world leaders in the art of linear measurement

GEMCO Series Displacement Transducer

Datasheet
502787
Issue 2
EDCR18327

S953

- 25.4 mm to 7620 mm measuring range
- <0.01% linearity
- Vibration resistant to 30G
- Shock resistant to 1000G
- Tricolor diagnostic LED
- All standard current and voltage analogue outputs
- RS, VP, CP, TP Digital outputs
- IP 68
- Protective housings for harsh environments

The S953 VMAX Linear Displacement Transducer is the ideal solution for automation solutions requiring accurate feedback of continuous position. It is especially recommended in environments where vibrations, extreme temperature and contaminants are present. The S953 is an ideal solution when velocity and position need to be incorporated into the automation control system process.

S955

- 100 mm to 4572 mm measuring range
- <0.05% linearity
- Non contact applications
- Analogue voltage and current outputs
- Analogue zero and span adjustable
- Digital RS, VP, CP outputs
- Quadrature outputs
- Tricolor diagnostic LED
- IP67 (Optional IP68)

The S955 Brik linear displacement transducer is an economical solution for monitoring continuous position. It is designed for OEM users wishing to opt for a cost effective alternative to limit switches, proximity sensors or linear potentiometers. The streamlined anodized aluminium extrusion houses the sensing element and the electronics. The position is determined by the magnet which is linearly guided over the sensing element.

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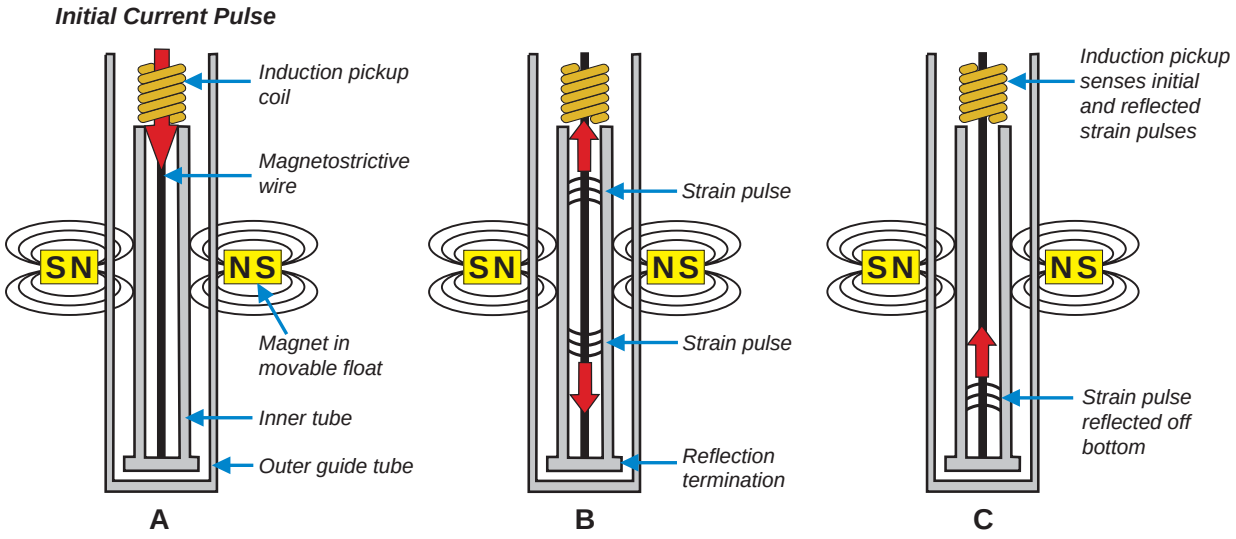
Magnetostrictive Technology Made Easy



In a Gemco Series position sensor, a current pulse is sent down a magnetostrictive wire in a specially designed waveguide (Figure A). The interaction of this current pulse with the magnetic field created by the movable magnet assembly produces a torsional strain pulse on the wire, which travels at sonic speed along the wire (Figure B). The strain pulse traveling up the wire is sensed by a small induction pickup coil in the head assembly of the LDT. The position of the movable magnet is determined with high precision by measuring the time between the launching of the current pulse and the arrival of the torsional strain pulse. The result is highly accurate non-contact position sensing with absolutely no wear on the sensing element.

Hysteresis
The difference in indicated position when the same point is reached from two different directions.

Repeatability
The deviation in indicated position when a point along a stroke length is approached repeatedly from the same direction.

Magnetostriction
A magnetic field produces a small change in the physical dimensions of ferromagnetic materials on the order of several parts per million in carbon steel and, conversely, a physical deformation or strain (or stress which causes strain) produces a change of magnetization in the material.

