UCA2, UCA2-B

Technical data ❹ Calculation of kinetic energy

4 Calculation of kinetic energy

Calculate the kinetic energy from the load weight (W) and speed (V), and ensure it is less than or equal to the allowable value in Table 7.
If the allowable energy value is exceeded, be sure to increase the cylinder size so that it is within the allowable energy, or consider an external shock absorber.
In addition, the speed value referred to here is not the average speed but the speed at the time of cushion entry, so calculate the cushion entry speed from equation (1).

$$E = \frac{1}{2} mV^2 + f S_1$$

$$Va = \frac{S_2}{t}$$

$$V = Va \times (1 + 1.5 \frac{\omega}{100}) \quad \text{——(1)}$$

E : Kinetic Energy (J)
m : Weight (kg)
V : Cushion impact speed (m/s)
f : Thrust (N)
S_1 : Shock Absorbers stroke (m)
Va : Average speed (m/s)
S_2 : Cylinder stroke (m)
t : Travel time (s)
ω : Load factor (%)

Table 7 Allowable absorption energy

Bore size (mm)	Allowable absorption energy (J)
ø10	0.25
ø16	0.65
ø25	2.4
ø32	4.5

Shock Absorber Stroke

Bore size (mm)	Stroke (mm)
ø10	4.5
ø16	5.0
ø25	6.5
ø32	7.0

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use.
For general cylinder information, see Opening Section P. 41, and for cylinder switches, see P. 808.

Individual Precautions: Unit cylinder UCA2 Series

During Use

1. During installation

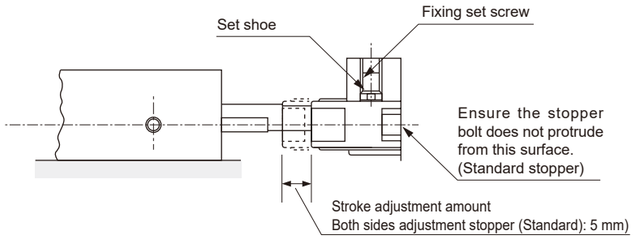
Caution

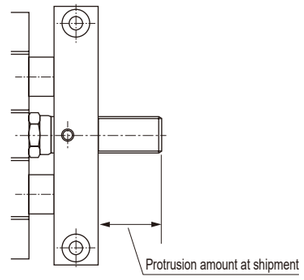
■ About stopper adjustment method

- When adjusting the stroke, loosen the fixing set screw and then turn the stopper bolt to adjust. Also, after adjustment, tighten the fixing set screw.
  Recommended tightening torque for fixing set screw: 1.4 N·m
- The adjustment amount of the stopper depends on Table A.
- Using a longer stroke will cause malfunction, so please refrain from doing so. Ensure the standard stopper does not protrude beyond the outside of the end plate. For single-side adjustment stopper P1 and both-sides adjustment stopper P2, do not adjust them to extend beyond the projection amount at the time of shipment (Table A).

Table A

Item		Stroke adjustment amount	Protrusion amount at shipment
Both sides adjustment stopper (Standard) Blank	Plate A side	-5 mm	0 mm
	Plate B side		
One side adjustment stopper P1A	Plate A side	-30 mm	25 mm
	Plate B side	-5 mm	0 mm
One side adjustment stopper P1B	Plate A side	-5 mm	0 mm
	Plate B side	-30 mm	25 mm
Both sides adjustment stopper P2	Plate A side	-17.5 mm	12.5 mm
	Plate B side		





■ Treat our Shock absorbers as consumable parts.
Replace when a decrease in energy absorption capacity is observed or when operation is no longer smooth.

For precautions regarding mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components Product website (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual