

# Low Speed Cylinders

## Slow, smooth, and stable operation!

- Enable stable operation from 1mm/s [0.04in./sec.].<sup>Note</sup>
- Smooth operation without stick-slips.
- Suitable for low speed transfer of fragile workpieces.
- Cylinder's outer dimensions are the same as the standard product.
- Wide range of cylinders are available: 6 types and 10 bore sizes.
- Speed controllers for low speed cylinders are also available.

Note : Excluding Jig cylinders with guides.



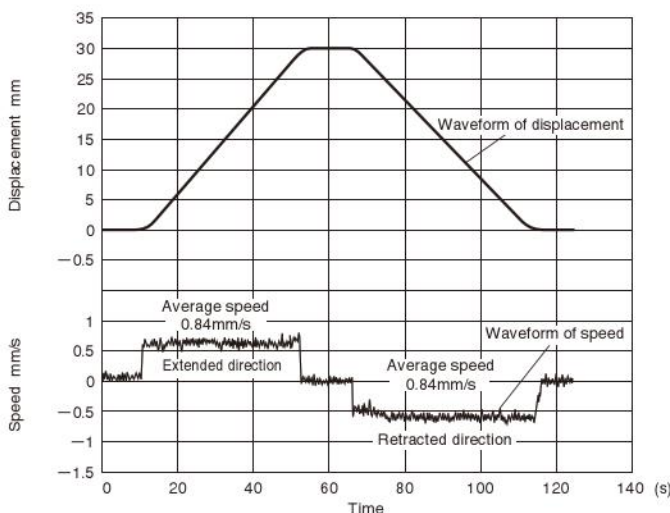
# Slow and smooth



## CAUTION

Always wash your hands thoroughly whenever you happen to touch the grease used in the Low Speed Cylinders. If you light a cigarette with greasy hands, the grease adhered to the cigarette could release toxic gases as it burns. (While the grease used in the Low Speed Cylinder is very stable in chemical terms at room temperature, it would release toxic gases if heated to 250°C [482°F] or higher.)

### Waveform of Speed and Displacement

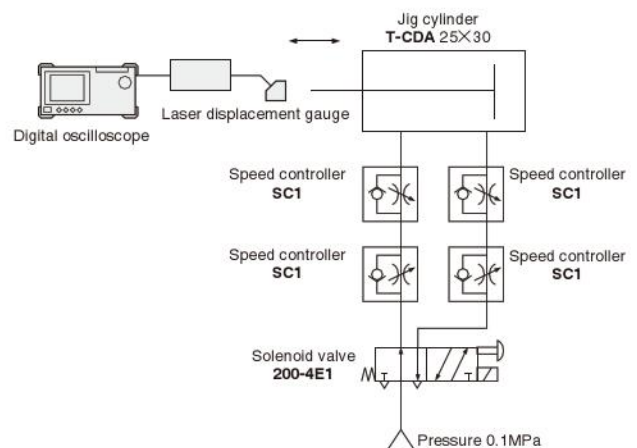


Remarks 1 : The average speed is obtained by dividing the stroke by the time required to travel the stroke. The above average speed values were obtained by tests undertaken at Koganei. They do not imply guaranteed values of the product.

2 : The speed value reads positive when the cylinder is extended.

1mm/s = 0.03944in./sec. 1mm = 0.0394in.

### Measurement method



## Low Speed Cylinder Variations

**Twin Rod Cylinders —1538**

**Jig Cylinders with Guides —1539**

**Jig Cylinders C Series—1535**

**Speed controller**  
**Improved characteristics**  
**In low-flow area.**  
 You can make full use of the capabilities of the Low Speed Cylinders by using the speed controllers.

**Slim Cylinders —1537**

**Multi Mount Cylinders —1536**

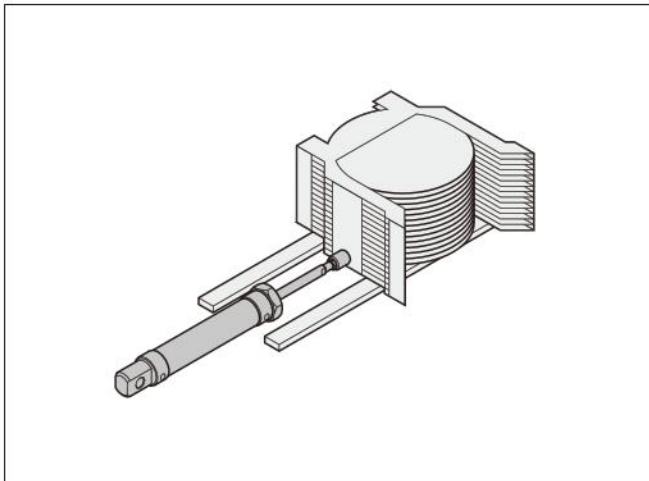
**Pen Cylinders —1534**

**Low speed Control Type Speed Controllers with Quick Fittings —1540**

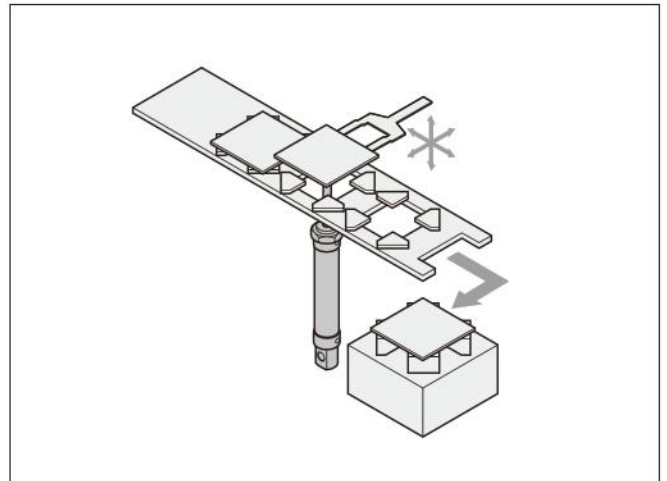
**Handling Instructions and Precautions —1533**