Linearity
The degree that the indicated position of the magnet at points along the stroke varies from the actual physical position. Linearity of an LDT is expressed in absolute error or as a percentage of the active stroke length.

Resolution
Resolution is the smallest incremental change in position along the stroke length of the sensor that can be detected and indicated in an output. When using LDTs with analog output (i.e., voltage or current outputs), resolution is limited by the amount of power supply-induced output ripple and the sensitivity and/or design capabilities of the receiver electronics. Digital system resolution is defined by a specific value.

Recirculation
A method used to improve the resolution of a system using digital LDTs. The on time of the pulse width output is multiplied by a specific factor. This multiplication provides more counting time for the counter in the customer's electronics, thus improving the resolution.

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Applications

Printing/Bindery

The industrial contruction of the GEMCO Series products means that these devices are perfectly suited to applications such as assembly automation, material handling, and robotics.

Automotive

Material Handling

Pulp/Paper

GEMCO Series products can be found in areas such as lumber mills, steel mills, stamping plants, etc.,

Food/Beverage

Forestry/Lumber

S953 Drawings and Part Numbers

Analogue Part Numbers

S953A — V0 — 0305M — X — X — S — X

Output	
V0	0 to 10 VDC
V1	10 to 0 VDC
V2	-10 to 10 VDC
V3	10 to -10 VDC
V4	0 to 5 VDC
V5	5 to 0 VDC
V6	-5 to 5 VDC
V7	5 to -5 VDC
C4	4 to 20mA
C2	20 to 4mA

Null Zone	
X	Standard 50.8mm.
N_	Insert non-standard Null Zone over 50.8mm.

Measurement Range
Insert measurement range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Dead Band	
X	Standard 63.5mm.
D_	Insert non-standard Dead Band over 63.5mm.

Connector Option	
S	Standard 5 Pin, 12mm Euro
C_	Integral Cable Assembly. Insert length in feet. Example: C6 = 6 foot cable.
M	6 Pin DIN, MTS Style D60
B	8 Pin DIN, Balluff S32

Options	
X	None
S	Stainless Steel cover and connector. Only available with connector options S and C.

Digital, CP and RS Part Numbers

S953D — RS — 0305M — X — X — S — X

Output	
CP	Control Pulse
RS	RS-422 Start/Stop Pulse

Measurement Range
Insert measurement range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Null Zone	
X	Standard 50.8mm.
N_	Insert non-standard Null Zone over 50.8mm.

Dead Band	
X	Standard 63.5mm.
D_	Insert non-standard Dead Band over 63.5mm.

Connector Option	
S	Standard 6 Pin, 12mm Euro
C_	Integral Cable Assembly. Insert length in feet. Example: C6 = 6 foot cable.
M	6 Pin DIN, MTS Style D60
B	8 Pin DIN, Balluff S32

Options	
X	None
S	Stainless Steel cover and connector. Only available with connector options S and C.

Digital, VP (PWM) Part Numbers

S953D — VP — 0305M — X — X — S — I — 001 — X

Output	
VP	Variable Pulse

Measurement Range
Insert measurement range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Null Zone	
X	Standard 50.8mm.
N_	Insert non-standard Null Zone over 50.8mm.

Dead Band	
X	Standard 63.5mm.
D_	Insert non-standard Dead Band over 63.5mm.

Connector Option	
S	Standard 6 Pin, 12mm Euro
C_	Integral Cable Assembly. Insert length in feet. Example: C6 = 6 foot cable.
M	6 Pin DIN, MTS Style D60
B	8 Pin DIN, Balluff S32

