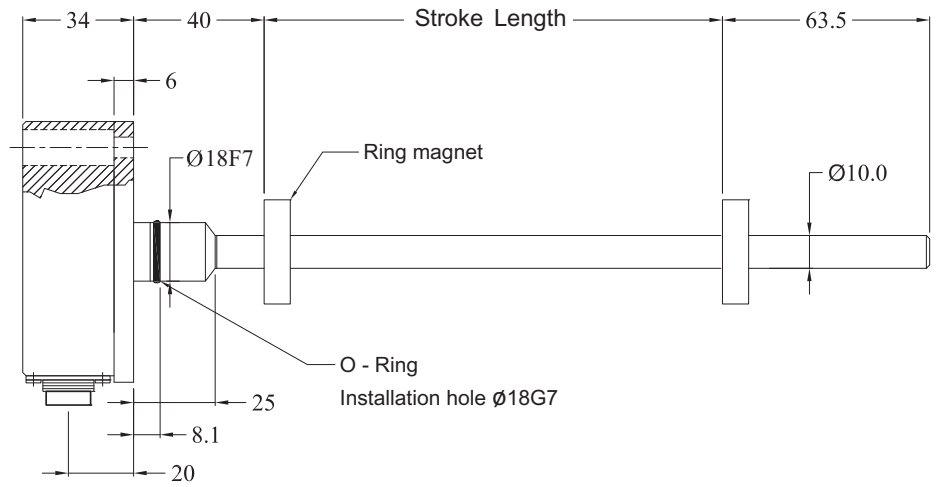
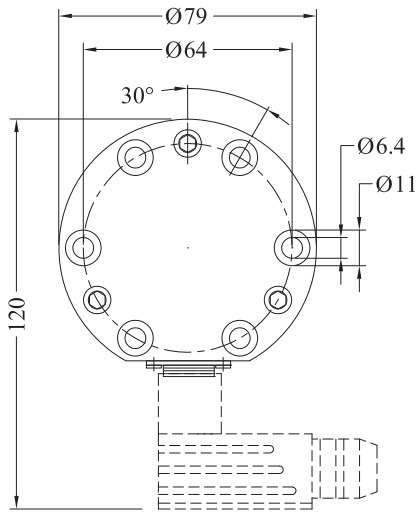


16 series is design for hydraulic cylinder with limited head space or clevis rod ends hydraulic cylinder. Sensing rod is made by stainless steel which installed inside the hydraulic cylinder. It has a wide variety of signal output selection included analog voltage, current, and SSI. It is a perfect combination with hydraulic valve to form a close-loop servo hydraulic system.

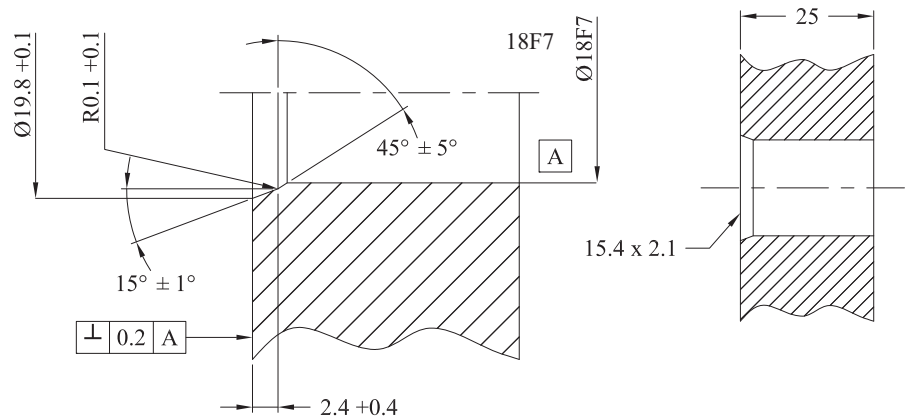
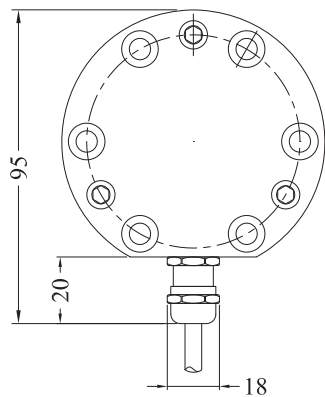
It adopts the non-contact magnet-rostrictive measuring technology for precise, accurate, and absolute measurement. The non-contact feature provides exceptional ease of installation and guarantees almost unlimited mechanical life expectancy. The high versatile IP67 profile housing offers full protection against outside agents for use in harsh environments with high contamination and presence of dust.



