# ⦿SMC Information

Slim-line Power Clamp Cylinder
CKZ2N-X2346 (Clamp arm accuracy adjustment specification)
⌀50, ⌀63, ⌀80

●Distance accuracy from the reference hole to the lower surface of the clamp arm is ±0.1 mm.
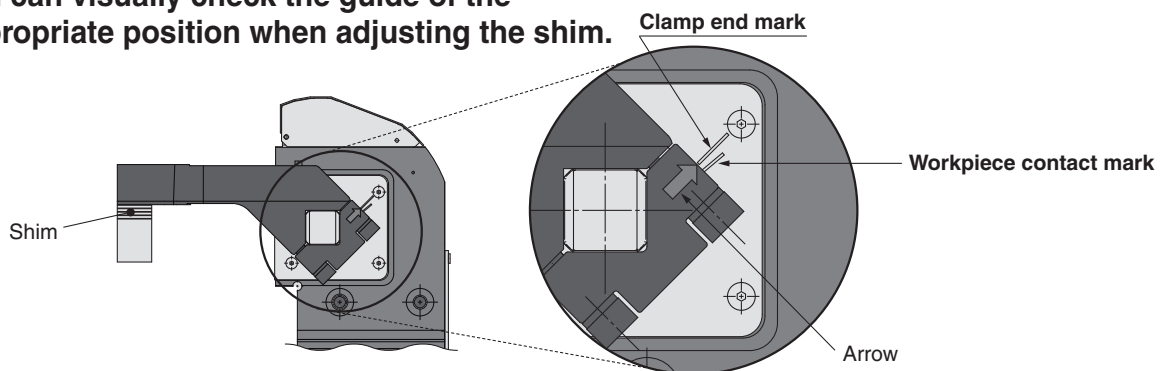
A hard stop is not required for the clamping.
**Mounting conditions are reproducible when the cylinder is replaced.**

Clamp arm

Reference plane

H ± 0.1

Holding screw part is welded

Reference hole
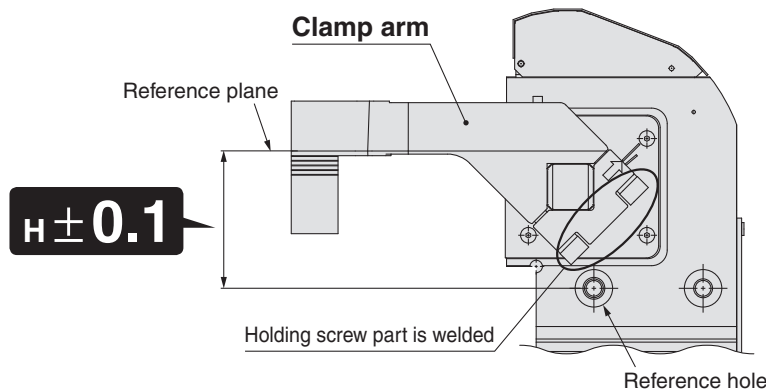
●Easy setup with a scale

You can visually check the guide of the appropriate position when adjusting the shim.

Clamp end mark

Workpiece contact mark

Shim

Arrow

●Reduced width

The torch of the spot welding or arc welding can enter easily.
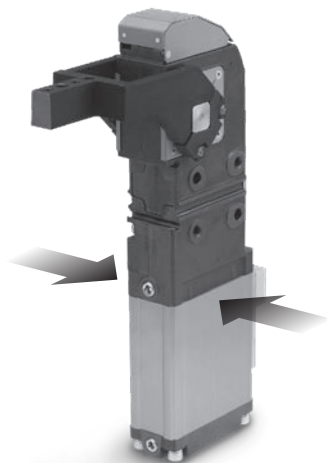
●Compatible with the magnetic field resistant auto switch D-P4DW□.

●A high clamping force is obtained through the toggle mechanism.

Slim-line Power Clamp Cylinder
CKZ2N-X2346
⌀50, ⌀63, ⌀80

How to Order

CKZ2N **63** – **120** – **P4DWSC** ☐ – **X2346**

Bore size

50	50 mm equivalent
63	63 mm equivalent
80	80 mm equivalent

Arm opening angle

30	30°
45	45°
60	60°
75	75°
90	90°
105	105°
120	120°
135	135°

X part no.

