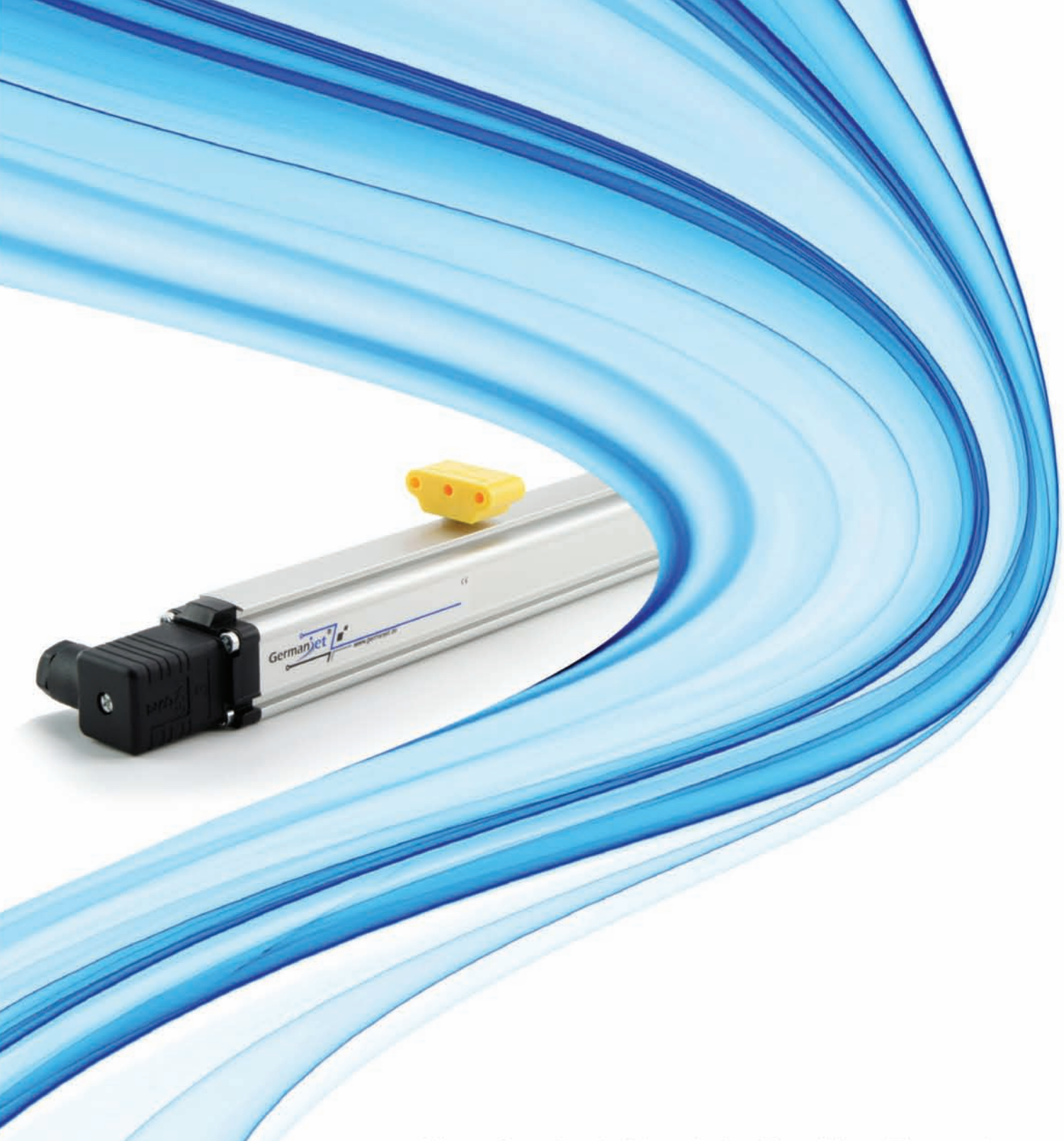


Non-Contact Absolute Position Transducer

Leading technology revolutionary determine who will hold the competitive advantage today and tomorrow.

MAGNETOSTRICTIVE TECHNOLOGY

Germanjet®

PART OF YOUR POSITIONING

...Experts in non-contact sensing

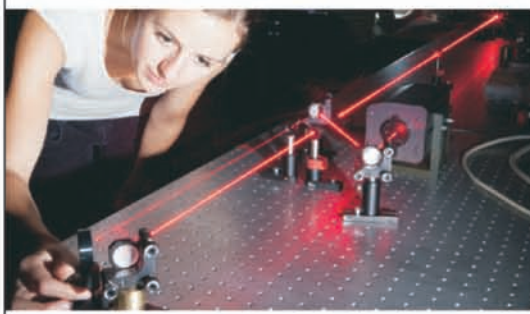
for extremely accurate, low-noise, and wear-free absolute position feedback

Our philosophy ...

Leading technology revolutionary can determine who will hold the competitive advantage today and tomorrow. Germanjet has been in the position to be the trendsetter for sensing revolution. Recognizing promising ideas and identify new approach to challenge has always been one of the most significant elements in our technology planning. To accomplish all this, we closely align our R&D activities toward our business strategy.

Our team is young, dynamic, and committed. Their excellent qualifications allow them to provide exceptional support to customers all around the world. Open and devoted cooperation results in an extraordinarily high degree of identification with the company.

In order to act proactively to our customers' technological needs, Germanjet Advance Sensing and Control Technology (ASCT) group was formed to specialize in designing intelligent product and solution. No matter how diverse and difficult the requirement is, our goal is to provide the highest possible performance with the most optimum service and price.



Worldwide Vision

Our team excellent qualifications allow them to provide exceptional support to customers all around the world.

Parisan control is an advance close-loop control system for blow molding machine. Non-contact absolute position transducer feedbacks the valve position to controller to precisely control the thickness of the bottle.

- Non-contact Technology
- Absolute Position
- IP 67 Protection
- Easy Installation

The fundamental principle of the magnetostrictive transducer is by analyzing the feedback sonic wave induced by an interaction of two magnetic fields. The first magnetic field is produced by the moveable magnetic cursor which attached at the moving component of a machine. The second field is generated by the pulse initiator. After the two magnetic fields interact, a sonic wave is induced and detected by the sonic wave analyzer.

By examining the characteristic of the wave pattern, the embedded microprocessor is able to generate the corresponding analog output signal to indicate the position of the machine. As a result, precise non-contact position is achieved with absolutely no wear to the sensing components.

high precision & reliability...