Installation



Flange Mounting



Specifications

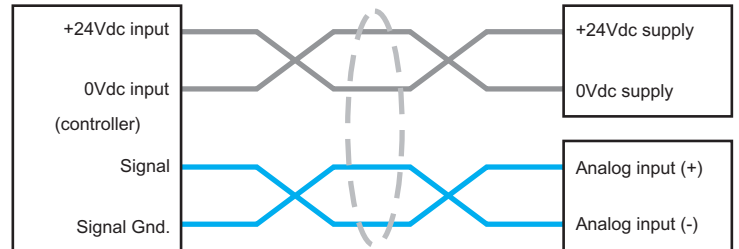
Order Code	1 6 0	1 6 1
Output	Voltage	Current
Measurement Type	Linear displacement	
Resolution	16 Bit D/A, 0.0015% (minimum 1µm)	
Repeatability	< ±0.001% of full scale (minimum ±2.5µm)	
Non-Linearity	< ±0.01% of full scale (minimum ±40µm)	
Update Time	0.5 ms up to 1200 mm / 1.0 ms up to 2400 mm 2.0 ms up to 4800 mm / 5.0 ms up to 7600 mm	
Input Voltage	+24Vdc (20.4 - 28.8Vdc)	
Input Protection	Polarity protection up to -30Vdc, Over voltage protection up to 36Vdc	
Power Consumption	100mA (stroke range dependent)	
Dielectric Strength	500Vdc (DC ground to machine ground)	
Connector Type	D60 Male	
Pressure Rating	350 bar / 600 bar peak	
Operation Temp.	-40 to 75°C, Humidity 90% non-condensing	
Sealing	IP 67 (with connector)	
Vibration Rating	15g / 10-2000Hz / IEC standard 68-2-6	
Shock Rating	100g single hit per IEC standard 68-2-27	
EMC	Emission EN 68000-6-3, Immunity EN 61000-6-2, EN 61000-4-2/3/4/6	

Pin Assignments



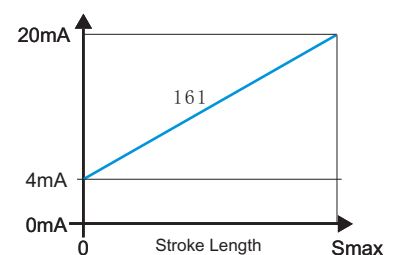
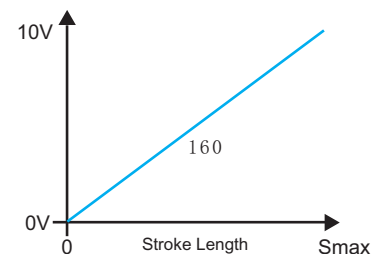
(View toward sensor pins)

	Cable	D60 Pin
1	Black	Signal
2	White	Signal Gnd
3	Yellow	N.C.
4	Green	N.C.
5	Red	+24 Vdc
6	Blue	0 Vdc



Order Code

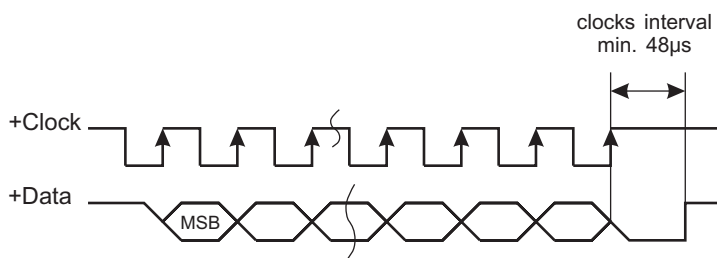
Order Code	Output	Stroke Length (mm)	Magnet Type	Connection Type
1 6 X X X H X X X X X X X X X	001 = 0 - 10V 011 = 10 - 0V	101 = 4 - 20mA 111 = 20 - 4mA	1 = Dia. 33mm ring 2 = Dia. 25mm ring 4 = Dia. 60mm ring	D60 = 6 pin male receptacle M16 (Connector not included) R02 = 2m PVC Direct Cable, Option: R01-R10 (1-10m) H02 = 2m PUR Direct Cable, Option: H01-H10 (1-10m)



