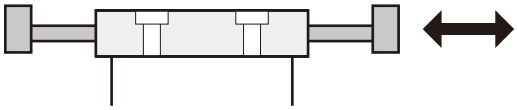
SPACE-SAVING

These space-saving, high-precision, advanced-performance actuators combine 2 air cylinders within a compact thin body pneumatic device. The flat, square shape achieves twice the cylinder thrust, for maximum utilization of the limited space.

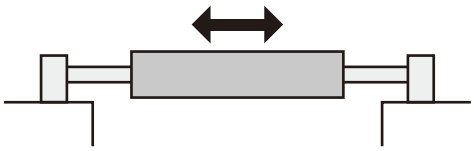
In addition, the cylinder's piston rods act as guides to improve non-rotating accuracy and positioning accuracy, demonstrating great effectiveness in reducing design hours and costs for mechanical devices.

Fixed Table Type HSUT



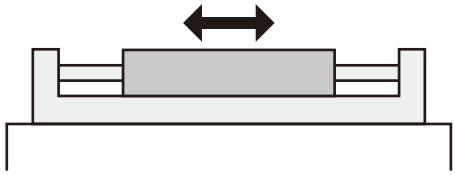
Because the piston rod moves, it can be used as a non-rotating cylinder, and both end plates can be used as sliding tables.

Fixed End Plate Type HSUP



By fixing both end plates, it can be used as a sliding table.
Piping connections are possible from either of the 2 end plates.

Fixed Rail-on Plate Type HSUL



A slide bearing is installed under the table of the fixed end plate type for heavy loads and/or longer strokes.

With End Keep Mechanism

Fixed table type HSUTK
Fixed end plate type HSUPK
Fixed rail-on plate type HSULK

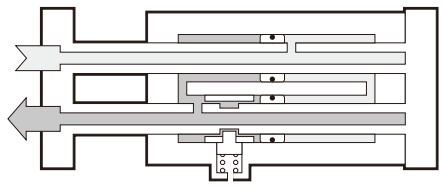
A lock mechanism, with proven performance on the Slim cylinders, prevents the table from falling in the event of pressure loss or failure.

Can select either the solid state type sensor switch or the reed type sensor switch.

The stroke adjusting bolt provides an adjustment range of ±5mm [±0.197in.].

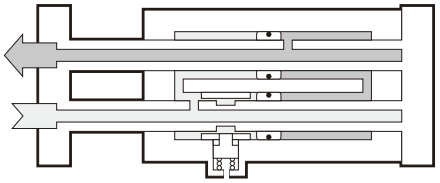
Optional shock absorber is installed in the table and achieves space savings.

■Keep Lock



When the piston reaches the end of the stroke and the locking mechanism side is completely exhausted, a spring force automatically actuates the lock piston to come out and hold the table.

■Release



When compressed air is supplied to the locking mechanism side, the lock piston returns to its original position and releases the lock and the table starts moving.

SLIDE UNITS

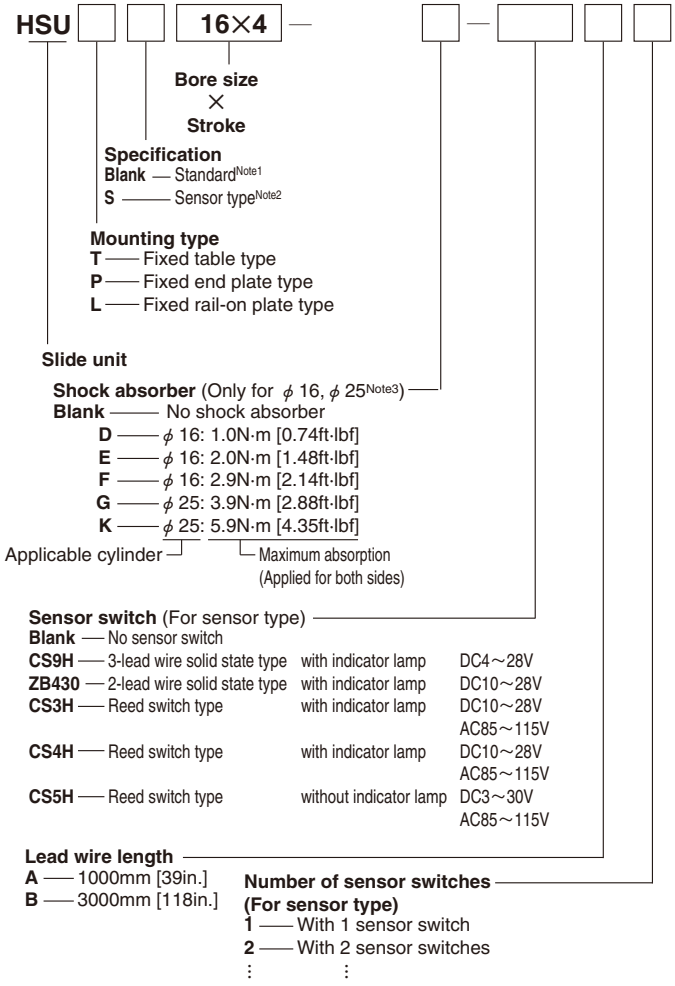
Normal Type

Specifications

Item \ Bore size mm [in.]		10 [0.394]	16 [0.630]	25 [0.984]
Operation type		Double acting, double piston type		
Media		Air		
Mounting type		Fixed table type, Fixed end plate type, Fixed rail-on plate type		
Operating pressure range MPa [psi.]	Fixed table type Fixed end plate type	0.15～0.9 [22～131]	0.15～0.9 [22～131]	0.1～0.9 [15～131]
	Fixed rail-on plate type	0.2～0.9 [29～131]		
Proof pressure MPa [psi.]		1.32 [191]		
Operating temperature range °C [°F]		0～60 [32～140]		
Operating speed range mm/s [in./sec.]	Standard	50～200 [2.0～7.9]		
	With shock absorber	—	50～400 [2.0～15.7]	
Cushion		None	Shock absorber (Optional)	
Lubrication		Not required		
Non-rotating accuracy		±0.1°	±0.05°	±0.02°
Stroke adjusting range mm [in.]		±10 [±0.394]		
Maximum loads N [lbf.]	Fixed table type[Note]	4.9 [1.10]	14.7 [3.30]	24.5 [5.51]
	Fixed end plate type	9.8 [2.20]	29.4 [6.61]	49.0 [11.02]
	Fixed rail-on plate type	98.1 [22.05]		
Port size		10-32 UNF		NPT1/8

Note : This is the total load when the load is equally applied on both plates (at the maximum stroke). When the load is on one side only, keep the load at the allowable lateral load or below.
For details, see p.889, “Allowable lateral load” and “Piston rod deflection.”

Order Codes



Notes: 1. Equipped with a magnet for sensor switch and mounting rail.

Bore Size and Stroke

inch

Bore size	Standard strokes
10	1, 2, 3, 4
16	1, 2, 3, 4, 5, 6, 7, 8
25	1, 2, 3, 4, 5, 6, 7, 8

Note: The standard strokes for the fixed rail-on plate type are 4inch or more.

Cylinder Thrust

N [lbf.]

Bore size mm [in.]	Piston rod dia. mm [in.]	Pressure area mm² [in.²]	Air pressure MPa [psi.] 0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	0.8 [116]	0.9 [131]
10 [0.394]	6 [0.236]	100.5 [0.156]	10 [2.2]	20 [4.5]	30 [6.7]	40 [9.0]	50 [11.2]	60 [13.5]	70 [15.7]	80 [18.0]	90 [20.2]
16 [0.630]	8 [0.315]	302 [0.468]	30 [6.7]	60 [13.5]	91 [20.5]	121 [27.2]	151 [33.9]	181 [40.7]	211 [47.4]	242 [54.4]	272 [61.1]
25 [0.984]	12 [0.472]	756 [1.172]	76 [17.1]	151 [33.9]	227 [51.0]	302 [67.9]	378 [85.0]	454 [102.1]	529 [118.9]	605 [136.0]	680 [152.9]

Air Consumption and Air Flow Rate

The figures in the table below show the air consumption when a Slide Unit makes 1 reciprocation with stroke of 1mm [0.0394in.].
The air flow rate and consumption actually required is found by the following calculations below.

Air consumption for each 1mm [0.0394in.] stroke

cm³ [in.³]/Reciprocation (ANR)

Bore size mm [in.]	Air pressure MPa [psi.]								
	0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	0.8 [116]	0.9 [131]
10 [0.394]	(0.40) [0.0244]	0.59 [0.0360]	0.79 [0.0482]	0.98 [0.0598]	1.18 [0.0720]	1.37 [0.0836]	1.57 [0.0958]	1.76 [0.1074]	1.96 [0.1196]
16 [0.630]	(1.19) [0.0726]	1.77 [0.1080]	2.36 [0.1440]	2.94 [0.1794]	3.53 [0.2154]	4.12 [0.2514]	4.70 [0.2868]	5.29 [0.3228]	5.87 [0.3582]
25 [0.984]	2.98 [0.1819]	4.44 [0.2709]	5.91 [0.3607]	7.38 [0.4504]	8.84 [0.5395]	10.31 [0.6292]	11.78 [0.7189]	13.24 [0.8080]	14.71 [0.8977]

● Finding the air consumption

Example 1. When operating a Slide Unit with bore size of 16mm [0.630in.] and stroke of 50mm [1.97in.], and under air pressure of 0.5MPa [73psi.], for 1 reciprocation

$3.53 \times 50 \times 10^{-3} = 0.1765$ ℓ [0.00623ft.³]/Reciprocation (ANR)

3.53: From the table; 50: Stroke

Example 2. When operating a Slide Unit with bore size of 16mm [0.630in.] and stroke of 50mm [1.97in.], and under air pressure of 0.5MPa [73psi.], for 20 reciprocations per minute

$3.53 \times 50 \times 20 \times 10^{-3} = 3.53$ ℓ [0.125ft.³]/min (ANR)

3.53: From the table; 50: Stroke; 20: Reciprocations per minute

●Finding the air flow rate (for selecting F.R.L., valves, etc.)

Example: When operating a Slide Unit with bore size of 16mm [0.630in.] at speed of 100mm/s [3.94in./sec.] and under air pressure of 0.5MPa [73psi.]

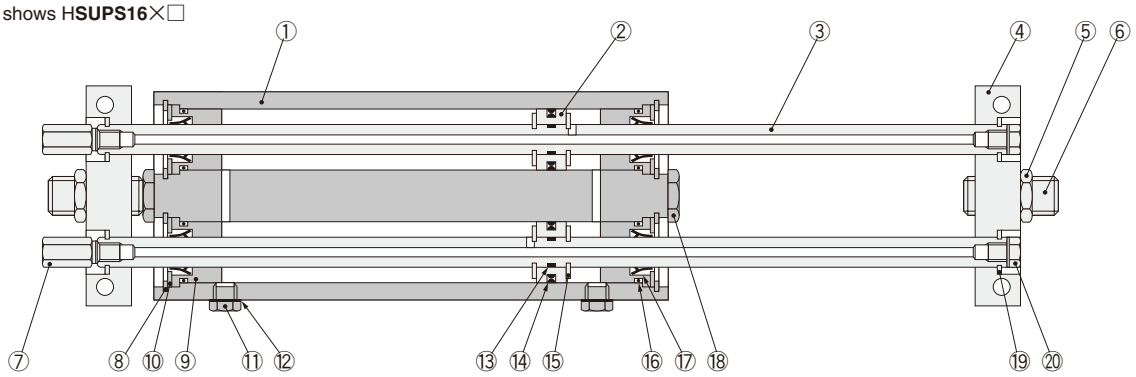
$3.53 \times 100 \times \frac{1}{2} \times 10^{-3} = 0.1765$ ℓ/s [0.00623ft.³/sec.] (ANR)

3.53: From the table; 100: Speed mm/s

(At this time, the flow rate per minute is 0.1765×60=10.59 ℓ/min [0.374ft.³/min.] (ANR).)

Inner Construction

The diagram shows H**SUPS16**×□



Major Parts and Materials

No.	Parts / Bore size mm [in.]	10 [0.394]	16 [0.630]	25 [0.984]
①	Table (cylinder body)	Aluminum alloy (anodized)		
②	Piston	Aluminum alloy (anodized)		
③	Piston rod	Steel (hard chrome plated)		
④	End plate	Steel (nickel plated)		
⑤	Lock nut	Steel (nickel plated)		
⑥	Stroke adjusting bolt			
⑦	Port adapter	Stainless steel	Brass (nickel plated)	—
⑧	Snap ring	Steel (nickel plated)		
⑨	Seal case	Aluminum alloy (special wear-resistant treatment)		
⑩	Seal holder	Mild steel (nickel plated)		
⑪	Plug	Brass (nickel plated)Note		Steel (nickel plated)

No.	Parts / Bore size mm [in.]	10 [0.394]	16 [0.630]	25 [0.984]
⑫	Plug gasket	Synthetic rubber (NBR) baked to steel		—
⑬	O-ring	Synthetic rubber (NBR)		
⑭	Piston seal			
⑮	Snap ring	Steel (black oxide)		
⑯	O-ring	Synthetic rubber (NBR)		
⑰	Rod seal			
⑱	Striker	Steel	Steel (nickel plated)	
⑲	Snap ring	Steel (black chromating)	Steel (black oxide)	
⑳	Plug	Steel (nickel plated)	Brass (nickel plated)	Steel (nickel plated)
	Magnet	Rare earth magnet (for sensor type only)		

Note: For non-ion specification, SUS is used.

Seals

Item / Bore size mm \ Quantity	Rod seal	Piston seal	Seal case gasket	Piston gasket	Plug gasket Note	Striker gasket
	4	2	4	2	2	2
10	**PIU-6**	**PWP-10**	12×9×1.5	6×4.4×0.8	89-14	—
16	**PIU-8**	**COP-16L**	16×13×1.5	8×6×1	89-14	11.8×9.8×1
25	**PIU-12**	**COP-25**	25×22×1.5	12×9×1.5	—	13.2×11.2×1

Note: Not available in the fixed table type.

