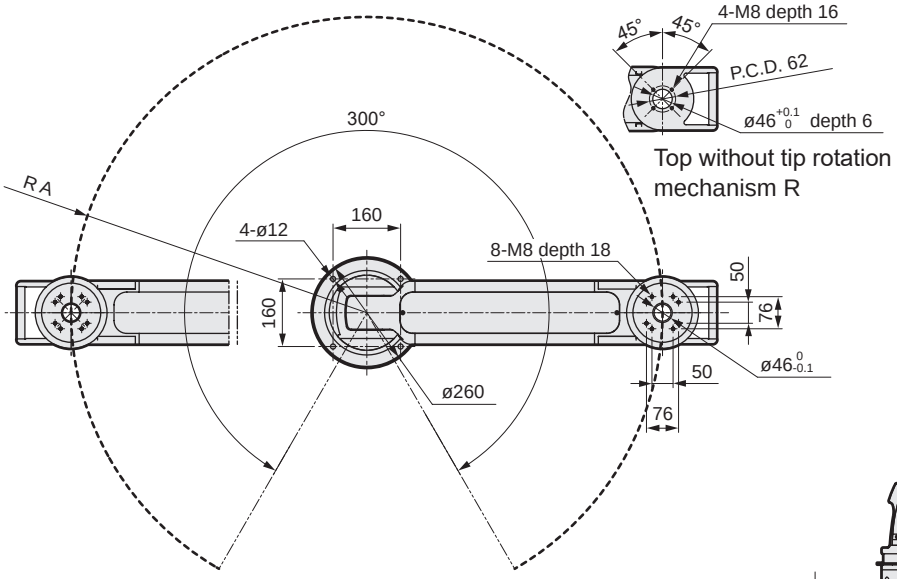




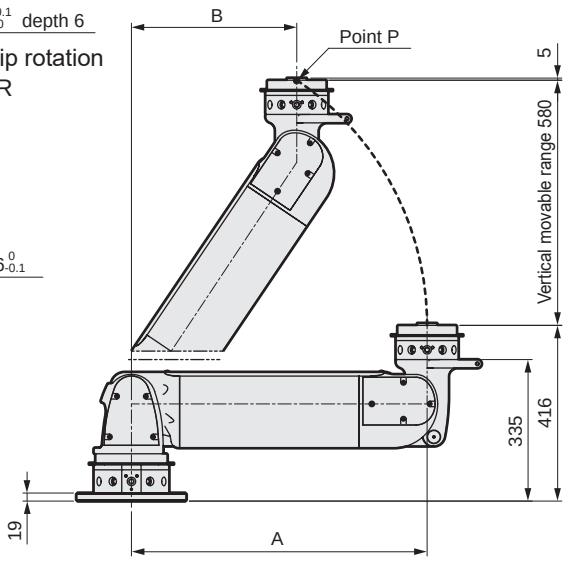
Shows dimensions with tip rotation mechanism R. Plane view shows movable view at the descending edge. Structurally, the movable range changes according to the rising height.

Code / Model No.	A	B
PAW-S-8-R	600	300
PAW-SB-8-R	650	390

- PAW-S-X-R (ø100 single axis)
- PAW-SB-X-R (ø100 single axis mechanical lock specifications)



Top without tip rotation mechanism R



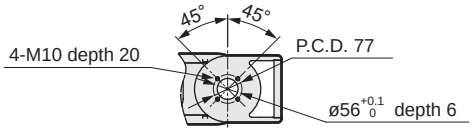
Shows dimensions with tip rotation mechanism R. Plane view shows movable view at the descending edge. Structurally, the movable range changes according to the rising height.

Code / Model No.	A	B
For PAW-S-X-R	700	392
PAW-SB-X-R	750	475

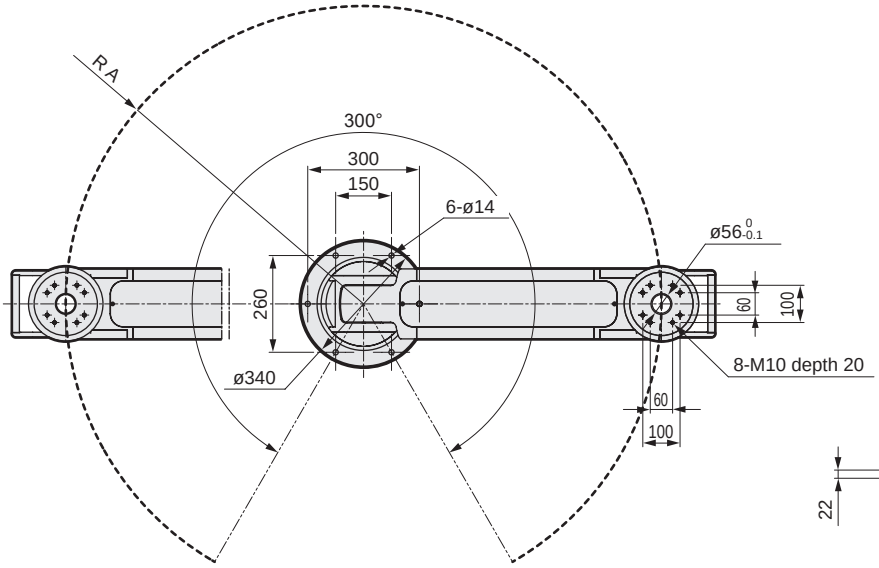
* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.

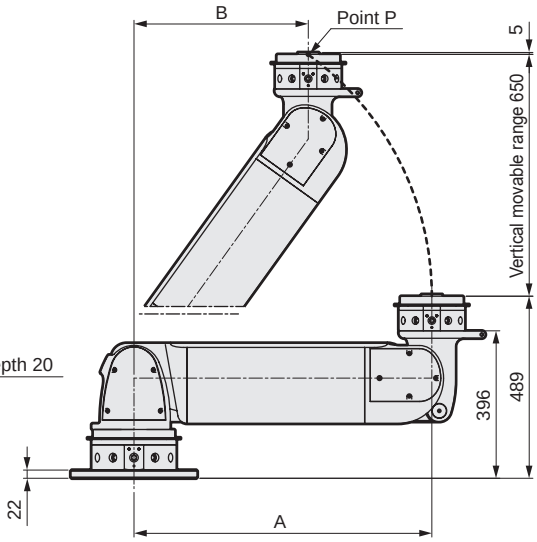
Dimensions (single-axis)

- PAW-S-Z-R (ø125 single axis)
- PAW-SB-Z-R (ø125 single axis mechanical lock specifications)



Top without tip rotation mechanism R





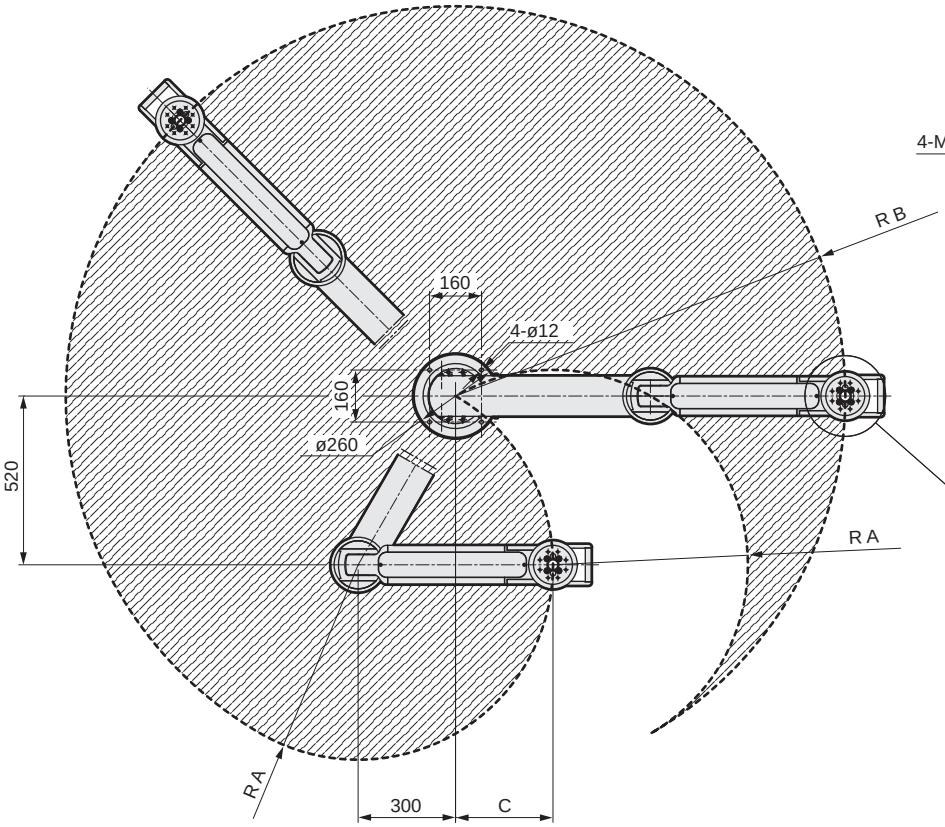
Shows dimensions with tip rotation mechanism R. Plane view shows movable view at the descending edge. Structurally, the movable range changes according to the rising height.

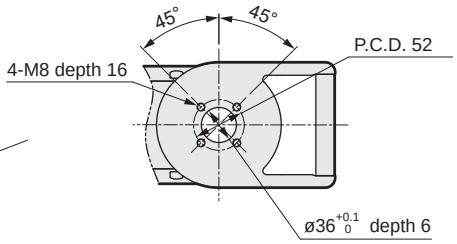
Code / Model No.	A	B
PAW-S-Z-R	800	466
PAW-SB-Z-R	850	548

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.

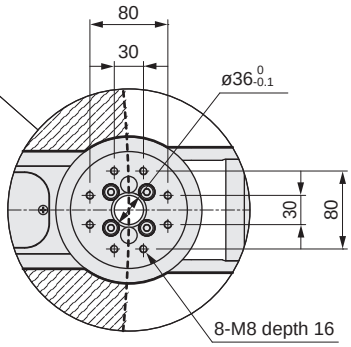
Dimensions (multi-axis)

- PAW-M-8S-R (upper section ø80 + lower section SCARA arm)
- PAW-MB-8S-R (upper section ø80 + lower section SCARA arm mechanical lock specifications)

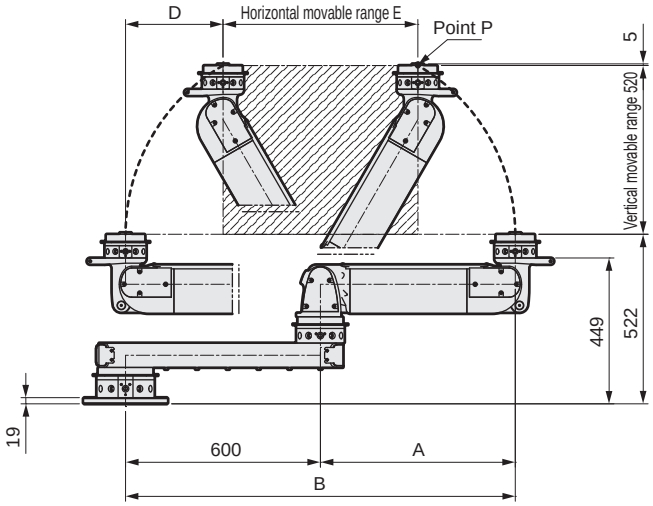




Top without tip rotation mechanism R



Enlarged view



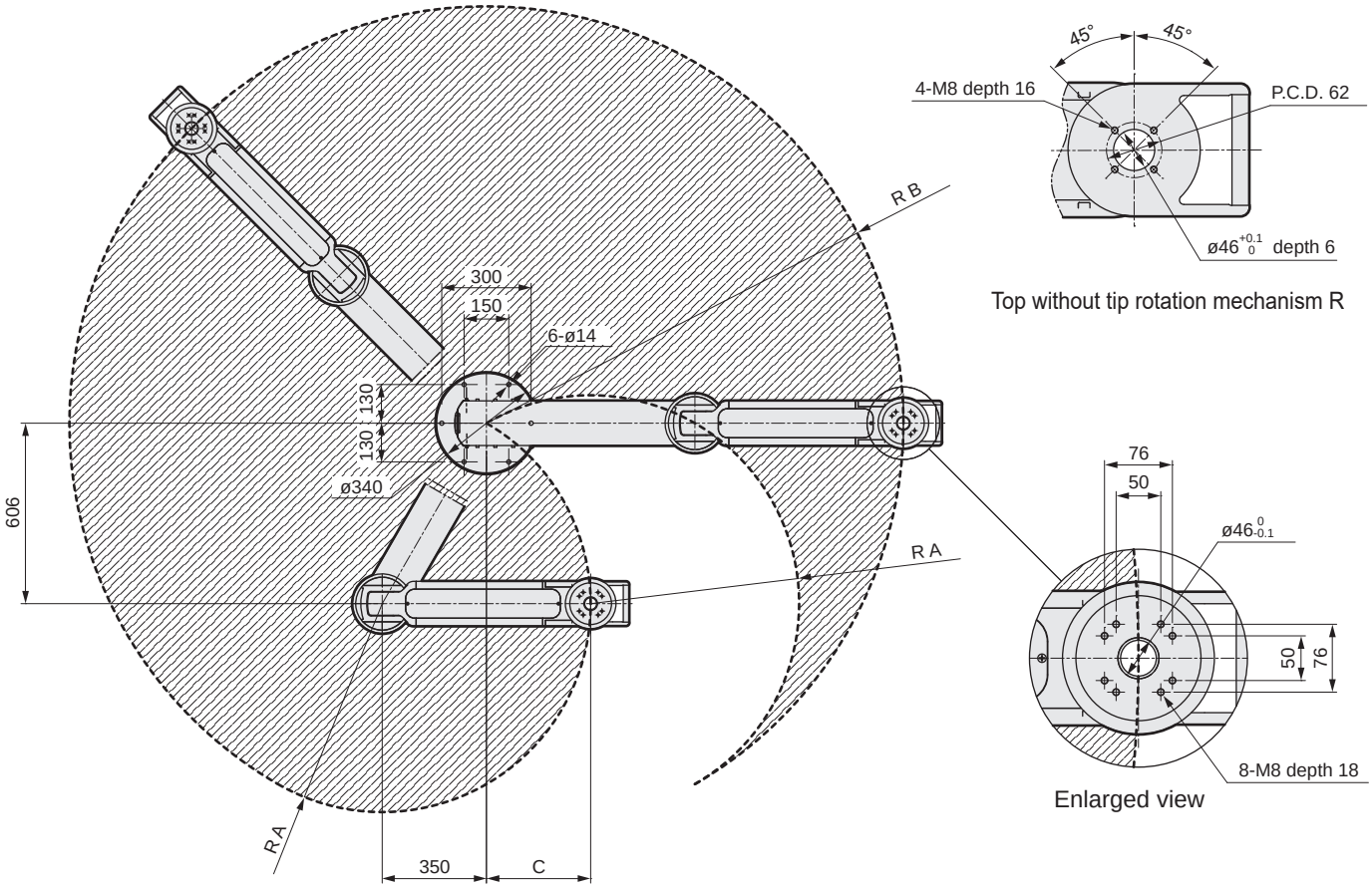
Code / Model No.	A	B	C	D	E
PAW-M-8S-R	600	1200	300	300	600
PAW-MB-8S-R	650	1250	350	210	780

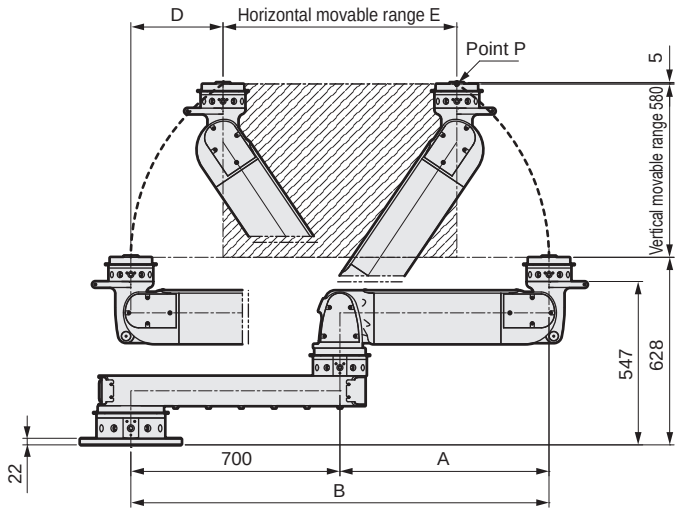
Shows dimensions with tip rotation mechanism R.Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions (multi-axis)

- PAW-M-XS-R (upper section ø100 + lower section SCARA arm)
- PAW-MB-XS-R (upper section ø100 + lower section SCARA arm mechanical lock specifications)





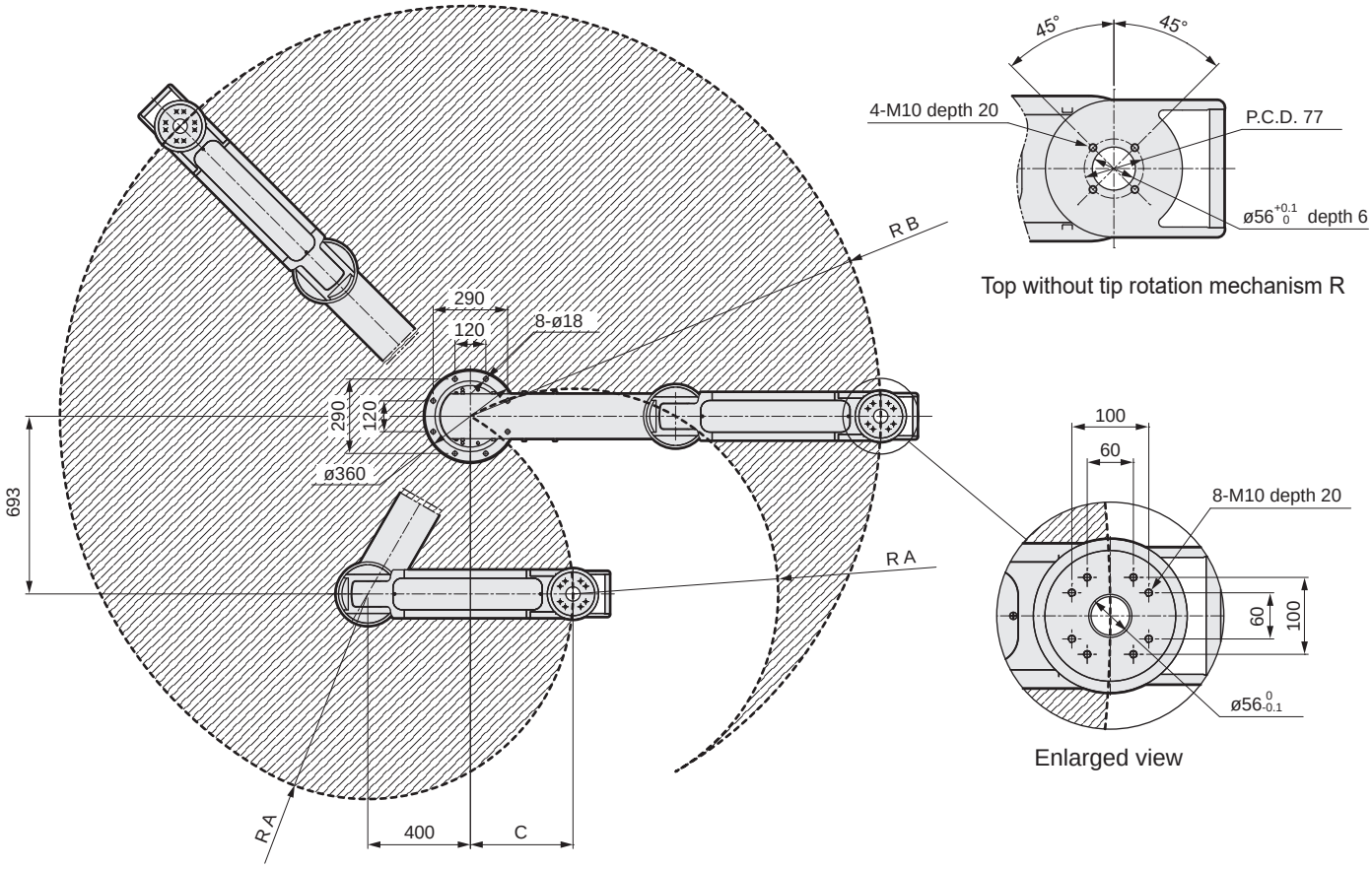
Shows dimensions with tip rotation mechanism R. Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