### Application Examples

● Positioning a wafer stacker



● Transfer of a liquid crystal display panel



## Handling Instructions and Precautions



### General precautions

1. Always thoroughly blow off (use compressed air) the tubing before piping. Entering metal chips, sealing tape, rust, etc., generated during piping work could result in air leaks or other defective operation.
2. Use air for the media. For the use of any other media, consult us.
3. 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  $\mu\text{m}$ ) 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.



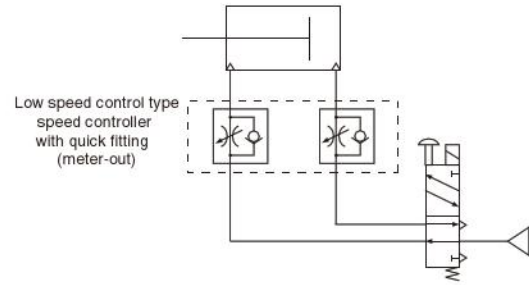
### Piping

See the diagrams below for piping with the Low Speed Cylinder.

#### Recommended circuit

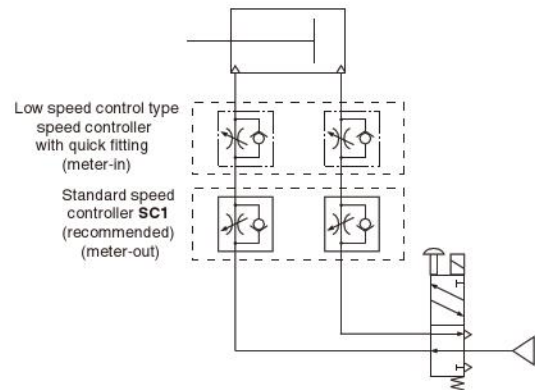
##### ① Basic circuit

Use meter-out speed controllers.



##### ② Jump start prevention circuit

Use in combination with speed controllers, as shown in the diagram below, is effective for low speed control as well as jump start prevention.



Note: Locate the cylinder and speed controller as close to each other as possible.

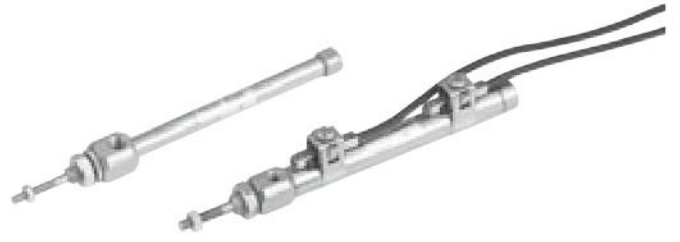
# LOW SPEED CYLINDERS

## Pen Cylinders

Operating speed range

**1~200** mm/s

[0.04~7.87in./sec.]



### Order Codes

Function		Head cover piping		Connection port		Sensor switch		Lead wire length	
Blank : Standard type S : With magnet type		Blank : Axial direction piping A : Lateral direction piping M : Lateral direction piping with mounting threads		Blank : M5×0.8 M3 : M3×0.5 (Only for φ6 [0.236in.])		Blank : No sensor switch ZC253 : 3-lead wire, Solid state type ZC230 : 2-lead wire, Solid state type ZC201 : Without indicator lamp, Reed switch type <sup>Note1</sup> ZC205 : With indicator lamp, Reed switch type <sup>Note1</sup>		A : 1000mm [39in.] B : 3000mm [118in.]	
Cylinder bore size		Stroke		Mounting type		Number of sensor switches			
6 : φ6 [0.236in.] 10 : φ10 [0.394in.] 16 : φ16 [0.630in.]				Blank : Basic type 1 : Double foot mounting type 1A : Single foot mounting type 3 : Flange mounting type		1 : With 1 sensor switch 2 : With 2 sensor switches 3 : With 3 sensor switches n : With n sensor switches			
<b>T</b>	<b>- PB DA</b>		×						
		Note2	×	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60	Blank	Blank	Blank	Blank	1
S		Note2	×	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60	-A	-M3	-1	-ZC253	2
S			×	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 75, 100	-M		-1A	-ZC230	3
			×				-3	-ZC201	n
			×					-ZC205	
								A	
								B	

\*The double rod cylinder and the cylinder for clean systems require special specifications. For details, consult us.

Notes: 1. If using reed-type sensor switches, maintain an operating speed of 30mm/s [1.2in./sec.] or higher.  
2. When using φ6 [0.236in.] or φ10 [0.394in.] bore size at 1mm/s [0.04in./sec.], apply air pressure of 0.4MPa [58psi.] or more.

● Except the items listed below, all outer dimensions, cylinder specifications, sensor switch specifications, and handling instructions are the same as the standard product. For details, see p.254.

1. Operating speed range: 1~200mm/s [0.04~7.87in./sec.]
2. Lubrication prohibited