Mass

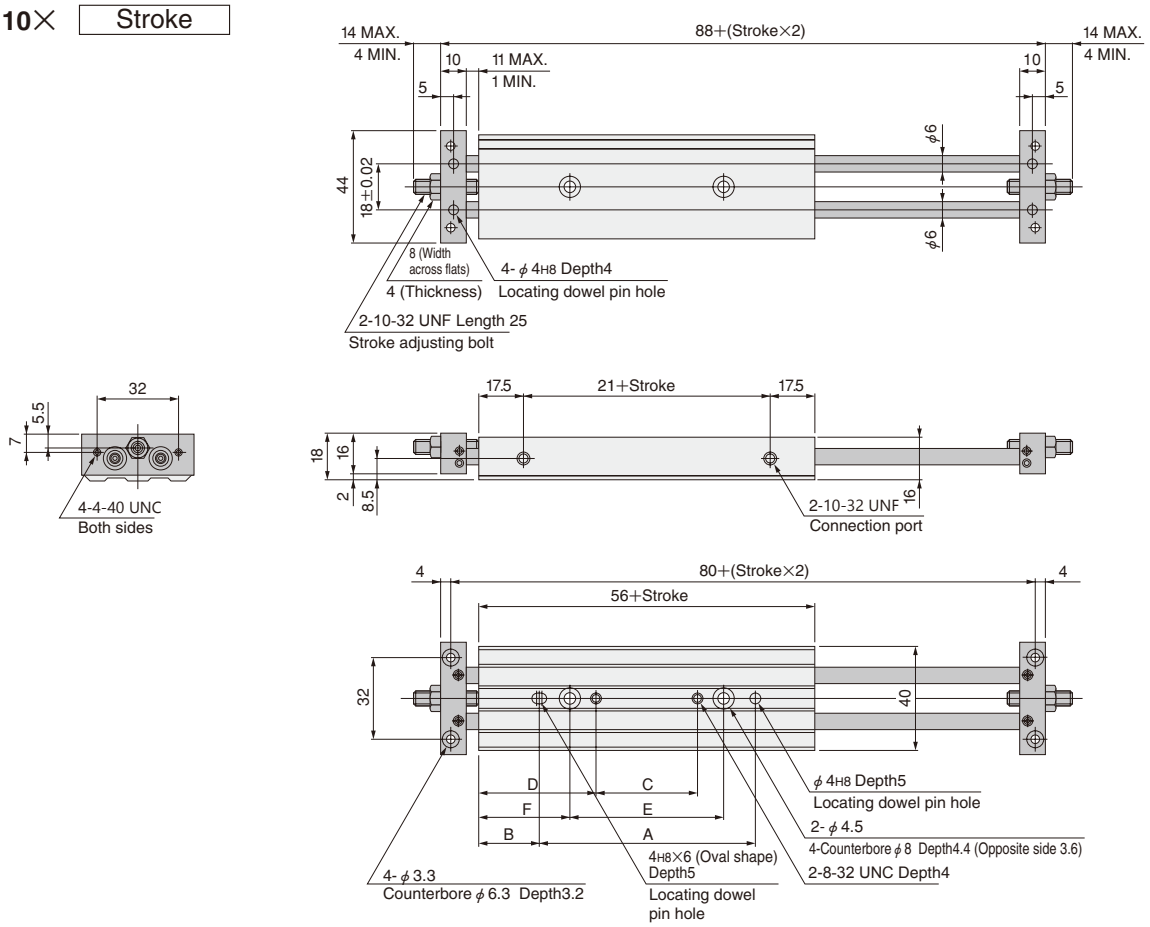
kg [lb.]

Model	Body mass Stroke inch 1	2	3	4	5	6	7	8	Additional mass: Shock absorber For 2 pcs.	Mass of 1 sensor switch: CS9H,ZB430	CS3H,CS4H,CS5H
HSUTS10×□ **HSUPS10×□**	0.27 [0.60] (0.28 [0.62])	0.31 [0.68] (0.33 [0.73])	0.36 [0.79] (0.38 [0.84])	0.41 [0.90] (0.43 [0.95])	—	—	—	—	—	0.04 [0.09]	0.03 [0.07]
HSULS10×□	—	—	—	1.00 [2.21] (1.02 [2.25])	—	—	—	—			
HSUTS16×□ **HSUPS16×□**	0.55 [1.21] (0.56 [1.23])	0.64 [1.41] (0.65 [1.43])	0.72 [1.59] (0.74 [1.63])	0.81 [1.79] (0.83 [1.83])	0.89 [1.96] (0.91 [2.01])	0.98 [2.16] (1.00 [2.21])	1.07 [2.36] (1.09 [2.40])	1.15 [2.54] (1.18 [2.60])	0.02 [0.04]	0.04 [0.09]	0.03 [0.07]
HSULS16×□	—	—	—	1.63 [3.59] (1.65 [3.64])	1.84 [4.06] (1.86 [4.10])	2.05 [4.52] (2.07 [4.56])	2.25 [4.96] (2.28 [5.03])	2.46 [5.42] (2.49 [5.49])			
HSUTS25×□ **HSUPS25×□**	1.25 [2.76] (1.26 [2.78])	1.43 [3.15] (1.44 [3.18])	1.61 [3.55] (1.63 [3.59])	1.79 [3.95] (1.81 [3.99])	1.97 [4.34] (1.99 [4.39])	2.15 [4.74] (2.17 [4.78])	2.32 [5.12] (2.35 [5.18])	2.50 [5.51] (2.53 [5.58])	0.03 [0.07]	0.04 [0.09]	0.03 [0.07]
HSULS25×□	—	—	—	3.09 [6.81] (3.11 [6.86])	3.44 [7.59] (3.46 [7.63])	3.80 [8.38] (3.82 [8.42])	4.15 [9.15] (4.18 [9.22])	4.51 [9.94] (4.54 [10.01])			

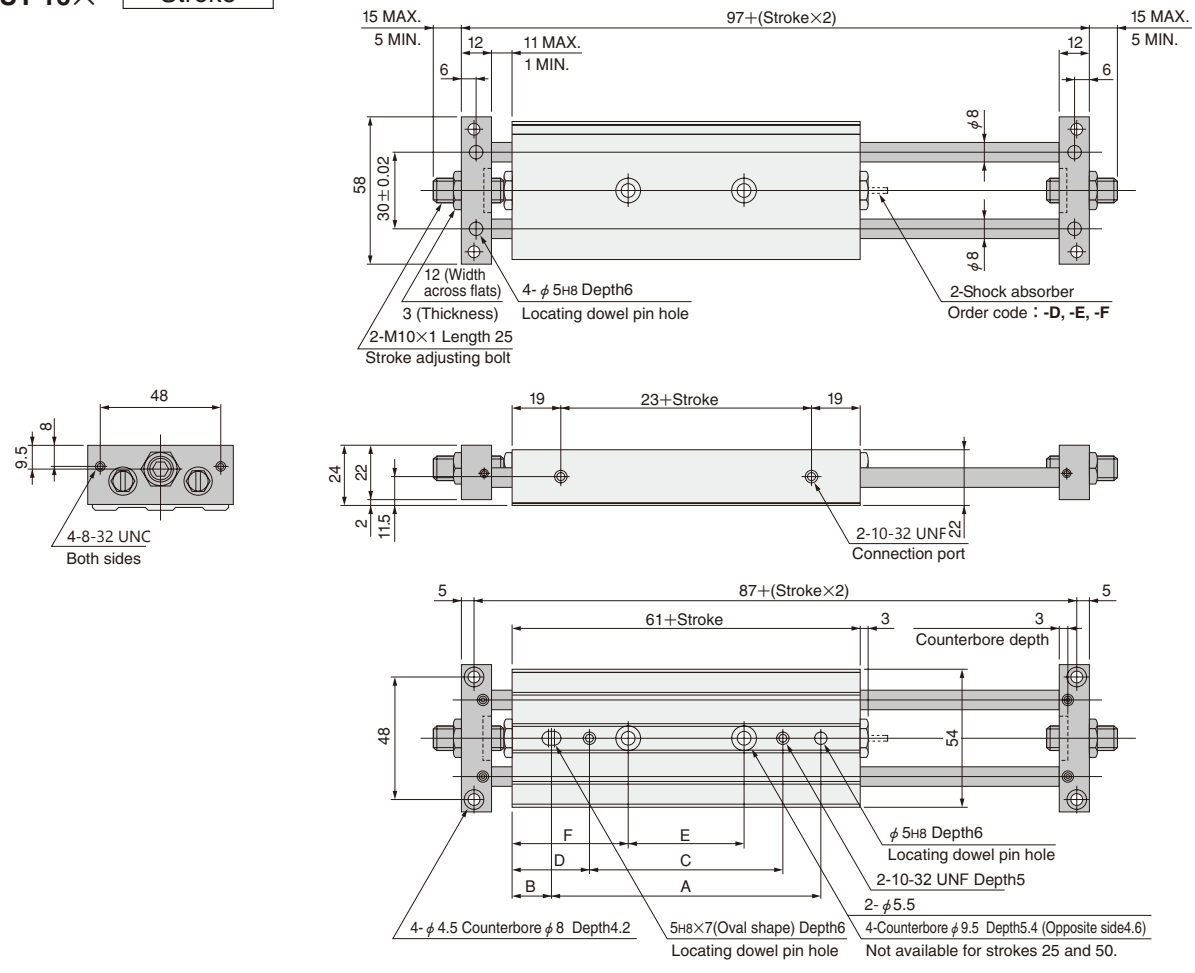
Remark : Figures in parentheses ( ) are for sensor type.

Dimensions of Fixed Table Type (HSUT) (mm)

●HSUT 10× Stroke

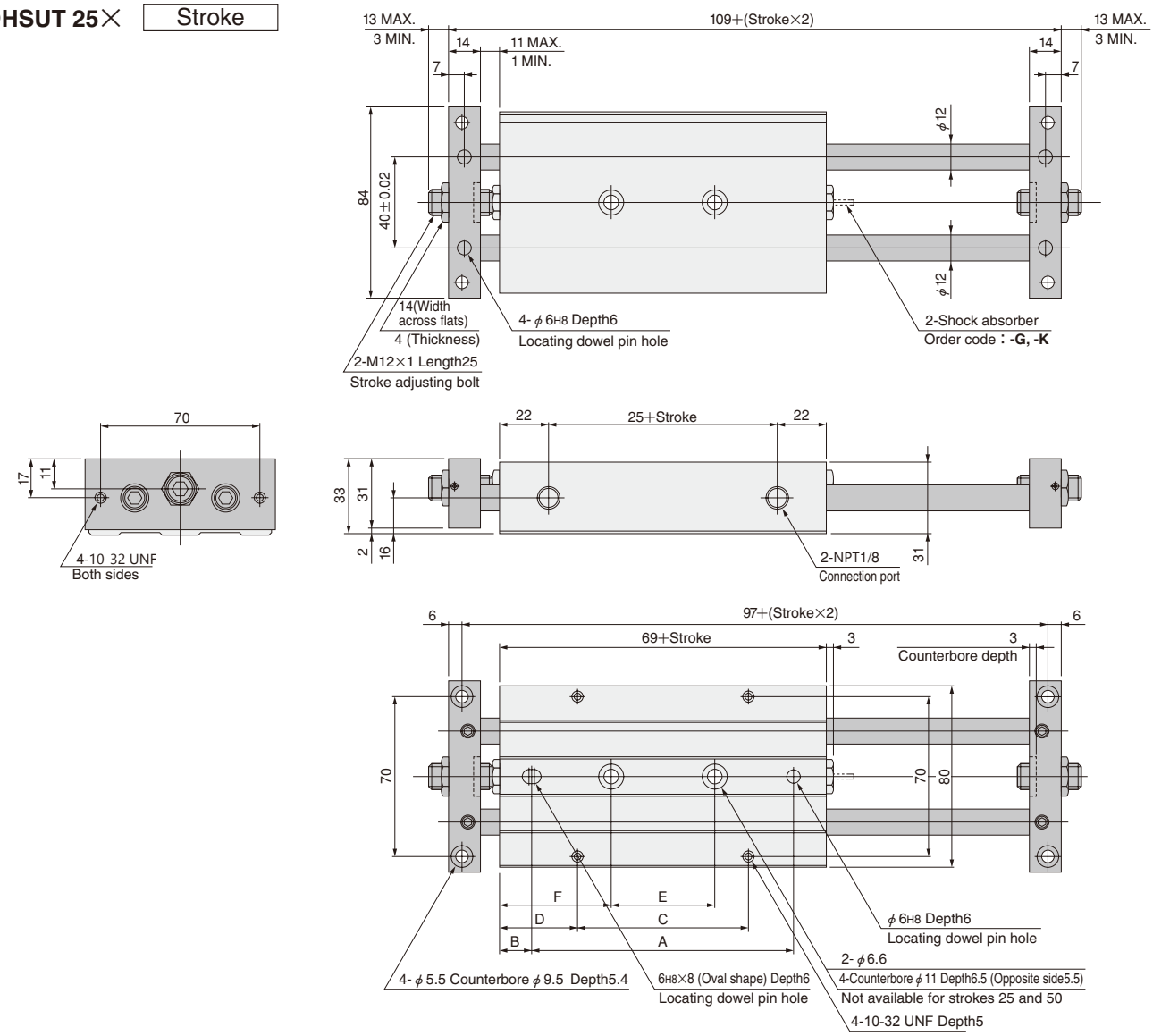


●HSUT 16× Stroke



Dimensions of Fixed Table Type (HSUT) (mm)

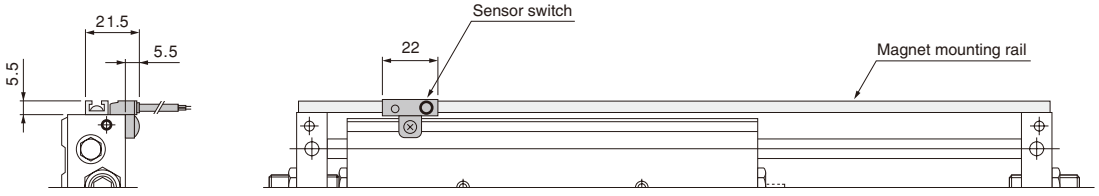
●**HSUT 25×** Stroke



Bore size mm [in.]	10 [0.394]						16 [0.630]						25 [0.984]					
Stroke \ Code	A	B	C	D	E	F	A	B	C	D	E	F	A	B	C	D	E	F
1	65	8	15	33	35	23	55	15.5	25	30.5	—	—	65	14.5	25	34.5	—	—
2	85	10.5	40	33	60	23	80	15.5	50	30.5	—	—	90	14.5	50	34.5	—	—
3	85	23	40	45.5	60	35.5	105	15.5	75	30.5	45	45.5	115	14.5	75	34.5	45	49.5
4	85	35.5	40	58	60	48	130	15.5	100	30.5	70	45.5	140	14.5	100	34.5	70	49.5
5	—	—	—	—	—	—	150	18	120	33	90	48	140	27	100	47	95	49.5
6	—	—	—	—	—	—	150	30.5	120	45.5	90	60.5	140	39.5	100	59.5	100	59.5
7	—	—	—	—	—	—	150	43	120	58	90	73	140	52	100	72	100	72
8	—	—	—	—	—	—	150	55.5	120	70.5	90	85.5	140	64.5	100	84.5	100	84.5

