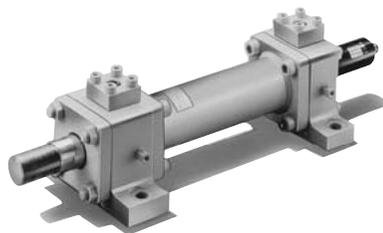


Installed absolute position sensor

- The position sensor applying a magnetostriction phenomenon enables high-accuracy absolute position sensing.
- No limit sensor is needed for original position setting, and position correction is not required.
- The sensor has a linearity of $\pm 0.05\%$ FS which cannot be obtained by conventional absolute position sensors. (The linearity indicates the accuracy at the full stroke.)
- The temperature drift of the sensor probe alone is remarkably low, ± 50 ppmFS/°C (ppm: 1/1,000,000)
- High-speed sample hold circuit ensures stable output and high response.
- Since the sensor is built in the mill type hydraulic cylinder (70/140M-3 Series), it excels in environmental resistance and durability.
- They are so compact that they are easy to install and space-saving in equipment.

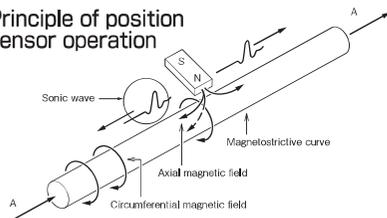


Position Sensor Specifications

Output method		Analog output		Digital output	
Sensor/controller name		GYcRP/GYFC-R9		GYcRP/GYDC-03A	
Accuracy	Linearity	0.05%FS or less			
	Resolution	0.01%FS or less		0.1 or 0.01 mm	
	Repeatability	0.01%FS or less			
	Temperature characteristics	Probe	0.005 mm/°C + 10 ppmFS/°C or less		
Controller		± 20 ppm FS/°C			
Output type	Voltage output	0 to +10 V DC	Output level	Open collector output or TTL output	
		Load current : 50 mA max.	Output logic	Positive logic or negative logic	
	Load resistance : 200 Ω min.	Output code		Binary output (19 bits) or BCD output (4-3/4 digits)	
	Current output		4 to 20 mA		
Others	Load resistance : 500 Ω max.	Error output (standard) and speed output (option)			
Scanning frequency		1 KHz (standard)			
Supply voltage		± 15 V DC or +24 V DC		85 to 132 V AC	
Environmental resistance	Working temperature range	Probe	-5°C to +65°C (no freezing)		
		Controller	0°C to +60°C (no freezing)		
	Storage temperature range	-40°C to +80°C (no freezing)			
	Proof pressure	35 MPa, parts in contact with liquid			
	Vibration resistance	58.8 m/s ² (or 40 Hz2mmpp)			
	Impact resistance	196 m/s ² 6mS			
Protective structure		IP65 (IEC Standard)			
Cable specifications		Oil-proof cable for composite instrumentation with shield			
Cable length (standard)		With 1.5 m long connector (extendable to up to 200 m)			

- We are ready to produce special models, such as high-temperature (to up to 100°C) models. Please contact us.

Principle of position sensor operation



The figure shows the basic principle.

When a current pulse shown by arrow A is given to the magnetostrictive curve, a circumferential magnetic field is generated on the magnetostrictive curve.

When a magnet is positioned as shown in the figure, an axial magnetic field is given only to the part, and a diagonal magnetic field as shown by the dotted line is generated, thereby causing torsion in this part of the magnetostrictive curve. Since this torsion is a kind of vibration, it propagates at the sonic speed on the magnetostrictive curve which is a metallic tube.

140MT-3 Series uses absolute position sensors which detect the magnet position by measuring the supersonic propagation time.

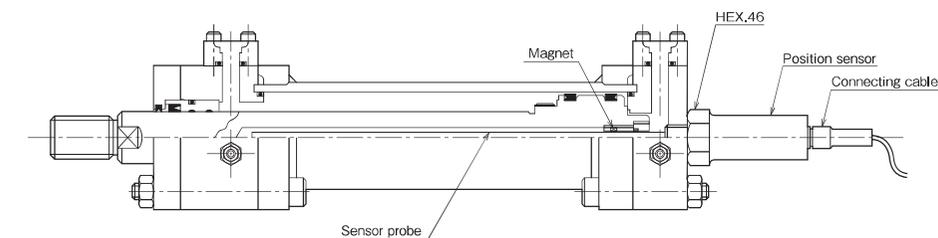
Cylinder Specifications

Series	140MT-3	
Cylinder bore	$\phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100 \cdot \phi 125 \cdot \phi 140$	$\phi 160 \cdot \phi 180 \cdot \phi 200 \cdot \phi 224 \cdot \phi 250$
Standard stroke	100 to 1500mm	100 to 2000mm
Nominal pressure	14 MPa	
Maximum allowable pressure	23 MPa	
Proof pressure	28 MPa	
Maximum working speed	500mm/s	
Minimum working speed	10mm/s	20mm/s
Working temperature range	-5°C to +65°C (ambient temp. and oil temp.) (no freezing)	
Structure of cushioning	Metal fitting system	
Applicable fluid	Petroleum-based fluid (When using another fluid, refer to the table of fluid adaptability.)	
Tolerance for thread	JIS 6g	
Mounting style	SD, LA, FA, TC	

Note) The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.

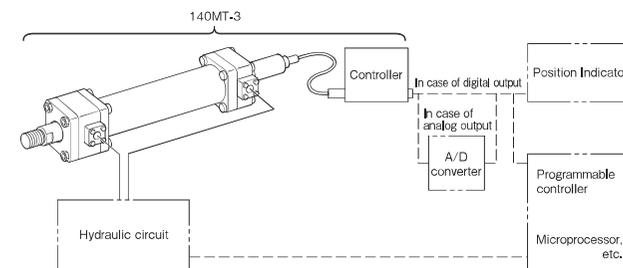
The position sensor can be installed in JIS type (70/140H-B) and special cylinders as well as in the mill type hydraulic cylinders. Feel free to contact us.

Sectional Drawing



- Notes) 1. For the dimensions of each part of the cylinders, see the catalog of 70/140M-3 Series mill type hydraulic cylinders.
2. Part of the structure may vary depending on the cylinder bore and position sensor type.
3. 140MT-3 Series are provided with a position sensor protecting steel cover.

Application example



- The cylinder position and operation can be checked on the position indicator, and position adjustment and inching can be easily performed by manual operation.
- When combined with a PC or a microprocessor, the cylinder can be decelerated and stopped at any position.