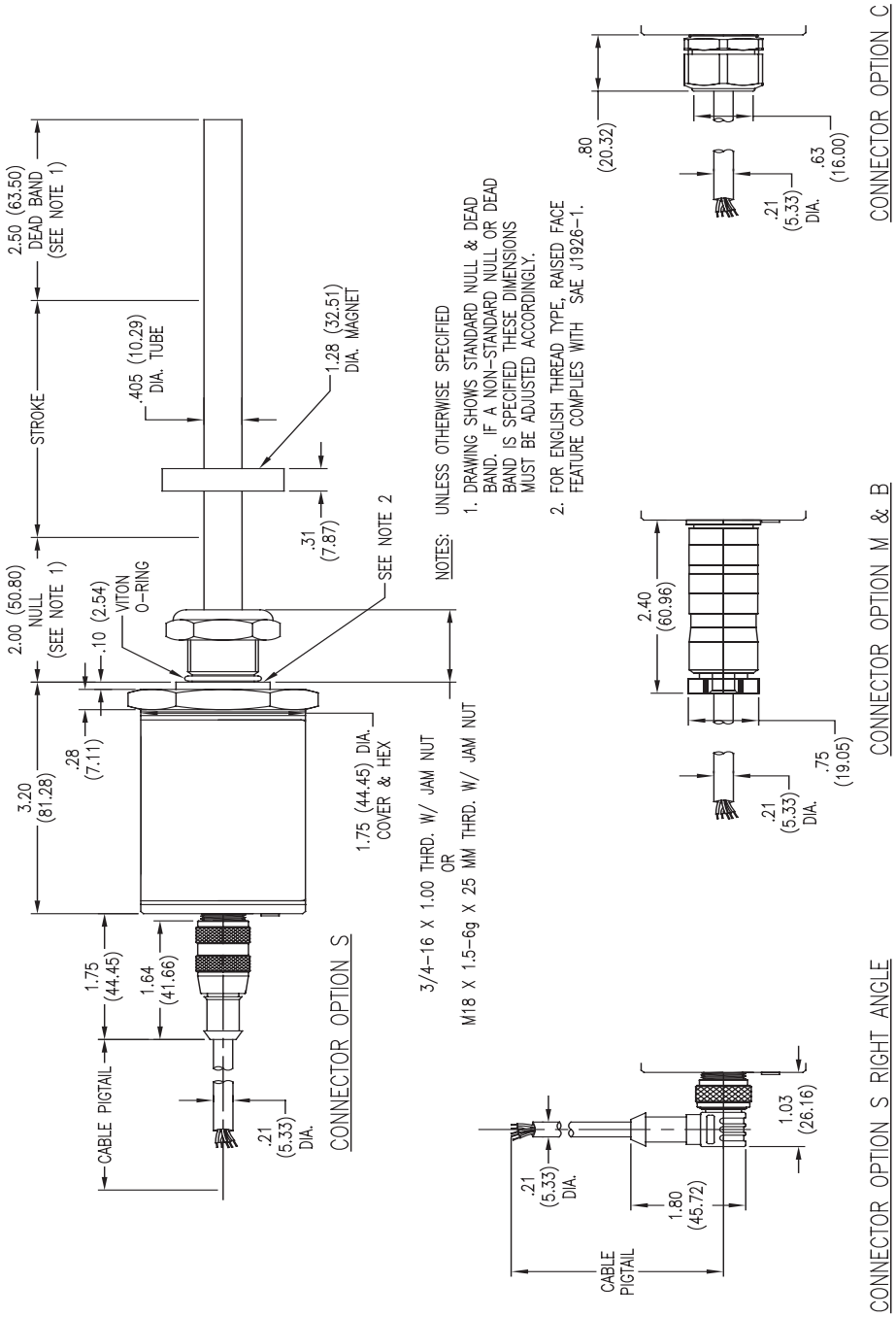
Interrogation Mode	
I	Internal Interrogation
E	External Interrogation

Number of Recirculations	
001	001 (Standard) to 255

Options	
X	None
S	Stainless Steel cover and connector. Only available with connector options S and C.

NOTE: Metric LDTs cannot be used with standard 950MD housings. Consult factory.

Dimensions

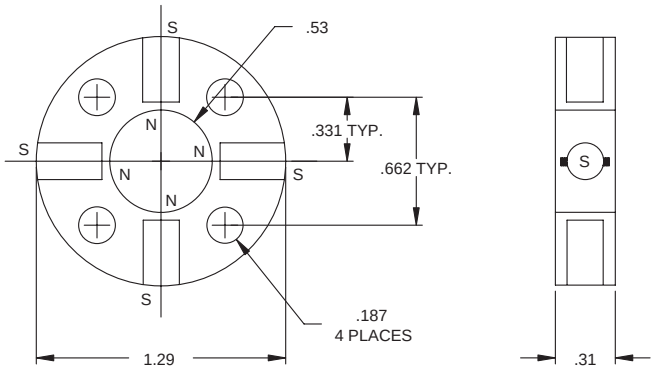


S953A Accessories		
Part Number	Description	Use With Connector
949011L6	2m (6 Foot), 5 Pin, Straight, 12mm Euro Cable	S
949011L12	4m (12 Foot), 5 Pin, Straight, 12mm Euro Cable	S
949012L6	2m (6 Foot), 5 Pin, Right Angle, 12mm Euro Cable	S
949012L12	4m (12 Foot), 5 Pin, Right Angle, 12mm Euro Cable	S
SD0553200LXX	6 Pin DIN Cable	M
SD0553300LXX	8 Pin DIN Voltage Cable	B
SD0553400LXX	8 Pin DIN Current Cable	B
SD0400800	Standard 4 Hole Magnet	All
Consult factory for complete accessory offerings. XX = Length in Feet.		

