



PowerArm

PAW Series

● Bore size: ø80/ø100/ø125



Specifications

Item	PAW			
	mm	ø80	ø100	ø125
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 a 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 (0.5 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 (ø80)	520
PAW-S-X (ø100)	580
PAW-S-Z (ø125)	650

· With multi-axis

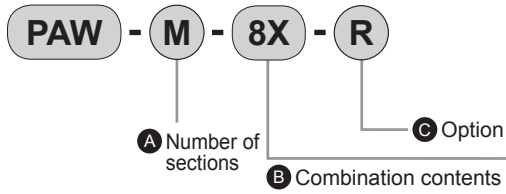
Model No.	Movable range	
	Vertical (mm)	Horizontal (mm)
PAW-M-8S	520	1200
PAW-M-XS	580	1400
PAW-M-ZS	650	1600
PAW-M-8X	1100	1300
PAW-M-XZ	1230	1500
PAW-M-8XS	1100	2000
PAW-M-XZS	1230	2300
PAW-M-8XZ	1750	2100

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.

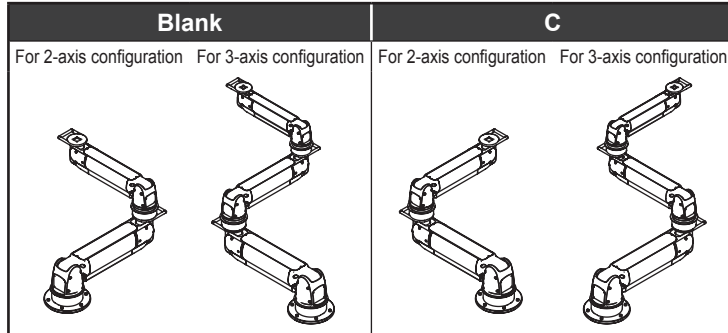
Weight

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

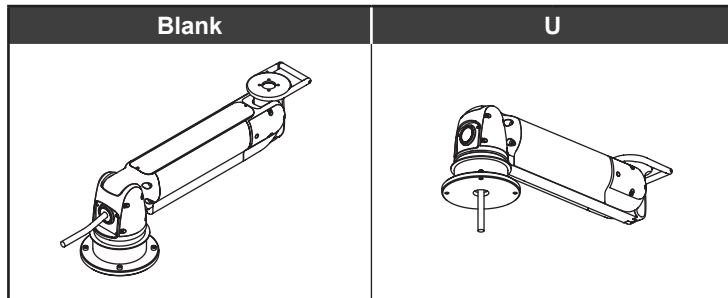


C Option: Bending direction



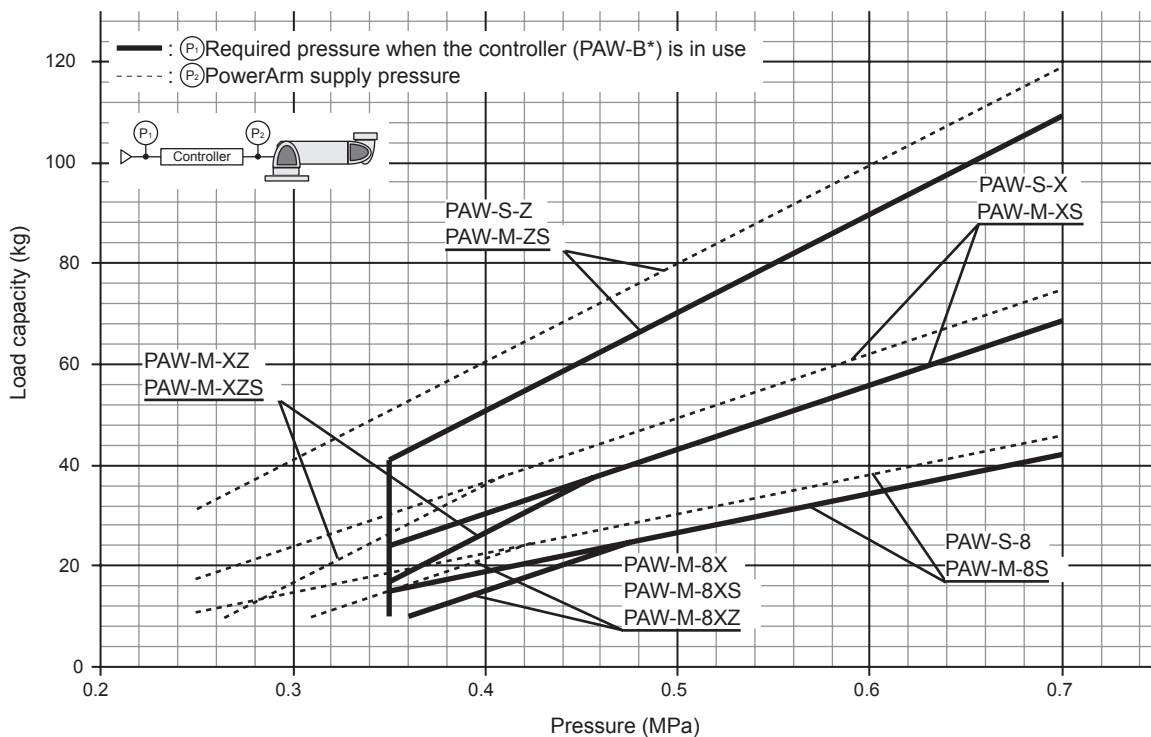
* C is not available for single axis (PAW-S).

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.

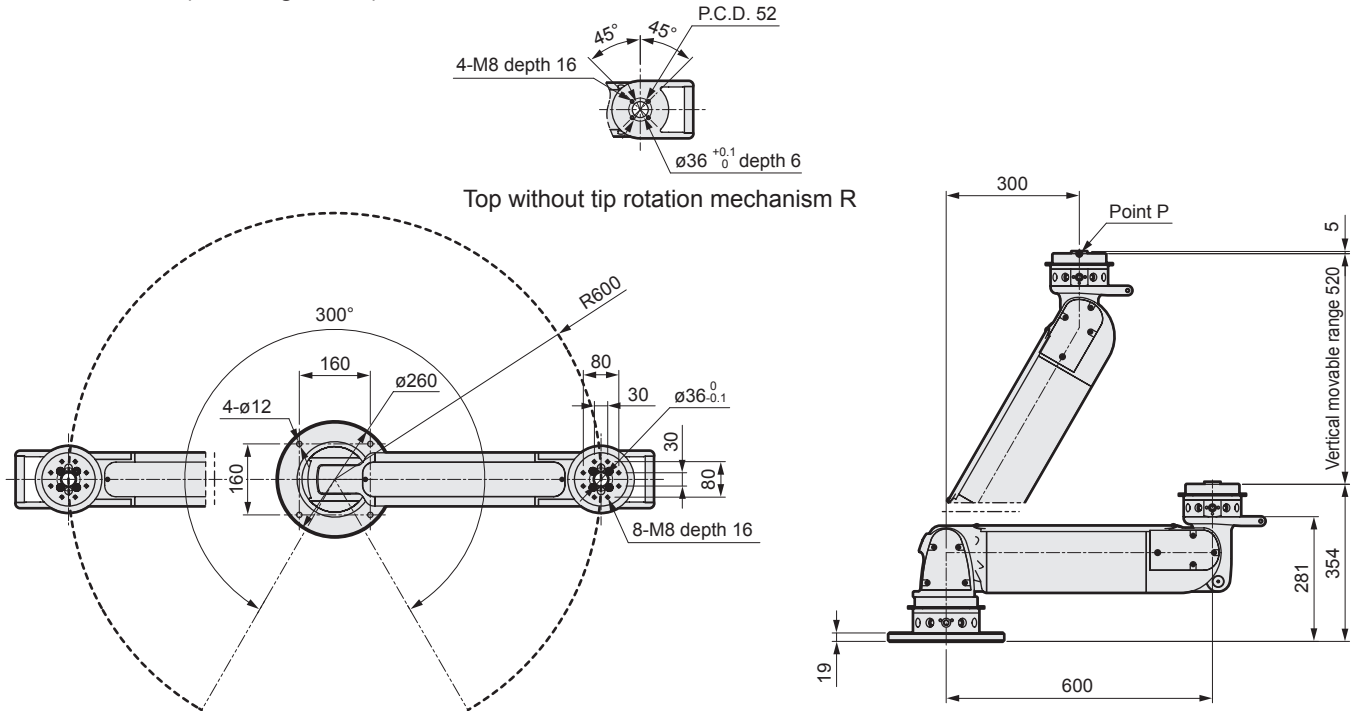
*4: While the load capacity has properties such that it alters slightly according to the arm rise angle, this graph shows the lower limit values.

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.