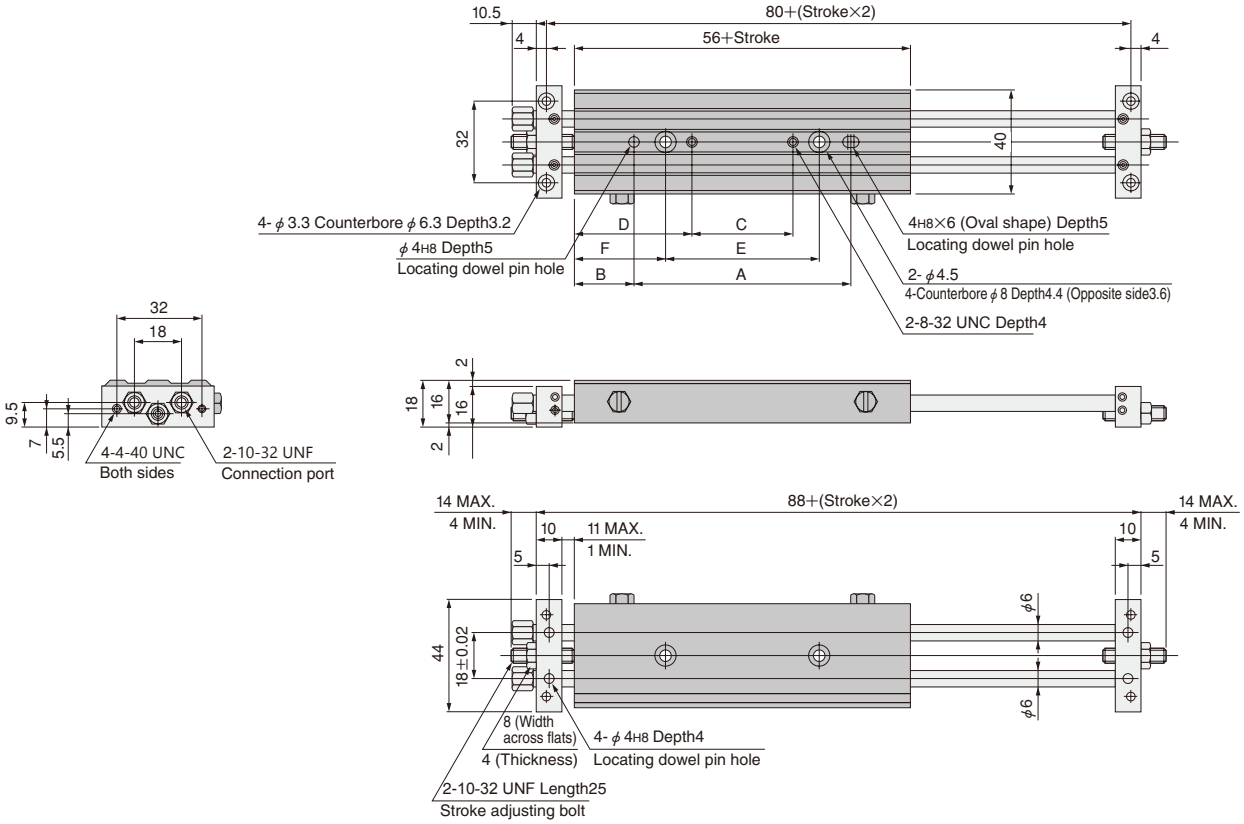
Option

●Sensor switches : CS9H, ZB430, CS3H, CS4H, CS5H

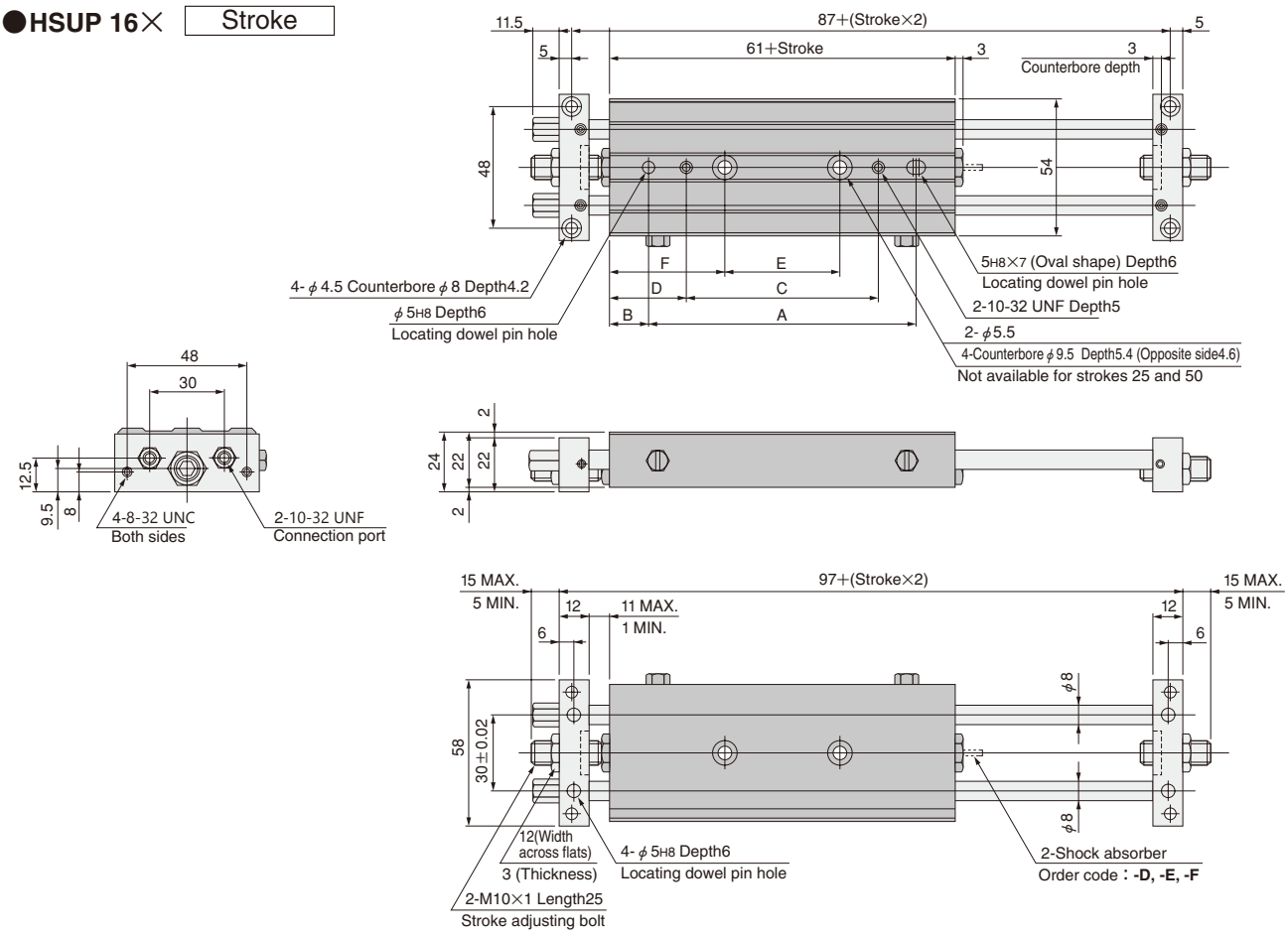


Dimensions of Fixed End Plate Type (HSUP) (mm)

●HSUP 10× Stroke

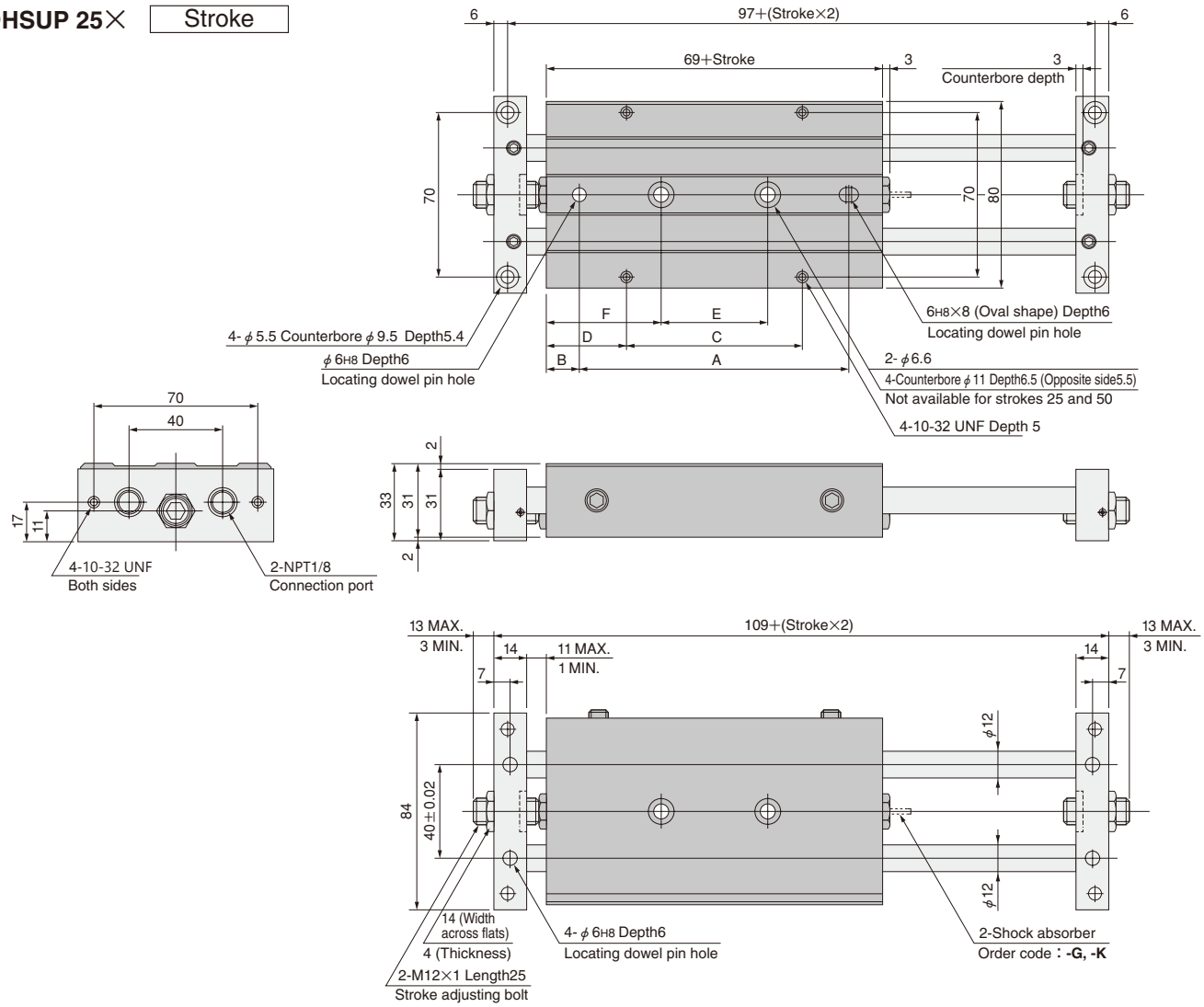


●HSUP 16× Stroke



Dimensions of Fixed End Plate Type (HSUP) (mm)

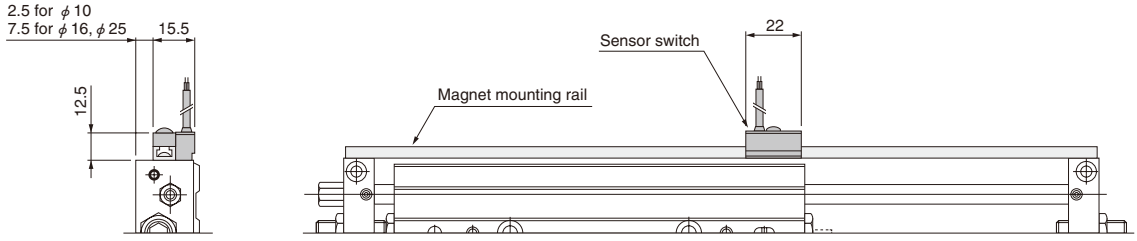
●**HSUP 25×** Stroke



Bore size mm [in.]	10 [0.394]						16 [0.630]						25 [0.984]					
Stroke \ Code	A	B	C	D	E	F	A	B	C	D	E	F	A	B	C	D	E	F
1	65	8	15	33	35	23	55	15.5	25	30.5	—	—	65	14.5	25	34.5	—	—
2	85	10.5	40	33	60	23	80	15.5	50	30.5	—	—	90	14.5	50	34.5	—	—
3	85	23	40	45.5	60	35.5	105	15.5	75	30.5	45	45.5	115	14.5	75	34.5	45	49.5
4	85	35.5	40	58	60	48	130	15.5	100	30.5	70	45.5	140	14.5	100	34.5	70	49.5
5	—	—	—	—	—	—	150	18	120	33	90	48	140	27	100	47	95	49.5
6	—	—	—	—	—	—	150	30.5	120	45.5	90	60.5	140	39.5	100	59.5	100	59.5
7	—	—	—	—	—	—	150	43	120	58	90	73	140	52	100	72	100	72
8	—	—	—	—	—	—	150	55.5	120	70.5	90	85.5	140	64.5	100	84.5	100	84.5