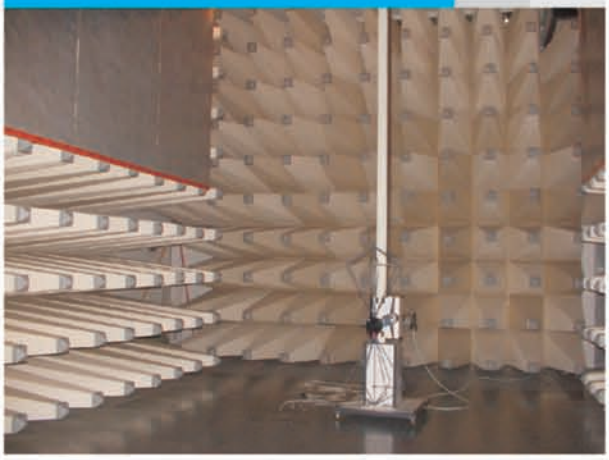
Electromagnetic Compatibility refers to the ability of equipment to perform satisfactorily in its electromagnetic environment without introducing intolerable interference into any thing in that environment.

The equipment must have a certain level of "immunity" to the Electromagnetic Interference (EMI) present in its environment so that it is not "susceptible" to that EMI. Product, in certain country, has to fulfill EMC test in order to be distributed legally.

Our EMC laboratory is fully compatible with ISO/IEC 17025:1996 standard. And our product are passed all required EMC tests and meet the CE standard.

EN 61000-6-3	Emission standard for residential, commercial and light-industrial environments
EN 61000-6-2	Immunity for industrial environments
EN 61000-4-2	Electrostatic discharge immunity test
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4	Electrical fast transient/burst immunity test
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-8	Power frequency magnetic field immunity test
	Temperature fatigue test
	Liquid and dust protection test
	Shock and vibration test
	On site shock and vibration test

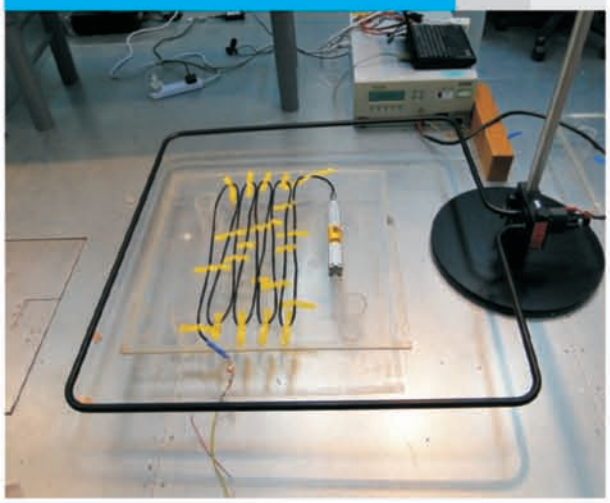
Emission standard for residential, commercial and light-industrial environments



Radiated, radio-frequency, electromagnetic field immunity test

Shock and vibration test laboratory

Power frequency magnetic field immunity test



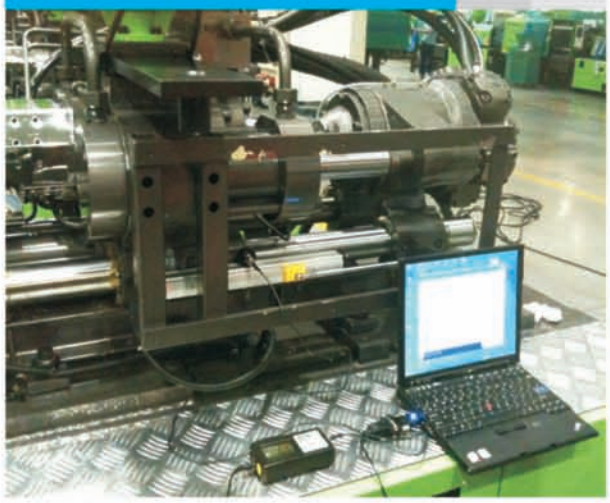
CE Quality and certification....

Temperature fatigue test

Product in most working environment would experience certain degree of shock and vibration. The purpose of shock and vibration test is to have product going through a similar simulated environment.

During design phase and pre-production cycle, our product would undergo a series of intensive shock and vibration tests. Machine such as plastic injection machine induces a severe level of vibration. In order to make sure our product overcome the actual challenge, we also perform a series of on-site test.