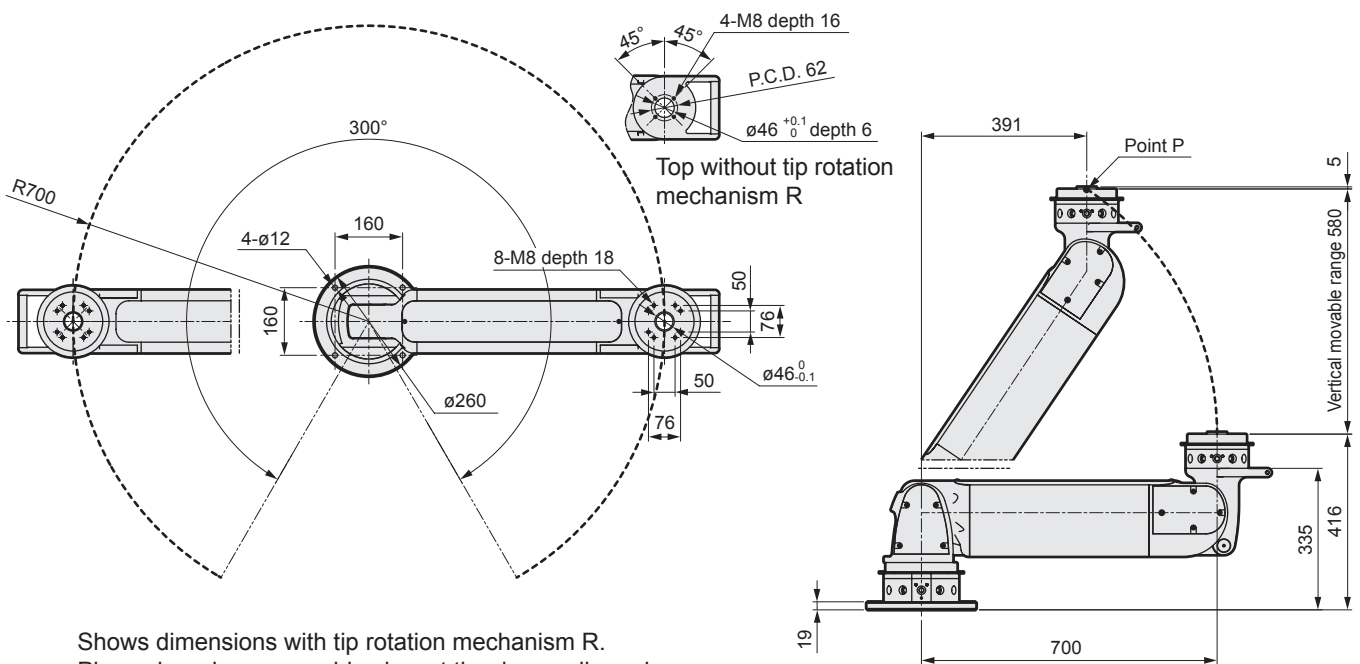
Dimensions (single-axis)

● PAW-S-8-R (ø80 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 (ø100 single axis)

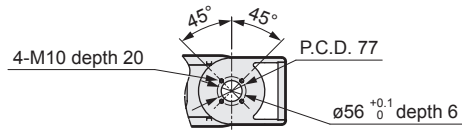


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the descending edge.
Structurally, the movable range changes according to the rising height.

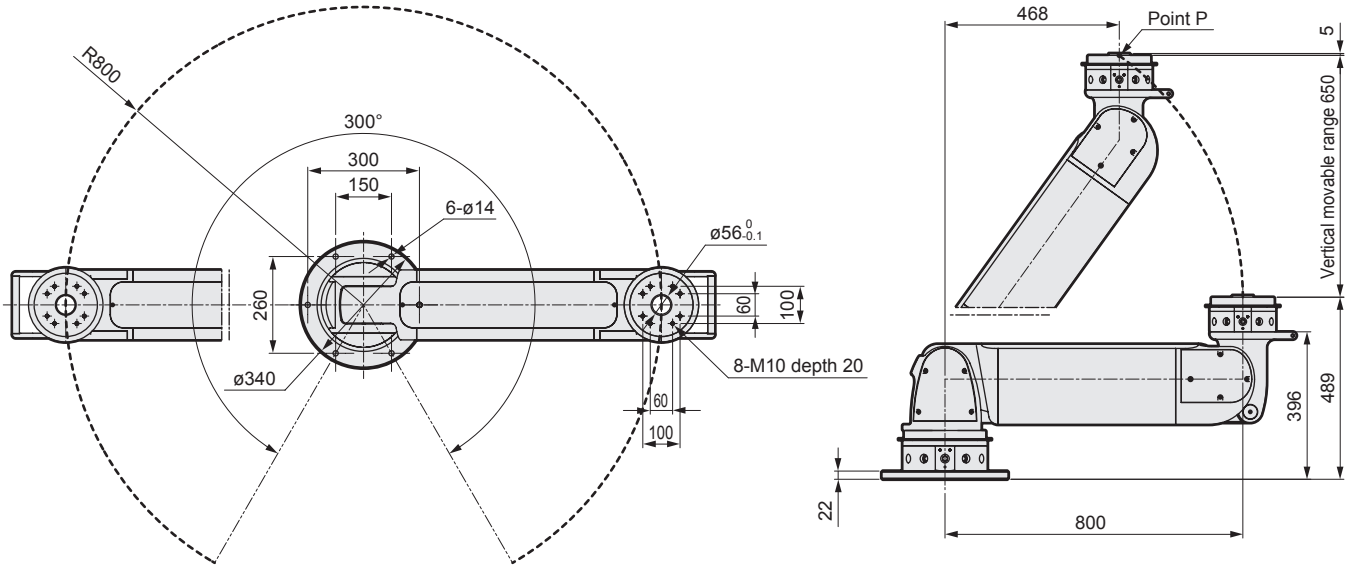
* Refer to page 13 for the optional dimensions of the tip rotation mechanism (R) option.

Dimensions (single-axis)

● PAW-S-Z-R (ø125 single axis)



Top without tip rotation mechanism R

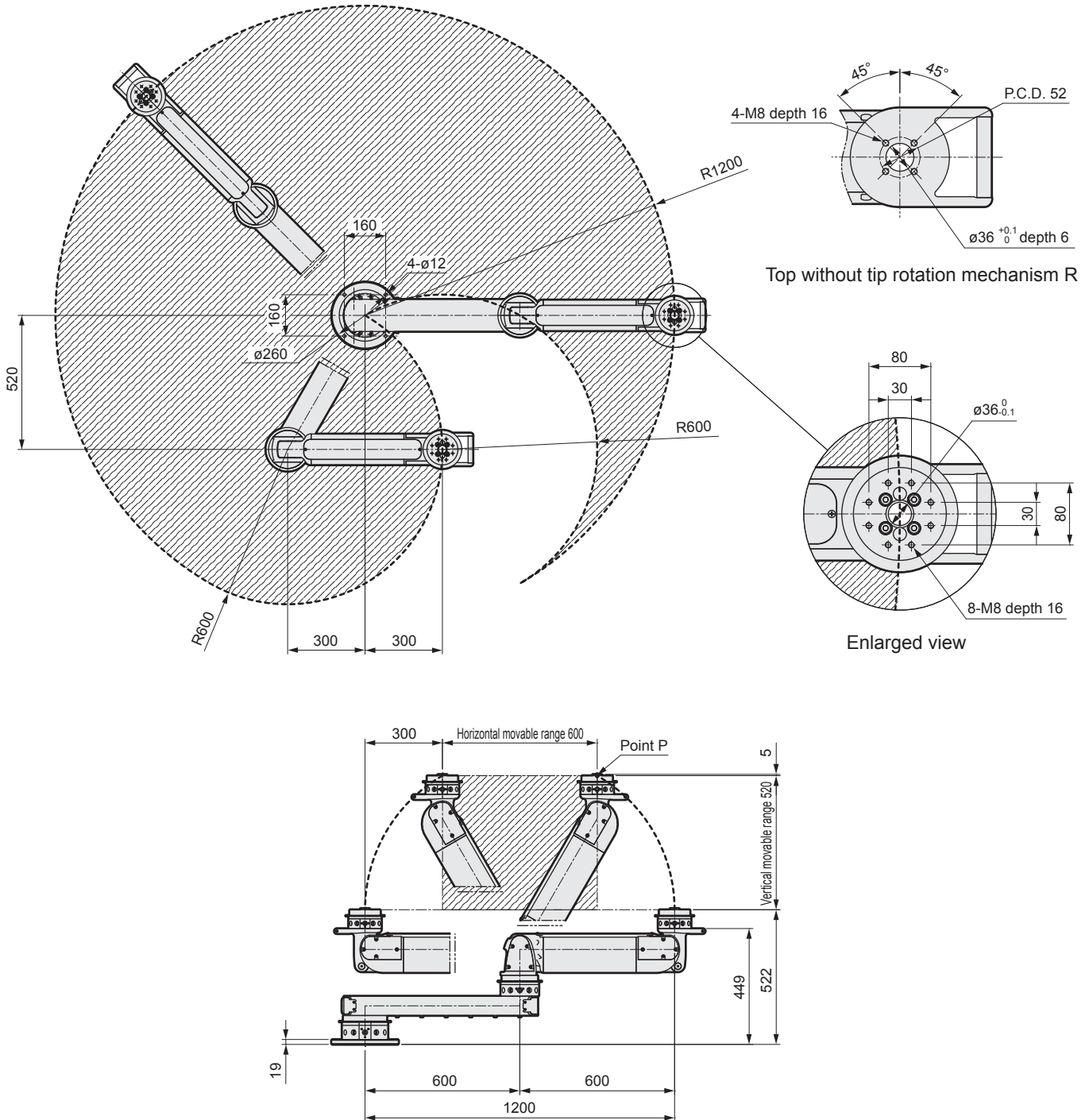


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the descending edge.
Structurally, the movable range changes according to the rising height.