X2346	• Clamp arm (fixed on the product) accuracy adjustment spec. • Compatible with magnetic field resistant auto switch • Toggle angle: 2° short of the dead point • With metal cover

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable auto switch

Nil	Without auto switch (Without switch mounting bracket)
P4DWL	D-P4DWL
P4DWZ	D-P4DWZ
P4DWSC	D-P4DWSC
P4DWSE	D-P4DWSE

Maximum Clamping Moment

Unit: N·m

Equivalent bore size (mm)	Max. clamping moment					
	0.3 MPa	0.4 MPa	0.5 MPa	0.6 MPa	0.7 MPa	0.8 MPa
50	100	130	160	190	220	250
63	300	350	400	450	500	550
80	560	720	880	1040	1200	1360

Cylinder Specifications

Equivalent bore size	50	63	80
Arm opening angle	30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°		
Cushion	Unclamping side rubber bumper		
Max. operating pressure	0.8 MPa		
Operating temperature range	−10 to 60°C		
Min. operating time	1 sec. to clamp, 1 sec. to unclamp		

Solid State Auto Switch Specifications

| Switch model	**D-P4DW☐**
Load voltage	24 VDC
Load current	6 to 40 mA or less
Internal voltage drop	5 V or less
Leakage current	1 mA or less
Operating time	40 ms
Impact resistance	Switch: 1000 m/s^2 Connector: 300 m/s^2 Note)
Indicator light	Operating position: Red LED lights up Optimum operating position: Green LED lights up

Note) The above specifications are those when the D-P4DWSC or D-P4DWSE is selected.

⬢SMC

Slim-line Power Clamp Cylinder
CKZ2N-X2346
Setup Procedure

Precautions ∗ In this cylinder, the shim is pulled out to increase the power.

Reference plane

H±0.1

Shim

Reference hole
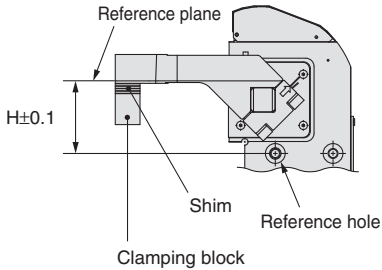
Clamping block

1. Since the distance accuracy from the reference hole to the lower surface of the clamp arm is ±0.1 mm at the stroke end as shown in the figure on the left side, a hard stop is not required for the clamping. When a clamp arm deflection lock is required, install the side guides.
2. Even when the arm operates to the clamp end, the internal toggle mechanism does not enter the dead point (2° short of the dead point). Therefore, clamping cannot be held during air exhaust.
3. For normal clamping with clamping force only and for mounting adjustment, be sure to insert a shim around 3 mm in size by referring to the clamping force characteristics graph, "Distance h from the reference plane".

Clamp end mark
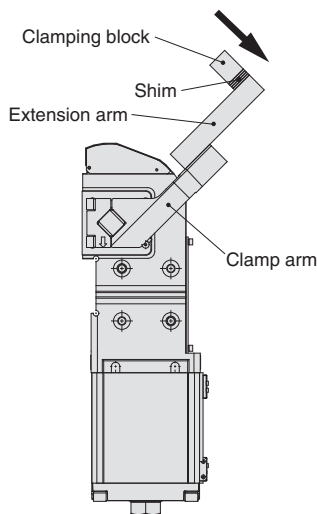
Arrow
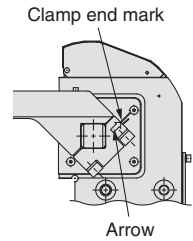
When using the side guide
Precaution
When using the side guide to the clamp arm to prevent lateral motion, make sure not to apply a lateral load or galling to the clamp arm.
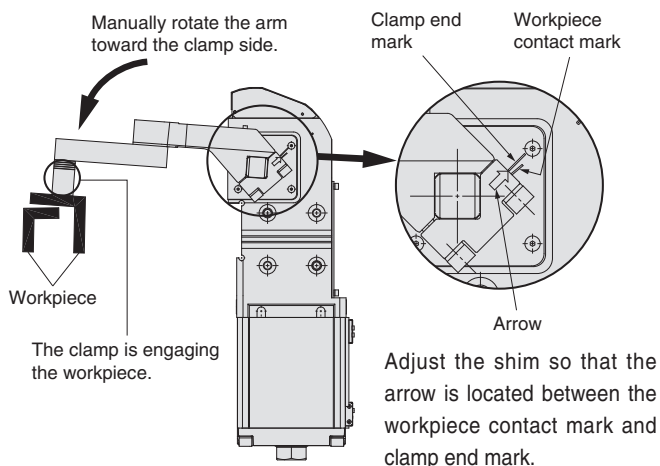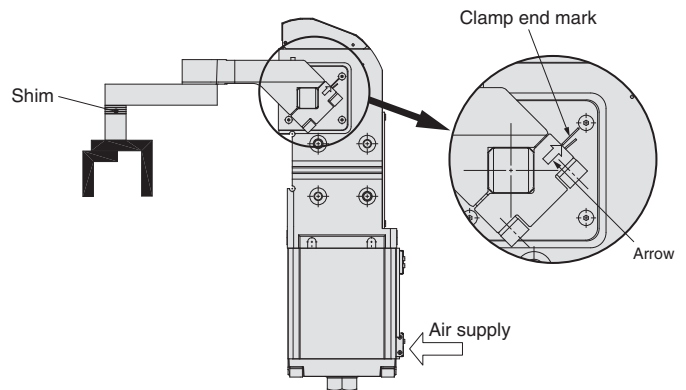
Clamp arm