On-site shock and vibration test

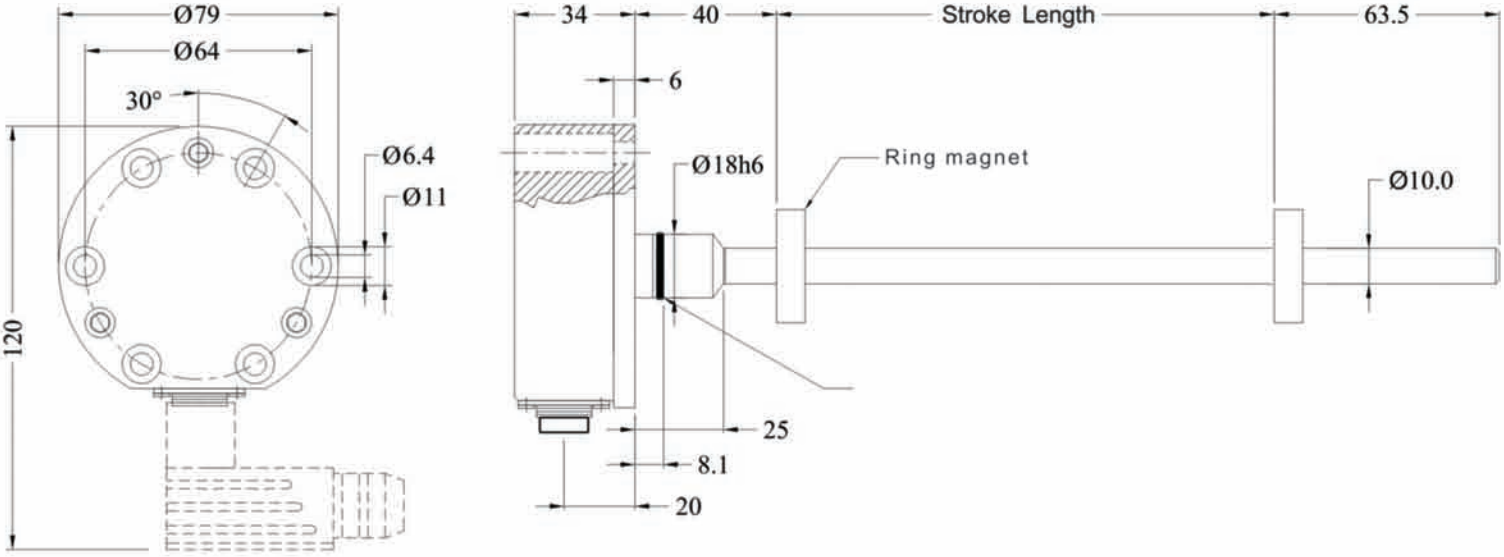


Liquid and dust protection

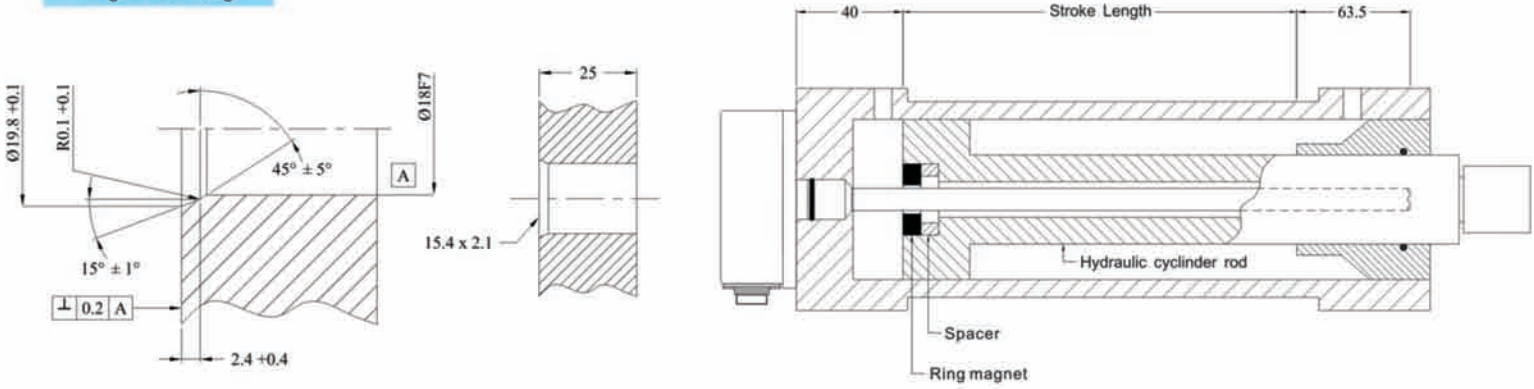
16 series is design for hydraulic cylinder with limited head space or clevis rod ends hydraulic cylinder. Sensing rod is made by stainless steel which installed inside the hydraulic cylinder. It has a wide variety of signal output selection included analog voltage, current, and SSI. It is a perfect combination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



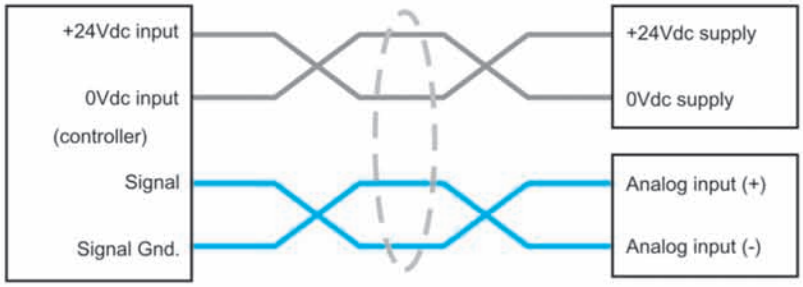
Specifications

Order Code	160	161
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, Humility 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)

1	Signal
2	Signal Gnd
3	N.C.
4	N.C.
5	+24 Vdc
6	0 Vdc



Order Code

1 6 X X X H X X X X X

Output

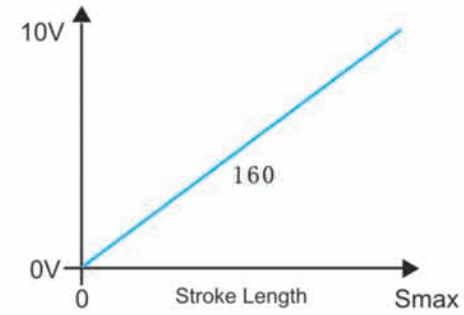
001 = 0 - 10V
011 = 10 - 0V
101 = 4 - 20mA
111 = 20 - 4mA

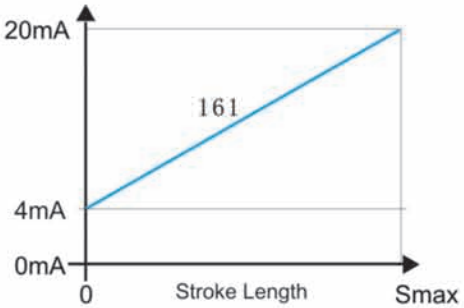
Stroke Length (mm)

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

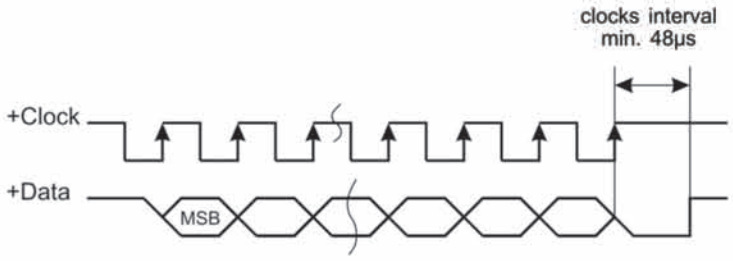




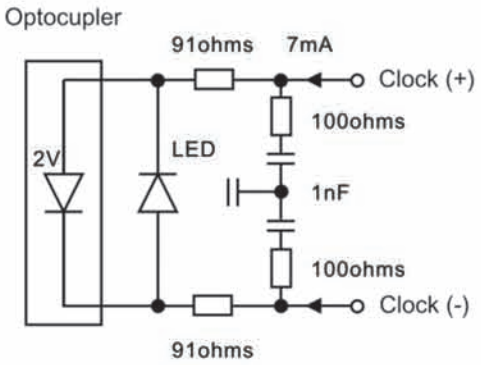
Specifications

Order Code	162
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 µm
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	D70 Male
Pressure Rating	350 bar / 600 bar peak
Operation Temp.	-40 to 75°C, Humility 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