* 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)

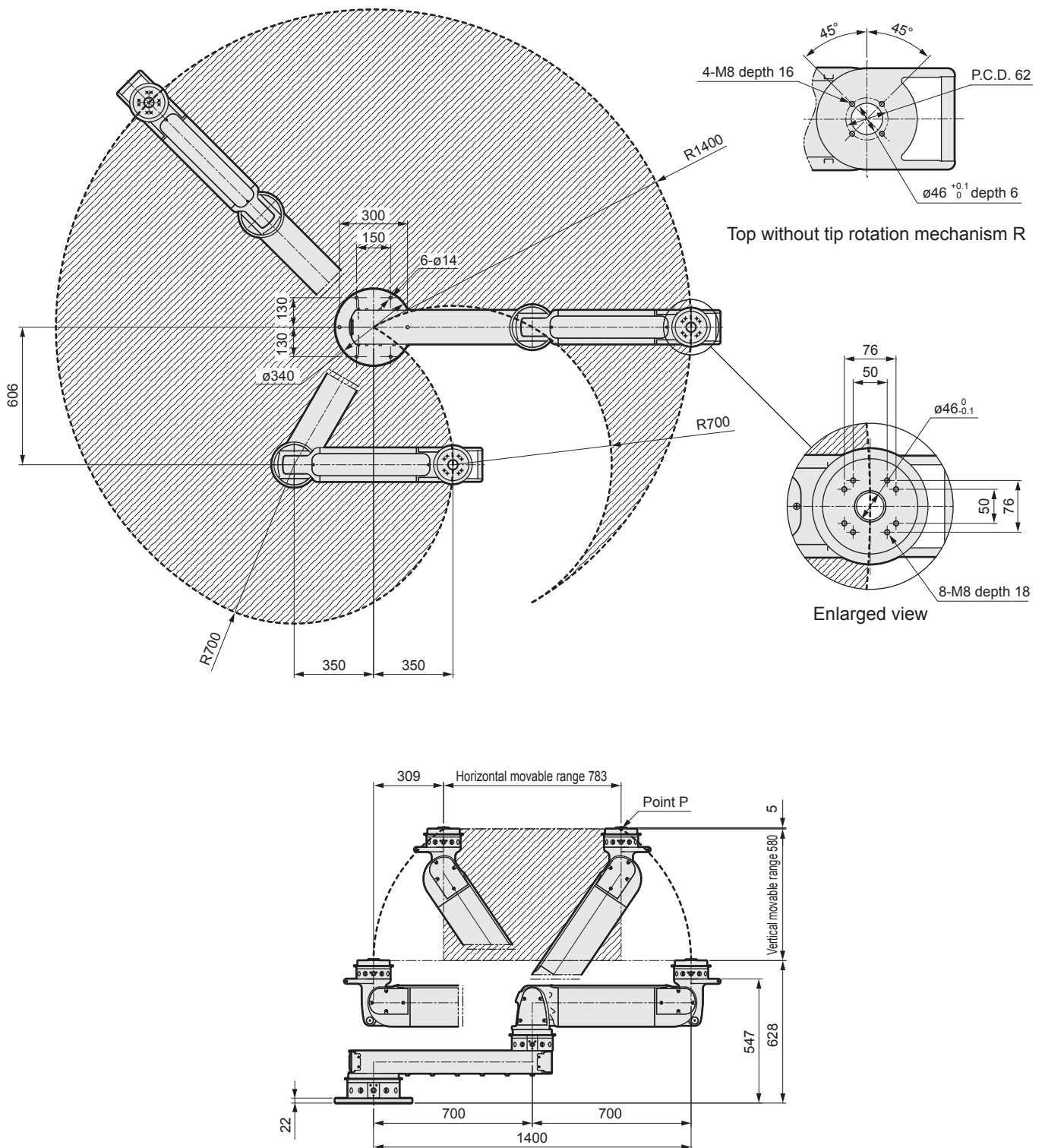


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * 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)

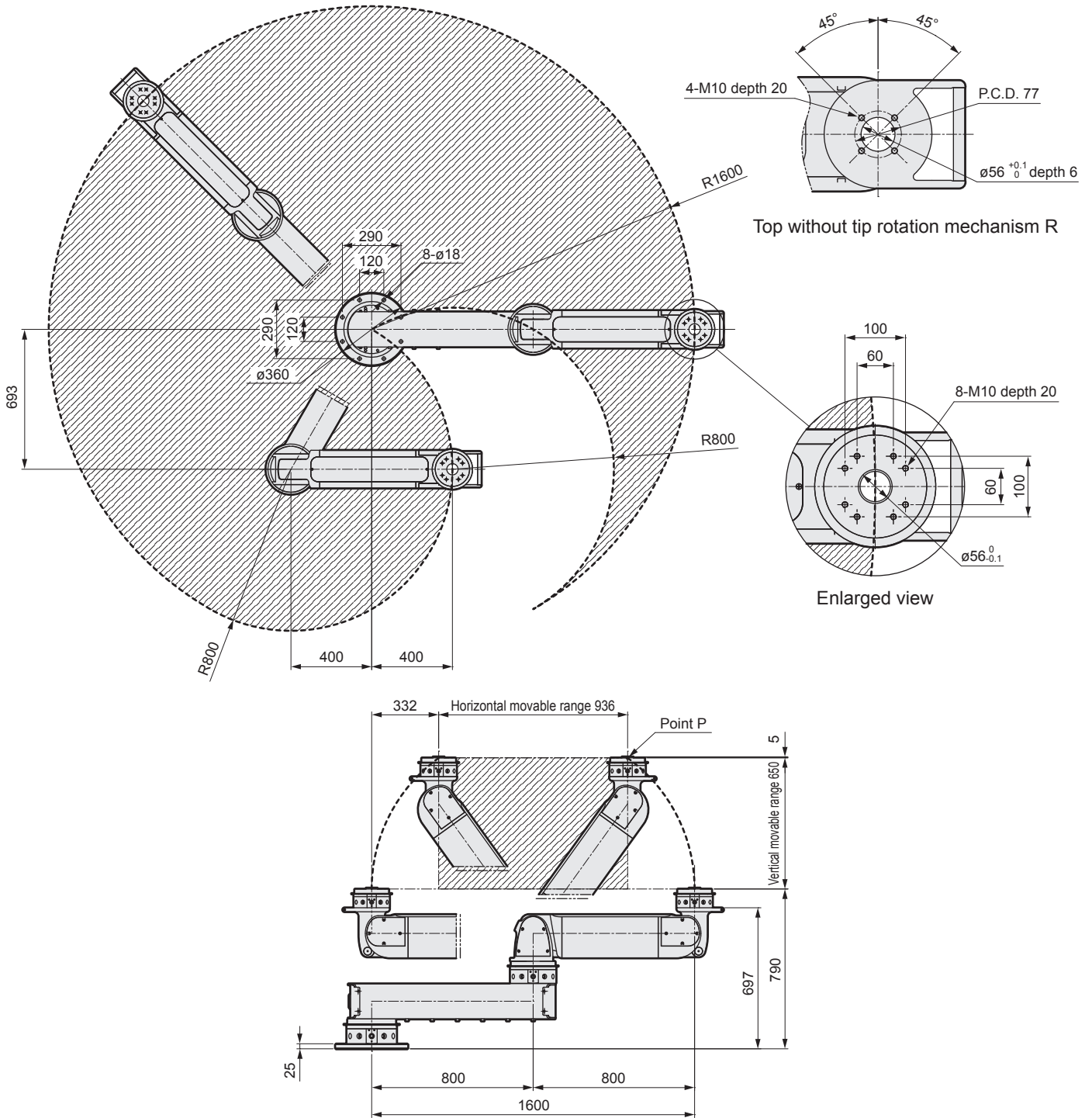


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the point P descending edge.
Structurally, the movable range changes according to the point P rising height.