Side guide
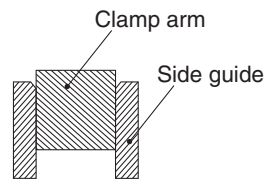
Mounting

Step 1 Exhaust the air to switch to the unclamped state.

Clamping block

Shim

Extension arm

Clamp arm

Step 3 Supply air to the clamp side and adjust with the shim so that the arrow mark is located at a position close to the clamp end mark. (For the shim amount, refer to the clamping force characteristics graph, "Distance h from the reference plane" on page 4.)

Clamp end mark

Shim

Arrow

Air supply

Step 2 Manually place the arm on workpieces.

Manually rotate the arm toward the clamp side.

Clamp end mark

Workpiece contact mark

Workpiece

The clamp is engaging the workpiece.

Arrow

Adjust the shim so that the arrow is located between the workpiece contact mark and clamp end mark.

Step 4 Use a speed controller and adjust it so that it takes at least 1 second when changing from clamping to unclamping (or vice versa).
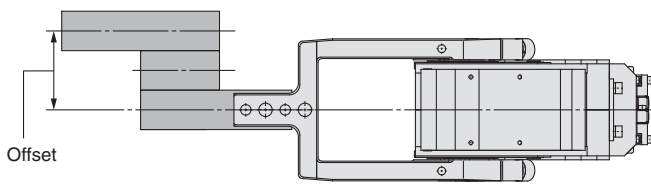
Clamping force characteristics

Clamping force characteristics by arm length, bore size, and operating pressure (0.5 MPa)

Allowable arm length

Arm length

Arm

Distance **h** from the reference plane (mm)

Clamp reference plane 0 mm

Measuring point

Extension arm   Load cell
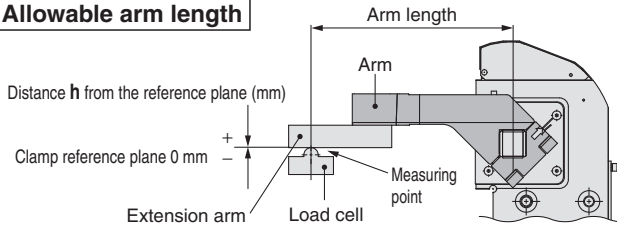
(mm)

Bore size	Arm length
50	250
63	300
80	400

Allowable offset

Offset

(mm)

Bore size	Offset
50	50
63	50
80	55

∗ The clamping force does not change within the allowable offset.

50

Arm length 250 mm
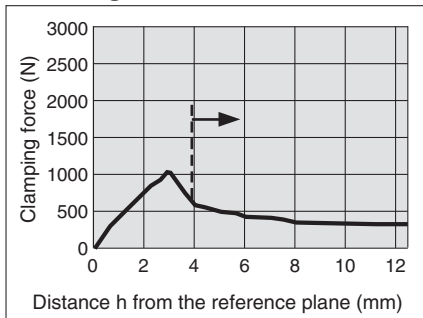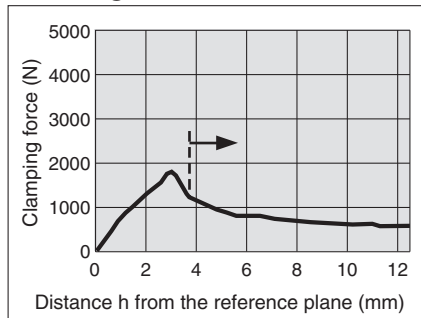
Distance h from the reference plane (mm)
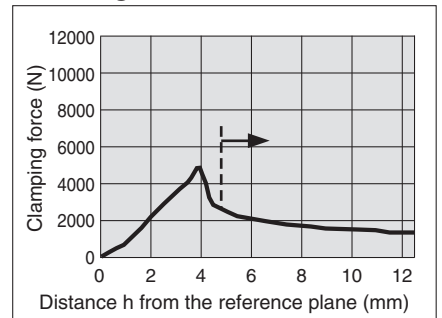
∗ The above arrow shows the recommended operating range.