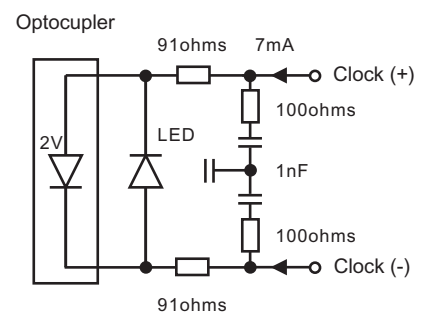
Specifications

Order Code	1 6 2
Output	SSI
Measurement Type	Linear displacement
Data Format	Binary or Grey, optional Parity and Errorbit
Data Length	8 - 32 bits
Data Speed	Length : <3 <50 <100 <200 <400 m Baud rate : 1000 <400 <300 <200 <100 kBd
Update Time	Measuring Length : 300 750 1000 2000 5000 mm Measurement/sec : 3.7 3.0 2.3 1.2 0.5 kHz
Resolution	Displacement : 1 / 2 / 5 / 10 / 20 / 50 / 100 μ m
Repeatability	< $\pm 0.001\%$ of full scale (minimum $\pm 2.5\mu$ m)
Non-Linearity	< $\pm 0.01\%$ of full scale (minimum $\pm 40\mu$ m)
Update Time	0.5 ms up to 1200 mm / 1.0 ms up to 2400 mm 2.0 ms up to 4800 mm / 5.0 ms up to 7600 mm
Input Voltage	+24Vdc (20.4 - 28.8Vdc)
Input Protection	Polarity protection up to -30Vdc, Over voltage protection up to 36Vdc
Power Consumption	100mA (stroke range dependent)
Dielectric Strength	500Vdc (DC ground to machine ground)
Connector Type	D70 Male
Pressure Rating	350 bar / 600 bar peak
Operation Temp.	-40 to 75°C, Humidity 90% non-condensing
Sealing	IP 67 (with connector)
Vibration Rating	15g / 10-2000Hz / IEC standard 68-2-6
Shock Rating	100g single hit per IEC standard 68-2-27
EMC	Emission EN 68000-6-3, Immunity EN 61000-6-2, EN 61000-4-2/3/4/6

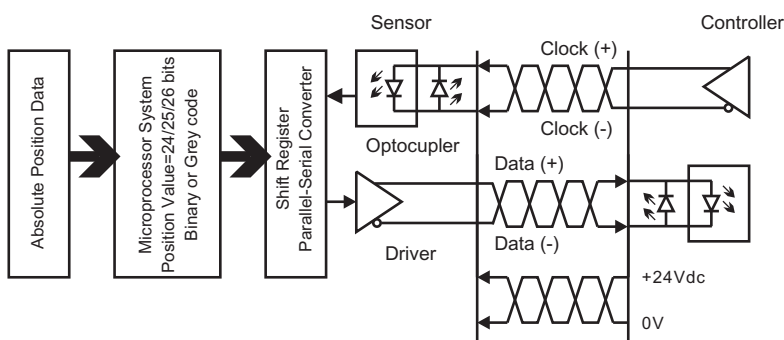
Timing Diagram



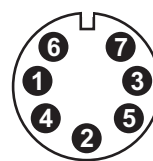
Sensor Input



Logic Diagram



Pin Assignments



(View toward sensor pins)

Cable shield connects to connector shell and grounded at controller side.

	D70 Pin	Cable
1	Data (-)	Black
2	Data (+)	White
3	Clock (+)	Yellow
4	Clock (-)	Green
5	+24 Vdc	Red
6	0 Vdc	Blue
7	N.C.	

Order Code

1 6 2 X X X X X X H X X X X X X X X X X

Data Length

- 1 = 25 bits
- 2 = 24 bits

Output Format

- B = Binary
- G = Grey Code

Resolution

- 1 = 5µm
- 2 = 10µm
- 3 = 50µm
- 4 = 100µm
- 5 = 20µm
- 6 = 2µm
- 8 = 1µm

Function

- 1 = Standard

Options

- 00 = Measuring direction forward
- 01 = Measuring direction reverse

Stroke Length (mm)

- 0075, 0100, 0125, 0150, 0175,
- 0200, 0225, 0250, 0275, 0300,
- 0325, 0350, 0375, 0400, 0425,
- 0450, 0475, (25mm increment after)

Magnet Type

- 1 = Dia. 33mm ring
- 2 = Dia. 25mm ring
- 4 = Dia. 60mm ring

Connection Type

- D60 = 6 pin male receptacle M16 (Connector not included)
- R02 = 2m PVC Direct Cable, Option: R01-R10 (1-10m)
- H02 = 2m PUR Direct Cable, Option: H01-H10 (1-10m)

Remark: Direction forward means position reading become larger while magnet move away from electronic carriage. Direction backward means position reading become smaller while magnet move away from electronic

Installation

