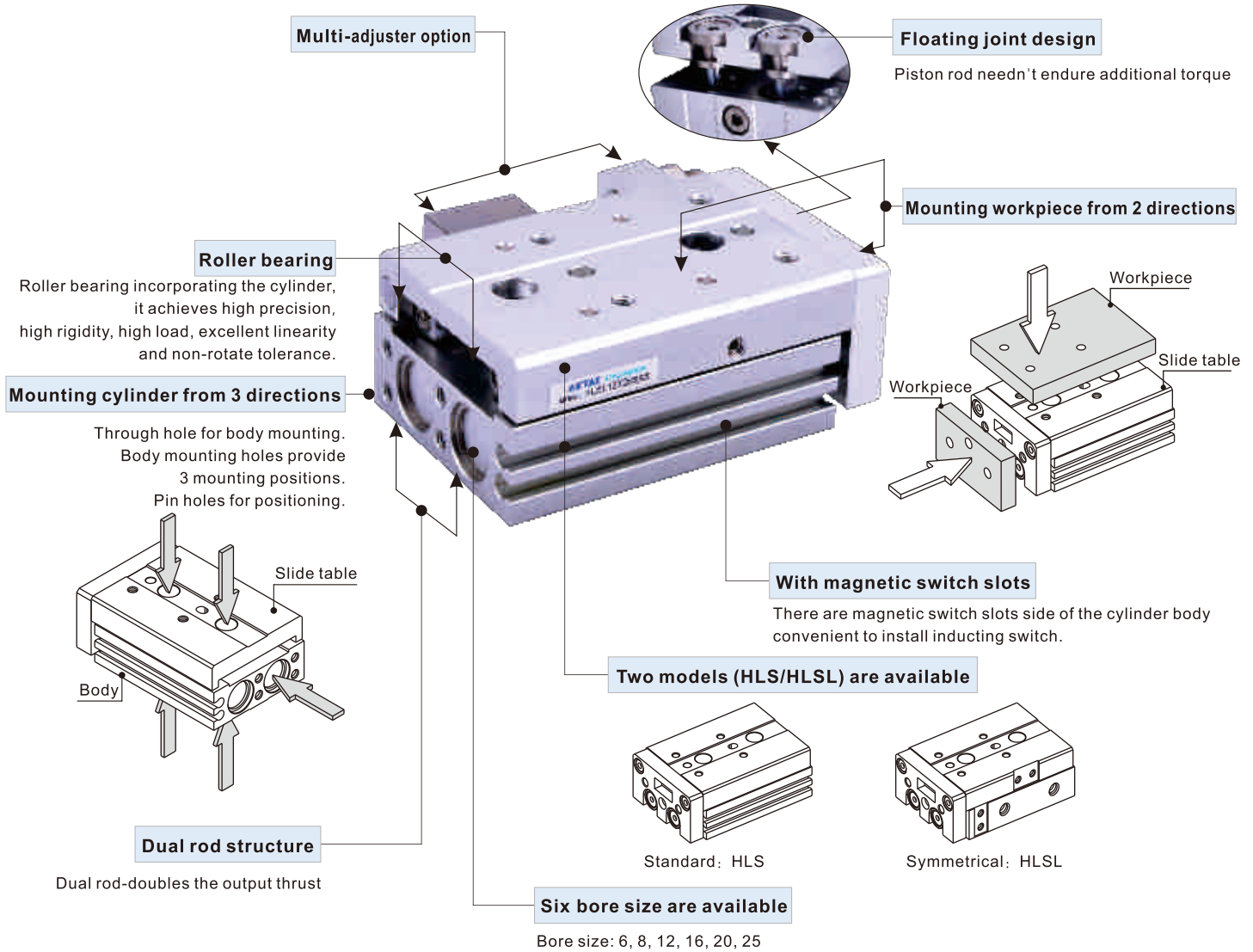




# Compact slide cylinder(Roller bearing)——HLS Series

## Compendium of HLS\HLSL Series



## Criteria for selection: Cylinder thrust

Unit: Newton(N)

| Bore size | Rod size | Acting type   | Pressure area(mm <sup>2</sup> ) | Operating pressure(MPa) |     |     |     |     |     |
|-----------|----------|---------------|---------------------------------|-------------------------|-----|-----|-----|-----|-----|
|           |          |               |                                 | 0.2                     | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 6         | 3        | Double acting | Push-side                       | 42                      | 8   | 13  | 17  | 21  | 29  |
|           |          |               | Pull-side                       | 57                      | 11  | 17  | 23  | 29  | 40  |
| 8         | 4        | Double acting | Push-side                       | 75                      | 15  | 23  | 30  | 38  | 45  |
|           |          |               | Pull-side                       | 101                     | 20  | 30  | 40  | 51  | 71  |
| 12        | 6        | Double acting | Push-side                       | 170                     | 34  | 51  | 68  | 85  | 102 |
|           |          |               | Pull-side                       | 226                     | 45  | 68  | 90  | 113 | 158 |
| 16        | 8        | Double acting | Push-side                       | 302                     | 60  | 91  | 121 | 151 | 211 |
|           |          |               | Pull-side                       | 402                     | 80  | 121 | 161 | 201 | 281 |
| 20        | 10       | Double acting | Push-side                       | 471                     | 94  | 141 | 188 | 236 | 283 |
|           |          |               | Pull-side                       | 628                     | 126 | 188 | 251 | 314 | 440 |
| 25        | 12       | Double acting | Push-side                       | 756                     | 151 | 227 | 302 | 378 | 454 |
|           |          |               | Pull-side                       | 982                     | 186 | 295 | 393 | 491 | 687 |

## Installation and application

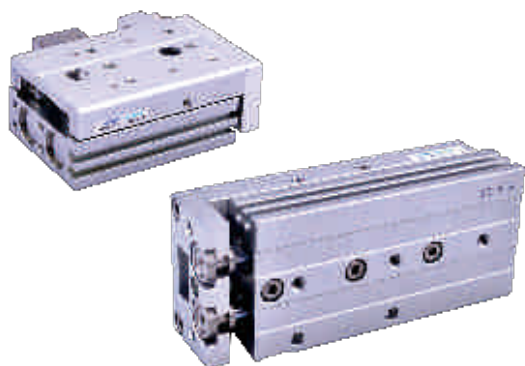


1. Dirty substances in the pipe must be eliminated before cylinder is connected with pipeline to prevent the entrance of impurities into the cylinder.
2. The medium used by cylinder should be filtered to 40 μm or below .
3. Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
4. If the cylinder is dismantled and stored for a long time, pay attention to conduct anti-rust treatment to the surface. Anti-dust caps shall be added in air inlet and outlet ports.



# Compact slide cylinder(Roller bearing)

HLS、HLSL Series



## Specification

| Bore size(mm)      | 6                                           | 8 | 12 | 16 | 20   | 25 |
|--------------------|---------------------------------------------|---|----|----|------|----|
| Acting type        | Double acting                               |   |    |    |      |    |
| Fluid              | Air(to be filtered by 40 μm filter element) |   |    |    |      |    |
| Operating pressure | 0.15~0.7MPa(22~100psi)(1.5~7.0bar)          |   |    |    |      |    |
| Proof pressure     | 1.2MPa(175psi)(12.0bar)                     |   |    |    |      |    |
| Temperature °C     | -20~70                                      |   |    |    |      |    |
| Speed range mm/s   | 50~500                                      |   |    |    |      |    |
| Stroke tolerance   | Stroke ≤ 100 $+1.0_0$ Stroke > 100 $+1.5_0$ |   |    |    |      |    |
| Cushion type       | Bumper(Both ends)、Shock absorber            |   |    |    |      |    |
| Sensor switches    | CMSS、DMSH(S)                                |   |    |    |      |    |
| Port size [Note1]  | M5 × 0.8                                    |   |    |    | 1/8" |    |

[Note1] PT thread, G thread, NPT thread are available.  
Refer to P353 for detail of sensor switch.

## Symbol



## Stroke

| Bore size (mm) | Standard stroke (mm) |    |    |    |    |    |     |     |     |  |  |  | Max.std stroke |
|----------------|----------------------|----|----|----|----|----|-----|-----|-----|--|--|--|----------------|
| 6              | 10                   | 20 | 30 | 40 | 50 |    |     |     |     |  |  |  | 50             |
| 8              | 10                   | 20 | 30 | 40 | 50 | 75 |     |     |     |  |  |  | 75             |
| 12             | 10                   | 20 | 30 | 40 | 50 | 75 | 100 |     |     |  |  |  | 100            |
| 16             | 10                   | 20 | 30 | 40 | 50 | 75 | 100 | 125 |     |  |  |  | 125            |
| 20             | 10                   | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 |  |  |  | 150            |
| 25             | 10                   | 20 | 30 | 40 | 50 | 75 | 100 | 125 | 150 |  |  |  | 150            |

[Note] Consult us for non-standard stroke.

## Ordering code

**HLS 20 × 30 S AS □**

① ② ③ ④ ⑤ ⑥

| ① Model                                                                                                                                                                | ② Bore Size                    | ③ Stroke                                   | ④ Magnet          | ⑤ Adjuster option [Note1]                    |                                   | ⑥ Thread type [Note2]       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------|-------------------|----------------------------------------------|-----------------------------------|-----------------------------|
| HLS: Compact slide cylinder<br>(Double acting type)<br>(Roller bearing)<br><br>HLSL: Symmetrical Compact<br>slide cylinder<br>(Double acting type)<br>(Roller bearing) | 6<br>8<br>12<br>16<br>20<br>25 | Refer to<br>stroke<br>table for<br>details | S: With<br>magnet | Blank: Without adjuster(Basic type)          |                                   | Blank: PT<br>G: G<br>T: NPT |
|                                                                                                                                                                        |                                |                                            |                   |                                              |                                   |                             |
|                                                                                                                                                                        |                                |                                            |                   | A: Adjustable rubber stopper(Both ends)<br>  | B: Shock absorber(Both ends)<br>  |                             |
|                                                                                                                                                                        |                                |                                            |                   | AS: Adjustable rubber stopper(Extension)<br> | BS: Shock absorber(Extension)<br> |                             |
|                                                                                                                                                                        |                                |                                            |                   | AF: Adjustable rubber stopper(Retractio)<br> | BF: Shock absorber(Retractio)<br> |                             |

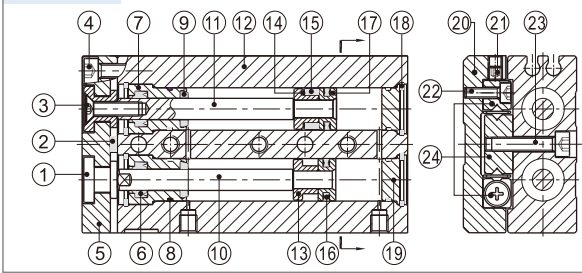
[Note1] B type, BS type, BF type are unavailable for bore size of Φ6. [Note2] When the thread is standard, the code is blank.

# Compact slide cylinder(Roller bearing)

## HLS、HLSL Series

### Inner structure and material of major parts

#### Basic type



| NO. | Item           | Material        | NO. | Item                   | Material                                 |
|-----|----------------|-----------------|-----|------------------------|------------------------------------------|
| 1   | Floating joint | Carbon steel    | 13  | Magnet holder          | Brass                                    |
| 2   | Bumper         | TPU             | 14  | Magnet washer          | NBR                                      |
| 3   | Screw          | Carbon steel    | 15  | Magnet                 | Sintered metal<br>(Neodymium-iron-boron) |
| 4   | Screw          | Carbon steel    | 16  | Piston seal            | NBR                                      |
| 5   | Fixing plate   | Aluminum alloy  | 17  | Piston                 | Brass                                    |
| 6   | Rod seal       | NBR             | 18  | C clip                 | Spring steel                             |
| 7   | Front cover    | Aluminum alloy  | 19  | Back cover             | Aluminum alloy                           |
| 8   | O-ring         | NBR             | 20  | Slide table            | Aluminum alloy                           |
| 9   | Bumper         | TPU             | 21  | Nut                    | Carbon steel                             |
| 10  | Piston rod A   | Carbon steel    | 22  | Screw                  | Carbon steel                             |
| 11  | Piston rod B   | Stainless steel | 23  | Screw                  | Carbon steel                             |
| 12  | Body           | Aluminum alloy  | 24  | Slide guidecombination | subassembly                              |

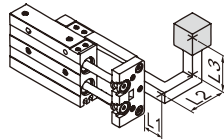
### Model Selection Method

Please select compact cylinder's type according to following procedure, and cross reference with data sheets.

#### A) Operating conditions(According to mounting position and work form)

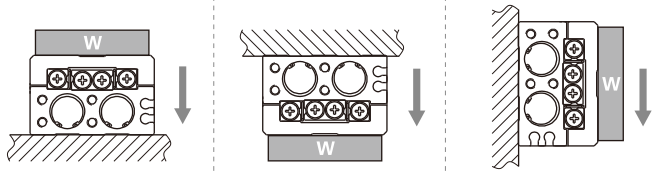
1. Model used(Bore size, Stroke)
2. Type of cushion(Bumper, Shock absorber)
3. Mounting position of work(Top, front)
4. Mounting direction(Axial, Vertical)
5. Average speed  $V_a$ (mm/s)
6. Applied load  $W$ (N)
7. Overhang  $L_1, L_2, L_3$ (mm)

Fig. 1



Explain:  $L_1$  is the distance of load's center beyond the end plank's plane.  
If load's center is not beyond the end plank's plane,  $L_1$  is negative.