S953D Accessories		
Part Number	Description	Use With Connector
949029L6	2m (6 Foot) 6 Pin, Straight, 12mm Euro Cable	S
949029L12	4m (12 Foot), 6 Pin, Straight, 12mm Euro Cable	S
949030L6	2m (6 Foot), 6 Pin, Right Angle, 12mm Euro Cable	S
949030L12	4m (12 Foot), 6 Pin, Right Angle, 12mm Euro Cable	S
SD0554500LXX	6 Pin DIN Cable	M
SD0554600LXX	8 Pin DIN Cable	B
SD0400800	Standard 4 Hole Magnet	All
Consult factory for complete accessory offerings. XX = Length in Feet.		

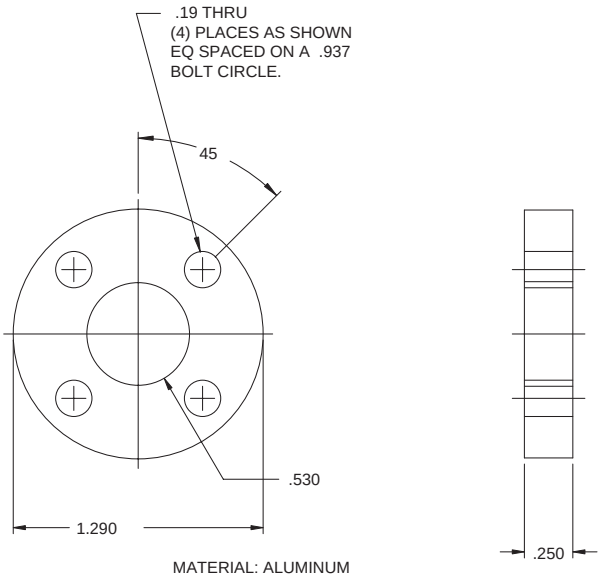
Rod Magnets

Standard 4 Hole Magnet



Standard P/N: SD0400800
Stainless Steel P/N: SD0480900

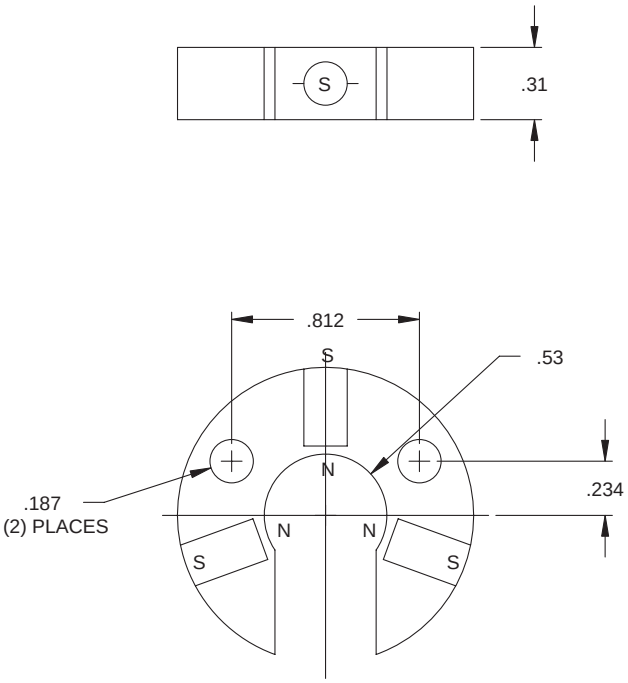