- * 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)

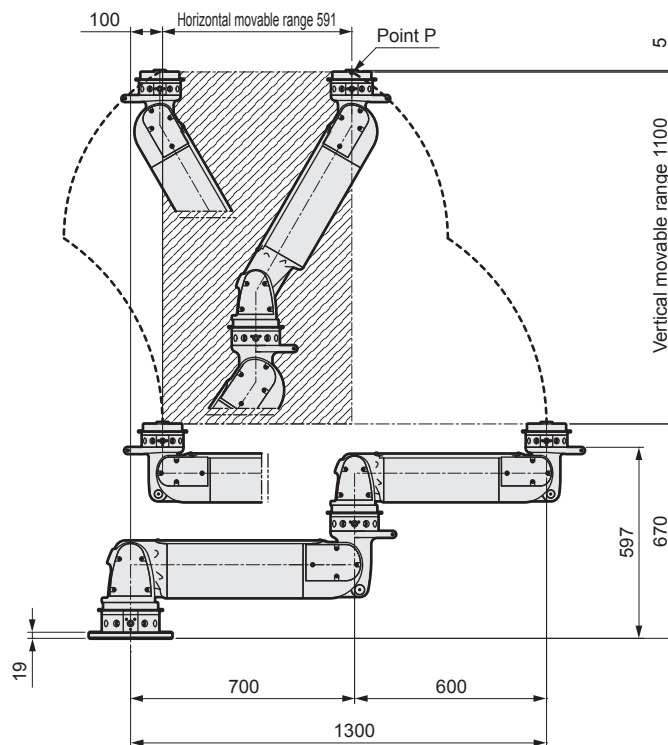
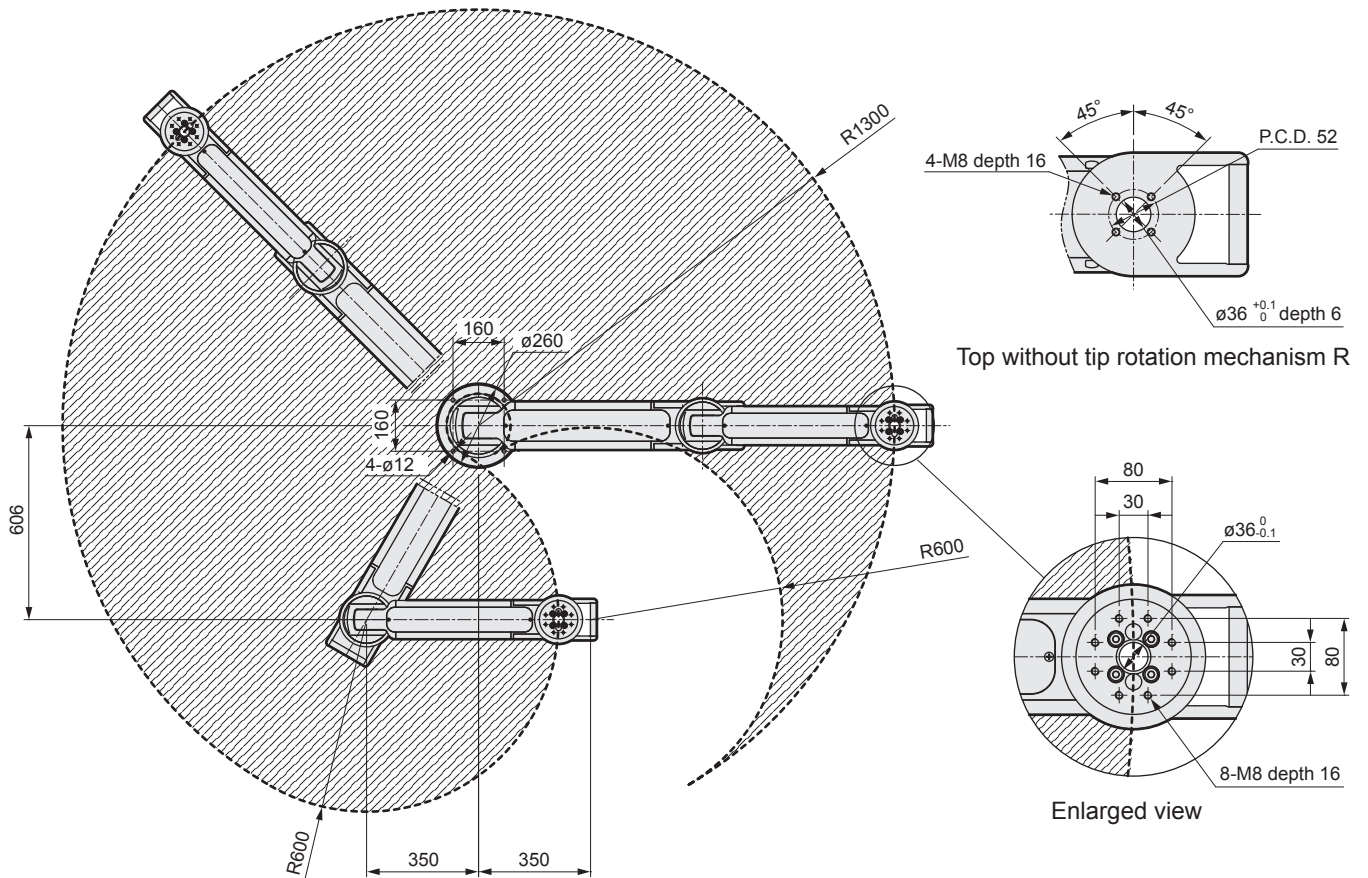


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * 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.

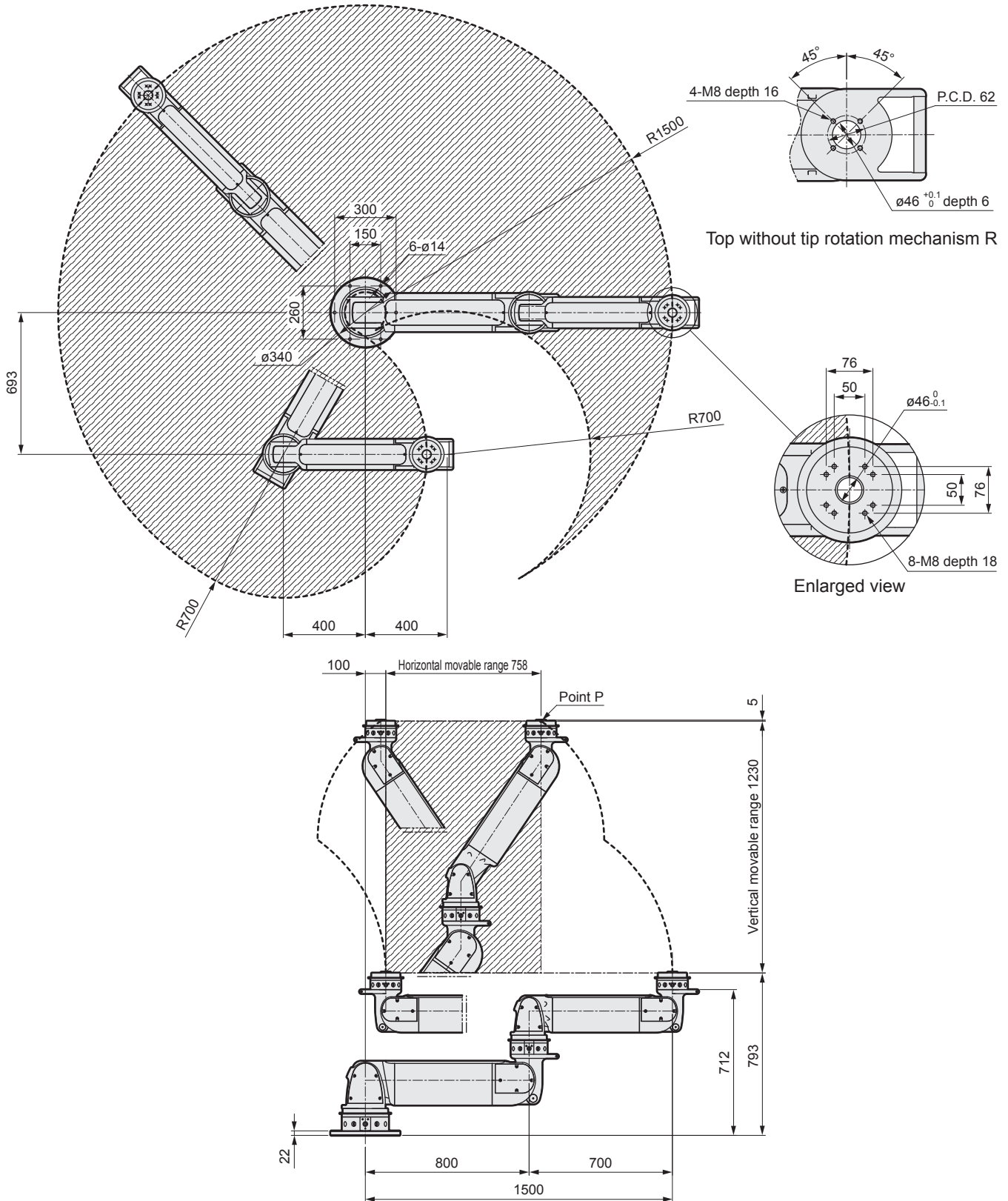
Plane view shows movable view at the point P descending edge.