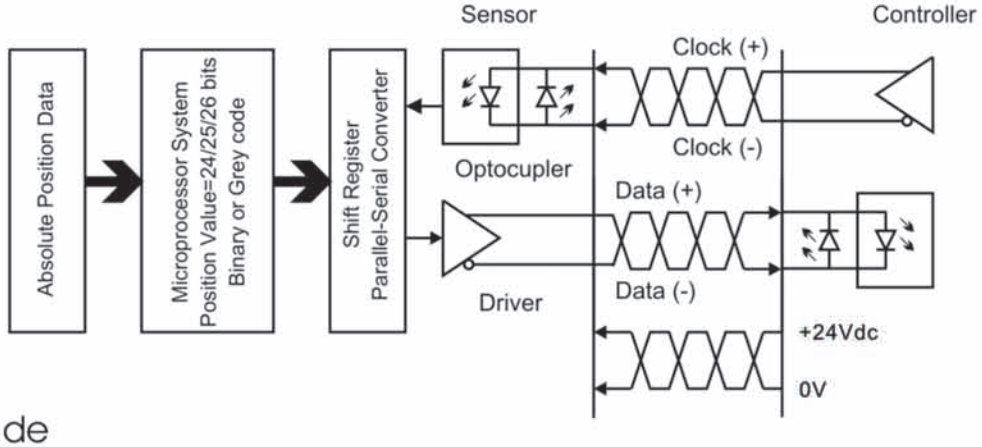
Timing Diagram



Sensor Input



Logic Diagram



Order Code

1	9	2	X	X	X	X	X	X	H	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

Resolution

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

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 carriage.

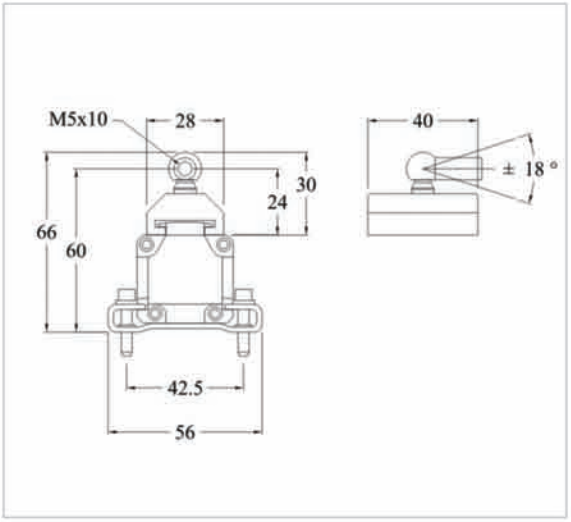
Pin Assignments

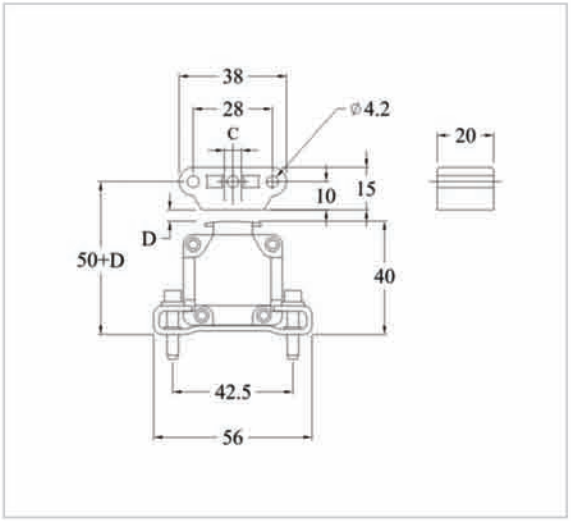
1	Data (-)
2	Data (+)
3	Clock (+)
4	Clock (-)
5	+24Vdc
6	0Vdc
7	n.c.

(View toward sensor pins)

high precision & reliability...

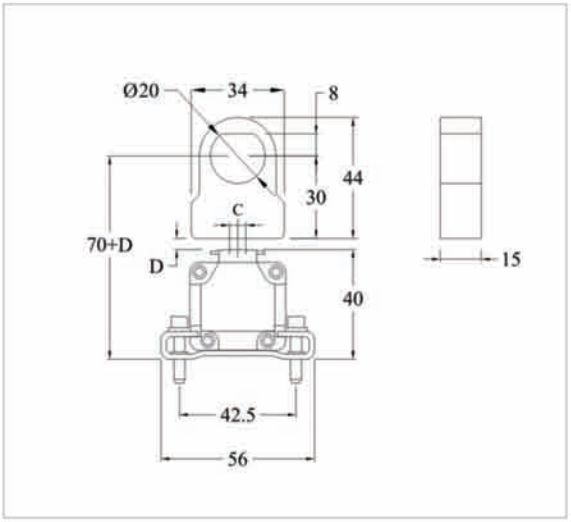
Discription	Captive	Floating
For series	18 Series	18 Series

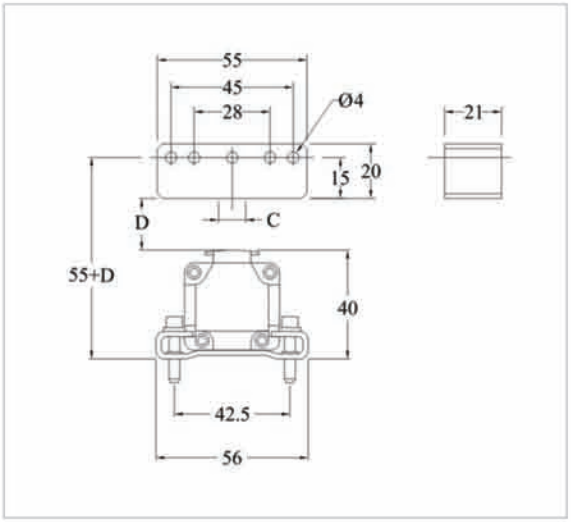




Order Code	1800951001	1800951002
Material	Plastic	Plastic
Weight	~30g	~12g
Vertical distance (D)	Fixed	0.1 - 4mm
Lateral offset (C)	Fixed	±8mm
Operation Temperature	-40 to 75℃	-40 to 75℃

Discription	Die-cast	Large floating
For series	18 Series	18 Series





Order Code	1800951003	1800951004
Material	Plastic	Plastic
Weight	~12g	~40g
Vertical distance (D)	0.1 - 4mm	0.1 - 10mm
Lateral offset (C)	±8mm	±20mm
Operation Temperature	-40 to 75℃	-40 to 75℃

