

PowerArm PAW Series



Carries, holds, lifts



Palletizing specifications added!!



モノづくり
部品大賞

* Cho Monodzukuri
Innovative Parts and
Components Award

For your safety at work, for the future of manufacturing, the assistive device takes this form

The PowerArm shares the payload for a safer workplace.

The new model is now even safer and easier to use.

Status quo of workers in the manufacturing industry

- 64% of workers are 40 years of age or older.
- **Back pain** accounts for more than half of work-related injuries.

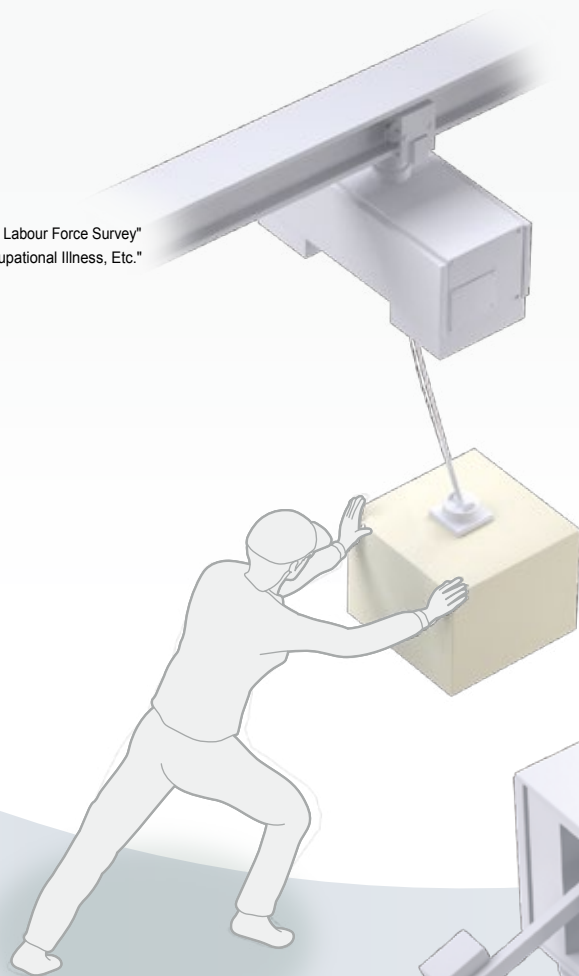
* From the Ministry of Internal Affairs and Communications "2017 Annual Report on the Labour Force Survey"

* From the Ministry of Health, Labour and Welfare "2017 Survey on the State of Occupational Illness, Etc."



Belt-type assistive devices

- The center of gravity is far from the area of operation (transported item), **making operation difficult. (Starts and stops are a strain)**



Arm-type assistive devices

- Compact storage is difficult, **requiring a large space.**
- Use of the arm is hampered by **interference with the ceiling or walls.**





New pneumatic pressure balancer enables
assistance from the downward direction

PAW Series
PowerArm

< GOOD DESIGN AWARD 2019 >

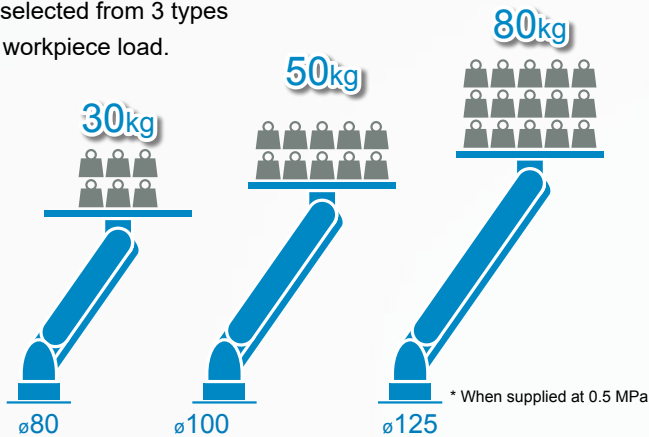
Transform workstyles with assistive devices.



Variation

Arm variations tailored to the specific workpiece

The arm can be selected from 3 types according to the workpiece load.

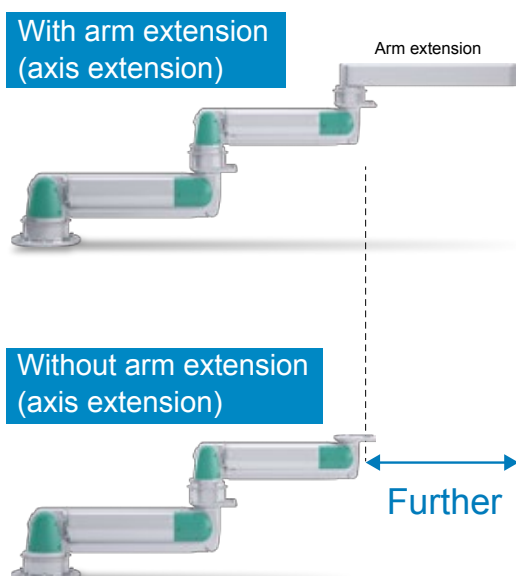


*Refer to the load capacity chart on page 2 for details.

Wide

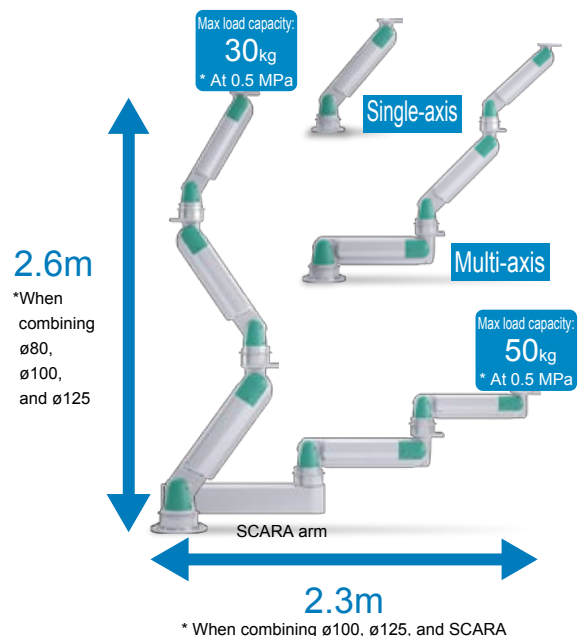
Achieving a wider range of movement

Extension arms (extension axes) can be used for multi-axis specification types to enable an even wider range of motion.



Wide range of motion to suit the application

Freely combine single-axis and multi-axis specifications to suit your applications and worksites.



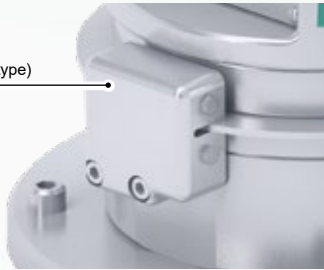


Safety

Holds position when motor power (air, electric power) is down

In addition to a position-locking function (standard equipment) via block valve, a rotation lock can be mounted on the normally closed type (option). Position holding is possible during emergency stops.

Rotation lock (normally closed type)



Snag prevention

Fingers, etc., do not fit into the joint gaps.

In addition, the space remaining when the joints are closed keeps fingers from being snagged.



* The European Safety Standards CE marking applies only to the Power Arm body.

Simple

Simple assistive mechanism based on pneumatic pressure control

Uses a pneumatic pressure cylinder in part of the body. The simple mechanism can be easily handled.

Compact

Compact

Even the multi-axis specification, foldable for storage, is more compact and easier to store than arm or belt types.

900mm

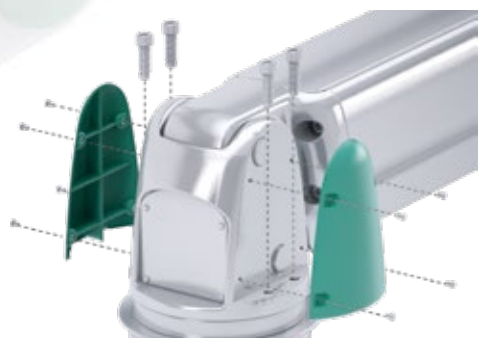
650mm



Flexible

Customers can easily incorporate arms

With the simple structure, arm combinations can be flexibly changed by the customer.

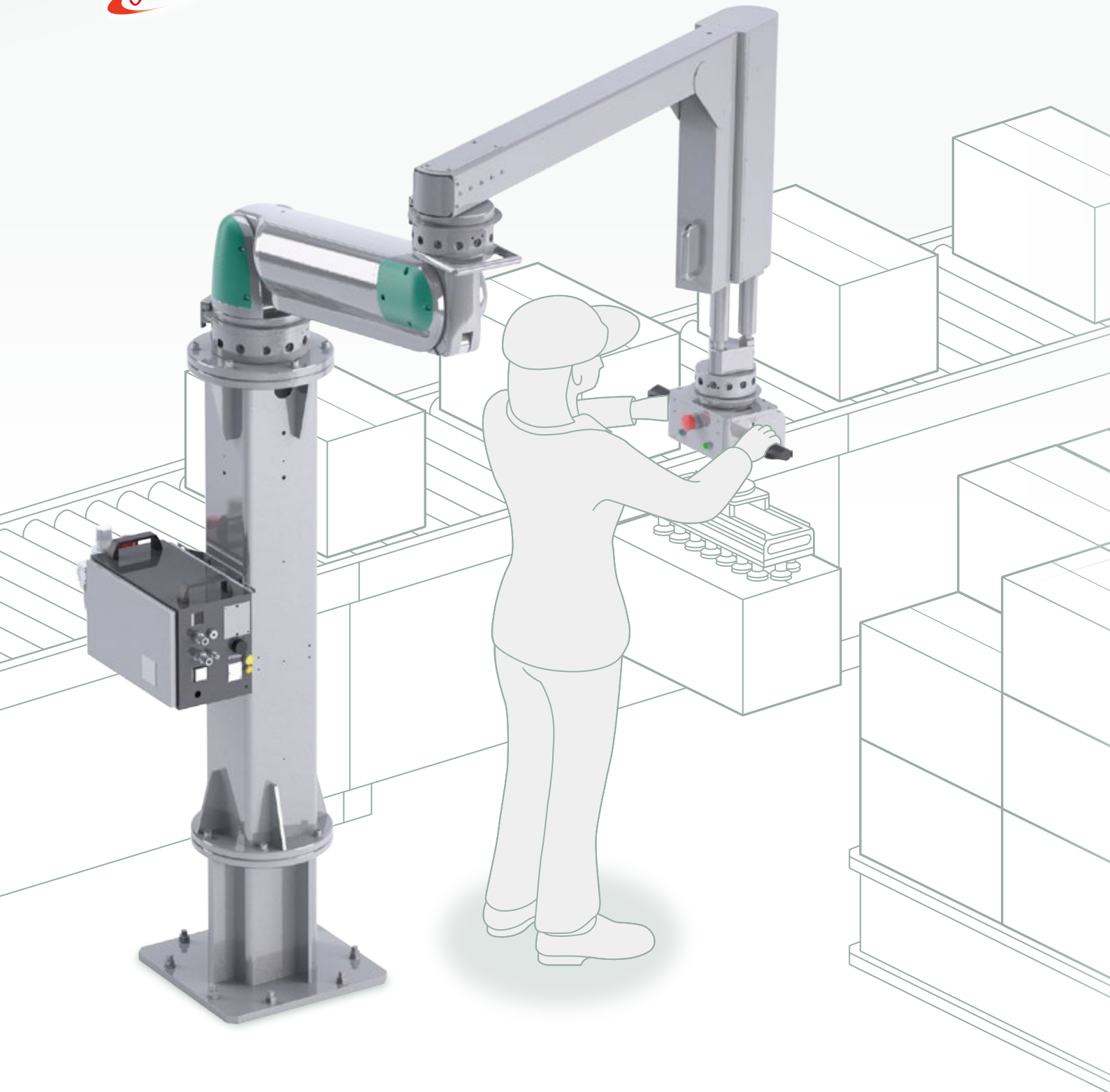


Human Assist

Palletizing specifications

**to allow stacking and unloading tasks to
be performed in limited spaces**

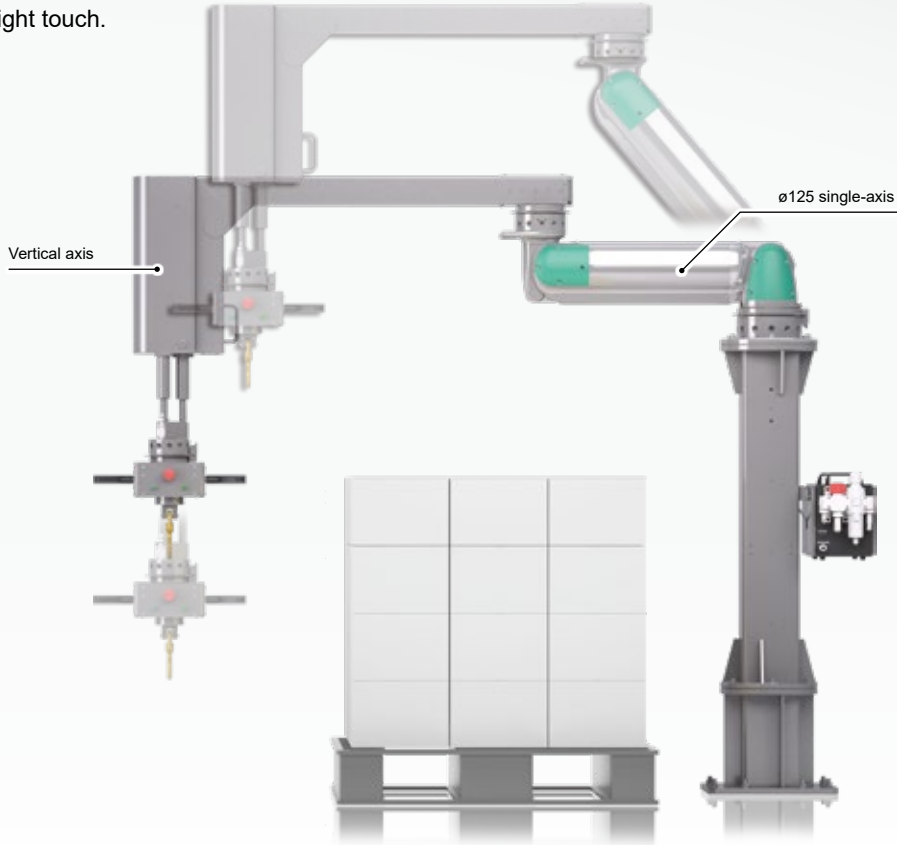
New



Specialized

Focused on stacking and unloading tasks

A vertical axis is now equipped with this product to ensure easier use in the palletizing process while maintaining PowerArm signature features; a space-saving, compact design, and a light touch.



Wide

A wide moving range

The combination of the ø125 single-axis and vertical axis provides a wider moving range.

Compact

Space saving storage

This product can be stored folded.



Storage condition

Variation

Simple combinations are possible

The vertical axis and SCARA arm can be combined and used if the product does not often make vertical strokes.



Compatible as an assistive system

In addition to the assistive components as single units, we address requests including attachments, controllers, and movable type dollies. Contact CKD for details.



Hook



Hanger

Vacuum

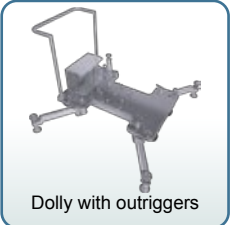


Materials bag



Plate-shaped workpieces, glass, etc.

Dolly / anchor



Dolly with outriggers



Dolly without outriggers



Pallet



Anchor fixed type

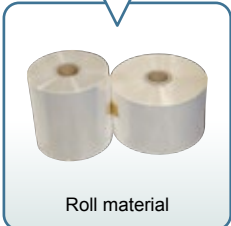
Clamp



Internal diameter clamp



External clamp



Roll material



Round objects / containers / food trays

Controller design and manufacture

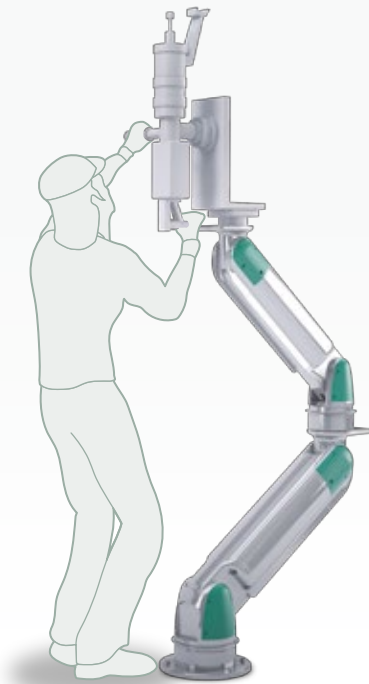
We propose ideal air circuits for various assistance mechanisms. Easy transport is possible with the ideal control method for your transported items.



Example of controller interior.
Let us go over your needs with you.

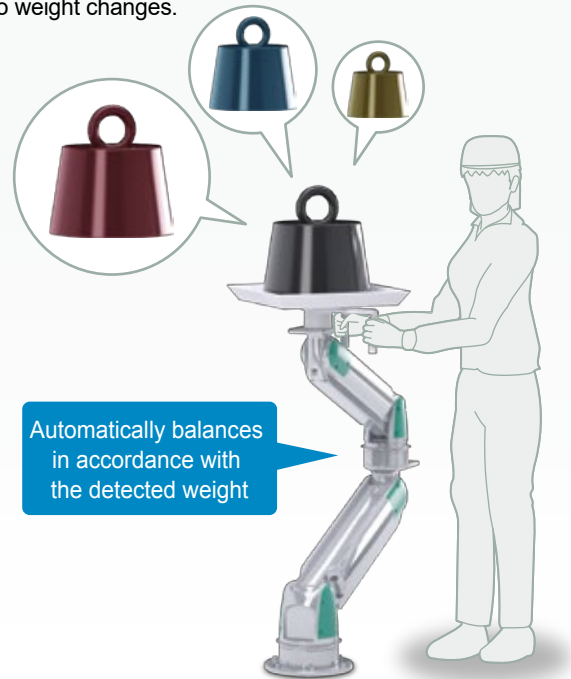
Operating pressure fixing control system

Suitable for assisting with the weight of jigs and tools.
Control that maintains balance at a constant weight.



Automatic operating pressure regulating control system

Suitable for transport of various types of workpieces of differing weights.
Control which detects the transported item weight at the tip, and automatically adjusts the operating pressure in response to weight changes.



Demonstrations

We perform demonstrations so that you can experience the actual PowerArm devices.
We offer demonstrations at various locations. Contact CKD for details.

Compatible with FP Series for secure food manufacturing processes *



This logo represents CKD's stance to provide you with safe components for supporting your food manufacturing processes.

* Contact CKD for details.

Introduction to PowerArm online

We have prepared a PowerArm introductory site.

* Depending on your smartphone environment, it may not be displayed correctly.





PowerArm

PAW Series

- Bore size: $\varnothing 80/\varnothing 100/\varnothing 125$



Specifications

Item	PAW			
	$\varnothing 80$	$\varnothing 100$	$\varnothing 125$	
Bore size	mm	$\varnothing 80$	$\varnothing 100$	$\varnothing 125$
Working fluid		Compressed air		
Max. working pressure	MPa	0.7		
Min. working pressure	MPa	0.25(When option L (with a rotation lock) is selected: 0.35)		
Proof pressure	MPa	1.05		
Ambient temperature	$^{\circ}\text{C}$	5 to 60		
Cushion		Rubber cushion		
Lubrication		Not available		
Load capacity (0.5 MPa pressurized)	kg	30	50	80
Air consumption	ℓ/min (ANR)	8	14	25

Note: Values are at air consumption 1 cycle/min. and working pressure 0.7 MPa.

Movable range

· With single-axis

Model No.	Movable range Vertical (mm)
PAW-S-8 ($\varnothing 80$)	520
PAW-S-X ($\varnothing 100$)	580
PAW-S-Z ($\varnothing 125$)	650

· With multi-axis

Model No.	Movable range	
	Vertical (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

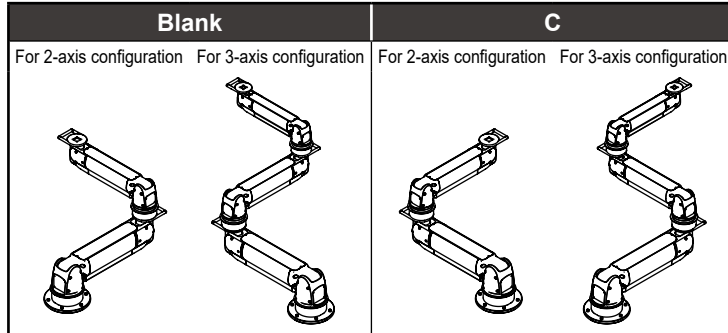
Model No.	Weight (kg)	Optional additional weight (kg)		
		L (rotation lock mechanism)	R (tip rotation mechanism)	LR
PAW-M-8	27	0.5	4	5
PAW-M-X	38	0.5	5.5	6.5
PAW-M-Z	71	0.5	7.5	8.5
PAW-M-8S	46	1.0	4	5.5
PAW-M-XS	77	1.0	5.5	7
PAW-M-ZS	123	1.0	7.5	9
PAW-M-8X	58	1.0	4	5.5
PAW-M-XZ	102	1.0	5.5	7
PAW-M-8XS	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**

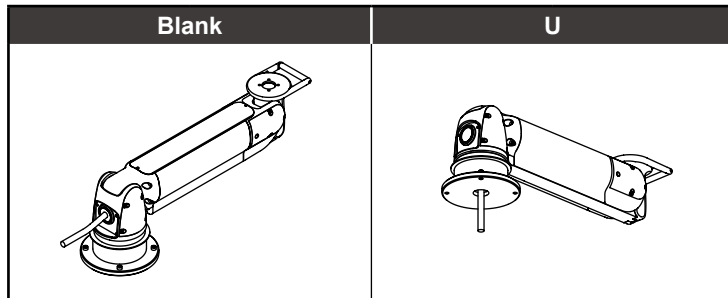
A Number of sections
B Combination contents
C Option

C Option: Bending direction



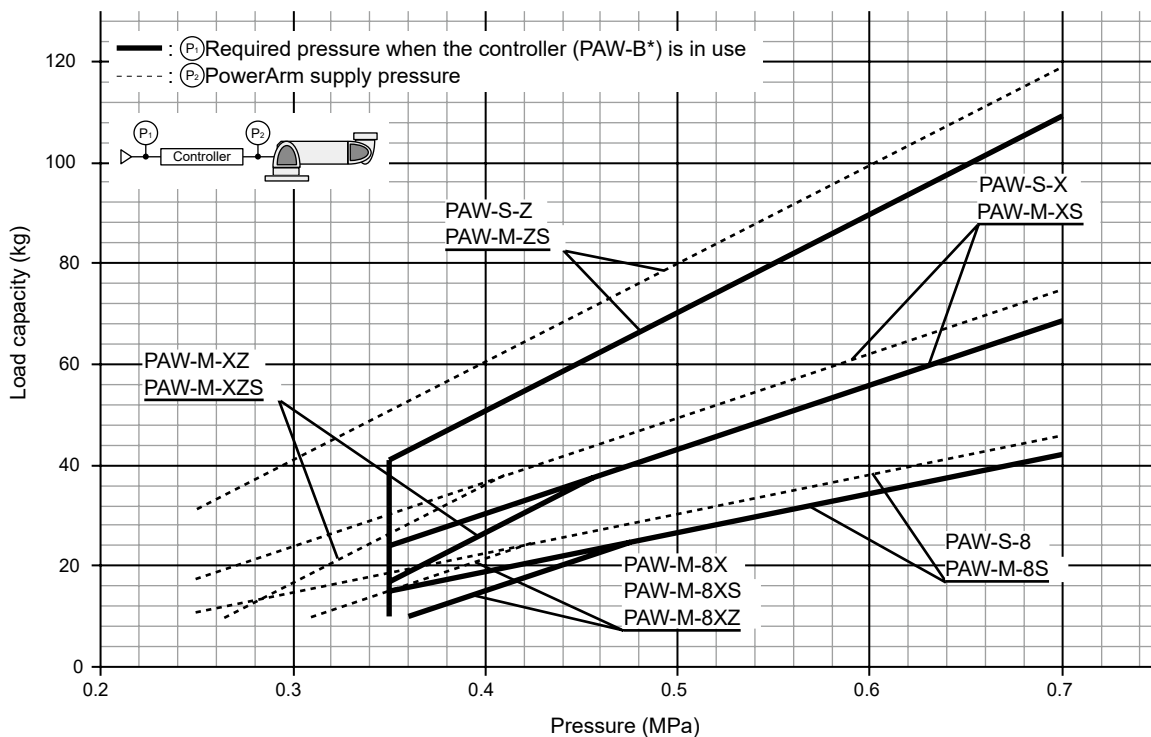
* C is not available for single axis (PAW-S).

C Option: Piping leadout direction



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

Load capacity under pressure



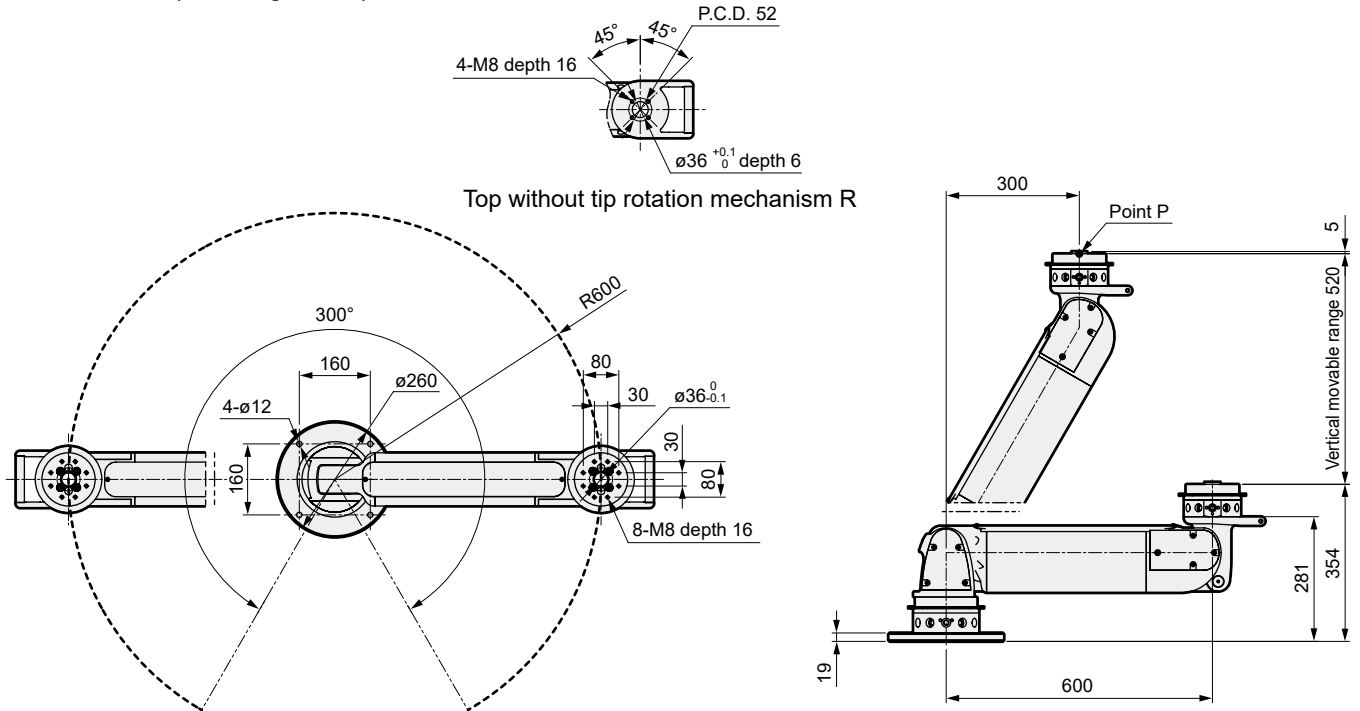
- *1: Indicates the load capacity with the optional tip rotation mechanism mounted.
- *2: Pressure supplied to the controller should be increased, depending on the operating frequency and speed.
- *3: Attachment weight is not included.
- *4: While the load capacity has properties such that it alters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

Code		Description		A Number of sections	
				Single-axis	Multi-axis
		S	M		
B Combination contents					
8	ø80 single-axis	•			
X	ø100 single-axis	•			
Z	ø125 single-axis	•			
8S	ø80 + SCARA arm				•
XS	ø100 + SCARA arm				•
ZS	ø125 + SCARA arm				•
8X	ø80 + ø100				•
XZ	ø100 + ø125				•
8XS	ø80 + ø100 + SCARA arm				•
XZS	ø100 + ø125 + SCARA arm				•
8XZ	ø80 + ø100 + ø125				•
C Option					
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)	•			•

* A mechanism designed to hold the force applied in rotational directions. It is not designed to stop dynamic rotational force.

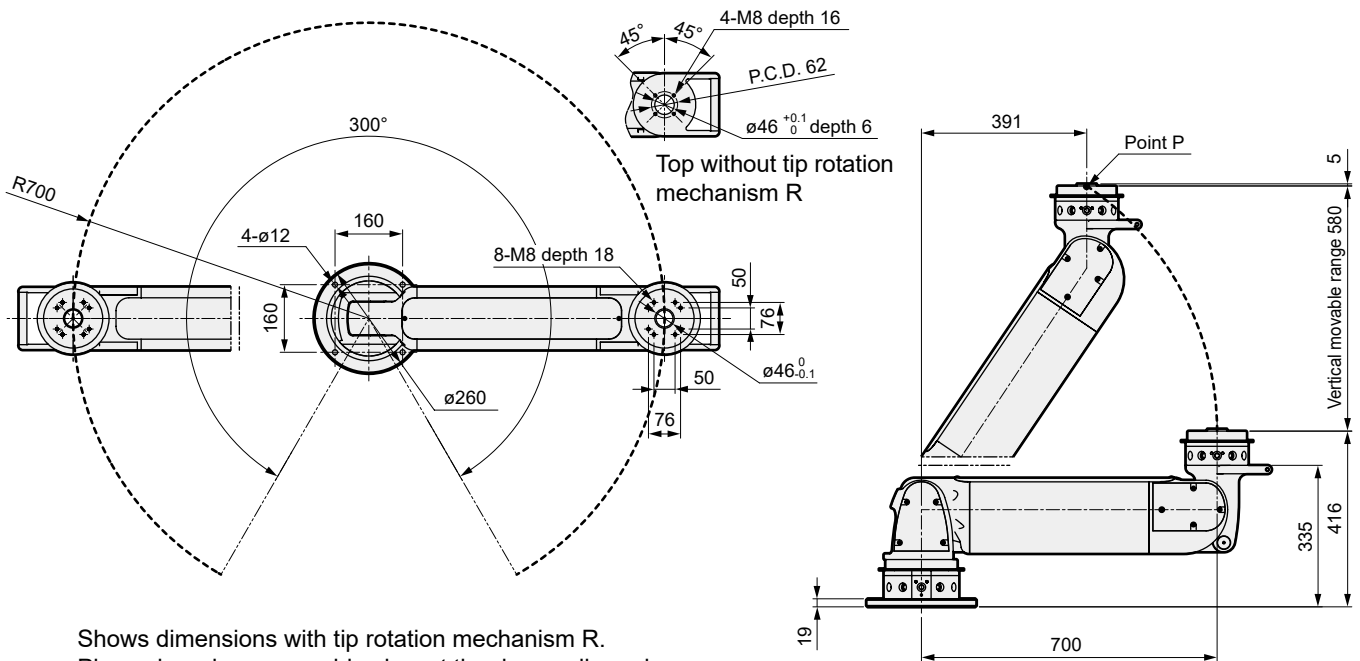
Dimensions (single-axis)

- PAW-S-8-R ($\varnothing 80$ single-axis)



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.