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 $\varnothing 125$)

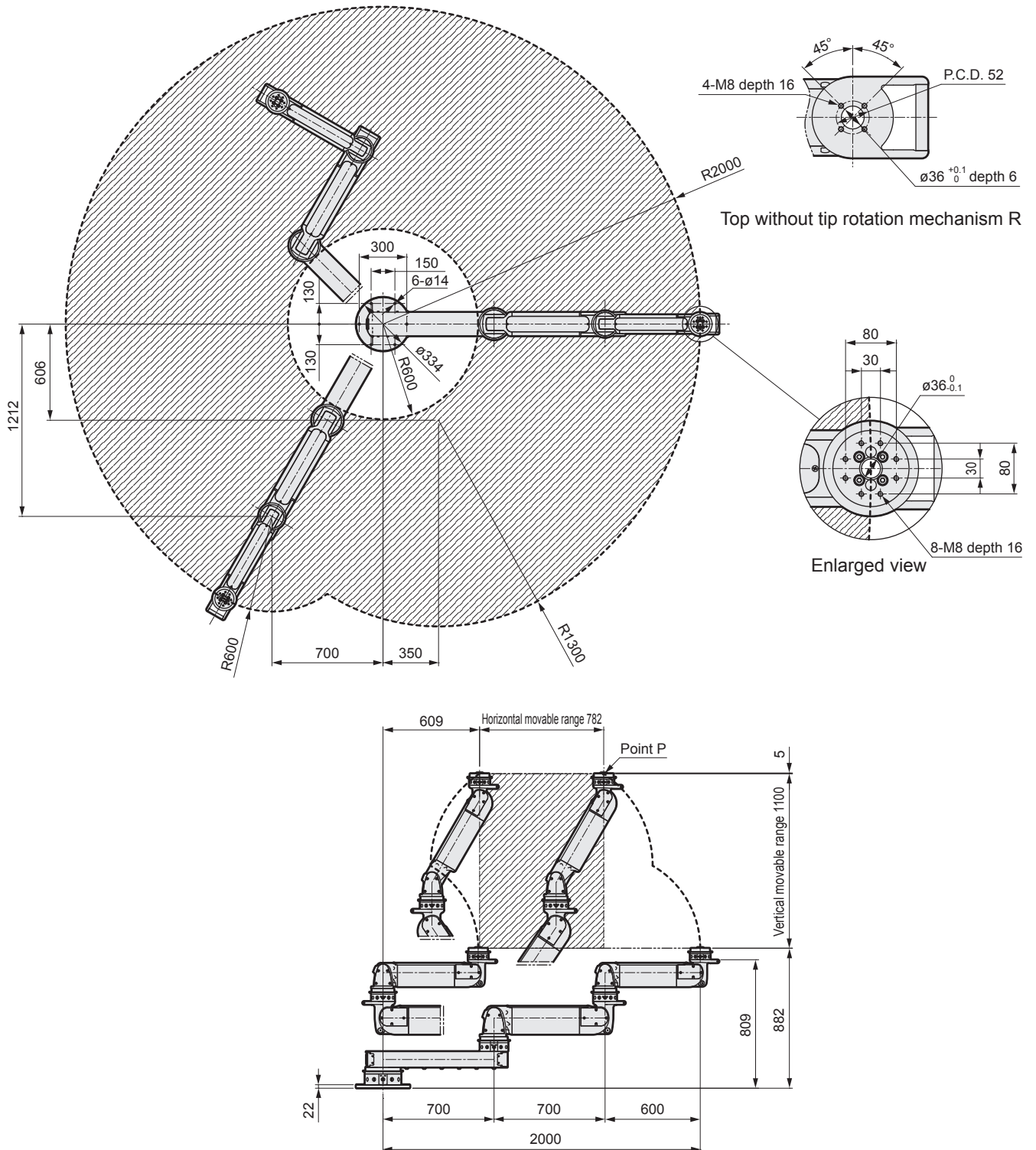


Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

- * 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 $\varnothing 80$ + middle section $\varnothing 100$ + lower section SCARA arm)

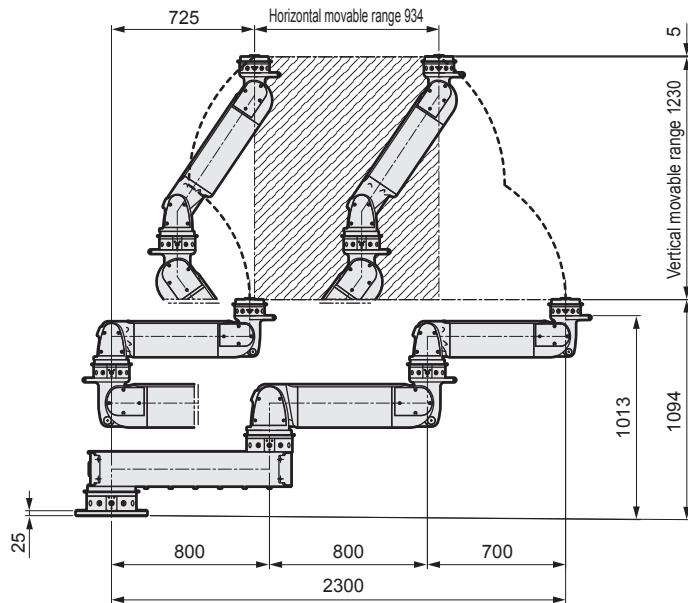
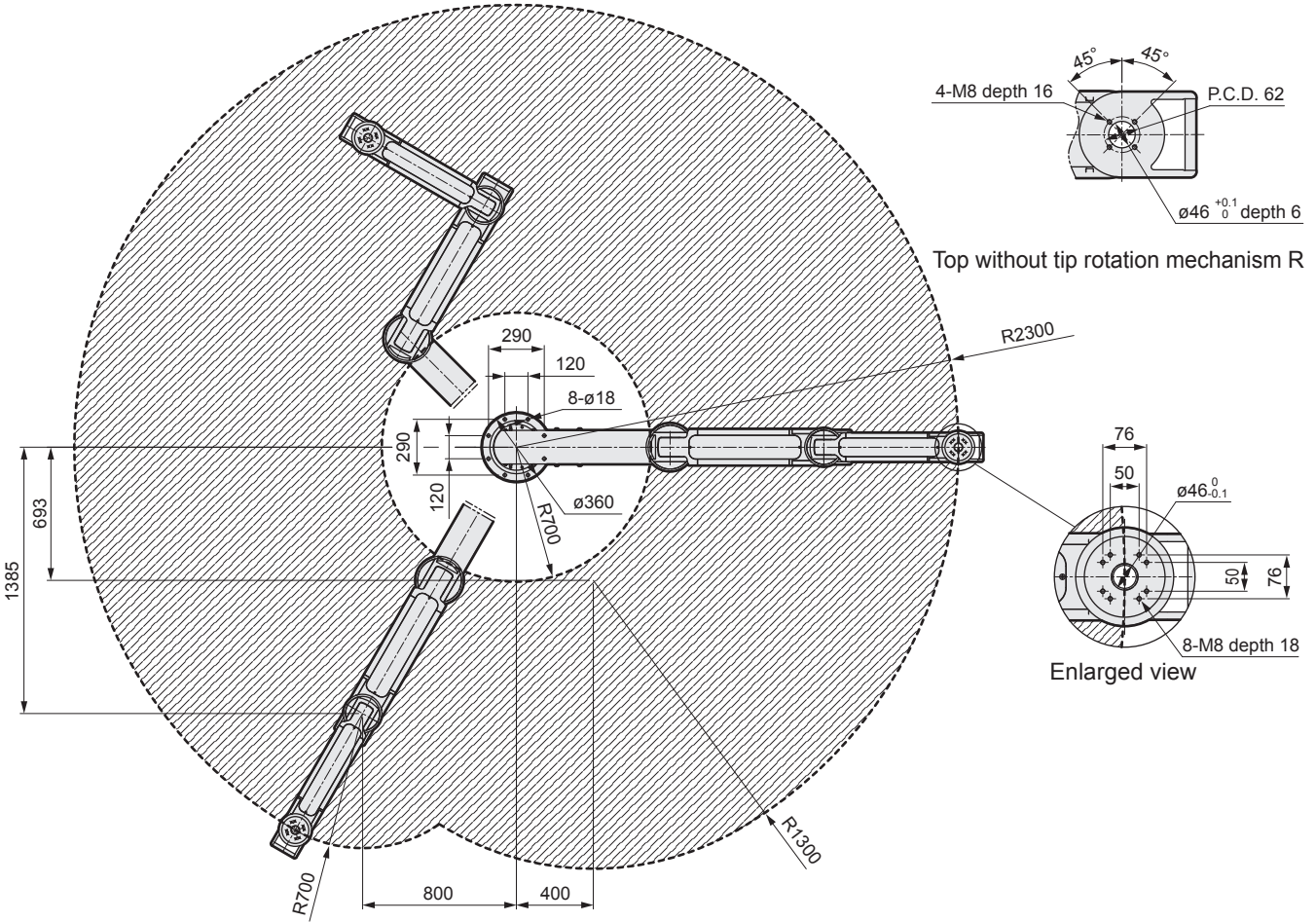


Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the point P descending edge.
Structurally, the movable range changes according to the point P rising height.