Fig. 1: Applied load



#### B) Kinetic energy check

1. Calculate kinetic energy of load  $E$ (J)  

$$E = \frac{1}{2} \times \frac{W}{g} \times \left( \frac{1.4 \times V_a}{1000} \right)^2$$
2. Calculate allowable kinetic energy  $E_a$ (J)  

$$E_a = K \times E_{max}$$

$K$ : Mounting work coefficient (Fig 2)  
 $E_{max}$ : Maximum allowable kinetic energy (Table 1)
3. Check that kinetic energy of load doesn't exceed allowable kinetic energy:  $E \leq E_a$

#### C) Load check

1. Calculate allowable applied load  $W_a$  (N)  

$$W_a = K \times \beta \times W_{max}$$

$K$ : Mounting work coefficient (Fig 2)  
 $W_{max}$ : Maximum allowable applied load (Table 1)  
 $\beta$ : Applied load coefficient (Fig 3)
2. Check that load( $W$ ) doesn't exceed allowable applied load( $W_a$ ):  $W \leq W_a$

Fig 2: Mounting work coefficient (K)

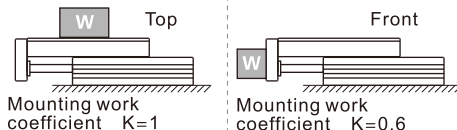
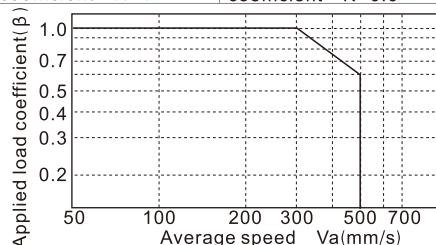


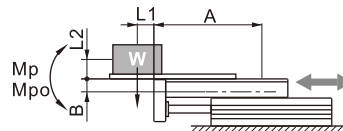
Fig 3: Applied load coefficient ( $\beta$ )



#### D) Moment check

##### Horizontal

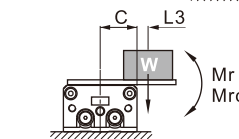
1. Calculate actual moment:  $M_p, M_{po}, M_y, M_{yo}, M_r, M_{ro}$  (Nm)



Dynamic moment:  

$$M_p = W \times (L_1 + A) / 1000$$
 Static moment:  

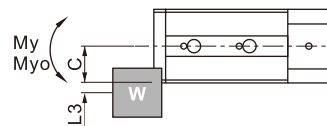
$$M_{po} = \frac{W \times (L_1 + A)}{1000} + \frac{W \times a \times (L_2 + B)}{1000 \times g}$$



Dynamic moment:  

$$M_r = W \times (C + L_3) / 1000$$
 Static moment:  

$$M_{ro} = (W \times a \times (C + L_3)) / 1000g$$



Dynamic moment:  

$$M_y = 0$$
 Static moment:  

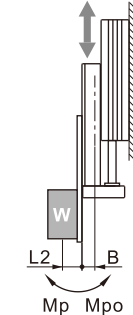
$$M_{yo} = (W \times a \times (C + L_3)) / 1000g$$

2. Check

Dynamic moment:  $\frac{M_p}{M_{p_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_r}{M_{r_{max}}} \leq 1$   
 Static moment:  $\frac{M_{po}}{M_{po_{max}}} + \frac{M_{yo}}{M_{yo_{max}}} + \frac{M_{ro}}{M_{ro_{max}}} \leq 1$

##### Vertical

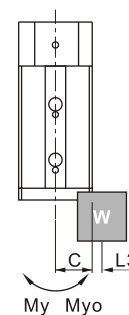
1. Calculate actual moment:  $M_p, M_{po}, M_y, M_{yo}$  (Nm)



Dynamic moment:  

$$M_p = W \times (L_2 + B) / 1000$$
 Static moment:  

$$M_{po} = \frac{W \times (L_2 + B)}{1000} + \frac{W \times a \times (L_2 + B)}{1000 \times g}$$



Dynamic moment:  

$$M_y = W \times (C + L_3) / 1000$$
 Static moment:  

$$M_{yo} = \frac{W \times a \times (C + L_3)}{1000g} + \frac{W \times (C + L_3)}{1000}$$

2. Check

Dynamic moment:  $\frac{M_p}{M_{p_{max}}} + \frac{M_y}{M_{y_{max}}} \leq 1$   
 Static moment:  $\frac{M_{po}}{M_{po_{max}}} + \frac{M_{yo}}{M_{yo_{max}}} \leq 1$

Explain:

$L_1/L_2/L_3$ : The distance of load center to mount plane(Determined by actuality).

$A/B/C$ : Correction value for center position distance of moment(Refer to table 2).

$M_{p_{max}}/M_{y_{max}}/M_{r_{max}}/M_{po_{max}}/M_{yo_{max}}/M_{ro_{max}}$ : Maximum allowable moment(Refer to table 2).

$g$ : Acceleration of gravity( $g=9.81m/s^2$ ).

$a$ : Acceleration of inertia

(Bumper:  $a=1600 \times (V_a/1000)^2$ , Shock absorber:  $a=400 \times (V_a/1000)^2$ )

$W$ : Load weight(Determined by actuality).

# Compact slide cylinder(Roller bearing)

## HLS、HLSL Series

**Table 1:** Maximum allowable kinetic energy(E<sub>max</sub>)  
Maximum allowable applied load(W<sub>max</sub>)

| Model | Max. allowable kinetic energy |                     | E <sub>max</sub> (J) | Max. allowable applied load W <sub>max</sub> (N) |
|-------|-------------------------------|---------------------|----------------------|--------------------------------------------------|
|       | Basic type                    | Rubber stopper type | Shock absorber type  |                                                  |
| HLS6  | 0.01                          | 0.01                | —                    | 4                                                |
| HLS8  | 0.024                         | 0.024               | 0.048                | 8                                                |
| HLS12 | 0.05                          | 0.05                | 0.1                  | 15                                               |
| HLS16 | 0.1                           | 0.1                 | 0.2                  | 30                                               |
| HLS20 | 0.13                          | 0.13                | 0.26                 | 40                                               |
| HLS25 | 0.22                          | 0.22                | 0.44                 | 70                                               |

**Note:** Symbol and unit

| Symbol                                                                                           | Item                                                    | Unit             |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------|
| A, B, C                                                                                          | Correction value for center position distance of moment | mm               |
| a                                                                                                | Acceleration of inertia                                 | —                |
| E                                                                                                | Kinetic energy                                          | J                |
| E <sub>a</sub>                                                                                   | Allowable kinetic energy                                | J                |
| E <sub>max</sub>                                                                                 | Maximum allowable kinetic energy                        | J                |
| g                                                                                                | Acceleration of gravity g=9.81                          | m/s <sup>2</sup> |
| K                                                                                                | Mounting work coefficient                               | —                |
| L1, L2, L3                                                                                       | Overhang                                                | mm               |
| M <sub>p</sub> , M <sub>y</sub> , M <sub>r</sub>                                                 | Dynamic moment(Pitch、Yaw、Roll)                          | Nm               |
| M <sub>pmax</sub> , M <sub>ymax</sub> , M <sub>rmax</sub>                                        | Maximum allowable dynamic moment (Pitch、Yaw、Roll)       | Nm               |
| M <sub>po</sub> , M <sub>yo</sub> , M <sub>ro</sub>                                              | Static moment(Pitch、Yaw、Roll)                           | Nm               |
| M <sub>po</sub> <sub>max</sub> , M <sub>yo</sub> <sub>max</sub> , M <sub>ro</sub> <sub>max</sub> | Maximum allowable static moment (Pitch、Yaw、Roll)        | Nm               |
| V <sub>a</sub>                                                                                   | Average speed                                           | mm/s             |
| W                                                                                                | Applied load                                            | N                |
| W <sub>max</sub>                                                                                 | Maximum allowable applied load                          | N                |
| β                                                                                                | Applied load coefficient                                | —                |

**Table 2:** Maximum allowable moment(Nm),  
Correction value for center position distance of moment(mm)

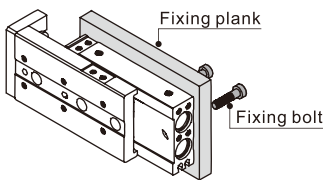
| Bore size | Stroke | Static moment                  |                                |                                | Dynamic moment                |                               |                               | Correction value |      |    |
|-----------|--------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------|------|----|
|           |        | M <sub>po</sub> <sub>max</sub> | M <sub>yo</sub> <sub>max</sub> | M <sub>ro</sub> <sub>max</sub> | M <sub>p</sub> <sub>max</sub> | M <sub>y</sub> <sub>max</sub> | M <sub>r</sub> <sub>max</sub> | A                | B    | C  |
| 6         | 10     | 3.3                            | 3.8                            | 2.6                            | 0.7                           | 0.7                           | 0.6                           | 27               | 7.3  | 16 |
|           | 20     | 3.3                            | 3.8                            | 2.6                            | 0.7                           | 0.8                           | 0.6                           | 42               |      |    |
|           | 30     | 3.3                            | 3.8                            | 2.6                            | 0.7                           | 0.8                           | 0.6                           | 52               |      |    |
|           | 40     | 7.2                            | 7.9                            | 3.6                            | 1.3                           | 1.3                           | 0.6                           | 72               |      |    |
|           | 50     | 12.4                           | 12.7                           | 4.7                            | 1.8                           | 1.8                           | 0.6                           | 87               |      |    |
|           | 60     | 10.1                           | 9.1                            | 8.8                            | 2.5                           | 2.5                           | 2.0                           | 32               |      |    |
| 8         | 10     | 10.1                           | 9.1                            | 8.8                            | 2.6                           | 2.6                           | 2.0                           | 42               | 8.5  | 20 |
|           | 20     | 10.1                           | 9.1                            | 8.8                            | 2.8                           | 2.8                           | 2.0                           | 57               |      |    |
|           | 30     | 10.1                           | 9.1                            | 8.8                            | 2.8                           | 2.8                           | 2.0                           | 57               |      |    |
|           | 40     | 12.4                           | 10.8                           | 10.1                           | 3.4                           | 3.4                           | 2.3                           | 72               |      |    |
|           | 50     | 23.6                           | 24.8                           | 13.9                           | 4.4                           | 4.4                           | 2.1                           | 92               |      |    |
|           | 60     | 32.8                           | 35.3                           | 16.4                           | 4.6                           | 4.6                           | 1.8                           | 132              |      |    |
| 12        | 10     | 33.0                           | 34.3                           | 30.9                           | 7.3                           | 7.3                           | 5.8                           | 48               | 10   | 25 |
|           | 20     | 33.0                           | 34.3                           | 30.9                           | 7.6                           | 7.6                           | 5.8                           | 58               |      |    |
|           | 30     | 33.0                           | 34.3                           | 30.9                           | 7.8                           | 7.8                           | 5.8                           | 68               |      |    |
|           | 40     | 33.0                           | 34.3                           | 30.9                           | 8.0                           | 8.0                           | 5.8                           | 78               |      |    |
|           | 50     | 53.4                           | 49.6                           | 39.7                           | 9.8                           | 9.8                           | 5.8                           | 88               |      |    |
|           | 60     | 78.8                           | 71.9                           | 48.6                           | 14.2                          | 14.2                          | 6.8                           | 125              |      |    |
| 16        | 10     | 78.8                           | 71.9                           | 48.6                           | 14.7                          | 14.7                          | 6.8                           | 160              | 11   | 30 |
|           | 20     | 33.0                           | 34.3                           | 30.9                           | 8.8                           | 8.8                           | 7.6                           | 43               |      |    |
|           | 30     | 33.0                           | 34.3                           | 30.9                           | 9.2                           | 9.2                           | 7.6                           | 53               |      |    |
|           | 40     | 33.0                           | 34.3                           | 30.9                           | 9.5                           | 9.5                           | 7.6                           | 63               |      |    |
|           | 50     | 33.0                           | 34.3                           | 30.9                           | 10.0                          | 10.0                          | 7.6                           | 78               |      |    |
|           | 60     | 53.4                           | 49.6                           | 39.7                           | 12.2                          | 12.2                          | 7.6                           | 93               |      |    |
| 20        | 10     | 78.8                           | 71.9                           | 48.6                           | 17.6                          | 17.6                          | 8.9                           | 130              | 16.5 | 35 |
|           | 20     | 78.8                           | 71.9                           | 48.6                           | 18.2                          | 18.2                          | 8.9                           | 165              |      |    |
|           | 30     | 143.7                          | 144.5                          | 53.3                           | 24.8                          | 24.8                          | 7.8                           | 204              |      |    |
|           | 40     | 60.1                           | 50.5                           | 72.8                           | 14.5                          | 14.5                          | 15.2                          | 47               |      |    |
|           | 50     | 60.1                           | 50.5                           | 72.8                           | 15.2                          | 15.2                          | 15.2                          | 57               |      |    |
|           | 60     | 60.1                           | 50.5                           | 72.8                           | 15.7                          | 15.7                          | 15.2                          | 67               |      |    |
| 25        | 10     | 60.1                           | 50.5                           | 72.8                           | 16.3                          | 16.3                          | 15.2                          | 82               | 20.3 | 42 |
|           | 20     | 60.1                           | 50.5                           | 72.8                           | 16.6                          | 16.6                          | 15.2                          | 92               |      |    |
|           | 30     | 169.3                          | 154.3                          | 114.4                          | 41.2                          | 41.2                          | 22.0                          | 136              |      |    |
|           | 40     | 169.3                          | 154.3                          | 114.4                          | 42.8                          | 42.8                          | 22.0                          | 176              |      |    |
|           | 50     | 169.3                          | 154.3                          | 114.4                          | 43.6                          | 43.6                          | 22.0                          | 205              |      |    |
|           | 60     | 267.5                          | 286.6                          | 145.6                          | 49.0                          | 49.0                          | 20.5                          | 249              |      |    |

## Installation and application

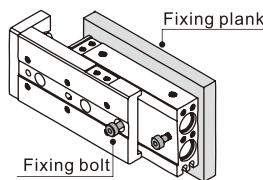
1. How to mount cylinder:

1.1) Cylinder can be mounted from 3 directions

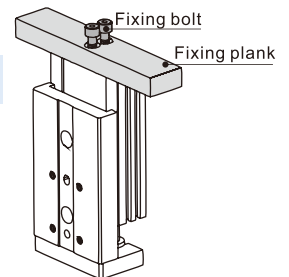
### Vertical Mounting(Body thread holes)



### Vertical Mounting(Body through holes)



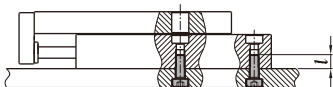
### Axial Mounting (Body thread holes)



1.2) When mounting an compact slide cylinder, screws of appropriate length should be used and tightened properly within the maximum tightening torque.