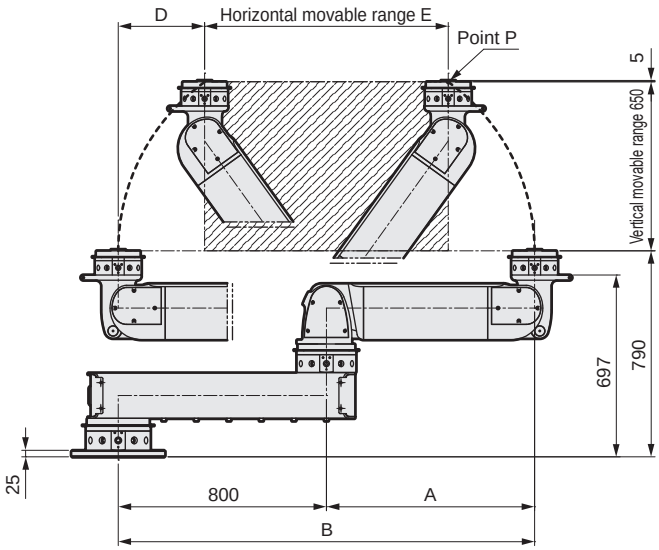
Code / Model No.	A	B	C	D	E
PAW-M-XS-R	700	1400	350	308	784
PAW-MB-XS-R	750	1450	400	225	950

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions (multi-axis)

- PAW-M-ZS-R (upper section ø125 + lower section SCARA arm)
- PAW-MB-ZS-R (upper section ø125 + lower section SCARA arm mechanical lock specifications)





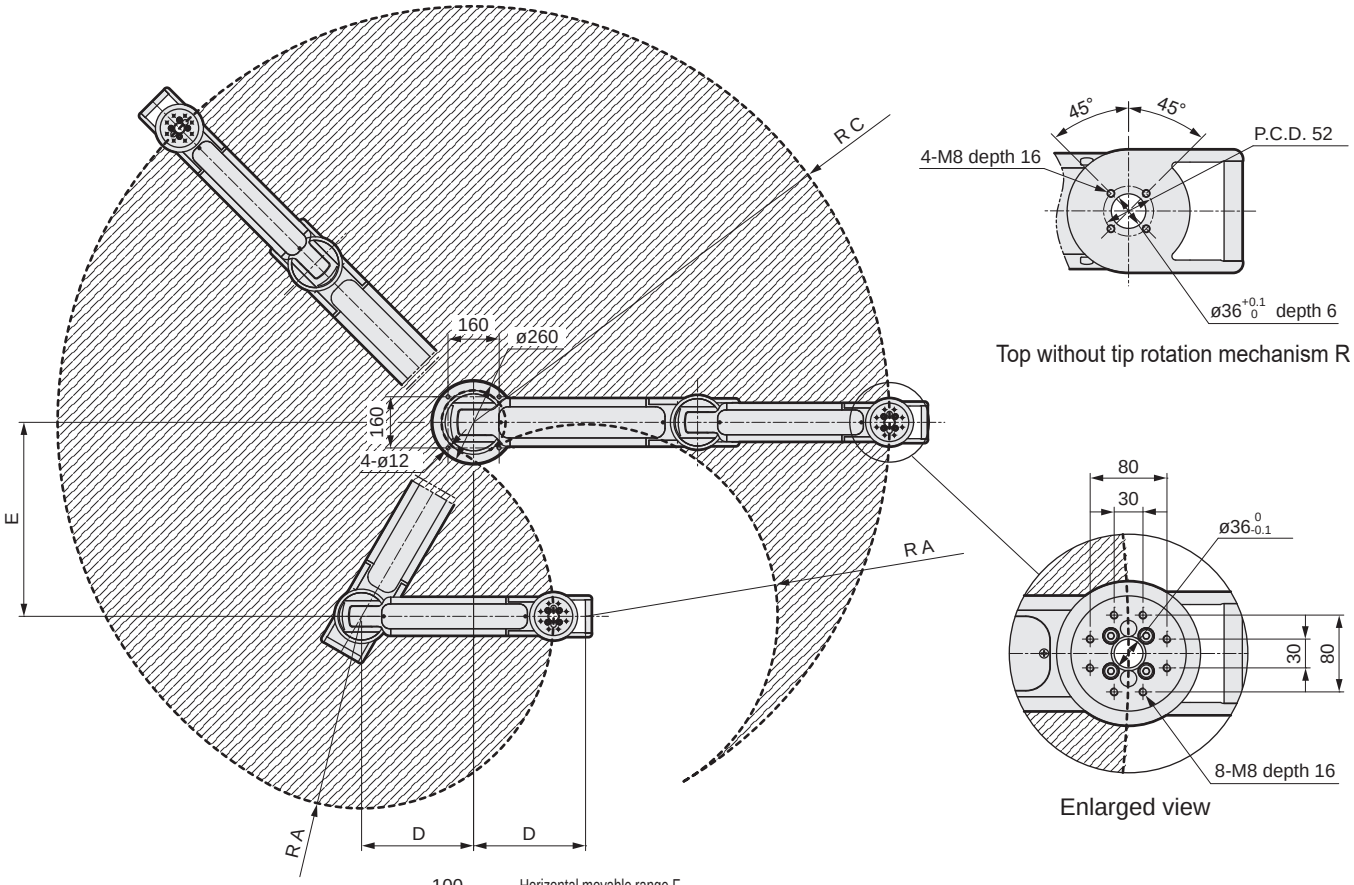
Code / Model No.	A	B	C	D	E
PAW-M-ZS-R	800	1600	400	334	932
PAW-MB-ZS-R	850	1650	450	252	1096

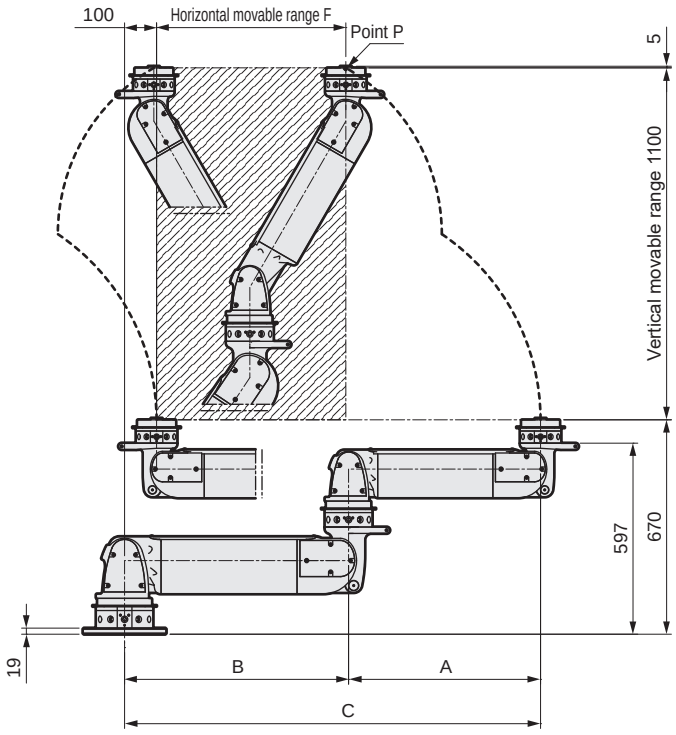
Shows dimensions with tip rotation mechanism R.Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions (multi-axis)

- PAW-M-8X-R (upper section ø80 + lower section ø100)
- PAW-MB-8X-R (upper section ø80 + lower section ø100 mechanical lock specifications)





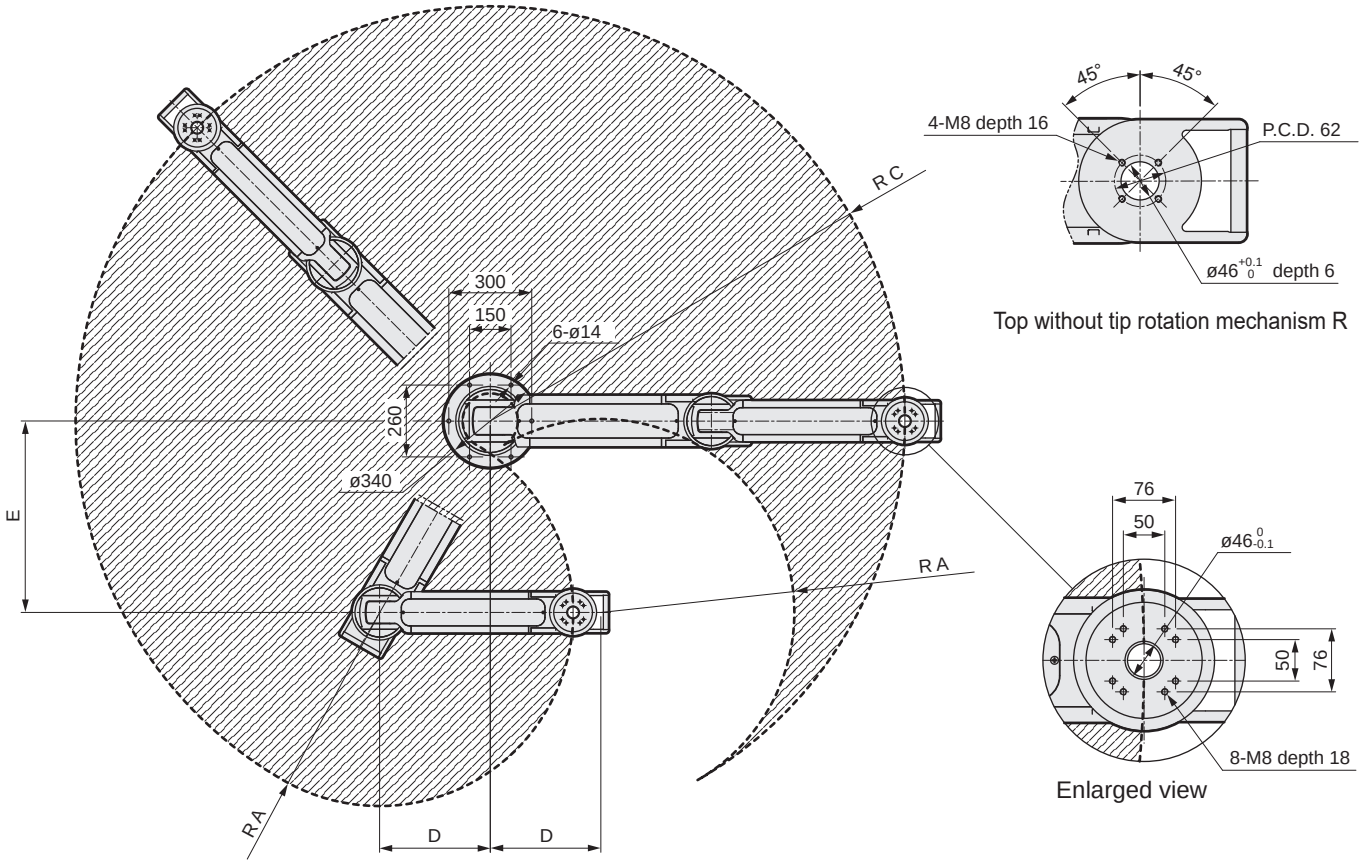
Shows dimensions with tip rotation mechanism R.Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

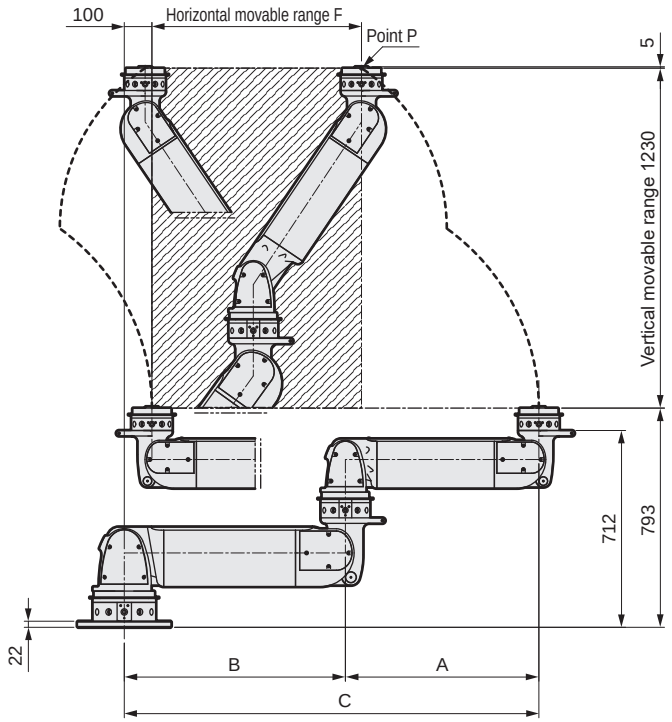
Code / Model No.	A	B	C	D	E	F
PAW-M-8X-R	600	700	1300	350	606	592
PAW-MB-8X-R	650	750	1400	375	650	765

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions (multi-axis)

- PAW-M-XZ-R (upper section ø100 + lower section ø125)
- PAW-MB-XZ-R (upper section ø100 + lower section ø125 mechanical lock specifications)





Shows dimensions with tip rotation mechanism R.Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

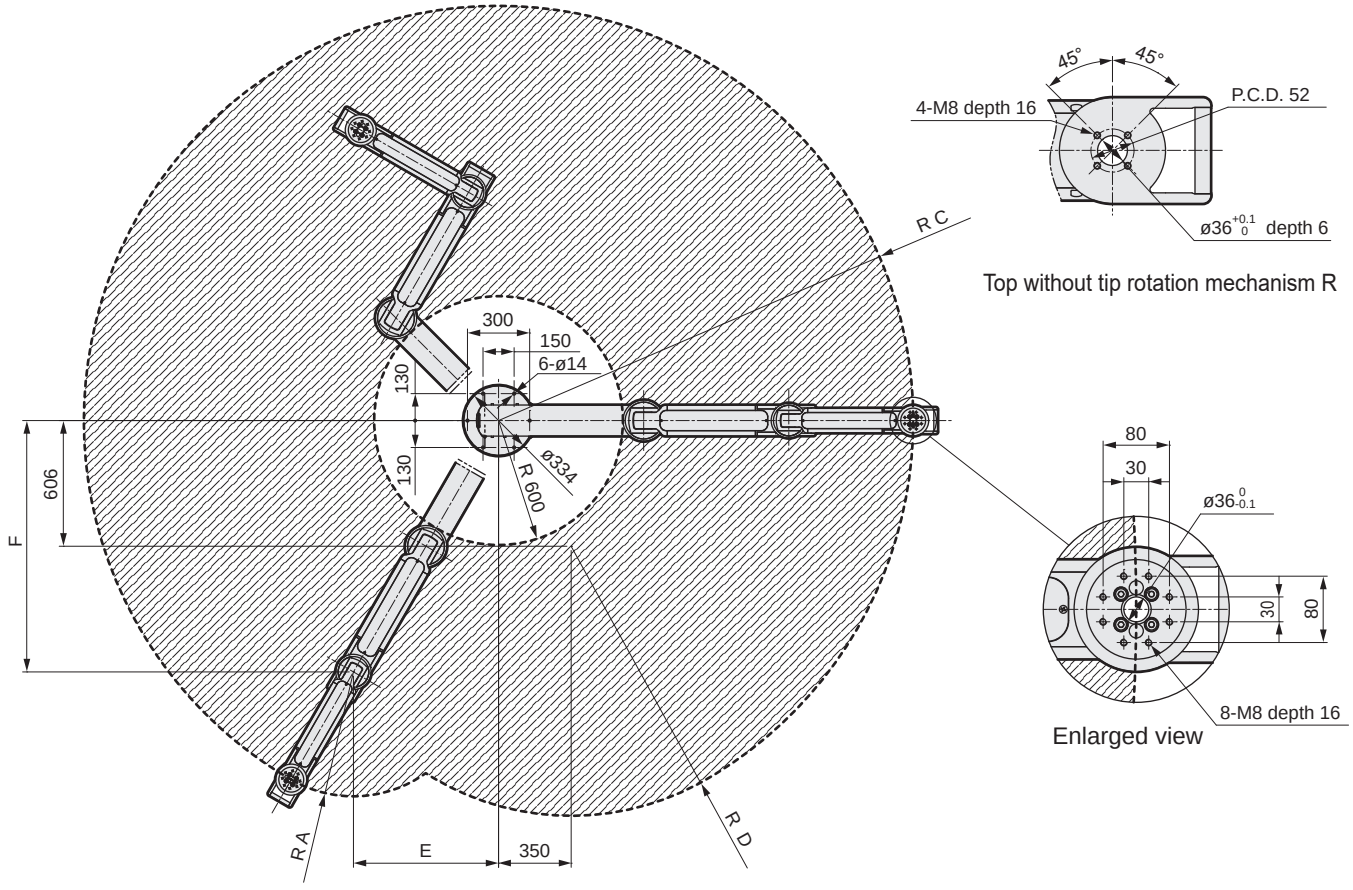
Code / Model No.	A	B	C	D	E	F
PAW-M-XZ-R	700	800	1500	400	693	758
PAW-MB-XZ-R	750	850	1600	425	736	923

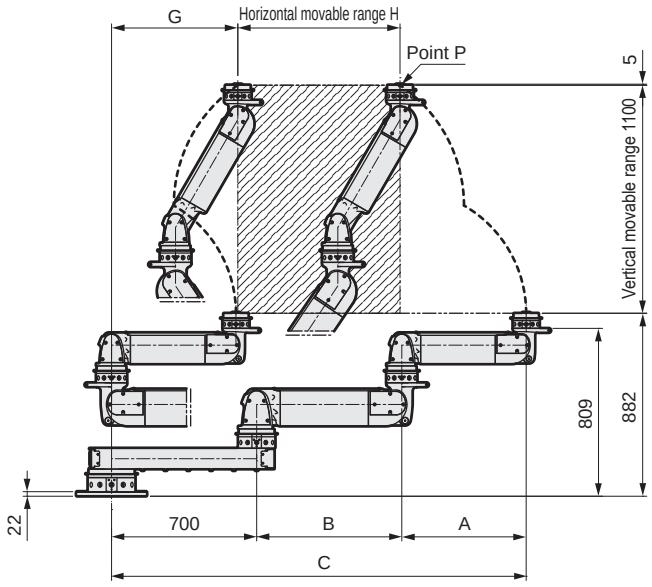
* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.

* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions (multi-axis)

- PAW-M-8XS-R (upper section ø80 + middle section ø100 + lower section SCARA arm)
- PAW-MB-8XS-R (upper section ø80 + middle section ø100 + lower section SCARA arm mechanical lock specifications)





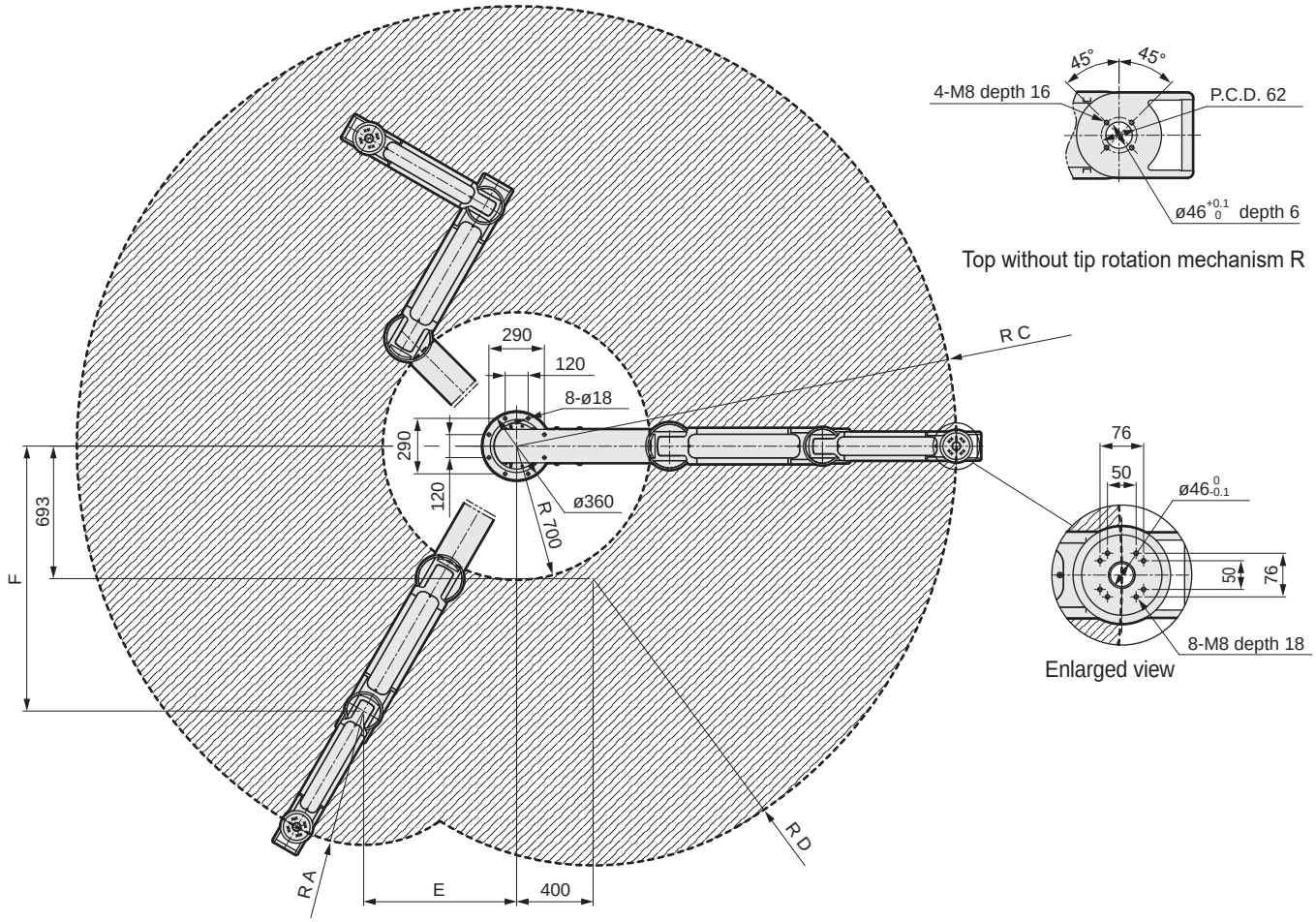
Shows dimensions with tip rotation mechanism R.Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

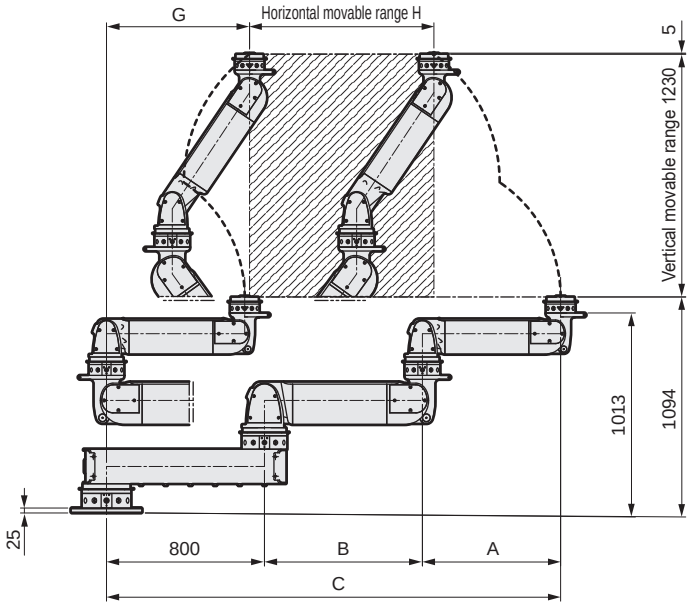
Code / Model No.	A	B	C	D	E	F	G	H
PAW-M-8XS-R	600	700	2000	1300	700	1212	608	784
PAW-MB-8XS-R	650	750	2100	1400	725	1256	614	951

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions (multi-axis)

- PAW-M-XZS-R (upper section ø100 + middle section ø125 + lower section SCARA arm)
- PAW-MB-XZS-R (upper section ø100 + middle section ø125 + lower section SCARA arm mechanical lock specifications)





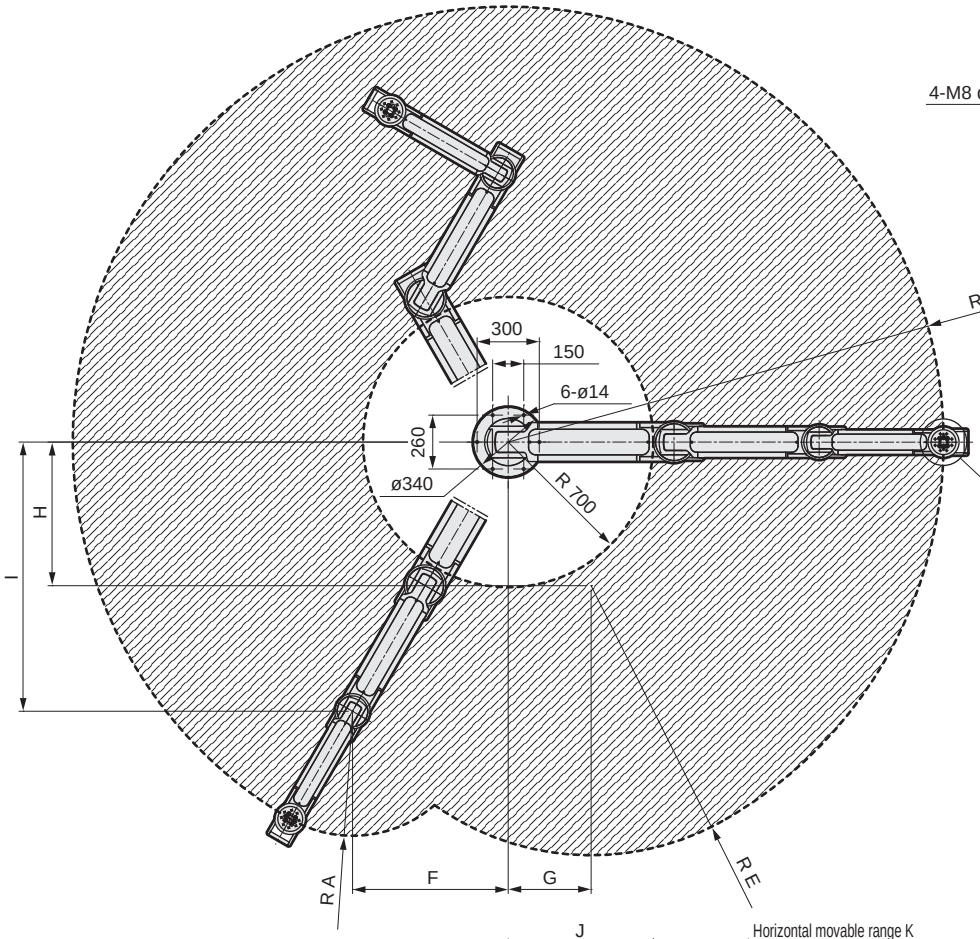
Code / Model No.	A	B	C	D	E	F	G	H
PAW-M-XZS-R	700	800	2300	1500	800	1386	726	932
PAW-MB-XZS-R	750	850	2400	1600	825	1429	727	1096

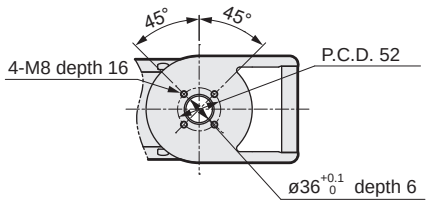
Shows dimensions with tip rotation mechanism R.Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

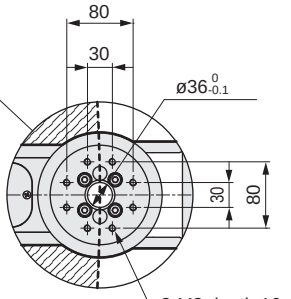
Dimensions (multi-axis)

- PAW-M-8XZ-R (upper section ø80 + middle section ø100 + lower section ø125)
- PAW-MB-8XZ-R (upper section ø80 + middle section ø100 + lower section ø125 mechanical lock specifications)

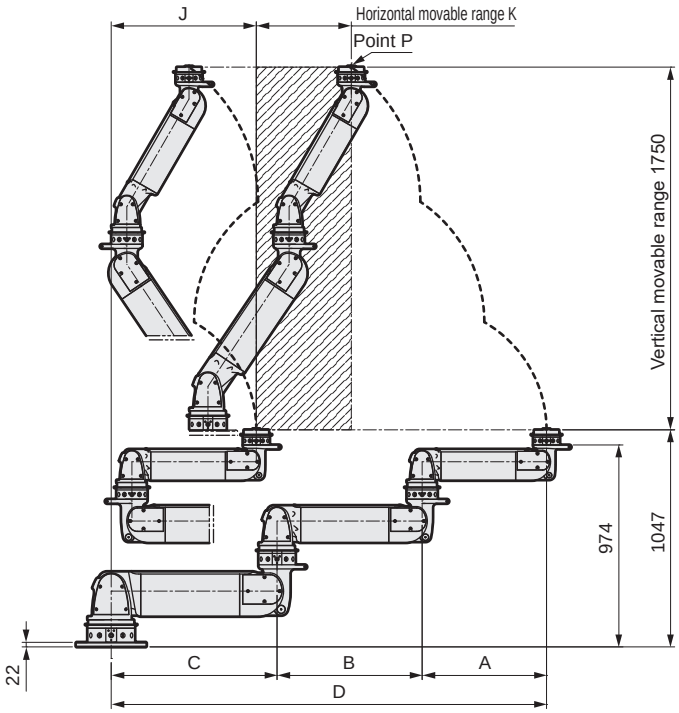




Top without tip rotation mechanism R



Enlarged view



Shows dimensions with tip rotation mechanism R. Plane view shows movable view at the point P descending edge. Structurally, the movable range changes according to the point P rising height.

Code / Model No.	A	B	C	D	E	F	G	H	I	J	K
PAW-M-8XZ-R	600	700	800	2100	1300	750	400	693	1299	700	458
PAW-MB-8XZ-R	650	750	850	2250	1400	774	425	736	1386	750	663

* Refer to page 15 for the optional dimensions of the tip rotation mechanism (R) option.
* With the bending direction (C) option, the operating range is left-right reversed.

PowerArm

PAW-*B Series Mechanical lock specifications

● Bore size: ø80/ø100/ø125

Specifications

Item		With PAW mechanical lock		
Bore size	mm	ø80	ø100	ø125
Working fluid		Compressed air		
Max. working pressure	MPa	0.7		
Min. working pressure	MPa	0.25 (when option L (with rotation lock) is selected: 0.35)		
Lock release pressure	MPa	0.5		
Proof pressure	MPa	1.05		
Ambient temperature	°C	5 to 60		
Cushion		Rubber cushion		
Lubrication		Not available		
Load capacity (0.5MPa pressurized) *1	kg	27	45	71
Air consumption *2	ℓ/min (ANR)	8	14	25
Noise level *3	dB (A)	Less than 85		

*1: Load capacity varies with supply pressure. Refer to "Load capacity at pressure" on the next page. Indicates the load capacity with the optional tip rotation mounted.
*2: Values are at air consumption 1 cycle/min. and working pressure 0.7MPa.
*3: Sound is generated when the mechanical lock is released. The noise level is the equivalent noise level at lock release operation 2 times/min and working pressures 0.7MPa at 1.0m.

Movable range

• With single-axis

Model No.	Movable range Top and bottom (mm)
PAW-SB-8 (ø80)	520
PAW-SB-X (ø100)	580
PAW-SB-Z (ø125)	650

• With multi-axis

Model No.	Movable range	
	Top and bottom (mm)	Horizontal (mm)
PAW-MB-8S	520	1250
PAW-MB-XS	580	1450
PAW-MB-ZS	650	1650
PAW-MB-8X	1100	1400
PAW-MB-XZ	1230	1600
PAW-MB-8XS	1100	2100
PAW-MB-XZS	1230	2400
PAW-MB-8XZ	1750	2250

Note:Horizontal movable range is the maximum value at the descending edge of the vertical movable range.
See the external dimensions for more information on the movable range.

Weight

Model No.	Weight (kg)	Optional additional weight (kg)		
		L(Rotation lock mechanism)	R(Tip rotation mechanism)	LR
PAW-SB-8	28	0.5	4	5
PAW-SB-X	42	0.5	5.5	6.5
PAW-SB-Z	76	0.5	7.5	8.5
PAW-MB-8S	47	1	4	5.5
PAW-MB-XS	81	1	5.5	7
PAW-MB-ZS	128	1	7.5	9
PAW-MB-8X	62	1	4	5.5
PAW-MB-XZ	110	1	5.5	7
PAW-MB-8XS	101	1.5	4	6
PAW-MB-XZS	162	1.5	5.5	7.5
PAW-MB-8XZ	130	1.5	4	6

Dimensions

Refer to pages 3 to 12 and 15.

How to order

PAW - **MB** - **8X** - **R**

- PAW: Model No.
- MB: ❶ Number of sections
- 8X: ❷ Combination contents
- R: ❸ Option

❷ Combination contents

Code		Description	❶ Number of sections: Single axis SB	❶ Number of sections: Multi-axis MB
8	Single axis	ø80	●	
X	Single axis	ø100	●	
Z	Single axis	ø125	●	
8S	Multi-axis	ø80 + SCARA arm		●
XS	Multi-axis	ø100 + SCARA arm		●
ZS	Multi-axis	ø125 + SCARA arm		●
8X	Multi-axis	ø80+ø100		●
XZ	Multi-axis	ø100+ø125		●
8XS	Multi-axis	ø80 + ø100 + SCARA arm		●
XZS	Multi-axis	ø100 + ø125 + SCARA arm		●
8XZ	Multi-axis	ø80+ø100+ø125		●

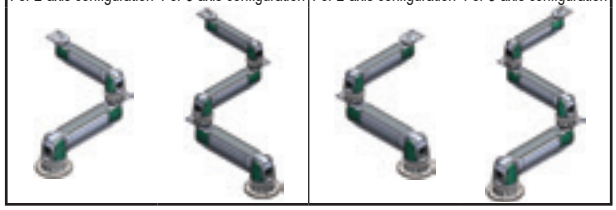
❸ Option

	Code	Description	❶ Number of sections: Single axis SB	❶ Number of sections: Multi-axis MB
*1	L	Rotation lock mechanism*	●	●
	R	Tip rotation mechanism	●	●
	C	Bending direction (Refer to the figure at left)		●
	U	Piping leadout direction (Refer to the figure at left)	●	●

*1:Mechanism to retain force in the rotation direction. It is not designed to stop the dynamic rotational force.

❸Option: Bending direction

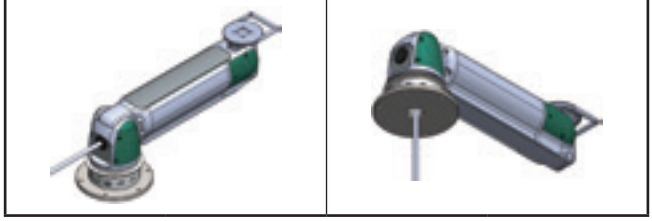
Blank		U	
For 2-axis configuration	For 3-axis configuration	For 2-axis configuration	For 3-axis configuration



* C is not available for single axis (PAW-S).

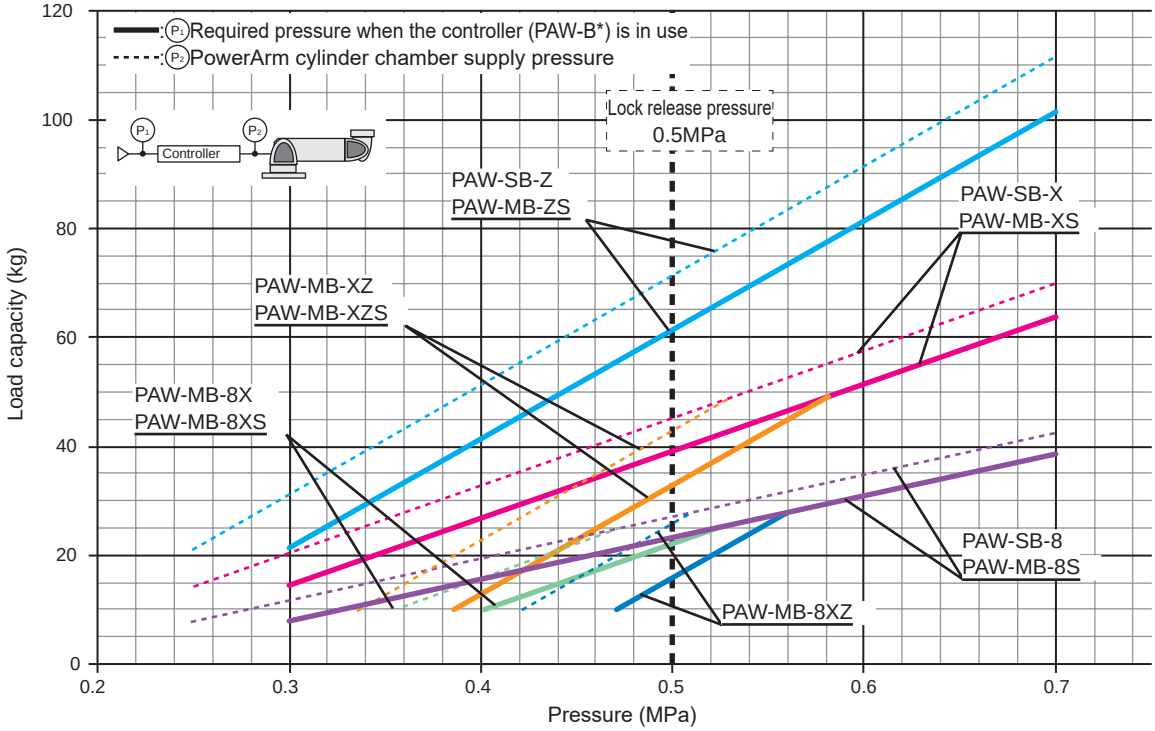
❸Option: Piping leadout direction

Blank	U



* Piping holes at the mounting surface center are required for U.

Load capacity with respect to pressure

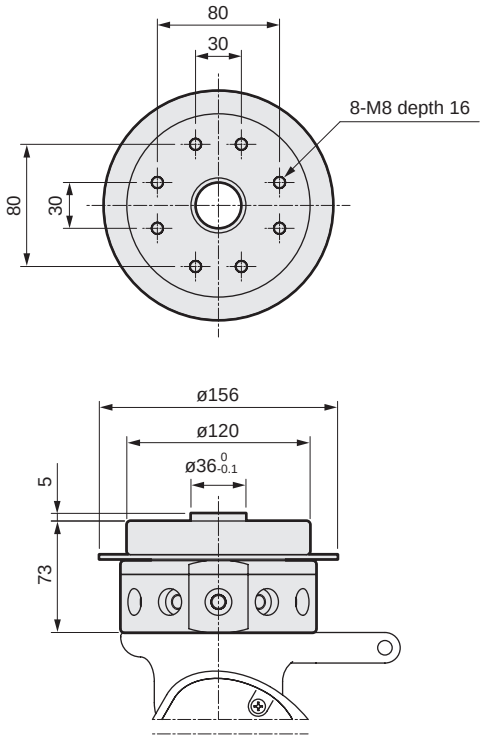


*1: Indicates the load capacity with the optional tip rotation mechanism mounted.
*2: Pressure supplied to the controller should be increased, depending on the operating frequency and speed.
*3: Attachment weight is not included.
*4: While the load capacity has properties such that it alters slightly according to the arm rise angle, this graph shows the lower limit values.