Level Sensing Accessories

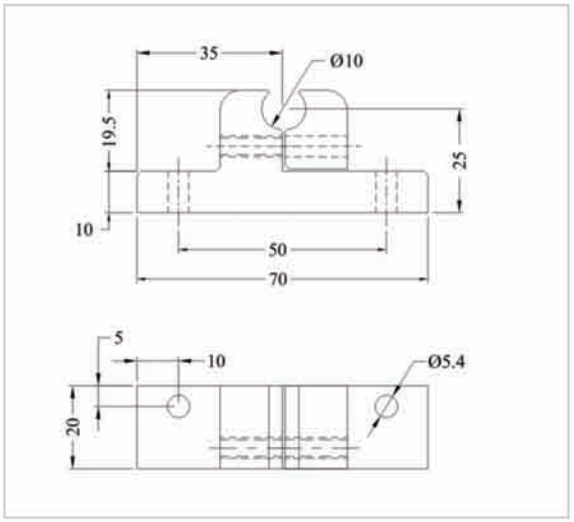
Discription	Floating Ball	Floating Ball	Floating Ball	Floating Ball
Order Code	1700 951 005	1700 951 006	1700 951 007	1700 951 008
Material	304 SS	304 SS	304 SS	304 SS
Inside Dia. (ID)	15 mm	23 mm	23 mm	9 mm
Out Dia./Height	52 x 52 mm	75 x 70 mm	125 x 120 mm	28 x 28 mm
Density	0.7	0.7	0.7	0.7
Pressure Rating	40 bar	40 bar	40 bar	40 bar

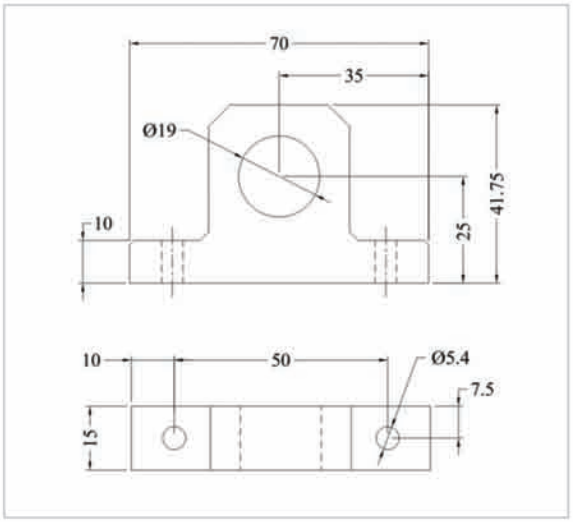
Discription	Floating Marker	Floating Marker	Floating Marker	Floating Marker
Order Code	1700 951 009	1700 951 010	1700 951 011	1700 951 012
Material	PP Plastic	PP Plastic	PP Plastic	PP Plastic
Inside Dia. (ID)	8 mm	8 mm	9 mm	9 mm
Out Dia./Height	18 x 8 mm	19 x 17 mm	24 x 10 mm	26 x 17 mm
Density	0.7	0.7	0.7	0.7

* use for special 7mm Stainless Steel tube

Discription	Floating Ball Stopper	Floating Ball Stopper
Order Code	1700 951 013	1700 951 014
Material	304 SS	304 SS
Inside Dia. (ID)	10 mm	7 mm
Out Dia./Height	20 x 13 mm	16 x 13 mm

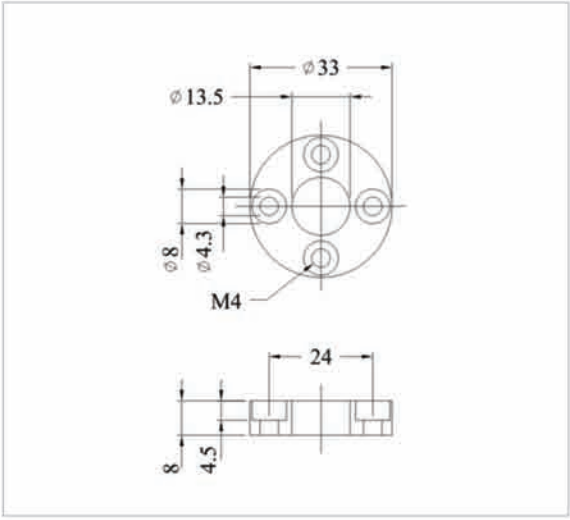
Discription	10mm dia. housing pipe mounting	M18x1.5 flange external mounting
For series	17/19 Series	17/19 Series
Order Code	1900 951 002	1900 951 003

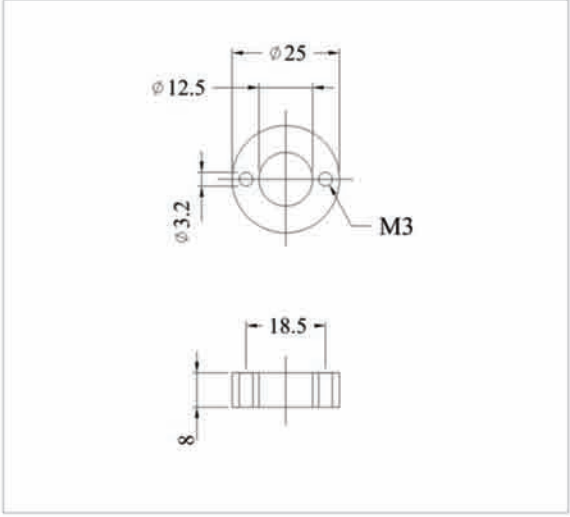




Material	Aluminium	Aluminium
Weight	~30g	~45g

Discription	Dia. 33mm ring	Dia. 25mm ring
For series	12/17/19 Series	12/17/19 Series
Order Code	1700 951 001	1700 951 003