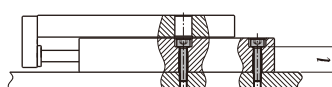
If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding or falling off from its position.

### Vertical Mounting(Body thread holes)



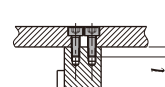
| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-----------|-----------------------------|-------------------------|
| HLS6  | M4 × 0.7  | 2.1                         | 8                       |
| HLS8  | M4 × 0.7  | 2.1                         | 8                       |
| HLS12 | M5 × 0.8  | 4.4                         | 10                      |
| HLS16 | M6 × 1.0  | 4.4                         | 10                      |
| HLS20 | M6 × 1.0  | 7.4                         | 12                      |
| HLS25 | M8 × 1.25 | 18.0                        | 16                      |

### Vertical Mounting(Body through holes)



| Model | Bolt used | Max. tightening torque (Nm) | Body depth(mm) |
|-------|-----------|-----------------------------|----------------|
| HLS6  | M3 × 0.5  | 1.2                         | 11.0           |
| HLS8  | M3 × 0.5  | 1.2                         | 12.5           |
| HLS12 | M4 × 0.7  | 2.8                         | 18.0           |
| HLS16 | M5 × 0.8  | 5.7                         | 25.0           |
| HLS20 | M5 × 0.8  | 5.7                         | 28.0           |
| HLS25 | M6 × 1.0  | 10.0                        | 36.2           |

### Axial Mounting(Body thread holes)



| Model | Bolt used   | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-------------|-----------------------------|-------------------------|
| HLS6  | M2.5 × 0.45 | 0.5                         | 3.5                     |
| HLS8  | M3 × 0.5    | 0.9                         | 4.0                     |
| HLS12 | M4 × 0.7    | 2.1                         | 6.0                     |
| HLS16 | M5 × 0.8    | 4.4                         | 7.0                     |
| HLS20 | M5 × 0.8    | 4.4                         | 8.0                     |
| HLS25 | M6 × 1.0    | 7.4                         | 10.0                    |

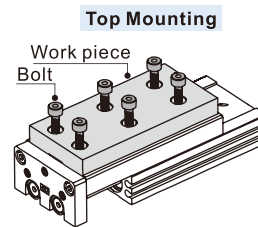
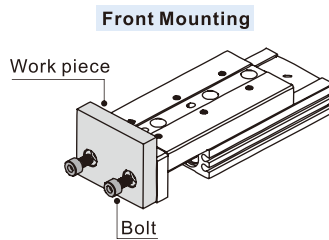


# Compact slide cylinder(Roller bearing)

## HLS、HLSL Series

### 2. Work Piece Mounting:

2.1) Work pieces can be mounted on 2 surfaces of the compact slide.



2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use blots at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

**Front Mounting**

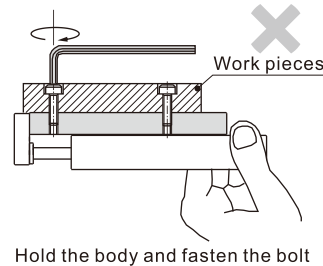
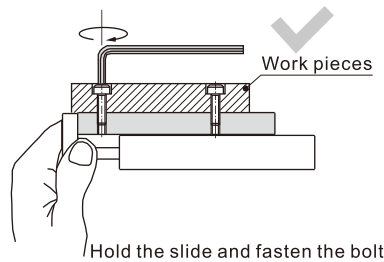
| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-----------|-----------------------------|-------------------------|
| HLS6  | M3×0.4    | 0.9                         | 5                       |
| HLS8  | M4×0.7    | 2.1                         | 6                       |
| HLS12 | M5×0.8    | 4.4                         | 8                       |
| HLS16 | M6×1.0    | 7.4                         | 10                      |
| HLS20 | M6×1.0    | 7.4                         | 13                      |
| HLS25 | M8×1.25   | 18.0                        | 15                      |

**Top Mounting**

| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-----------|-----------------------------|-------------------------|
| HLS6  | M3×0.5    | 0.9                         | 4.0                     |
| HLS8  | M3×0.5    | 0.9                         | 5.0                     |
| HLS12 | M4×0.7    | 2.1                         | 5.5                     |
| HLS16 | M5×0.8    | 4.4                         | 6.0                     |
| HLS20 | M5×0.8    | 4.4                         | 10.0                    |
| HLS25 | M6×1.0    | 7.4                         | 13.0                    |

2.3) Since the table is supported by the linear guide, take care not to apply strong impact or large moment to the guide section.

2.4) Hold the slide when fastening work pieces to it with bolts. If the body is held while tightening bolts, excessive moment may damage guide section.

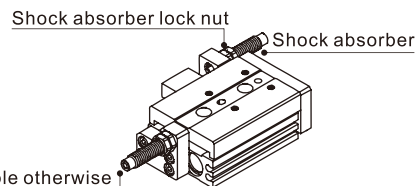


### 3. About shock absorber:

3.1) Shock absorbers are expendable. Promptly replace them when energy absorbing capacity decreases.

3.2) Never turn or adjust the screws on bottom of the shock absorber body. The screws are not for adjusting. Otherwise would cause oil leakage.

3.3) Follow the table for tightening torque of shock absorber to lock nuts.

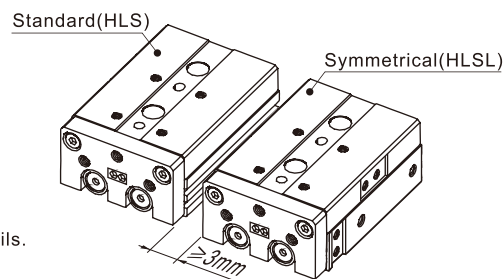


| Model | Shock absorber         | Tightening torque |
|-------|------------------------|-------------------|
| HLS6  | Without shock absorber |                   |
| HLS8  | ACA0806-1N             | 1.67(Nm)          |
| HLS12 | ACA0806-1N             | 1.67(Nm)          |
| HLS16 | ACA1007-1N             | 3.14(Nm)          |
| HLS20 | ACA1210-1N             | 3.14(Nm)          |
| HLS25 | ACA1412-1N             | 10.8(Nm)          |

### 4. How to mount sensor switch:

4.1) HLS Series are all with magnet. The matching sensor switches are CMSH、DMSH(S) series.

4.2) Maintain a minimum spacing of at least 3mm if two compact cylinders are used side by side in order to avoid malfunction.



5. Make sure to connect the compact cylinder to speed controller at the meter-out side, and the speed of compact cylinder must below 500mm/s.

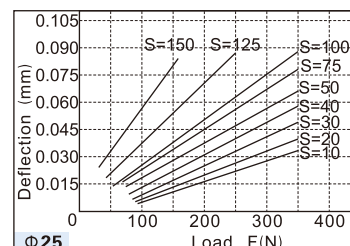
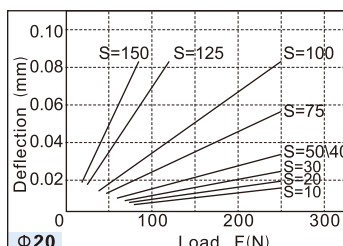
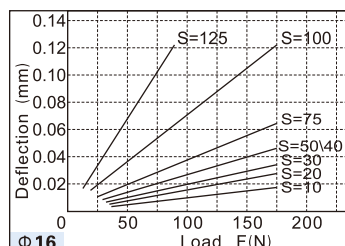
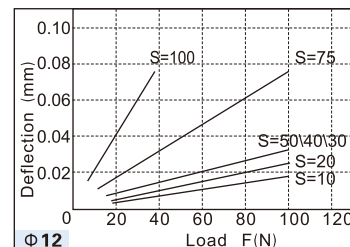
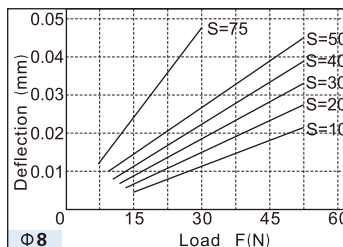
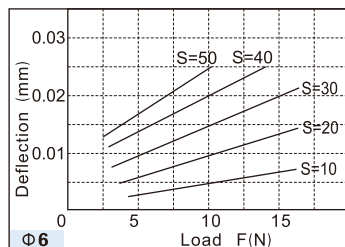
6. Don't apply a load beyond the range of the operation limits. Different load or torque will cause different deflection to table, please see below for details.

# Compact slide cylinder(Roller bearing)

## HLS、HLSL Series

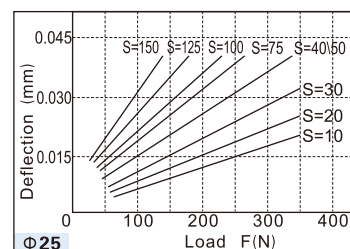
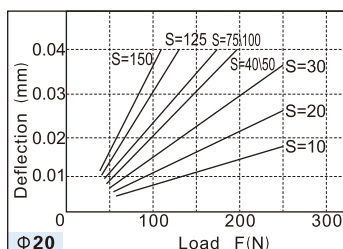
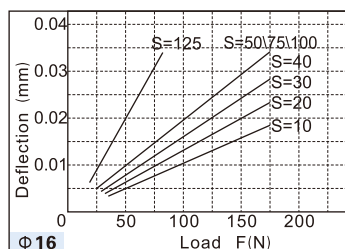
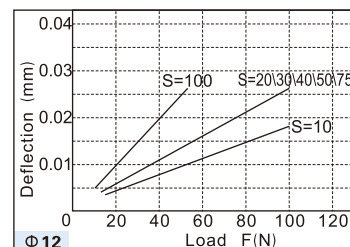
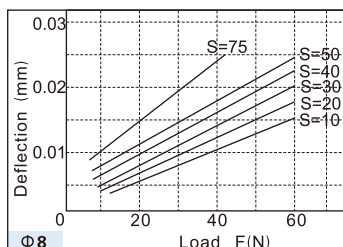
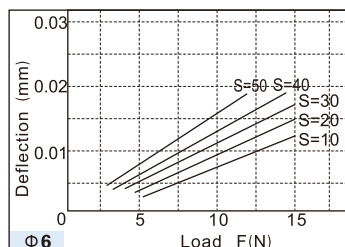
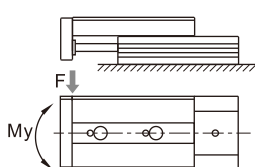
### 6.1) Table deflection due to pitch moment:

Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.



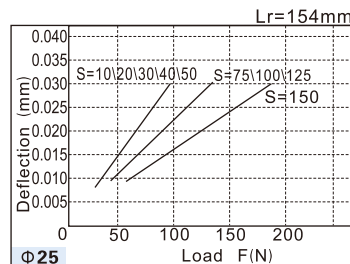
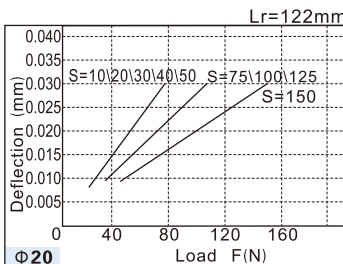
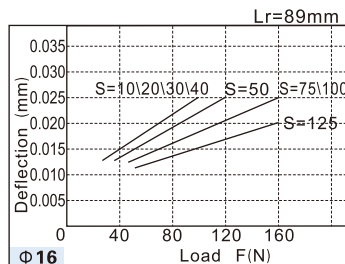
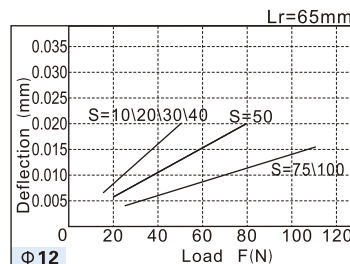
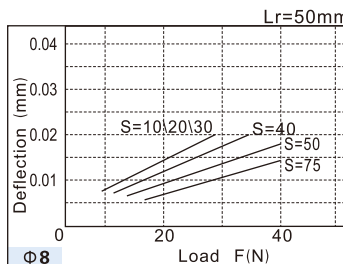
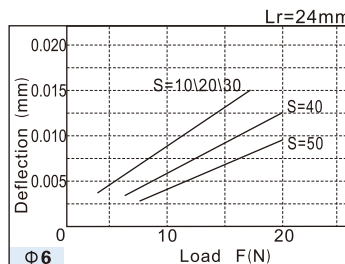
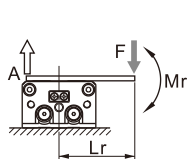
### 6.2) Table deflection due to yaw moment:

Table deflection (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide.



### 6.3) Table deflection due to roll moment:

Table deflects (A) when a load acts upon section F at the full stroke of the compact slide.