- PAW-S-X-R ($\varnothing 100$ single axis)

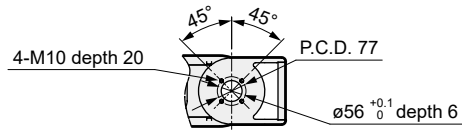


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the descending edge.
Structurally, the movable range changes according to the rising height.

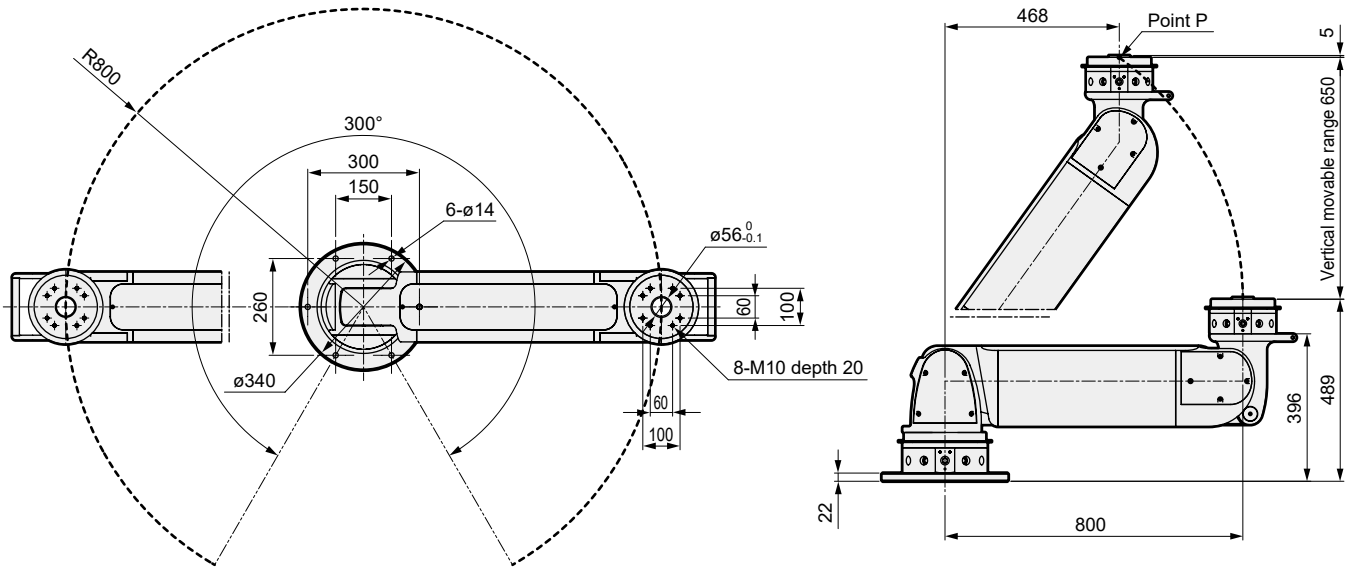
* Refer to page 13 for the optional dimensions of the tip rotation mechanism (R) option.

Dimensions (single-axis)

- PAW-S-Z-R (ø125 single axis)



Top without tip rotation mechanism R

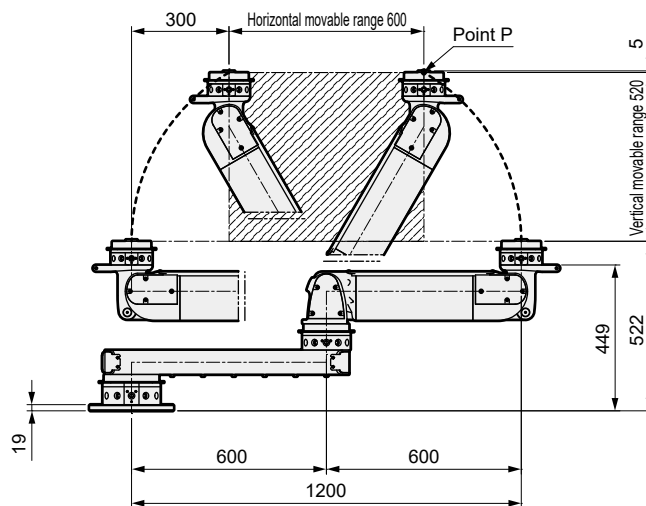
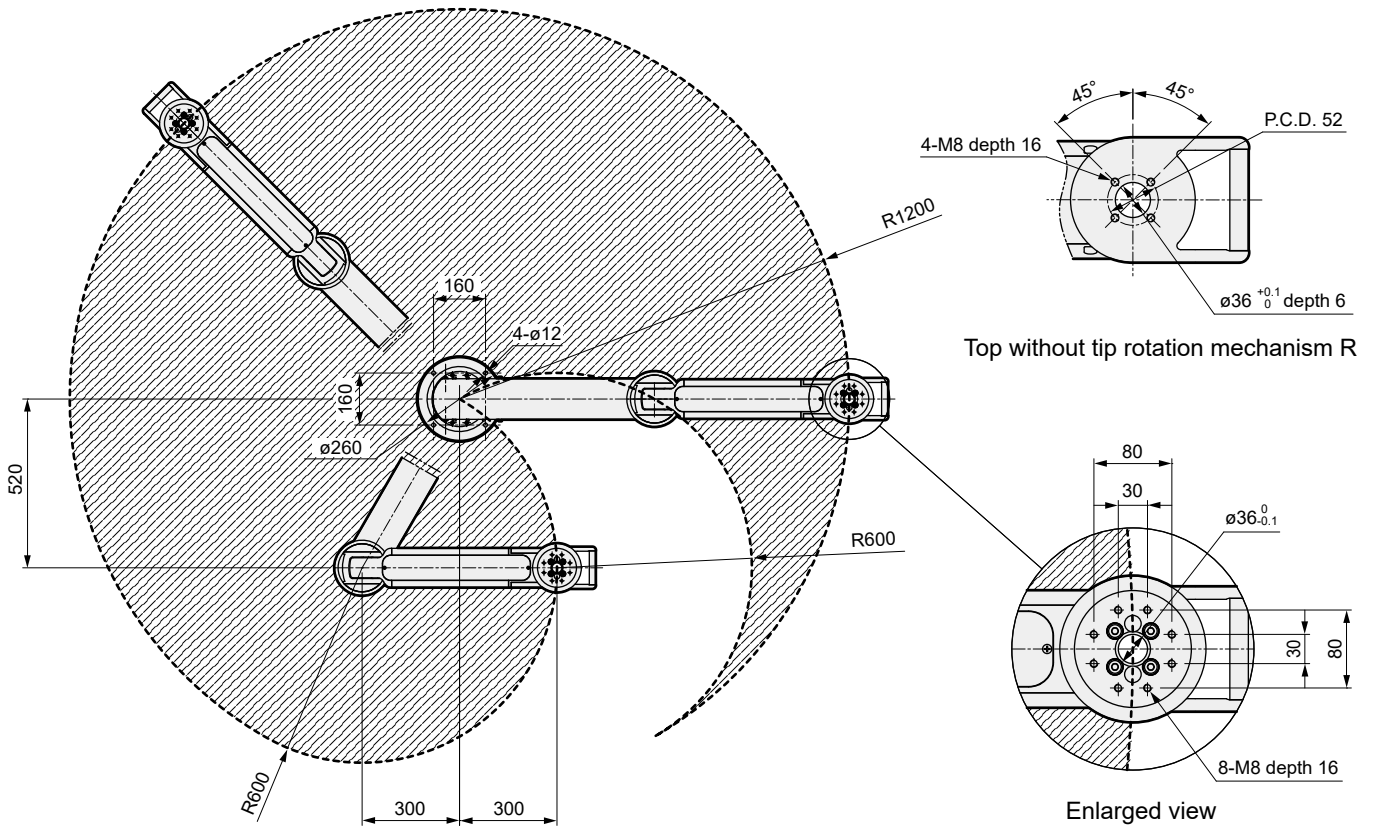


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the descending edge.
Structurally, the movable range changes according to the rising height.

* Refer to page 13 for the optional dimensions of the tip rotation mechanism (R) option.

Dimensions (multi-axis)

- PAW-M-8S-R (upper section $\varnothing 80$ + lower section SCARA arm)

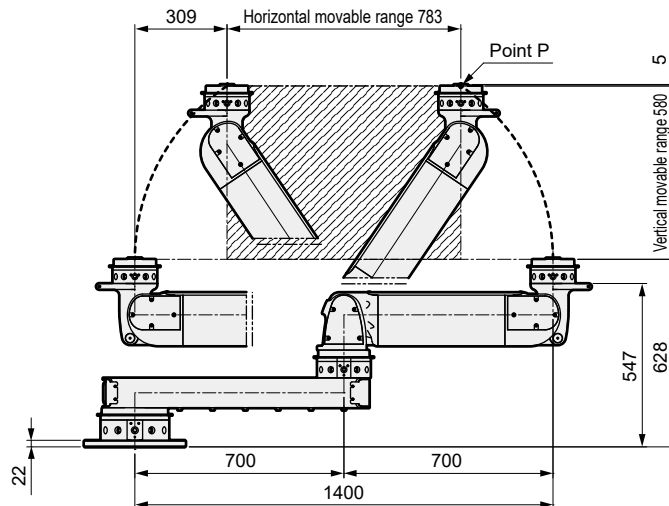
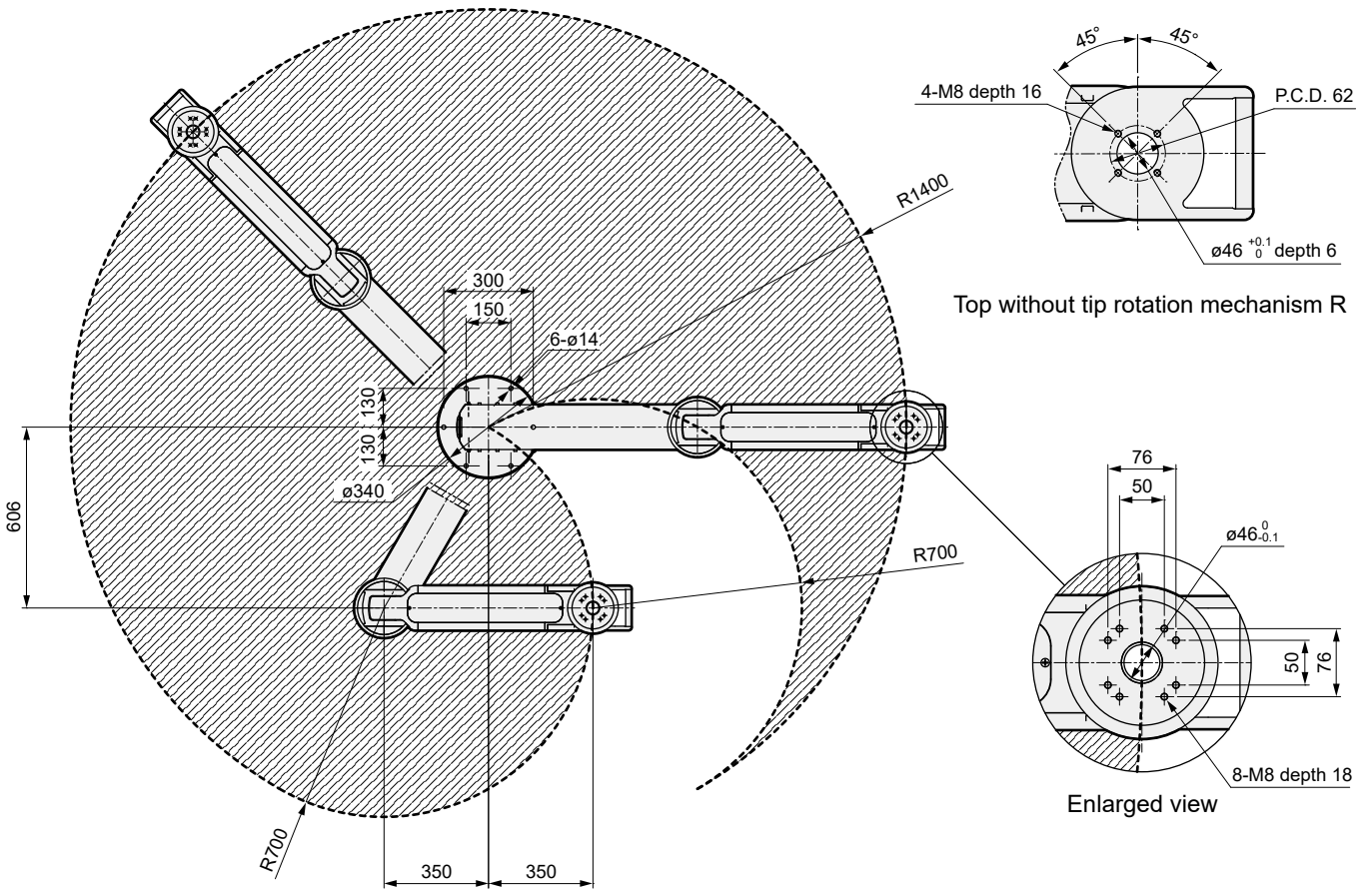


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\varnothing 100$ + lower section SCARA arm)

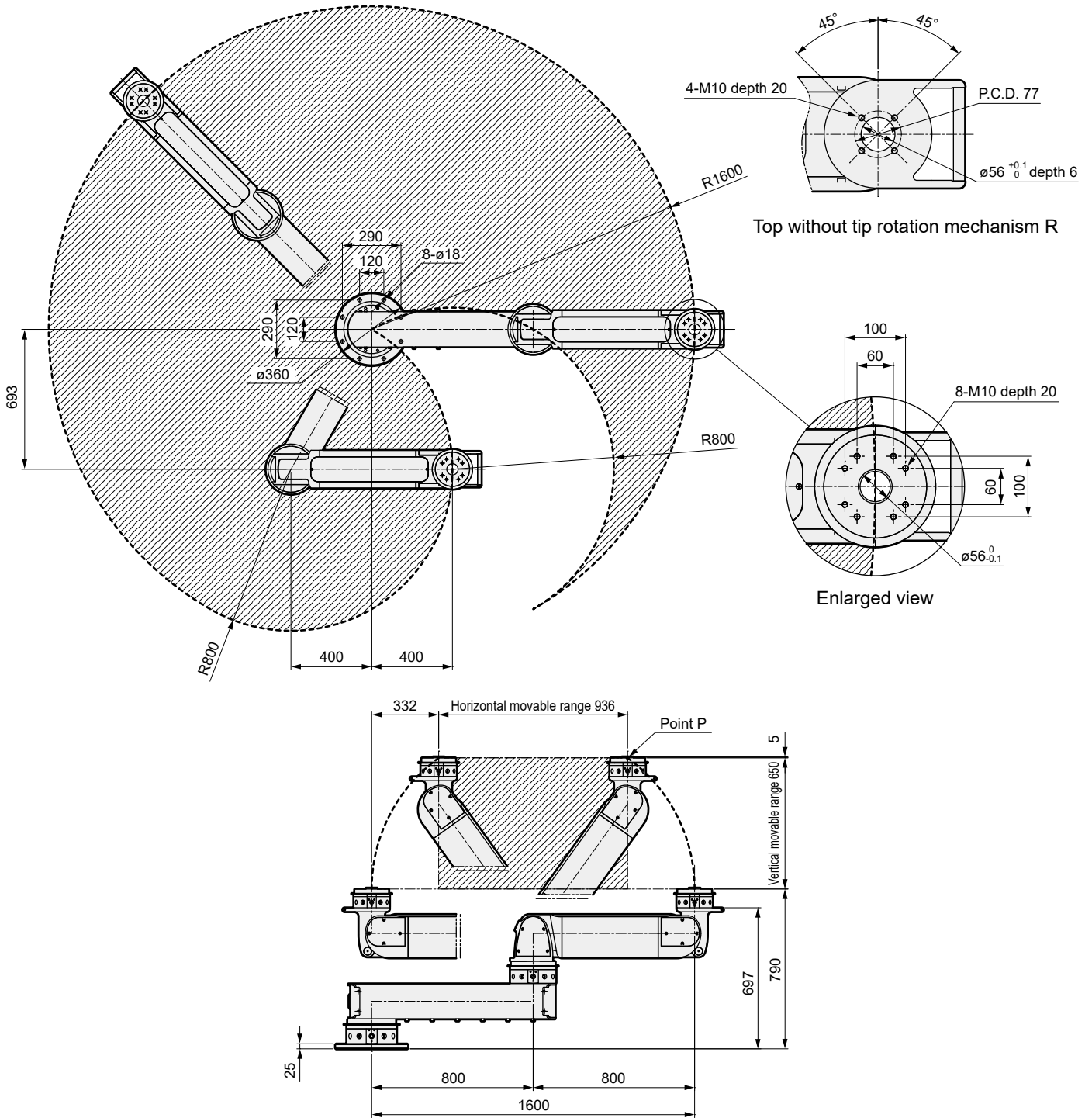


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the point P descending edge.
Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\phi 125$ + lower section SCARA arm)

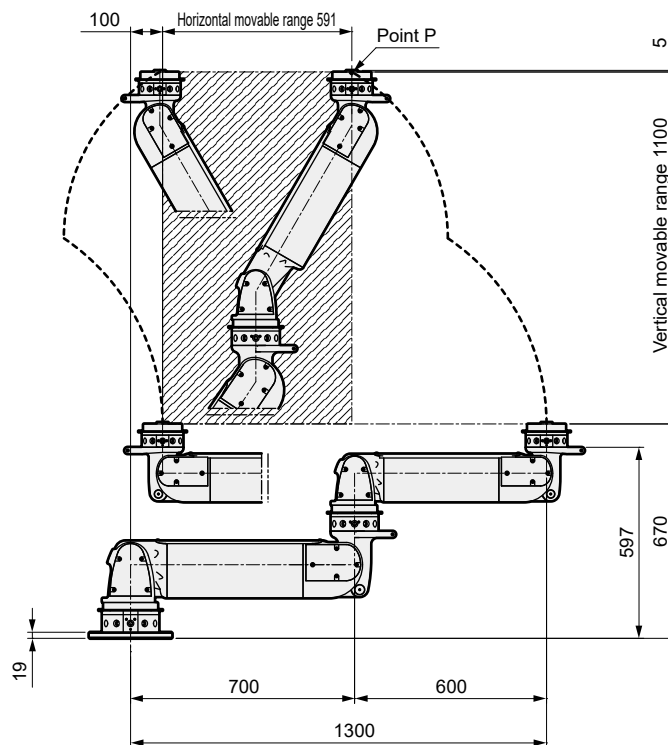
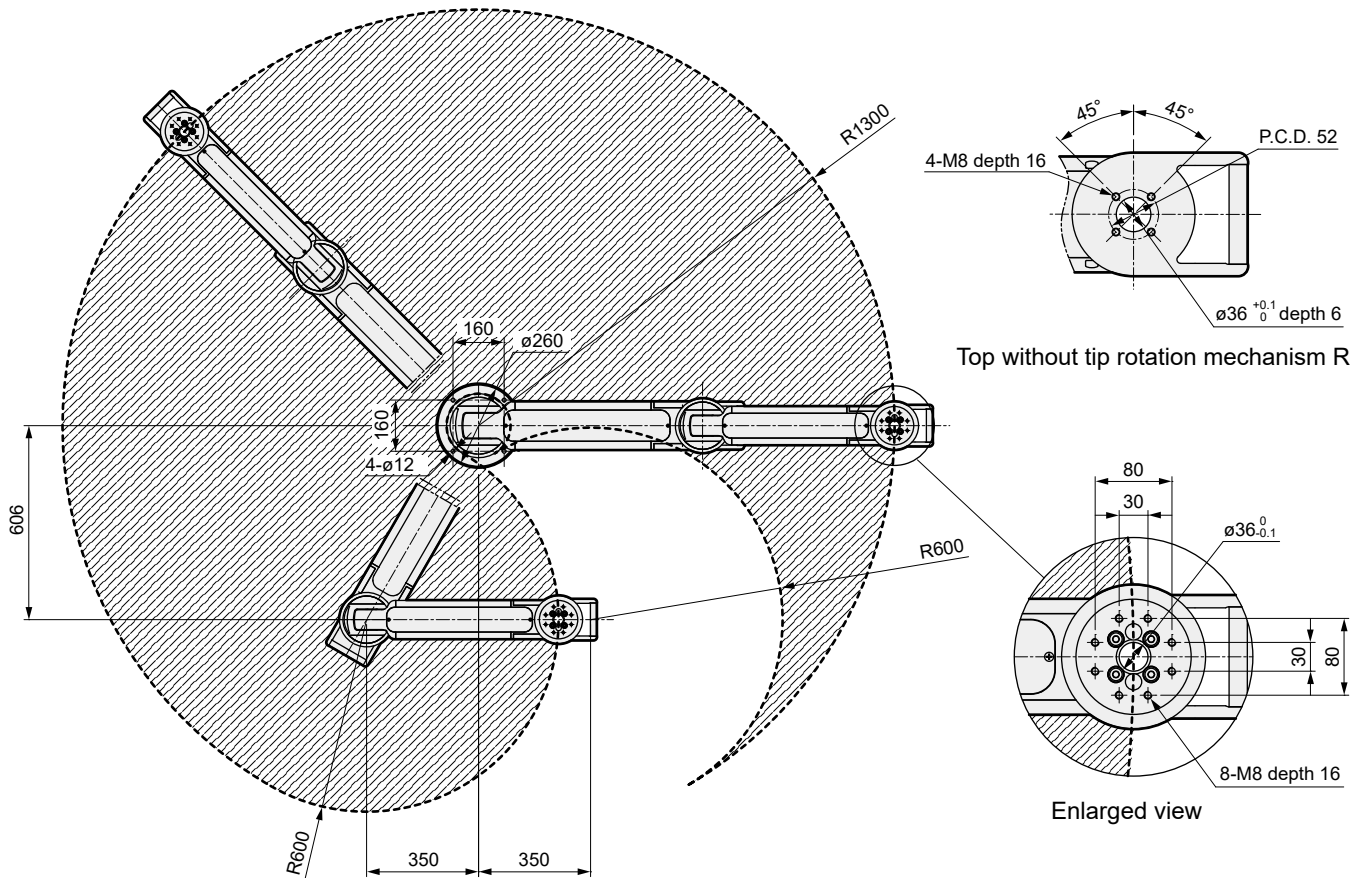


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\varnothing 80$ + lower section $\varnothing 100$)



Shows dimensions with tip rotation mechanism R.

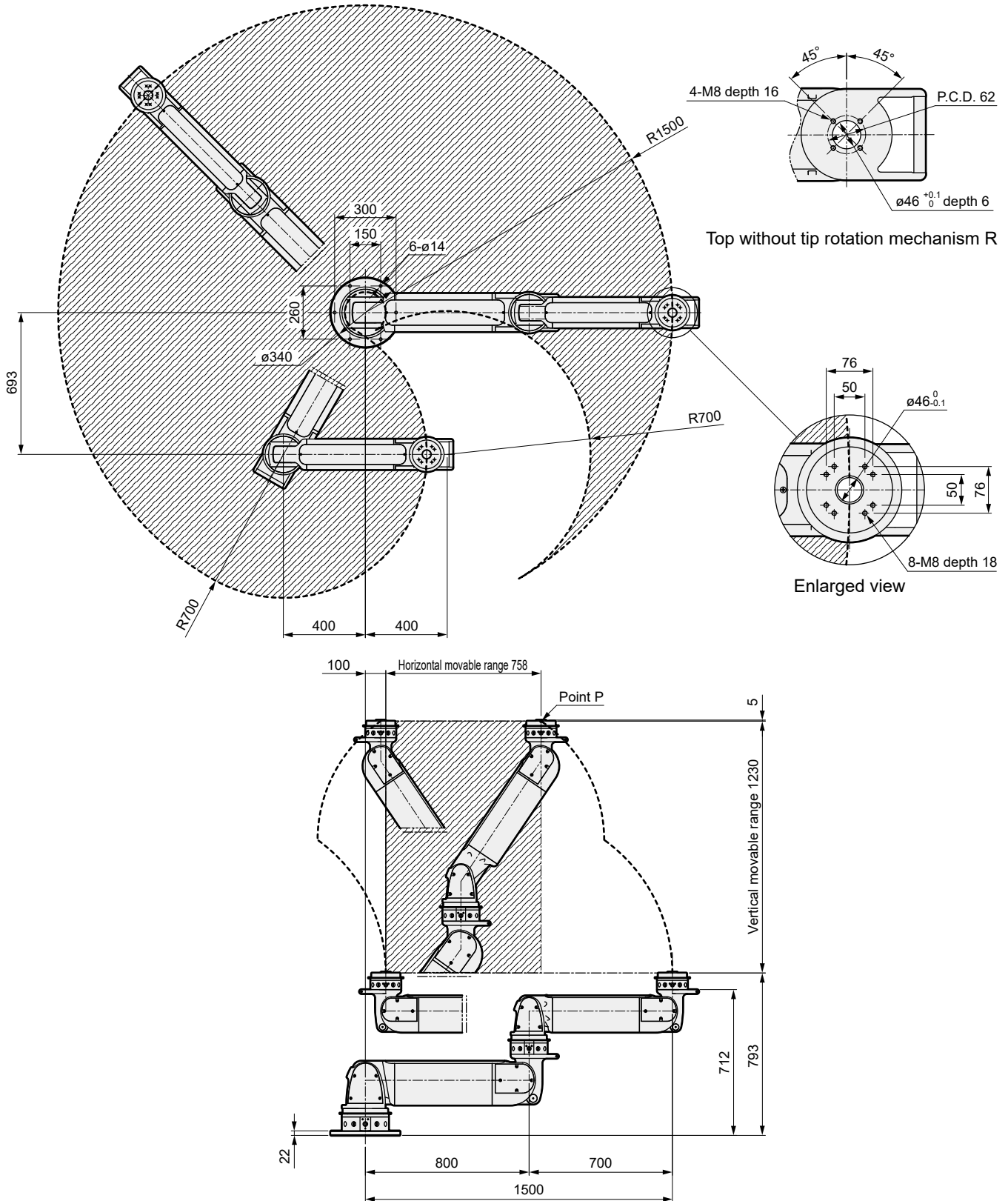
Plane view shows movable view at the point P descending edge.

Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\varnothing 100$ + lower section $\varnothing 125$)

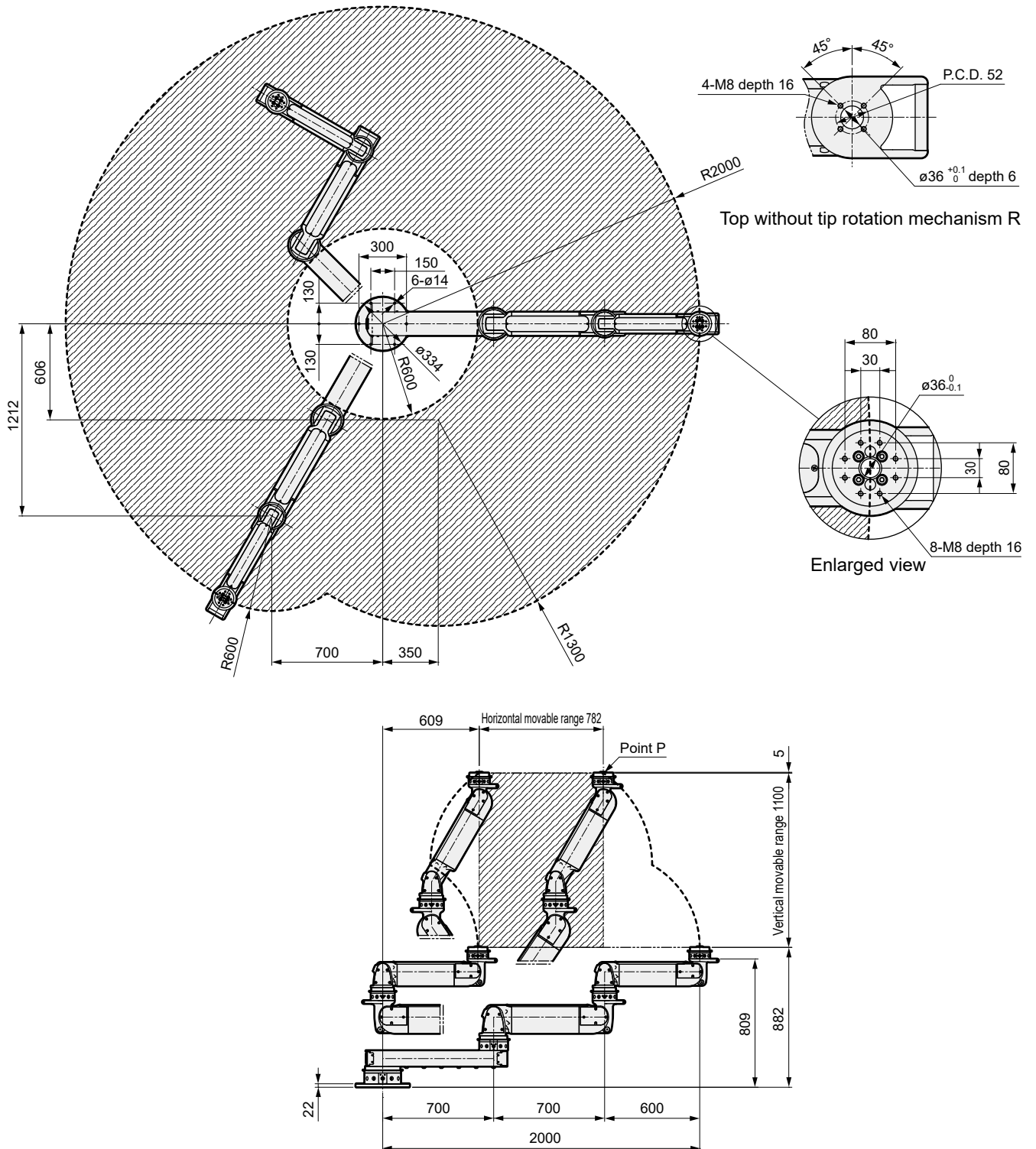


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\phi 80$ + middle section $\phi 100$ + lower section SCARA arm)

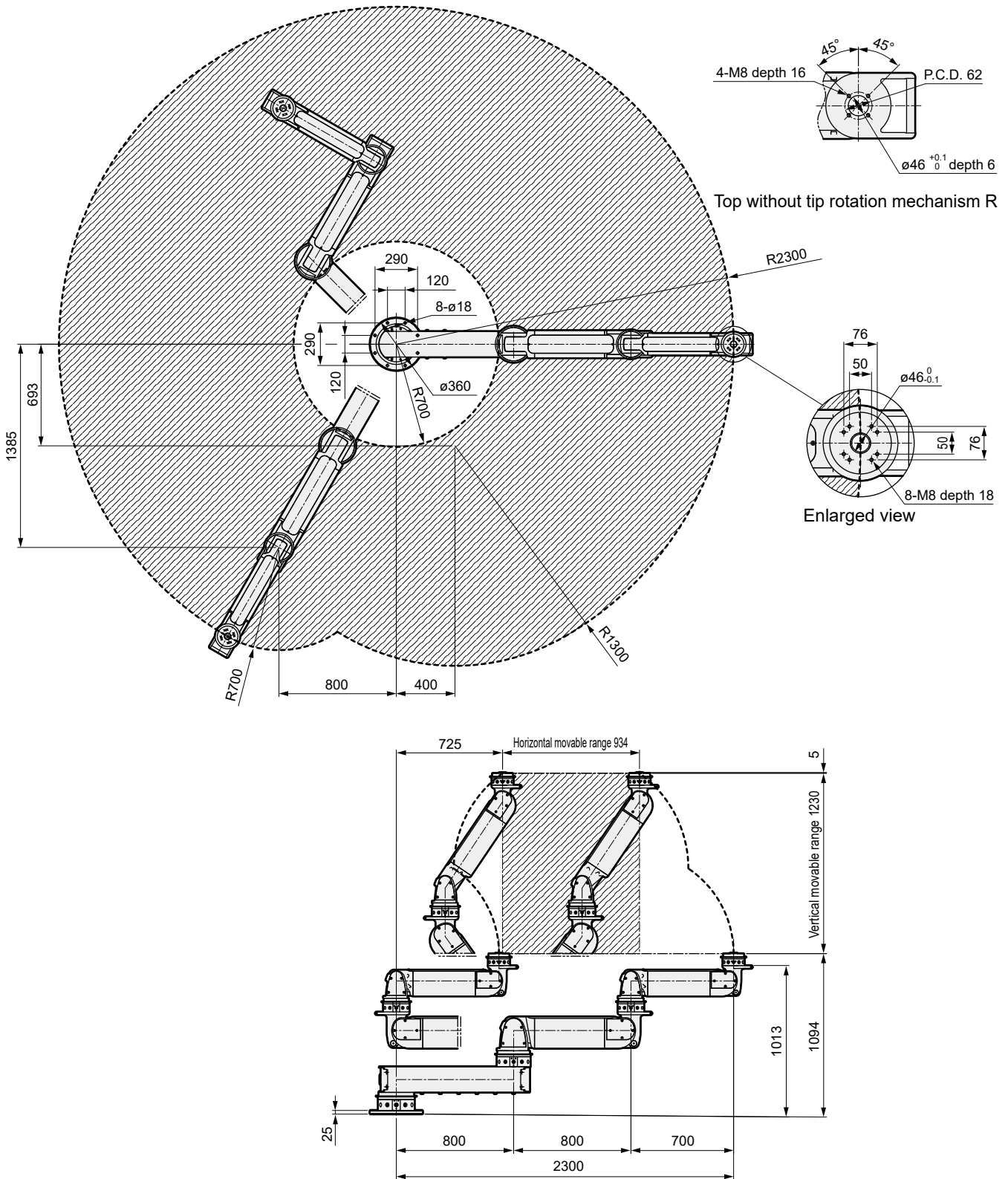


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the point P descending edge.
Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\varnothing 100$ + middle section $\varnothing 125$ + lower section SCARA arm)

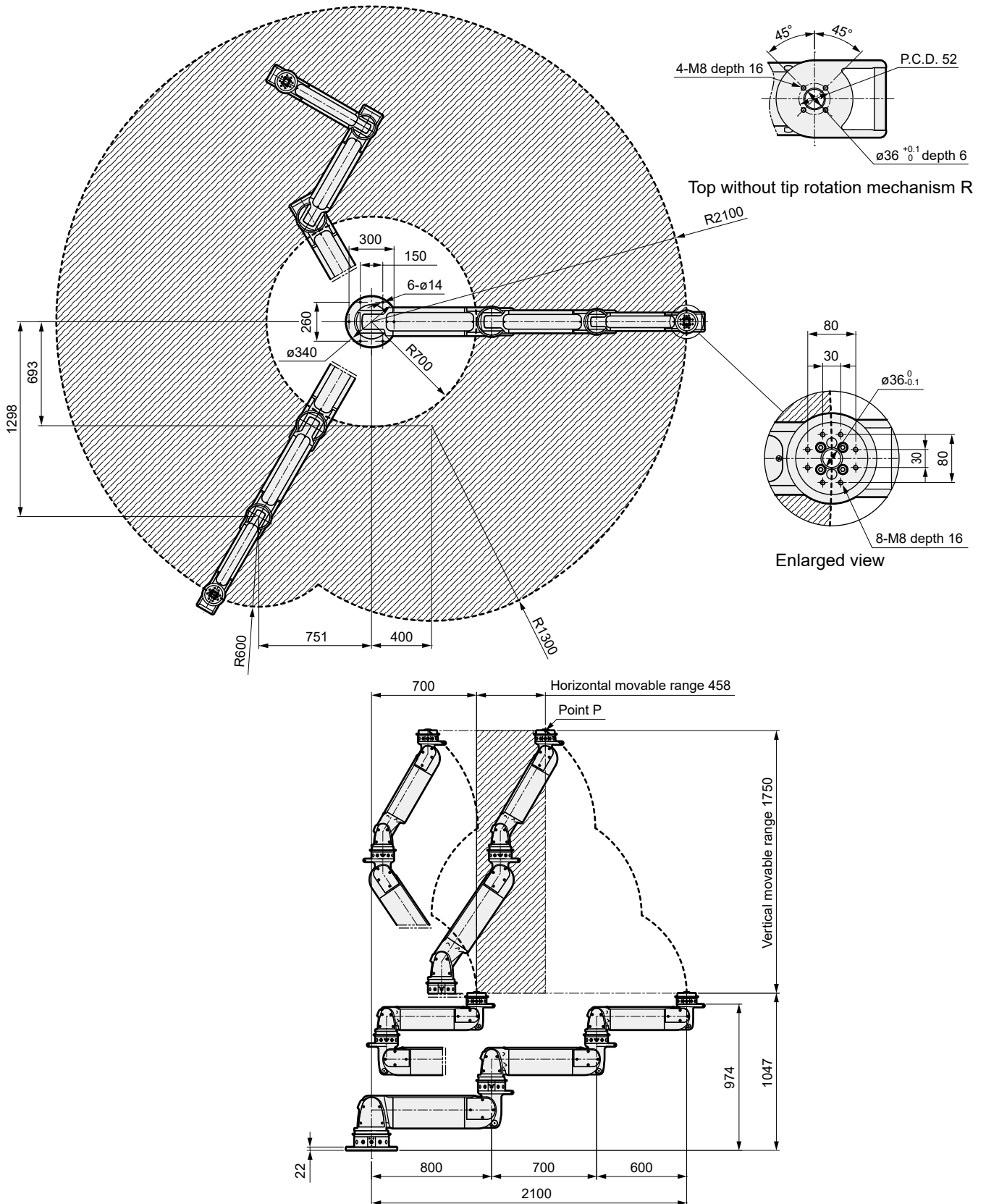


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 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 $\varnothing 80$ + middle section $\varnothing 100$ + lower section $\varnothing 125$)



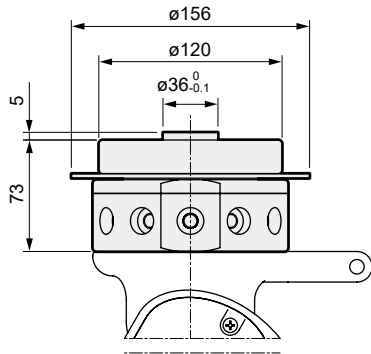
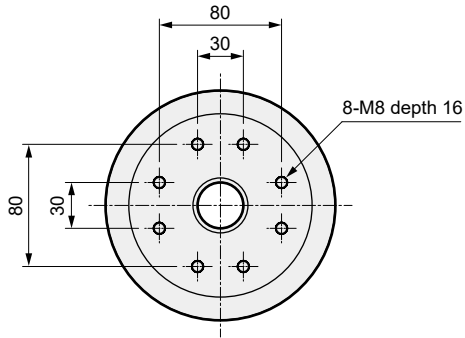
Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the point P descending edge.
Structurally, the movable range changes according to the point P rising height.

- * Refer to page 13 for the optional dimensions of the tip rotation mechanism (R) option.
- * With the bending direction (C) option, the operating range is left-right reversed.

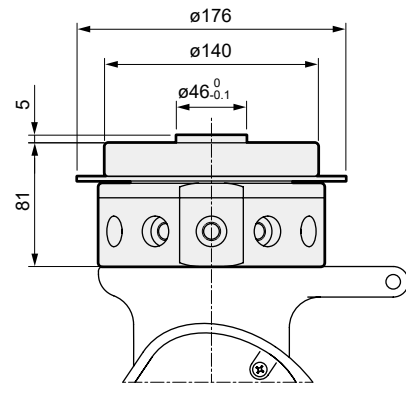
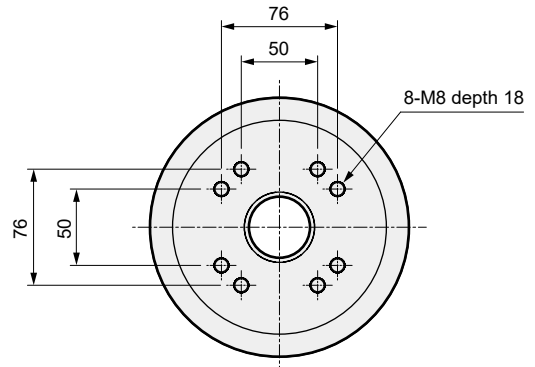
Optional dimensions

• Tip rotation mechanism (R)

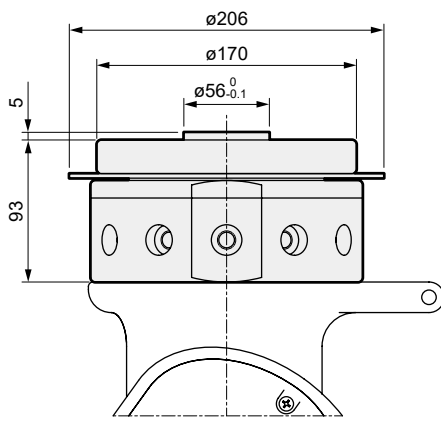
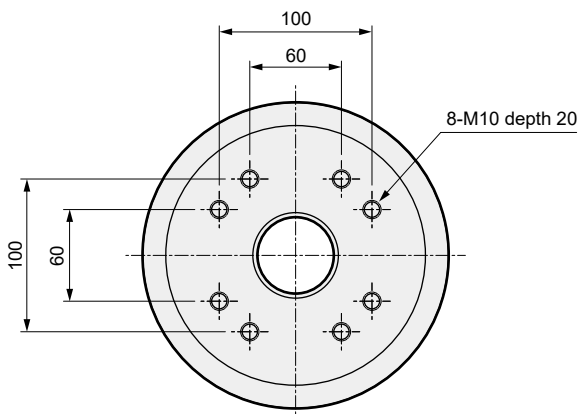
· For PAW-S-8-R
 PAW-M-8S-R
 PAW-M-8X-R
 PAW-M-8XS-R
 PAW-M-8XZ-R



· For PAW-S-X-R
 PAW-M-XS-R
 PAW-M-XZ-R
 PAW-M-XZS-R



· For PAW-S-Z-R
 PAW-M-ZS-R



Discrete unit model No.

PowerArm unit

PAW-AU-()	
8	ø80
X	ø100
Z	ø125

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

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)

Base plate

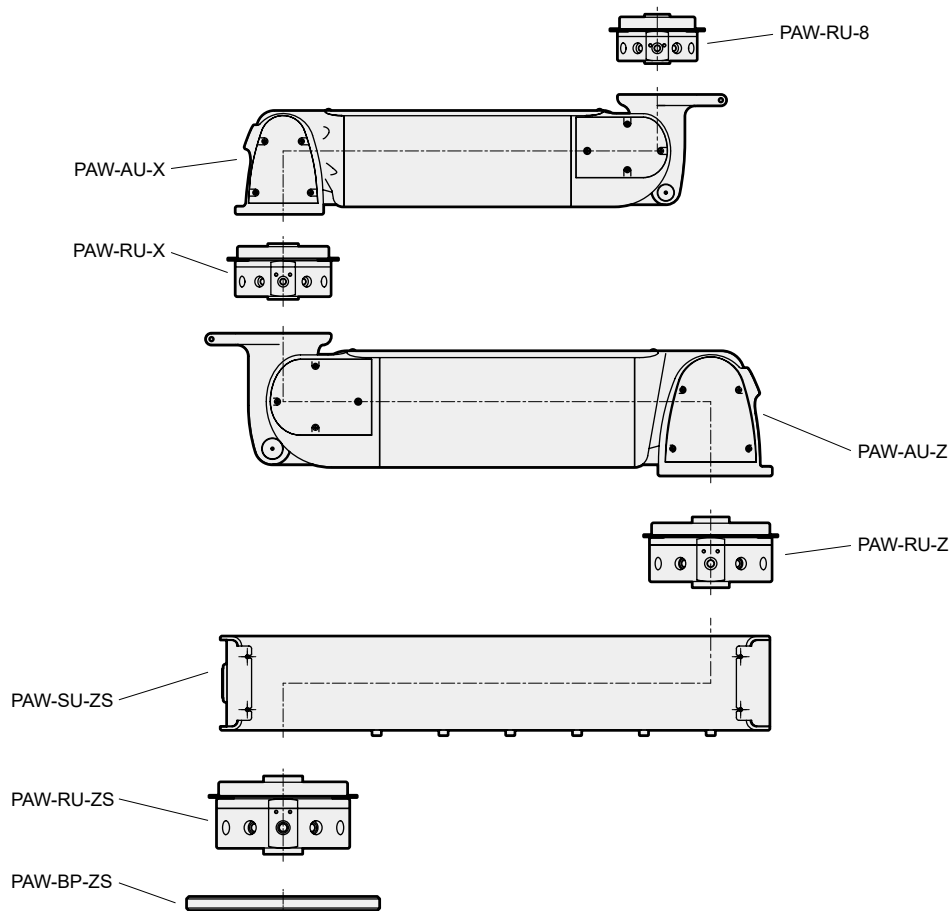
PAW-BP-()	
8	AU-8 base part (assembled to RU-8)
X	AU-X base part (assembled to RU-X)
Z	AU-Z base part (assembled to RU-Z)
ZS	SU-Z base part (assembled to RU-ZS)

Rotation lock unit

PAW-LU

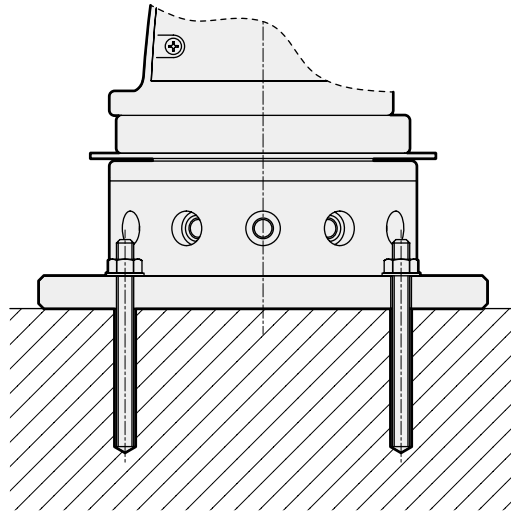
...Common to each rotation unit (1 unit is required for each rotation unit location)

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.

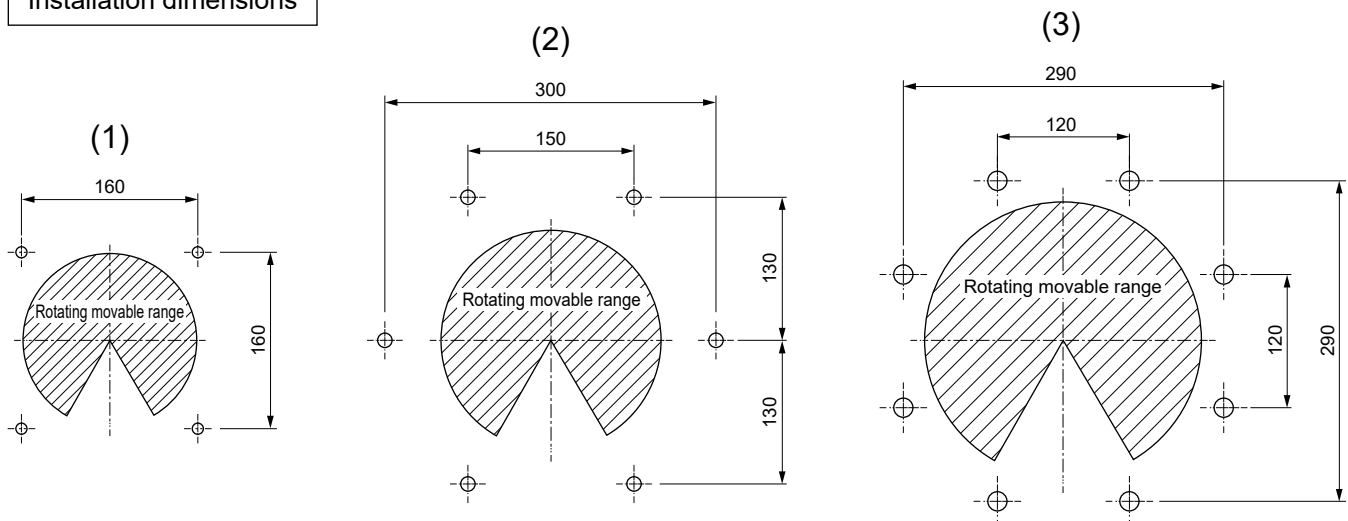
Anchor work



- 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 types	Anchor bar dimensions	No. of units
(1)	PAW-S-8, PAW-S-X PAW-M-8X, PAW-M-8S	R-10N or R-10LN	W3/8" or M10	4
(2)	PAW-S-Z, PAW-M-XZ PAW-M-8XZ, PAW-M-XS PAW-M-8XS	R-12N or R-12LN	W1/2" or M12	6
(3)	PAW-M-ZS PAW-M-XZS	R-16N or R-16LN	W5/8" or M16	8

Installation dimensions



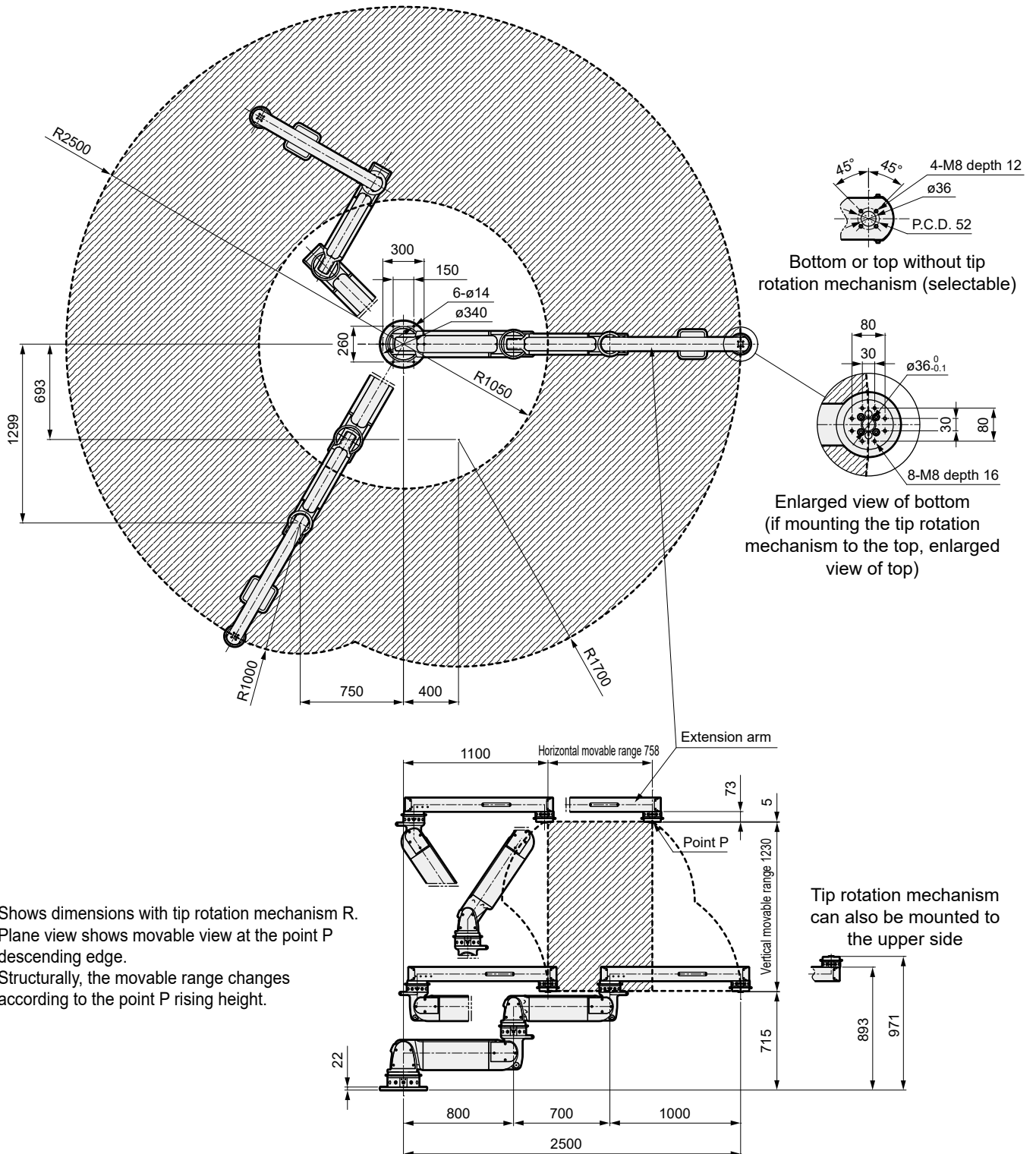
- If mounting to a frame or dolly, etc., use 10.8 or 12.9 category bolt strength, and check that the screw insertion depth is 1.5D or more.
- When installing the product, make sure that the installation surface is accurately leveled. If not level, position holding may become impossible due to arm tip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

Extension arm

When a wider movable range must be secured, or when the workpiece is suspended for transport, an extension arm can be installed on the arm upper part.

When designing the attachment, refer to page 17, and be careful to maintain the allowable moment or below.

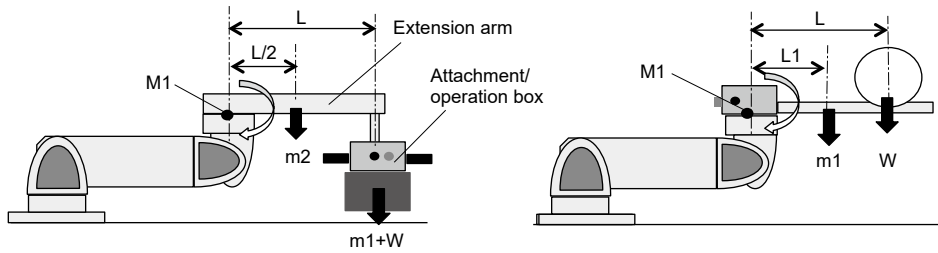
Example: Movable range when the arm extension is installed on PAW-M-XZ (upper section $\varnothing 100$ + lower section $\varnothing 125$)



Contact CKD for details.

Moment load

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



When mounting the extension arm

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

m1: Attachment/operation box weight

m2: Extension arm weight

W: Weight of workpiece

L: Distance from the PowerArm mounting part to the center of gravity of the attachment/workpiece

When the attachment is offset

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

m1: Attachment/operation box weight

W: Weight of workpiece

L1: Distance from the PowerArm mounting part to the center of gravity of the attachment/operation box

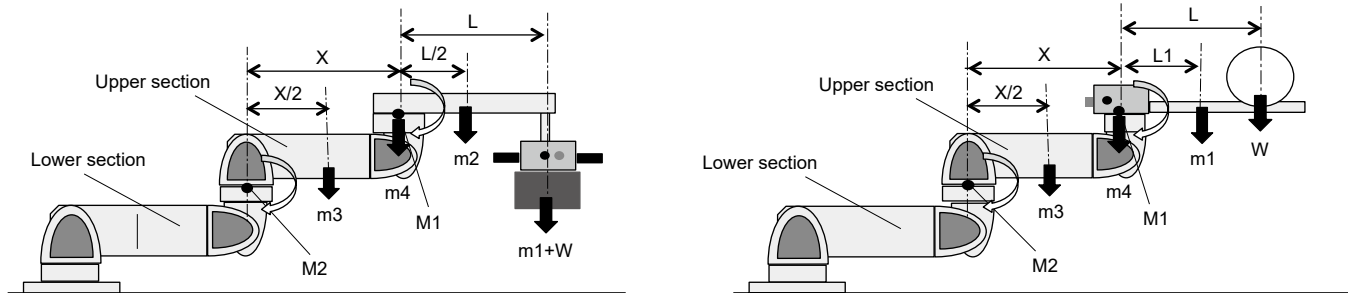
L: Distance from the PowerArm mounting part to the center of gravity of the workpiece

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

* Design the workpiece, attachment, and extension arm so that the moment load is at or below the value in the table.

* Calculate the movable arm part only.

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



When mounting the extension arm

(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: Extension arm weight

m3: PowerArm weight

PAW-AU-8: 14kg PAW-AU-X: 23kg

PAW-AU-Z: 42kg

m4: Rotation unit weight

PAW-RU-T: 4kg PAW-RU8: 5kg

PAW-RU-X: 8kg

W: Weight of workpiece

L: Distance from the PowerArm mounting part to the center of gravity of the attachment/workpiece

X: PowerArm length

PAW-AU-8: 600mm, PAW-AU-X: 700mm

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-X: 23kg

PAW-AU-Z: 42kg

m4: Rotation unit weight

PAW-RU-T: 4kg PAW-RU-8: 5kg

PAW-RU-X: 8kg

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-X: 700mm

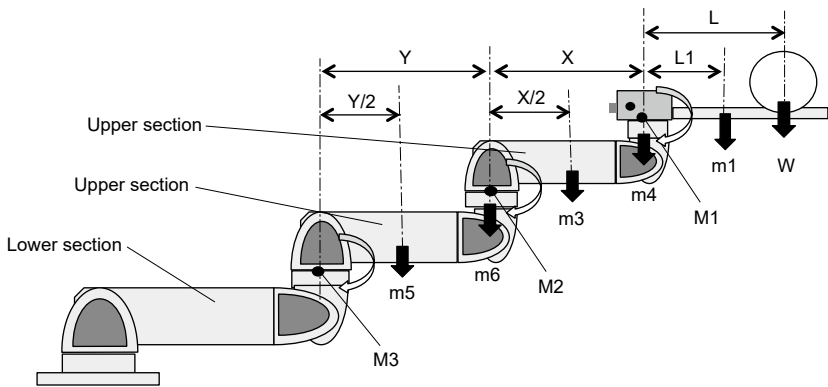
Model No.	Upper section M1 (N · m)	Lower section M2 (N · m)
PAW-M-8X	350	550
PAW-M-XZ	550	900
PAW-M-8XS	350	550
PAW-M-XZS	550	900

* Design the workpiece, attachment, and extension arm so that the moment load is at or below the value in the table.

* Calculate the movable arm part only.

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: 14 kg

m4: Rotation unit weight; PAW-RU-T: 4 kg

m5: PowerArm weight; PAW-AU-X: 23 kg

m6: Rotation unit weight; PAW-RU-8: 5 kg

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

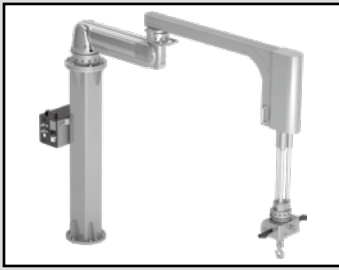
X: PowerArm length; PAW-AU-8: 600 mm

Y: PowerArm length; PAW-AU-X: 700 mm

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

* Design the workpiece, attachment, and extension arm so that the moment load is at or below the value in the table.

* Calculate the movable arm part only.



Palletizing specifications

PAW-A* Series

Specifications

Item	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 a rotation lock) is selected: 0.35)			
Proof pressure	MPa 1.05			
Ambient temperature	°C 5 to 60			
Lubrication	Not available			
Load capacity (when pressurized at 0.5 MPa)	kg 53	kg 53	kg 43	kg 47
When the controller (PAW-B*) is in use	kg 47	kg 47	kg 32	kg 36
Air consumption (*1)	ℓ/min(ANR) 11		ℓ/min(ANR) 35	
Product weight (*2)	kg 164	kg 161	kg 183	kg 180
Vertical movable range of the transport section	mm 450		mm 1100	
Maximum movable radius of the transport section	mm 2000	mm 1600	mm 2100	mm 1700

*1: Air consumption represents a value with 1 return/min and 0.7 MPa working pressure.

*2: When Option L (with a rotation lock) is selected, an additional 2 kg is added respectively.

*3: Refer to page 26 for load capacity when an offset is used.