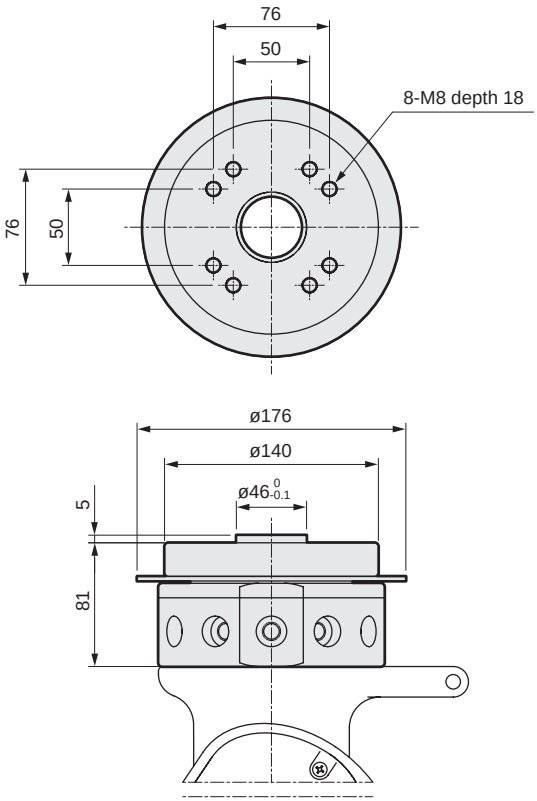
Optional dimensions

● Tip rotation mechanism (R)

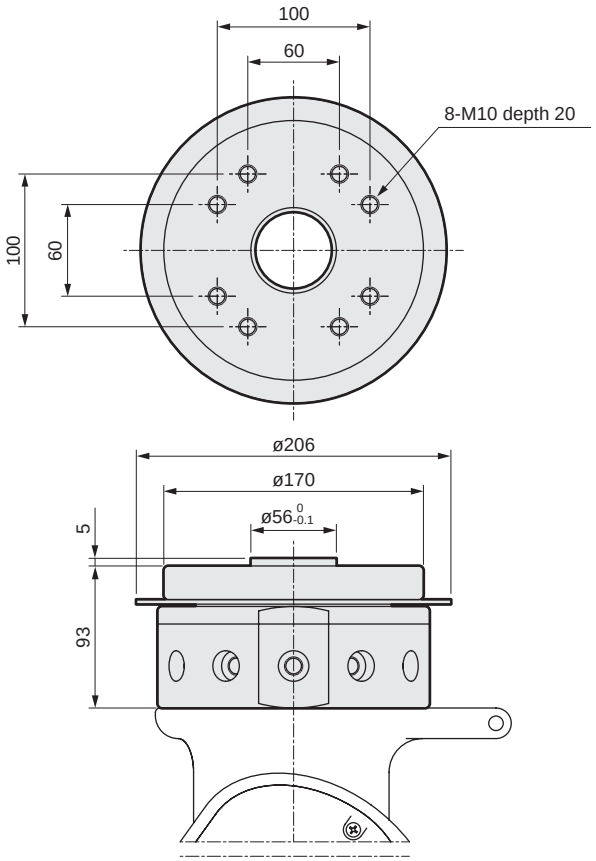
・For PAW-[S, SB]-8-R
PAW-[M, MB]-8S-R
PAW-[M, MB]-8X-R
PAW-[M, MB]-8XS-R
PAW-[M, MB]-8XZ-R



・For PAW-[S, SB]-X-R
PAW-[M, MB]-XS-R
PAW-[M, MB]-XZ-R
PAW-[M, MB]-XZS-R



・For PAW-[S, SB]-Z-R
PAW-[M, MB]-ZS-R



Discrete unit model No.

PowerArm unit

PAW-AU-( )	
8	ø80 standard specifications
X	ø100 standard specifications
Z	ø125 standard specifications
8-B	ø80 Mechanical lock specifications
X-B	ø100 Mechanical lock specifications
Z-B	ø125 Mechanical lock specifications

SCARA arm unit

PAW-SU-( )	
8S	For AU-8 (AU-8 lower part)
XS	For AU-X (AU-X lower part)
ZS	For AU-Z (AU-Z lower part)

Rotation unit

PAW-RU-( )	
T	AU-8 tip part
8	AU-8 base part / AU-X tip part
X	AU-X base part / AU-Z tip part
Z	AU-Z base part
ZS	SU-Z base part

Base plate

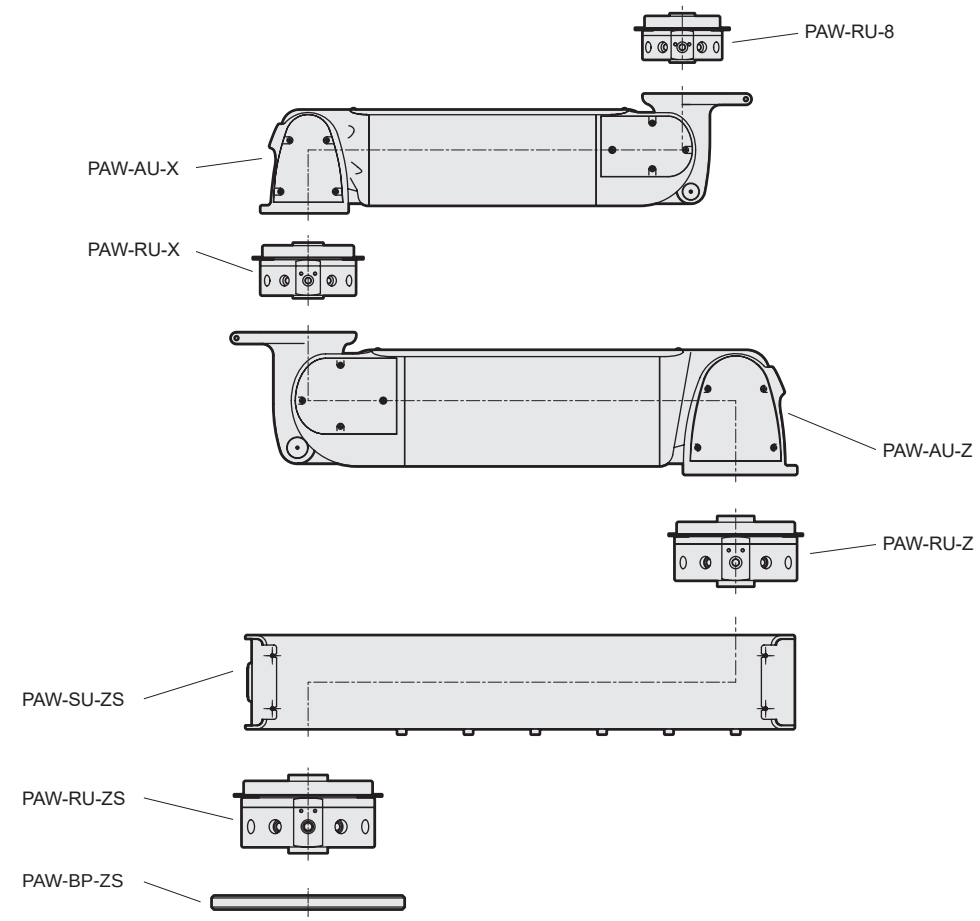
PAW-BP-( )	
8	AU-8 base part (assembled to RU-8)
X	AU-X base part (assembled to RU-X)
Z	AU-Z base part (assembled to RU-Z)
ZS	SU-Z base part (assembled to RU-ZS)

Rotation lock unit

PAW-LU

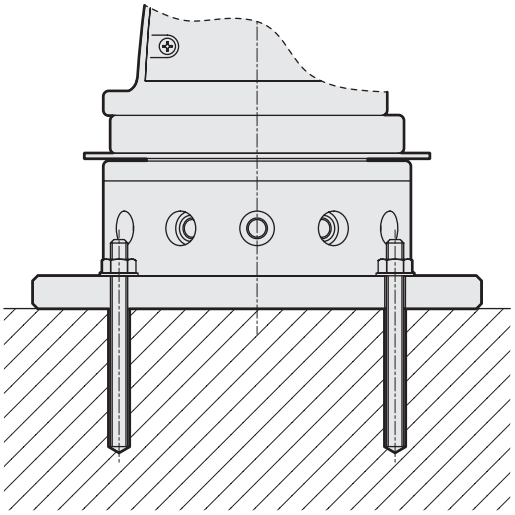
...Common to each rotation unit (1 unit is required for each rotation unit location)
* PAW-LU is a dedicated part for PowerArm. It cannot be used for any other purpose.

Example: When configuring PAW-M-XZS-R



• Refer to the Instruction Manual for details about assembly and piping. An air tube must be prepared separately.
• A bolt and washer for fastening is attached with each unit.

Anchor work

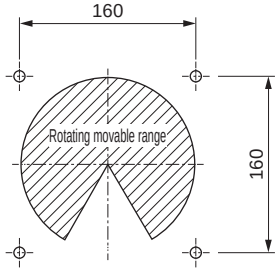


- When installing on an existing concrete floor (which must include reinforcing bars [ø6 or more]), use a chemical anchor (made by Nihon Decoluxe Co., Ltd.).
- For chemical anchor types, anchor bar dimensions, No. of units, and installation dimensions, refer to the table and figures below. Perform installation (drilling) as shown in the chemical anchor Instruction Manual.

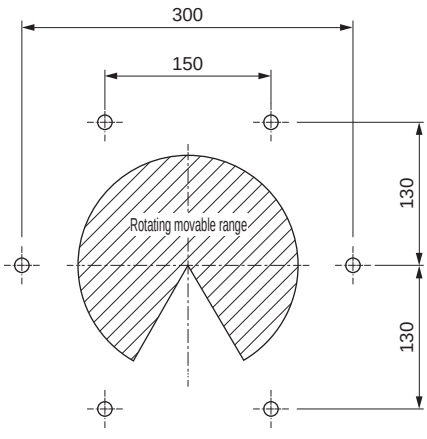
	Product model No.	chemical anchor Type	Anchor bar dimensions	Quantity
(1)	PAW-[S,SB]-8 , PAW-[S,SB]-X PAW-[M,MB]-8X , PAW-[M,MB]-8S	R-10N or R-10LN	W 3/8" or M10	4
(2)	PAW-[S,SB]-Z , PAW-[M,MB]-XZ PAW-[M,MB]-8XZ , PAW-[M,MB]-XS PAW-[M,MB]-8XS	R-12N or R-12LN	W 1/2" or M12	6
(3)	PAW-[M,MB]-ZS PAW-[M,MB]-XZS	R-16N or R-16LN	W 5/8" or M16	8

Installation dimensions

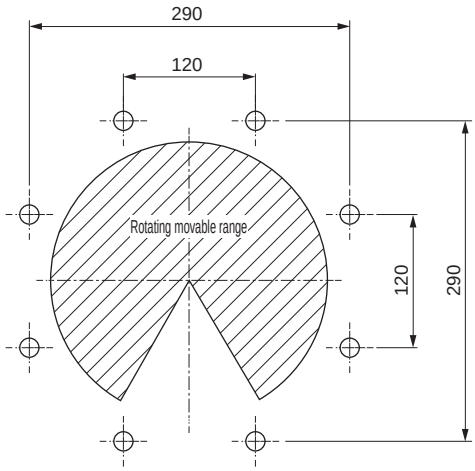
(1)



(2)



(3)

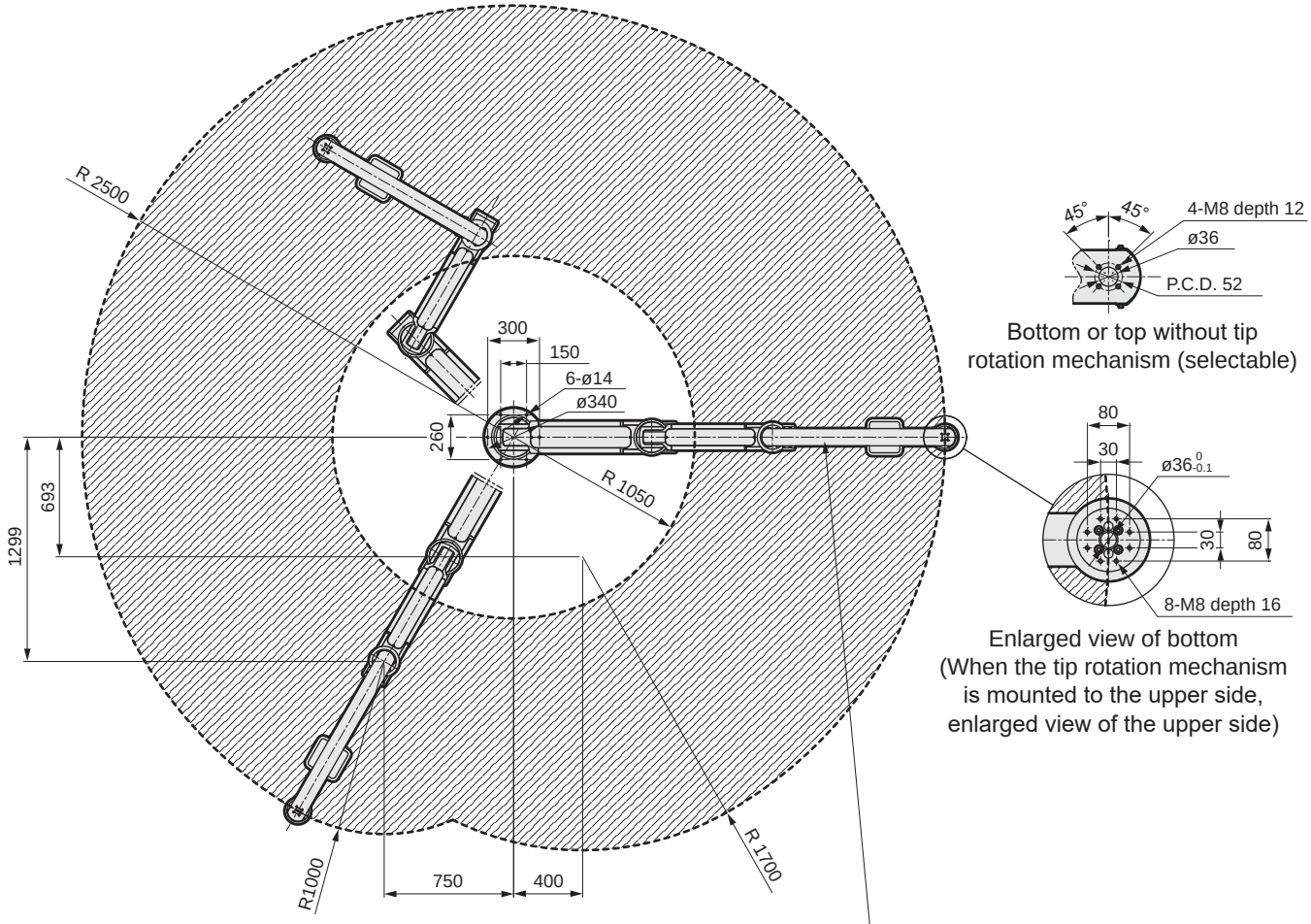


- If mounting to a frame or dolly, etc., use 10.8 or 12.9 category bolt strength, and check that the screw insertion depth is 1.5D or more.
- When installing the product, make sure that the installation surface is accurately leveled. If not level, position holding may become impossible due to arm tip tilting or arm imbalance.
- Installation must be performed by a professional.

Arm extensions

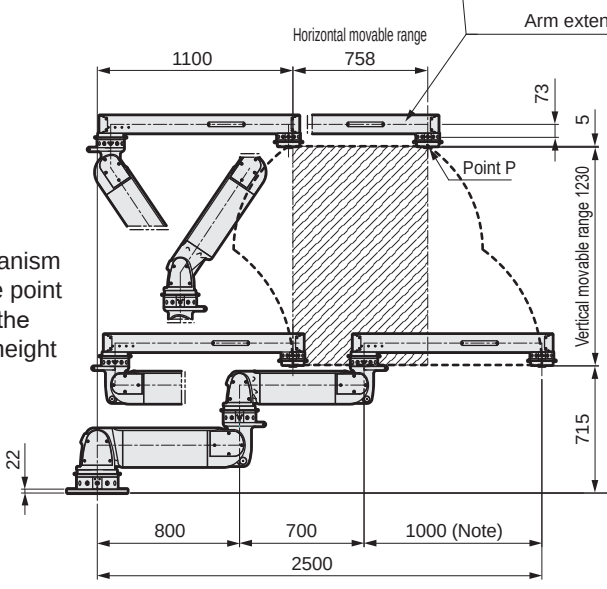
When a wider movable range must be secured, or when the workpiece is suspended for transport, an arm extension can be installed on the arm upper part. When designing the attachment, refer to page 19, and be careful to maintain or be below the allowable moment.

Example: Movable range when the arm extension is installed in PAW-M-XZ (upper section ø100 + lower section ø125)

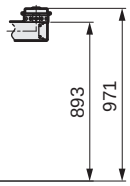


Bottom or top without tip rotation mechanism (selectable)

Enlarged view of bottom
(When the tip rotation mechanism is mounted to the upper side, enlarged view of the upper side)



Shows dimensions with tip rotation mechanism R. Plane view shows movable view at the point P descending edge. Due to its structure, the movable range varies depending on the height of the P point.



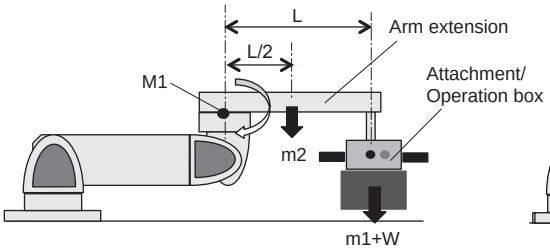
Tip rotation mechanism can also be mounted to the upper side

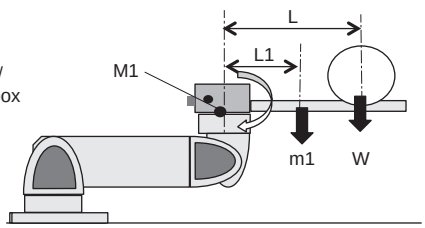
Note) 1000 is the example length. It can be changed.

Contact CKD for details.

Moment load

[When upper and lower movable arms are single-axis]





When mounting the arm extension

$$M1=(m1+W)\times L+m2\times L/2$$

m1: Attachment/operation box weight
m2: Arm extension weight
W: Weight of workpiece
L: From the PowerArm mounting part
Distance to center of gravity of attachment/workpiece

When the attachment is offset

$$M1=m1\times L1+W\times L$$

m1: Attachment/operation box weight
W: Weight of workpiece
L1: From the PowerArm mounting part
Distance to center of gravity of attachment/operation box
L: From the PowerArm mounting part
Distance to center of gravity of workpiece

Standard specifications

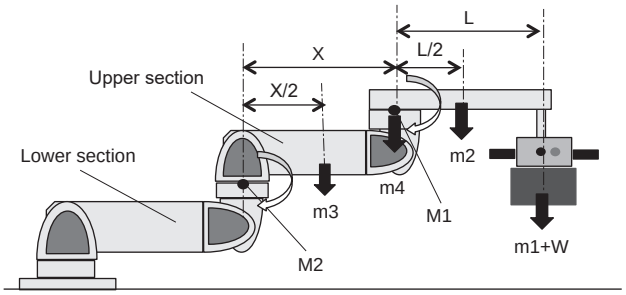
Model No.	M1 (N^am)
PAW-S-8	350
PAW-S-X	550
PAW-S-Z	900
PAW-M-8S	350
PAW-M-XS	550
PAW-M-ZS	900

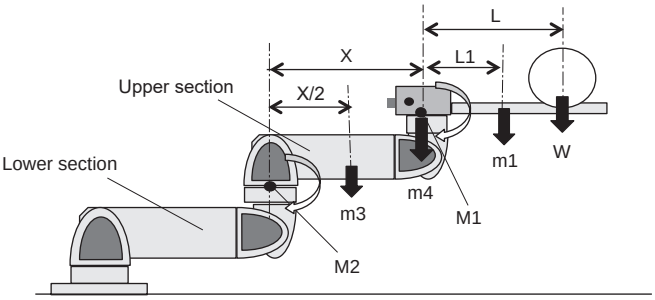
Mechanical lock specifications

Model No.	M1 (N^am)
PAW-SB-8	300
PAW-SB-X	500
PAW-SB-Z	850
PAW-MB-8S	300
PAW-MB-XS	500
PAW-MB-ZS	850

*Design the workpiece/attachment/extension arm so that the moment load is within the values in the table
*Calculate only the movable arm section.

