

Slide table cylinder(ball bearing type)

HLQ、HLQL Series

Table 1 : Maximum allowable kinetic energy(Emax)
Maximum allowable applied load(Wmax)

| Model | Max. allowable kinetic energy Emax(J) | | | Max. allowable applied load Wmax(N) |
|-------|---------------------------------------|---------------------|---------------------|-------------------------------------|
| | Basic type | Rubber stopper type | Shock absorber type | |
| HLQ6 | 0.01 | 0.01 | - | 4 |
| HLQ8 | 0.024 | 0.024 | 0.048 | 8 |
| HLQ12 | 0.05 | 0.05 | 0.1 | 15 |
| HLQ16 | 0.1 | 0.1 | 0.2 | 30 |
| HLQ20 | 0.13 | 0.13 | 0.26 | 40 |
| HLQ25 | 0.22 | 0.22 | 0.44 | 70 |

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 _{po} _{max} | M _{yo} _{max} | M _{ro} _{max} | M _p _{max} | M _y _{max} | M _r _{max} | A | B |
| 6 | 10 | 3.3 | 3.8 | 2.6 | 0.7 | 0.7 | 0.6 | 30 | 7 |
| | 20 | 3.3 | 3.8 | 2.6 | 0.7 | 0.8 | 0.6 | 40 | |
| | 30 | 3.3 | 3.8 | 2.6 | 0.7 | 0.8 | 0.6 | 50 | |
| | 40 | 7.2 | 7.9 | 3.6 | 1.3 | 1.3 | 0.6 | 60 | |
| | 50 | 12.4 | 12.7 | 4.7 | 1.8 | 1.8 | 0.6 | 70 | |
| | 8 | 10 | 10.1 | 9.1 | 8.8 | 2.5 | 2.5 | 2.0 | |
| 20 | | 10.1 | 9.1 | 8.8 | 2.6 | 2.6 | 2.0 | 40 | |
| 30 | | 10.1 | 9.1 | 8.8 | 2.8 | 2.8 | 2.0 | 50 | |
| 40 | | 12.4 | 10.8 | 10.1 | 3.4 | 3.4 | 2.3 | 60 | |
| 50 | | 23.6 | 24.8 | 13.9 | 4.4 | 4.4 | 2.1 | 70 | |
| 75 | | 32.8 | 35.3 | 16.4 | 4.6 | 4.6 | 1.8 | 95 | |
| 12 | 10 | 8.5 | 8.5 | 13.6 | 2.5 | 2.5 | 4 | 32 | 11 |
| | 20 | 8.5 | 8.5 | 13.6 | 2.5 | 2.5 | 4 | 44 | |
| | 30 | 8.5 | 8.5 | 13.6 | 2.5 | 2.5 | 4 | 54 | |
| | 40 | 8.5 | 8.5 | 13.6 | 2.5 | 2.5 | 4 | 62 | |
| | 50 | 8.5 | 8.5 | 13.6 | 2.5 | 2.5 | 4 | 72 | |
| | 75 | 52.3 | 52.3 | 85.6 | 18.9 | 18.9 | 13 | 115 | |
| 16 | 100 | 53.9 | 53.9 | 86.9 | 19.5 | 19.5 | 13 | 142 | 12 |
| | 10 | 33.6 | 33.6 | 35.2 | 8.4 | 8.4 | 8.8 | 49 | |
| | 20 | 33.6 | 33.6 | 35.2 | 8.4 | 8.4 | 8.8 | 49 | |
| | 30 | 33.6 | 33.6 | 35.2 | 8.4 | 8.4 | 8.8 | 59 | |
| | 40 | 33.6 | 33.6 | 35.2 | 8.4 | 8.4 | 8.8 | 69 | |
| | 50 | 33.6 | 33.6 | 35.2 | 8.4 | 8.4 | 8.8 | 79 | |
| 20 | 75 | 70.2 | 70.2 | 62.5 | 28.1 | 28.1 | 25 | 120 | 14 |
| | 100 | 76.6 | 76.6 | 62.5 | 38.3 | 38.3 | 25 | 150 | |
| | 125 | 78 | 78 | 62.5 | 39 | 39 | 25 | 175 | |
| | 10 | 34.8 | 34.8 | 36.8 | 8.7 | 8.7 | 9.2 | 53 | |
| | 20 | 34.8 | 34.8 | 36.8 | 8.7 | 8.7 | 9.2 | 53 | |
| | 30 | 34.8 | 34.8 | 36.8 | 8.7 | 8.7 | 9.2 | 63 | |
| 25 | 40 | 34.8 | 34.8 | 36.8 | 8.7 | 8.7 | 9.2 | 73 | 17 |
| | 50 | 34.8 | 34.8 | 36.8 | 8.7 | 8.7 | 9.2 | 83 | |
| | 75 | 70.2 | 70.2 | 74.5 | 28.1 | 28.1 | 29.7 | 123 | |
| | 100 | 76.6 | 76.6 | 74.5 | 38.3 | 38.3 | 29.7 | 157 | |
| | 125 | 78 | 78 | 74.5 | 39 | 39 | 29.7 | 178 | |
| | 150 | 98.4 | 98.4 | 74.5 | 49.2 | 49.2 | 29.7 | 210 | |
| 25 | 10 | 56.7 | 56.7 | 51 | 16.2 | 16.2 | 17 | 60 | 17 |
| | 20 | 56.7 | 56.7 | 51 | 16.2 | 16.2 | 17 | 60 | |
| | 30 | 56.7 | 56.7 | 51 | 16.2 | 16.2 | 17 | 70 | |
| | 40 | 56.7 | 56.7 | 51 | 16.2 | 16.2 | 17 | 80 | |
| | 50 | 56.7 | 56.7 | 51 | 16.2 | 16.2 | 17 | 90 | |
| | 75 | 122.5 | 122.5 | 138.5 | 49 | 49 | 55.4 | 130 | |
| 25 | 100 | 173.8 | 173.8 | 138.5 | 79 | 79 | 55.4 | 168 | 17 |
| | 125 | 217 | 217 | 138.5 | 108.6 | 108.6 | 55.4 | 205 | |
| | 150 | 221.8 | 221.8 | 138.5 | 110.9 | 110.9 | 55.4 | 230 | |