- * 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-XZS-R (upper section $\varnothing 100$ + middle section $\varnothing 125$ + lower section SCARA arm)



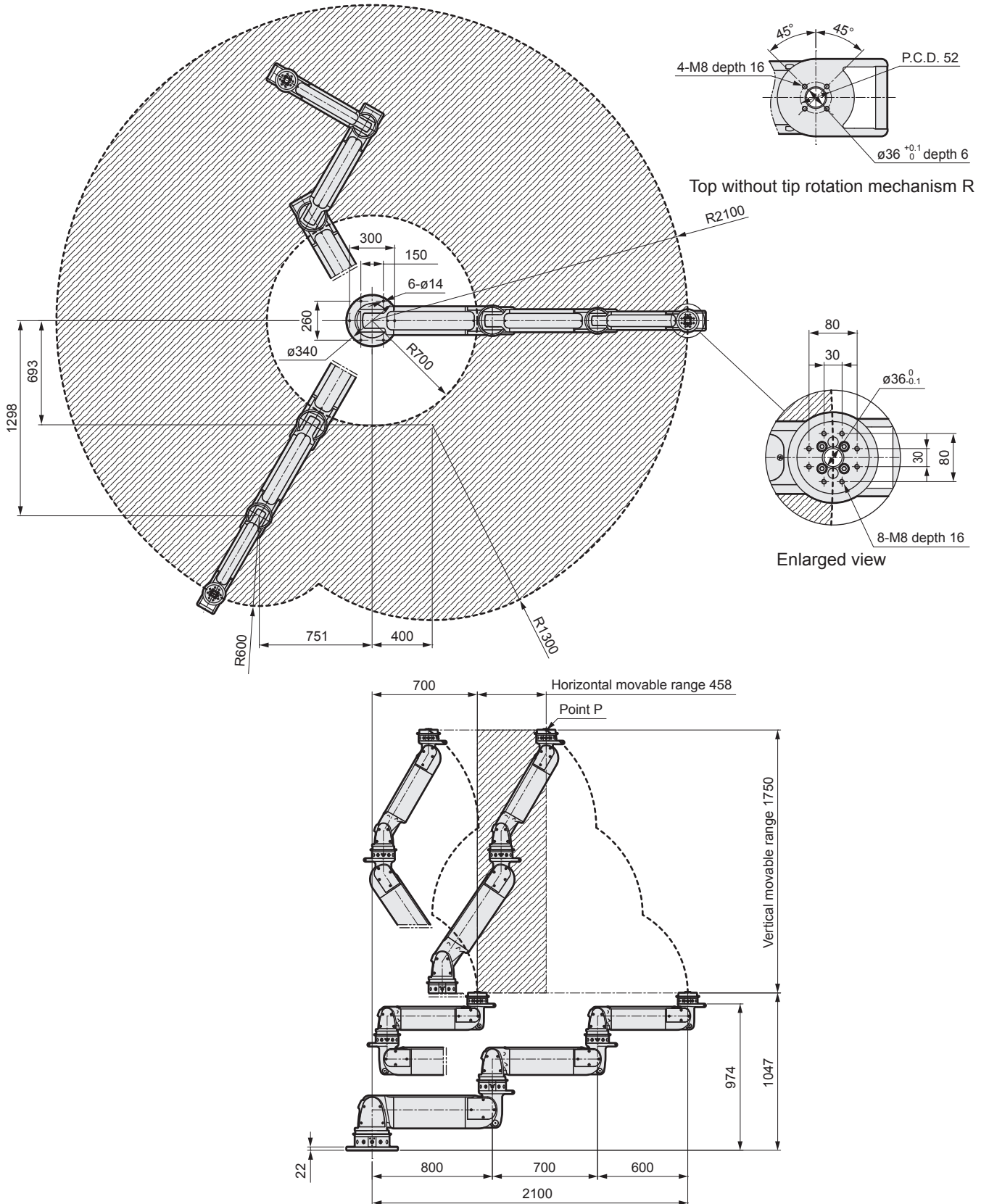
Shows dimensions with tip rotation mechanism R.
 Plane view shows movable view at the point P descending edge.
 Structurally, the movable range changes according to the point P rising height.

* 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 $\varnothing 125$)



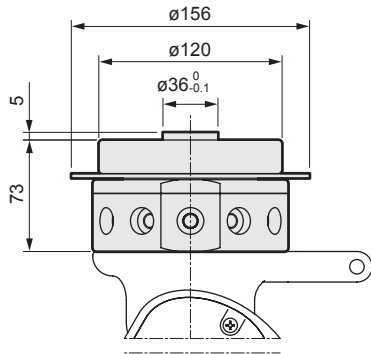
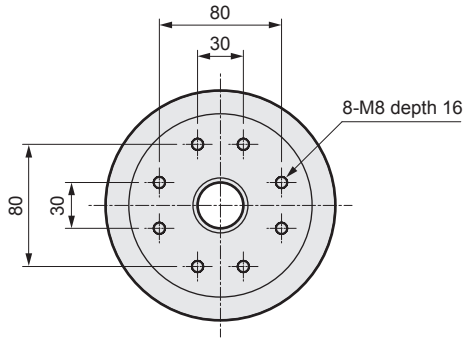
Shows dimensions with tip rotation mechanism R.
Plane view shows movable view at the point P descending edge.
Structurally, the movable range changes according to the point P rising height.

- * 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.

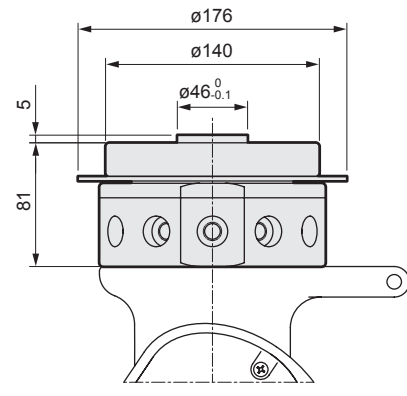
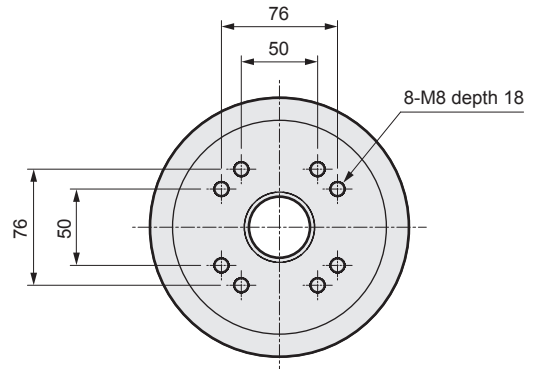
Optional dimensions

● Tip rotation mechanism (R)

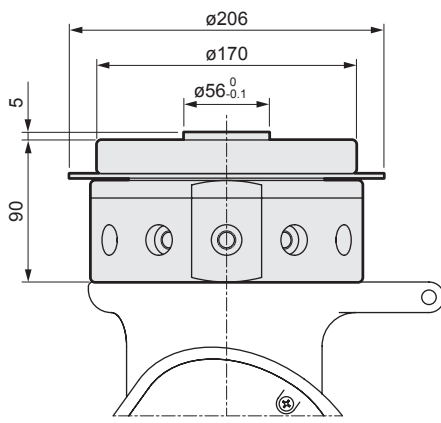
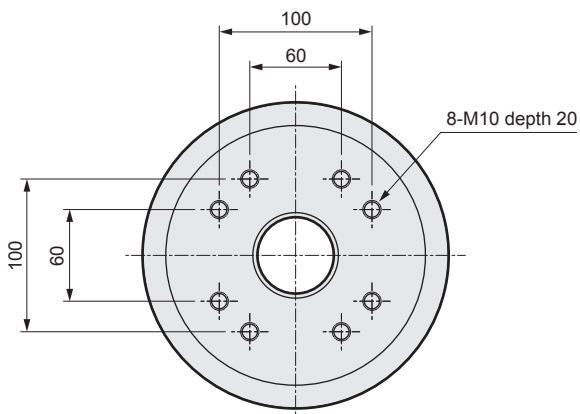
· For PAW-S-8-R
 PAW-M-8S-R
 PAW-M-8X-R
 PAW-M-8XS-R
 PAW-M-8XZ-R