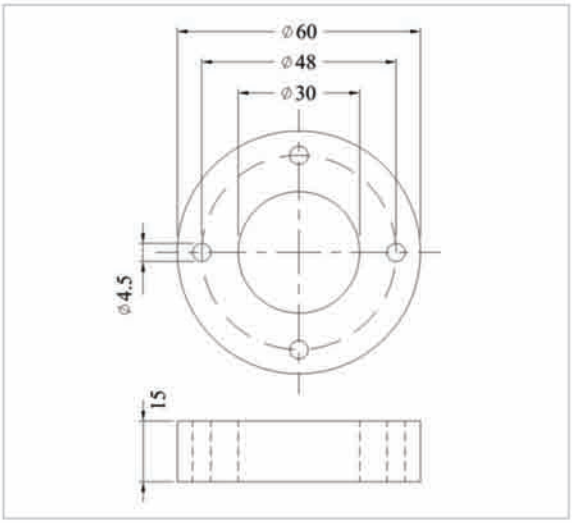




Material	Plastic	Plastic
Weight	~8g	~8g

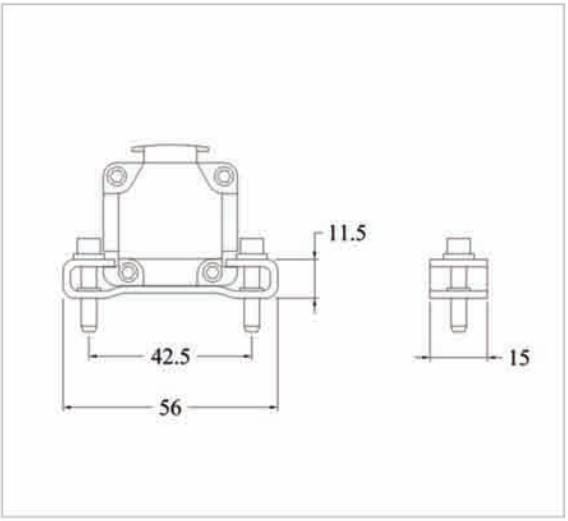
Discription	Dia. 33mm Spacer	Dia. 25mm Spacer
Order Code	1700 951 002	1700 951 004
Material	Plastic	Plastic

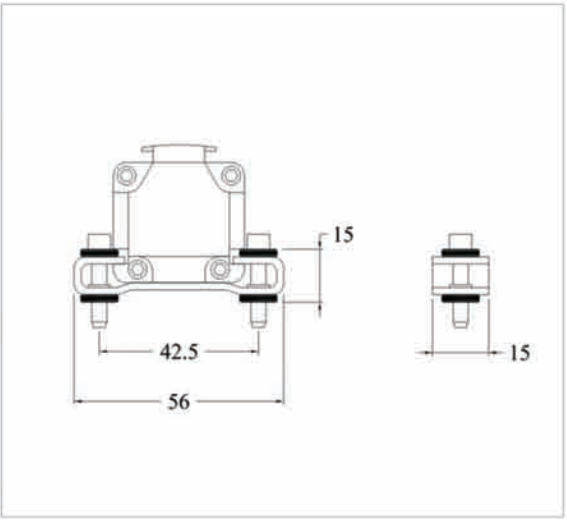
Discription	Dia. 60mm ring
For series	17/19 Series
Order Code	1900 951 004



Material	Plastic
Weight	~30g

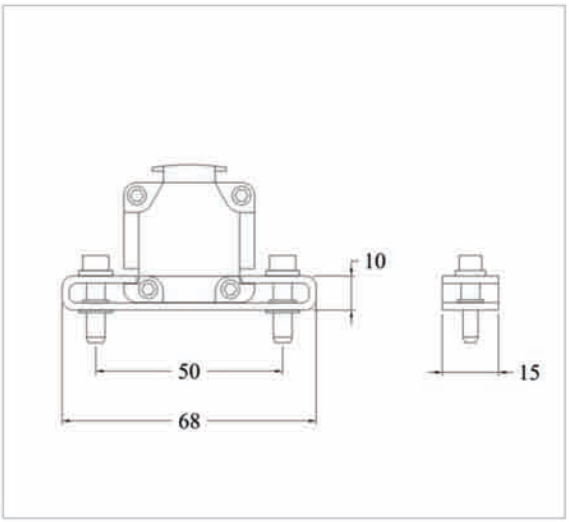
Discription	42.5mm Mounting	42.5mm Isolation Mounting
For series	18 Series	18 Series





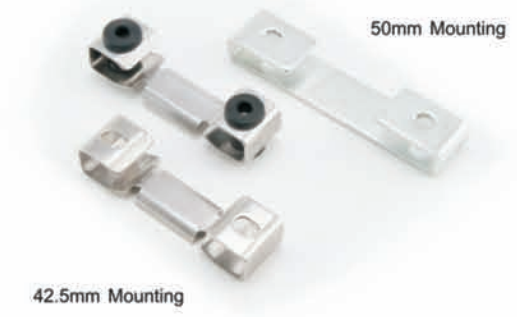
Order Code	1800 951 007	1800 951 008
Material	Stainless Steel	Stainless Steel
Installation	M4 x 20 (not included)	M4 x 20 (not included)
Torque	Max. 4 Nm	Max. 0.5 Nm

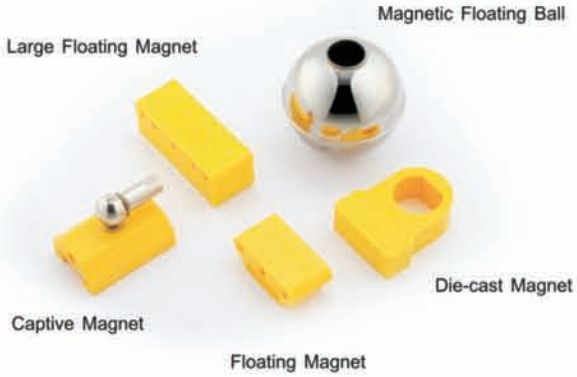
Discription	50mm Mounting
For series	18 Series

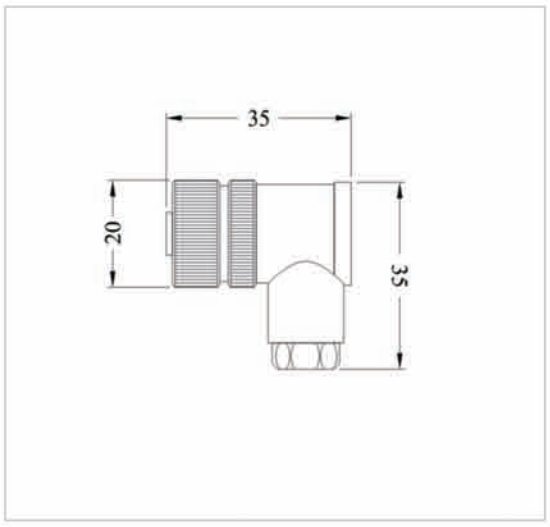
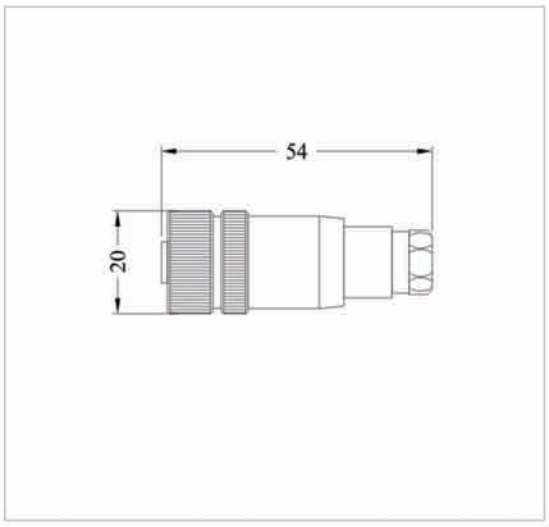
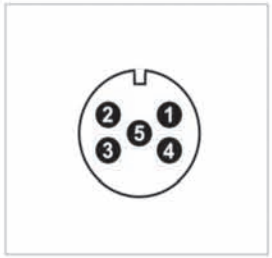