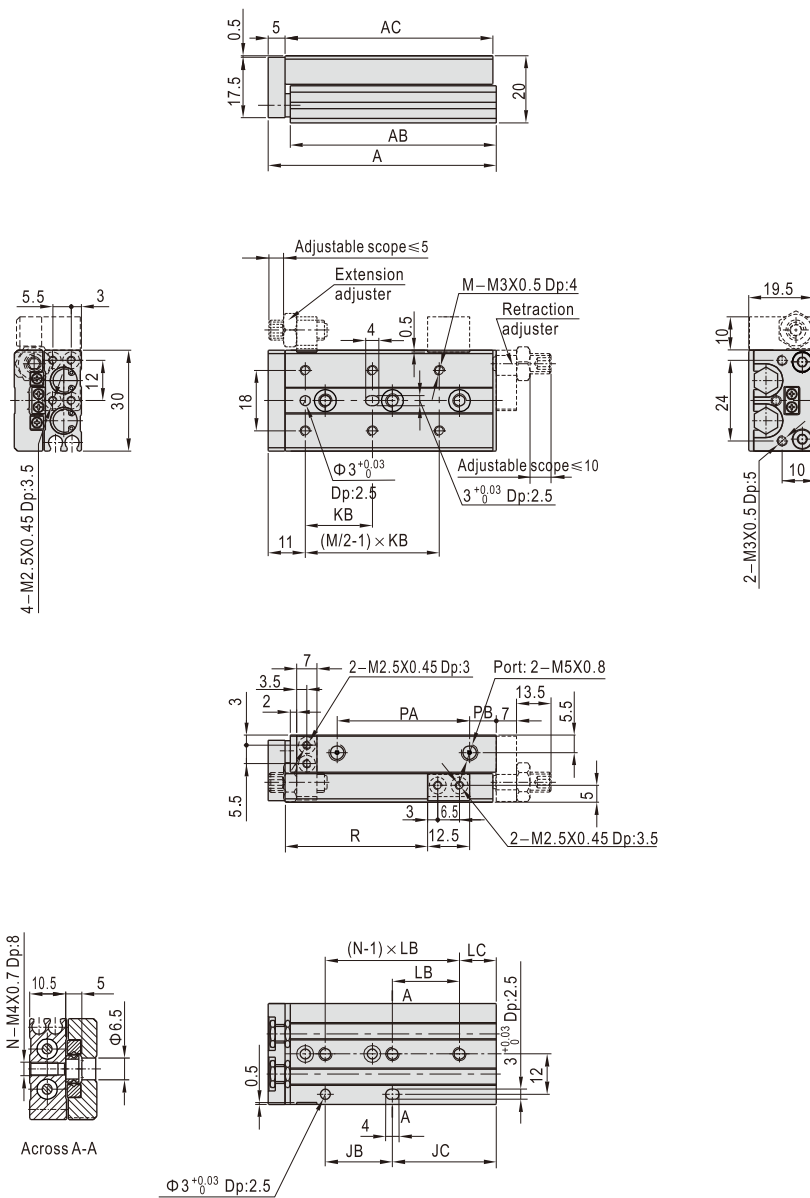


# Compact slide cylinder(Roller bearing)

HLS、HLSL Series

## Dimensions

### HLS6

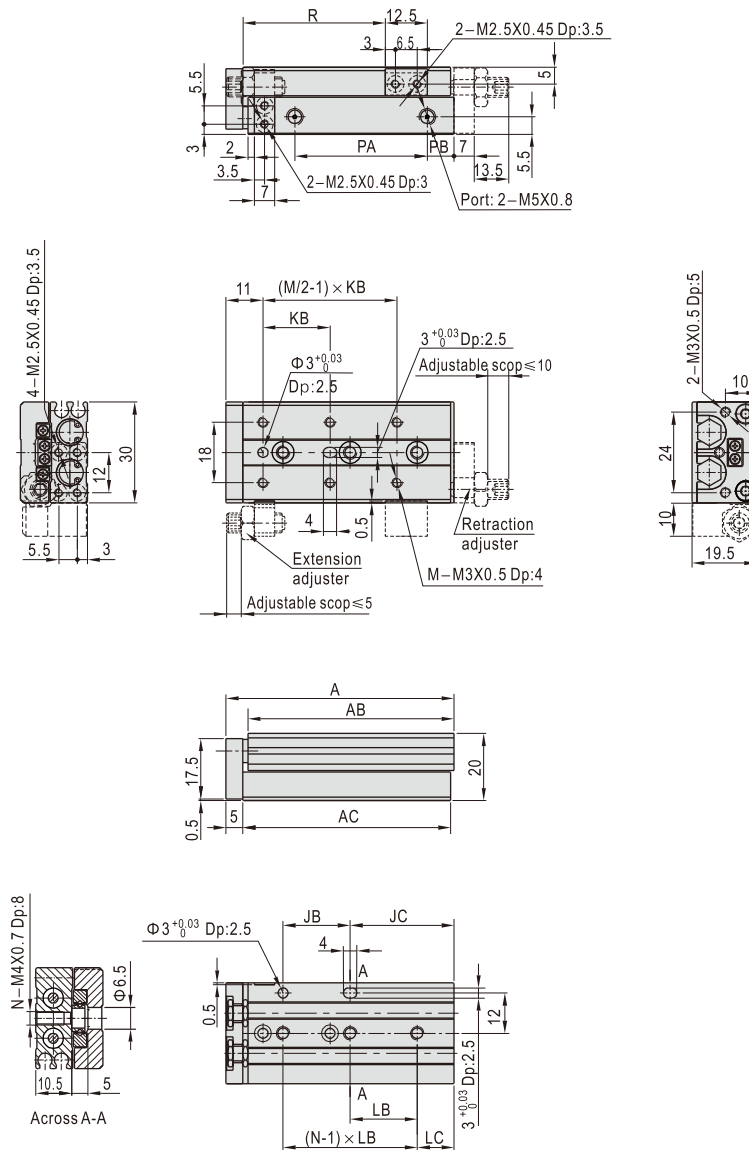


| Stroke\Item | A   | AB   | AC  | JB | JC | KB | LB | LC | M | N | PA | PB | R    |
|-------------|-----|------|-----|----|----|----|----|----|---|---|----|----|------|
| 10          | 48  | 41.5 | 42  | 20 | 11 | 20 | 25 | 6  | 4 | 2 | 19 | 8  | 21.5 |
| 20          | 58  | 51.5 | 52  | 20 | 21 | 30 | 35 | 6  | 4 | 2 | 28 | 9  | 31.5 |
| 30          | 68  | 61.5 | 62  | 20 | 31 | 20 | 20 | 11 | 6 | 3 | 39 | 8  | 41.5 |
| 40          | 90  | 83.5 | 84  | 30 | 43 | 28 | 30 | 13 | 6 | 3 | 51 | 18 | 51.5 |
| 50          | 106 | 99.5 | 100 | 48 | 41 | 38 | 24 | 17 | 6 | 4 | 61 | 24 | 61.5 |

# Compact slide cylinder(Roller bearing)

## HLS、HLSL Series

### HLSL6



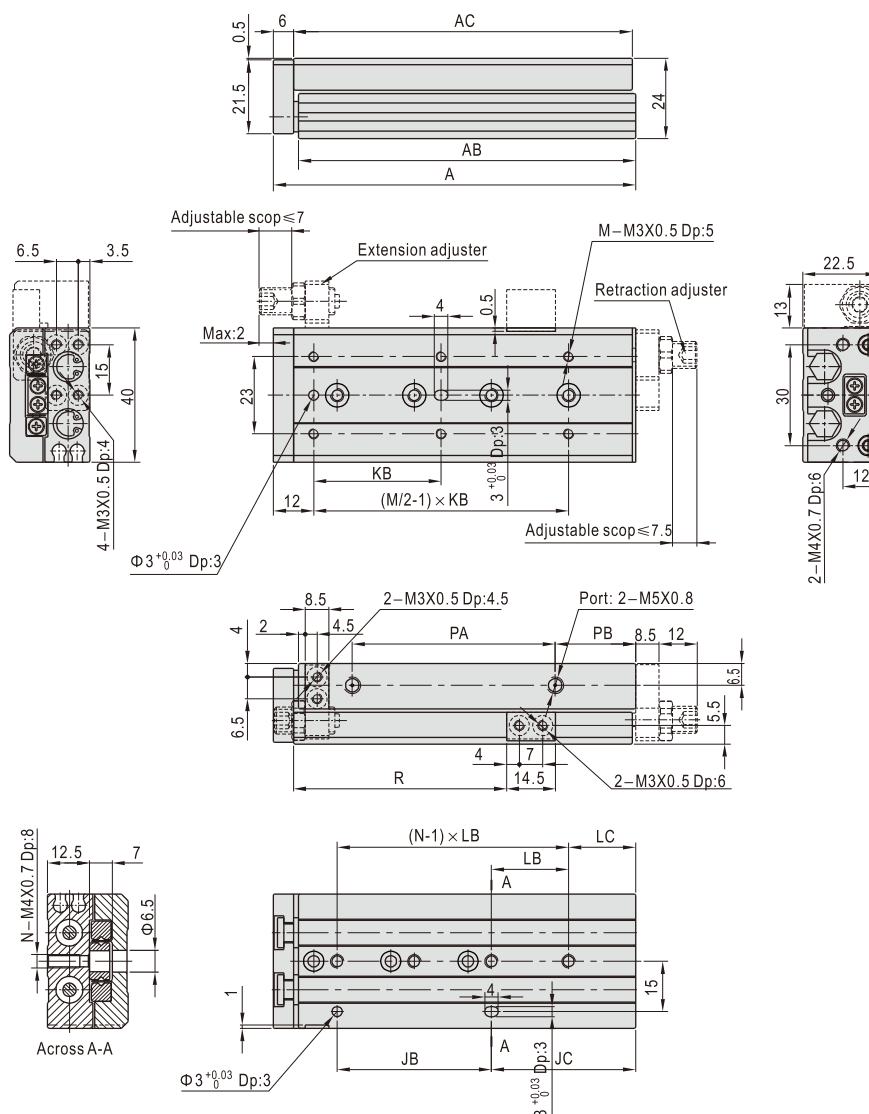
| Stroke\Item | A   | AB   | AC  | JB | JC | KB | LB | LC | M | N | PA | PB | R    |
|-------------|-----|------|-----|----|----|----|----|----|---|---|----|----|------|
| 10          | 48  | 41.5 | 42  | 20 | 11 | 20 | 25 | 6  | 4 | 2 | 19 | 8  | 21.5 |
| 20          | 58  | 51.5 | 52  | 20 | 21 | 30 | 35 | 6  | 4 | 2 | 28 | 9  | 31.5 |
| 30          | 68  | 61.5 | 62  | 20 | 31 | 20 | 20 | 11 | 6 | 3 | 39 | 8  | 41.5 |
| 40          | 90  | 83.5 | 84  | 30 | 43 | 28 | 30 | 13 | 6 | 3 | 51 | 18 | 51.5 |
| 50          | 106 | 99.5 | 100 | 48 | 41 | 38 | 24 | 17 | 6 | 4 | 61 | 24 | 61.5 |



# Compact slide cylinder(Roller bearing)

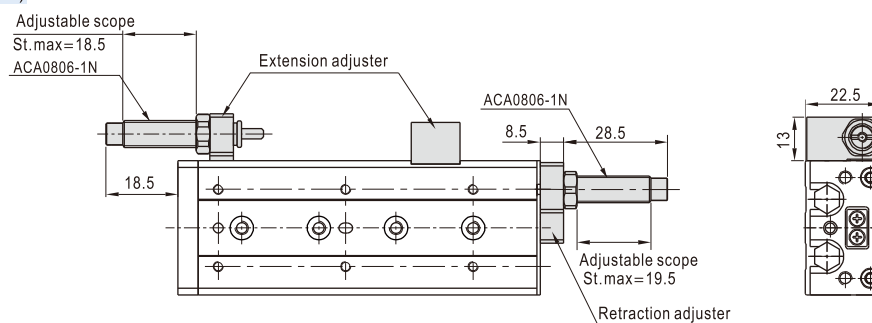
## HLS、HLSL Series

### HLS8



| Stroke\Item | A   | AB    | AC  | JB | JC | KB | LB | LC | M | N | PA   | PB   | R    |
|-------------|-----|-------|-----|----|----|----|----|----|---|---|------|------|------|
| 10          | 56  | 48.5  | 49  | 20 | 17 | 25 | 28 | 9  | 4 | 2 | 19.5 | 12.5 | 23.5 |
| 20          | 61  | 53.5  | 54  | 30 | 12 | 25 | 30 | 12 | 4 | 2 | 30   | 7    | 33.5 |
| 30          | 72  | 64.5  | 65  | 20 | 33 | 40 | 20 | 13 | 4 | 3 | 41   | 7    | 43.5 |
| 40          | 90  | 82.5  | 83  | 28 | 43 | 50 | 28 | 15 | 4 | 3 | 56   | 10   | 53.5 |
| 50          | 108 | 100.5 | 101 | 46 | 43 | 38 | 23 | 20 | 6 | 4 | 68   | 16   | 63.5 |
| 75          | 158 | 150.5 | 151 | 56 | 83 | 50 | 28 | 27 | 6 | 5 | 94   | 40   | 88.5 |