· 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

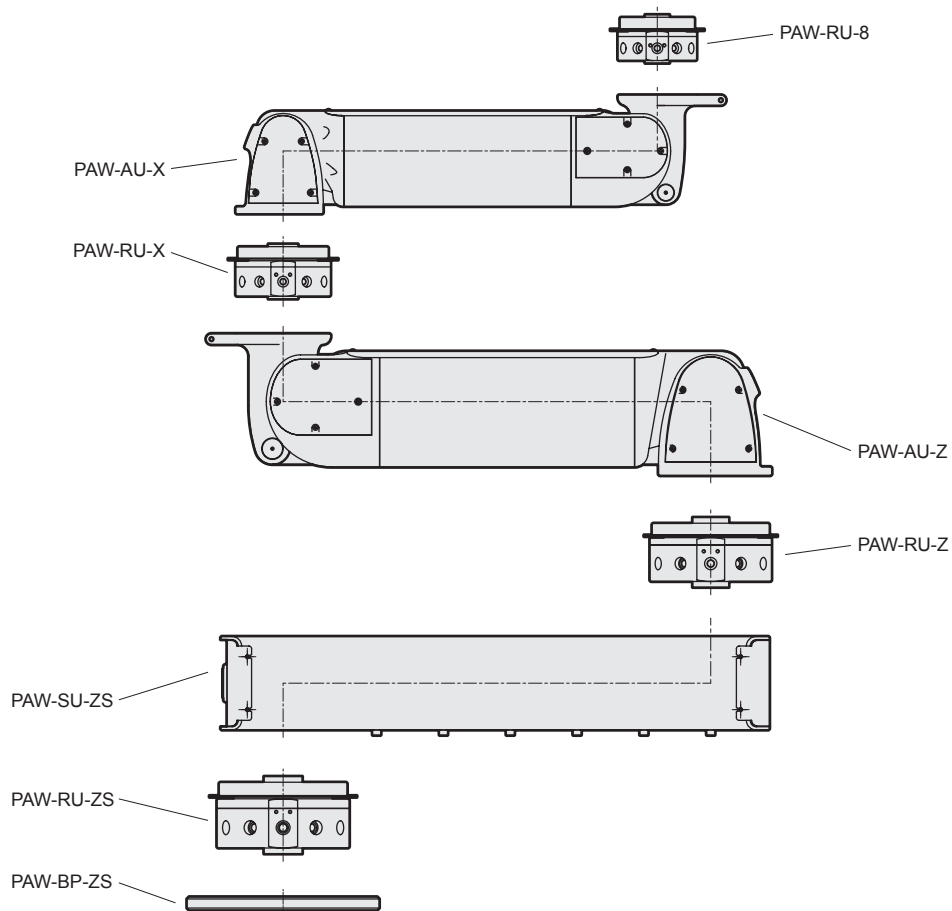
PAW-BP-()	
8	AU-8 base part (assembled to RU-8)
X	AU-X base part (assembled to RU-X)
Z	AU-Z base part (assembled to RU-Z)
ZS	SU-Z base part (assembled to RU-ZS)

Rotation lock unit

PAW-LU

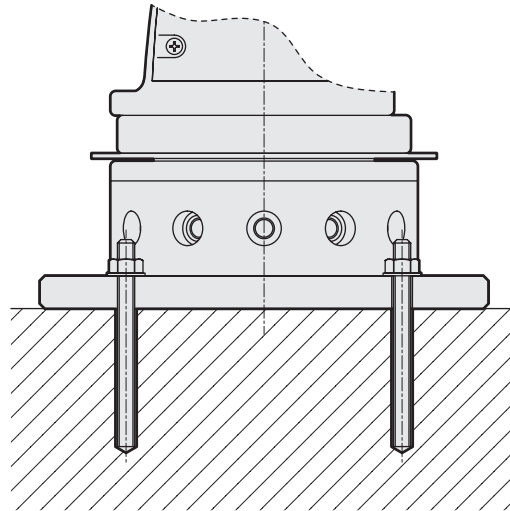
...Common to each rotation unit (1 unit is required for each rotation unit location)

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.

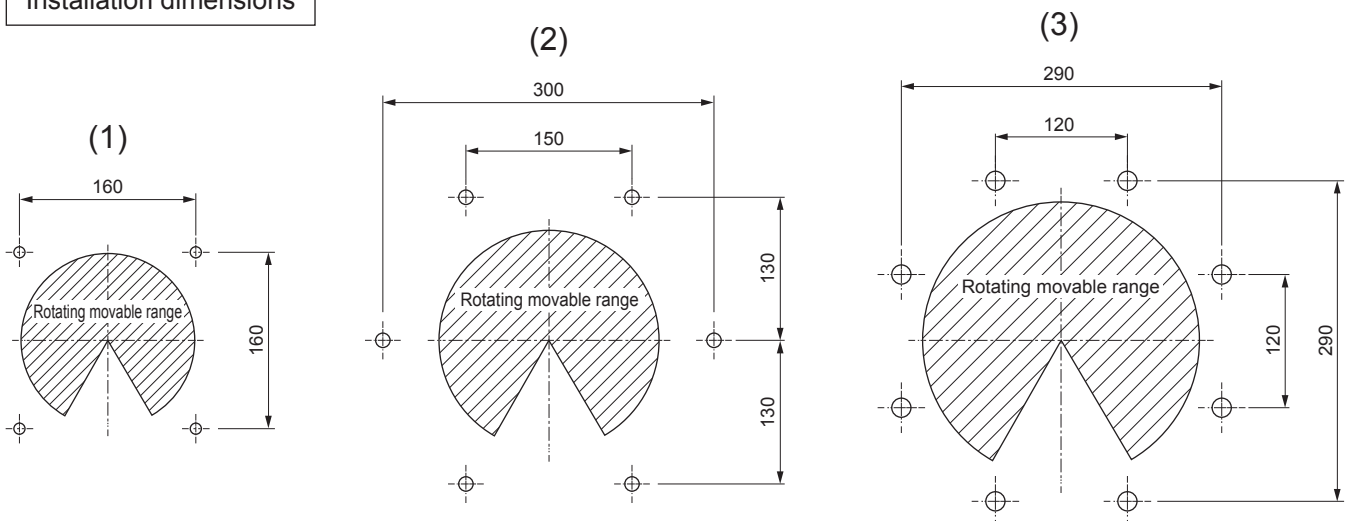
Anchor work



- 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



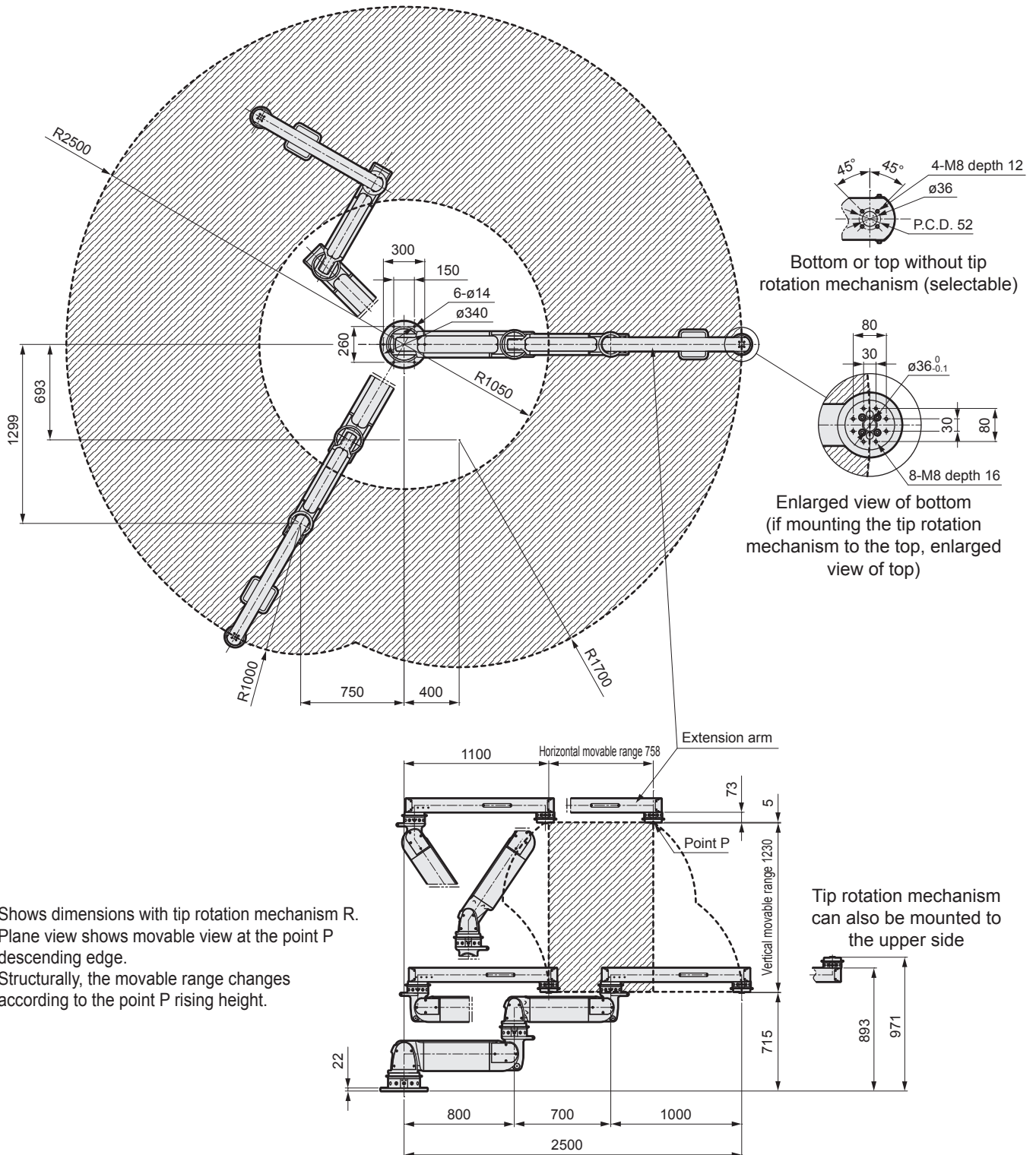
- If mounting to a frame or dolly, etc., use 10.8 or 12.9 category bolt strength, and check that the screw insertion depth is 1.5D or more.
- When installing the product, make sure that the installation surface is accurately leveled. If not level, position holding may become impossible due to arm tip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