[When upper and lower movable arms are 2-axis]





When mounting the arm extension

(1) Moment applied to the upper section

$$M1=(m1+W)\times L+m2\times L/2$$

(2) Moment applied to the lower section

$$M2=(m1+W)\times(L+X)+m2\times(L/2+X)+m3\times X/2+m4\times X$$

m1: Attachment/operation box weight
m2: Arm extension weight
m3: PowerArm weight
PAW-AU-8:14kg PAW-AU-8-B:15kg PAW-AU-X:23kg
PAW-AU-X-B:27kg PAW-AU-Z:42kg PAW-AU-Z-B:47kg
m4: Rotation unit weight
PAW-RU-T:4kg PAW-RU-8:6kg
PAW-RU-X:8kg
W: Weight of workpiece
L: From the PowerArm mounting part
Distance to center of gravity of attachment/workpiece
X: PowerArm length
PAW-AU-8:600mm PAW-AU-8-B:650mm PAW-AU-X:700mm PAW-AU-X-B:750mm

When the attachment is offset

(1) Moment applied to the upper section

$$M1=m1\times L1+W\times L$$

(2) Moment applied to the lower section

$$M2=W\times(L+X)+m1\times(L1+X)+m3\times X/2+m4\times X$$

m1: Attachment/operation box weight
m3: PowerArm weight
PAW-AU-8:14kg PAW-AU-8-B:15kg PAW-AU-X:23kg
PAW-AU-X-B:27kg PAW-AU-Z:42kg PAW-AU-Z-B:47kg
m4: Rotation unit weight
PAW-RU-T:4kg PAW-RU-8:6kg
PAW-RU-X:8kg
W: Weight of workpiece
L1: From the PowerArm mounting part
Distance to center of gravity of attachment/operation box
L: From the PowerArm mounting part
Distance to center of gravity of workpiece
X: PowerArm length
PAW-AU-8:600mm PAW-AU-8-B:650mm PAW-AU-X:700mm PAW-AU-X-B:750mm

Standard specifications

Model No.	Upper section M1 (N^am)	Lower section M2 (N^am)
PAW-M-8X	350	550
PAW-M-XZ	550	900
PAW-M-8XS	350	550
PAW-M-XZS	550	900

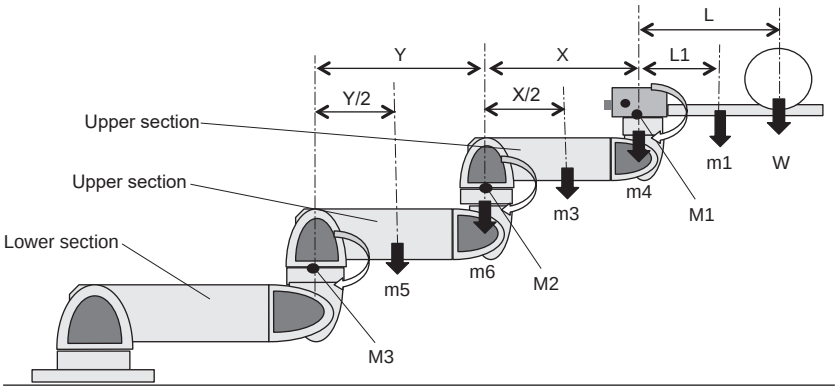
Mechanical lock specifications

Model No.	Upper section M1 (N^am)	Lower section M2 (N^am)
PAW-MB-8X	300	500
PAW-MB-XZ	500	850
PAW-MB-8XS	300	500
PAW-MB-XZS	500	850

*Design the workpiece/attachment/extension arm so that the moment load is within the values in the table
*Calculate only the movable arm section.

Moment load

[When upper and lower movable arms are 3-axis]



When the attachment is offset

(1) Moment applied to the upper section

$$M1=m1\times L1+W\times L$$

(2) Moment applied to the middle section

$$M2=W\times(L+X)+m1\times(L1+X)+m3\times X/2+m4\times X$$

(3) Moment applied to the lower section

$$M3=W\times(L+X+Y)+m1\times(L1+X+Y)+m3\times(X/2+Y)+m4\times(X+Y)+m5\times Y/2+m6\times Y$$

m1: Attachment/operation box weight
m3: PowerArm weight; PAW-AU-8:14kg PAW-AU-8-B:15kg
m4: Rotation unit weight; PAW-RU-T:4kg
m5: PowerArm weight; PAW-AU-X:23kg PAW-AU-X-B:27kg
m6: Rotation unit weight; PAW-RU-8:6kg
W: Weight of workpiece
L1: Distance from the PowerArm mounting part to the center of gravity of the attachment/operation box
L: Distance from the PowerArm mounting part to the center of gravity of the workpiece
X: PowerArm length; PAW-AU-8:600mm PAW-AU-8-B:650mm
Y: PowerArm length; PAW-AU-X:700mm PAW-AU-X-B:750mm

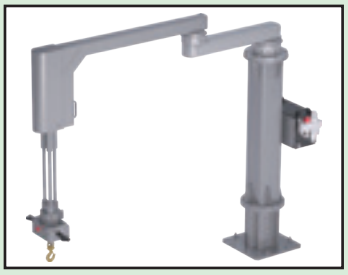
■ Standard specifications

Model No.	Upper section M1 (N^am)	Middle section M2 (N^am)	Lower section M3(N•m)
PAW-M-8XZ	350	550	900

■ Mechanical lock specifications

Model No.	Upper section M1 (N^am)	Middle section M2 (N^am)	Lower section M3(N•m)
PAW-MB-8XZ	300	500	850

*Design the workpiece/attachment/extension arm so that the moment load is within the values in the table
*Calculate only the movable arm section.



Palletizing specifications

PAW-A* Series

Specifications

Descriptions	PAW-AS-45	PAW-AS-45-S	PAW-AZ-110	PAW-AZ-110-S
Working fluid	Compressed air			
Max. working pressure MPa	0.7			
Min. working pressure MPa	0.25 (when option L (with rotation lock) is selected: 0.35)			
Proof pressure MPa	1.05			
Ambient temperature °C	5 to 60			
Lubrication	Not available			
Load capacity (0.5MPa pressurized) *1kg	55	55	48	51
When controller (PAW-B*) is used	49	49	37	40
Air consumption *2 ℓ/min (ANR)	11		35	
Product weight *3 kg	164	161	183	180
Vertical movable range of transport section mm	450		1100	
Max. movable radius of transport section mm	2000	1600	2100	1700

*1: Load capacity varies with supply pressure. Refer to "Load capacity at pressure" on the next page.
Refer to page 28 for the load capacity when an offset is used.
*2: Values are at air consumption 1 cycle/min. and working pressure 0.7MPa.
*3: When Option L (with rotation lock) is selected, an additional 2 kg is added respectively.

How to order

PAW - AS-45 - L

- PAW: Model No.
- AS-45: ❶ Vertical operating range / max. rotational radius
- L: ❷ Option

❶ Vertical operating range / max. rotational radius

Code	Description	
	Vertical operation range	Max. rotation radius
AS-45	450 mm	2,000 mm
AS-45-S	450 mm	1,600 mm
AZ-110	1,100 mm	2,100 mm
AZ-110-S	1,100 mm	1,700 mm

*1 If the vertical operating range / maximum rotational radius is exceeded, contact CKD Sales.

❷ Option

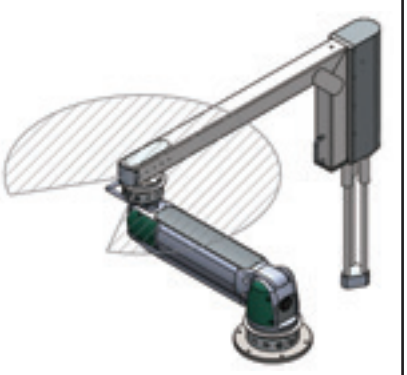
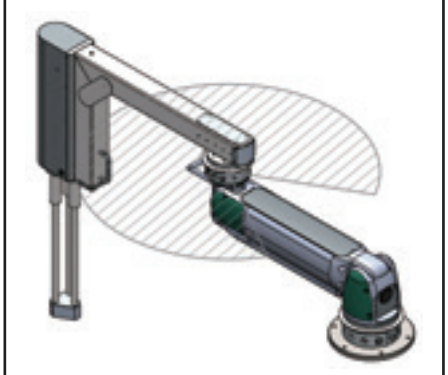
	Code	Description
	L	Rotation lock mechanism *2
*1	C	Bending direction (refer to diag. below)

*1: Mechanism to retain force in the rotation direction. It is not designed to stop dynamic rotation.

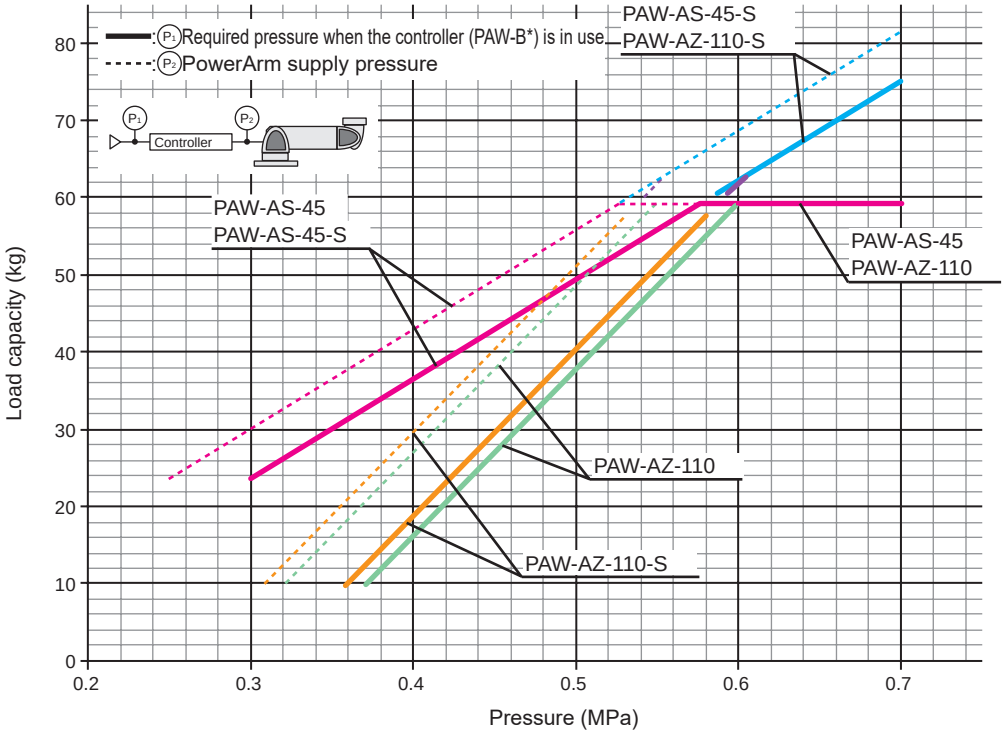
❷ Option: Bending direction

Only PAW-AS-45 and PAW-AZ-110 can be selected

*Bending direction of PAW-AS-45-S, PAW-AZ-110-S

Blank	C	Blank (C cannot be selected)
		

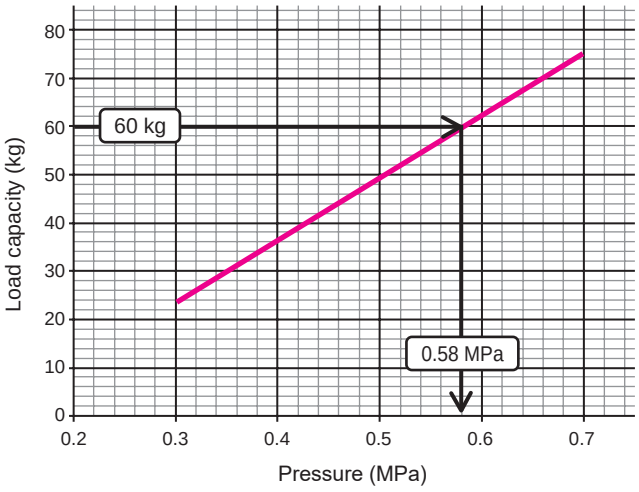
Load capacity with respect to pressure



*1: Pressure supplied to the controller should be increased, depending on the operating frequency and speed.
*2: Load capacity is the sum of weights of the “workpiece, attachment, and operation box”.

[Selection example 1]

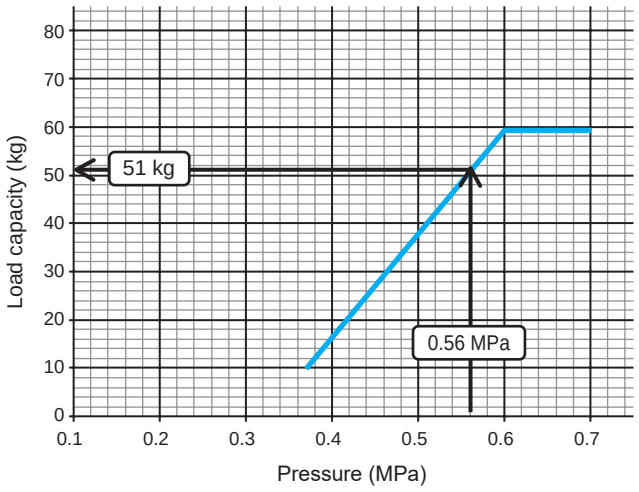
Model: PAW-AS-45-S Controller: PAW-BH1
Workpiece weight: 40kg, Operation Box weight: 9 kg,
Cardboard box suction attachment weight: 11kg For total 60kg



Pressure supplied to the controller will need to be 0.58 MPa.

[Selection example 2]

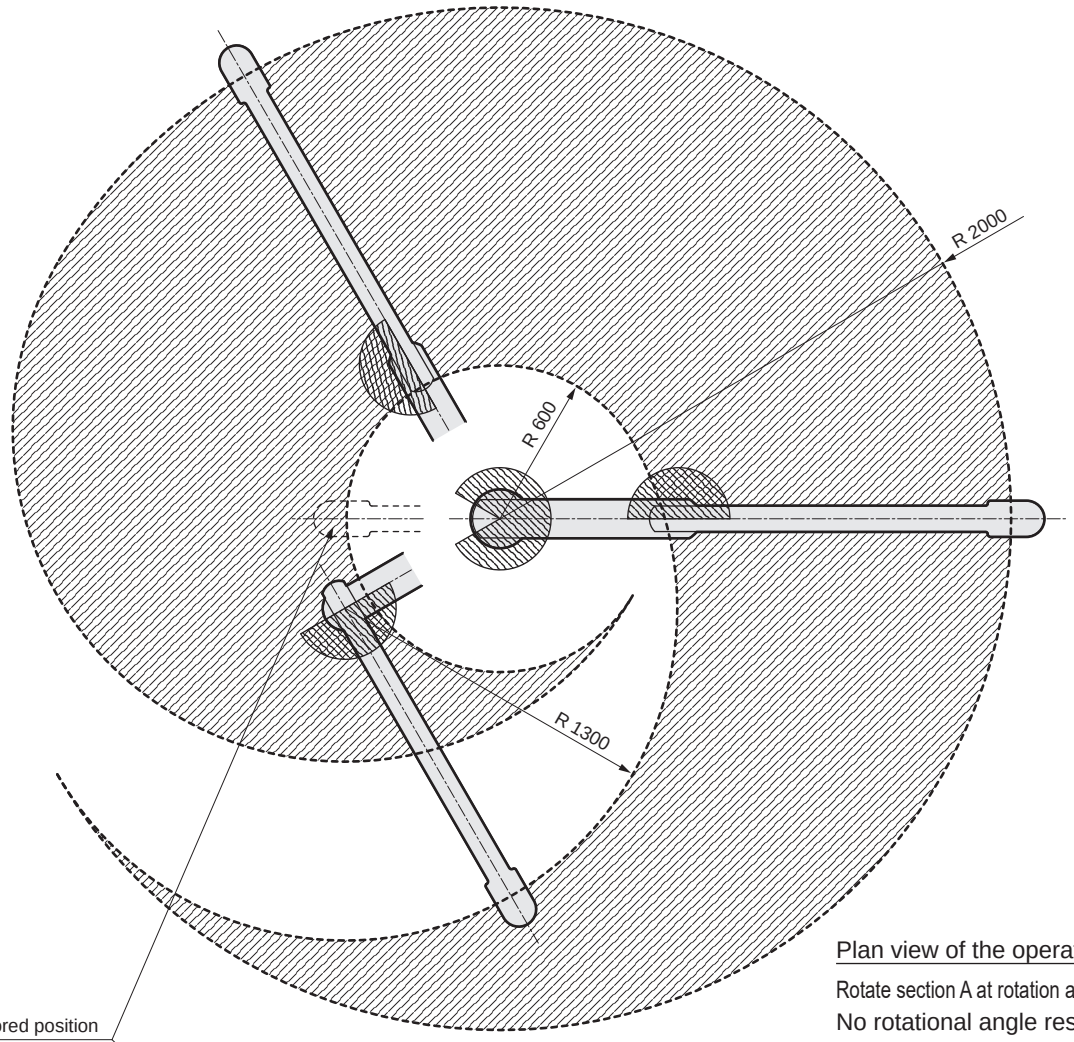
Model: PAW-AZ-110 Controller: PAW-BS2
Operation box weight: 9 kg, hook attachment weight: 2 kg
When pressure supplied to the controller is 0.56 MPa



The weight of Operation Box (9 kg) and Hook Attachment (2 kg) subtracted from the Load Capacity (51 kg) leaves 40 kg, which is the maximum workpiece weight that can be transported.

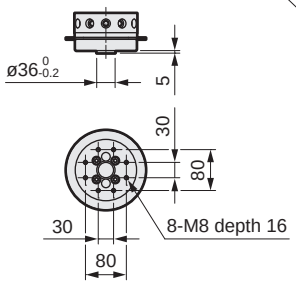
Dimensions

● PAW-AS-45 (Vertical operating range: 450 mm / maximum rotational radius: 2000 mm)

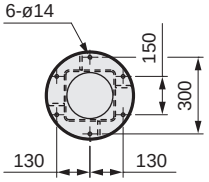


Plan view of the operating range

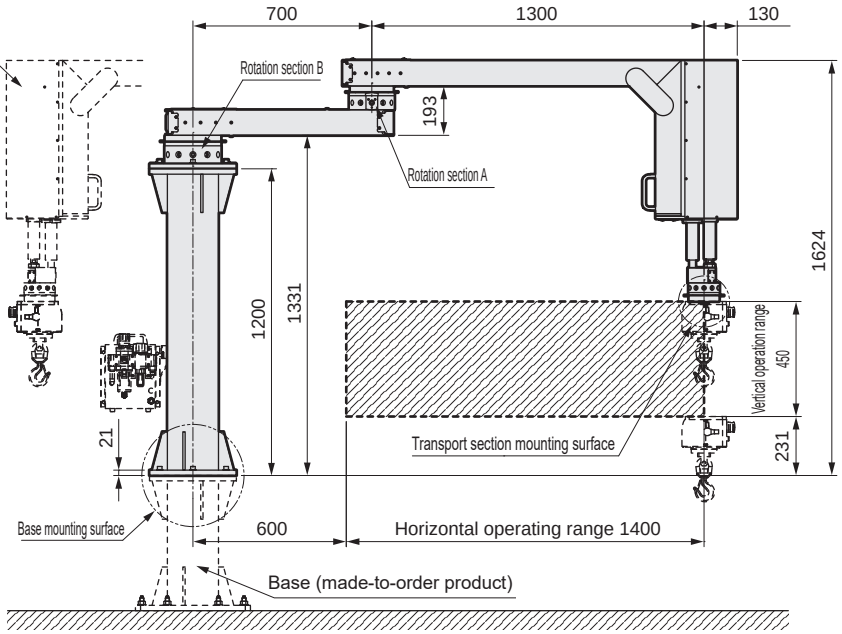
Rotate section A at rotation angle 180°restriction
No rotational angle restriction for rotating part B (300°).
* With the bending direction (C) option, the operating range is left-right reversed.