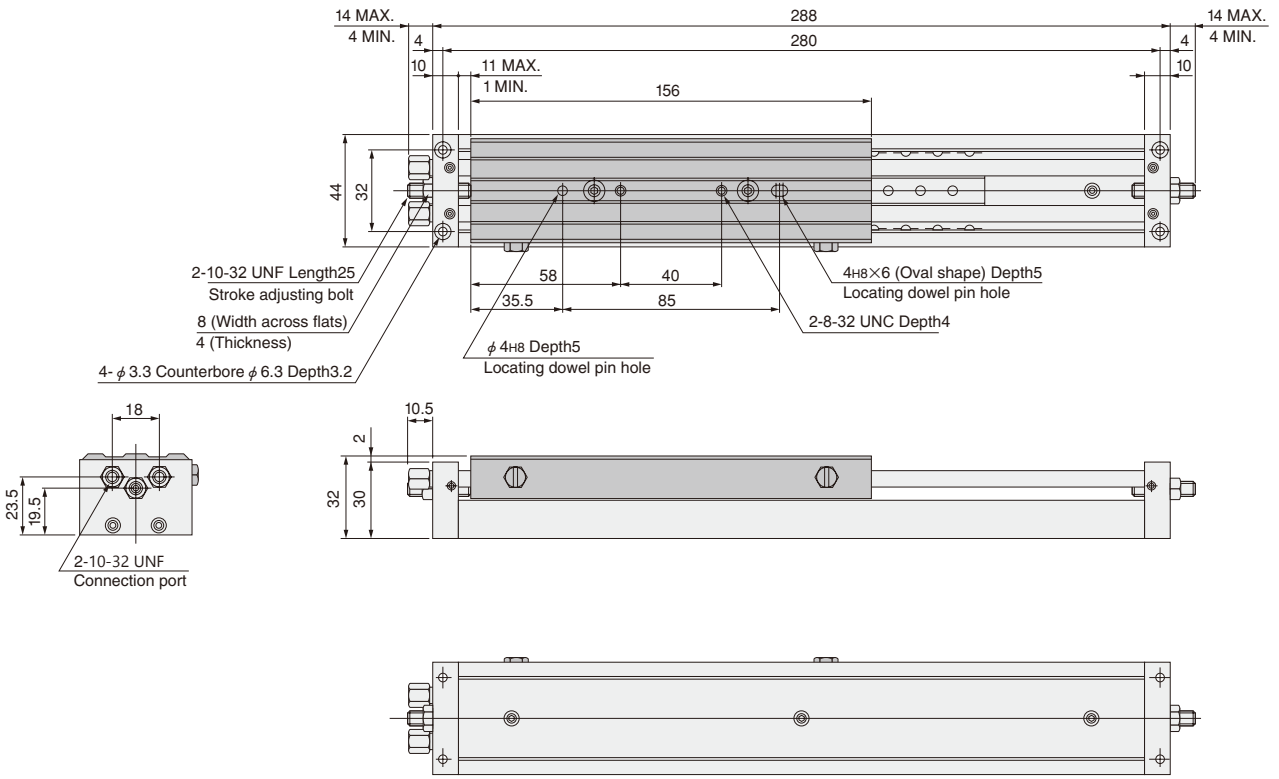
Option

●Sensor switches : CS9H, ZB430, CS3H, CS4H, CS5H

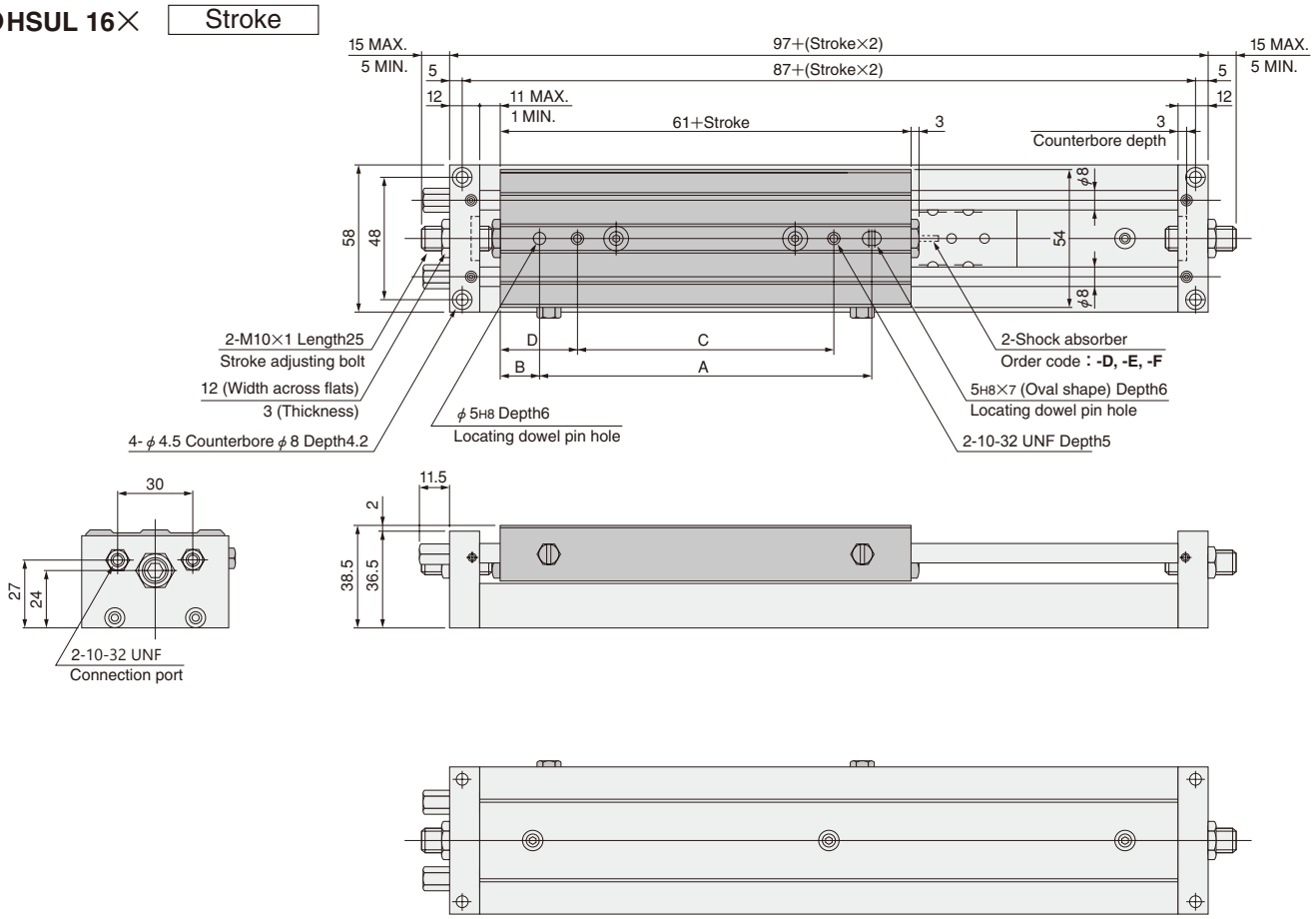


Dimensions of Fixed Rail-on Plate Type (HSUL) (mm)

●HSUL 10×4

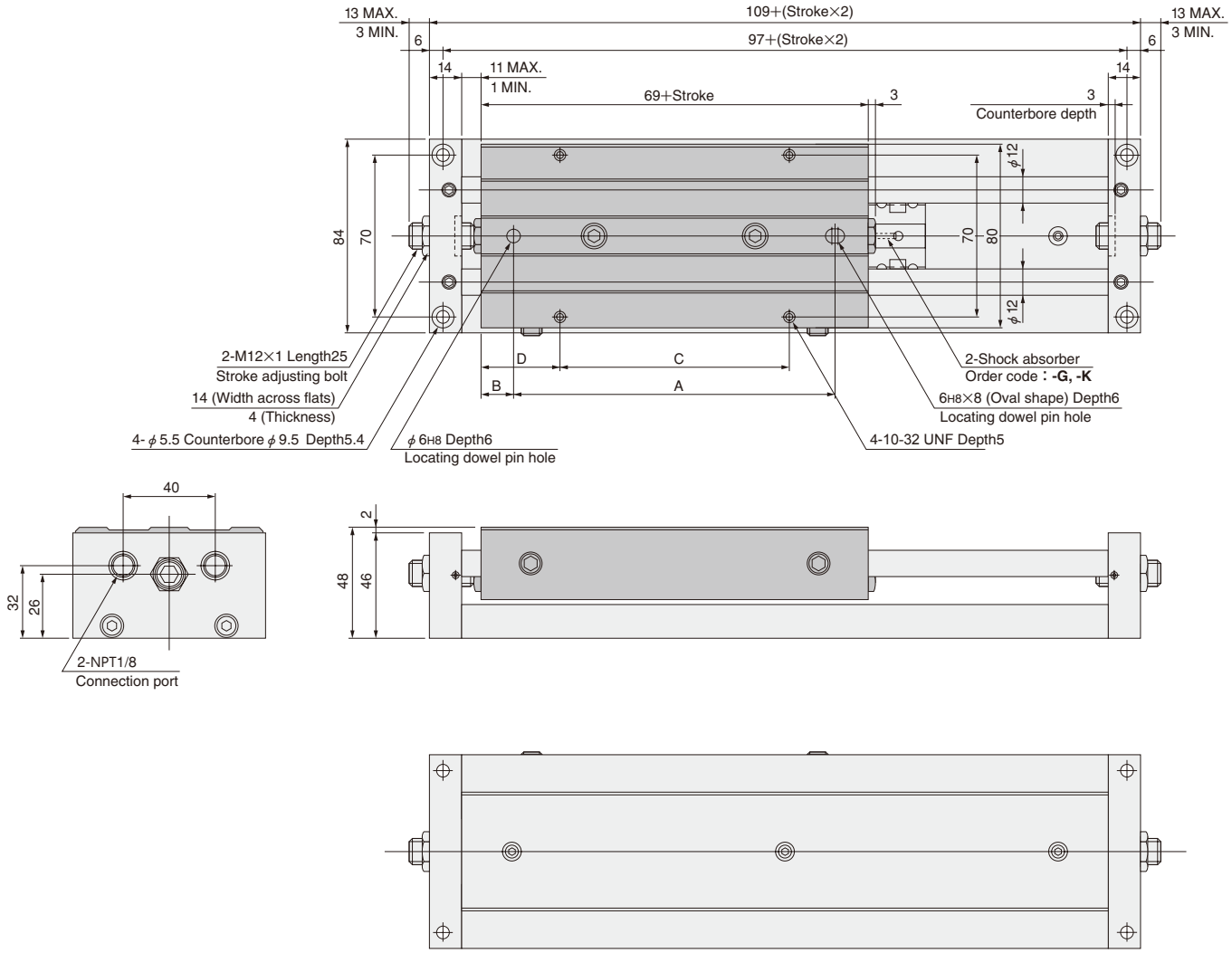


●HSUL 16× Stroke



Dimensions of Fixed Rail-on Plate Type (HSUL) (mm)

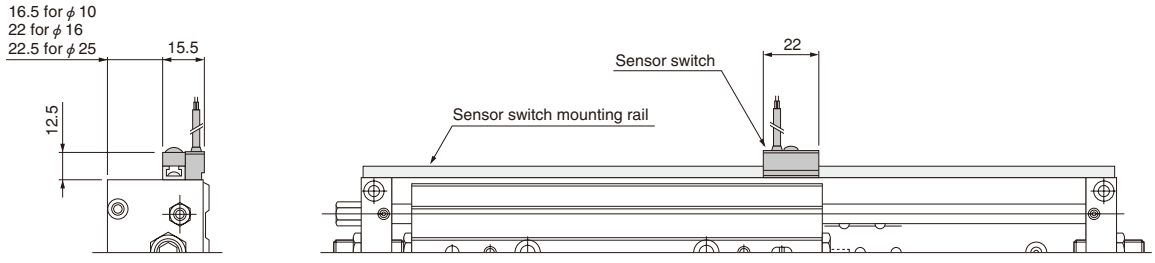
●HSUL 25× Stroke



Bore size mm [in.]	16 [0.630]				25 [0.984]			
Stroke \ Code	A	B	C	D	A	B	C	D
4	130	15.5	100	30.5	140	14.5	100	34.5
5	150	18	120	33	140	27	100	47
6	150	30.5	120	45.5	140	39.5	100	59.5
7	150	43	120	58	140	52	100	72
8	150	55.5	120	70.5	140	64.5	100	84.5

Option

●Sensor switches: CS9H, ZB430, CS3H, CS4H, CS5H



With End Keep Mechanism

Specifications

Item \ Bore size mm [in.]		16 [0.630]	25 [0.984]
Operation type		Double acting, double piston type	
Media		Air	
Mounting type		Fixed table type, Fixed end plate type, Fixed rail-on plate type	
Operating pressure range MPa [psi.]		0.2～0.9 [29～131]	
Proof pressure MPa [psi.]		1.32 [191]	
Operating temperature range °C [°F]		0～60 [32～140]	
Operating speed range mm/s [in./sec.]	Standard	50～200 [2.0～7.9]	
	With shock absorber	50～400 [2.0～15.7]	
Cushion		Shock absorber (Optional)	
Lubrication		Not required	
Non-rotating accuracy		±0.05°	±0.02°
Stroke adjusting range mm [in.]		±5 [±0.197] (Opposite side of lock mechanism only)	
Maximum holding force (at end keep) kgf [lbf.]		10 [22]	24 [53]
Backlash (at end keep) mm [in.]		1.5 [0.059] or less	
Maximum loads N [lbf.]	Fixed table type[Note]	14.7 [3.30]	24.5 [5.51]
	Fixed end plate type	29.4 [6.61]	49 [11.0]
	Fixed rail-on plate type	98.1 [22.05]	
Port size		10-32 UNF	NPT1/8

Note: This is the total load when the load is equally applied on both plates (at the maximum stroke). When the load is on one side only, keep the load at the allowable lateral load or below.
For details, see p.889, “Allowable lateral load” and “Piston rod deflection.”

Bore Size and Stroke

inch

Bore size	Standard strokes[Note]
16	1, 2, 3, 4, 5, 6, 7, 8
25	1, 2, 3, 4, 5, 6, 7, 8

Note: The standard strokes for the fixed rail-on plate type are 4inches or more.