Non-Ferrous Spacer for 4 Hole Magnet



MATERIAL: ALUMINUM

P/N: M0822400

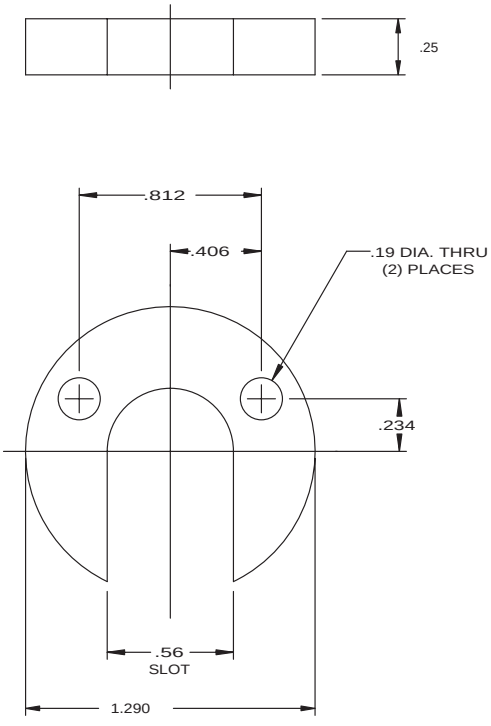
Aluminum Split Magnet



MAT'L.: ALUMINUM

P/N: SD0403900

Non-Ferrous Spacer for Split Magnet

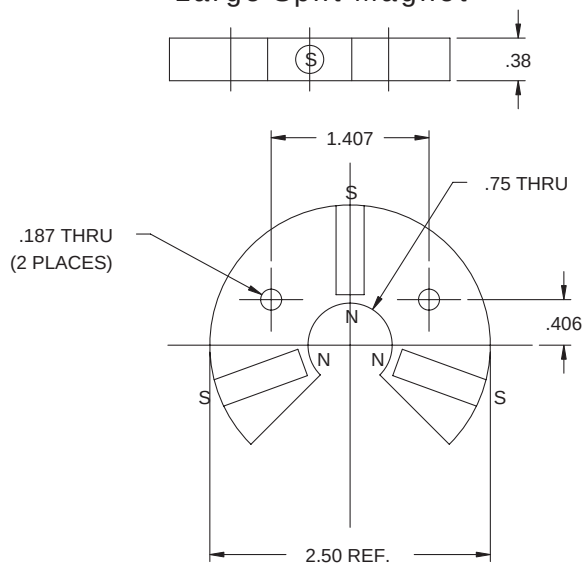


MAT'L.: ALUMINUM

P/N: M0750500

Rod Magnets

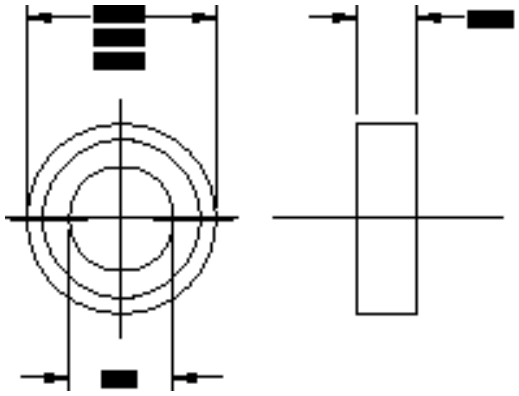
Large Split Magnet



NOTE: USE THIS MAGNET WITH ROD SUPPORT BRACKET SD0411100

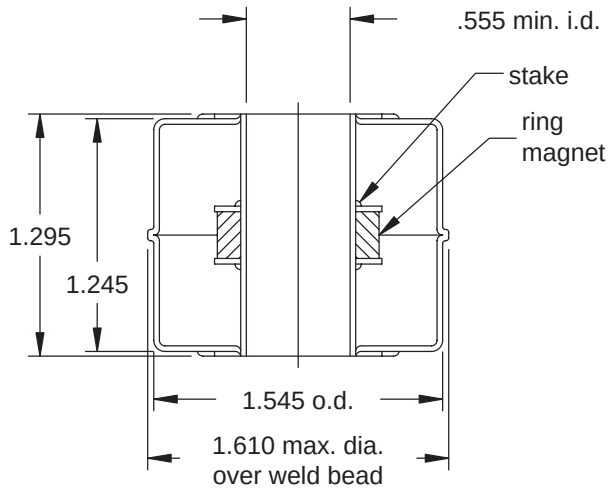
Standard P/N: SD0411200
Stainless Steel P/N: SD0411201

Cylinder Magnet



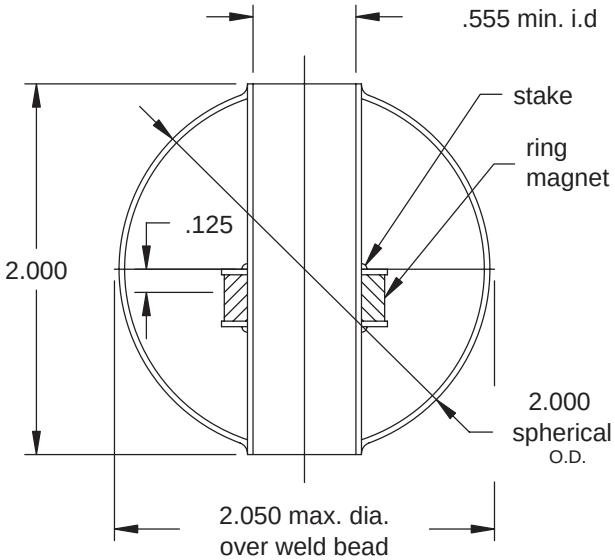
Standard P/N: SD0410300
Teflon Coated P/N: SD0410301