63

Arm length 250 mm

Distance h from the reference plane (mm)

Arm length 300 mm

Distance h from the reference plane (mm)

80

Arm length 250 mm

Distance h from the reference plane (mm)

Arm length 300 mm

Distance h from the reference plane (mm)

Arm length 400 mm

Distance h from the reference plane (mm)

SMC
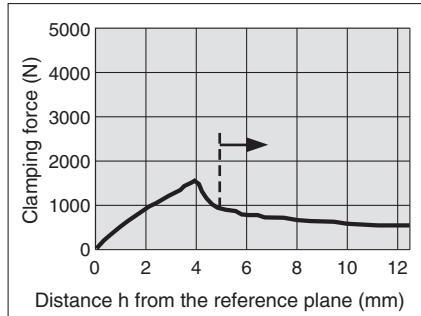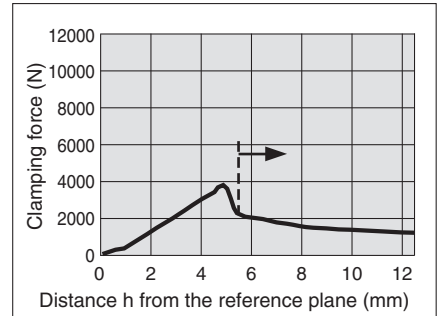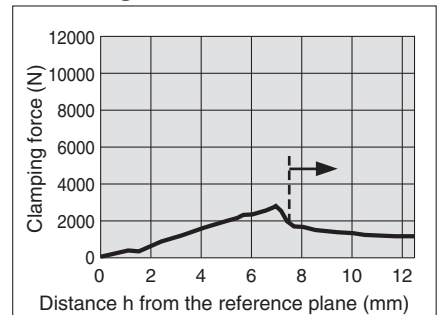
Arm end load capacity

The weight of the extension arm and clamping block to be mounted on the clamp arm may vary depending on the unclamping angle. Be sure to use the product within the allowable values in the graphs shown below.

∗ The load indicates the total weight of the extension arm and clamping block.

Selection procedure of arm end load capacity
1. Calculate the distance **L** from the fulcrum to the center of gravity of the extension arm + clamping block.
2. Check the unclamping angle of the product.
3. Obtain the load capacity from the graph, and use the product within the allowable range.

Unclamping angle

θ

Clamp arm

Extension arm

W

Fulcrum

Clamping block

L

50

Distance to the load center of gravity L (mm)

Arm end load capacity W (kg)

30
45
60
75
90
105
120
135

63

Diagram of unclamping angle 90°

Distance to the load center of gravity L (mm)

250 mm
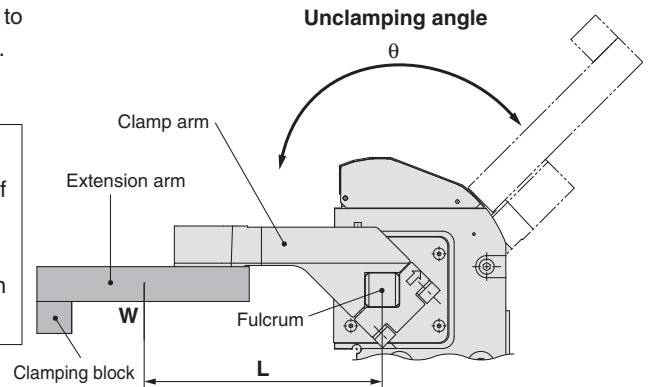
1.2 Kg

Arm end load capacity W (kg)

30
45
60
75
90
105
120
135

80

Distance to the load center of gravity L (mm)

Arm end load capacity W (kg)

30
45
60
75
90
105
120
135

Selection example For graph size 63, when the unclamping angle is 90° and the extension arm + clamping block center of gravity position is 250 mm.