Order Codes

HSU □ K □ 16×100 — □ — □ □ □

- **Bore size × Stroke**
- **Specification**
  - **Blank** — Standard[Note1]
  - **S** — Sensor type[Note2]
- **With end keep mechanism**
- **Mounting type**
  - **T** — Fixed table type
  - **P** — Fixed end plate type
  - **L** — Fixed rail-on plate type
- **Slide unit**
- **Shock absorber** (Only for ϕ16, ϕ25[Note3])
  - **Blank** — No shock absorber
  - **D** — ϕ16: 1.0N·m [0.74ft·lbf]
  - **E** — ϕ16: 2.0N·m [1.48ft·lbf]
  - **F** — ϕ16: 2.9N·m [2.14ft·lbf]
  - **G** — ϕ25: 3.9N·m [2.88ft·lbf]
  - **K** — ϕ25: 5.9N·m [4.35ft·lbf]
  - Applicable cylinder
  - Maximum absorption (Applied for both sides)
- **Sensor switch** (For sensor type)

Blank	No sensor switch		
CS9H	3-lead wire solid state type	with indicator lamp	DC4～28V
ZB430	2-lead wire solid state type	with indicator lamp	DC10～28V
CS3H	Reed switch type	with indicator lamp	DC10～28V AC85～115V
CS4H	Reed switch type	with indicator lamp	DC10～28V AC85～115V
CS5H	Reed switch type	without indicator lamp	DC3～30V AC85～115V

- **Lead wire length**
  - **A** — 1000mm [39in.]
  - **B** — 3000mm [118in.]
- **Number of sensor switches (For sensor type)**
  - **1** — With 1 sensor switch
  - **2** — With 2 sensor switches
  - ⋮ ⋮

Notes: 1. The standard Slide Unit is not equipped with a magnet for sensor switch.
2. Equipped with a magnet for sensor switch and mounting rail.

Cylinder Thrust

N [lbf.]

Bore size mm [in.]	Piston rod dia. mm [in.]	Pressure area mm² [in.²]	Air pressure MPa [psi.] 0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	0.8 [116]	0.9 [131]
16 [0.630]	8 [0.315]	302 [0.468]	30 [6.7]	60 [13.5]	91 [20.5]	121 [27.2]	151 [33.9]	181 [40.7]	211 [47.4]	242 [54.4]	272 [61.1]
25 [0.984]	12 [0.472]	756 [1.172]	76 [17.1]	151 [33.9]	227 [51.0]	302 [67.9]	378 [85.0]	454 [102.1]	529 [118.9]	605 [136.0]	680 [152.9]

Air Consumption and Air Flow Rate

The figures in the table below show the air consumption when a Slide Unit makes 1 reciprocation with stroke of 1mm [0.0394in.].
The air flow rate and consumption actually required is found by the following calculations below.

Air consumption for each 1mm [0.0394in.] stroke

cm³ [in³]/Reciprocation (ANR)

Bore size mm [in.]	Air pressure MPa [psi.]							
	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]	0.8 [116]	0.9 [131]
16 [0.630]	1.77 [0.1080]	2.36 [0.1440]	2.94 [0.1794]	3.53 [0.2154]	4.12 [0.2514]	4.70 [0.2868]	5.29 [0.3228]	5.87 [0.3582]
25 [0.984]	4.44 [0.2709]	5.91 [0.3607]	7.38 [0.4504]	8.84 [0.5395]	10.31 [0.6292]	11.78 [0.7189]	13.24 [0.8080]	14.71 [0.8977]

● Finding the air consumption

Example 1. When operating a Slide Unit with bore size of 16mm [0.630in.] and stroke of 50mm [1.97in.], and under air pressure of 0.5MPa [73psi.], for 1 reciprocation

$$\underset{\text{From the table}}{3.53} \times \underset{\text{Stroke}}{50} \times 10^{-3} = 0.1765\ \ell\ [0.00623\text{ft}^3]/\text{Reciprocation (ANR)}※$$

Example 2. When operating a Slide Unit with bore size of 16mm [0.630in.] and stroke of 50mm [1.97in.], and under air pressure of 0.5MPa [73psi.], for 20 reciprocations per minute

$$\underset{\text{From the table}}{3.53} \times \underset{\text{Stroke}}{50} \times \underset{\text{Reciprocations per minute}}{20} \times 10^{-3} = 3.53\ \ell\ [0.125\text{ft}^3]/\text{min (ANR)}※$$

●Finding the air flow rate (for selecting F.R.L., valves, etc.)

Example: When operating a Slide Unit with bore size of 16mm [0.630in.] at speed of 100mm/s [3.94in./sec.] and under air pressure of 0.5MPa [73psi.]

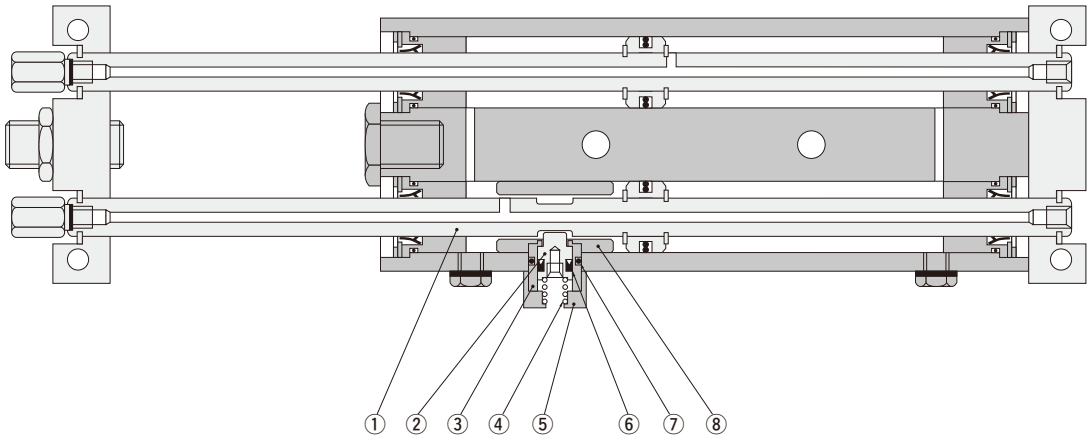
$$\underset{\text{From the table}}{3.53} \times \underset{\text{Speed mm/s}}{100} \times \frac{1}{2} \times 10^{-3} = 0.1765\ \ell/\text{s}\ [0.00623\text{ft}^3/\text{sec.}]\text{(ANR)}※$$

(At this time, the flow rate per minute is 0.1765×60=10.59 ℓ/min [0.374ft³/min.] (ANR)※.)

※Refer to p.54 for an explanation of ANR.

Inner Construction

The diagram shows **HSUPK16×□**



Major Parts and Materials

No.	Parts	Materials
①	Piston rod	Steel (hard chrome plated)
②	Lock piston	Steel
③	Sleeve	Aluminum alloy (anodized)
④	Spring	Stainless steel
⑤	Lock cover	Aluminum alloy (anodized)
⑥	Lock piston seal	Synthetic rubber (NBR)
⑦	Lock cover O-ring	
⑧	Lock piston collar	Aluminum alloy (anodized)

Remark: For items other than the above, see the normal type on p.871.

Mass

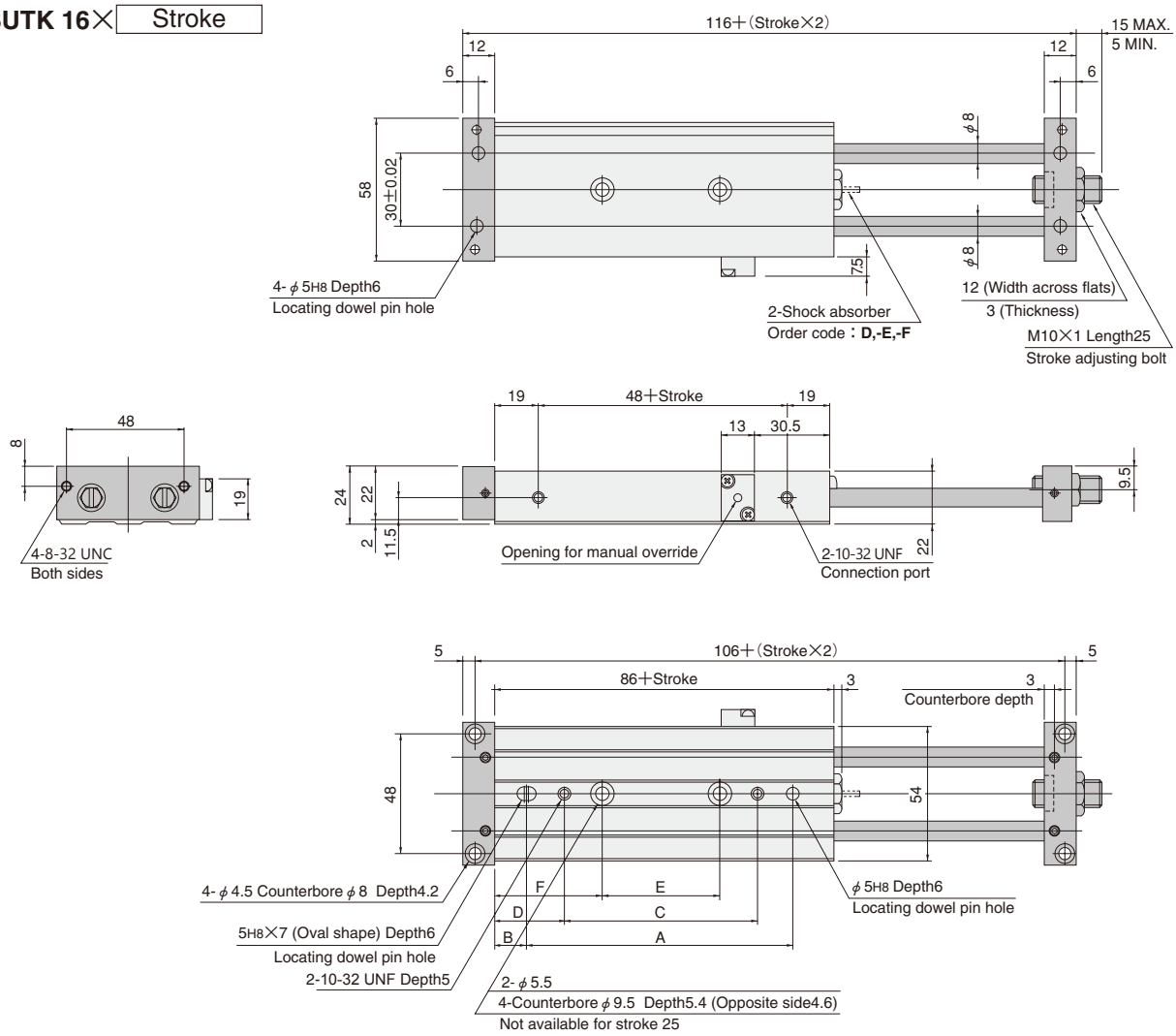
kg [lb.]

Model	Body mass								Additional mass		
	Stroke mm								Shock absorber	Mass of 1 sensor switch	
	1	2	3	4	5	6	7	8	For 2 pcs.	**CS9H, ZB430**	**CS3H, CS4H, CS5H**
HSUTK16×□ **HSUPK16×□**	0.61 [1.35] (0.62 [1.37])	0.70 [1.54] (0.71 [1.57])	0.78 [1.72] (0.80 [1.76])	0.87 [1.92] (0.89 [1.96])	0.95 [2.09] (0.97 [2.14])	1.04 [2.29] (1.06 [2.34])	1.13 [2.49] (1.15 [2.54])	1.21 [2.67] (1.24 [2.73])	0.02 [0.04]	0.04 [0.09]	0.03 [0.07]
HSULK16×□	—	—	—	1.72 [3.79] (1.74 [3.84])	1.93 [4.26] (1.95 [4.30])	2.14 [4.72] (2.16 [4.76])	2.34 [5.16] (2.36 [5.20])	2.55 [5.62] (2.58 [5.69])			
HSUTK25×□ **HSUPK25×□**	1.37 [3.02] (1.38 [3.04])	1.55 [3.42] (1.56 [3.44])	1.73 [3.81] (1.75 [3.86])	1.91 [4.21] (1.93 [4.26])	2.09 [4.61] (2.11 [4.65])	2.27 [5.01] (2.29 [5.05])	2.44 [5.38] (2.47 [5.45])	2.62 [5.78] (2.65 [5.84])	0.03 [0.07]	0.04 [0.09]	0.03 [0.04]
HSULK25×□	—	—	—	3.26 [7.19] (3.28 [7.23])	3.61 [7.96] (3.63 [8.00])	3.97 [8.75] (3.99 [8.80])	4.32 [9.53] (4.35 [9.59])	4.68 [10.32] (4.71 [10.39])			

Remark: Figures in parentheses ( ) are for sensor type.