Note: Symbol and unit

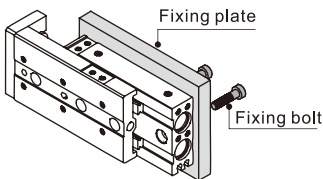
| Symbol | Item | Unit |
|--|---|------------------|
| A, B | Correction value for center position distance of moment | mm |
| a | Acceleration of inertia | - |
| E | Kinetic energy | J |
| Ea | Allowable kinetic energy | J |
| Emax | Maximum allowable kinetic energy | J |
| g | Acceleration of gravity g=9.81 | m/s ² |
| K | Mounting work coefficient | - |
| L1, L2, L3 | Overhang | mm |
| Mp, My, Mr | Dynamic moment(Pitch, Yaw, Roll) | Nm |
| M _p _{max} , M _y _{max} , M _r _{max} | Maximum allowable dynamic moment (Pitch, Yaw, Roll) | Nm |
| M _{po} , M _{yo} , M _{ro} | Static moment(Pitch, Yaw, Roll) | Nm |
| M _{po} _{max} , M _{yo} _{max} , M _{ro} _{max} | Maximum allowable static moment (Pitch, Yaw, Roll) | Nm |
| Va | Average speed | mm/s |
| W | Applied load | N |
| Wmax | Maximum allowable applied load | N |
| β | Applied load coefficient | - |

Installation and application

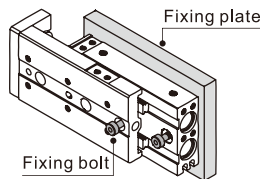
1. How to mount cylinder :

1.1) Cylinder can be mounted from 3 directions

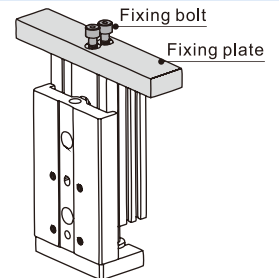
Vertical Mounting(Body thread holes)



Vertical Mounting(Body through holes)



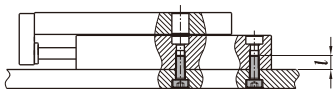
Axial Mounting (Body thread holes)



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

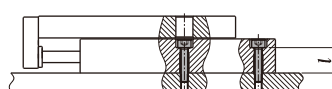
If screws are tightened beyond designed limits, malfunction may occur. If they are tightened insufficiently, it may result in sliding or falling off from its position.