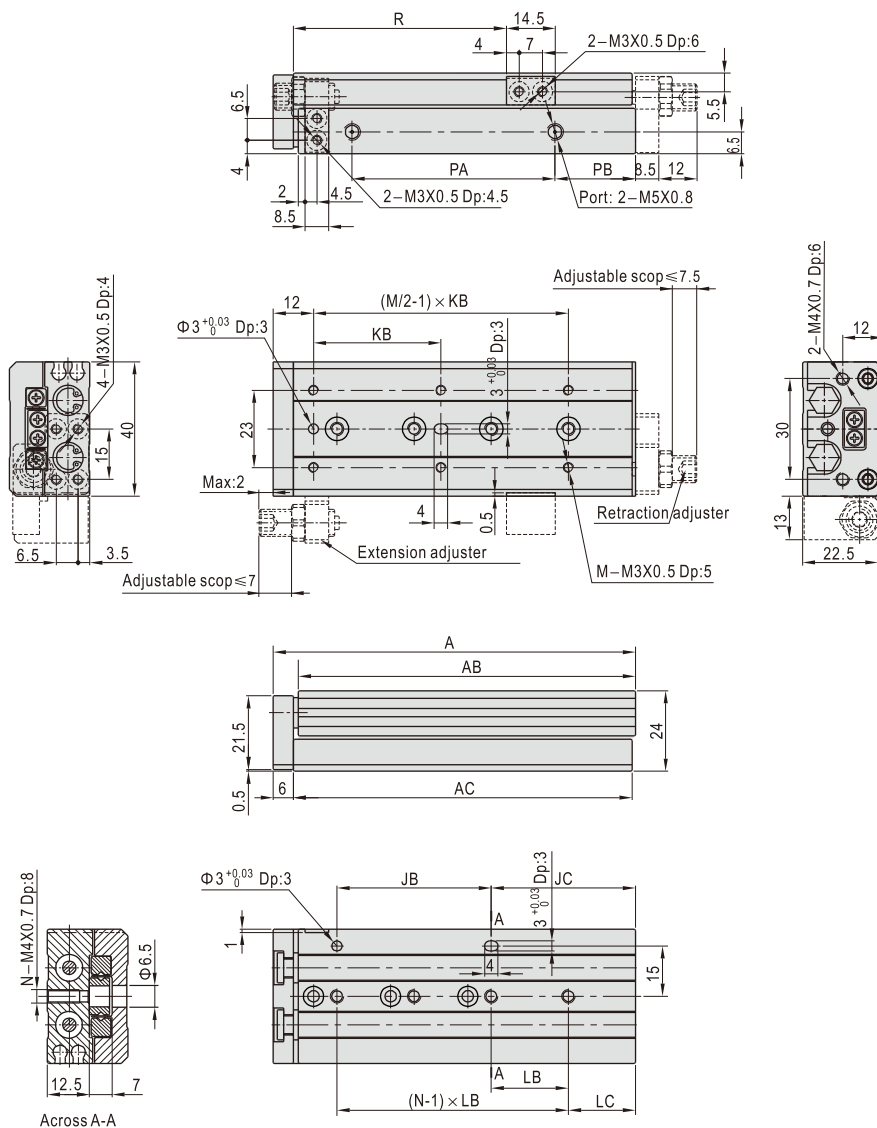
### HLS8(With shock absorber)



# Compact slide cylinder(Roller bearing)

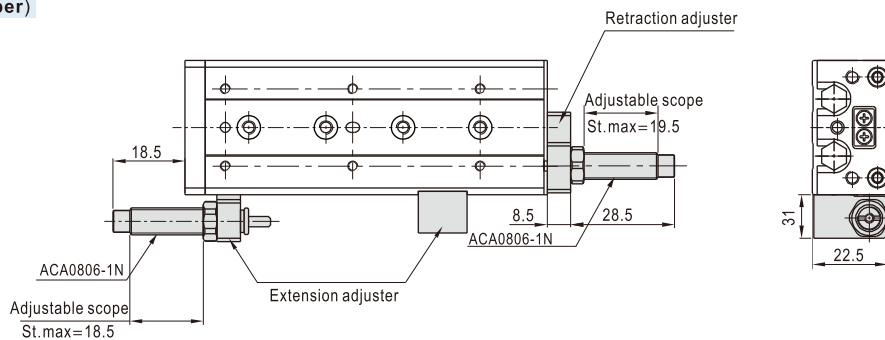
## HLS、HLSL Series

### HLSL8



| Stroke\Item | A   | AB    | AC  | JB | JC | KB | LB | LC | M | N | PA   | PB   | R    |
|-------------|-----|-------|-----|----|----|----|----|----|---|---|------|------|------|
| 10          | 56  | 48.5  | 49  | 20 | 17 | 25 | 28 | 9  | 4 | 2 | 19.5 | 12.5 | 23.5 |
| 20          | 61  | 53.5  | 54  | 30 | 12 | 25 | 30 | 12 | 4 | 2 | 30   | 7    | 33.5 |
| 30          | 72  | 64.5  | 65  | 20 | 33 | 40 | 20 | 13 | 4 | 3 | 41   | 7    | 43.5 |
| 40          | 90  | 82.5  | 83  | 28 | 43 | 50 | 28 | 15 | 4 | 3 | 56   | 10   | 53.5 |
| 50          | 108 | 100.5 | 101 | 46 | 43 | 38 | 23 | 20 | 6 | 4 | 68   | 16   | 63.5 |
| 75          | 158 | 150.5 | 151 | 56 | 83 | 50 | 28 | 27 | 6 | 5 | 94   | 40   | 88.5 |

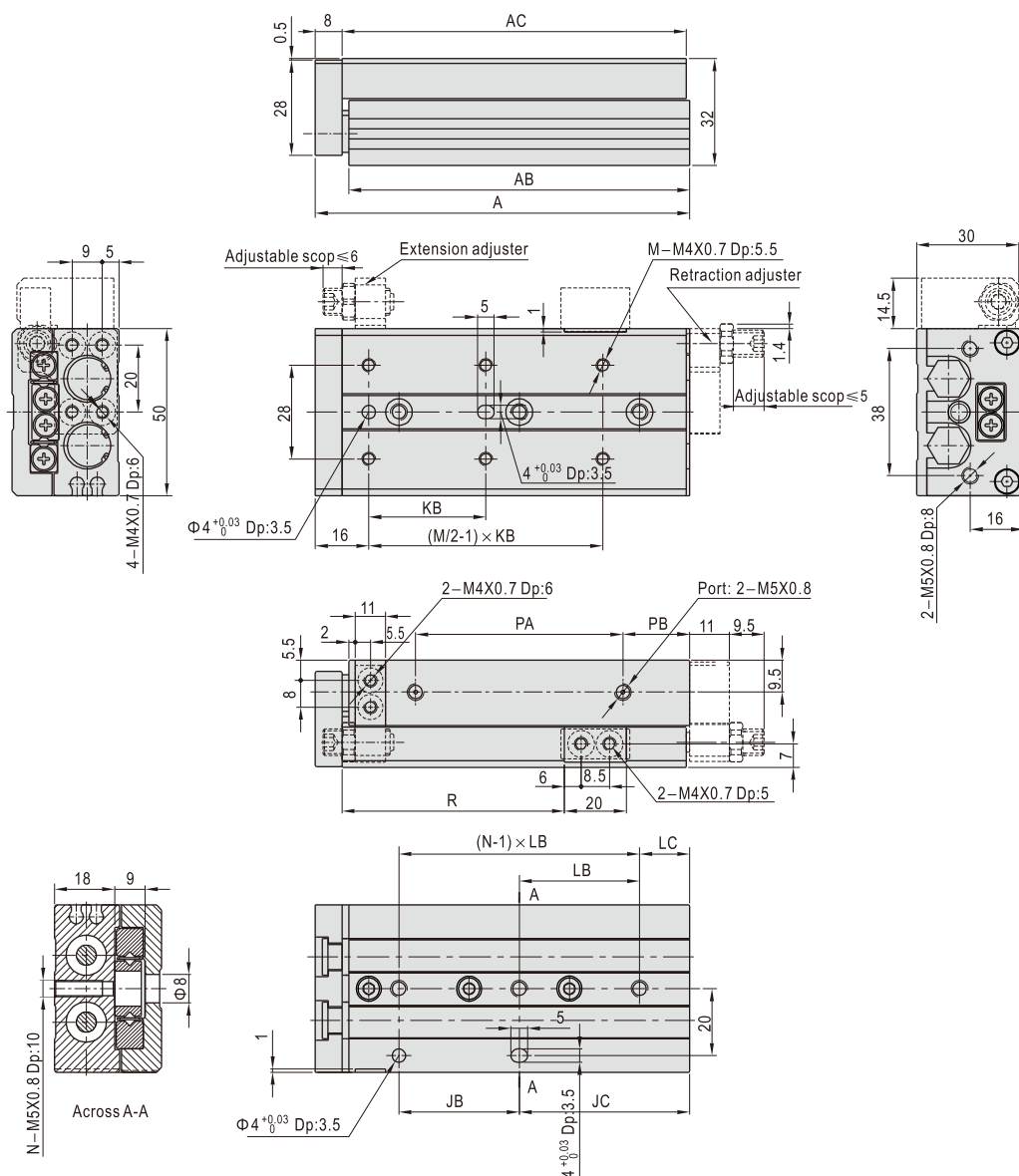
### HLSL8(With shock absorber)



# Compact slide cylinder(Roller bearing)

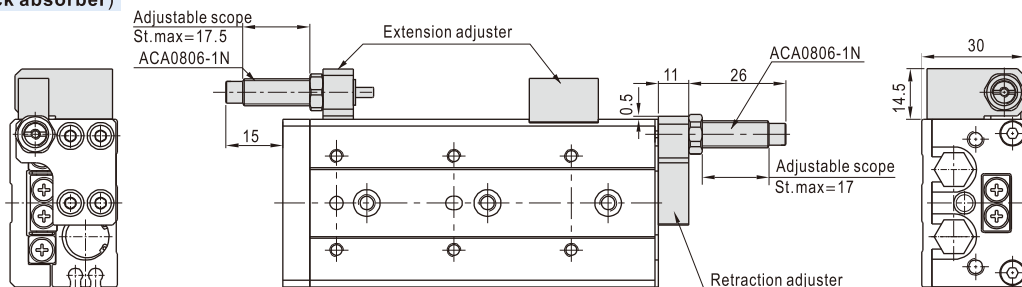
## HLS、HLSL Series

### HLS12



| Stroke\Item | A   | AB  | AC  | JB | JC  | KB | LB | LC | M | N | PA    | PB | R   |
|-------------|-----|-----|-----|----|-----|----|----|----|---|---|-------|----|-----|
| 10          | 80  | 70  | 71  | 40 | 15  | 35 | 40 | 15 | 4 | 2 | 39.5  | 10 | 25  |
| 20          | 80  | 70  | 71  | 40 | 15  | 35 | 40 | 15 | 4 | 2 | 39.5  | 10 | 35  |
| 30          | 80  | 70  | 71  | 40 | 15  | 35 | 40 | 15 | 4 | 2 | 39.5  | 10 | 45  |
| 40          | 92  | 82  | 83  | 25 | 42  | 50 | 25 | 17 | 4 | 3 | 51.5  | 10 | 55  |
| 50          | 112 | 102 | 103 | 36 | 51  | 35 | 36 | 15 | 6 | 3 | 61.5  | 20 | 65  |
| 75          | 158 | 148 | 149 | 72 | 61  | 55 | 36 | 25 | 6 | 4 | 87.5  | 40 | 90  |
| 100         | 212 | 202 | 203 | 76 | 111 | 65 | 38 | 35 | 6 | 5 | 131.5 | 50 | 115 |

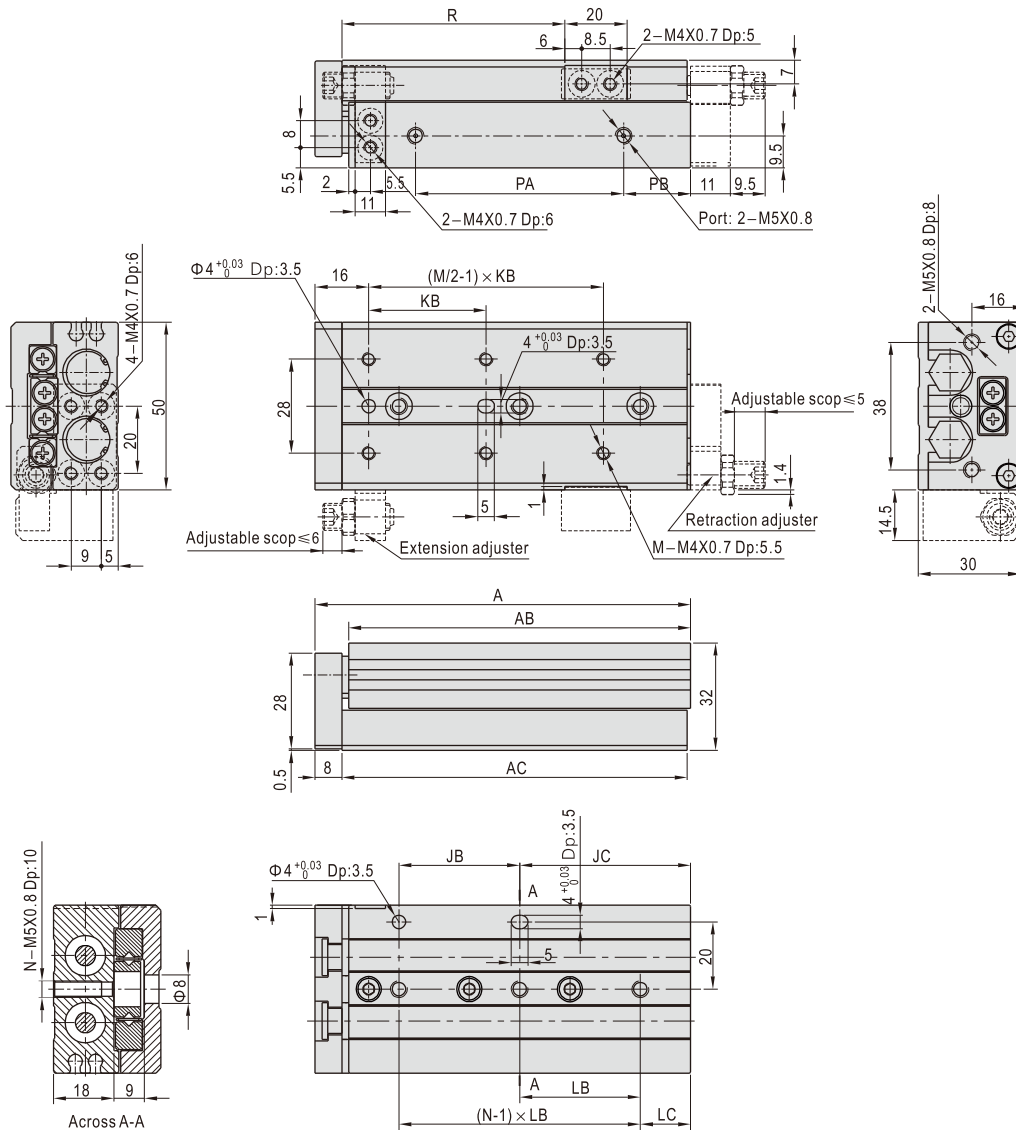
### HLS12(With shock absorber)