Dimensions of Fixed Table Type with End Keep Mechanism (HSUTK) (mm)

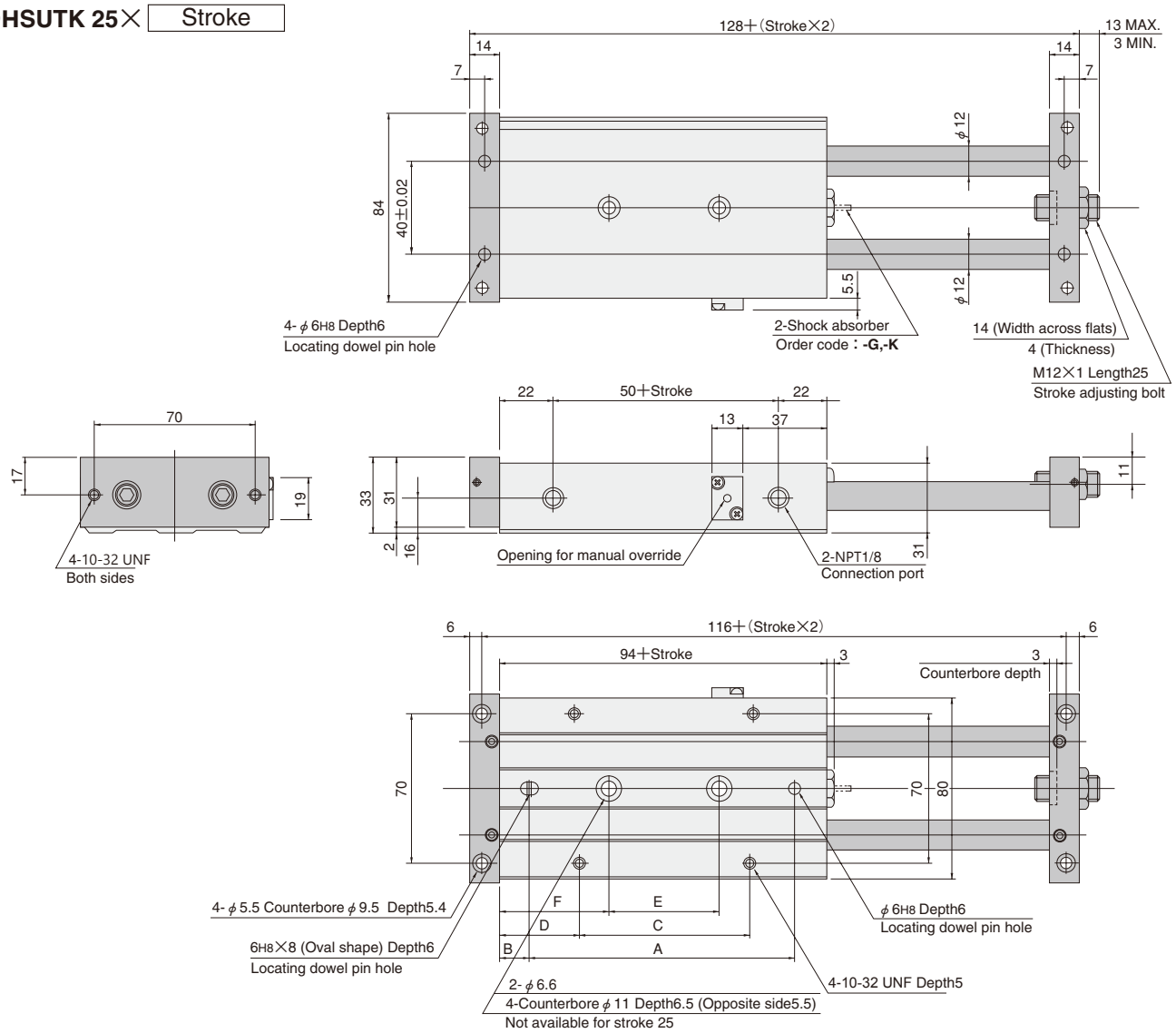
●**HSUTK 16×** Stroke



Stroke \ Code	A	B	C	D	E	F
25	80	15.5	50	30.5	—	—
50	105	15.5	75	30.5	45	45.5
75	130	15.5	100	30.5	70	45.5
100	150	18	120	33	90	48
125	150	30.5	120	45.5	90	60.5
150	150	43	120	58	90	73
175	150	55.5	120	70.5	90	85.5
200	170	58	140	73	110	88

Remark: The drawings show locked end keep condition.

●HSUTK 25× Stroke

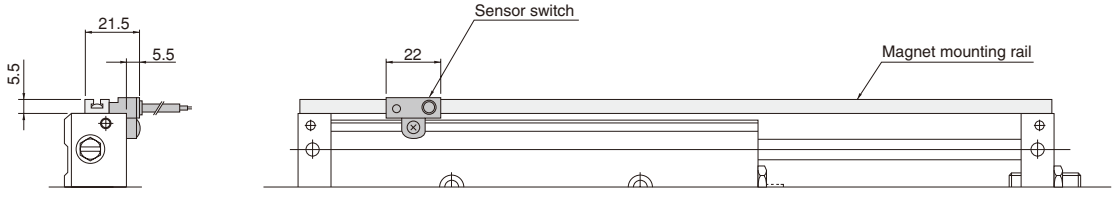


Stroke \ Code	A	B	C	D	E	F
25	90	14.5	50	34.5	—	—
50	115	14.5	75	34.5	45	49.5
75	140	14.5	100	34.5	70	49.5
100	140	27	100	47	95	49.5
125	140	39.5	100	59.5	100	59.5
150	140	52	100	72	100	72
175	140	64.5	100	84.5	100	84.5
200	160	67	120	87	120	87

Remark: The drawings show locked end keep condition.

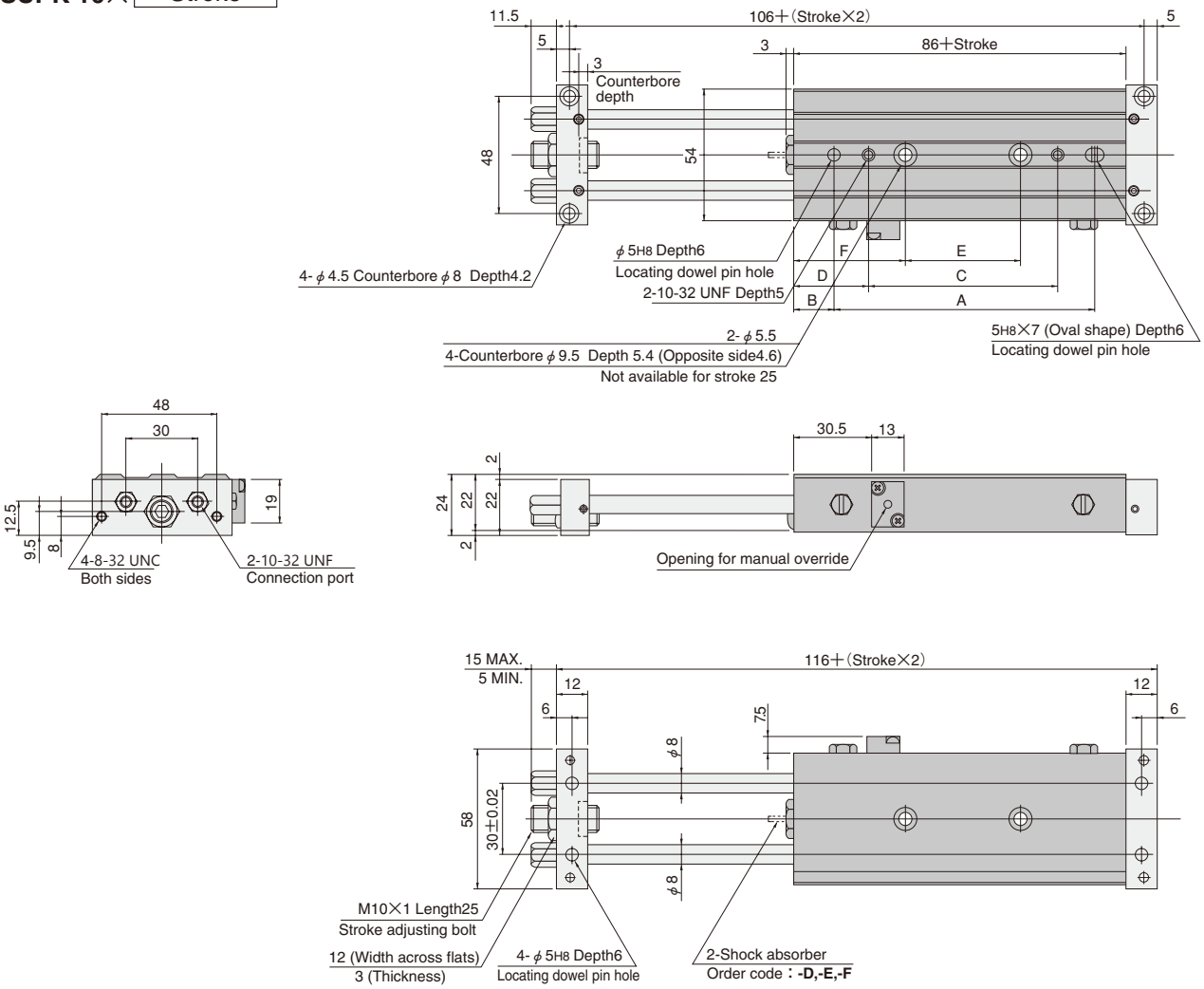
Option

●Sensor switches: CS9H, ZB430, CS3H, CS4H, CS5H



Dimensions of Fixed End Plate Type with End Keep Mechanism (HSUPK) (mm)

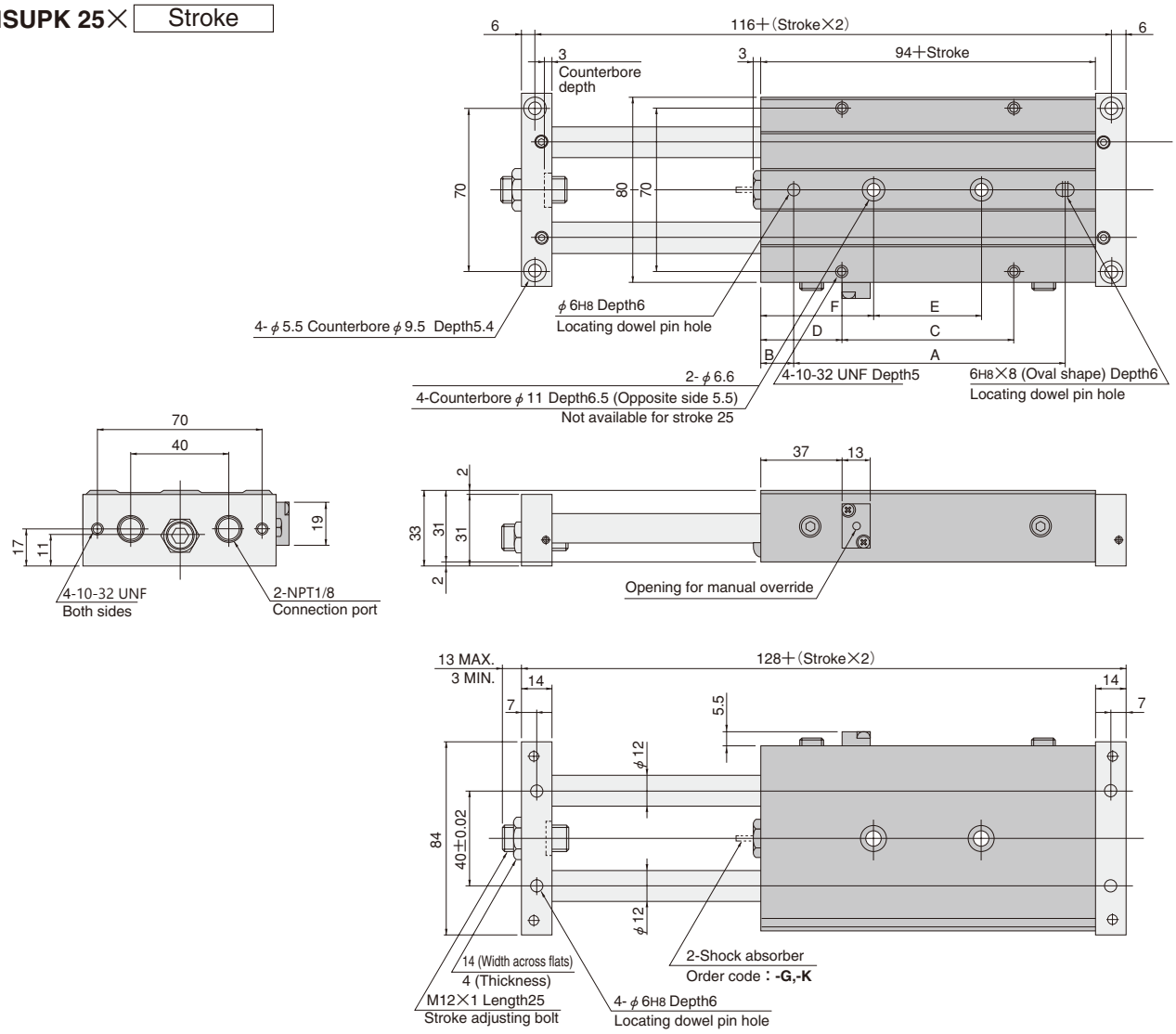
●**HSUPK 16×** Stroke



Stroke \ Code	A	B	C	D	E	F
25	80	15.5	50	30.5	—	—
50	105	15.5	75	30.5	45	45.5
75	130	15.5	100	30.5	70	45.5
100	150	18	120	33	90	48
125	150	30.5	120	45.5	90	60.5
150	150	43	120	58	90	73
175	150	55.5	120	70.5	90	85.5
200	170	58	140	73	110	88

Remark: The drawings show locked end keep condition.

●HSUPK 25× Stroke

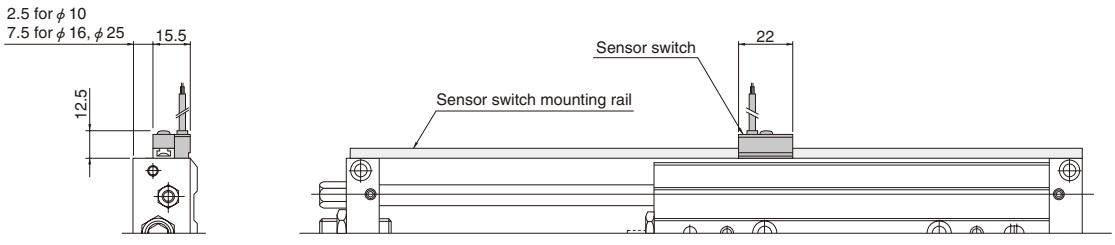


Stroke \ Code	A	B	C	D	E	F
25	90	14.5	50	34.5	—	—
50	115	14.5	75	34.5	45	49.5
75	140	14.5	100	34.5	70	49.5
100	140	27	100	47	95	49.5
125	140	39.5	100	59.5	100	59.5
150	140	52	100	72	100	72
175	140	64.5	100	84.5	100	84.5
200	160	67	120	87	120	87

Remark: The drawings show locked end keep condition.