Vertical Mounting(Body thread holes)



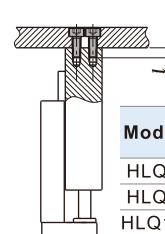
| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-----------|-----------------------------|-------------------------|
| HLQ6 | M4×0.7 | 2.1 | 8 |
| HLQ8 | M4×0.7 | 2.1 | 8 |
| HLQ12 | M5×0.8 | 4.4 | 10 |
| HLQ16 | M6×1.0 | 4.4 | 10 |
| HLQ20 | M6×1.0 | 7.4 | 12 |
| HLQ25 | M8×1.25 | 18.0 | 16 |

Vertical Mounting(Body through holes)



| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-----------|-----------------------------|-------------------------|
| HLQ6 | M3×0.5 | 1.2 | 8.0 |
| HLQ8 | M3×0.5 | 1.2 | 9.6 |
| HLQ12 | M4×0.7 | 2.8 | 13.4 |
| HLQ16 | M5×0.8 | 5.7 | 16.7 |
| HLQ20 | M5×0.8 | 5.7 | 22.0 |
| HLQ25 | M6×1.0 | 10.0 | 27.0 |

Axial Mounting(Body thread holes)



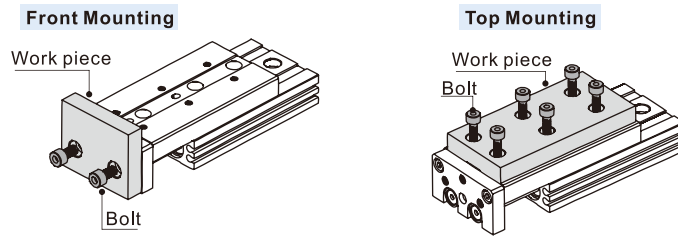
| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
|-------|-----------|-----------------------------|-------------------------|
| HLQ6 | M2.5×0.45 | 0.5 | 3.5 |
| HLQ8 | M3×0.5 | 0.9 | 4.0 |
| HLQ12 | M4×0.7 | 2.1 | 6.0 |
| HLQ16 | M5×0.8 | 4.4 | 7.0 |
| HLQ20 | M5×0.8 | 4.4 | 8.0 |
| HLQ25 | M6×1.0 | 7.4 | 10.0 |

Slide table cylinder(ball bearing type)

HLQ、HLQL Series

2. Work Piece Mounting :

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

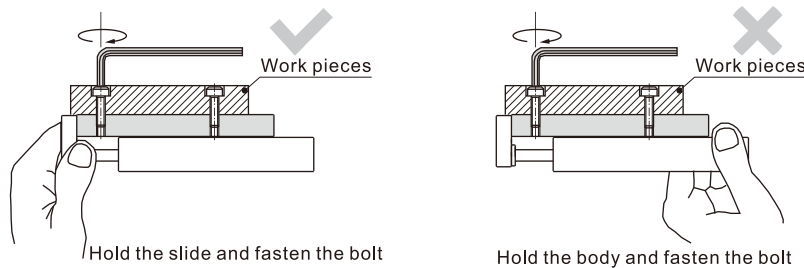


2.2) When mounting a work piece, tighten the bolts properly at a torque value within the limiting range. Use bolts at least 0.5mm shorter than maximum thread depth to prevent bolts from contacting the guide block. If the bolts are too long, they hit the guide block and cause damage.

| Front Mounting | | | | Top Mounting | | | |
|----------------|-----------|-----------------------------|-------------------------|--------------|-----------|-----------------------------|-------------------------|
| Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) | Model | Bolt used | Max. tightening torque (Nm) | Max. screw-in depth(mm) |
| HLQ6 | M3×0.4 | 0.9 | 5 | HLQ6 | M3×0.5 | 0.9 | 4.7 |
| HLQ8 | M4×0.7 | 2.1 | 6 | HLQ8 | M3×0.5 | 0.9 | 4.7 |
| HLQ12 | M5×0.8 | 4.4 | 8 | HLQ12 | M4×0.7 | 2.1 | 5.0 |
| HLQ16 | M6×1.0 | 7.4 | 10 | HLQ16 | M5×0.8 | 4.4 | 5.0 |
| HLQ20 | M6×1.0 | 7.4 | 13 | HLQ20 | M5×0.8 | 4.4 | 8.0 |
| HLQ25 | M8×1.25 | 18.0 | 15 | HLQ25 | M6×1.0 | 7.4 | 9.0 |

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.

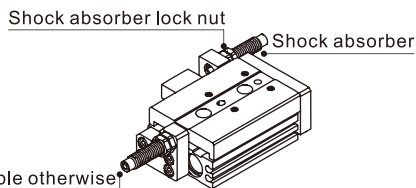


3. About shock absorber :

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.