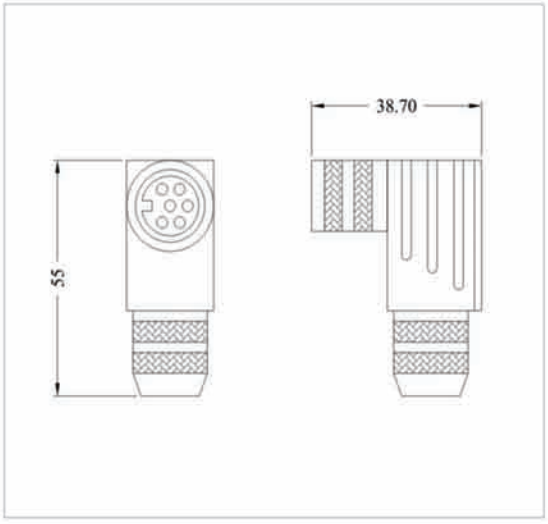
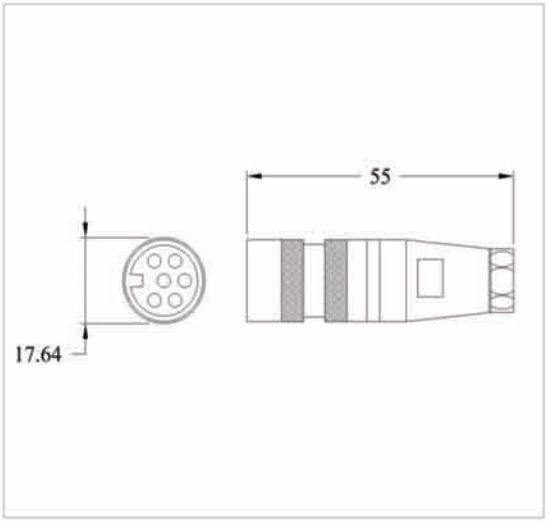
Order Code	1800 951 009
Material	Stainless Steel
Installation	M5 x 20 (not included)
Torque	Max. 5 Nm

42.5mm Isolation Mounting





Discription	M12 90Deg Connector (Female)		M12 Connector (Female)	
Cable Diameter	6 - 8 m m		6 - 8 m m	
Material	Cu Zn / Plastic		Cu Zn / Plastic	
				
Model	5 Pins	8 Pins	5 Pins	8 Pins
				
Order Code	1800 951 018	1800 951 027	1800 951 017	1800 951 026

Discription	90Deg. 6/7pin. Connector (female)		6/7pin. Connector (female)	
Model	D60	D70	D60	D70
				
Order Code	1800 951 011	1800 951 013	1800 951 010	1800 951 012
Material	Housing: Zinc nickel platedl		Housing: Zinc nickel platedl	
Weight	~60g		~40g	

Order Code	1800 951 028
Discription	Profibus Terminator

Profibus operates at high frequencies transmission medium called RS485. This terminator absorbs reflections of the signal where the copper cable segment ends.

Order Code	1800 951 032
Discription	Profibus Simulator

The master simulator can be used to check the sensors functions and to change the slave address. The magnet positions can be read out and diagnostic data.

Order Code	1700 951 018
Discription	19 Analog Programmer

This service tools is used for modifying sensor active measuring stroke (null and span) via external cable. There is no need to open the sensors electronic cartridge.

3 Twisted Pairs Cable Order Code

1	8	0	0	9	5	1	1	X	X

Cable Length

Please select the cable length in unit Meter
For example, 01 = 1 Meter
(Cable price not include connector)
If purchase the connector together, we can install the connector with cable for free of charge.

PVC shield twisted pair 3 x 2 x 0.2mm²

Color Code	D60	D70	4 Pins Voltage	4 Pins Current
Black	1	1	P3	N.C
White	2	2	P3 Gnd.	N.C
Yellow	3	3	P2	P2
Green	4	4	P2 Gnd.	P2 Gnd.
Red	5	5	P1	P1
Blue	6	6	P4	P4

Color Code	5P M12 Voltage	5P M12 Current	8P M12 Digital
Black	2	2	4
White	5	5	3
Yellow	4	N . C	1
Green	5	N . C	2
Red	1	1	7
Blue	3	3	8

D60 90Deg Connector

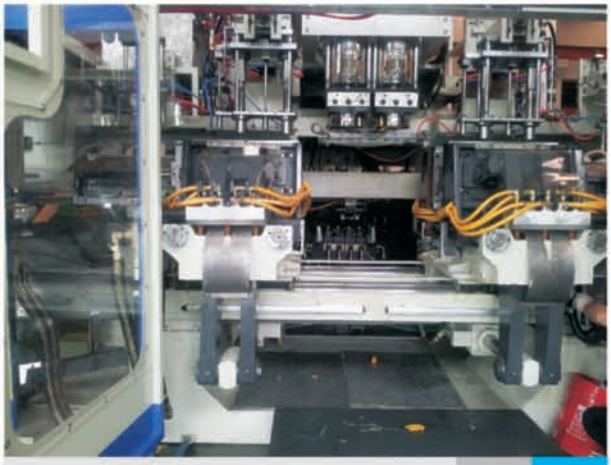
D60 Connector

easy of installation ...