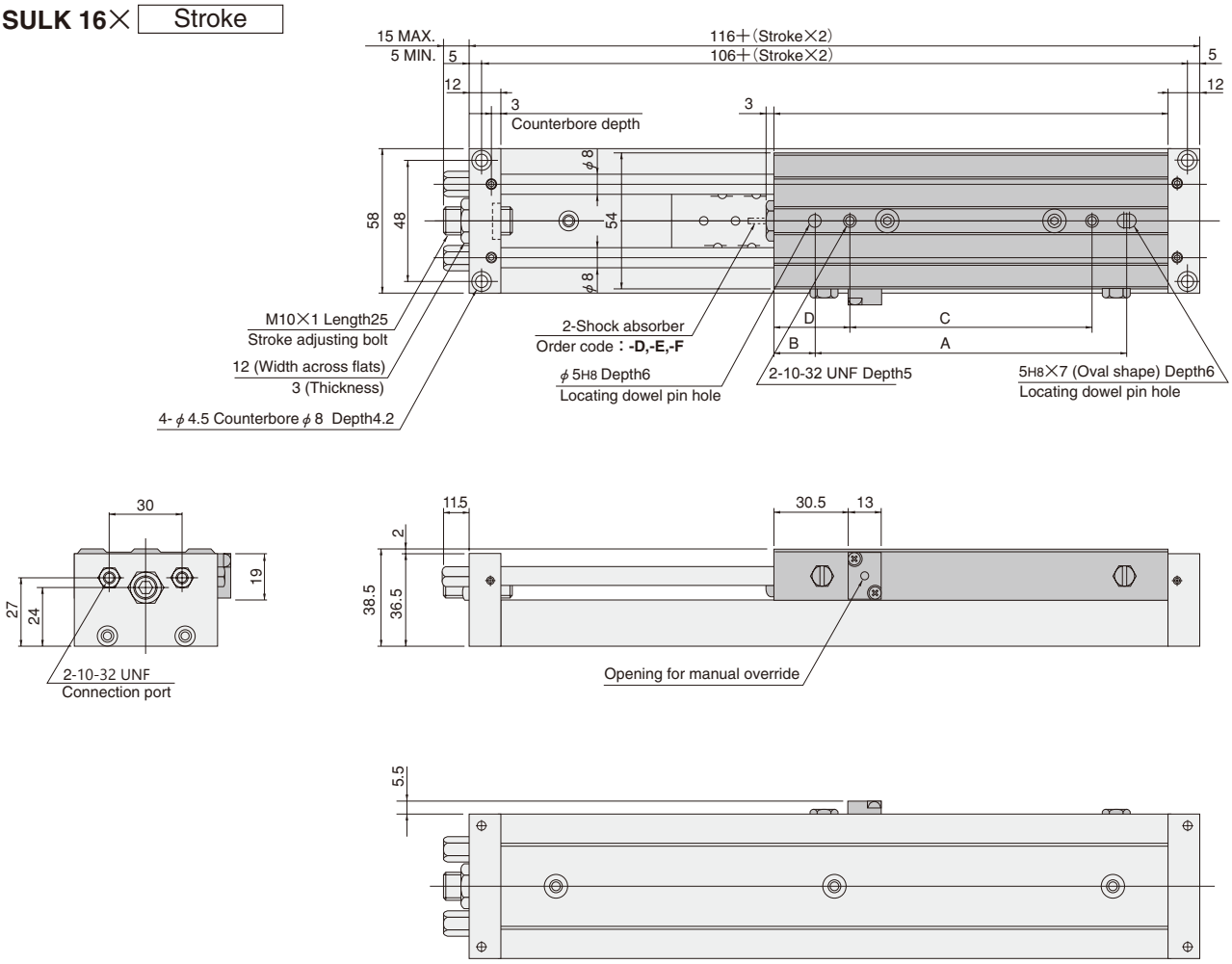
Option

●Sensor switches: CS9H, ZB430, CS3H, CS4H, CS5H



Dimensions of Fixed Rail-on Plate Type with End Keep Mechanism (HSULK) (mm)

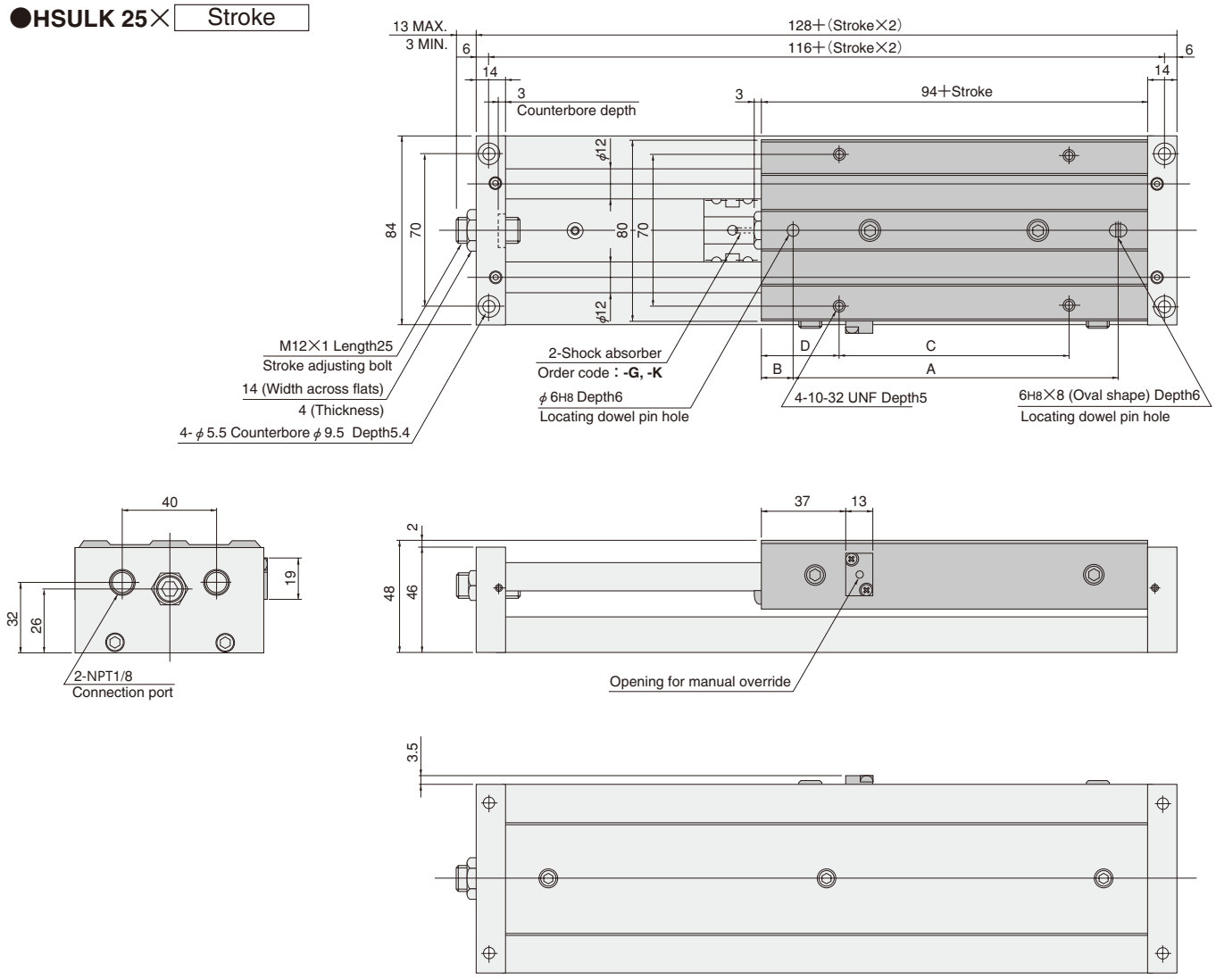
●**HSULK 16×** Stroke



Stroke \ Code	A	B	C	D
100	150	18	120	33
125	150	30.5	120	45.5
150	150	43	120	58
175	150	55.5	120	70.5
200	170	58	140	73

Remark: The drawings show locked end keep condition.

●HSULK 25× Stroke

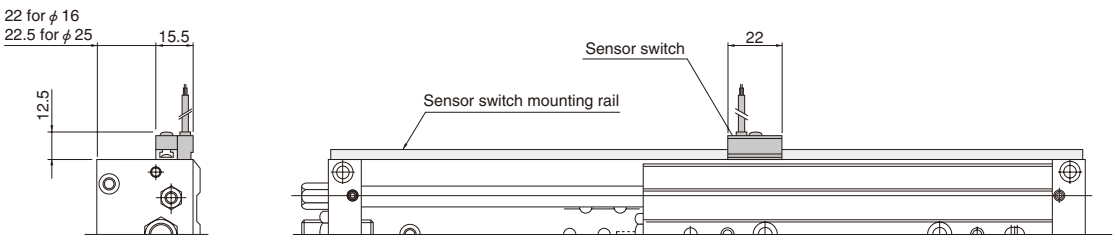


Stroke \ Code	A	B	C	D
100	140	27	100	47
125	140	39.5	100	59.5
150	140	52	100	72
175	140	64.5	100	84.5
200	160	67	120	87

Remark: The drawings show locked end keep condition.

Option

●Sensor switches: CS9H, ZB430, CS3H, CS4H, CS5H



SENSOR SWITCHES

Solid State Type, Reed Switch Type

Order Codes

□ — □ — □

With mounting screw for Slide Unit
SUTS ——Fixed table type
SUPS ——Fixed end plate type
SULS ——Fixed rail-on plate type

Lead wire length
A —— 1000mm [39in.]
B —— 3000mm [118in.]

Sensor switch (For sensor type)

CS9H —— 3-lead wire solid state type	with indicator lamp	DC4～28V	
ZB430 —— 2-lead wire solid state type	with indicator lamp	DC10～28V	
CS3H —— Reed switch type	with indicator lamp	DC10～28V	AC85～115V
CS4H —— Reed switch type	with indicator lamp	DC10～28V	AC85～115V
CS5H —— Reed switch type	without indicator lamp	DC3～30V	AC85～115V

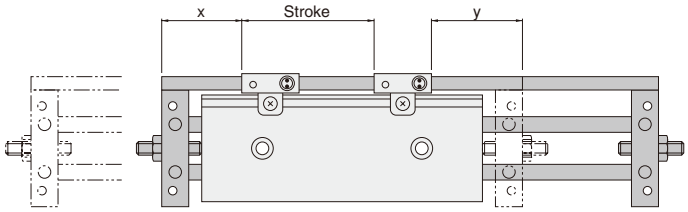
Note: The standard Slide Unit is not equipped with a magnet for sensor switch.

● For details of sensor switches, see p.1544.

Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the locations shown below (the figures in the tables are reference values), the magnet comes to the maximum sensing location of the sensor switch at the end of the stroke.

Fixed table type (HSUTS, HSUTKS)

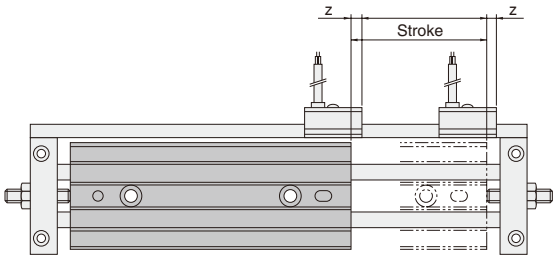


mm [in.]

Bore size	x	y	z
10 [0.394]Note	30 [1.181]	36 [1.417]	4 [0.157]
16 [0.630]	34.5 [1.358] (44 [1.732])	40.5 [1.594] (50 [1.969])	4 [0.157]
25 [0.984]	40.5 [1.594] (50 [1.969])	46.5 [1.831] (56 [2.205])	4 [0.157]

Note: Not available for types with end keep mechanism.
Remark: Values in parentheses ( ) are values for types with end keep mechanism.

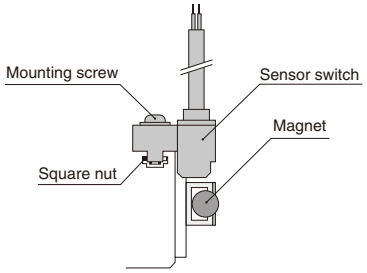
Fixed end plate type (HSUPS, HSULS, HSUPKS, HSULKS)



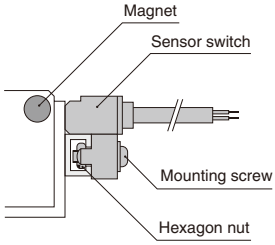
Moving Sensor Switch

● Loosening the mounting screw allows the sensor switch to be moved along the mounting groove.
● Tighten the mounting screw with a tightening torque of 19.6N·cm [1.7in·lbf] or less.

Fixed table type (HSUTS, HSUTKS)

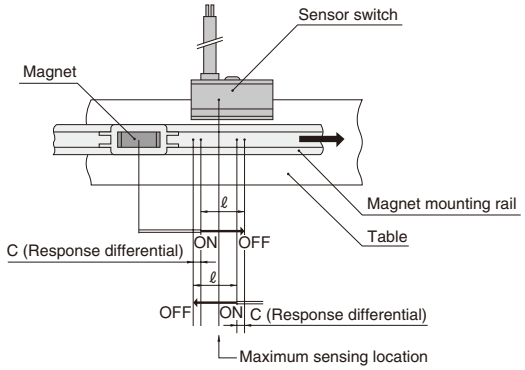


Fixed end plate type (HSUPS, HSULS, HSUPKS, HSULKS)

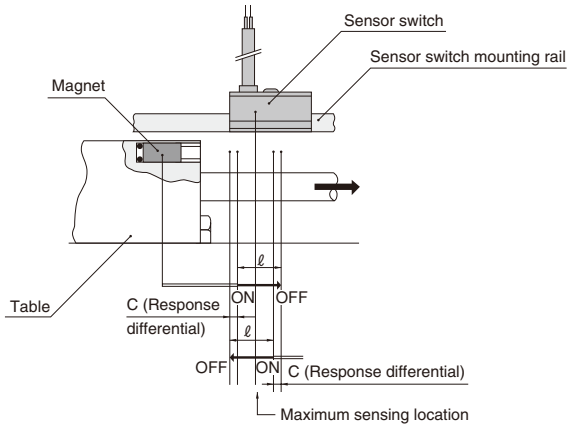


●**Operating range: ℓ**
The distance the piston travels in one direction, while the switch is in the ON position.
●**Response differential: C**
The distance between the point where the piston turns the switch ON and the point where the switch is turned OFF as the piston travels in the opposite direction.

Fixed table type (HSUTS, HSUTKS)



Fixed end plate type (HSUPS, HSULS, HSUPKS, HSULKS)



mm [in.]