How to order

PAW - AS-45 - LC

A Vertical operating range / maximum rotational radius

B Option

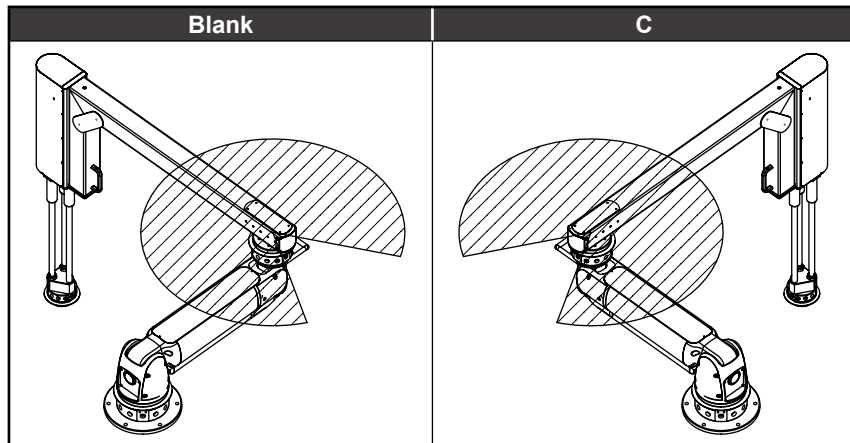
Code	Description	
A Vertical operating range / maximum rotational radius *1		
	Vertical operating range	Maximum rotational radius
AS-45	450 mm	2,000 mm
AS-45-S	450 mm	1,600 mm
AZ-110	1,100 mm	2,100 mm
AZ-110-S	1,100mm	1,700mm
B Option		
L	Rotation lock mechanism *2	
C	Bending directions (see the following illustration)	

*1 If the vertical operating range / maximum rotational radius are exceeded, consult with CKD.

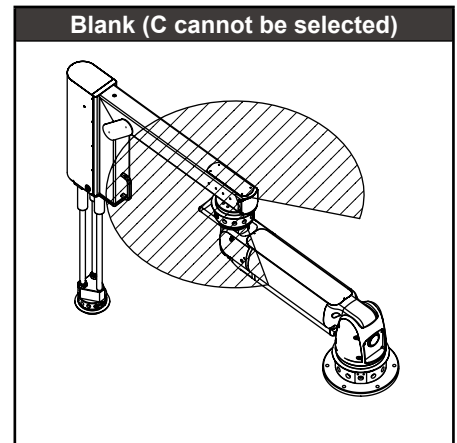
*2 A mechanism designed to hold the force applied in rotational directions. It is not designed to stop dynamic rotation.

B Option: Bending directions

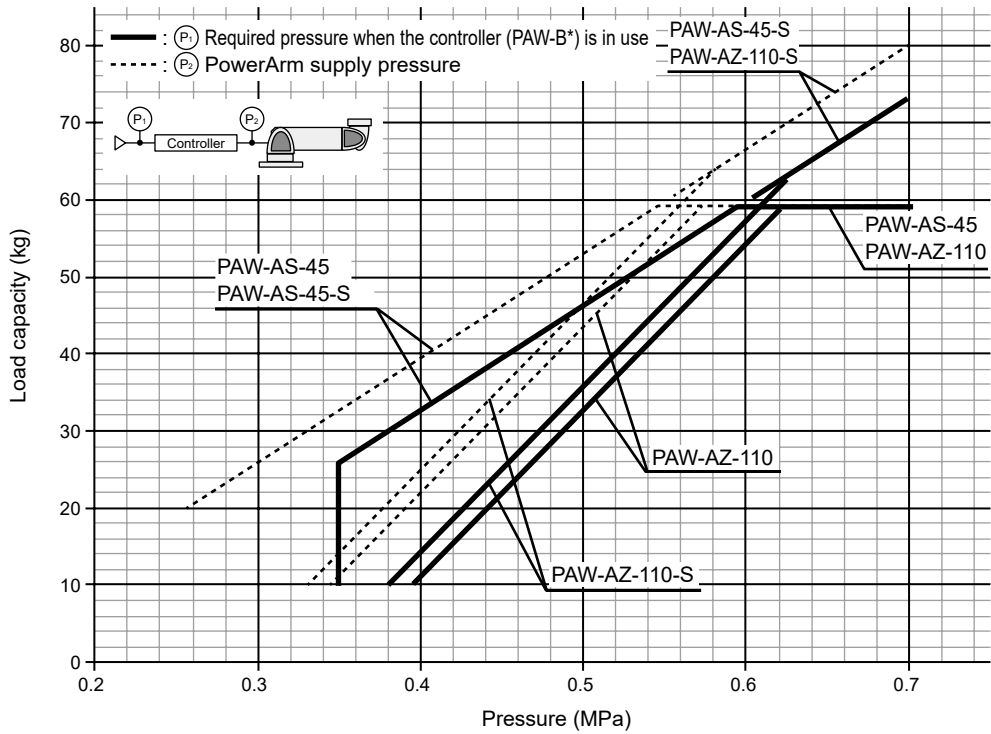
Only PAW-AS-45 and PAW-AZ-110 can be selected



*Bending directions for PAW-AS-45-S and PAW-AZ-110-S



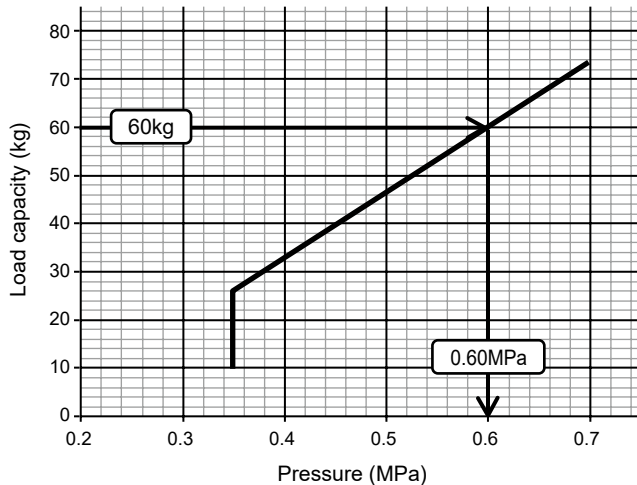
Load capacity under pressure



*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>

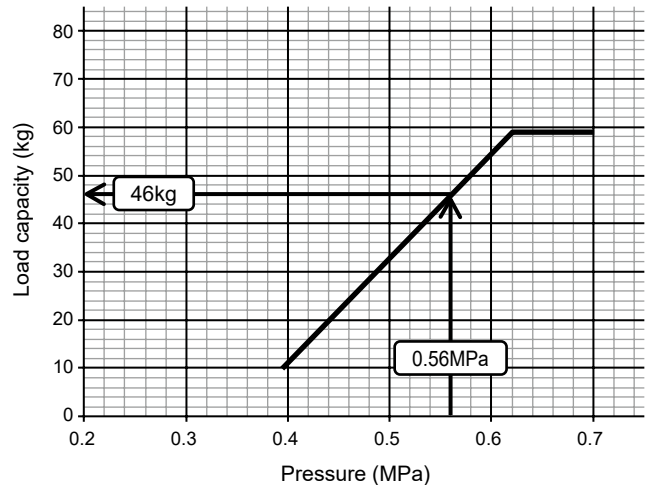
Model: PAW-AS-45-S Controller: PAW-BH1
Workpiece weight: 40 kg, Operation Box weight: 9 kg
When cardboard box suction attachment weight is 11 kg and total weight is 60 kg



Pressure supplied to the controller should be 0.60 MPa.

<Selection example 2>

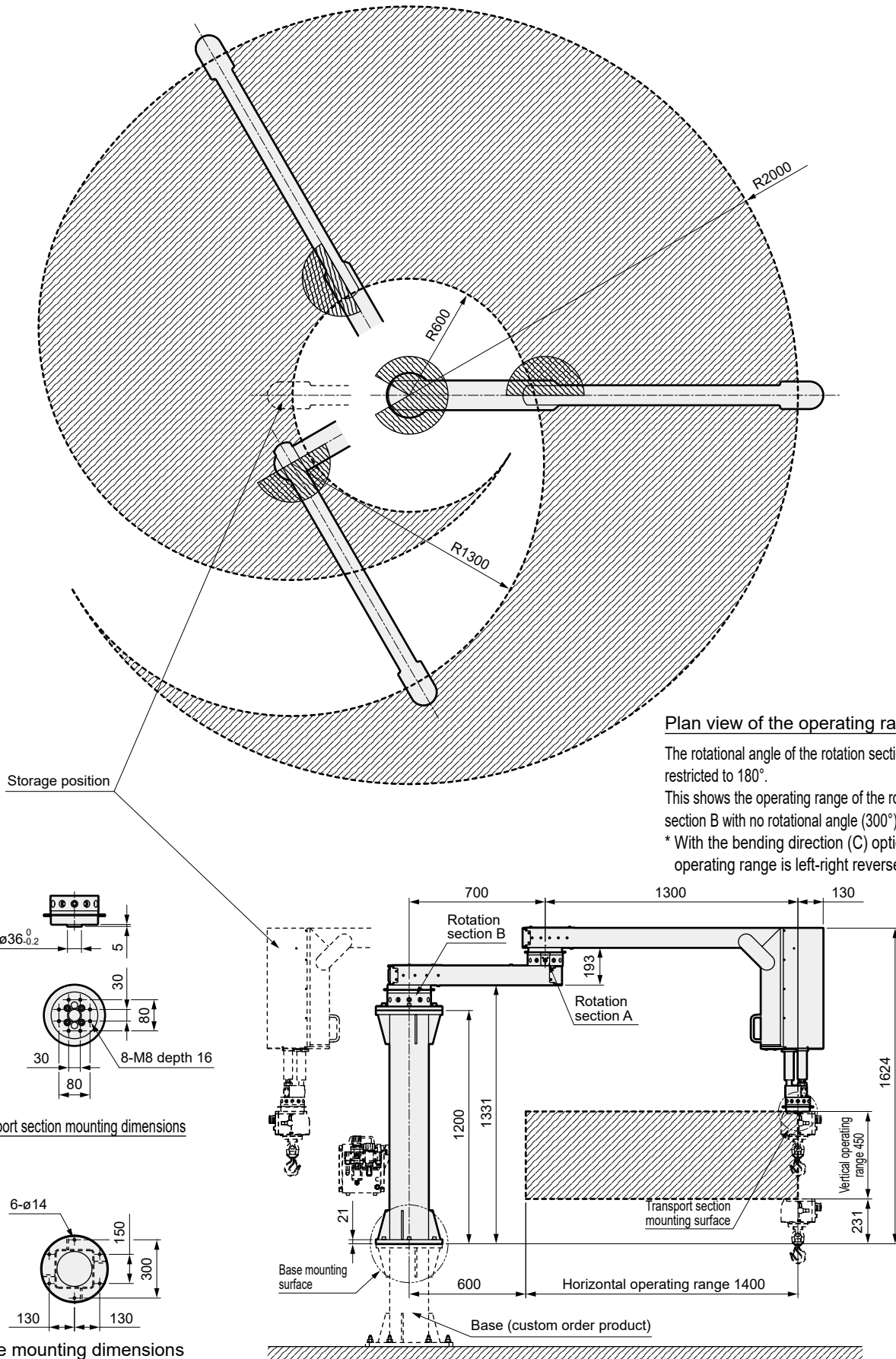
Model: PAW-AZ-110 Controller: PAW-BS2
Operation Box weight: 9 kg, Hook Attachment weight: 2 kg
When pressure supplied to the controller is 0.56 MPa



The weight of Operation Box (9 kg) and Hook Attachment (2 kg) subtracted from the load capacity (46 kg) leaves 35 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

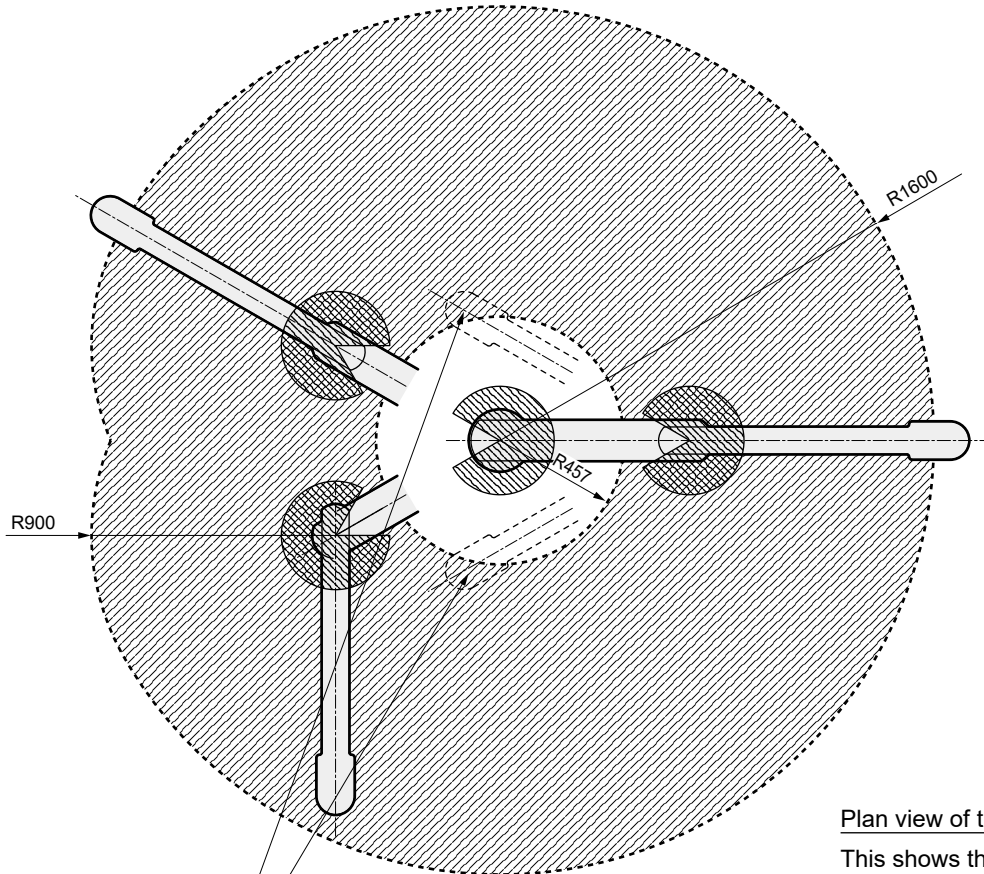
The rotational angle of the rotation section A is restricted to 180°.

This shows the operating range of the rotation section B with no rotational angle (300°) restrictions.

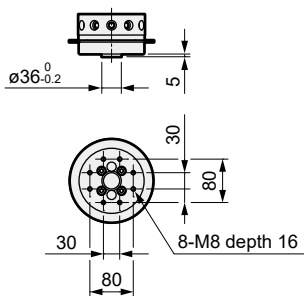
* With the bending direction (C) option, the operating range is left-right reversed.

Dimensions

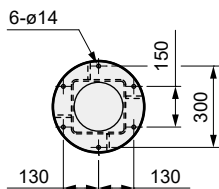
- PAW-AS-45-S (Vertical operating range: 450 mm / maximum rotational radius: 1600 mm)



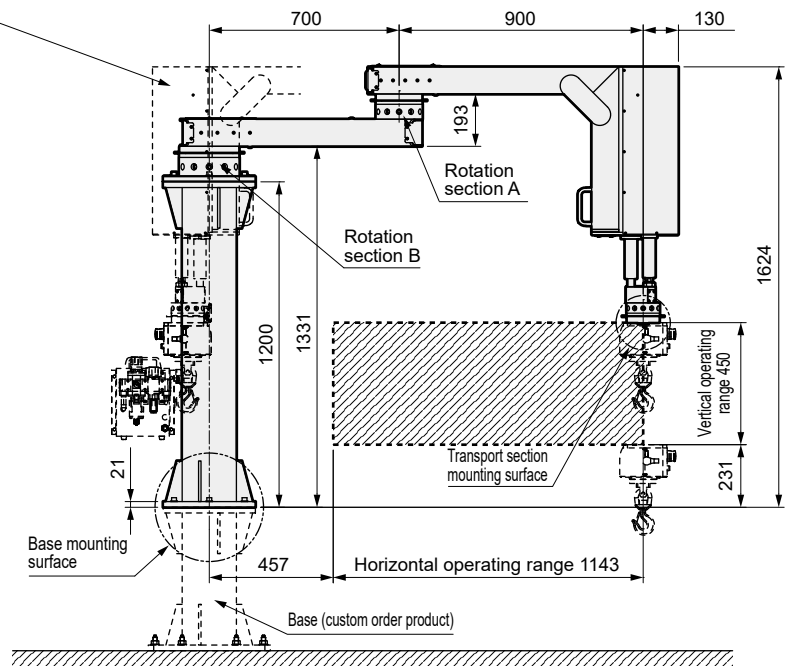
Plan view of the operating range
This shows the operating range of the rotation sections A and B with no rotational angle restrictions (300°).



Transport section mounting dimensions

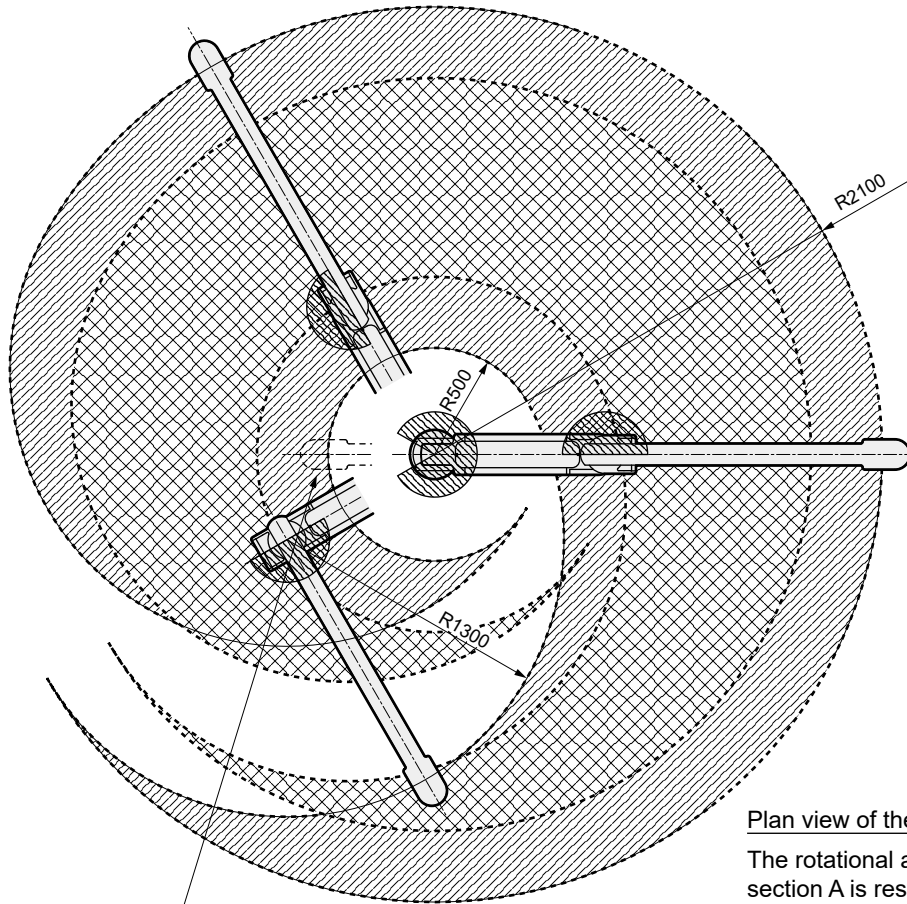


Base mounting dimensions





Dimensions

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



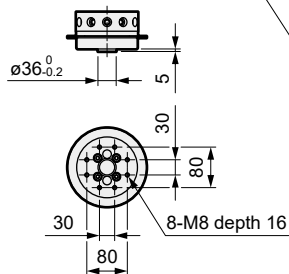
Plan view of the operating range

The rotational angle of the rotation section A is restricted to 180°. This shows the operating range of the rotation section B with no rotational angle (300°) restrictions.

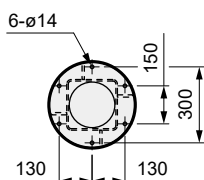
 is the operating range at the top end.
 is the operating range at the bottom end.

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

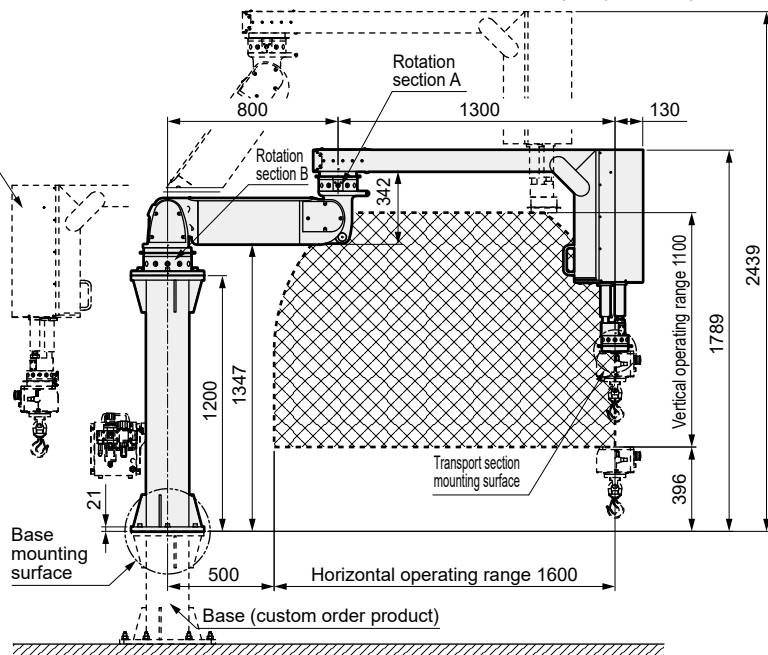
Storage position



Transport section mounting dimensions

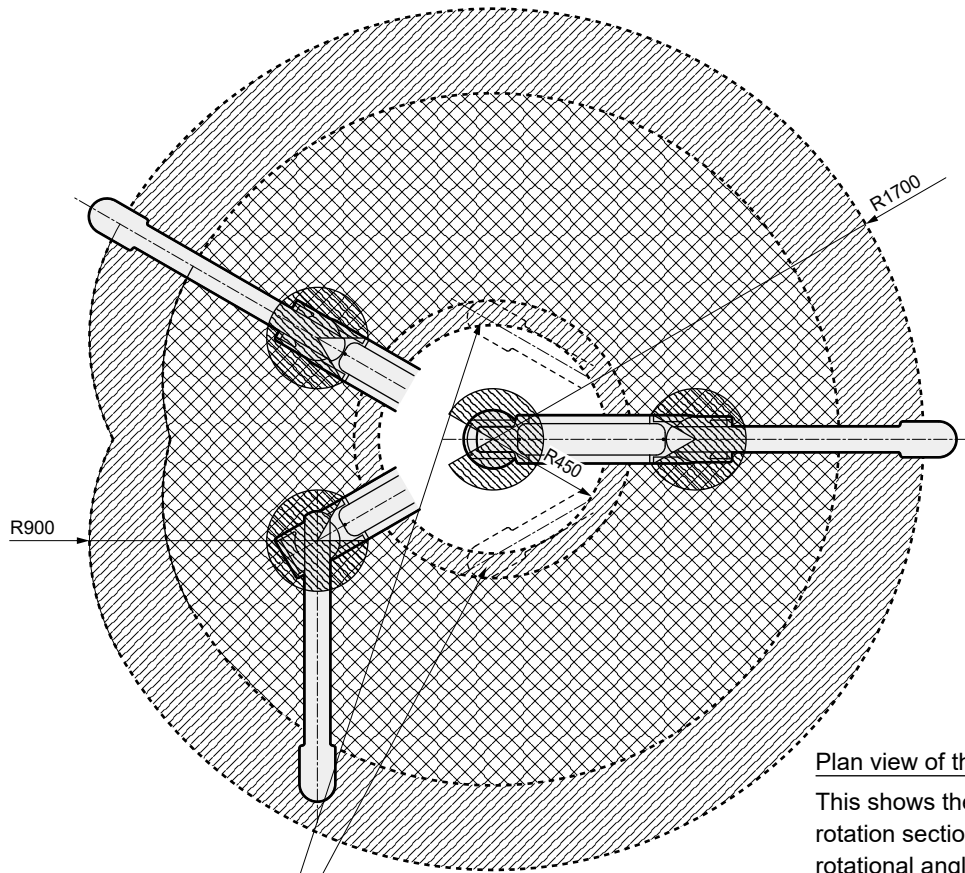


Base mounting dimensions





Dimensions

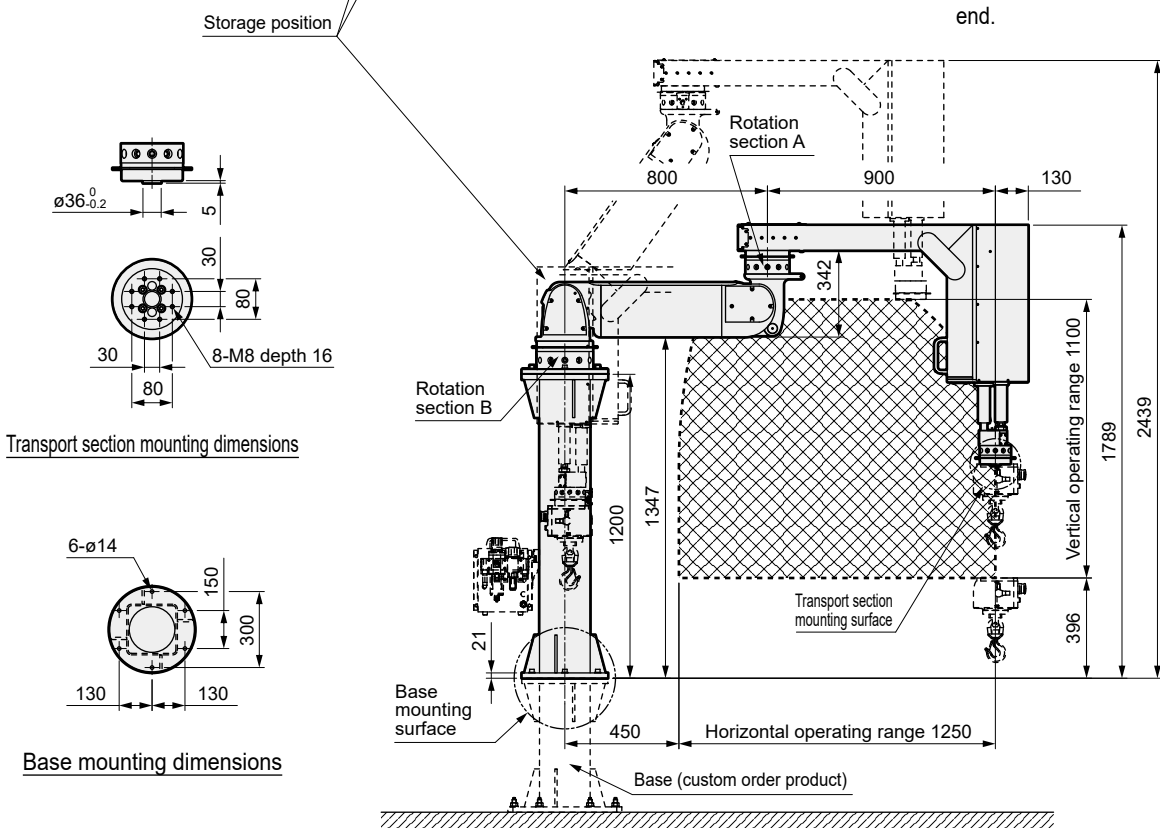
- PAW-AZ-110-S (Vertical operating range: 1100 mm / maximum rotational radius:1700 mm)



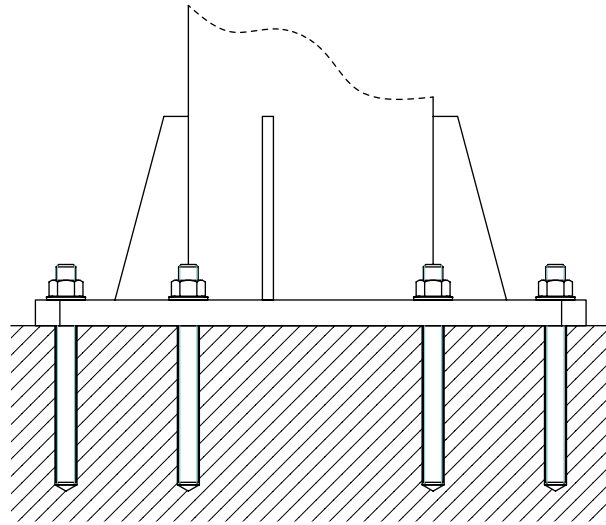
Plan view of the operating range

This shows the operating range of the rotation sections A and B with no rotational angle restrictions (300°).

 is the operating range at the top end.
 is the operating range at the bottom end.



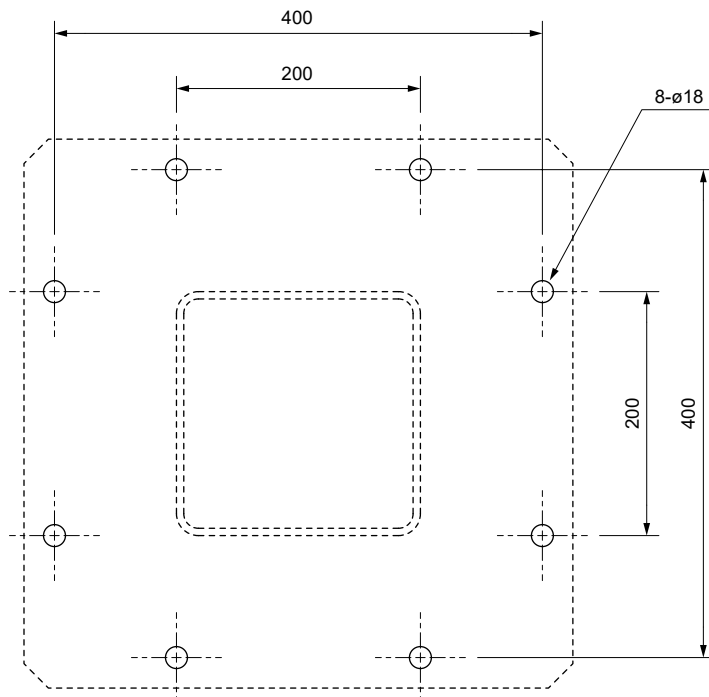
About installing the base (custom order product) on the concrete floor with anchors



- 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.