When the center of gravity position of the load capacity of the extension arm + clamping block is 250 mm on the diagram at an unclamping angle of 90° in the size 63 graph, the total load capacity of the extension arm + clamping block is to 1.2 kg.

CKZ2N-X2346

Dimensions

CKZ2N50-☐-☐☐-X2346

2 x ø10.2

30±0.02

(20)

24±0.1

30±0.2

2 x ø8H7

Open the metal cover when operating the manual release.

Manual release point

Dead point mark

149±0.1

123.8

101.15

92.8

23.3

Clamp fulcrum 19h9

78.5

(28)

Clamp end mark

Workpiece contact mark Note 3)

55±0.1

68

39.6

2 x 2 x M8 x 1.25
Depth 12

Rc 1/4
(Unclamping side)

2 x 2 x ø8H7
Depth 12

D-P4DW☐
Switch on the clamping side
With spatter cover (D-P5DWL-491)

40±0.05

45±0.02

45±0.02

149.5

138.5

5±0.05

110±0.1

(376.8)

D-P4DW☐
Switch on the unclamping side Note 4)
For the 30° arm opening angle Note 2)
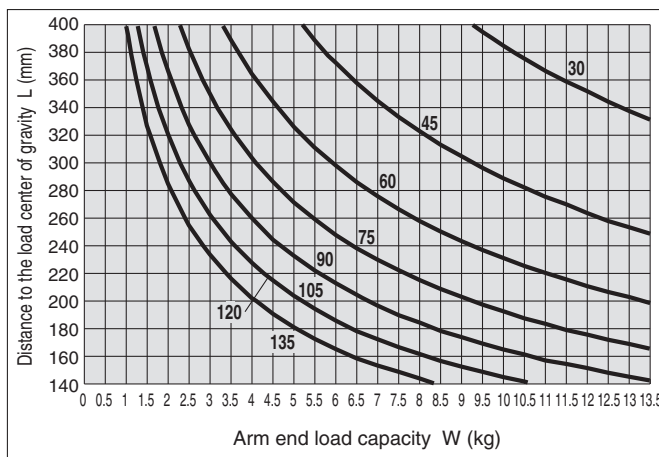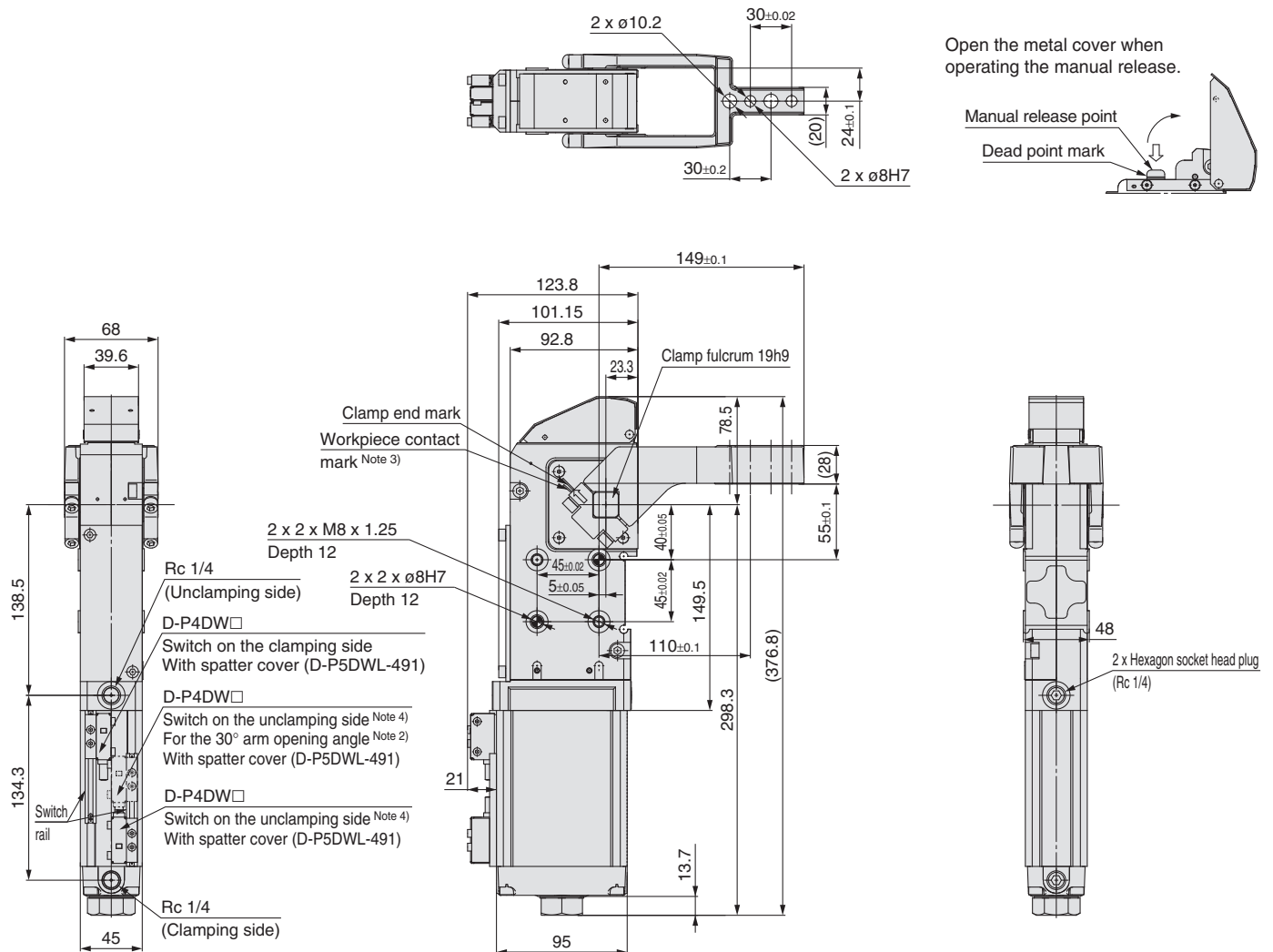With spatter cover (D-P5DWL-491)