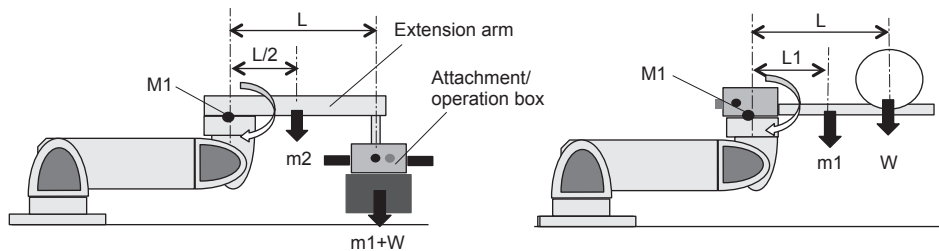
Example: Movable range when the arm extension is installed on PAW-M-XZ (upper section $\varnothing 100$ + lower section $\varnothing 125$)



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

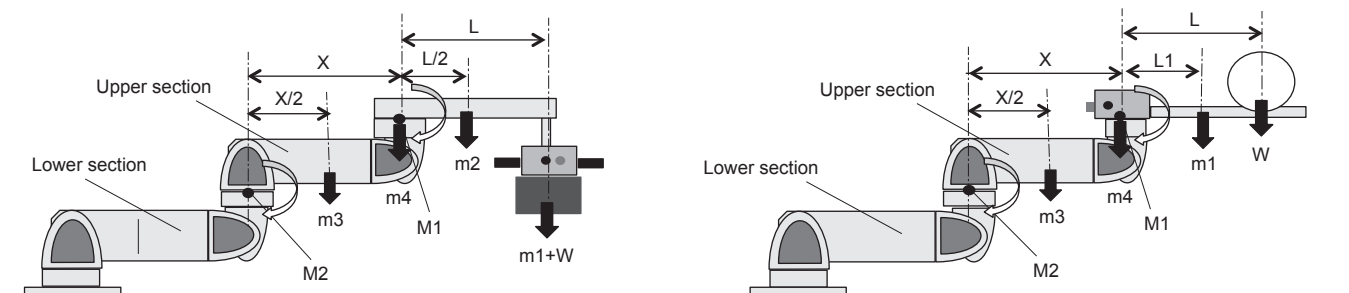
When the attachment is offset
 $M1=m1 \times L1+W \times L$

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

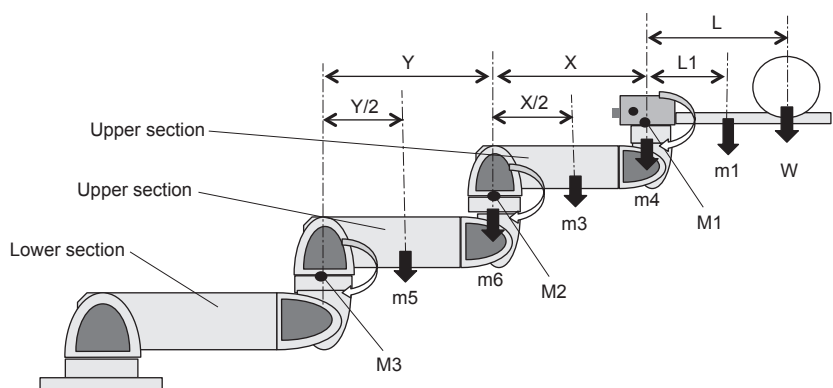
m1: Attachment/operation box weight
 m3: PowerArm weight
 PAW-AU-8: 14kg PAW-AU-X: 23kg
 PAW-AU-Z: 42kg
 m4: Rotation unit weight
 PAW-RU-T: 4kg PAW-RU-8: 5kg
 PAW-RU-X: 8kg
 W: Weight of workpiece
 L1: Distance from the PowerArm mounting part to the center of gravity of the attachment/operation box
 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

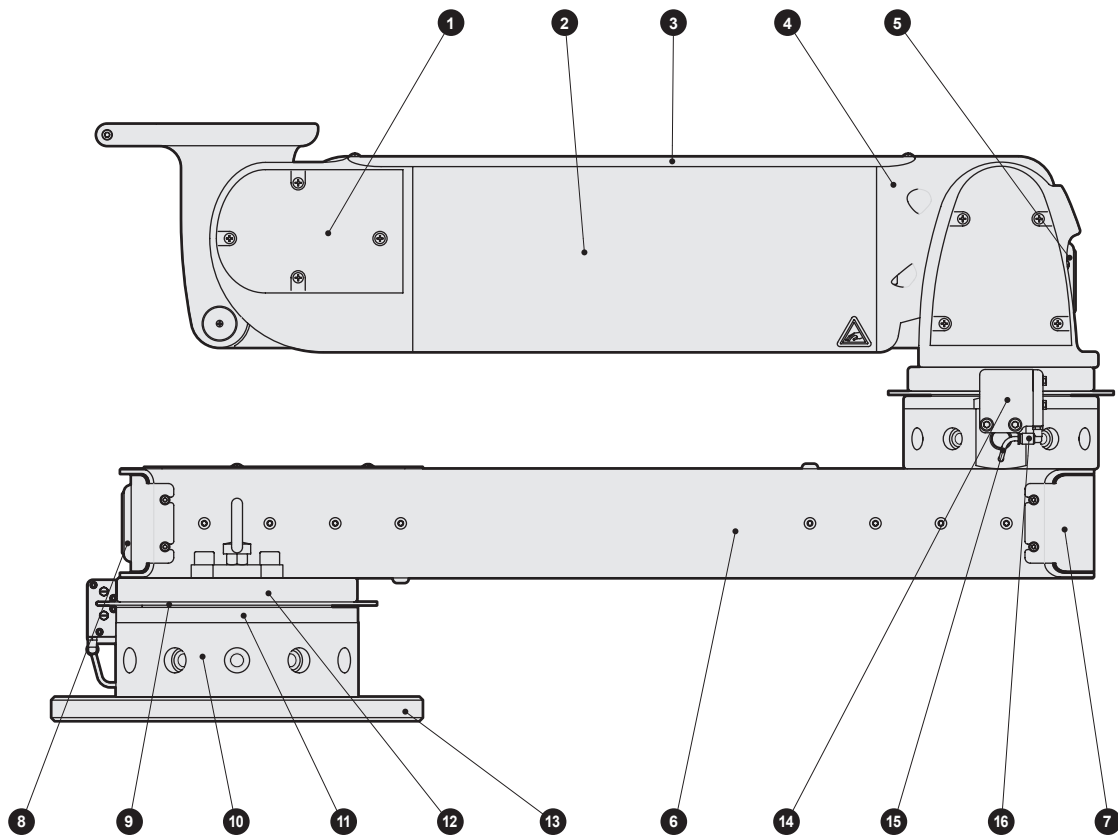
Model No.	Upper section M1(N·m)	Middle section M2(N·m)	Lower section M3(N·m)
PAW-M-8XZ	350	550	900

* 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.

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