Stainless Steel Float



* For use with 940, 951 & 952.
P/N: 04535090

Stainless Steel Float



* For use with 940, 951 & 952.
P/N: 04535091

S955 Drawings and Part Numbers

S955A

Accessories	
Item	Part Number
Slide Magnet	SD0521800
Float Magnet	SD0522100
Mounting Foot	SD0522000
2m (6 Ft.) Cable	949019L6
4m (12 Ft.) Cable	949019L12
2m (6 Ft.) Cable; Right Angle Connector	949020L6
4m (12 Ft.) Cable; Right Angle Connector	949020L12

Part Number

S955A — V0 — 0305M — X

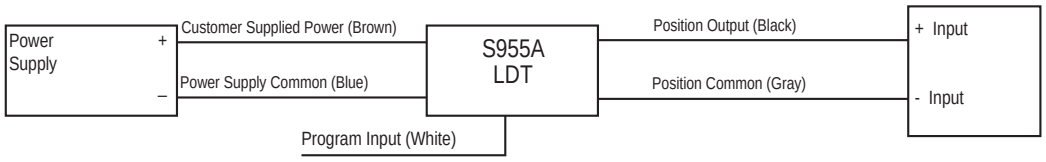
Output	
V0	0 to 10 VDC
V1	10 to 0 VDC
C4	4 to 20mA
C2	20 to 4mA
D0	Differential 0 to 10 VDC*
D1	Differential 4 to 20mA*

Measuring Range

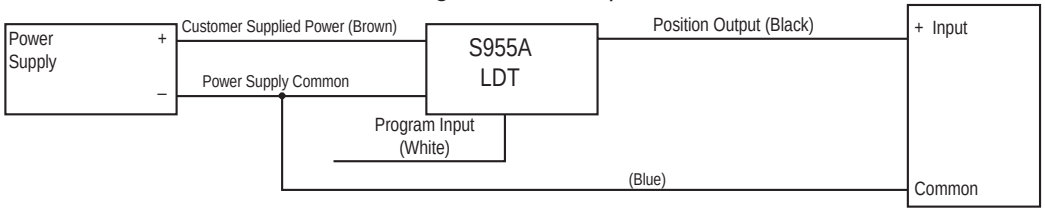
Insert range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Options	
X	No options.
E	Wet environment, electronics sealed to IP68 rating

Differential Input



Single Ended Input



Note: S955A-C is current sourcing, which allows the current to flow from the LDT into the user's equipment.

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S955D

Accessories	
Item	Part Number
Slide Magnet	SD0521800
Float Magnet	SD0522100
Mounting Foot	SD0522000
2m (6 Ft.) Cable (6 Pin, Straight Micro Connector, Option E)	949021L6
3m (12 Ft.) Cable (6 Pin, Straight Micro Connector, Option E)	949021L12
2m (6 Ft.) Cable (6 Pin, Right Angle Micro Connector, Option E)	949022L6
3m (12 Ft.) Cable (6 Pin, Right Angle Straight Micro Connector, Option E)	949022L12

Variable Pulse

S955D — VP — 0305M — E — 001 — X

Output	
VP	Variable Pulse

Measuring Range
Insert range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Interrogation Mode	
I	Internal Interrogation
E	External Interrogation

Number of Recirculations
001 (Standard) to 127

Options	
X	No options.
E	Wet environment, electronics sealed to IP68 rating

Control Pulse or Stop/Start Pulse

S955D — CP — 0305M — X

Output	
CP	Control Pulse
RS	RS422 Start/Stop Pulse

Measuring Range
Insert range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Options	
X	No options.
E	Wet environment, electronics sealed to IP68 rating

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S955DQ

S955QD — 0305M — E — 1000 — E — F7 — X1 — N — D — X

S955DQ Quadrature

Measuring Range

Insert range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Connector Option	
H	HRS environmental connector
E	Euro 12 Pin, 12mm connector, consult factory for others

Output Resolution

Cycles per inch, maximum internal resolution is 0.001 inches 1000 standard (available range is 0001 through 9999)

Input	
E	Sinking (typically used with sourcing output type)
C	Sourcing (typically used with sinking output type)
T	TTL Level