The screws are not adjustable otherwise would cause oil leakage.

| Model | Shock absorber | Tightening torque |
|-------|------------------------|-------------------|
| HLQ6 | Without shock absorber | |
| HLQ8 | ACA0806-1N | 1.67(Nm) |
| HLQ12 | ACA0806-1N | 1.67(Nm) |
| HLQ16 | ACA1007-1N | 3.14(Nm) |
| HLQ20 | ACA1210-1N | 3.14(Nm) |
| HLQ25 | ACA1412-1N | 10.8(Nm) |

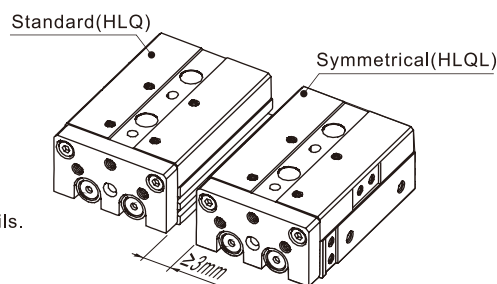
4. How to mount sensor switch :

4.1) HLQ Series are all with magnet. The matching sensor switches are CMSH, DMSH, EMSH 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 be 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.

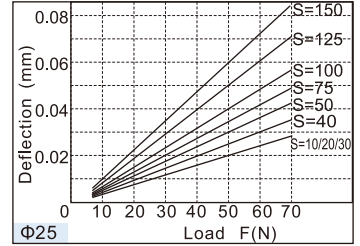
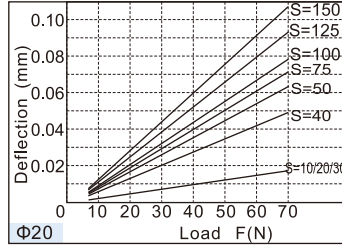
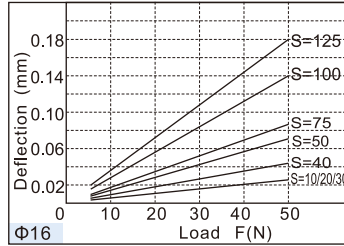
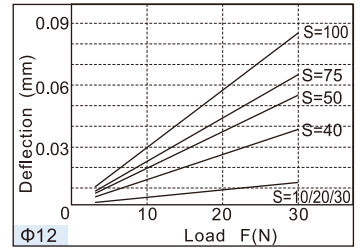
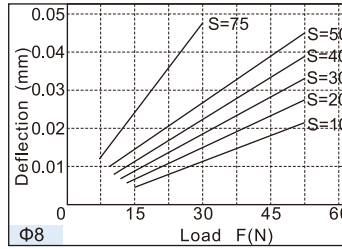
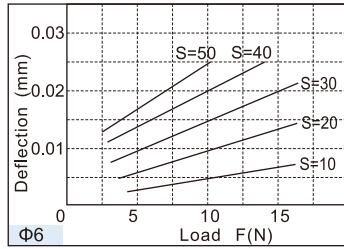


Slide table cylinder(ball bearing type)

HLQ、HLQL Series

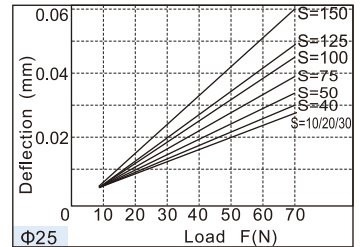
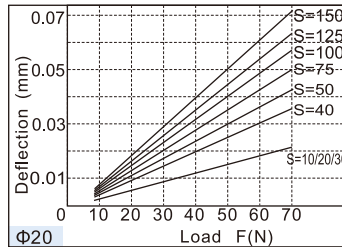
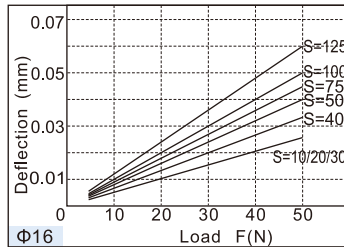
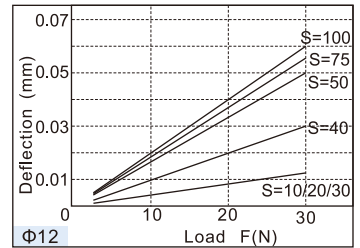
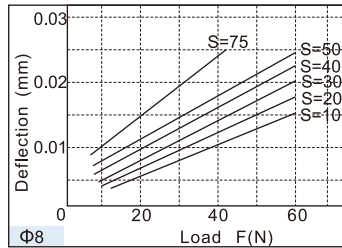
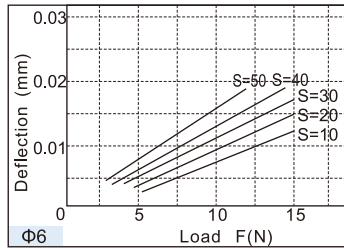
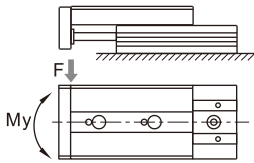
6.1) Table deflection due to pitch moment:

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