# Compact slide cylinder(Roller bearing)

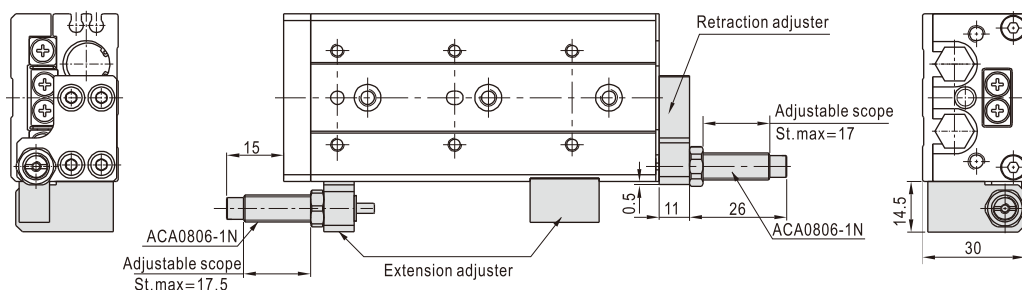
## HLS、HLSL Series

### HLSL12



| Stroke\Item | A   | AB  | AC  | JB | JC  | KB | LB | LC | M | N | PA    | PB | R   |
|-------------|-----|-----|-----|----|-----|----|----|----|---|---|-------|----|-----|
| 10          | 80  | 70  | 71  | 40 | 15  | 35 | 40 | 15 | 4 | 2 | 39.5  | 10 | 25  |
| 20          | 80  | 70  | 71  | 40 | 15  | 35 | 40 | 15 | 4 | 2 | 39.5  | 10 | 35  |
| 30          | 80  | 70  | 71  | 40 | 15  | 35 | 40 | 15 | 4 | 2 | 39.5  | 10 | 45  |
| 40          | 92  | 82  | 83  | 25 | 42  | 50 | 25 | 17 | 4 | 3 | 51.5  | 10 | 55  |
| 50          | 112 | 102 | 103 | 36 | 51  | 35 | 36 | 15 | 6 | 3 | 61.5  | 20 | 65  |
| 75          | 158 | 148 | 149 | 72 | 61  | 55 | 36 | 25 | 6 | 4 | 87.5  | 40 | 90  |
| 100         | 212 | 202 | 203 | 76 | 111 | 65 | 38 | 35 | 6 | 5 | 131.5 | 50 | 115 |

### HLSL12(With shock absorber)

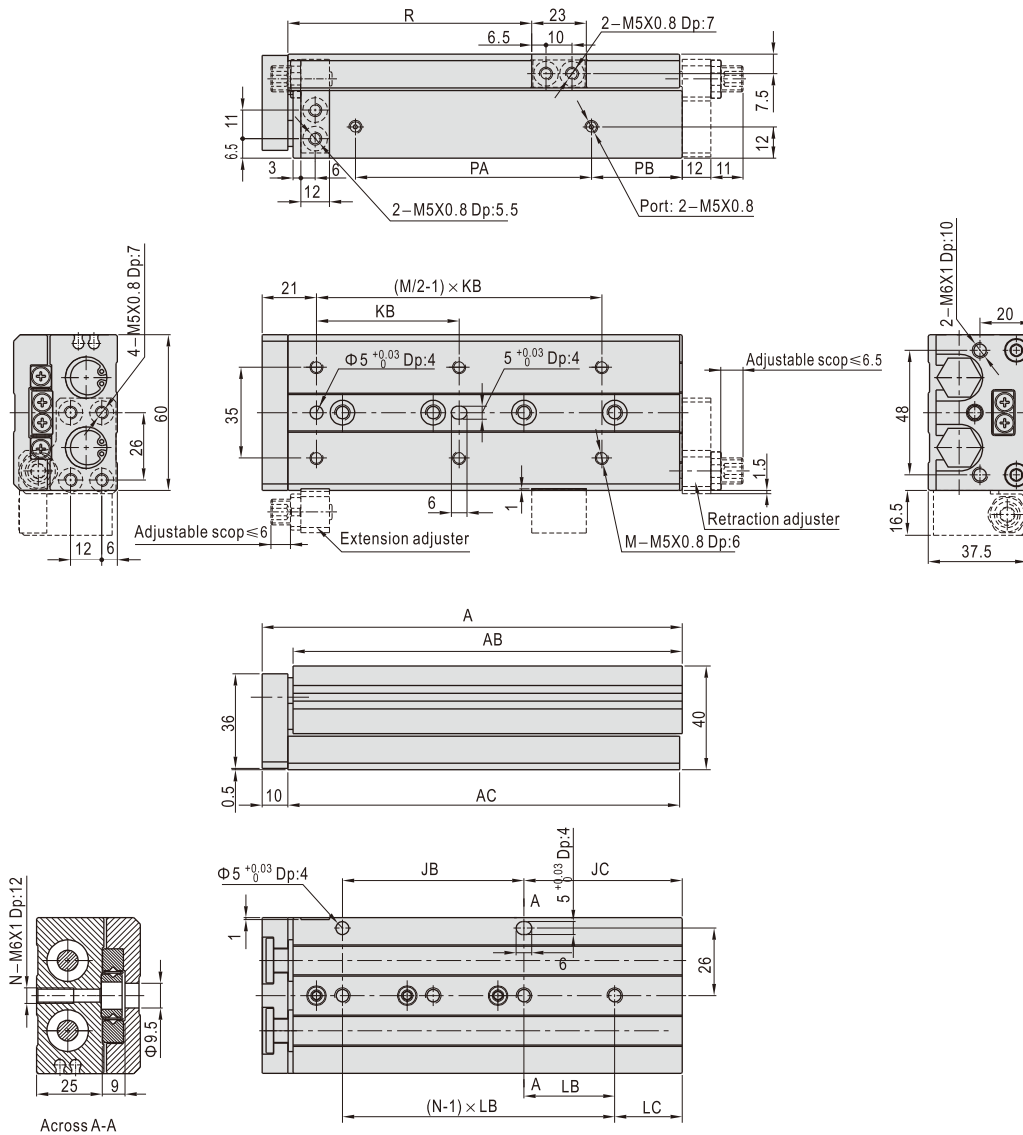






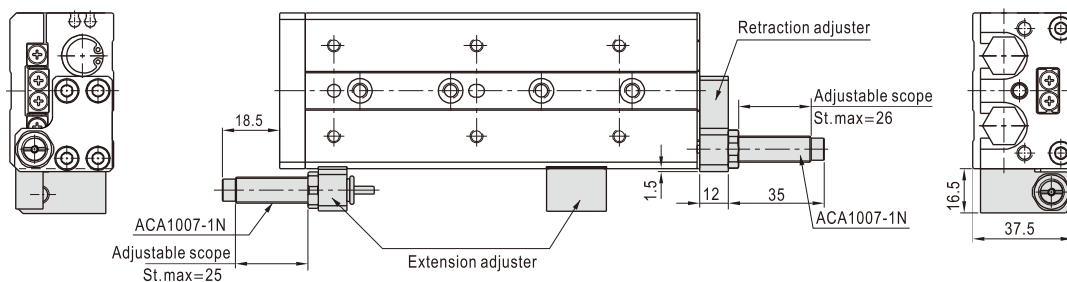
## HLS、HLSL Series

## HLSL16



| Stroke\Item | A   | AB  | AC  | JB | JC  | KB | LB | LC | M | N | PA    | PB | R     |
|-------------|-----|-----|-----|----|-----|----|----|----|---|---|-------|----|-------|
| 10          | 87  | 75  | 76  | 40 | 16  | 35 | 40 | 16 | 4 | 2 | 42.5  | 8  | 28.5  |
| 20          | 87  | 75  | 76  | 40 | 16  | 35 | 40 | 16 | 4 | 2 | 42.5  | 8  | 38.5  |
| 30          | 87  | 75  | 76  | 40 | 16  | 35 | 40 | 16 | 4 | 2 | 42.5  | 8  | 48.5  |
| 40          | 97  | 85  | 86  | 50 | 16  | 40 | 50 | 16 | 4 | 2 | 52.5  | 8  | 58.5  |
| 50          | 112 | 100 | 101 | 30 | 51  | 30 | 30 | 21 | 6 | 3 | 63.5  | 12 | 68.5  |
| 75          | 162 | 150 | 151 | 70 | 61  | 55 | 35 | 26 | 6 | 4 | 90.5  | 35 | 93.5  |
| 100         | 210 | 198 | 199 | 70 | 109 | 65 | 35 | 39 | 6 | 5 | 118.5 | 55 | 118.8 |
| 125         | 260 | 248 | 249 | 70 | 159 | 70 | 35 | 19 | 8 | 7 | 153.5 | 70 | 143.5 |

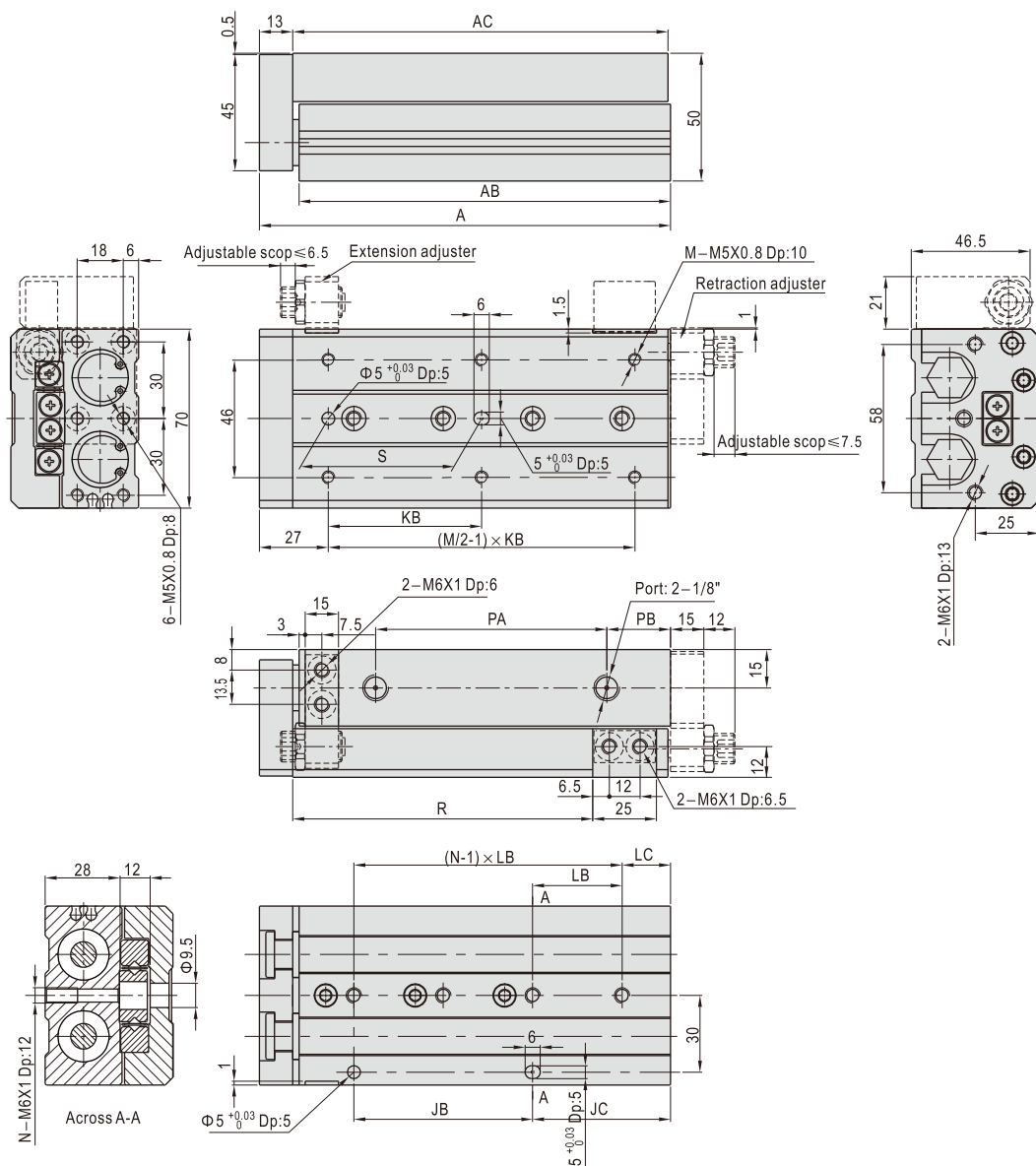
**HLSL16(With shock absorber)**



# Compact slide cylinder(Roller bearing)

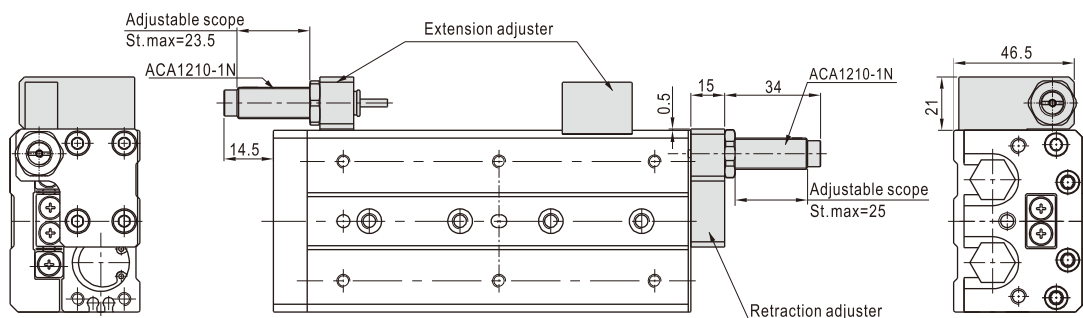
## HLS、HLSL Series

### HLS20



| Stroke\Item | A   | AB    | AC  | JB | JC  | KB | LB | LC | M | N | S  | PA    | PB | R     |
|-------------|-----|-------|-----|----|-----|----|----|----|---|---|----|-------|----|-------|
| 10          | 97  | 81.5  | 83  | 35 | 25  | 50 | 45 | 15 | 4 | 2 | 40 | 43.5  | 10 | 32.5  |
| 20          | 97  | 81.5  | 83  | 35 | 25  | 50 | 45 | 15 | 4 | 2 | 40 | 43.5  | 10 | 42.5  |
| 30          | 97  | 81.5  | 83  | 35 | 25  | 50 | 45 | 15 | 4 | 2 | 40 | 43.5  | 10 | 52.5  |
| 40          | 107 | 91.5  | 93  | 35 | 35  | 60 | 55 | 15 | 4 | 2 | 50 | 53.5  | 10 | 62.5  |
| 50          | 122 | 106.5 | 108 | 35 | 50  | 35 | 35 | 15 | 6 | 3 | 35 | 68.5  | 10 | 72.5  |
| 75          | 161 | 145.5 | 147 | 70 | 54  | 60 | 35 | 19 | 6 | 4 | 60 | 107.5 | 10 | 97.5  |
| 100         | 214 | 198.5 | 200 | 70 | 107 | 70 | 35 | 37 | 6 | 5 | 70 | 115.5 | 55 | 122.5 |
| 125         | 268 | 252.5 | 254 | 76 | 155 | 70 | 38 | 41 | 8 | 6 | 70 | 154.5 | 70 | 147.5 |
| 150         | 320 | 304.5 | 306 | 88 | 195 | 80 | 44 | 19 | 8 | 7 | 80 | 186.5 | 90 | 172.5 |