Two plates plastic injection machine use Germanjet fully digital solution

Wood forming machine
use Germanjet 17 and 18 series

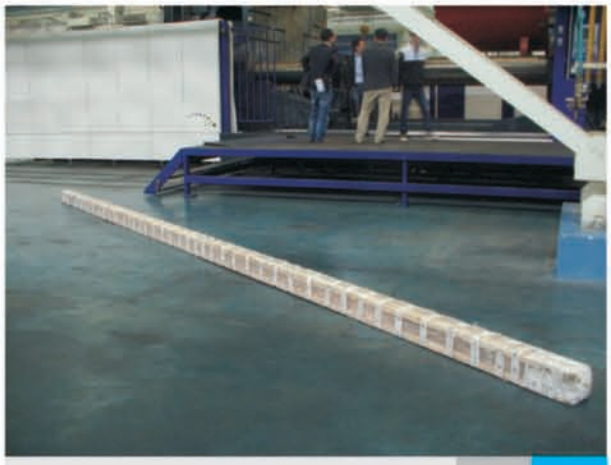
Mold closing at die-cast machine. injection speed at 10m/s



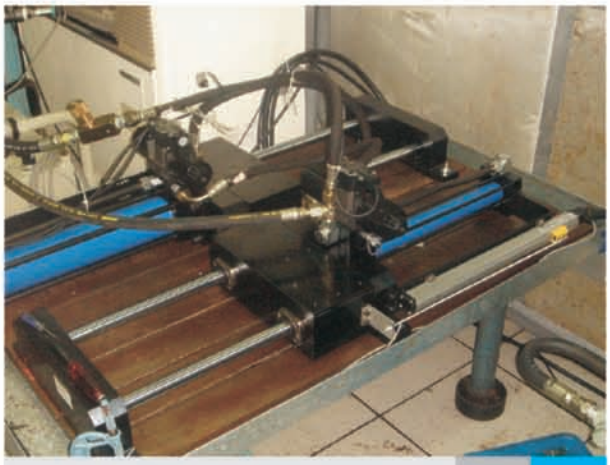
Fast mold shifting at blow molding machine

Automatic Control Valve
use 17 series

Product unloading machine



6600 ton two plates plastic injection machine
Germanjet 19 series 7600mm CANBus



University laboratory testing equipment

Packaging machine used IP67 Germanjet
18 series

Garbage burning gasifiers use 19 series

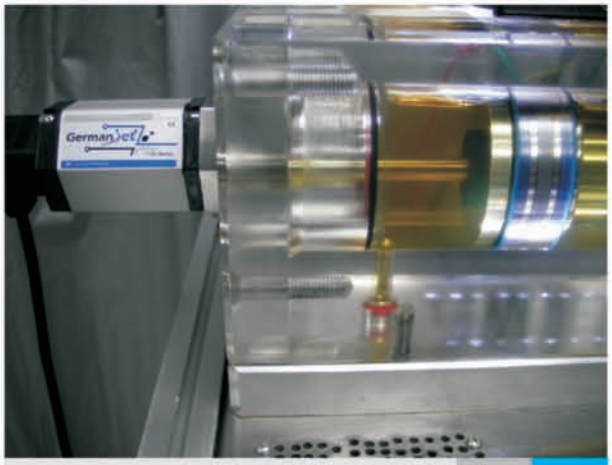
Heavy duty hydraulic press

Hot chamber die-cast machine
used Germanjet 17 series

Hydro-forming machine

Stainless Steel Rolling Machine used Germanjet 19 series

Steel Mill used Germanjet 19 series SSI



Crystall cyclinder demo at university

6550mm hydraulic cyclinder uses 19 series

Handheld testing equipment

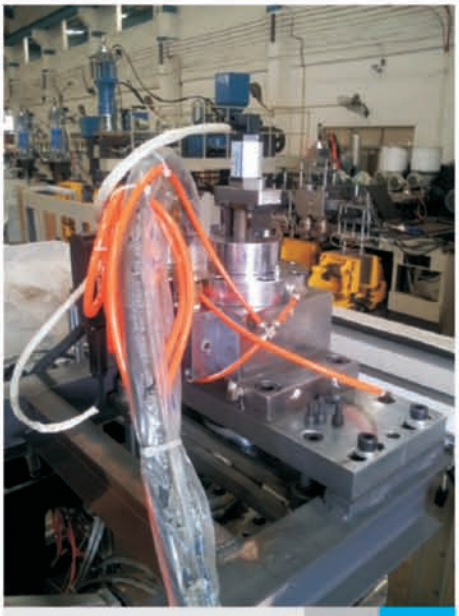
Large two-plate plastic injection machine used Germanjet 12 Series

Automotive exhaust pipe bending machine used Germanjet 17 series

Multi-color plastic second injector

Sand cast molding machines use 18 series

Large hydraulic press uses 19 series



Parisan control used Germanjet 12 series

Transducer on machine calibration

To make sure the nominal stroke length is fully covered, all analog position transducers' output signal were calibrated slightly wider than the stroke. After installation, the machine needs to go through calibration. The step is as follow.

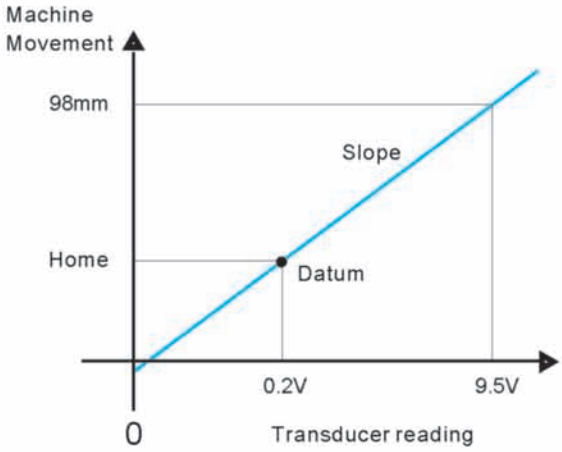
1) Move the machine to home position and record the transducer reading.
Example: at home, the transducer reading = 0.2V

2) Move the machine away from home position, measure the actual movement and record the transducer reading.
Example: actual movement = 98mm,
transducer actual movement reading = 9.5V

3) Calculate the "slope"
Slope = actual movement / (transducer actual movement reading - transducer home reading).
Example: slope = 98mm / (9.5V - 0.2V) = 10.537

4) Calculate the "datum"
Datum = slope x transducer home reading
Example: datum = 10.537 x 0.2V = 2.106

5) Machine position = (slope x transducer reading) - datum
Example: machine position = (10.537 x transducer reading) - 2.106



International Protection Rating (IP)

IP X X

Solid particle protection

4 = >1mm object size protected against

5 = Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment;

6 = No ingress of dust; complete protection against contact

Liquid ingress protection

0 = Not protected

5 = Water projected by a nozzle (6.3mm) against enclosure from any direction shall have no harmful effects.

7 = Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).

Transducer may in touch with dust and water, having proper IP rating is needed. Potentiometer IP rating is IP 40 or 50 but non-contact position transducer IP rating is IP 65 or even 67.

Installation of floating magnet

Installation of floating magnet is very simple. Compared to captive magnet, floating magnet can truly demonstrate the advantage of non-contact sensing and eliminate the wear of captive magnet socket.