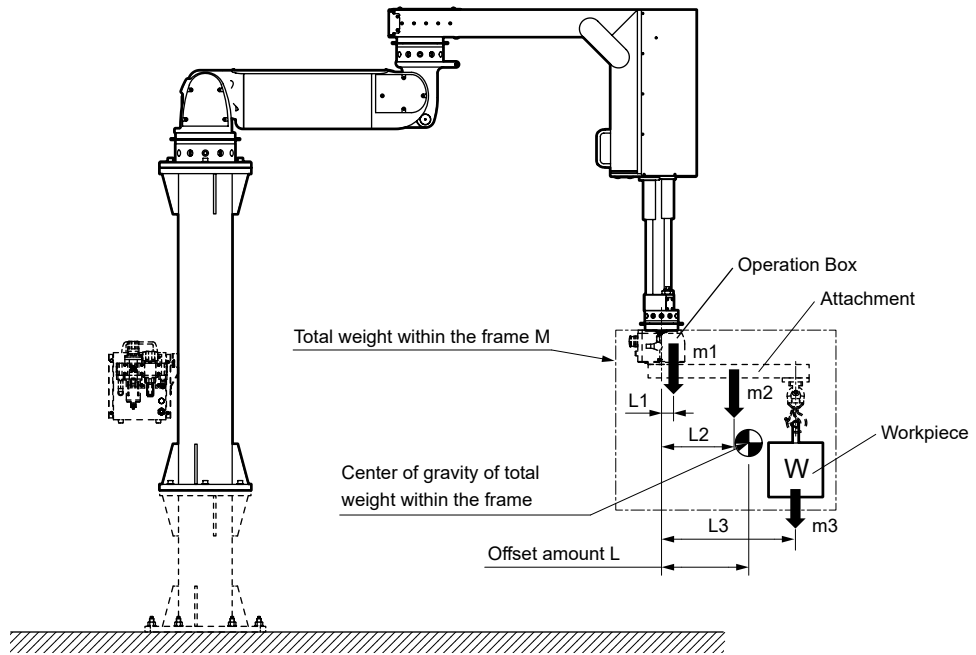
Type of chemical anchors	Anchor bar dimensions	Number of anchors
R-16N or R-16LN	W5/8 "or M16	8

Placement dimensions



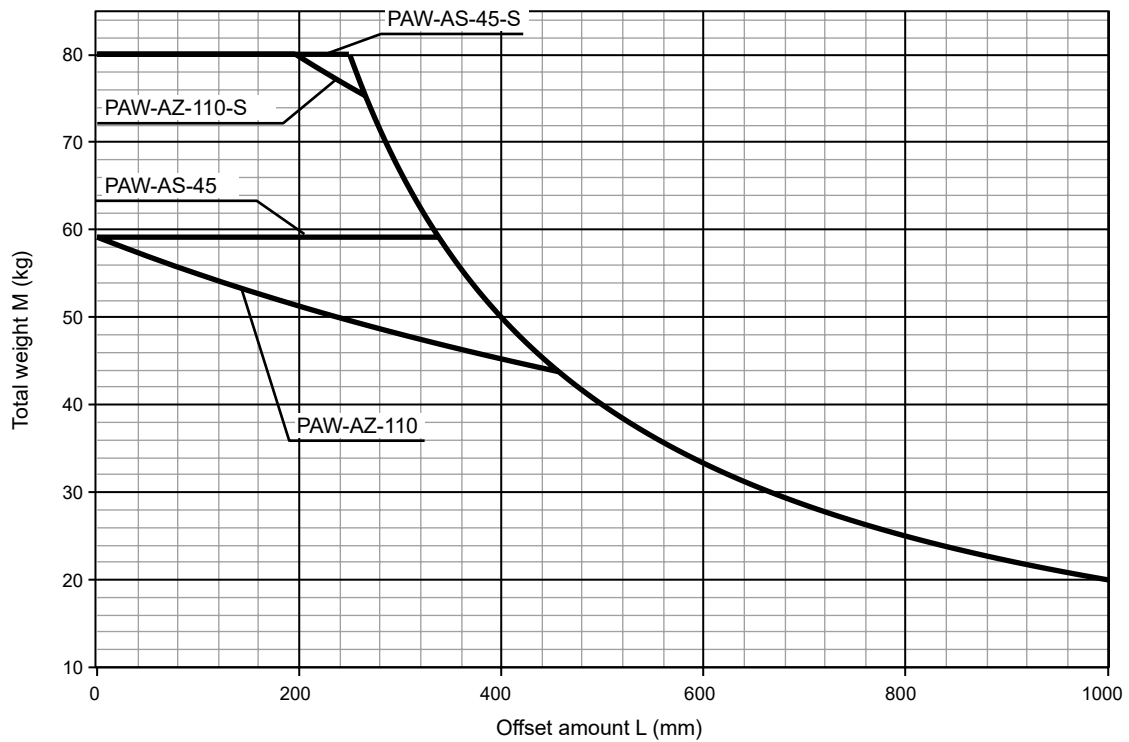
- When installing the product, accurately keep the installation surface level. If the surface is not level, the product may not be able to maintain the proper position in the horizontal direction due to inclination (when the rotation lock mechanism is not in use).
- Make sure to have the product installed by qualified service personnel.
- The dedicated dolly (custom order product) is available for installation on a dolly. Select the dolly (page 33) from PAW-C*-H.

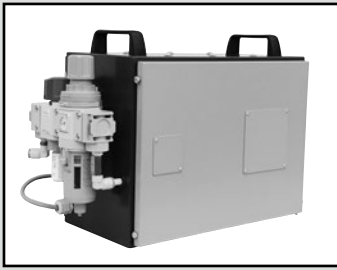
Load capacity when an offset is used



*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

Proposing the ideal air circuit for various supporting 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 General-purpose signals: Input 1, Output 2		Dedicated signals: Input 3, Output 2 General-purpose signals: Input 9, Output 7	
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	
Shaft *1	1 shaft	2 shafts	1 shaft	2 shafts

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

Applications

Application example 1: Hold

	Digital input	Digital output
1	Operation switch	Operation light
2	Stop switch	Stop light
3	Emergency stop button	Hold light*1
4	Hold button	-

*1: The function which allows the product to maintain the pressure that is applied at the start of the hold, regardless of workpiece load applied to the tip of the arm.

*2: The function which increases the pressure applied to the arm while the button is being held, to force the workpiece to be raised.

Select PAW-BS

(when a switch (input) and two or more indicators (output) are added for general-purpose input)

Application example 2: Suction

	Digital input	Digital output
1	Operation switch	Operation light
2	Stop switch	Stop light
3	Emergency stop button	Hold light*1
4	Hold button	Suction valve 1
5	Suction button	Suction valve 2
6	Outrigger 1	Suction light
7	Outrigger 2	-
8	Outrigger 3	-
9	Outrigger 4	-
10	-	-
11	-	-
12	-	-

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

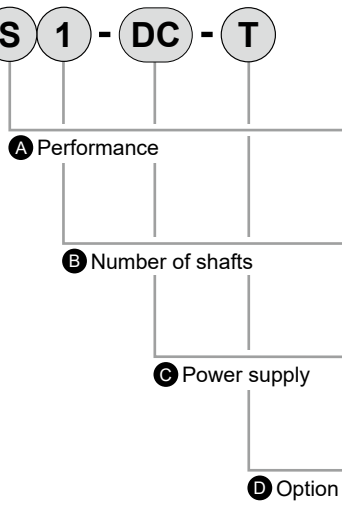
	Digital input	Digital output
1	Operation switch	Operation light
2	Stop switch	Stop light
3	Emergency stop button	Hold light
4	Hold button	Clamp solenoid valve
5	Clamp button	Unclamp solenoid valve
6	Cylinder switch 1	Clamp light
7	Cylinder switch 2	Solenoid valve for cylinder brake
8	Turbo button *2	-
9	Outrigger 1	-
10	Outrigger 2	-
11	Outrigger 3	-
12	Outrigger 4	-

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)

How to order

PAW - B S 1 - DC - T

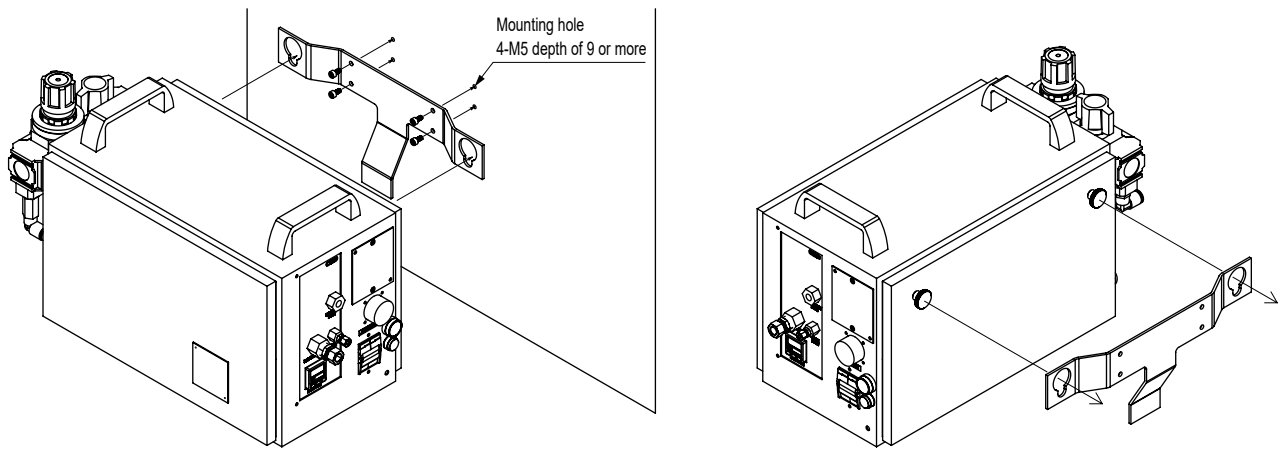


Code	Description
A Performance	
S	Standard
H	High end
B Number of shafts	
1	1 shaft
2	2 shafts
C Power supply	
Blank	Single-phase 100 to 220 VAC
DC	24 VDC
D Option	
T	T type bracket
L	L type bracket

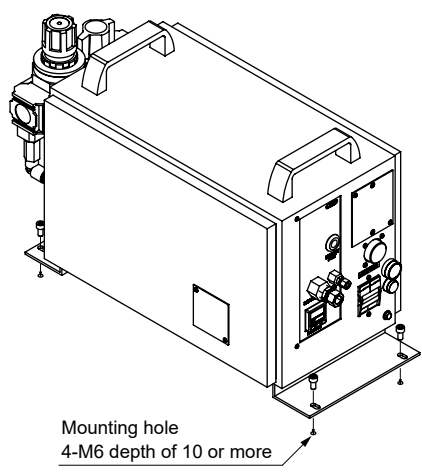
*We will make a quotation for each custom order product.
 *A power cable (2.5 m) supplied (For the 100 VAC specification (domestic), a 2 flat pin AC power cable with a ground pin is supplied.) For other specifications, a 3-core (N, L, and PE) cable with a round crimp terminal for M5 is supplied.
 *Main exterior areas except for the product are made of steel (baking finish).

[Bracket installation procedure]

- T type bracket

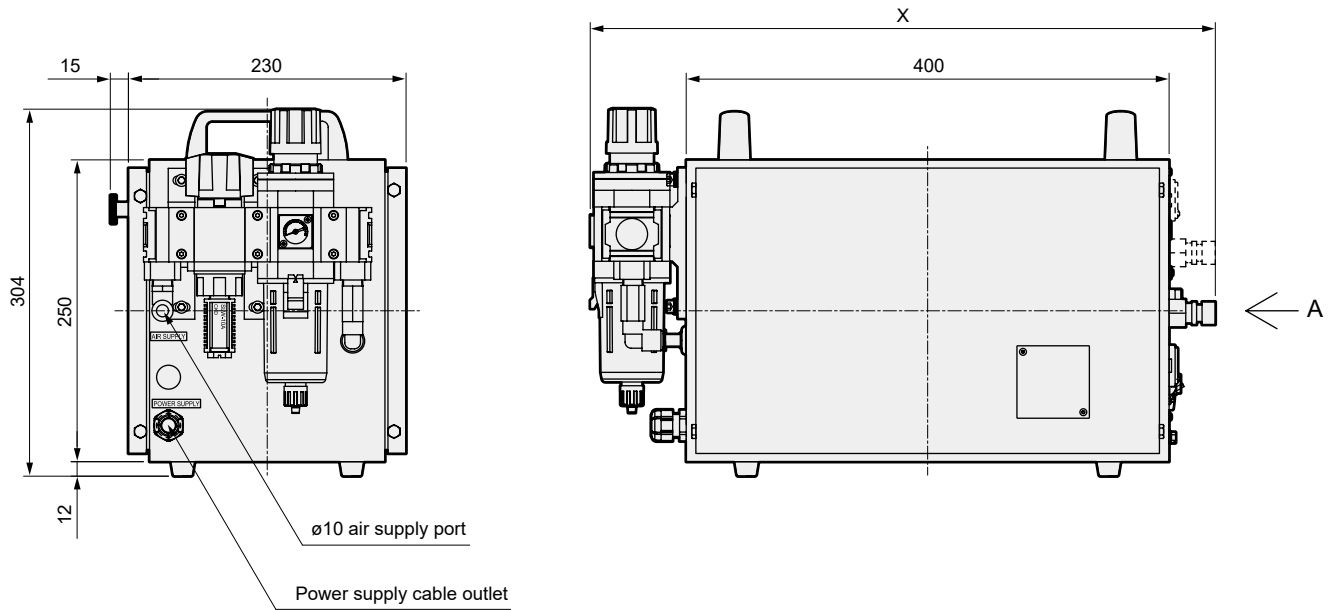


- L type bracket

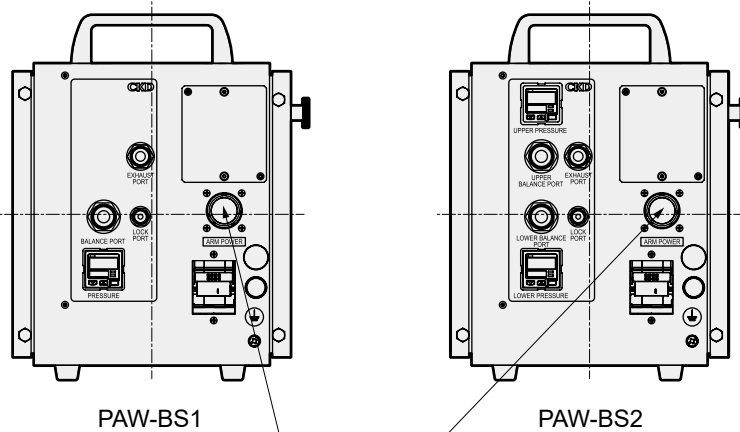


Dimensions

- PAW-BS (standard type)



A arrow view

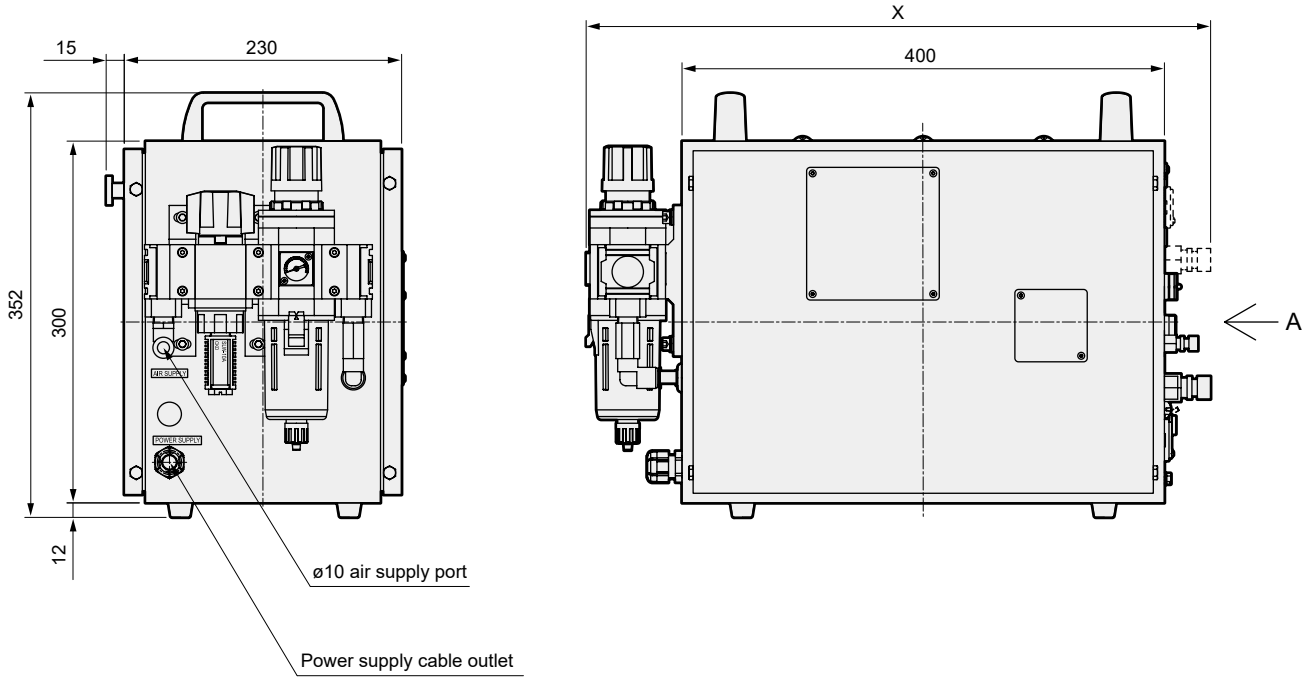


I/O signal receptacle
NJC-2816-RF

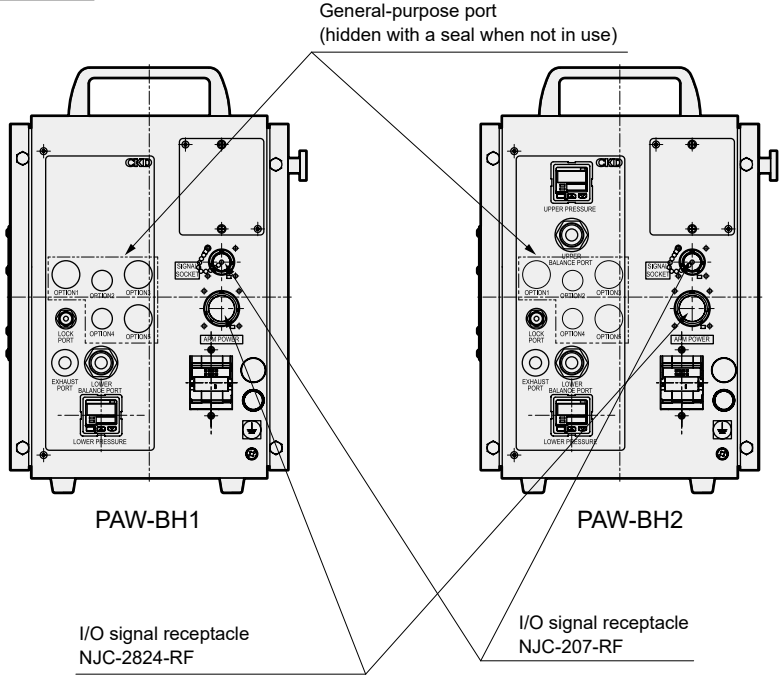
Combination contents	Number of shafts	X
8, 8S	1	516
X, XS, Z, ZS		518
8X, XZ, 8XS, XZS	2	

Dimensions

- PAW-BH (high-end type)

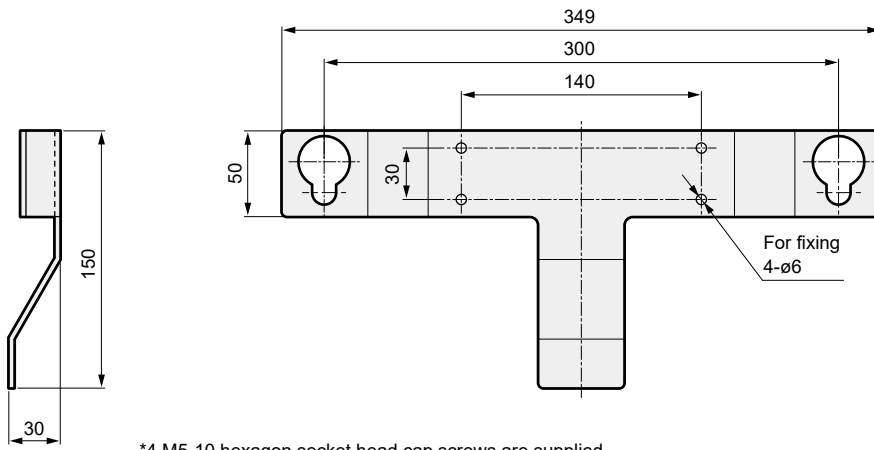


A arrow view



Combination contents	Number of shafts	X
8, 8S	1	516
X, XS, Z, ZS		518
8X, XZ, 8XS, XZS	2	

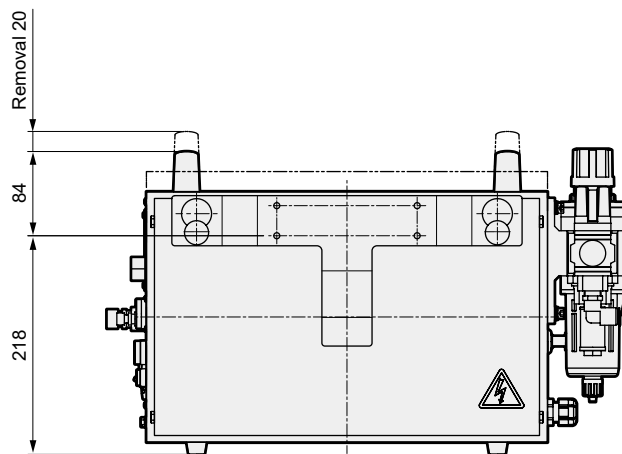
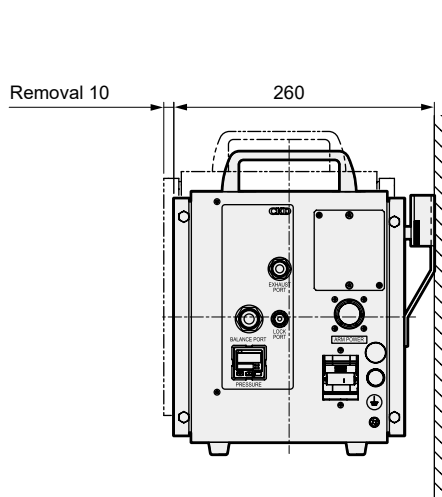
T type bracket dimensions



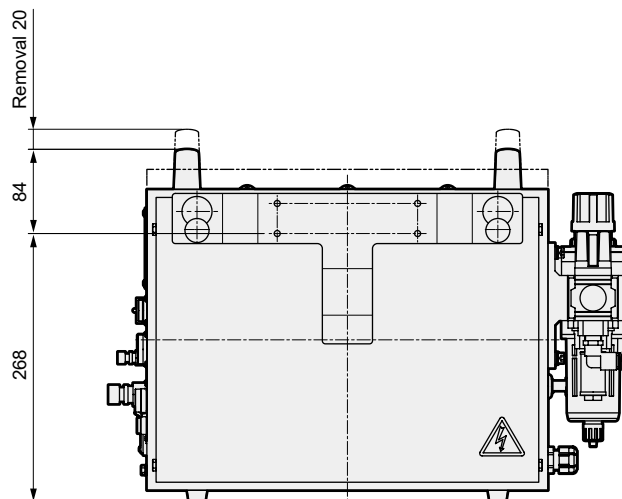
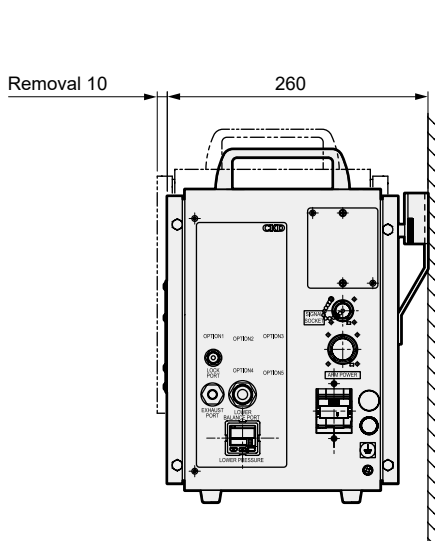
*4 M5-10 hexagon socket head cap screws are supplied.

*When the controller is installed

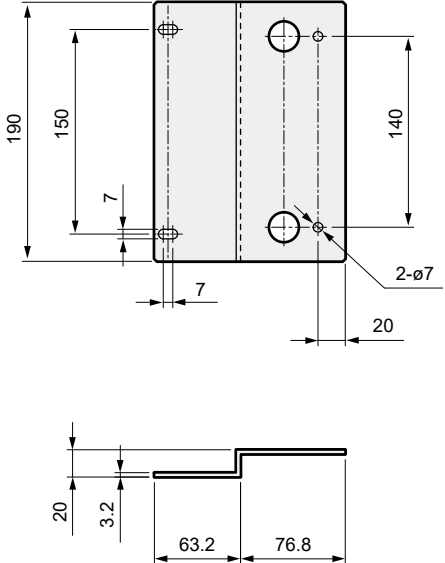
PAW-BS



PAW-BH

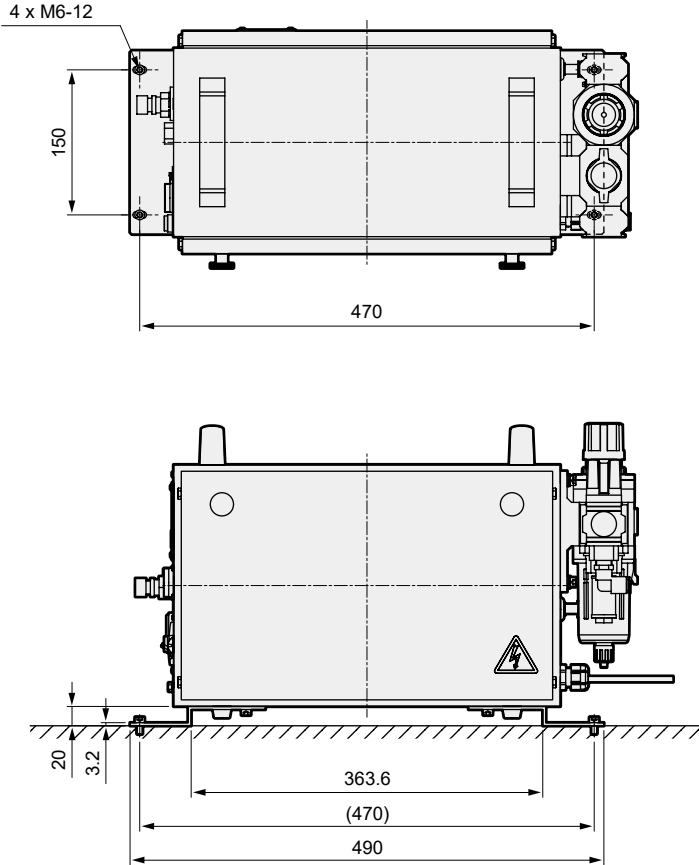


L type bracket dimensions



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

*When the controller is installed





Dolly PAW-C* Series

How to order

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

A Shape

B Size

C Option

Code	Description
A Shape	
R	With outriggers
A	Without outriggers
P	Pallet
B Size	
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)
C Option	
B	Controller mounting bracket*

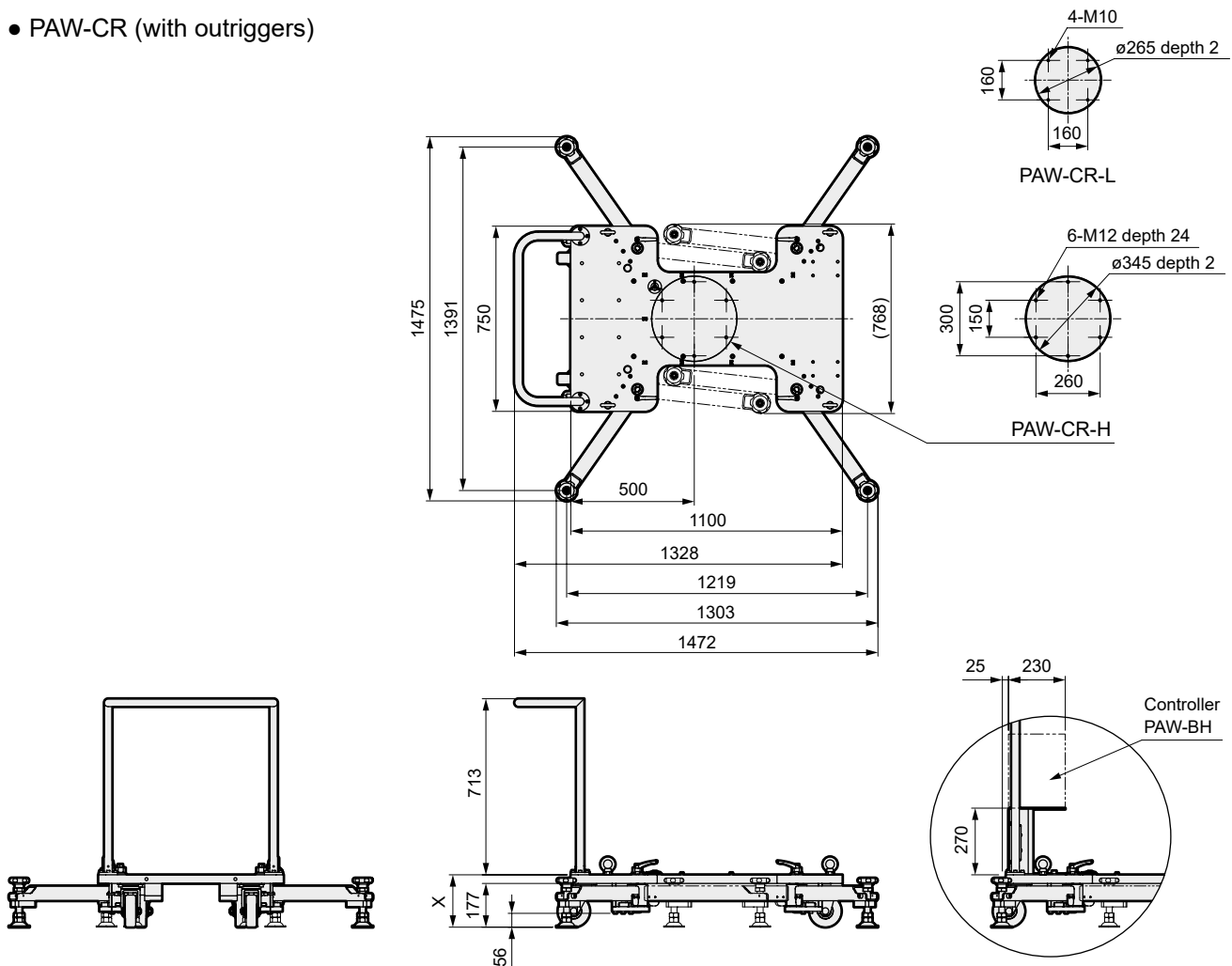
*A bracket to prevent interference from the piping and controller when installing PowerArm directly on the dolly.*Must be selected if a base of 400 mm or greater (custom order product) is not used.