### HLS20(With shock absorber)

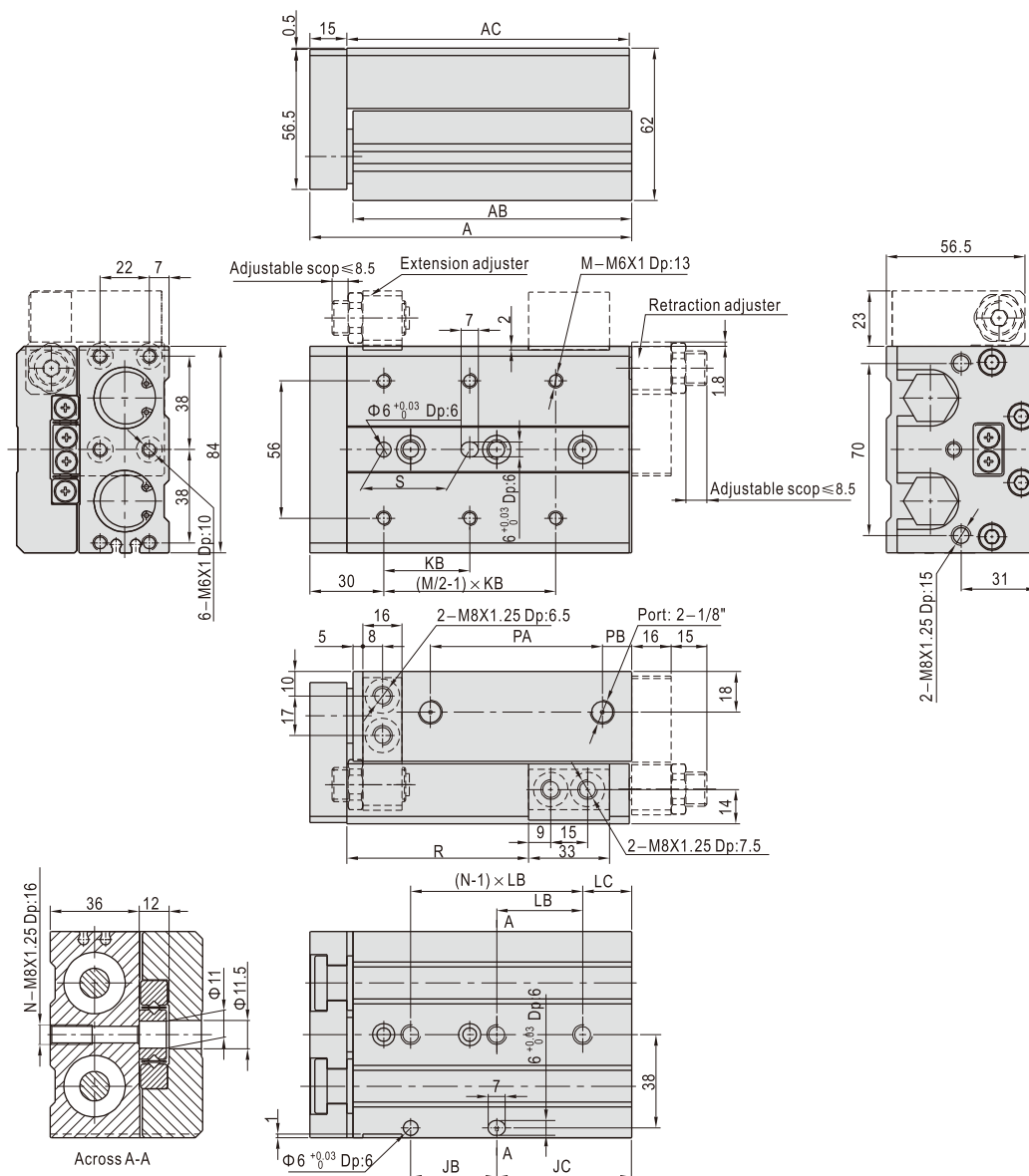


## HLS、HLSL Series

# Compact slide cylinder(Roller bearing)

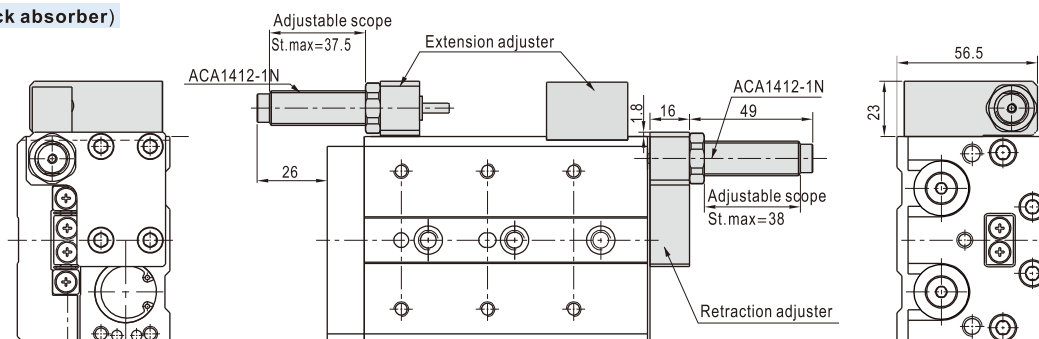
## HLS、HLSL Series

### HLS25



| Stroke\Item | A   | AB    | AC  | JB | JC  | KB | LB | LC | M | N | S  | PA  | PB | R   |
|-------------|-----|-------|-----|----|-----|----|----|----|---|---|----|-----|----|-----|
| 10          | 108 | 90.5  | 92  | 45 | 22  | 50 | 45 | 22 | 4 | 2 | 40 | 47  | 12 | 35  |
| 20          | 108 | 90.5  | 92  | 45 | 22  | 50 | 45 | 22 | 4 | 2 | 40 | 47  | 12 | 45  |
| 30          | 108 | 90.5  | 92  | 45 | 22  | 50 | 45 | 22 | 4 | 2 | 40 | 47  | 12 | 55  |
| 40          | 118 | 100.5 | 102 | 55 | 22  | 60 | 55 | 22 | 4 | 2 | 50 | 57  | 12 | 65  |
| 50          | 131 | 113.5 | 115 | 35 | 55  | 35 | 35 | 20 | 6 | 3 | 35 | 70  | 12 | 75  |
| 75          | 172 | 154.5 | 156 | 70 | 61  | 60 | 35 | 26 | 6 | 4 | 60 | 90  | 33 | 100 |
| 100         | 213 | 195.5 | 197 | 70 | 102 | 70 | 35 | 32 | 6 | 5 | 70 | 119 | 45 | 125 |
| 125         | 271 | 253.5 | 255 | 76 | 154 | 75 | 38 | 40 | 8 | 6 | 75 | 155 | 67 | 150 |
| 150         | 311 | 293.5 | 295 | 80 | 190 | 80 | 40 | 30 | 8 | 7 | 80 | 180 | 82 | 175 |

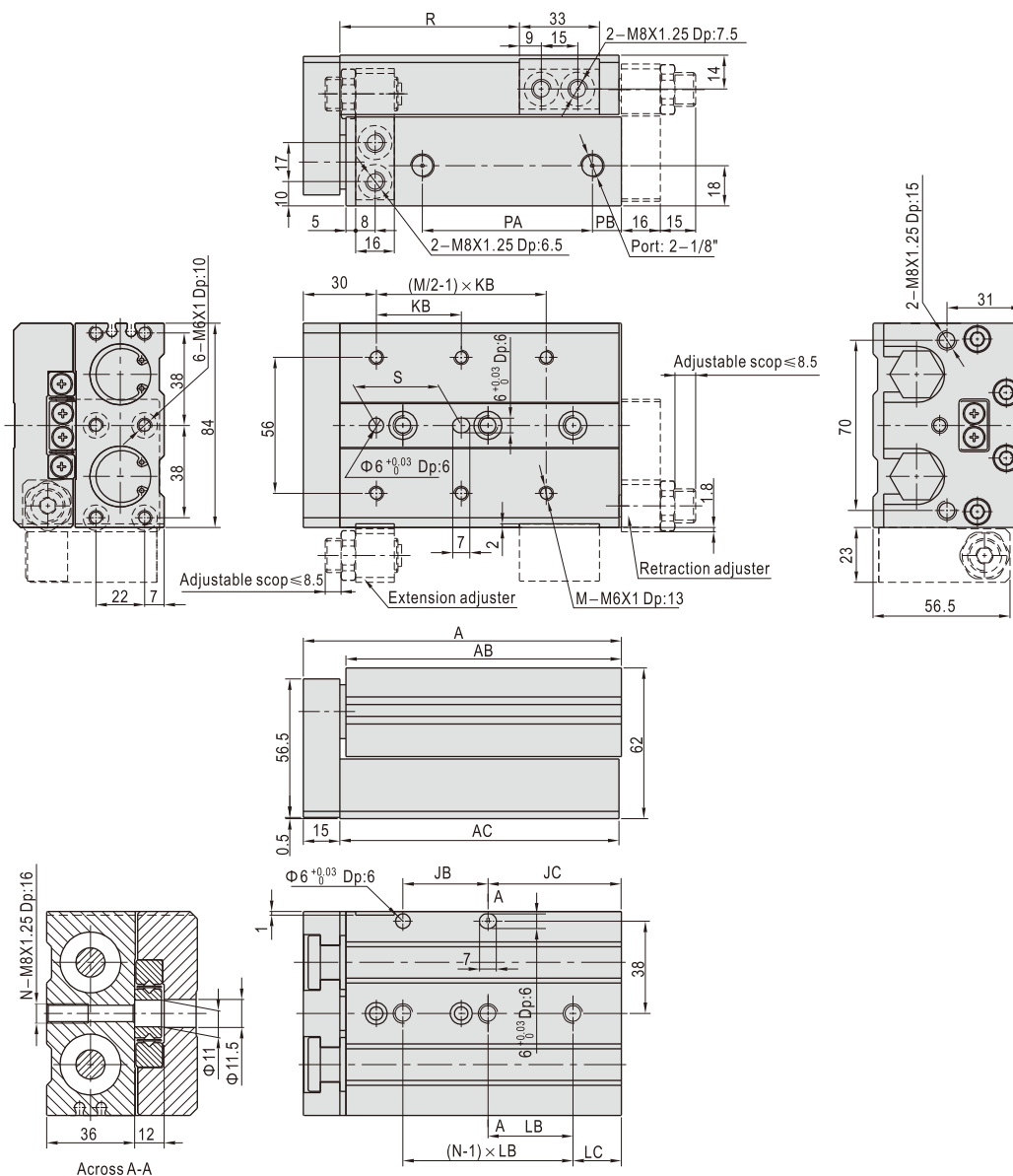
### HLS25(With shock absorber)