298.3

134.3

D-P4DW☐
Switch on the unclamping side Note 4)
With spatter cover (D-P5DWL-491)

21

Switch
rail

13.7

Rc 1/4
(Clamping side)

45

95

48

2 x Hexagon socket head plug
(Rc 1/4)

Note 1) Since this product is set so that the toggle angle is 2° short of the dead point at the clamp end, it does not lock when the air is exhausted.
Note 2) For the 30° arm opening angle, the electrical entry direction of the auto switch is different.
Note 3) When setting up the product, set the position of where the clamp arm is in contact with the workpiece on the clamping side so that the arrow mark is located between the workpiece contact mark and clamp end mark.
Note 4) When only one switch is provided, it is mounted on the unclamping side.

SMC

Dimensions

CKZ2N63-□-□□-X2346

2 x ø10.2

30±0.02

27±0.1

30±0.2

2 x ø8H7

Open the metal cover when operating the manual release.

Manual release point
Dead point mark

154±0.1
142.3
113.6
105.3
28.8

Clamp fulcrum
22h9

77.5

(28)

70±0.1

Clamp end mark
Workpiece contact mark Note 3)

55±0.05

55±0.02

10±0.05

45±0.02

158.5

115±0.1

317.6

(395.1)

2 x 2 x M10 x 1.5
Depth 12

2 x 2 x ø10H7
Depth 15

22

16.6

112

78
46.6

147.5

Rc 1/4
(Unclamping side)

D-P4DW□
Switch on the clamping side
With spatter cover (D-P5DWL-491)

D-P4DW□
Switch on the unclamping side Note 4)
For the 30° arm opening angle Note 2)
With spatter cover (D-P5DWL-491)

D-P4DW□
Switch on the unclamping side Note 4)
With spatter cover (D-P5DWL-491)

141.2

Switch rail

Rc 1/4
(Clamping side)

50

2 x Hexagon socket head plug
(Rc 1/4)