Quadrature Cycle Output Frequency Range	
A1	1 KHz
A2	2 KHz
A3	5 KHz
F1	10 kHz
F2	25 kHz
F3	50 kHz
F4	75 kHz
F5	100 kHz
F6	150 kHz
F7	250 kHz
F8	500 kHz
F9	1 MHz

Output Mode	
X1	X1 quadrature, consult factory for other output modes
D1	Dual magnet, difference between magnets

Zero Offset Storage	
V	Volatile (non retentive)
N	Nonvolatile (retentive, 100,000 storage cycles maximum)

Output Drivers	
D	Differential RS422 line driver, TTL compatible
L	Differential line driver 10 to 30 VDC, V out = V in (LDT Power) -1 Volt

Options	
X	None
E	Wet environment, electronics sealed to IP68 rating, connector option E only

Accessories	
Item	Part Number
Slide Magnet	SD0521800
Float Magnet	SD0522100
Mounting Foot	SD0522000
2m (6 Ft.) Cable (Option H)	SD0527700L6
3m (12 Ft.) Cable (Option H)	SD0527700L12
7m (25 Ft.) Cable (Option H)	SD0527700L25
2m (6 Ft.) 12 Pin (Option E Connector)	949023L6
3m (12 Ft.) 12 Pin (Option E Connector)	949023L12
Control Arm	955ARMXX (X = Inches)

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S955S

Part Numbering

S955S —— V0 —— 0305M ——

Output	
V0	0 to 10 VDC
V1	10 to 0 VDC
V2	-10 to 10 VDC
V3	10 to -10 VDC
V4	0 to 5 VDC
V5	5 to 0 VDC
V6	-5 to 5 VDC
V7	5 to -5 VDC
C4	4 to 20mA
C2	20 to 4mA

Measuring Range
Insert range in millimeters to 1mm. Enter as a four-place number. Example: 305mm range entered as 0305M. Metric length includes metric mounting, M18x1.5-6G.

Options	
	Leave blank for no options.
E	Wet environment, electronics sealed to IP68 rating

Accessories	
Item	Part Number
Slide Magnet	SD0521800
Slide Magnet Side Adapter	SD0521801
Float Magnet	SD0522100
Mounting Foot	SD0522000
2m (6 Ft.) Cable	949001L6
3m (12 Ft.) Cable	949001L12
2m (6 Ft.) Cable, Right Angle Connector	949002L6
3m (12 Ft.) Cable, Right Angle Connector	949002L12
Control Arm	955ARMXX (X = Inches)
In-Line Programming Unit	955-1409
Rod Ends	04-570252

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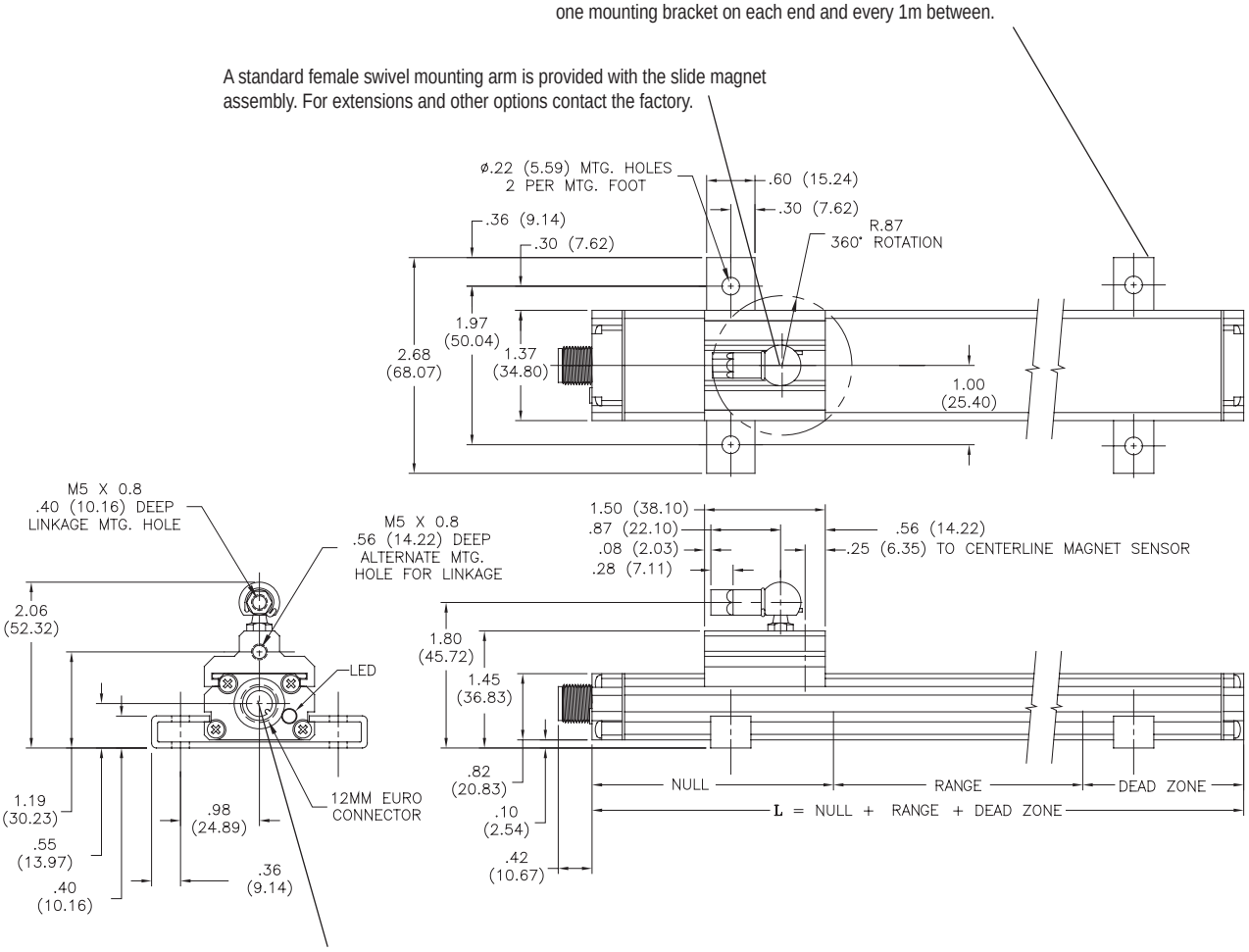
Dimensions