PowerArm Option "U" cannot be selected when installing PowerArm directly on the dolly.

*Main exterior areas are made of steel (baking finish or two-component painting).

Dimensions

- PAW-CR (with outriggers)



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

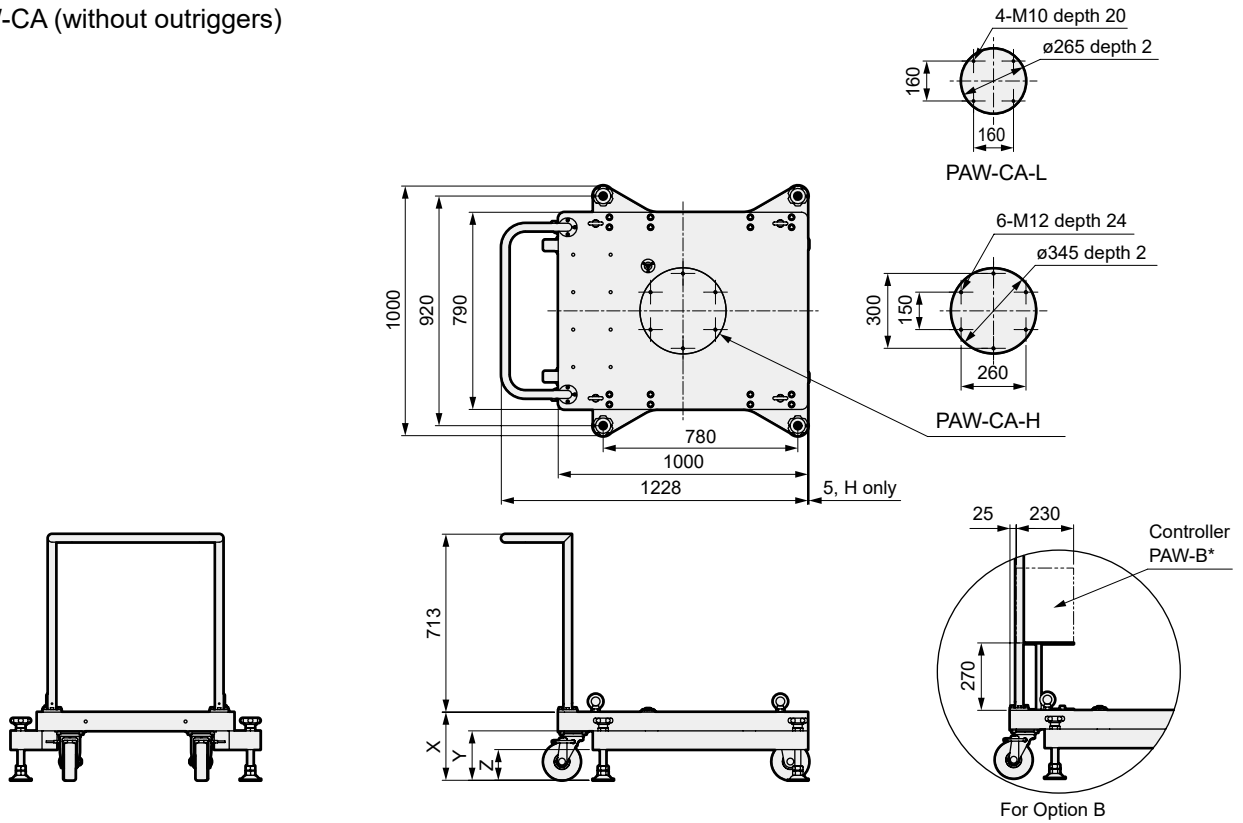
For Option B

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: For toppling prevention, design this product so that this product can be used at levels below the allowable moment, even with all moment loads including dolly-loaded objects (PowerArm body, maximum workpiece weight, etc.) and an additional 80 kg load at the tip.

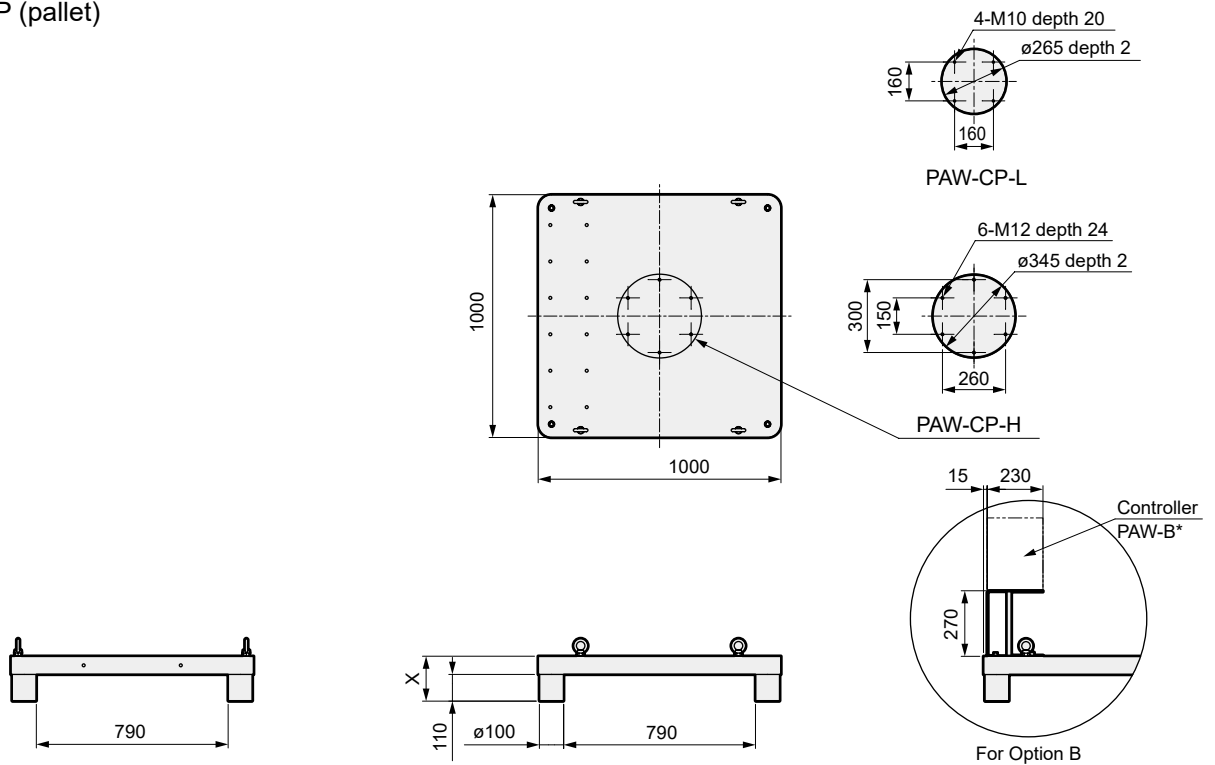
Dimensions

- PAW-CA (without outriggers)



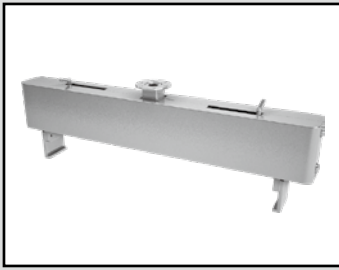
Model No.	X	Y	Z	Product weight (kg)	Load resistance (kg)	Allowable moment (N·m)	Note
PAW-CA-L	222	177	102	410	410	1840	
PAW-CA-H	273	198	123	600	310	2700	

- 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: For toppling prevention, design this product so that this product can be used at levels below the allowable moment, even with all moment loads including dolly-loaded objects (PowerArm body, maximum workpiece weight, etc.) and an additional 80 kg load at the tip.

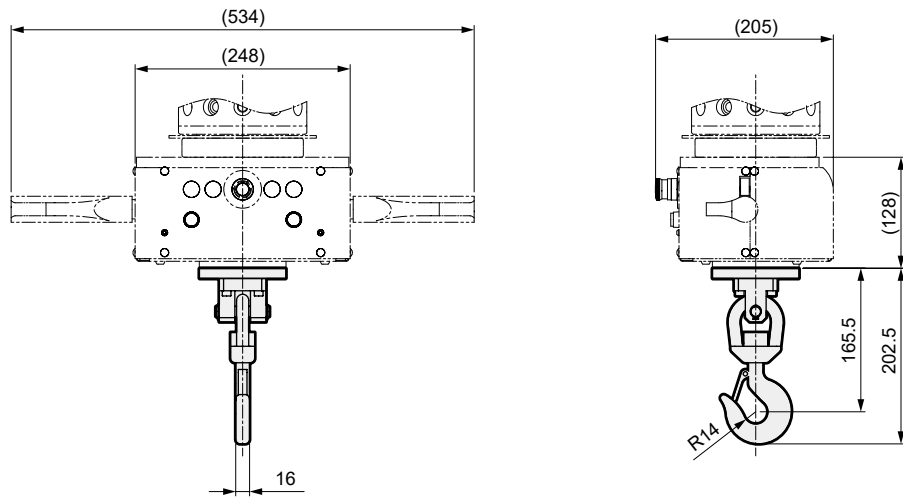


Attachment

The shape and weight are provided for reference.

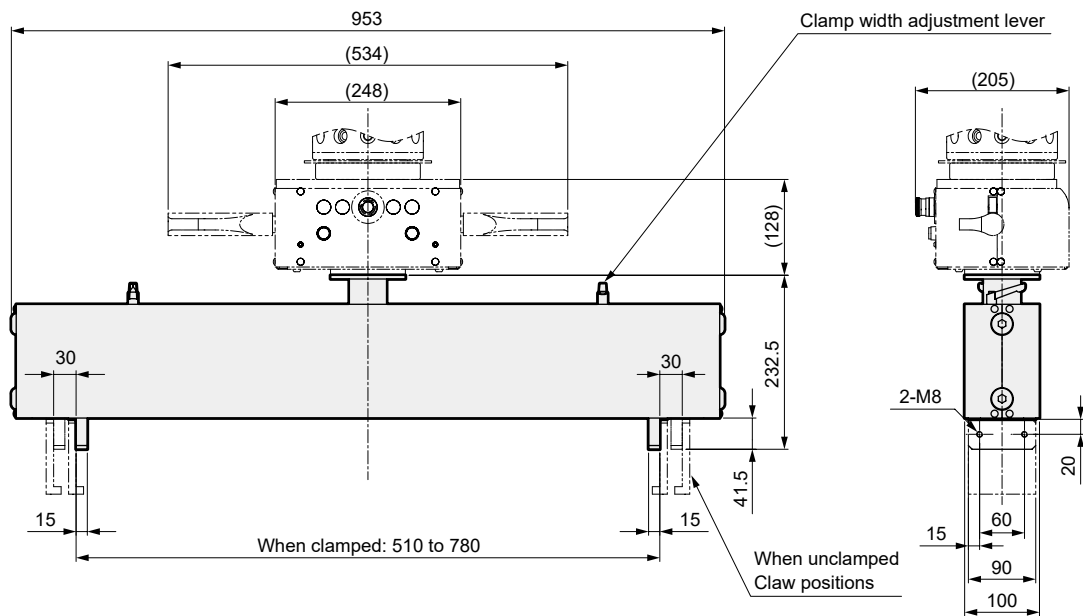
We will design attachments according to workpiece shapes used by our customers.

- Hook attachment (PAW-JF)



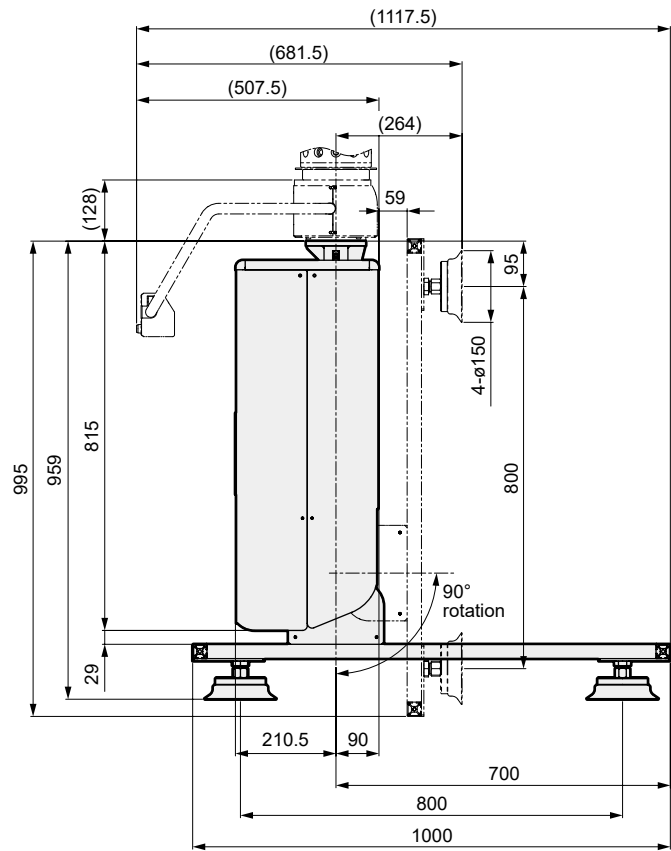
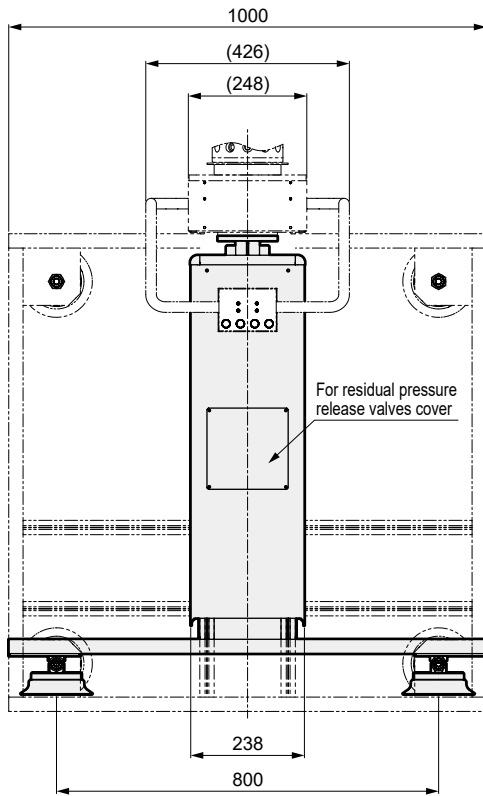
Weight: 2 kg

- Clamp attachment (PAW-JC)



Weight: 15 kg

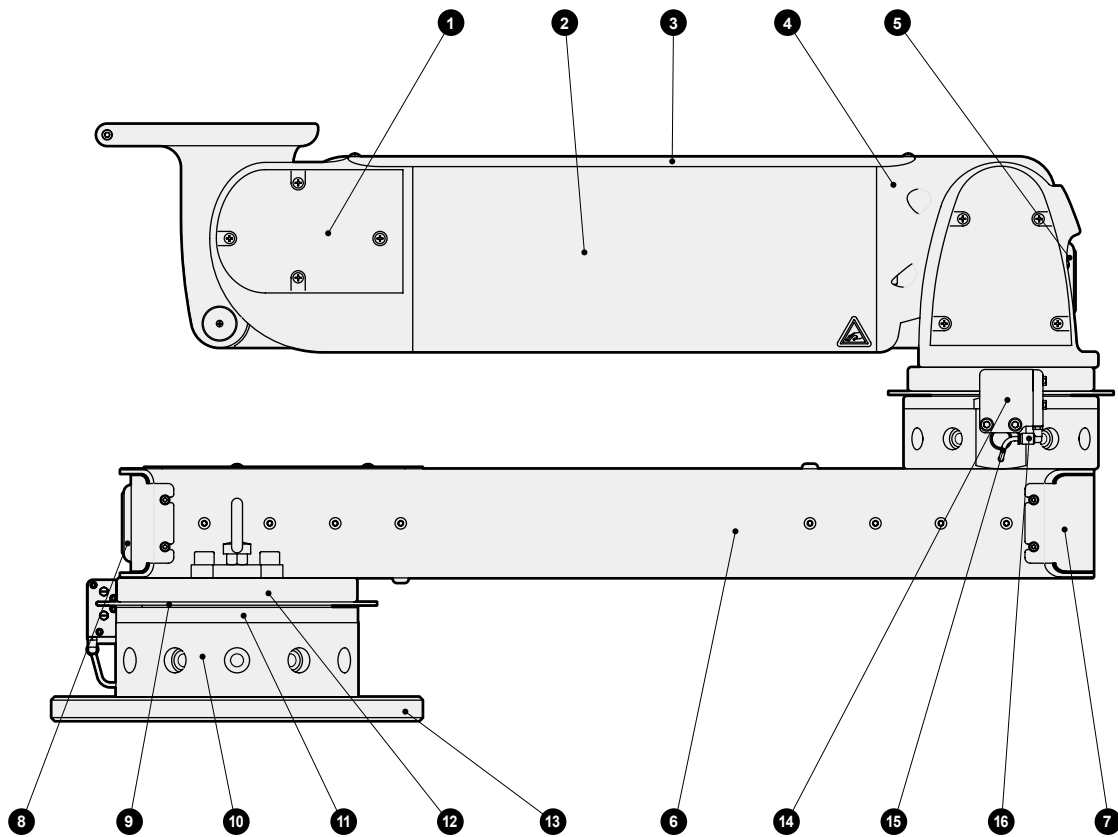
- Sheet suction attachment (PAW- JV)



Weight: 40 kg

Material/Treatment

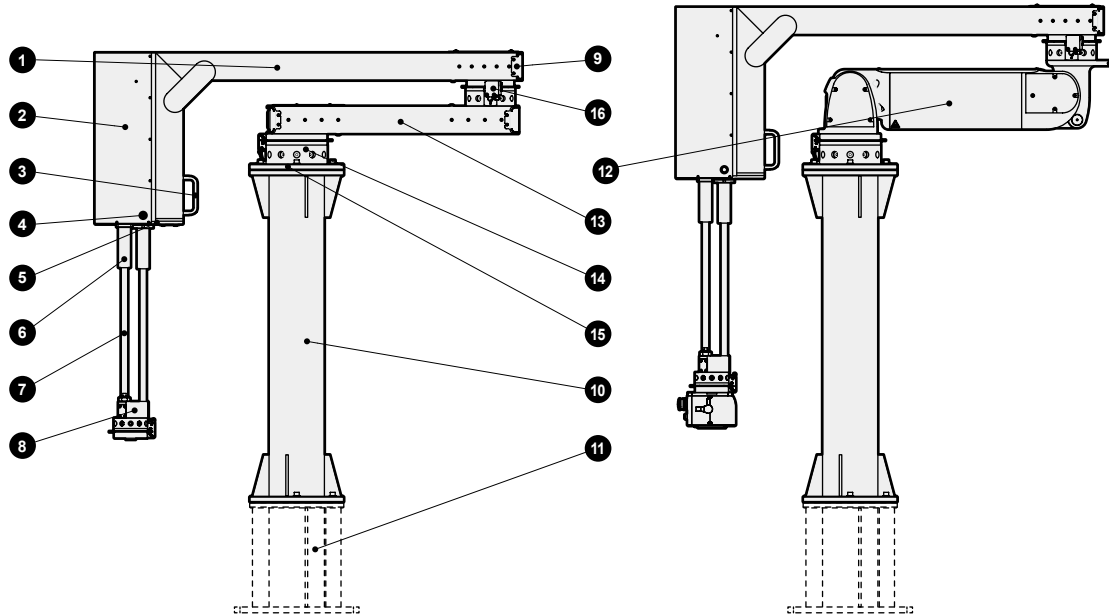
- PowerArm PAW



No.	Product name	Part name	Material	Surface-treated
1	PowerArm unit (*1)	Crevice cover, bracket cover	Flame retardant ABS resin	
2		Body	Aluminum alloy	Alumite treatment
3		Top cover	Aluminum alloy	Alumite treatment
4		Crevice, bracket, link arm	Aluminum alloy	Baking finish
5		Grommet	EPDM	
6	SCARA arm unit (*2)	Body	Steel	Baking finish
7		Cover	Aluminum alloy	Alumite treatment
8		Grommet	EPDM	
9	Rotation unit (*3)	Lock disk	Stainless steel alloy	Industrial chrome plating
10		Body	Aluminum alloy	Alumite treatment
11		Washer	Steel	Zinc plating chromate treatment
12		Mounting plate	Aluminum alloy	Alumite treatment
13	Base plate (*4)	Base plate	Steel	Zinc plating chromate treatment
14	Rotation lock unit (*5)	Rotation lock unit	Steel	Zinc plating chromate treatment
15		Tube	Nylon	
16		Fitting	Flame retardant PBT Copper alloy	Electroless nickel plating of the copper alloy section

Material/Treatment

- Palletizing specifications PAW-A



No.	Product name	Part name	Material	Surface-treated
1	Palletizing unit	Extension body	Steel	Baking finish
2		Cover A, Cover B	Stainless steel alloy	Baking finish
3		Handle	Aluminum alloy	Electrostatic painting
4		Grommet	EPDM	
5		Mounting flange	Steel	Zinc plating chromate treatment
6		Linear bush	Steel	Electroless nickel plating
7		Guide shaft, piston rod	Steel	Industrial chrome plating
8		Connection block	Aluminum alloy	Alumite treatment
9		Rear cover	Aluminum alloy	Alumite treatment
10		Mount frame	Steel	Paint
11	Base (custom order product)	Base	Steel	Paint
12	PowerArm unit		Compliant to PAW (*1)	
13	SCARA arm unit		Compliant to PAW (*2)	
14	Rotation unit		Compliant to PAW (*3)	
15	Base plate		Compliant to PAW (*4)	
16	Rotation lock unit		Compliant to PAW (*5)	



Safety Precautions

Be sure to read this section before use.

When designing and manufacturing equipment using CKD products, the manufacturer is obligated to ensure that the safety of the mechanism, pneumatic control circuit and/or water control circuit and the system that runs the electrical controls are secured.

It is important to select, use, handle and maintain CKD products appropriately to ensure their safe usage.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. In addition, never modify or additionally machine this product. This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.

(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications.)

The customer should provide safety measures to avoid danger in the event of problems.)

① Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.

② Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of the device design and control, etc.

ISO4414, JIS B 8370 (Pneumatic fluid power - General rules and safety requirements for systems and their components) JFPS2008 (Principles for pneumatic cylinder selection and use)

Including High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, body standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

① Inspect and service the machine and devices after confirming safety of all systems related to this product.


② Note that there may be hot or charged sections even after operation is stopped.


③ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.


④ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe the warnings and cautions on the following pages to prevent accidents.

■ Precautions are ranked as “DANGER”, “WARNING”, and “CAUTION” in this section.

 **DANGER:** In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.

 **WARNING:** A dangerous situation may occur if handling is mistaken, leading to fatal or serious injuries.

 **CAUTION:** A dangerous situation may occur if handling is mistaken, leading to minor injuries or property damage.

Note that some items indicated with “CAUTION” may lead to serious results depending on the conditions. All items contain important information and must be observed.

Limited warranty and disclaimer

1 Warranty period

This warranty is valid for one (1) year after delivery to the customer's designated site.

2 Scope of warranty

In case any defect clearly attributable to CKD is found during the warranty period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part and at no cost, according to its own judgment.

Note that the following failures are excluded from the warranty scope:

(1) Failures due to use outside the conditions and environments set forth in the catalog or these specifications.

(2) Failures resulting from factors other than this product.

(3) Failures caused by improper use of the product.

(4) Failures resulting from modifications or repairs made without CKD consent.

(5) Failures caused by matters that could not be predicted with the technologies in practice when the product was delivered.

(6) Failures resulting from natural disasters or accidents for which CKD is not liable.

The warranty covers the actual delivered product, as a single unit, and does not cover any damages resulting from losses induced by malfunctions in the delivered product.

3 Compatibility check

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Design/selection

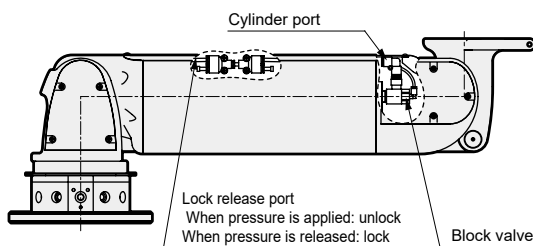
1. PAW Series

⚠ WARNING

- This product is a pneumatic assistive device, intended for use as a machine with a jig, attachment, etc. mounted to the arm tip. For use, be sure to implement a risk assessment for the machine overall, and confirm safety before use. In addition, the end user should perform a risk assessment on the user side, based on residual risk information for the machine overall, and stipulate a safe operating method for use.
- During attachment manufacture and control circuit design, mount an interlock circuit for detecting whether a workpiece is present, preventing unforeseen action of the arm.

⚠ CAUTION

- Each PowerArm unit has a block valve built in. The block valve serves as a vertical lock which is released by pressurization. If malfunctions, etc., cause the primary pressure (source pressure) to increase sharply and activate the block valve, once the primary pressure has been restored and balance pressure supplied to the cylinder port, pressurize the lock release port to release the lock. Releasing the lock without supplying balance pressure is dangerous, as the arm may fall.



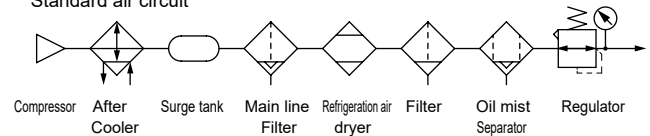
In addition, since it is an air block system that seals the internal cylinder chamber, if left for long periods, the arm will drop due to minute air leakage of the cylinder chamber. When leaving it for long periods, put all the arm sections in the descended state. If you need to leave it at a state other than the fully descended one, please contact us.

- Units cannot be disassembled. Do not disassemble, as it could impair the original performance and accuracy.
- For an overhaul of unit single items, contact a CKD representative.
- The rotation lock mechanism is designed to hold the force towards rotational directions generated due to inclination of the installation surface, deflection of the product, etc. It is not designed to stop dynamic rotational force.

[Pneumatic source]

- Prepare pneumatic pressure supplied to the PowerArm in the range of operating pneumatic pressure (balance pressure) + 0.05 MPa to 0.7 MPa.
- Prepare clean air ([standard air circuit] compressed air quality class: 1.5.1 to 1.6.1 equivalent) for

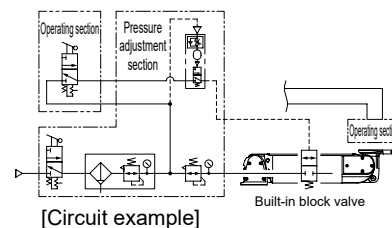
Standard air circuit



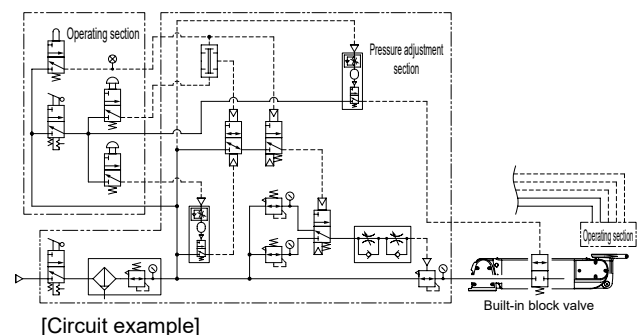
- Securely connect pneumatic piping, so that it does not come out while working.

[Recommended air circuit]

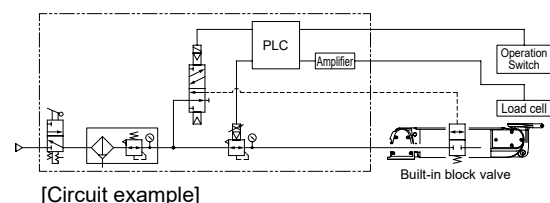
- To prevent sudden rising and falling during air supply, use the recommended circuit below.
- Air 1 pressure control
A control to maintain a balance of a certain weight. It is suitable for supporting the weight of a heavy jig or tool.



- Air 2 pressure control
Given balance preset with and without transported objects, the control can be changed between them using switch operation. This is well suited to batch production, such as continuous transport of identical products.



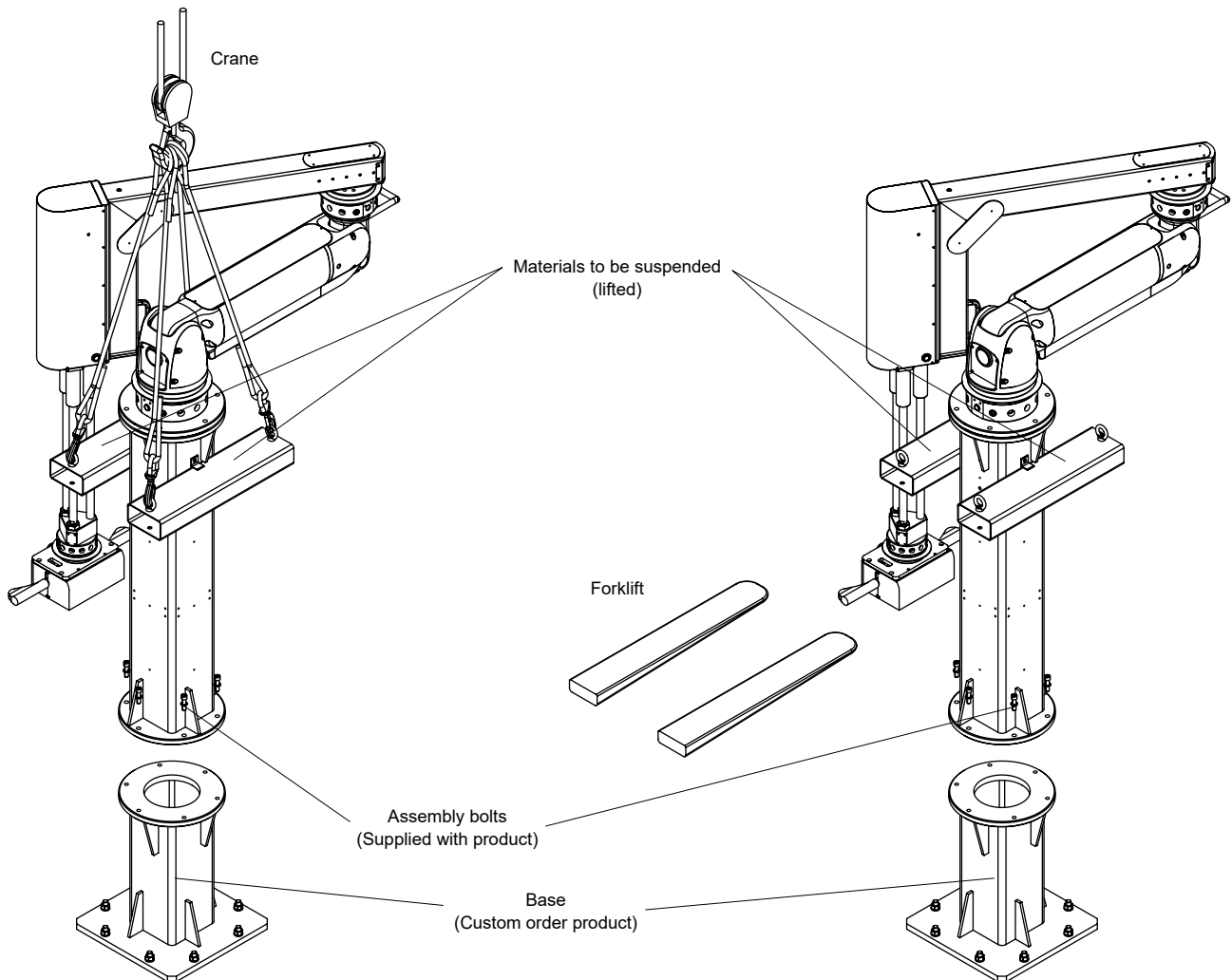
- Automatic pneumatic pressure adjustment control
This control supports random weights by detecting the weight of transported objects at the tip. It is suitable for handling multi-model transported objects.



2. PAW-A palletizing specifications

⚠ CAUTION

- This product is shipped in a wooden container.
- A crane or a forklift is required that can handle the weight of the product when transporting, installing and assembling the product.
- Materials to be suspended (lifted) are pre-assembled before shipping. Install and assemble them on the base by suspending or lifting with a crane or a forklift.



3. Controller PAW-B

⚠ DANGER

- Use a tightening fitting to connect the pipes between the controller and this product.

⚠ WARNING

- When connecting the air piping (electrical wiring) protruding from the piping outlet of this product to the air circuit, make sure that the air piping or electrical wiring is not crushed, or tensile strain is not applied.

Use/maintenance

1. PAW Series

WARNING

- If vibrations, noise, or other abnormalities occur, first assure your own safety, and then, if possible in safety, apply the lock. A fatal accident or total damage to the device may occur.
- Do not modify the product or device without the manufacturer's approval.
- Do not put hands or fingers into product or device gaps.
- When placing transported items on the arm tip part (including mounted attachments and jigs, etc.), do not stack lopsidedly or so as to tip the load over.
- During work or transport operation, never move away from the product or device. When releasing contact, always be sure to apply the lock, even if it is in a balanced state.

[Tip hazards]

- Do not use in excess of the maximum load capacity.
- Do not use in excess of the moment load.

2. PAW-A palletizing specifications

WARNING

- Do not hang the product by the arm section.
- Do not step onto the product.

CAUTION

- When relocating or servicing this product, do not suspend the arm section.

3. Controller PAW-B

WARNING

- Do not touch the live parts
- Establish a ground connection before use.
- Do not use as a step.
- Do not step onto the product.
- When using the T type wall-mounted bracket, do not push this product from underneath.
- Do not place yourself under this product when it is mounted on a wall.
- Install this product on a firmly paved, flat surface when installing it on a floor.

CAUTION

- When the PowerArm is no longer used as the day work is completed, turn OFF the product, close the residual pressure exhaust valve to discharge air.
- When moving this product, do so by holding the handles with two persons.
- Do not remove the hexagon bolts inserted in the cover except for installation or maintenance.
- Do not use this product with the cover removed.

4. Dolly PAW-C

- Do not use this product at levels exceeding the allowable moment.
- Use on a firmly paved, flat surface.
- For a dolly with outriggers, use it with its outriggers fully extended.
- For a dolly with or without outriggers, use it with its four adjusters remaining in contact with the floor.
- Move the dolly when the arm tip is completely lowered; for multiple axes, move only with the product folded into its most compact state.
- Do not move the dolly when the arm tip part (including mounted attachments and jigs, etc.) is carrying transported items.

Example 1

PAW Order Sheet (Basic Specifications)

Date _____

Sales office _____

Customer company name _____

Address / ☎ _____

Contact _____

Office manager	Contact

1. Enter details of work in progress and purpose of use for PAW.

(Work contents) Load a workpiece from the workpiece transport dolly into the vertical machining center and remove the machined workpiece.

(Intended use) Stabilize the process and prevent workplace accidents.

2. Shape/weight/type of workpiece to be transported

(1) Height H =	G	mm
(2) Width W =		mm
(3) Depth L =		mm
(4) Diameter ϕ =	C	mm
(5) Weight	20	kg
(6) Type	1	Type
Examples of shape dimensions		
<p>Fill in the shape dimensions.</p>		
* For multiple workpieces, attach the shape dimensions separately.		

3. PAW tip attachment

Manufacturer

(CKD/customer) * If CKD is selected as the manufacturer, detailed dimensions of the workpiece are required.

Grip method

Fork Chuck Vacuum suction / Other ()

Summary weight

Approx. _____ kg When manufactured by customer

4. PAW control box

Manufacturer

(Required) Not required

Control method

(Manual pressure regulating control system Automatic pressure regulating control system)

5. PAW power source

Pneumatic supply pressure **0.5** MPa Power **AC100** V

* For air supply pressure, fill in the pressure which can be supplied by the customer.

6. PAW installation method

Fixed on floor Movable on floor (dolly) / Other ()

7. PAW working environment

Water drops (Yes/ No) Dust (Yes/ No) Other ()

8. PAW operating frequency

20 times/day **20** days/month

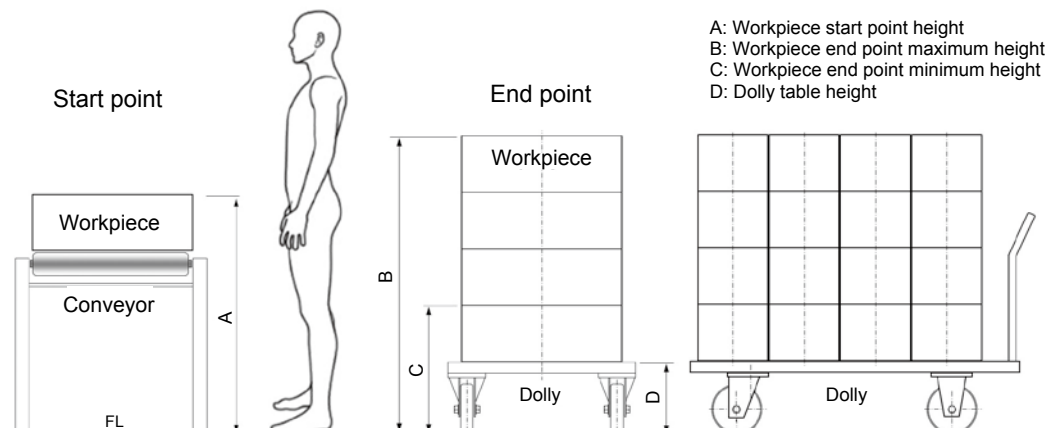
9. Work layout

When considering the arm shaft configuration, we need to confirm the vertical and horizontal movable range required.

Provide layout dimensions with the workpiece start and end points indicated.* Attach drawings if available.

The figure below is an example of layout dimensions showing the start and end point height positions.

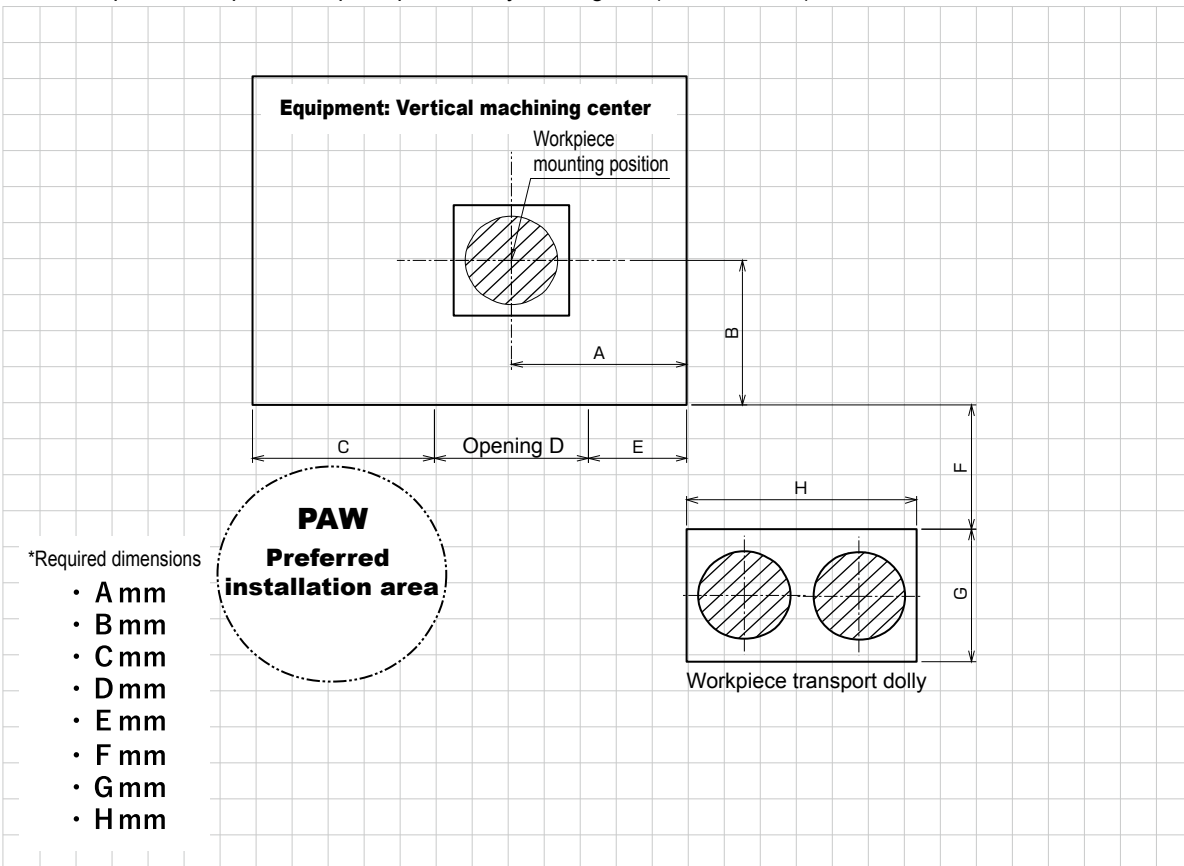
Layout diagram showing the start and end point heights when picking workpieces up off the conveyor and stacking them in rows of 4 by 4 high on a transport dolly



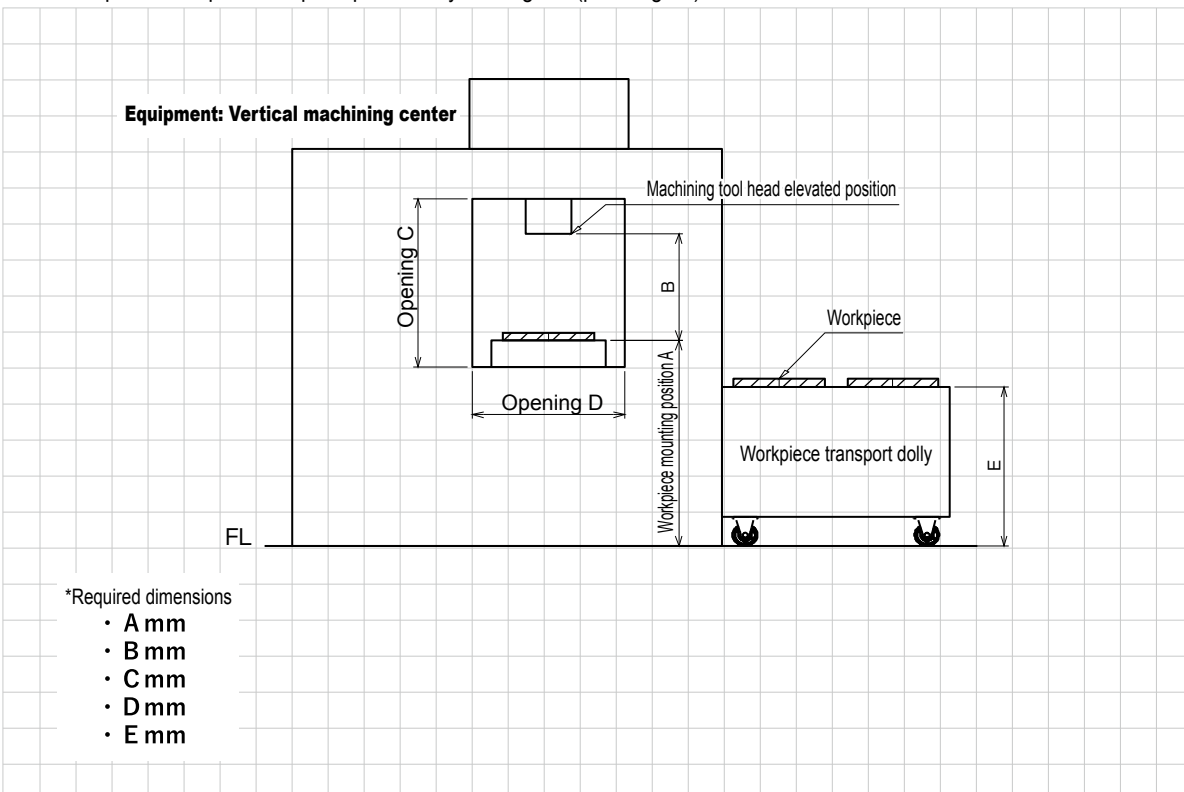
Example 1

PAW Order Sheet (Work Layout Diagram)

9-1. Workpiece start point/end point position layout diagram (cross-section)



9-2. Workpiece start point/end point position layout diagram (plane figure)



Include detailed dimensions, including peripheral equipment, in the layout diagram.

10. Remarks and notes

When feeding a workpiece: Workpiece dolly -> Vertical machining center

When removing a workpiece: Vertical machining center -> Workpiece dolly

Possible to change the position to place a transporting dolly

Example 2 (palletizing)

PAW Order Sheet (Basic Specifications)

Date _____
Sales office _____

Customer company name _____
Address / ☎ _____
Contact _____

Office manager	Contact

1. Enter details of work in progress and purpose of use for PAW.

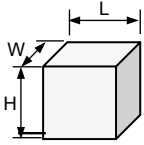
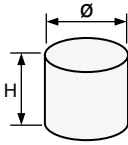
(Task) Palletize the workpieces unloaded from the conveyor.

(Intended use) Stabilize the process, prevent workplace accidents, and staff female operators.

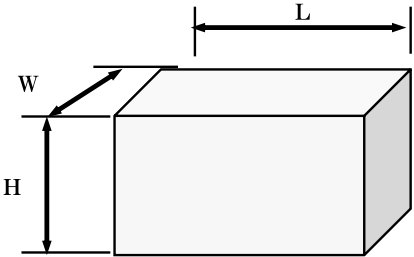
2. Shape/weight/type of workpiece to be transported

(1) Height H =	250	mm
(2) Width W =	280	mm
(3) Depth L =	350	mm
(4) Diameter \varnothing =		mm
(5) Weight	20	kg
(6) Type	1	Type

Examples of shape dimensions

Fill in the shape dimensions.



Cardboard box

* For multiple workpieces, attach the shape dimensions separately.

3. PAW tip attachment

- Manufacturer **(CKD) customer** * If CKD is selected as the manufacturer, detailed dimensions of the workpiece are required.
- Grip method Fork / Chuck **Vacuum suction** Other ()
- Summary weight Approx. _____ kg When manufactured by customer

4. PAW control box

- Manufacturer **(Required)** Not required
- Control method (Manual pressure regulating control system **Automatic pressure regulating control system**)

5. PAW power source

- Pneumatic supply pressure **0.6** MPa Power **AC100** V

* For air supply pressure, fill in the pressure which can be supplied by the customer.

6. PAW installation method

- Fixed on floor** Movable on floor (dolly) / Other ()

7. PAW working environment

- Water drops (Yes **No**) Dust (Yes **No**) Other ()

8. PAW operating frequency

- 200** times/day **20** days/month

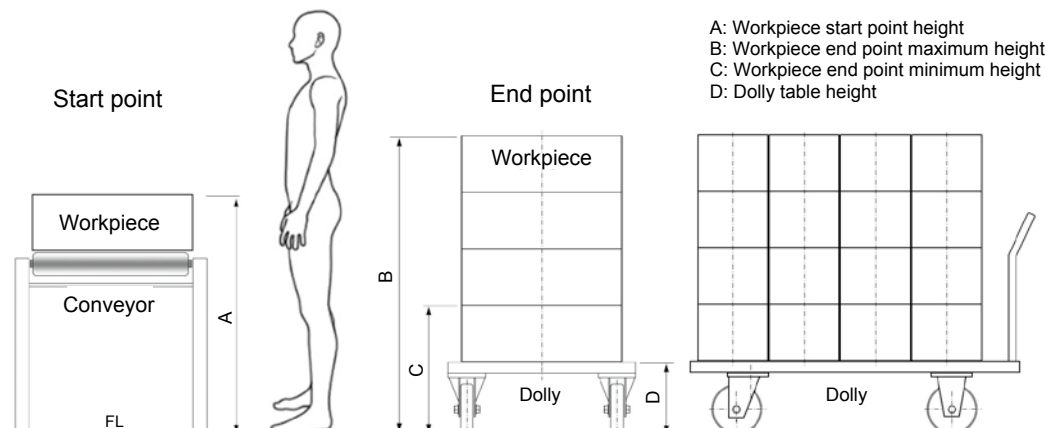
9. Work layout

When considering the arm shaft configuration, we need to confirm the vertical and horizontal movable range required.

Provide layout dimensions with the workpiece start and end points indicated.* Attach drawings if available.

The figure below is an example of layout dimensions showing the start and end point height positions.

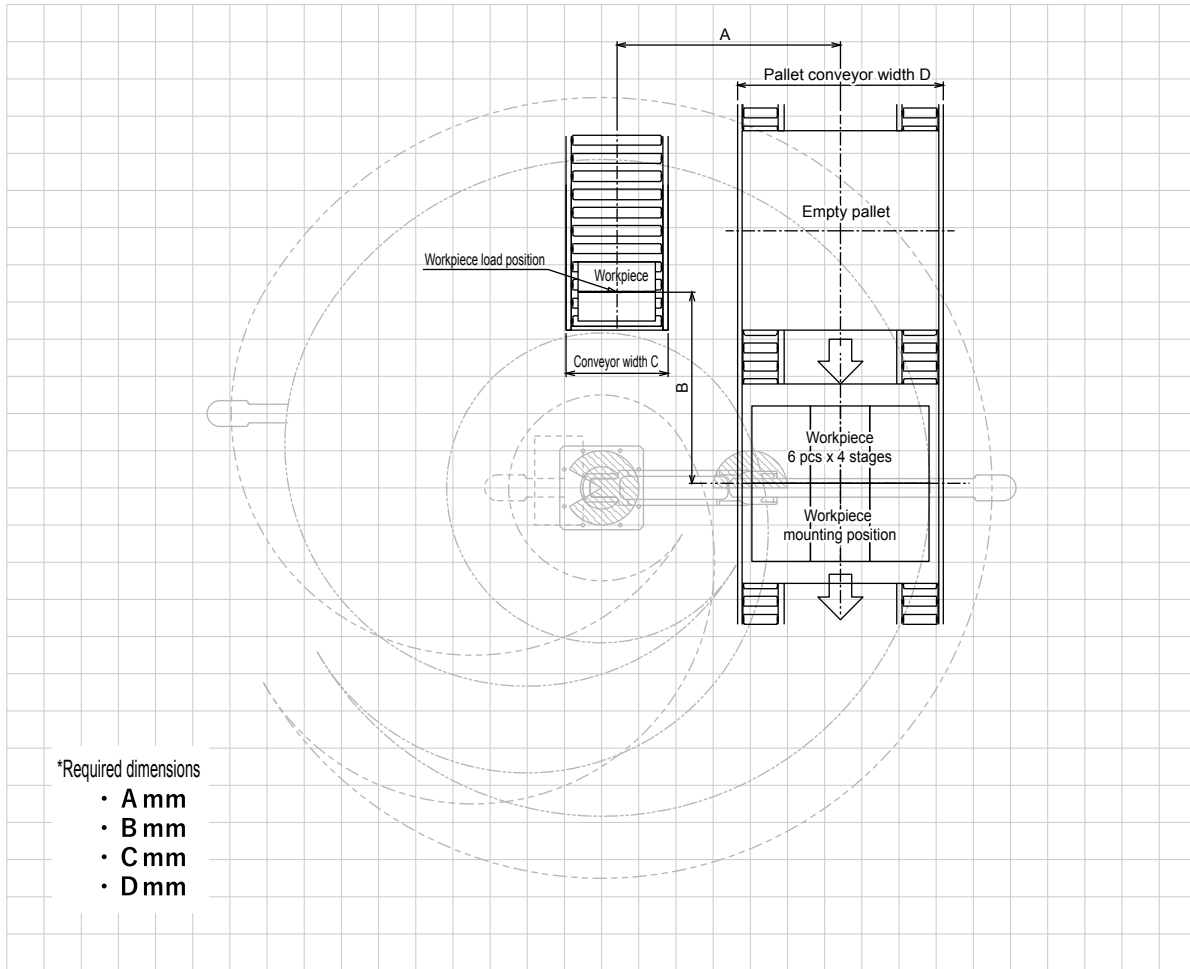
Layout diagram showing the start and end point heights when picking workpieces up off the conveyor and stacking them in rows of 4 by 4 high on a transport dolly



Example 2 (palletizing)

Palletizing system order sheet (work layout)

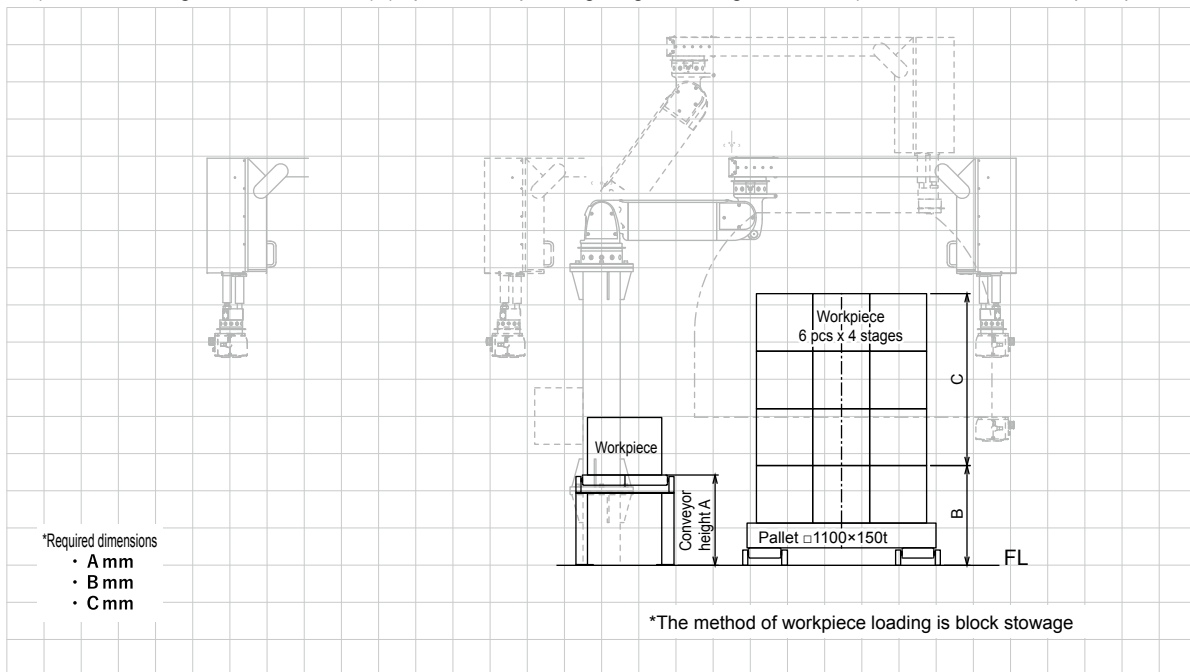
•PAW-AZ-110



*Required dimensions

- A mm
- B mm
- C mm
- D mm

----- Within the operating range at the bottom end - - - - - Within the operating range at the top end (when the bending direction is blank)
 (For the bending direction blank or (C) option, the operating range is left-right reversed.) 200 mm × 200 mm per square



*Required dimensions

- A mm
- B mm
- C mm

*The method of workpiece loading is block stowage

PAW Order Sheet (Basic Specifications)

Date _____

Sales office _____

Customer company name _____

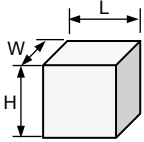
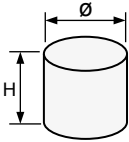
Address / ☎ _____

Contact _____

Office manager	Contact

1. Enter details of work in progress and purpose of use for PAW.

2. Shape/weight/type of workpiece to be transported

(1) Height H = _____ mm (2) Width W = _____ mm (3) Depth L = _____ mm (4) Diameter \varnothing = _____ mm (5) Weight _____ kg (6) Type _____ Type	Fill in the shape dimensions.
Examples of shape dimensions	
	
* For multiple workpieces, attach the shape dimensions separately.	

3. PAW tip attachment

- Manufacturer (CKD/customer) * If CKD is selected as the manufacturer, detailed dimensions of the workpiece are required.
- Grip method Fork / Chuck / Vacuum suction / Other (_____)
- Summary weight Approx. _____ kg When manufactured by customer

4. PAW control box

- Manufacturer (Required / Not required)
- Control method (Manual pressure regulating control system / Automatic pressure regulating control system)

5. PAW power source

- Pneumatic supply pressure _____ MPa
- Power _____ V

* For air supply pressure, fill in the pressure which can be supplied by the customer.

6. PAW installation method

- Fixed on floor / Movable on floor (dolly) / Other (_____)

7. PAW working environment

- Water drops (Yes / No)
- Dust (Yes / No)
- Other (_____)

8. PAW operating frequency

- _____ times/day _____ days/month

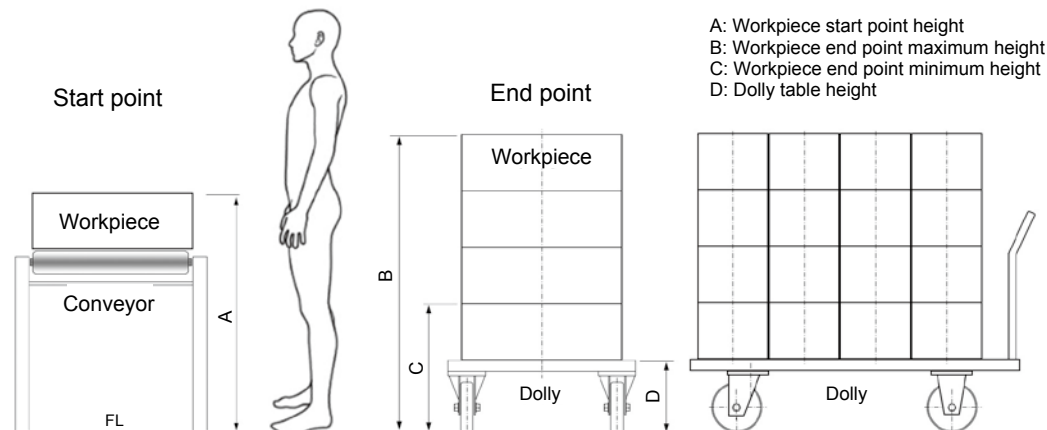
9. Work layout

When considering the arm shaft configuration, we need to confirm the vertical and horizontal movable range required.

Provide layout dimensions with the workpiece start and end points indicated.* Attach drawings if available.

The figure below is an example of layout dimensions showing the start and end point height positions.

Layout diagram showing the start and end point heights when picking workpieces up off the conveyor and stacking them in rows of 4 by 4 high on a transport dolly



PAW Order Sheet (Work Layout Diagram)

9-1. Workpiece start point/end point position layout diagram (cross-section)



9-2. Workpiece start point/end point position layout diagram (plane figure) * Indicate the desired arm arrangement if applicable.

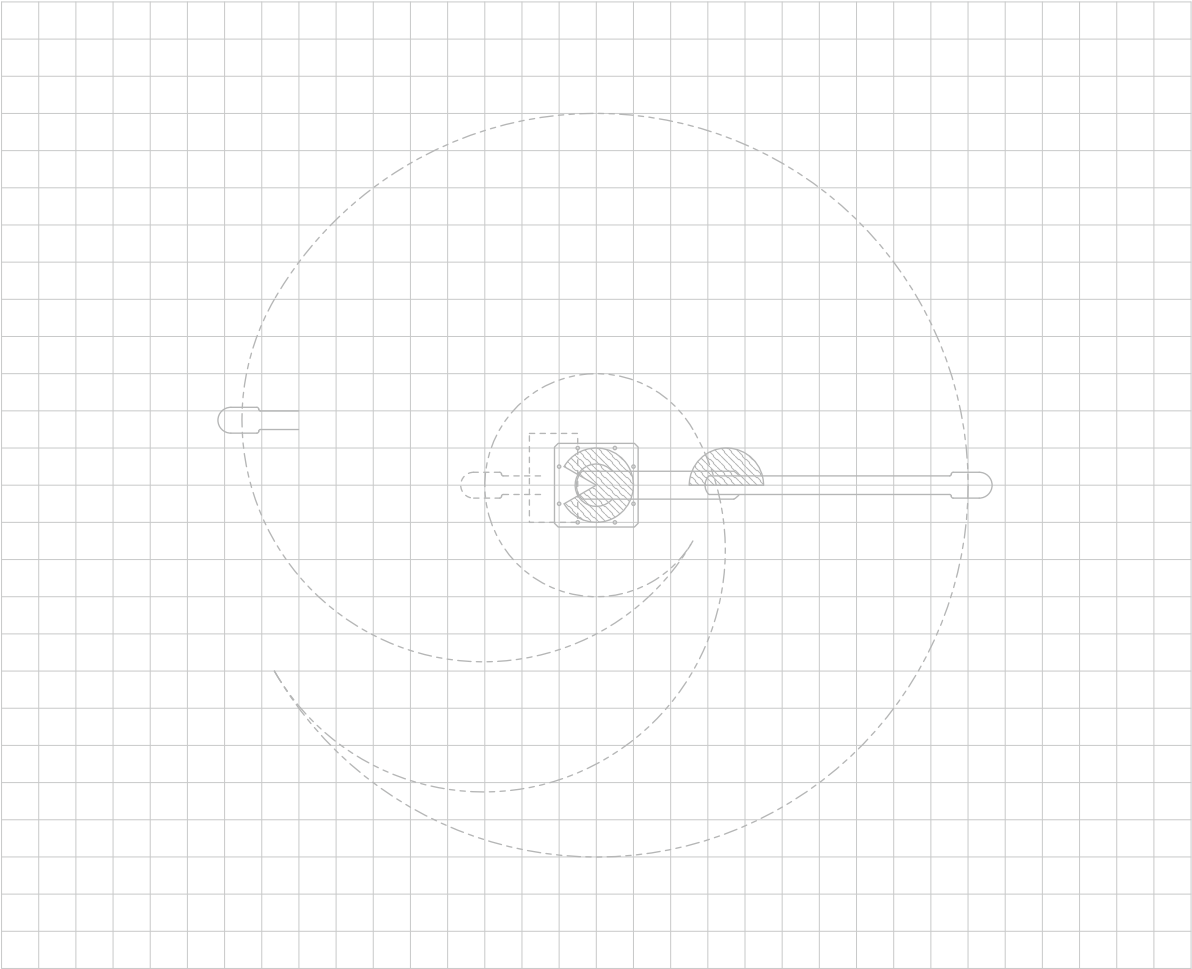


Include detailed dimensions, including peripheral equipment, in the layout diagram.