Transport section mounting dimensions

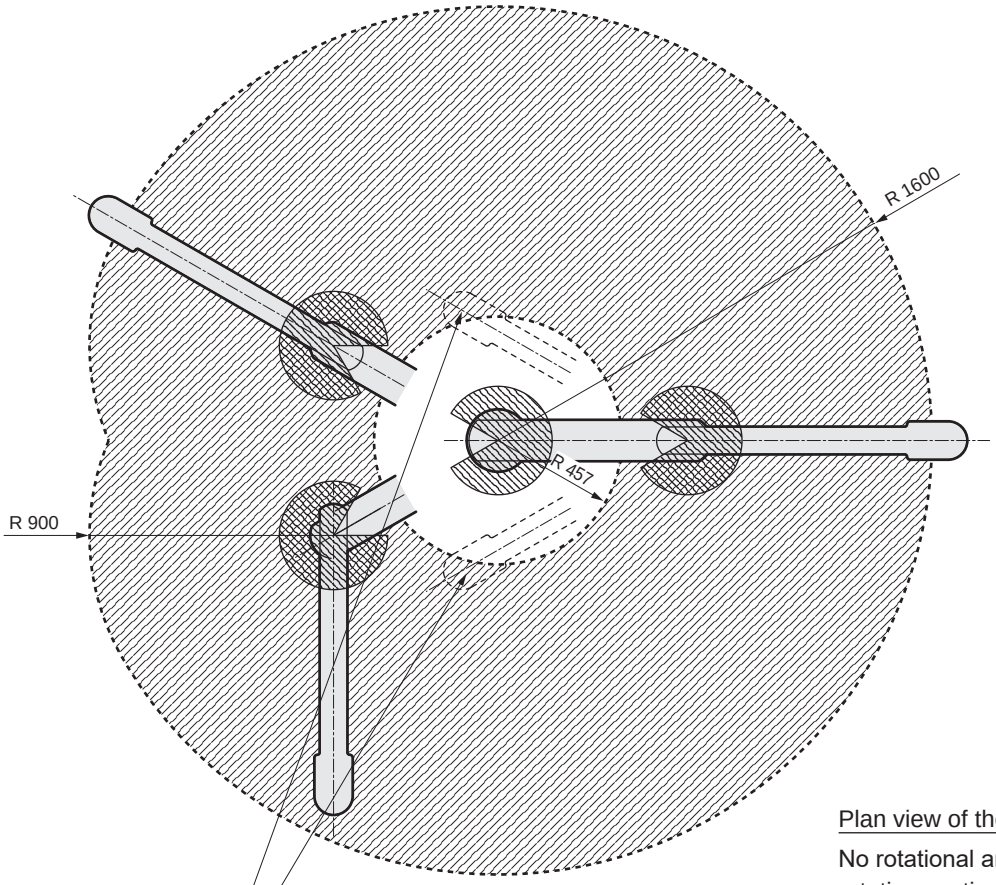


Base mounting dimensions



Dimensions

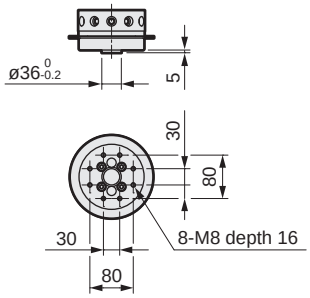
● PAW-AS-45-S (Vertical operating range: 450 mm / maximum rotational radius:1600 mm)



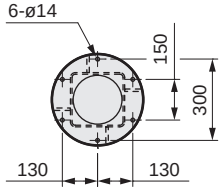
Plan view of the operating range

No rotational angle regulation for both rotation section A and rotation section B (300°).

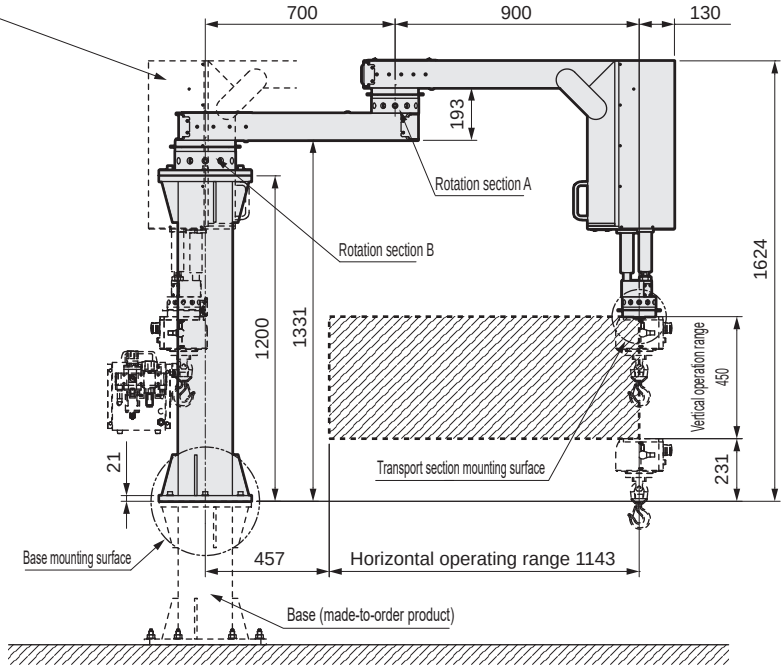
Stored position



Transport section mounting dimensions

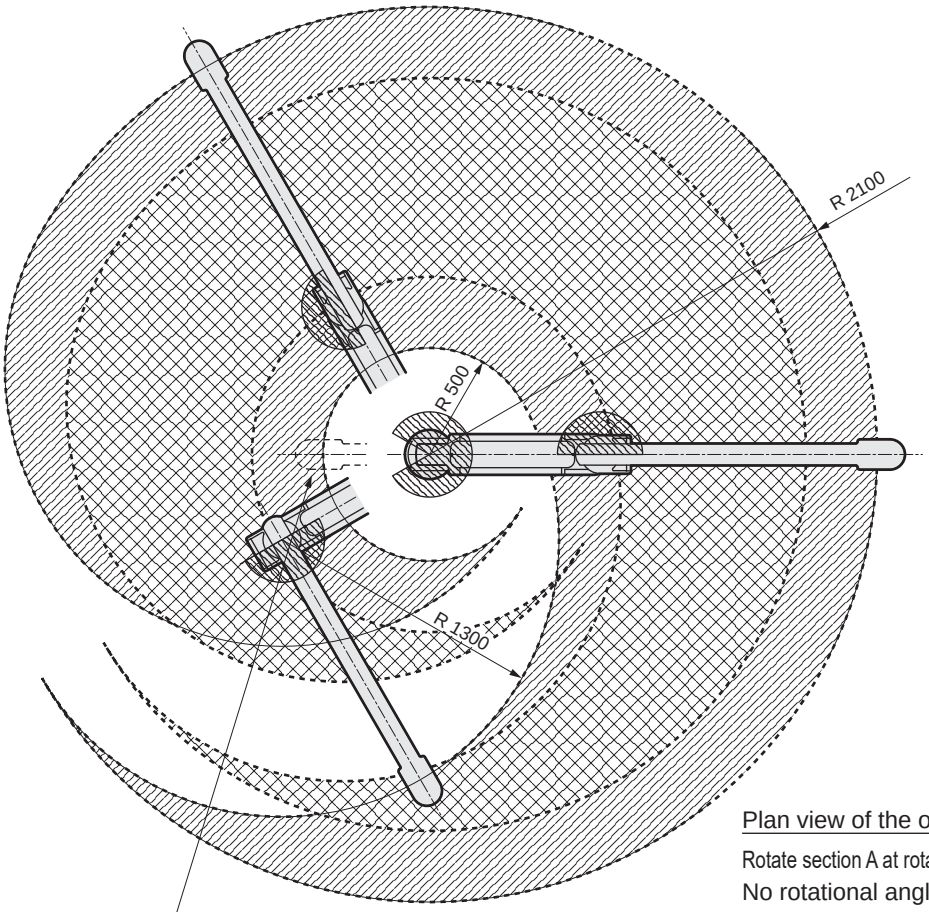


Base mounting dimensions



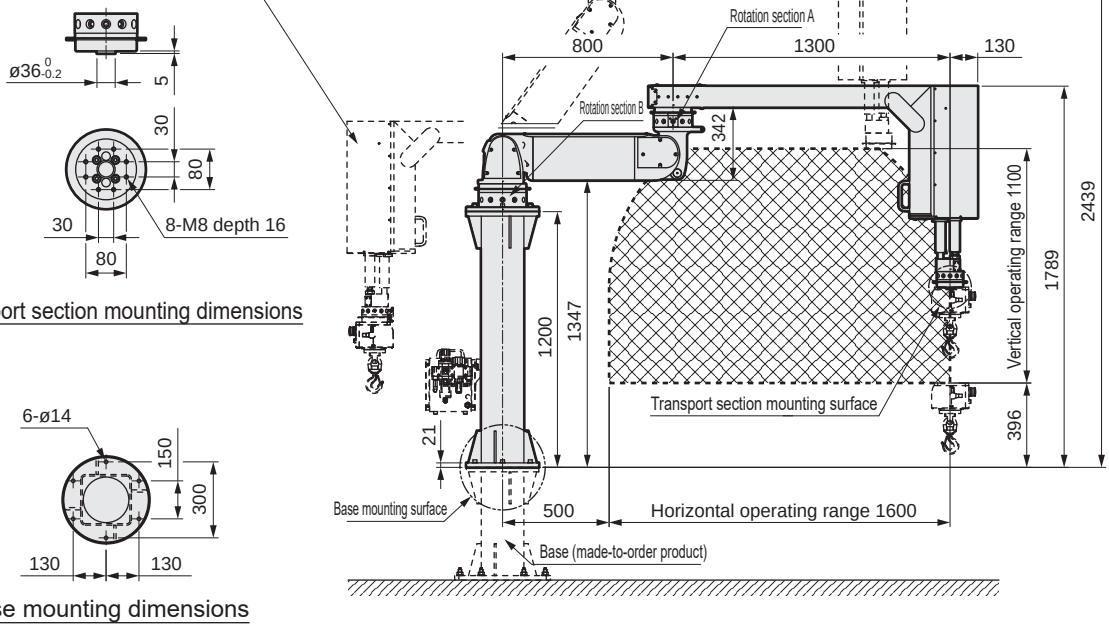
Dimensions

● PAW-AZ-110 (Vertical operating range: 1100 mm / maximum rotational radius: 2100 mm)



Plan view of the operating range

Rotate section A at rotation angle 180°restriction
No rotational angle restriction for rotating part B (300°).
is the operating range at the top end.
is the operating range at the bottom end.
* With the bending direction (C) option, the operating range is left-right reversed.

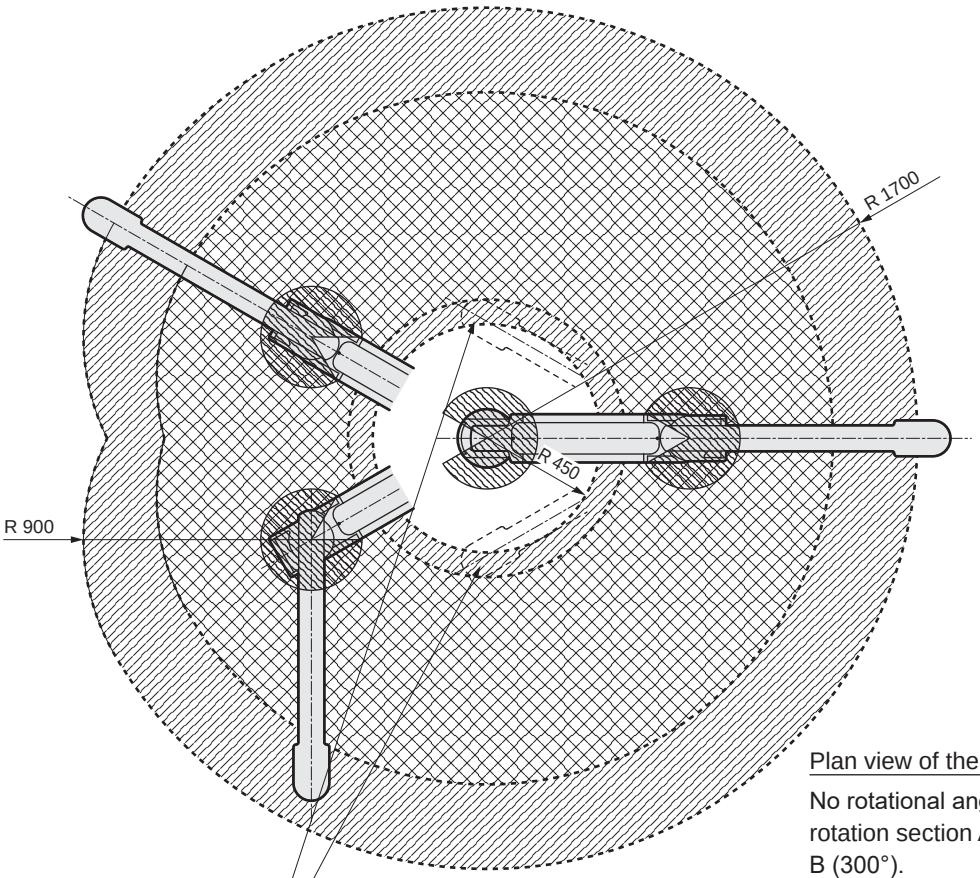


Transport section mounting dimensions

Base mounting dimensions

Dimensions

● PAW-AZ-110-S (Vertical operating range: 1100 mm / maximum rotational radius:1700 mm)



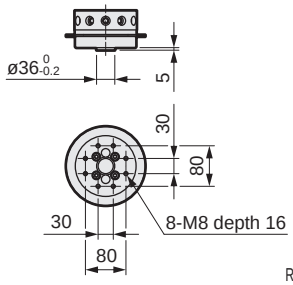
Plan view of the operating range

No rotational angle regulation for both rotation section A and rotation section B (300°).

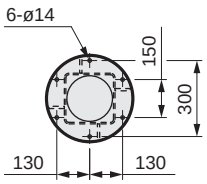
is the operating range at the top end.

is the operating range at the bottom end.

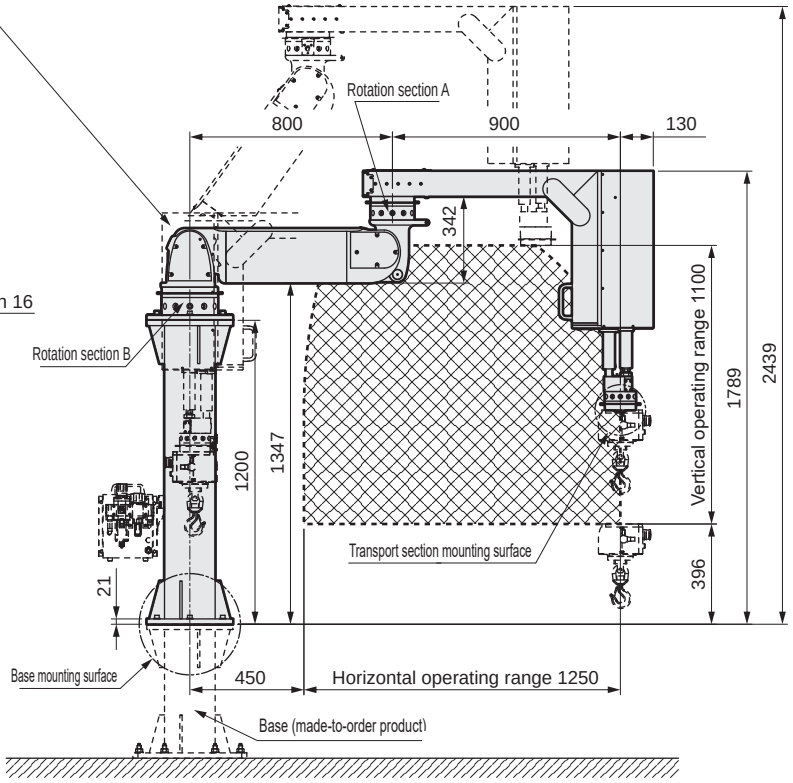
Stored position



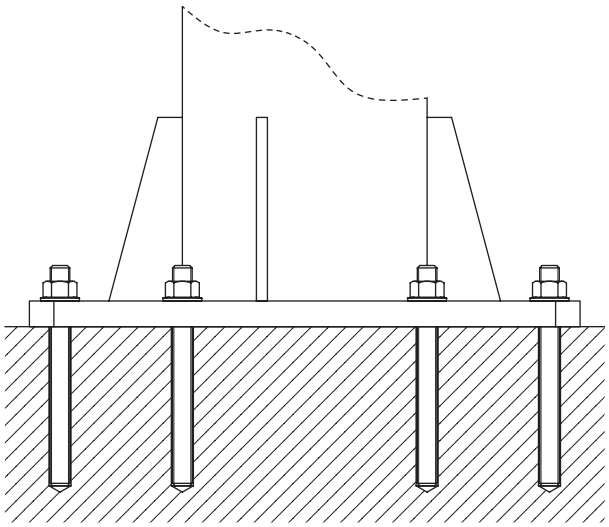
Transport section mounting dimensions



Base mounting dimensions



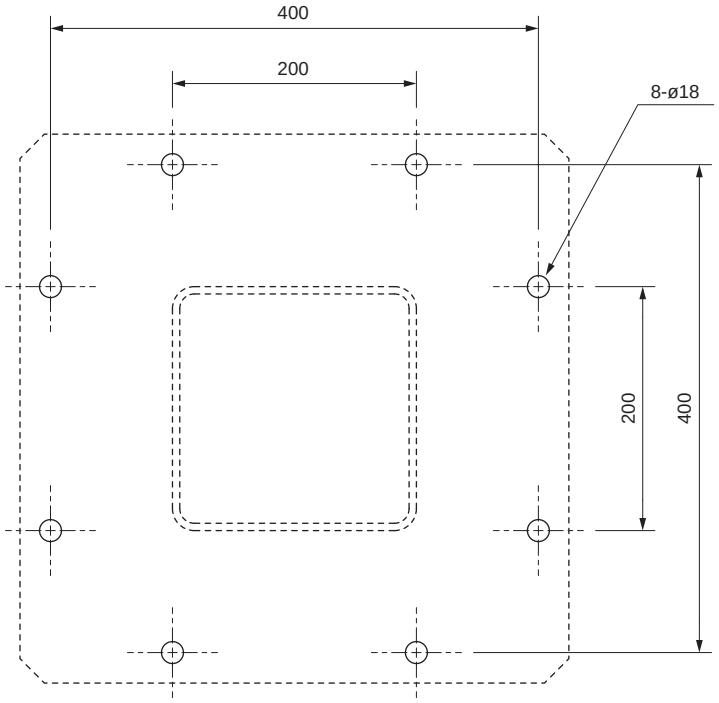
Installing the base (made-to-order product) on a concrete floor with anchors



- When installing on an existing concrete floor (containing reinforcing bars (ø6 or more)), use a chemical anchor (made by Nihon Decoluxe Co., Ltd.).
- For chemical anchor types, anchor bar dimensions, No. of units, and installation dimensions, refer to the table and figures below. The chemical anchor installation method (drilling method) should be as shown in the chemical anchor instruction manual.