Mounting brackets (SD0522000) slide in the grooves on the side of the extruded housing. When tightened down with fastening hardware the mounting brackets clamp the unit into place. It is recommended to use one mounting bracket on each end and every 1m between.

A standard female swivel mounting arm is provided with the slide magnet assembly. For extensions and other options contact the factory.



A standard 12 mm 5 pin micro connector is used. Straight mating cables can be ordered in a 2m length (949019L6), or 4m length (949019L12). If space is a consideration a right angle connector is also available, (949020L6 or 949020L12).

* WARNING: do not use cord sets with LED's

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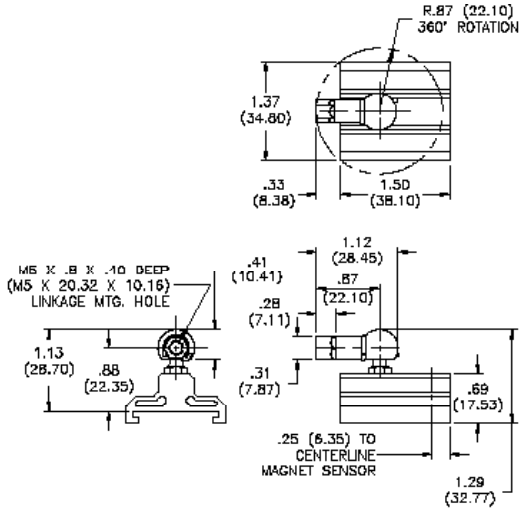
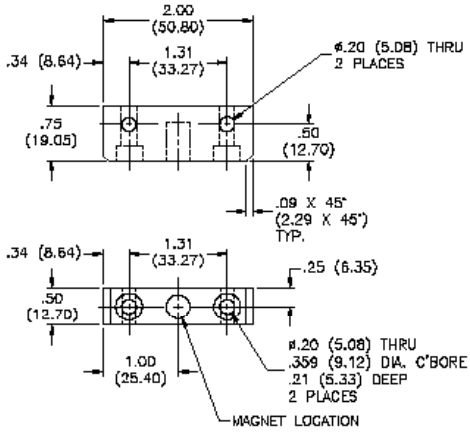
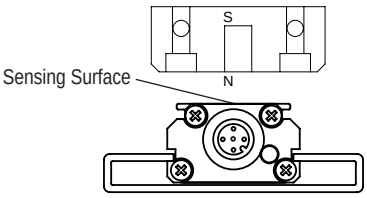
Slide Magnet Assembly
Part Number SD0521800



Floating Magnet Assembly
Part Number SD0522100



Floating Magnet Assembly (SD0522100)



NOTE: The north pole of the magnet should be pointed towards the probe.

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