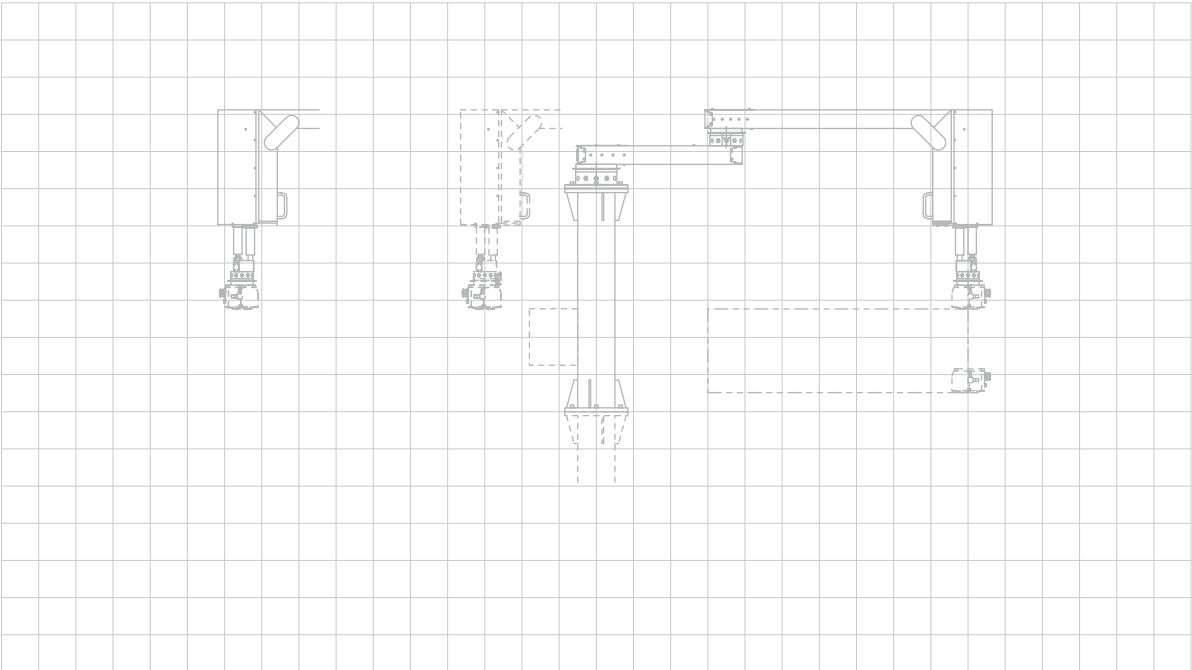
10. Remarks and notes

Palletizing system order sheet (work layout)

●PAW-AS-45

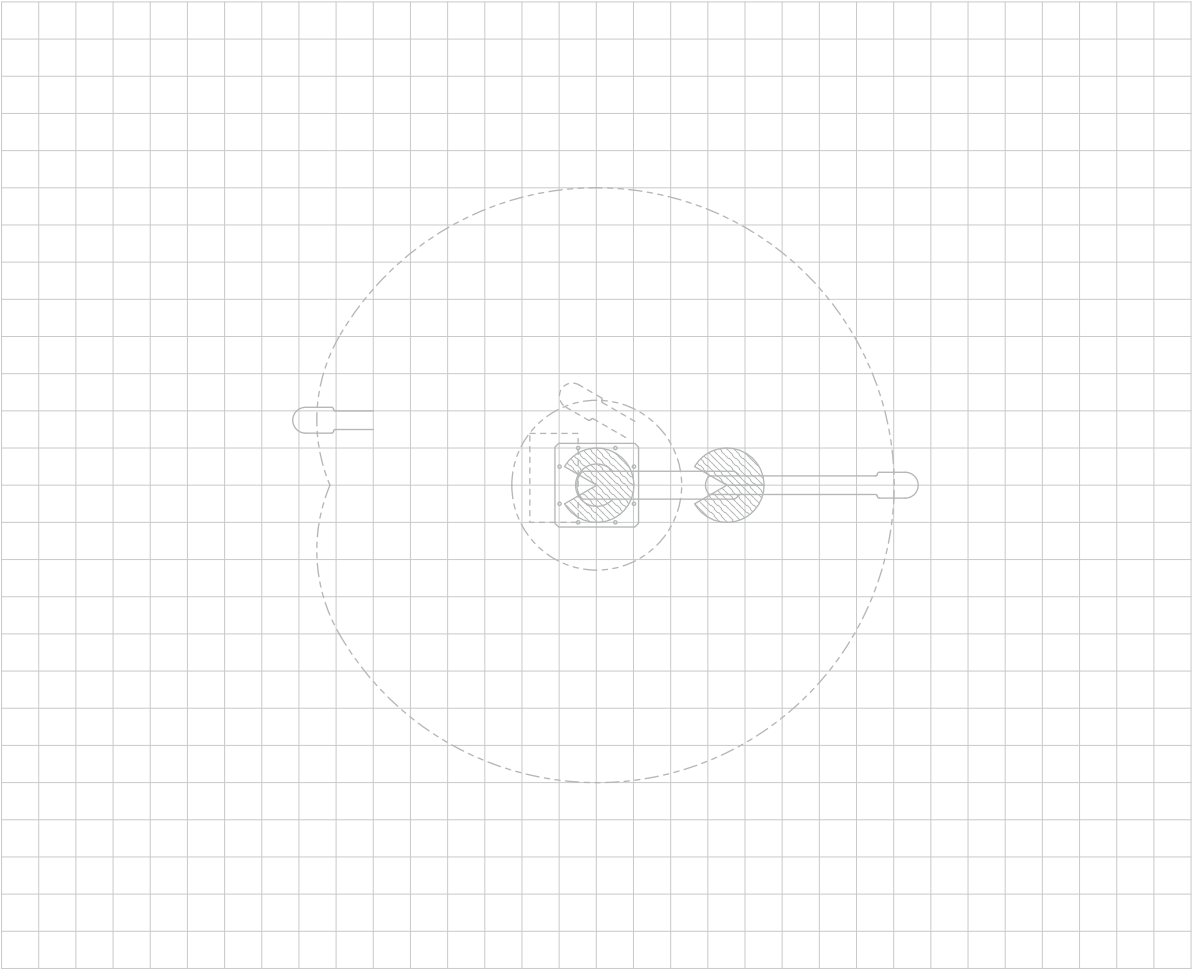


----- Within the operating range (For the bending direction blank or (C) option, the operating range is left-right reversed.)
200 mm × 200 mm per square

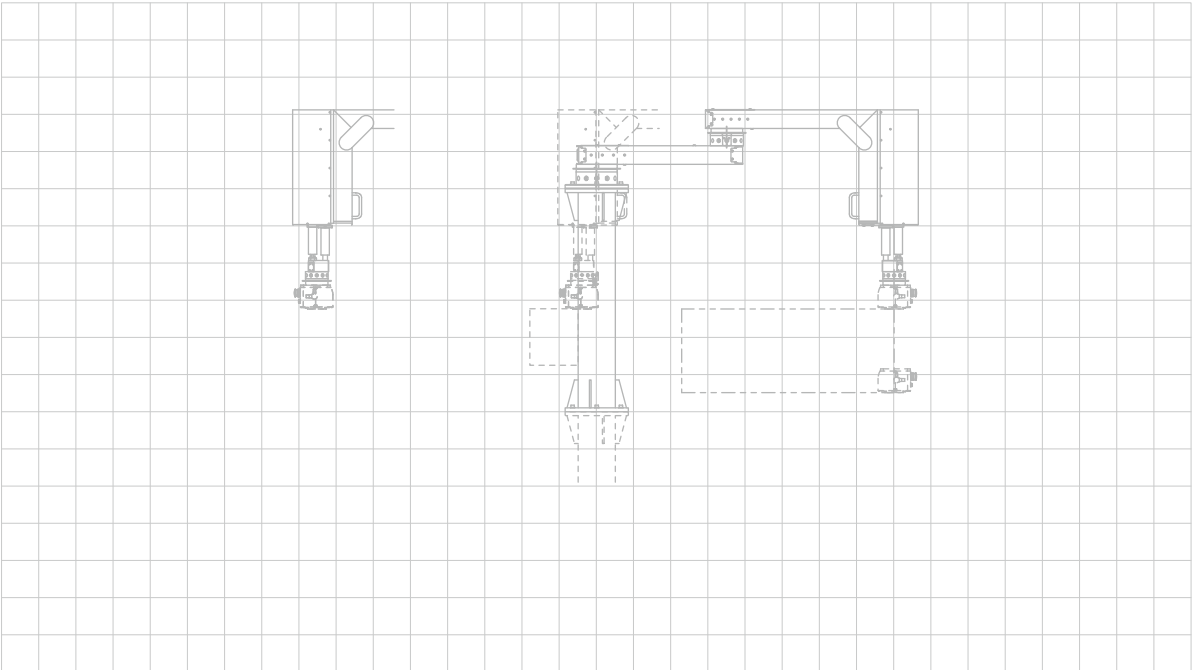


Palletizing system order sheet (work layout)

●PAW-AS-45-S

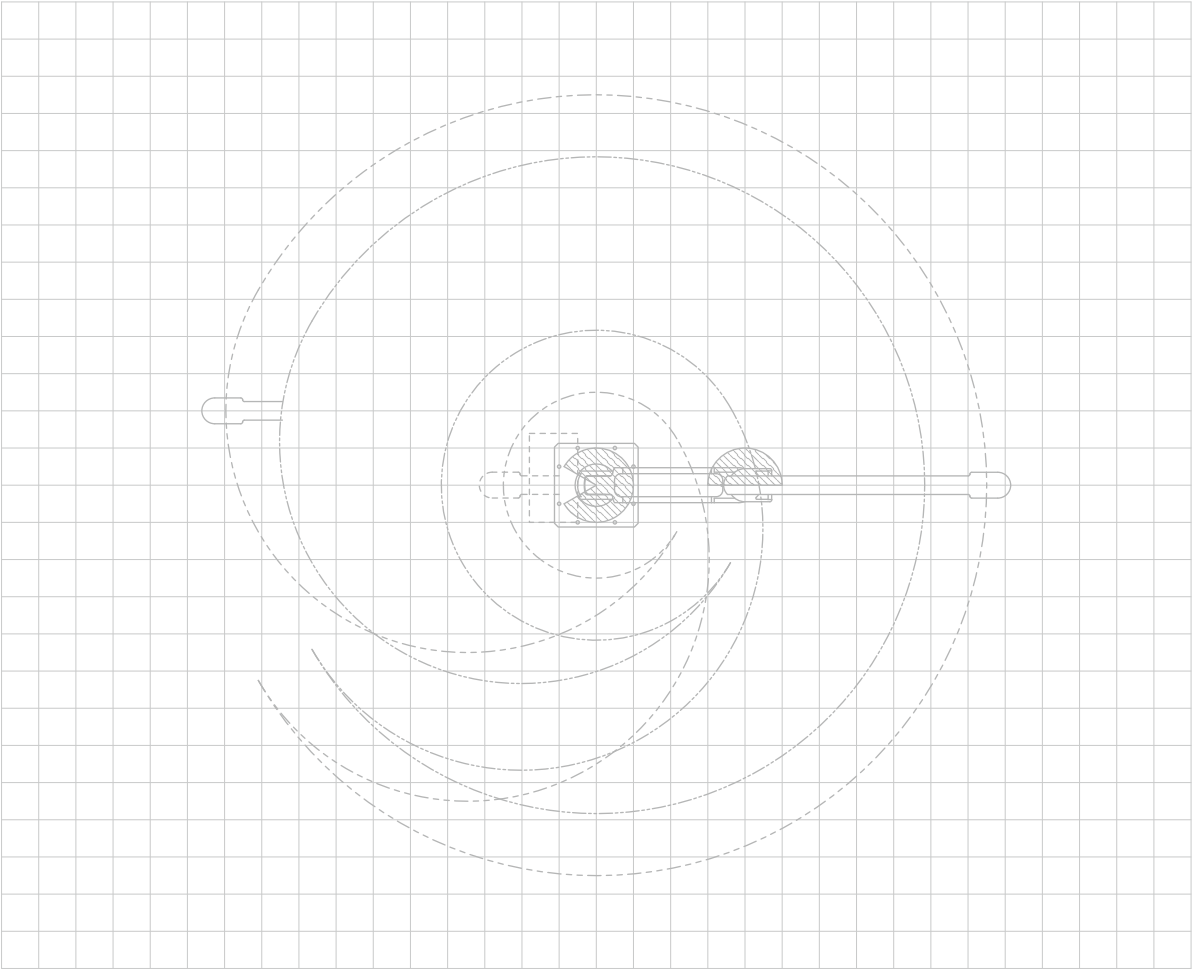


----- Within the operating range 200 mm × 200 mm per square

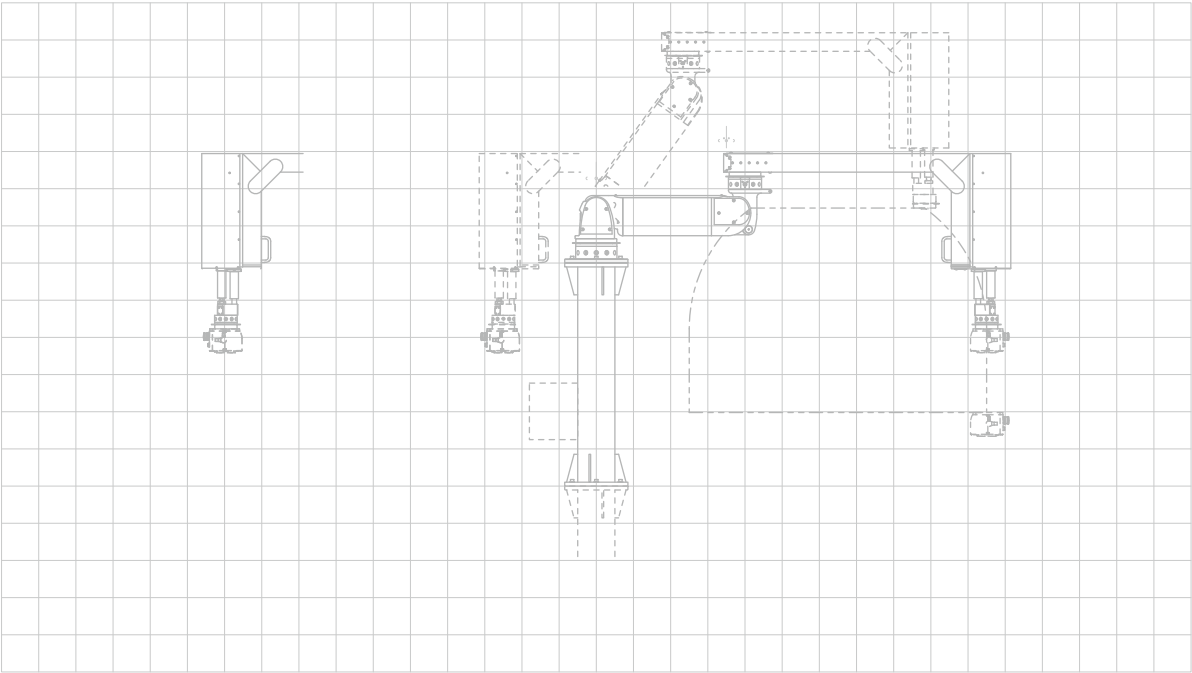


Palletizing system order sheet (work layout)

●PAW-AZ-110

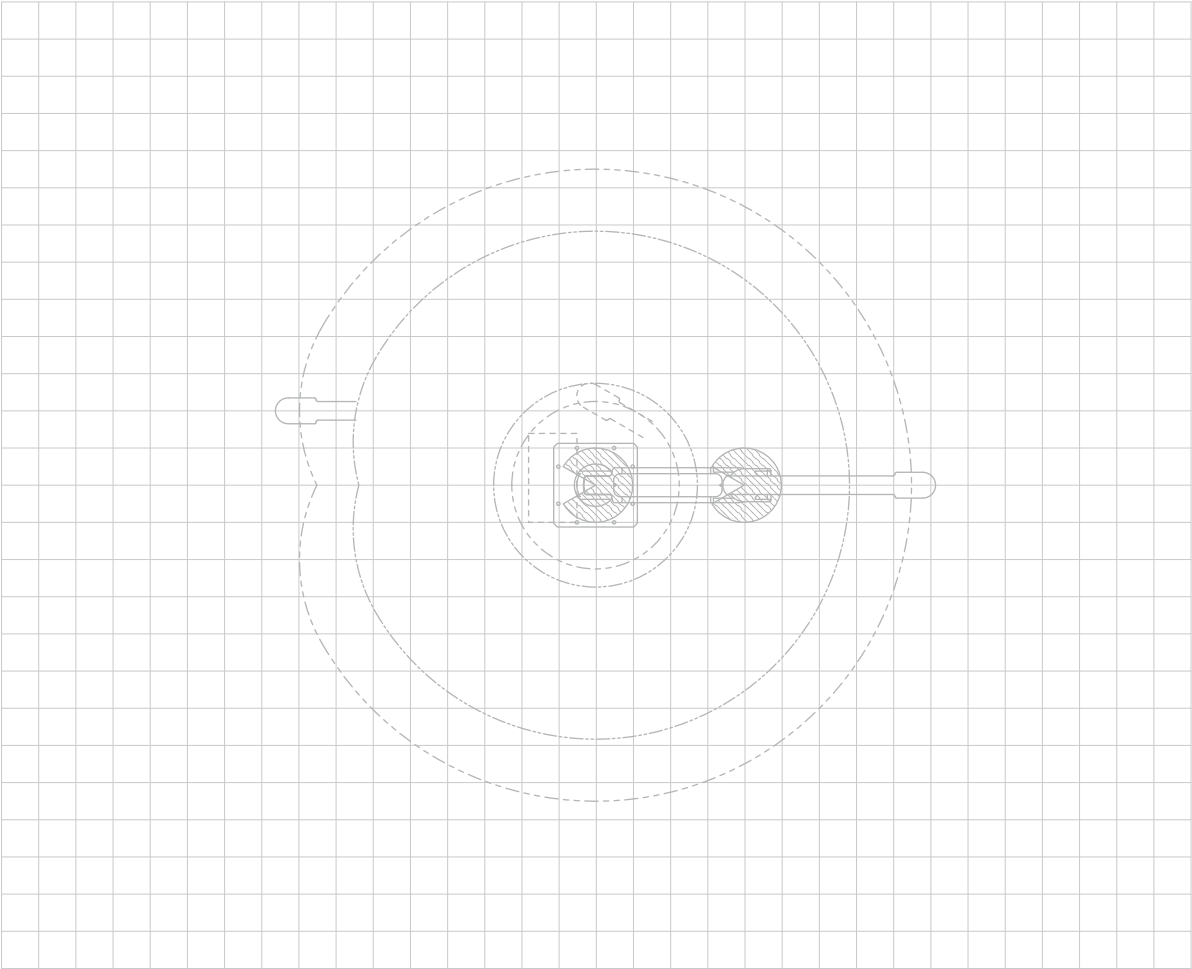


----- Within the operating range at the bottom end - - - - - Within the operating range at the top end (when the bending direction is blank)
 (For the bending direction (C) option, the operating range is left-right reversed.) 200 mm × 200 mm per square

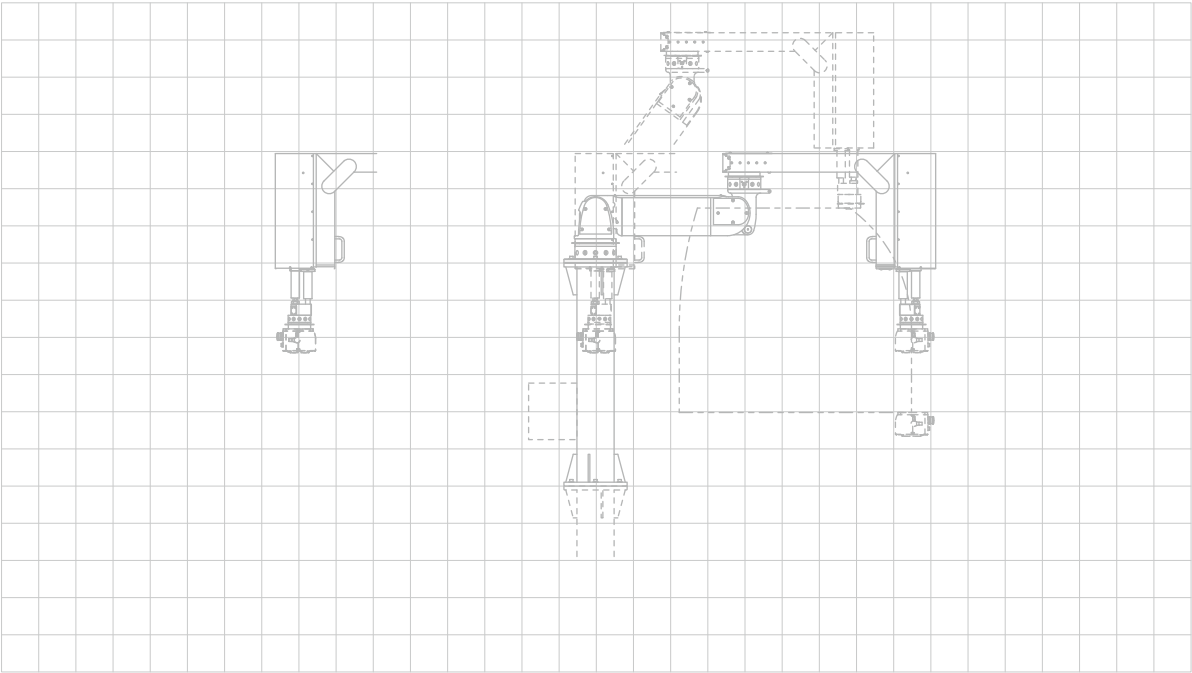


Palletizing system order sheet (work layout)

●PAW-AZ-110-S



----- Within the operating range at the bottom end - - - - - Within the operating range at the top end
200 mm × 200 mm per square



Related products

Balancer unit BBS Series

- A maximum load of 200 kg can be balanced with just 5 kg, and workpieces can be lifted with very little force
- Brake equipped as standard. Safety mechanism that ensures workpieces do not fall even if the air is cut off
- Retains optimal balance by automatically recognizing weight differences between workpieces (BBS-A)
- Compatible with all-air method not requiring electricity. Specifications for explosion-proof environments also available

Catalog No. CC-960A



Ultra low friction balance cylinder BBS Series

- With position locking mechanism for safety concerns (BBS-OU)
- Special packing and treatment for low sliding
- Compatible with lateral load as well (BBS-OS/OU-B)

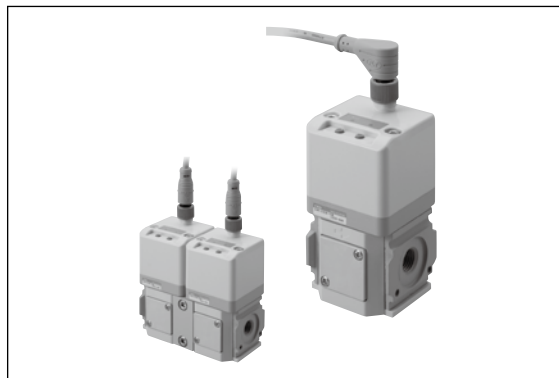
Catalog No. CC-1212A



Vacuum regulator EVR Series

- High-precision pressure control
 - Hysteresis: 0.3%F.S. Linearity: $\pm 0.5\%$ F.S., resolution: 0.1%F.S., repeatability: 0.2%F.S.
- Improved temperature stability and durability
 - Zero point fluctuation: 0.06%F.S., span fluctuation: 0.06%F.S., durability: 3 times (compared to existing products)
- New functions added
 - Residual pressure is 0 when the input signal is 0%F.S. Selection of pressure control patterns.
- Easy operation
 - "Zero point adjustment", "Span point adjustment", and "Pressure control patterns" can be controlled with two buttons.
- Compatibility, installation
 - Compatible mounting with the conventional product (EV2500).
 - Two types of connectors are available. (straight type and L type, 1 m or 3 m respectively)

Catalog No. CC-1174A



Precision regulator RP2000 Series

- High-precision pressure control
 - Repeatability: Within $\pm 0.5\%$ of full scale
 - Sensitivity: Within 0.2% of full scale regardless of the flow rate.
- Long service life
 - Low-sliding packing used for moving parts. Also uses grease resistant to dry air.
- Stable flow characteristics with minimal pressure drop
- Large relief flow rate

Catalog No. CC-1072A



Air supply unit ASU Series **Made-to-order product**

- 2 flow rates (72 ℓ/min, 25 ℓ/min)
- Localized supply is enabled with easy installation.
- Filter, drain separator, dryer, etc., converted to one unit (300 W only)
- Pressure source for emergency use (supports BCP)

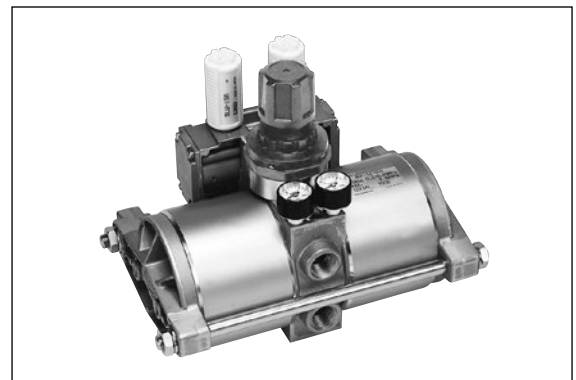
Catalog No. CC-1284A



Air booster ABP Series

- Boosting up to double (or equivalent) ratio
 - Boosting ratio is adjusted within range of twice primary pressure (0.99 MPa max.) by pressure adjustment knob.
- Flexible installation
- Pressure adjustment without using a tool
- Compact

Catalog No. CB-024SA

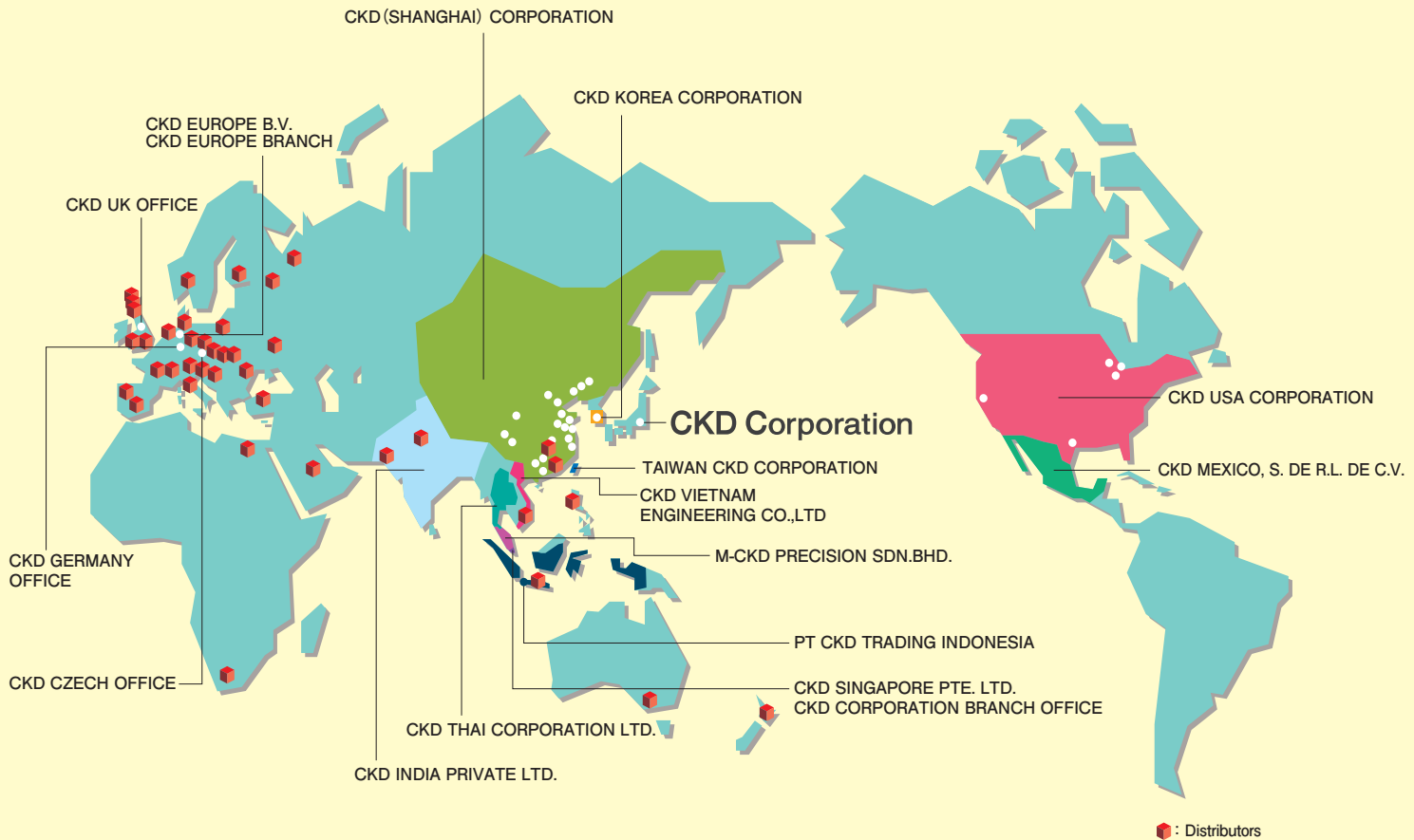


Air tank AT Series

- Air tank directly connected to air booster ABP with compact body.
- Compact installation

Catalog No. CB-024SA





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