54

Note 1) Since this product is set so that the toggle angle is 2° short of the dead point at the clamp end, it does not lock when the air is exhausted.
Note 2) For the 30° arm opening angle, the electrical entry direction of the auto switch is different.
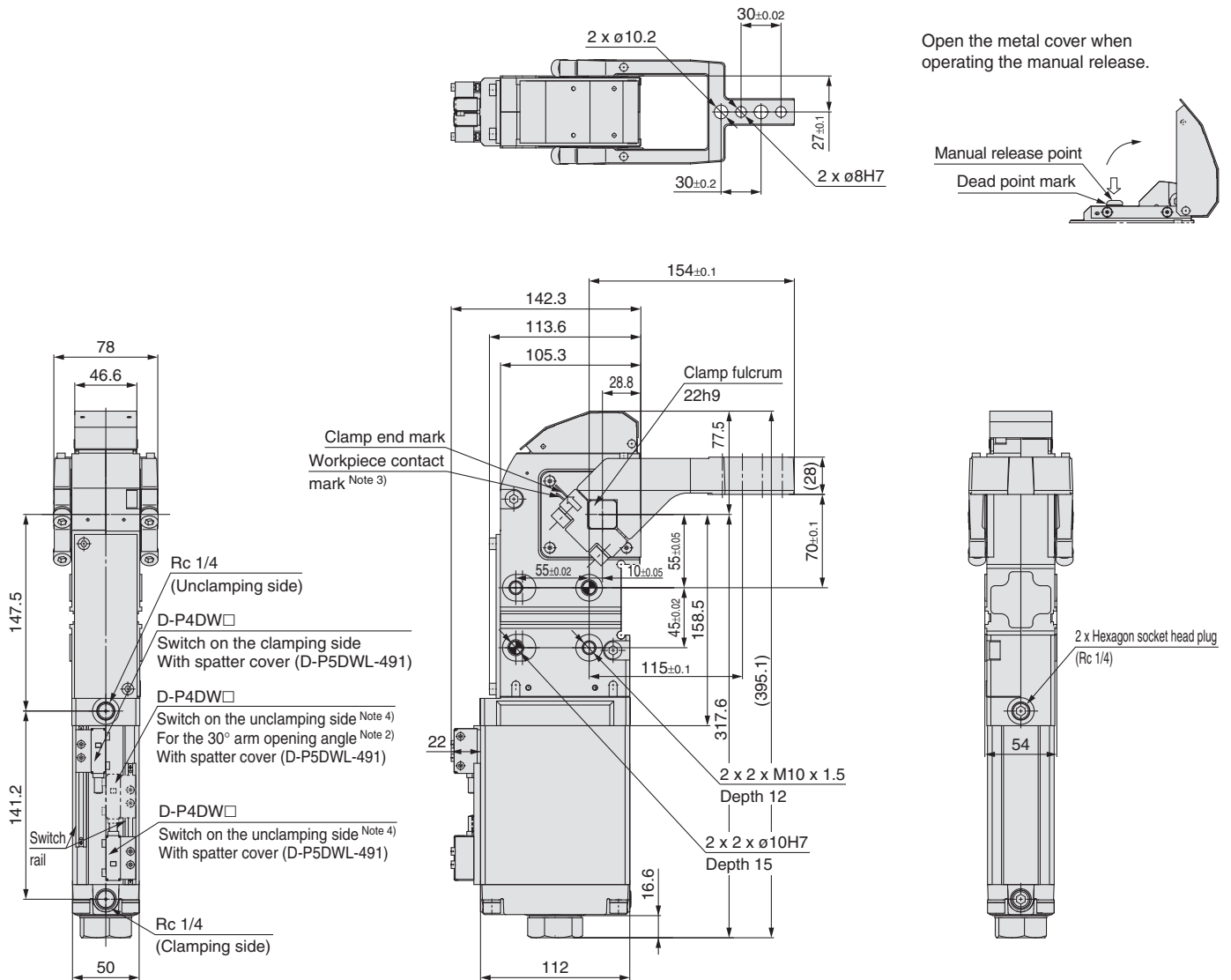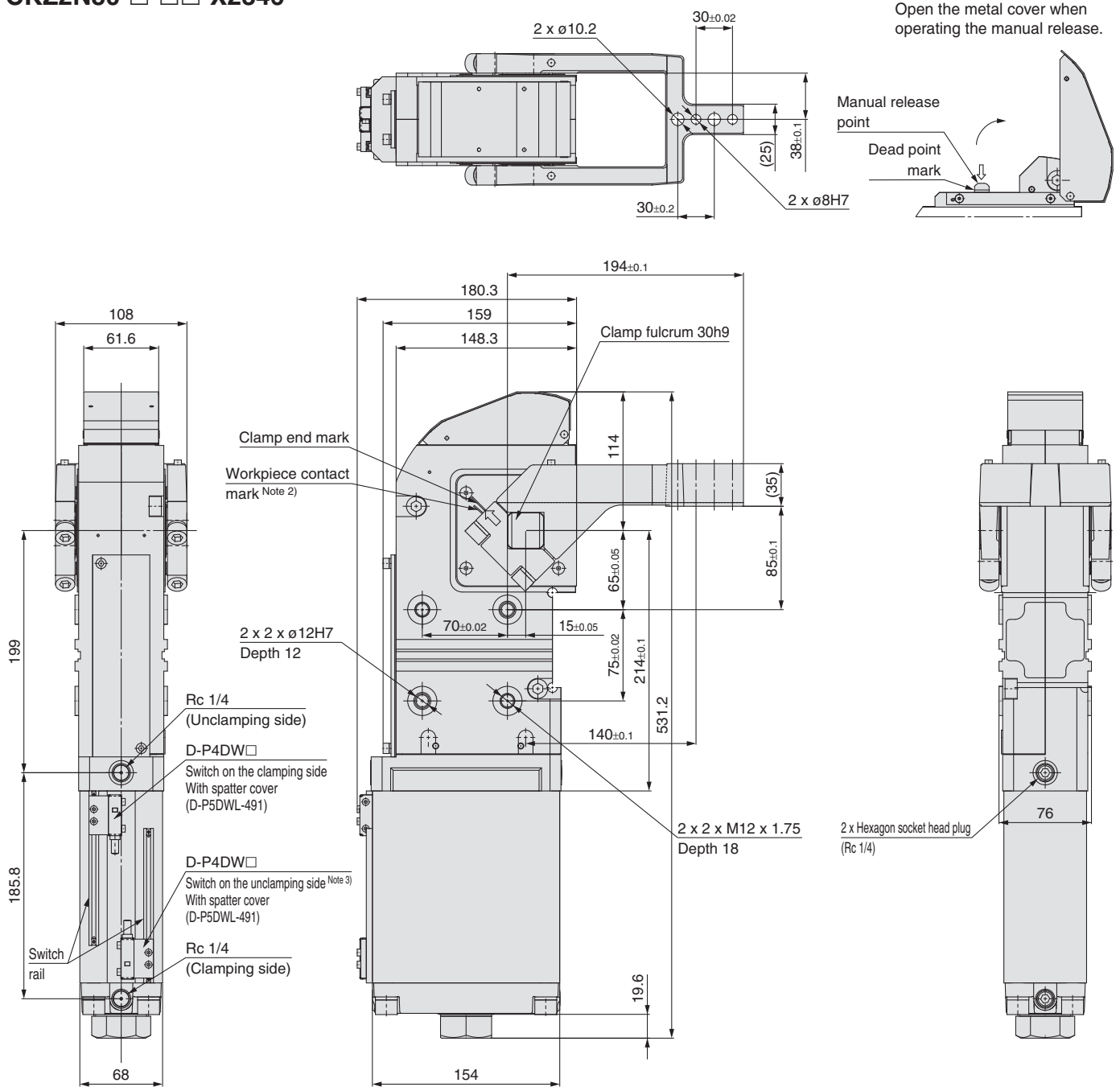Note 3) When setting up the product, set the position of where the clamp arm is in contact with the workpiece on the clamping side so that the arrow mark is located between the workpiece contact mark and clamp end mark.
Note 4) When only one switch is provided, it is mounted on the unclamping side.