Item \ Type	Solid state type		Reed switch type	
	CS9H	**ZB430**	**CS3H, CS4H, CS5H**	
Bore size	**10, 16, 25 [0.394, 0.630, 0.984]**		**10 [0.394]**	**16, 25 [0.630, 0.984]**
Operating range: ℓ	3.2～3.5 [0.126～0.138] TYP (25°C [77°F])	3.2～3.5 [0.126～0.138] TYP (25°C [77°F])	5.5～8.0 [0.217～0.315]	6.0～8.5 [0.236～0.335]
Response differential: C	0.7 [0.028] MAX (25°C [77°F])		2 [0.079]	
Maximum sensing location[Note]	8 [0.315]			

Remark: The above table shows reference values.
Note: This is the length measured from the switch's opposite end side to the lead wire.

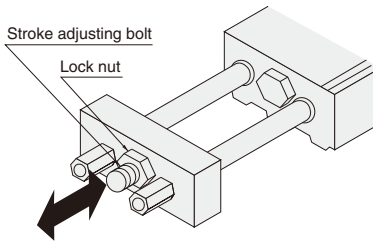
Mounting and adjustment

Mounting

1. While any mounting direction is allowed, the mounting surface should always be flat. Twisting or bending in the table or plate during mounting may disturb the accuracy and may also result in air leaks or improper operation.
2. Care should be taken that scratches or dents on the mounting surface of the table and/or plate may damage its flatness.
3. Use JIS B 1354 straight pins to locate the table and the plate.
4. In applications with high load ratios or speeds of 200mm/s [7.9in./sec.] or higher, either select a unit with a shock absorber or use an externally mounted shock absorber.

Stroke adjustment

In the Slide Unit, the stroke is easily adjustable. Loosening the lock nut and turning the stroke adjusting bolt to the right (clockwise) shortens the stroke. Turning it to the left (counterclockwise) lengthens the stroke. After adjustment, tighten the lock nut and secure it in place.



mm [in.]

Model	Stroke adjusting range	Stroke changes (per 1 rotation)
HSUT10×□,HSUP10×□ HSUL10×□	±10 [±0.394]	0.8 [0.031]
HSUT(K)16×□, HSUT(K)25×□ HSUP(K)16×□, HSUP(K)25×□ HSUL(K)16×□, HSUL(K)25×□	±10 [±0.394] (±5 [0.197])	1 [0.039]

Remark: Figures in parentheses ( ) are for types with end keep mechanism (one side only).

Allowable lateral load

When applying a lateral load on the plate in the fixed table type, keep the load at or below the values in the table below.

Allowable lateral load N [lbf.]

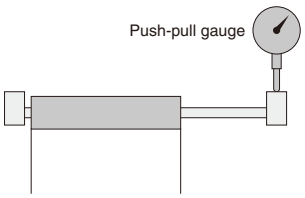
Model \ Stroke mm	25	50	75	100	125	150	175	200
HSUT10×□	1.34 [0.301]	0.93 [0.209]	0.71 [0.160]	0.58 [0.130]	—	—	—	—
HSUT(K)16×□	3.06 [0.688]	2.12 [0.477]	1.62 [0.364]	1.31 [0.294]	1.11 [0.250]	0.95 [0.214]	0.83 [0.187]	0.75 [0.169]
HSUT(K)25×□	8.40 [1.888]	5.92 [1.331]	4.57 [1.027]	3.72 [0.836]	3.14 [0.706]	2.71 [0.609]	2.38 [0.535]	2.13 [0.479]

Remark: These are reference values, not guaranteed values.

Piston rod deflection

Applying load on the table or plate can cause deflection in the piston rod. For the amount of the deflection, use the table below as a guide.

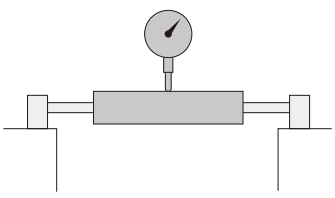
●Fixed table type (HSUT, HSUTK)



mm [in.]

Model	Load N [lbf.]	Stroke 100	Stroke 200
HSUT10×□	2.0 [0.45]	0.11 [0.0043]	—
	2.9 [0.65]	0.16 [0.0063]	—
	4.9 [1.10]	0.27 [0.0106]	—
HSUT(K)16×□	4.9 [1.10]	0.07 [0.0028]	0.44 [0.0173]
	9.8 [2.20]	0.15 [0.0059]	0.88 [0.0346]
	14.7 [3.30]	0.22 [0.0087]	1.32 [0.0520]
HSUT(K)25×□	9.8 [2.20]	0.03 [0.0012]	0.18 [0.0071]
	14.7 [3.30]	0.05 [0.0020]	0.27 [0.0106]
	24.5 [5.51]	0.08 [0.0031]	0.45 [0.0177]

●Fixed end plate type (HSUP, HSUPK)



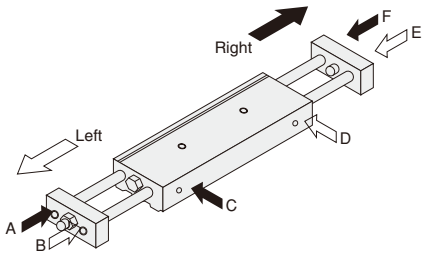
mm [in.]

Model	Load N [lbf.]	Stroke 100	Stroke 200
HSUP10×□	2.0 [0.45]	0.02 [0.0008]	—
	4.9 [1.10]	0.04 [0.0016]	—
	9.8 [2.20]	0.07 [0.0028]	—
HSUP(K)16×□	9.8 [2.20]	0.02 [0.0008]	0.12 [0.0047]
	19.6 [4.41]	0.05 [0.0020]	0.25 [0.0098]
	29.4 [6.61]	0.07 [0.0028]	0.37 [0.0146]
HSUP(K)25×□	19.6 [4.41]	0.01 [0.0004]	0.05 [0.0020]
	29.4 [6.61]	0.01 [0.0004]	0.08 [0.0031]
	49 [11.0]	0.02 [0.0008]	0.13 [0.0051]

Piping

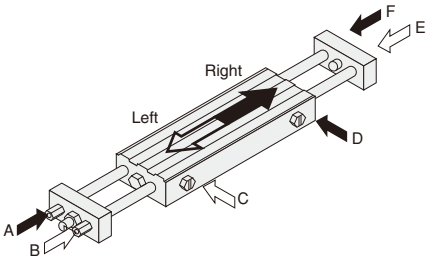
Piping location and operating direction

●Fixed table type (HSUT, HSUTK)



When supplying air to the C port, the piston rod and end plate move to the right. When supplying air to the D port, they move to the left. While the unit can also be used by plugging C, D ports, and plumbing A, B, E, F ports, consult us since such configuration needs special adapters and plugs, etc. (In this case, when supplying air to A, F ports, the piston rod and end plate move to the right. When supplying air to B, E ports, they move to the left.)

●Fixed end plate type (HSUP, HSUPK)
●Fixed rail-on plate type (HSUL, HSULK)



When supplying air to the A port, the table moves to the right. When supplying air to the B port, it moves to the left. While the unit can also be used by plugging A, B ports, and plumbing C, D, E, F ports, consult us since such configuration requires special plugs, etc. (In this case, when supplying air to D, F ports, the table moves to the right, when supplying to C, E ports, it moves to the left.)

Cautions:
1. Always thoroughly blow off (use compressed air) the tubing before connecting it to the Slide Unit. Entering chips, sealing tape, rust, etc., generated during piping work could result in air leaks or other defective operation.
2. When piping to moving portions, be careful about bending or folding tubes. Excessive bending or repeated folding may damage the tubes or fittings.

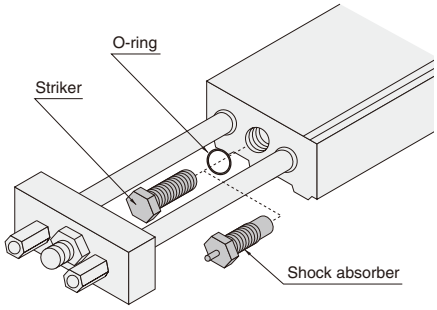
Shock absorber

Selection

The absorbing capacity of the shock absorber built into the Slide Unit is a fixed type. From the graph below, select the shock absorber with the optimum absorbing capacity (see the table below).

Replacements

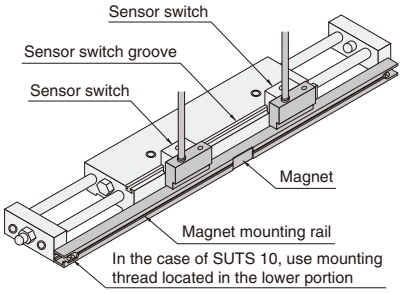
If the load and operating speed have been changed, replace the shock absorber with one that has the appropriate absorbing capacity.



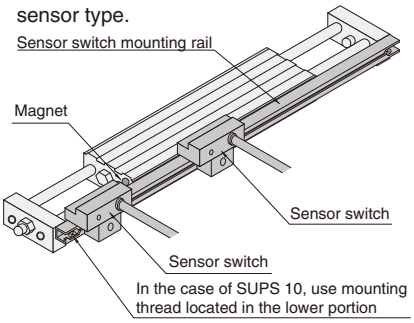
Cautions : 1. Be careful to avoid scratching the piston rod when detaching the shock absorber or striker.
2. Always attach O-rings when mounting the shock absorber or striker to the slide table.
3. Never use the unit when the shock absorber or striker is removed.
4. Do not loosen or remove the mounting screw on the rear surface of the shock absorber. Oil sealed inside could leak, damaging the shock absorber function.

Sensor switches

●Fixed table type (HSUTS, HSUTKS)
Can be used as a sensor type by installing a magnet mounting rail. If a magnet mounting rail is required, consult us.



●Fixed end plate type (HSUPS, HSUPKS)
Fixed rail-on plate type (HSULS, HSULKS)
The magnet for sensor switch is not built into the standard type. When mounting a sensor switch is required, always order the sensor type.



Cautions: 1. For the sensor switch mounting location and moving instructions, see p.887.
2. Contact protection is needed when the sensor switch is connected to inductive loads or when capacitive surges occur. For contact protection, see p.1566.

Shock absorber selection guide

Model	Code / Model / Air pressure MPa [psi.] / Absorbing capacity J	-D KSHA6×8-D-X	-E KSHA6×8-E-X	-F KSHA6×8-F-X	-G KSHA7×8-G-X	-K KSHA7×8-K-X
		1.0	2.0	2.9	3.9	4.9 5.9
HSUT16×□ **HSUTK16×□** **HSUP16×□** **HSUPK16×□**	0.4 [58] 0.5 [73] 0.6 [87] 0.7 [102]					
HSUL16×□ **HSULK16×□**	0.4 [58] 0.5 [73] 0.6 [87] 0.7 [102]					
HSUT25×□ **HSUTK25×□** **HSUP25×□** **HSUPK25×□**	0.4 [58] 0.5 [73] 0.6 [87] 0.7 [102]					
HSUL25×□ **HSULK25×□**	0.4 [58] 0.5 [73] 0.6 [87] 0.7 [102]					

Slow speed light loads
High speed heavy loads

1J = 0.7376ft·lbf

Control circuit for types with end keep mechanism

1. For control of the Slide Units with end keep mechanisms, we recommend the use of 2-position, 4-, 5-port valves. Avoid the use of control circuit with ABR connection (exhaust center) 3-position valves that exhaust air from 2 delivery ports.
2. Always use meter-out control for speed control. Meter-in control may result in failure of the locking mechanism to release.
3. Always set the air pressure to 0.2MPa [29psi.] or more.

Cautions : 1. It is dangerous to supply air to a connection port on a side with a locking mechanism while the cylinder has already been exhausted, because the piston rod may suddenly extend (or retract). In addition, since the lock piston could also cause galling of the lock piston and piston rod, resulting in defective operation. Always supply air to the connection port opposite the adjacent to the locking mechanism to ensure applying back pressure.

2. When restarting operations after air has been exhausted from the cylinder due to completion of operations or to an emergency stop, always start by supplying air to the connection port opposite the adjacent to the locking mechanism.

3. Connect the valve port A (NC) to the connection port on the side with the locking mechanism.

Installation and adjustment of types with end keep mechanism

Avoid using an external stopper, etc., to adjust the stroke on the side of the locking mechanism, since it becomes unable to make the end keep lock.
Stroke adjustment on the side without the locking mechanism is allowed within a range of ±5mm [±0.197in.].

Manual operation for types with end keep mechanism

While the locking mechanism is normally released automatically through cylinder operations, it can also be released manually. For manual release, insert an M3×0.5 screw that has 30mm [1.18in.] screw length into the opening for manual override, thread it in about 3 turns into the internal lock piston, and then pull up the screw. To maintain the manual override for adjustment, etc., thread the locknut onto the screw and, with the locking mechanism in a released state, tighten the locknut against the cylinder.

Cautions : 1. It is dangerous to release the lock when load (weight) is present on the piston rod, because it may cause the unintended piston rod's extension (or retraction). In this case, always supply air to the connection port opposite the one adjacent to the locking mechanism before releasing the locking mechanism.

2. If the locking mechanism cannot easily be released even with manual override, it could be the result of galling of the lock piston and piston rod. In this case, supply air to the connection port opposite the one adjacent to the locking mechanism before releasing the locking mechanism.

3. Water, oil, dust, etc., intruding through the opening for manual override may be a cause of defective locks or other erratic operation. If using in locations subject to dripping water, dripping oil, etc., or large amounts of dust, use a cover to protect the unit.

General precautions

Media

1. Use air for the media. For the use of any other media, consult us.
2. Air used for the cylinder should be clean air that contains no deteriorated compressor oil, etc. Install an air filter (filtration of a minimum 40 µm) near the cylinder or valve to remove collected liquid or dust. In addition, drain the air filter periodically.
   Collected liquid or dust entering the cylinder may cause improper operation.

Lubrication

The product can be used without lubrication, if lubrication is required, use Turbine Oil Class 1 (ISO VG32) or equivalent. Avoid using spindle oil or machine oil.

Atmosphere

1. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use a cover to protect the unit.
2. The product cannot be used when the media or ambient atmosphere contains any of the substances listed below.
   Organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, or acids, etc.