# Compact slide cylinder(Roller bearing)

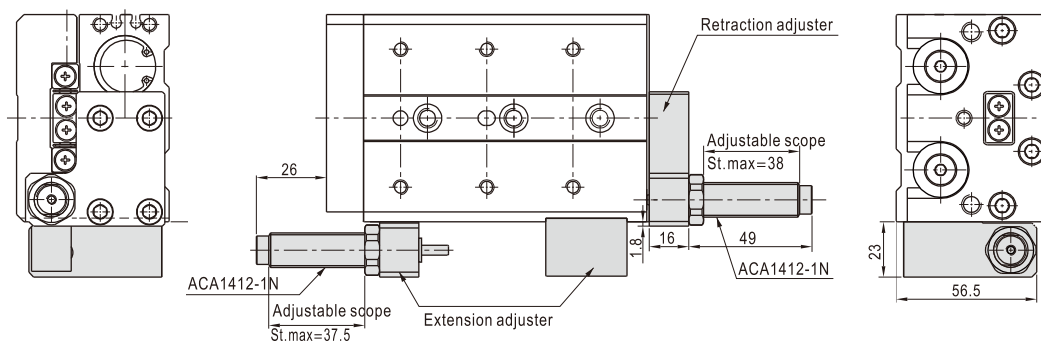
## HLS、HLSL Series

### HLSL25



| Stroke\Item | A   | AB    | AC  | JB | JC  | KB | LB | LC | M | N | S  | PA  | PB | R   |
|-------------|-----|-------|-----|----|-----|----|----|----|---|---|----|-----|----|-----|
| 10          | 108 | 90.5  | 92  | 45 | 22  | 50 | 45 | 22 | 4 | 2 | 40 | 47  | 12 | 35  |
| 20          | 108 | 90.5  | 92  | 45 | 22  | 50 | 45 | 22 | 4 | 2 | 40 | 47  | 12 | 45  |
| 30          | 108 | 90.5  | 92  | 45 | 22  | 50 | 45 | 22 | 4 | 2 | 40 | 47  | 12 | 55  |
| 40          | 118 | 100.5 | 102 | 55 | 22  | 60 | 55 | 22 | 4 | 2 | 50 | 57  | 12 | 65  |
| 50          | 131 | 113.5 | 115 | 35 | 55  | 35 | 35 | 20 | 6 | 3 | 35 | 70  | 12 | 75  |
| 75          | 172 | 154.5 | 156 | 70 | 61  | 60 | 35 | 26 | 6 | 4 | 60 | 90  | 33 | 100 |
| 100         | 213 | 195.5 | 197 | 70 | 102 | 70 | 35 | 32 | 6 | 5 | 70 | 119 | 45 | 125 |
| 125         | 271 | 253.5 | 255 | 76 | 154 | 75 | 38 | 40 | 8 | 6 | 75 | 155 | 67 | 150 |
| 150         | 311 | 293.5 | 295 | 80 | 190 | 80 | 40 | 30 | 8 | 7 | 80 | 180 | 82 | 175 |

### HLSL25(With shock absorber)



# Compact slide cylinder(Roller bearing)

## HLS、HLSL Series—Accessories

### Accessory selection

| Standard<br>(HLS)     | Accessories\Bore size |                               | 6          | 8          | 12         |
|-----------------------|-----------------------|-------------------------------|------------|------------|------------|
|                       | Both ends             | A(Adjustable rubber stopper)  | F-HLQ6A    | F-HLS8A    | F-HLS12A   |
|                       |                       | B(Shock absorber)             | ×          | F-HLS8B    | F-HLS12B   |
|                       | Extention             | AS(Adjustable rubber stopper) | F-HLQ6AS   | F-HLQ8AS   | F-HLQ12AS  |
|                       |                       | BS(Shock absorber)            | ×          | F-HLQ8BS   | F-HLQ12BS  |
|                       | Retraction            | AF(Adjustable rubber stopper) | F-HLQ6AF   | F-HLS8AF   | F-HLS12AF  |
| BF(Shock absorber)    |                       | ×                             | F-HLS8BF   | F-HLS12BF  |            |
|                       |                       |                               |            |            |            |
| Standard<br>(HLS)     | Accessories\Bore size |                               | 16         | 20         | 25         |
|                       | Both ends             | A(Adjustable rubber stopper)  | F-HLS16A   | F-HLS20A   | F-HLS25A   |
|                       |                       | B(Shock absorber)             | F-HLS16B   | F-HLS20B   | F-HLS25B   |
|                       | Extention             | AS(Adjustable rubber stopper) | F-HLQ16AS  | F-HLQ20AS  | F-HLQ25AS  |
|                       |                       | BS(Shock absorber)            | F-HLQ16BS  | F-HLQ20BS  | F-HLQ25BS  |
|                       | Retraction            | AF(Adjustable rubber stopper) | F-HLS16AF  | F-HLS20AF  | F-HLS25AF  |
| BF(Shock absorber)    |                       | F-HLS16BF                     | F-HLS20BF  | F-HLS25BF  |            |
|                       |                       |                               |            |            |            |
| Symmetrical<br>(HLSL) | Accessories\Bore size |                               | 6          | 8          | 12         |
|                       | Both ends             | A(Adjustable rubber stopper)  | F-HLQL6A   | F-HLSL8A   | F-HLSL12A  |
|                       |                       | B(Shock absorber)             | ×          | F-HLSL8B   | F-HLSL12B  |
|                       | Extention             | AS(Adjustable rubber stopper) | F-HLQ6AS   | F-HLQ8AS   | F-HLQ12AS  |
|                       |                       | BS(Shock absorber)            | ×          | F-HLQ8BS   | F-HLQ12BS  |
|                       | Retraction            | AF(Adjustable rubber stopper) | F-HLQL6AF  | F-HLSL8AF  | F-HLSL12AF |
| BF(Shock absorber)    |                       | ×                             | F-HLSL8BF  | F-HLSL12BF |            |
|                       |                       |                               |            |            |            |
| Symmetrical<br>(HLSL) | Accessories\Bore size |                               | 16         | 20         | 25         |
|                       | Both ends             | A(Adjustable rubber stopper)  | F-HLSL16A  | F-HLSL20A  | F-HLSL25A  |
|                       |                       | B(Shock absorber)             | F-HLSL16B  | F-HLSL20B  | F-HLSL25B  |
|                       | Extention             | AS(Adjustable rubber stopper) | F-HLQ16AS  | F-HLQ20AS  | F-HLQ25AS  |
|                       |                       | BS(Shock absorber)            | F-HLQ16BS  | F-HLQ20BS  | F-HLQ25BS  |
|                       | Retraction            | AF(Adjustable rubber stopper) | F-HLSL16AF | F-HLSL20AF | F-HLSL25AF |
| BF(Shock absorber)    |                       | F-HLSL16BF                    | F-HLSL20BF | F-HLSL25BF |            |

Note): A=AS+AF; B=BS+BF.

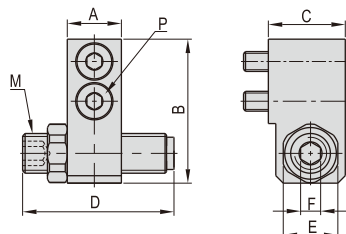
| F - HLS 20 AF |                   |            |                                           |
|---------------|-------------------|------------|-------------------------------------------|
| ①             | ②                 | ③          | ④                                         |
| ①Accessory    | ②Cylindeer model  | ③Bore size | ④Accessory type[Note]                     |
|               | HLS: Standard     | 6          | A: Adjustable rubber stopper(Both ends)   |
|               | HLSL: Symmetrical | 8          | AF: Adjustable rubber stopper(Retraction) |
|               |                   | 12         | B: Shock absorber (Both ends)             |
|               |                   | 16         | BF: Shock absorber (Retraction)           |
|               |                   | 20         |                                           |
|               |                   | 25         |                                           |

[Note]The list accessories are for HLS cylinder. Accessories that are adaptable to other cylinder are not shown. Please refer to accessory list for selection and ordering information.

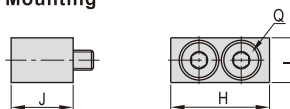
### Dimensions

#### AS: Adjustable rubber stopper(Extention)

##### Body Mounting



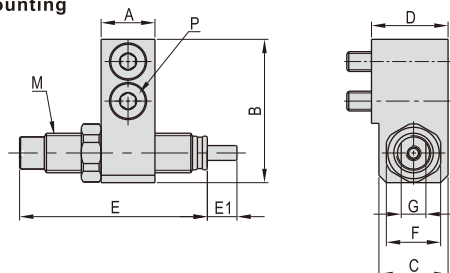
##### Table Mounting



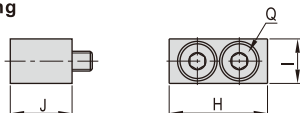
| Bore size\Item | Adjusting stroke range | A   | B    | C    | D    | E  | F | M         | P              | H    | I    | J    | Q              |
|----------------|------------------------|-----|------|------|------|----|---|-----------|----------------|------|------|------|----------------|
| 6              | 5                      | 7   | 19   | 10.5 | 16.5 | 8  | 3 | M6 × 1.0  | M2.5 Length:10 | 12.5 | 6.5  | 10.5 | M2.5 Length:10 |
| 8              | 5                      | 8.5 | 21.5 | 14   | 21.5 | 11 | 4 | M8 × 1.0  | M3 Length:14   | 14.5 | 8    | 12   | M3 Length:14   |
| 12             | 5                      | 11  | 29   | 15.5 | 31.5 | 11 | 4 | M8 × 1.0  | M4 Length:16   | 20   | 9    | 13.5 | M4 Length:12   |
| 16             | 5                      | 12  | 36   | 17.5 | 24   | 14 | 5 | M10 × 1.0 | M5 Length:16   | 23   | 10.5 | 17   | M5 Length:16   |
| 20             | 5                      | 15  | 44.5 | 22   | 28   | 17 | 6 | M12 × 1.0 | M6 Length:20   | 25   | 12.5 | 21   | M6 Length:20   |
| 25             | 5                      | 16  | 53.5 | 24   | 32   | 19 | 6 | M14 × 1.5 | M8 Length:20   | 33   | 16.5 | 23   | M8 Length:20   |

#### BS: Shock absorber(Extention)

##### Body Mounting



##### Table Mounting



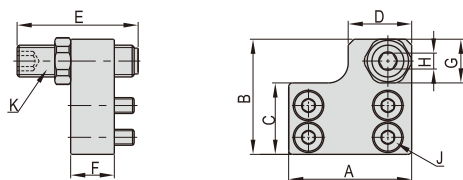
| Bore size\Item | A   | B    | C    | D    | E    | E1 | F  | G  | M         | P            | H    | I    | J    | Q            |
|----------------|-----|------|------|------|------|----|----|----|-----------|--------------|------|------|------|--------------|
| 8              | 8.5 | 21.5 | 12.5 | 14   | 40   | 6  | 11 | 7  | M8 × 1.0  | M3 Length:14 | 14.5 | 8    | 12   | M3 Length:14 |
| 12             | 11  | 29   | 14   | 15.5 | 40   | 6  | 11 | 7  | M8 × 1.0  | M4 Length:16 | 20   | 9    | 13.5 | M4 Length:12 |
| 16             | 12  | 36   | 16   | 17.5 | 49   | 7  | 14 | 9  | M10 × 1.0 | M5 Length:16 | 23   | 10.5 | 17   | M5 Length:16 |
| 20             | 15  | 44.5 | 20   | 22   | 53.5 | 10 | 17 | 11 | M12 × 1.0 | M6 Length:20 | 25   | 12.5 | 21   | M6 Length:20 |
| 25             | 16  | 53.5 | 22   | 24   | 68.5 | 12 | 19 | 12 | M14 × 1.5 | M8 Length:20 | 33   | 16.5 | 23   | M8 Length:20 |

# Compact slide cylinder(Roller bearing)

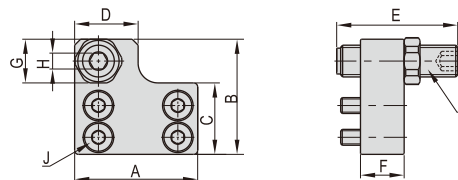
## HLS、HLSL Series—Accessories

### AF: Adjustable rubber stopper(Retraction)

For standard type



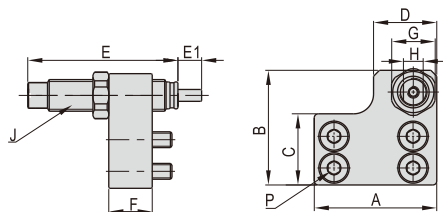
For symmetrical type



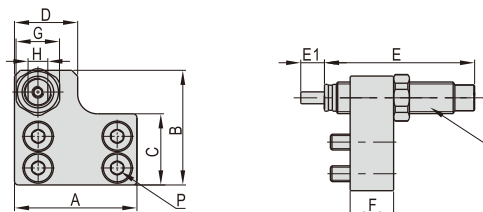
| Bore size\Item | Adjusting stroke range | A    | B    | C    | D  | E    | F   | G  | H | J             | K         |
|----------------|------------------------|------|------|------|----|------|-----|----|---|---------------|-----------|
| 6              | 5                      | 18   | 19   | 11   | 8  | 21.5 | 7   | 8  | 3 | M2.5 Length:6 | M6 × 1.0  |
| 8              | 5                      | 24   | 22   | 13   | 14 | 21.5 | 8.5 | 11 | 4 | M3 Length:8   | M8 × 1.0  |
| 12             | 5                      | 31   | 29   | 18   | 16 | 21.5 | 11  | 11 | 4 | M4 Length:12  | M8 × 1.0  |
| 16             | 5                      | 37   | 37.5 | 23   | 18 | 24   | 12  | 14 | 5 | M5 Length:12  | M10 × 1.0 |
| 20             | 5                      | 45.5 | 47   | 28.5 | 23 | 28   | 15  | 17 | 6 | M5 Length:16  | M12 × 1.0 |
| 25             | 5                      | 54   | 56   | 34   | 28 | 32   | 16  | 19 | 6 | M6 Length:18  | M14 × 1.5 |

### BF: Shock absorber(Retraction)

For standard type



For symmetrical type



| Bore size\Item | A    | B    | C    | D  | E    | E1 | F   | G  | H  | J         | P            |
|----------------|------|------|------|----|------|----|-----|----|----|-----------|--------------|
| 8              | 24   | 22   | 13   | 14 | 40   | 6  | 8.5 | 11 | 7  | M8 × 1.0  | M3 Length:8  |
| 12             | 31   | 29   | 18   | 16 | 40   | 6  | 11  | 11 | 7  | M8 × 1.0  | M4 Length:12 |
| 16             | 37   | 37.5 | 23   | 18 | 49   | 7  | 12  | 14 | 9  | M10 × 1.0 | M5 Length:12 |
| 20             | 45.5 | 47   | 28.5 | 23 | 53.5 | 10 | 15  | 17 | 11 | M12 × 1.0 | M5 Length:16 |
| 25             | 54   | 56   | 34   | 28 | 68.5 | 12 | 16  | 19 | 12 | M14 × 1.5 | M6 Length:18 |