CKZ2N-X2346

Dimensions

CKZ2N80-□-□□-X2346

Open the metal cover when operating the manual release.

2 x ø10.2

30±0.02

38±0.1

(25)

2 x ø8H7

Manual release point

Dead point mark

194±0.1

180.3

159

148.3

Clamp fulcrum 30h9

114

Clamp end mark

Workpiece contact mark Note 2)

(35)

85±0.1

65±0.05

70±0.02

15±0.05

75±0.02

214±0.1

531.2

140±0.1

108

61.6

199

185.8

Rc 1/4 (Unclamping side)

D-P4DW□
Switch on the clamping side
With spatter cover
(D-P5DWL-491)

D-P4DW□
Switch on the unclamping side Note 3)
With spatter cover
(D-P5DWL-491)

Rc 1/4 (Clamping side)

Switch rail

68

2 x 2 x ø12H7
Depth 12

2 x 2 x M12 x 1.75
Depth 18

19.6

154

76

2 x Hexagon socket head plug (Rc 1/4)

Note 1) Since this product is set so that the toggle angle is 2° short of the dead point at the clamp end, it does not lock when the air is exhausted.
Note 2) When setting up the product, set the position of where the clamp arm is in contact with the workpiece on the clamping side so that the arrow mark is located between the workpiece contact mark and clamp end mark.
Note 3) When only one switch is provided, it is mounted on the unclamping side.

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