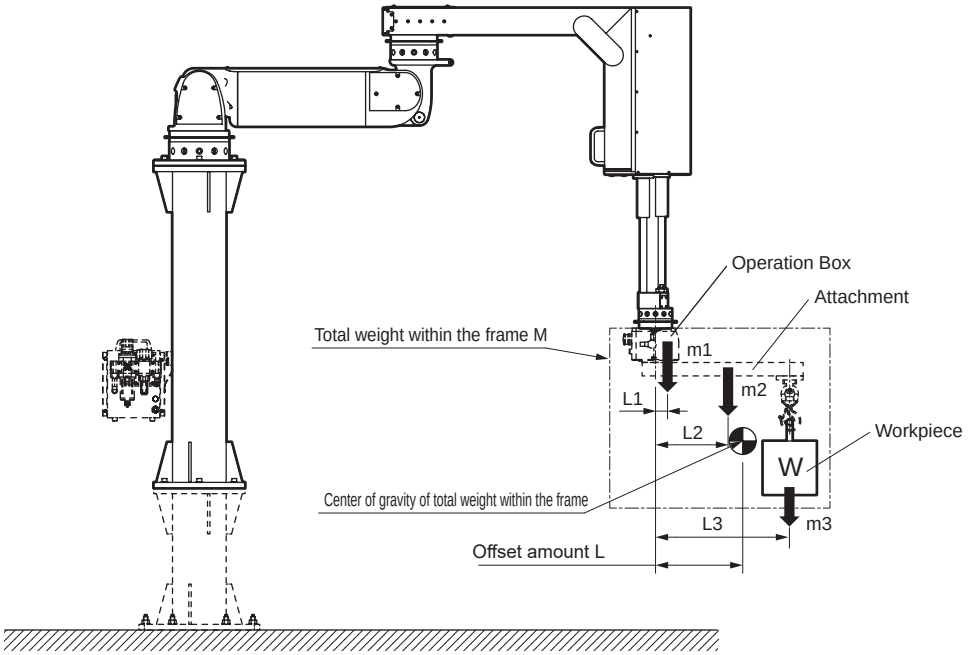
Chemical anchor types	Anchor bar dimensions	Quantity
R-16N or R-16LN	W5/8 "or M16	8

Installation dimensions



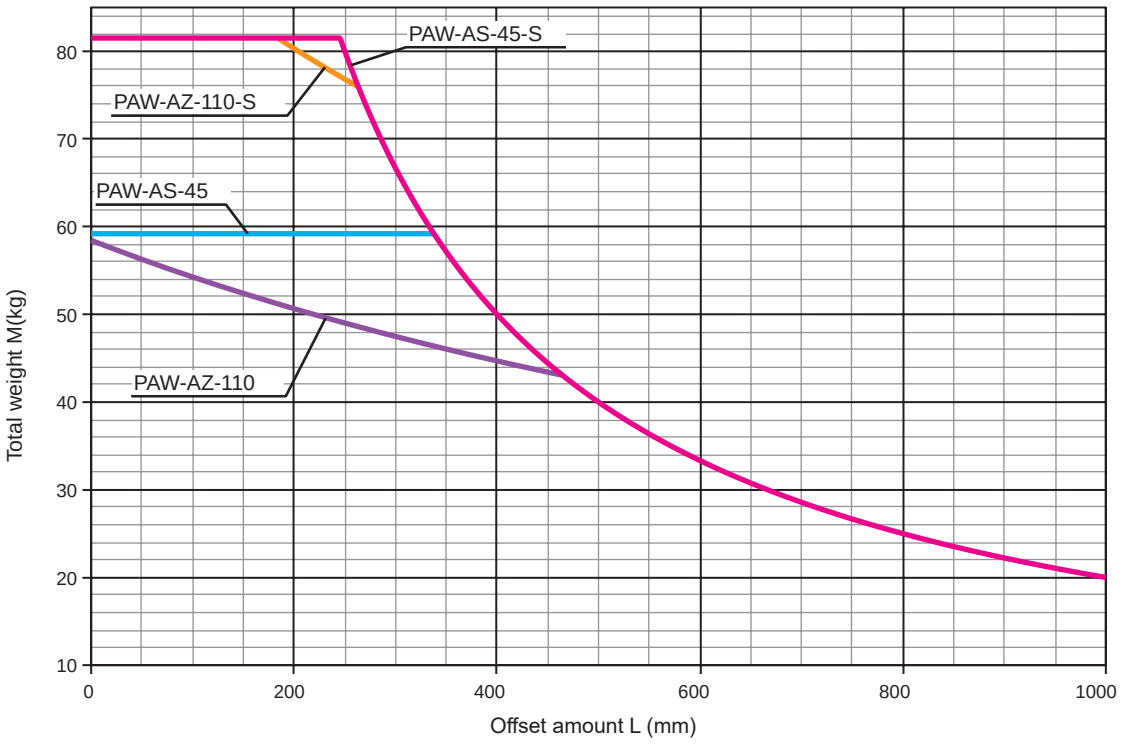
- When installing the product, accurately keep the installation surface level. If not level, tilting may prevent holding of horizontal position (when rotation lock mechanism is not used)).
- Make sure to have the product installed by qualified service personnel.
- The dedicated dolly (custom order product) is available for installation on a dolly. Select the dolly (page 35) from PAW-C*-H.

Load capacity when an offset is used



*Total weight: M = Operation Box weight: m1 + Hook Attachment weight: m2 + Workpiece: m3

$$L = \frac{m1 \times L1 + m2 \times L2 + m3 \times L3}{M}$$



Controller

PAW-B Series

We propose ideal air circuits for various assist mechanisms.

Specifications

Item	PAW-BS	PAW-BH	PAW-BS-DC	PAW-BH-DC
Working fluid	Clean compressed air (JIS B8392-1:2012 (ISO 8573-1:2010) [1:3:2])			
Max. working pressure MPa	0.7			
Min. working pressure MPa	0.35			
Proof pressure MPa	1.05			
Power supply voltage	Single-phase 100 to 220 VAC (50/60 Hz)		24 VDC ±10%	
Rated current	1 A		1.1 A	
Ambient temperature °C	5 to 50			
Ambient humidity	45%RH to 85%RH (no condensation)			
Ambient atmosphere	Indoors (no water or dust)			
Installation orientation	Upright			
Lubrication	Not available			
Weight kg	14	16	14	16
Air supply port	Push-in fitting ø10			

Performance specifications

Item	PAW-BS1	PAW-BS2	PAW-BH1	PAW-BH2
I/O signal	Dedicated signals: Input 3, Output 2 Common signals: Input 0, Output 2		Dedicated signals: Input 3, Output 2 Common signals: Input 9, Output 6	
General-purpose single solenoid valve (ø4)	-		1	
General-purpose double solenoid valve (up to ø8)	-		2	
General-purpose port (ø4)	-		2	
General-purpose port (up to ø8)	-		3	
Axis *1	1 axis	2 axes	1 axis	2 axes

*1: A selective compliance assembly robot arm and extension arm are excluded.

Applications

Application example 1: Start/standby

	Digital input	Digital output
1	Start switch	Start lamp
2	Standby switch	Standby lamp
3	Emergency stop button	-
4		-

Select PAW-BS
(when two or more indicators (output) are added for general-purpose input)

*1:The function which allows the body to maintain the pressure applied when the balance lock is started, regardless of the workpiece load applied to the tip of the arm.
*2:This function increases the supply pressure to the arm while the button is being pressed, forcing the workpiece to rise.

Application example 2: Vacuum

	Digital input	Digital output
1	Start switch	Start lamp
2	Standby switch	Standby lamp
3	Emergency stop button	Balance lock lamp * 1
4	Balance lock button	Valve for vacuum 1
5	Vacuum button	Valve for vacuum 2
6	Outriggers 1	Vacuum lamp
7	Outriggers 2	-
8	Outriggers 3	-
9	-	
10	-	
11	-	

Select PAW-BH (when a suction or clamp attachment is installed, or sensors are installed on the outriggers (1 to 4) of the dolly to serve as interlocks)

Application example 3: Clamp

	Digital input	Digital output
1	Start switch	Start lamp
2	Standby switch	Standby lamp
3	Emergency stop button	Balance lock lamp
4	Balance lock button	Clamp solenoid valve
5	Clamp button	Unclamp solenoid valve
6	Cylinder switch 1	Clamp lamp
7	Cylinder switch 2	Solenoid valve for cylinder brake
8	UP button *2	-
9	Outriggers 1	
10	Outriggers 2	
11	Outriggers 3	

Select PAW-BH

How to order

PAW - B **S** **1** - **DC** - **T**

1 Performance
2 No. of axes
3 Power
4 Option

1 Performance

Code	Description
S	Standard
H	High end

2 No. of axes

Code	Description
1	1 axis
2	2 axes

3 Power

Code	Description
Blank	Single-phase 100 to 220 VAC
DC	Single-phase 100 to 220 VAC

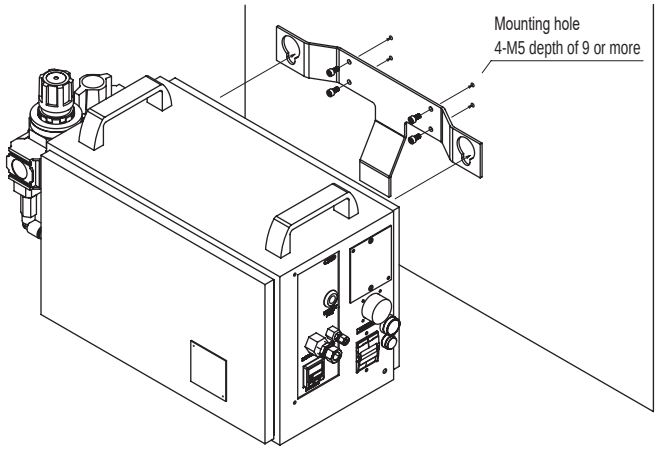
4 Option

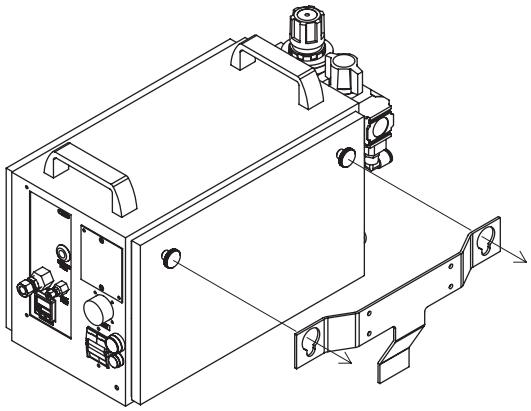
Code	Description	
T	T-bracket	
L	L-bracket	

*1: quotation will be performed each time for Special-order product.
*2: Power supply cable 2.5m included (For domestic 100VAC, flat 2P + earth pin AC code. For other specifications, a 3-core (N, L, and PE) cable with a round crimp terminal for M5 is supplied.
*3: The main material of the exterior except for components is steel (baked).

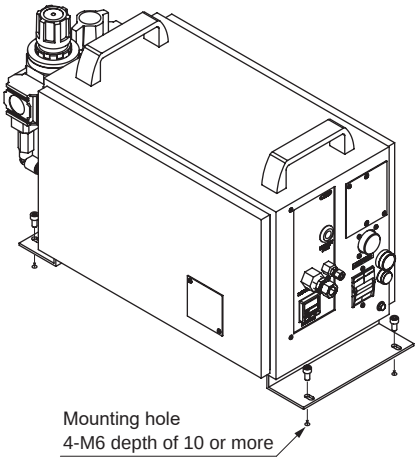
[Bracket mounting method]

● T-bracket



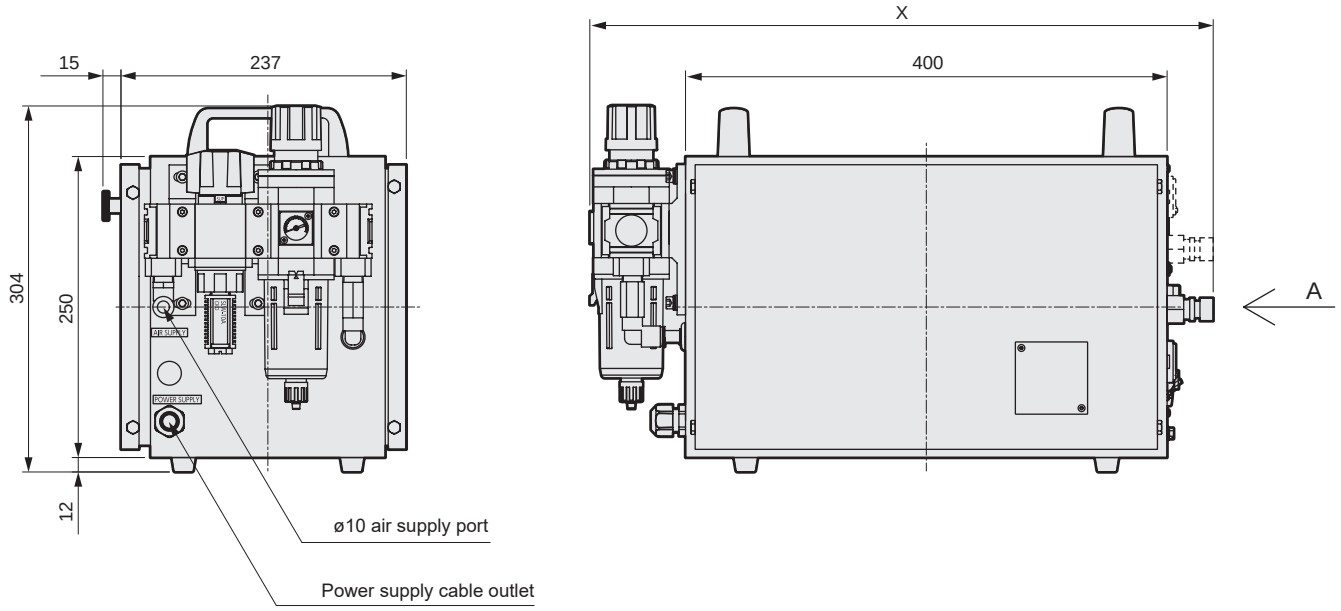


● L-bracket

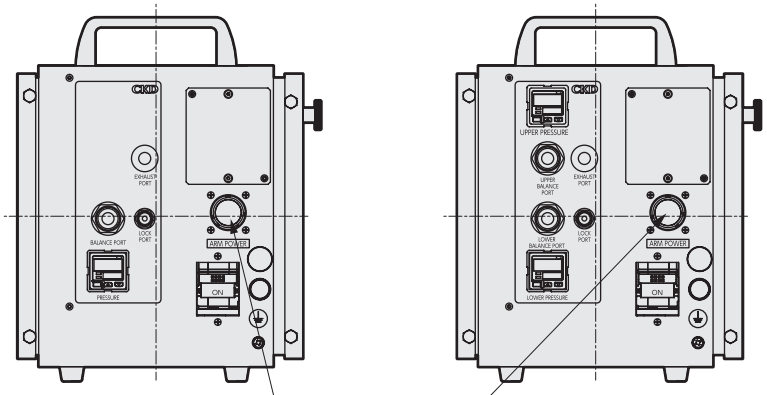


Dimensions

● PAW-BS (standard type)



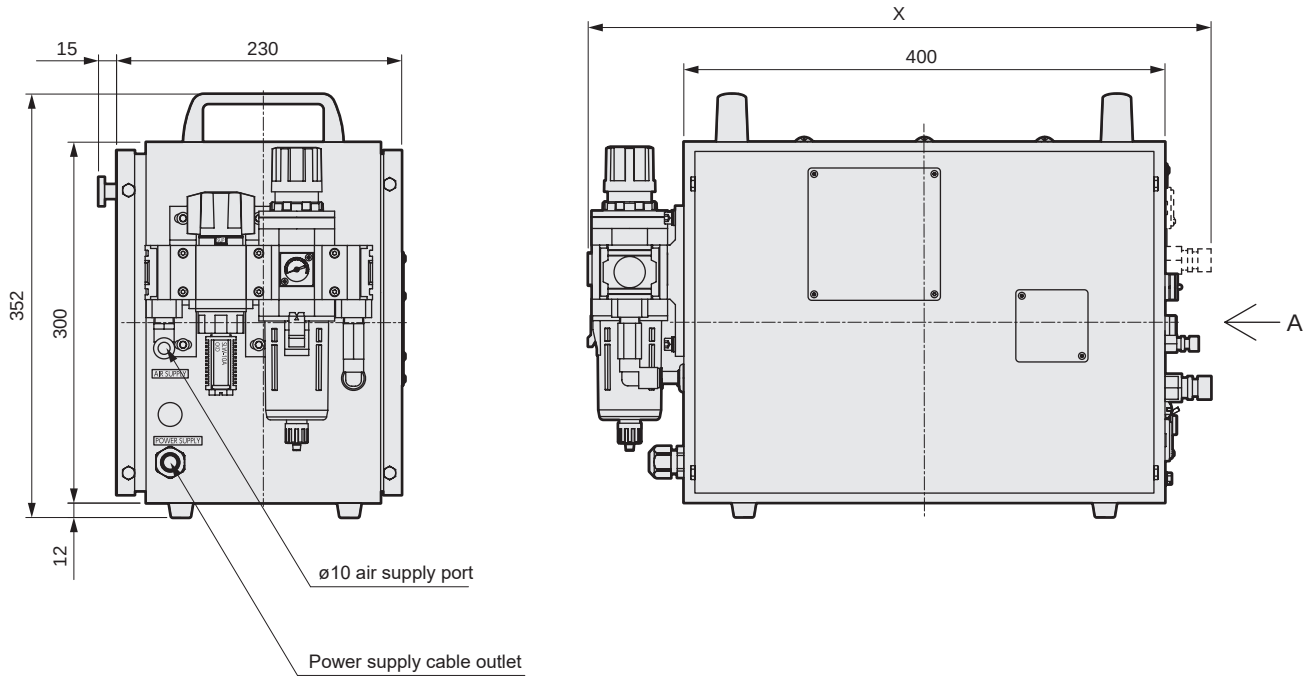
A arrow view



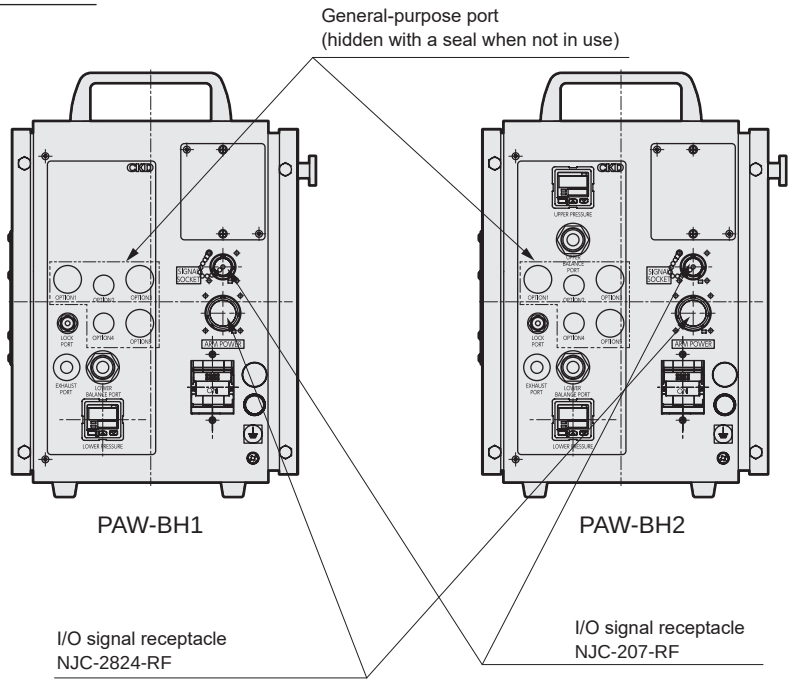
Combination contents	No. of axes	X
8, 8S	1	516
X, XS, Z, ZS		518
8X, XZ, 8XS, XZS	2	

Dimensions

● PAW-BH (high-end type)

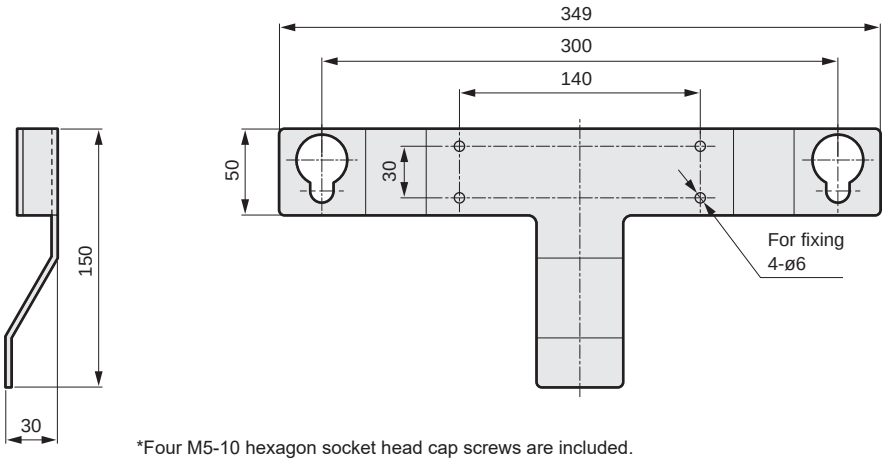


A arrow view



Combination contents	No. of axes	X
8, 8S	1	516
X, XS, Z, ZS		518
8X, XZ, 8XS, XZS	2	

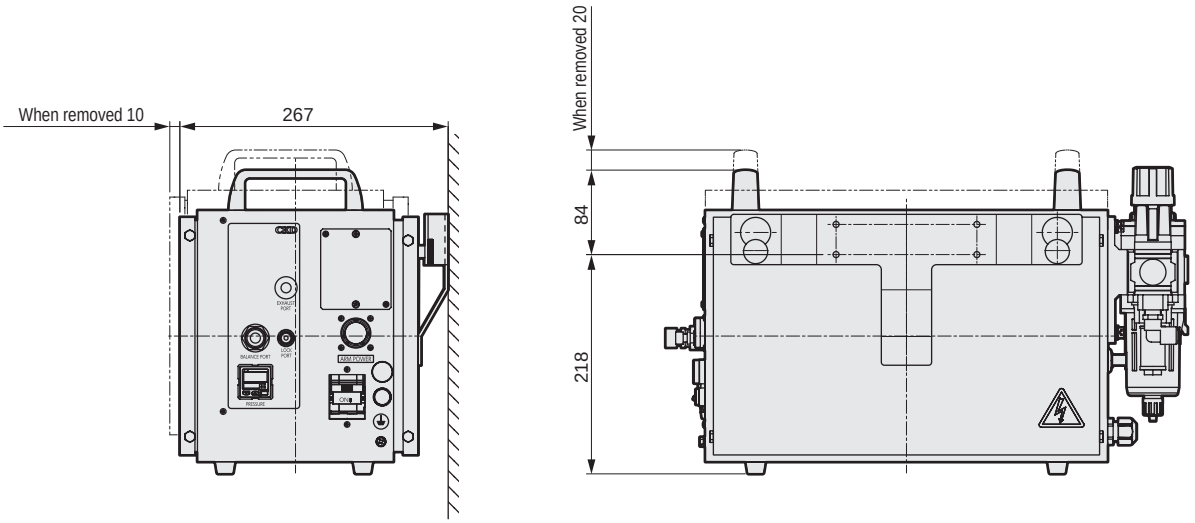
T-bracket dimensions



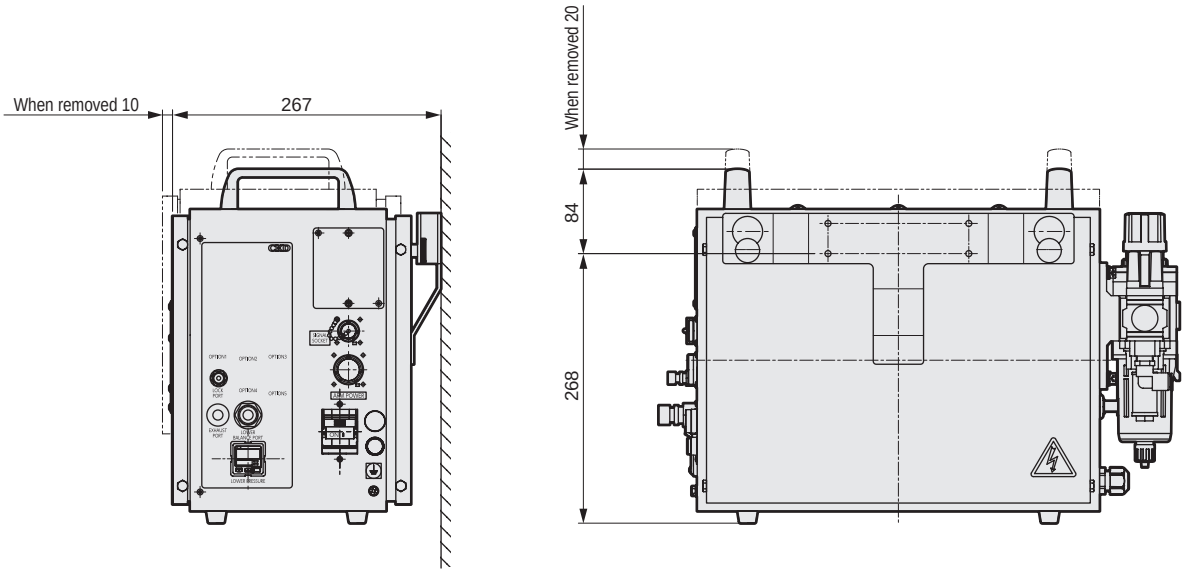
*Four M5-10 hexagon socket head cap screws are included.

• When the controller is mounted

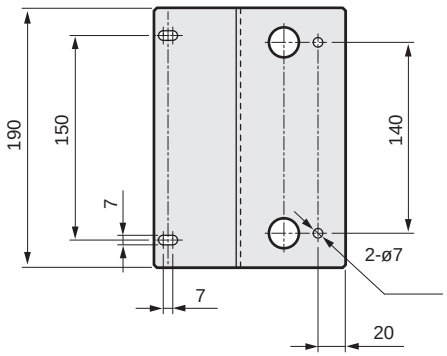
PAW-BS

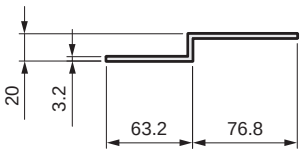


PAW-BH



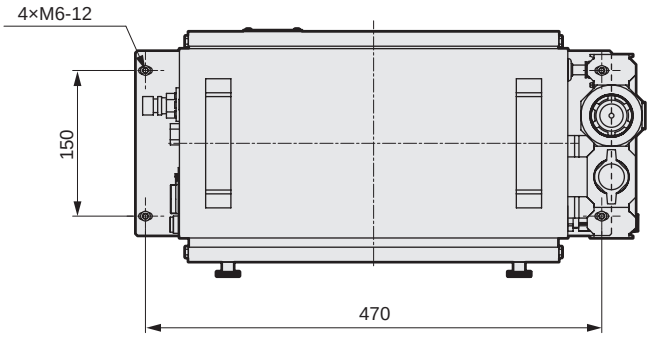
L-bracket dimensions

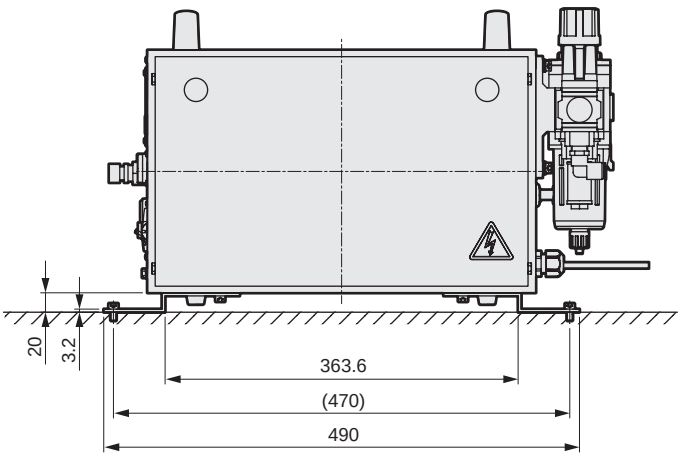


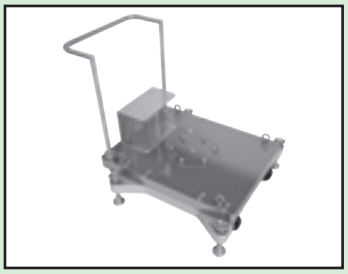


*Four M6-12 hexagon socket head cap screws are included.
*Four M6-12 hexagon socket head cap screws and 4 hexagon nuts are included if purchased separately.

• When the controller is mounted







Dolly

PAW-C* Series

How to order

PAW - C **R** - **L** - **B**

R: ❶ Shape
L: ❷ Size
B: ❸ Option

❶ Shape

Code	Description
R	With outriggers
A	Without outriggers
P	Pallet

❷ Size

Code	Description
L	PAW-S-8/X, PAW-M-8X/8S
H	PAW-S-Z, PAW-M-XZ/XS PAW-M-8XZ/8XS PAW-AS-45(-S) PAW-AZ-110(-S)

❸ Option

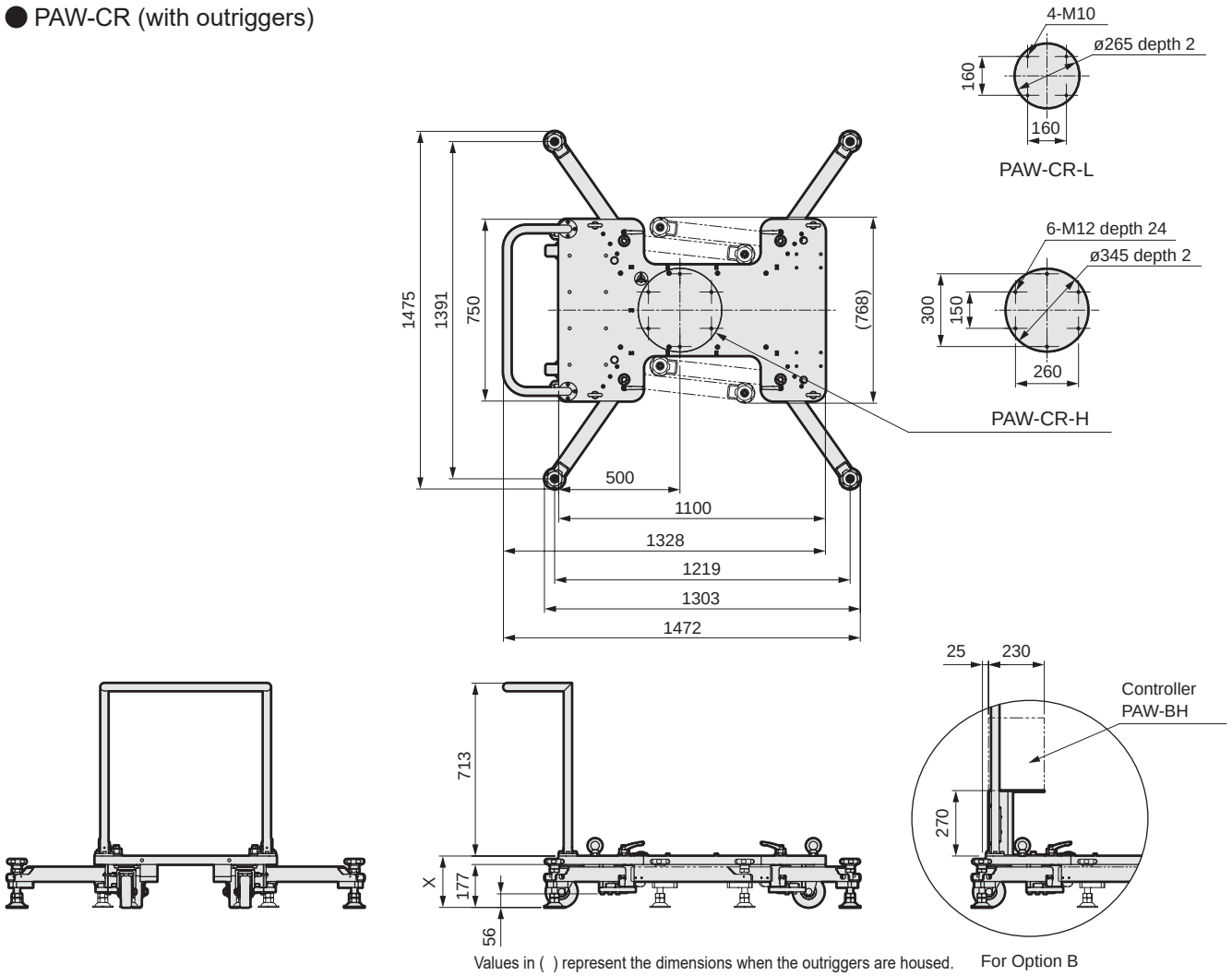
	Code	Description
*1 *2	B	Controller mounting bracket*

*1: This bracket prevents interference between the piping and the controller when installing PowerArm directly on a dolly. Must be selected if a base of 400 mm or greater (made-to-order product) is not used. PowerArm Option "U" cannot be selected when installing PowerArm directly on the dolly.

*2: Main exterior areas are made of steel (baked finish or two-component coating).

Dimensions

● PAW-CR (with outriggers)



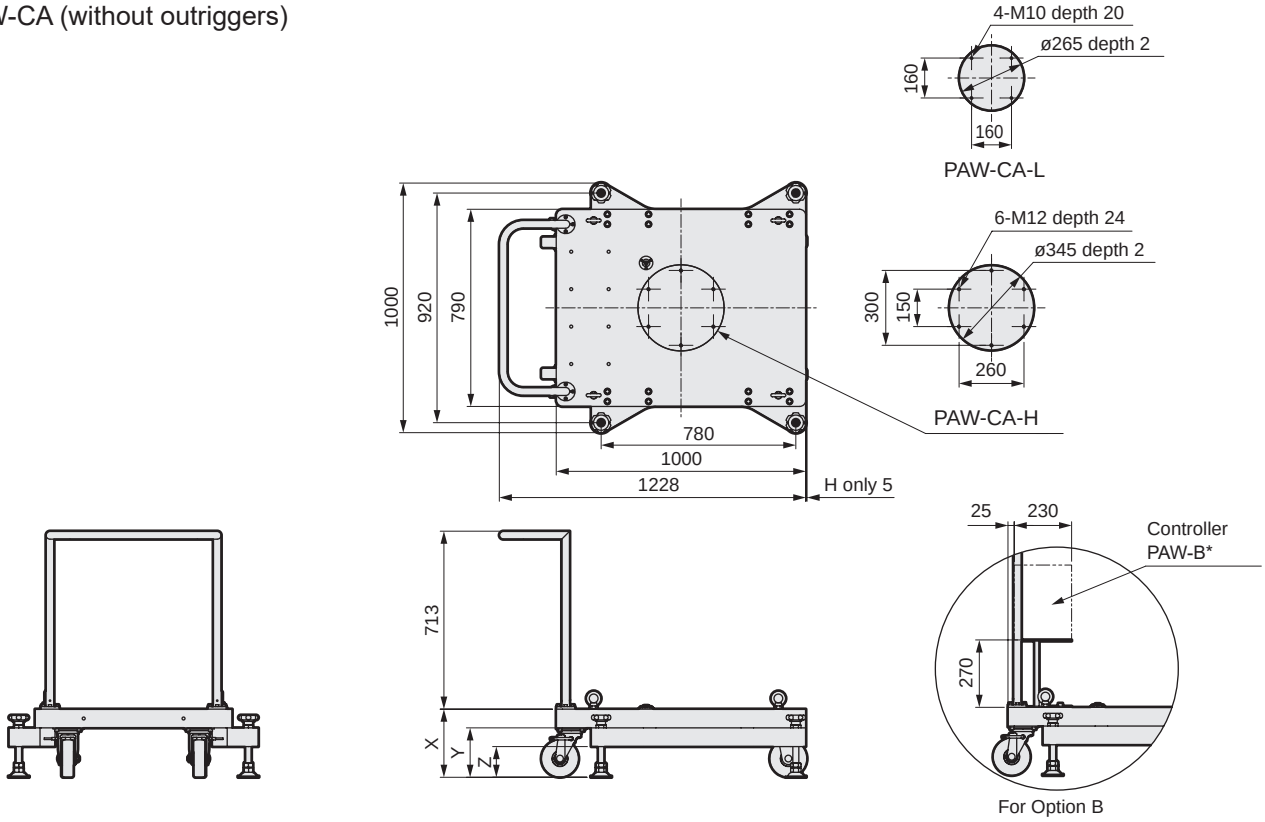
Values in ( ) represent the dimensions when the outriggers are housed. For Option B

Model No.	X	Product weight (kg)	Load resistance (kg)	Allowable moment (N·m) Note
PAW-CR-L	196	230	590	1560
PAW-CR-H	212	310	510	2110

Note To prevent falling, design the product so that it is less than the allowable moment when all moment loads (PowerArm body, max. weight workpiece, etc.) are applied and a load of 80kg is applied to the tip.

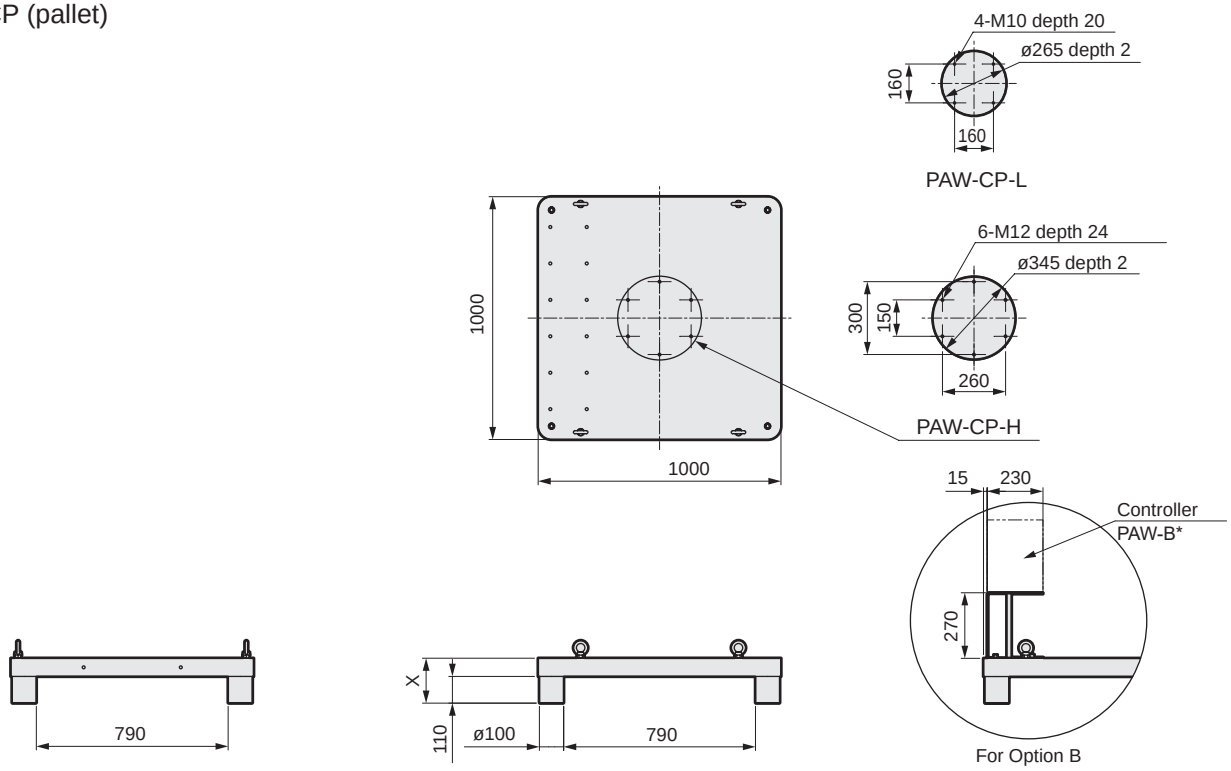
Dimensions

● PAW-CA (without outriggers)



Model No.	X	Y	Z	Product weight (kg)	Load resistance (kg)	Allowable moment (N•m) Note
PAW-CA-L	222	177	102	410	410	1840
PAW-CA-H	273	198	123	600	310	2700

● PAW-CP (pallet)



Model No.	X	Product weight (kg)	Allowable moment (N•m) Note
PAW-CP-L	155	390	1910
PAW-CP-H	185	620	3030

Note To prevent falling, design the product so that it is less than the allowable moment when all moment loads (PowerArm body, max. weight workpiece, etc.) are applied and a load of 80kg is applied to the tip.