

DESCRIPTION

Linear Displacement Transducers (LDT) play an important role in automation. They provide accurate, reliable, absolute position feedback to help automate today's sophisticated machinery. Sensors must deliver value, be easy to set up, and interface easily into the host controller.

With this in mind, we designed the 958A, focusing on the mobile hydraulics market. The 958A utilizes our field-proven Magnetostrictive technology to give absolute analog position, accurate to 0.04% of the programmable sensing distance. It is a rugged, accurate, programmable (zero & span), auto-tuning, non-contact linear displacement transducer in a compact **embedded rod-style package**. The embedded package style allows the unit to be totally installed inside of a hydraulic cylinder, thus protecting the transducers from outside conditions.

The 958A includes three unique features: **(1)** The unit can be powered from 8 to 30 VDC at 1.6 watts, making it easy to fit into a variety of systems. **(2)** The unit features an auto-tuning capability, which allows it to sense a magnet other than the standard ring magnet, and adjust its signal strength accordingly. **(3)** The unit includes diagnostics, which indicate if the magnet position lies outside of the specified range by outputting a signal outside of the range. If the magnet remains inside of the range, it will output a signal within the range, depending on the location of the magnet. All units can easily be changed in the field for reverse operation.

Our units offer a variety of different analog outputs, all with field programmable Zero & Span points. Units can be ordered in English or metric span lengths from 2" to 100" (50 mm to 2540 mm), and come standard with either integral cable assemblies, bare leads, or M12 style connectors.

GENERAL SPECIFICATIONS

Displacement: **2" to 100" (50 mm to 2540 mm) in .1" or 5 mm increments**

MEASUREMENT

Linearity: **+/-0.04% of Span or +/-0.008", whichever is greater**

Hysteresis: **0.001" maximum**

Repeatability: **Equal to Resolution of output signal, +/-0.01% of Span or 0.001", whichever is greater**

Update Time: **0.5 ms minimum, proportional to length of LDT – not to exceed 4ms**

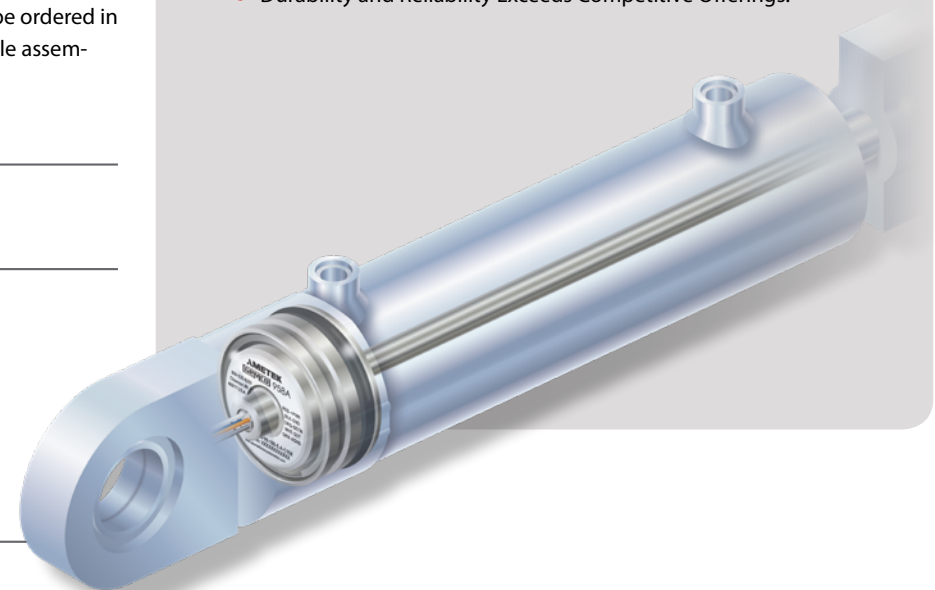
NULL AND DEAD BANDS

Null: **1.18" (30 mm) from flat face of LDT housing**

Dead: **2.49" (63.5 mm) from end of rod**

FEATURES

- High Vibration Resistance to 30 G, 10Hz-2kHz (per IEC 60068-2-6).
- High Shock Resistance to 1000 G, single hit (per IEC 60068-2-27).
- High Accuracy/ High Resolution – 16-bits.
- Analog Output, 0-10 VDC, 0-5 VDC, 0.25 to 4.75VDC, 0.5 to 4.5VDC, 4-20mA, with diagnostics.
- Sensor Lengths from 2" to 100" (50 mm to 2540 mm).
- Wide Input Power Range of 8 to 30 VDC.
- Contaminant Resistant – IP68 Rated.
- Programmable Zero and Span points.
- Durability and Reliability Exceeds Competitive Offerings.



HOUSING

Housing Material: **Stainless Steel 1.4305 / AISI 303**

Diameter: **1.89" (48 mm)**

Length (width): **1.31" (33.3 mm)**

Guide Tube Material: **Stainless Steel 1.4404 / AISI 316/316L**

Guide Tube Diameter: **8 mm and 10 mm (10.29mm actual)**

Continuous: **10 mm: 5,076 psi (350 bar)**
8 mm: 4,351 psi (300 bar)

Spike: **10 mm: 10,000 psi (689 bar)**
8 mm: 5,801 psi (400 bar)

O-ring Housing: **5,076 psi (350 bar)**

TEMPERATURE

Head Electronics: **-40° C to 85° C**

Guide Tube: **-40° C to 105° C**

Storage: **-40° C to 105° C**

SHOCK AND VIBRATION

Shock: **1000 G, single hit (per IEC 60068-2-27)**

Vibration: **30 G, 10 Hz - 2k Hz (per IEC 60068-2-6)**

INGRESS PROTECTION

Protection Level: **IP68 (per EN 60529)**

ELECTRICAL

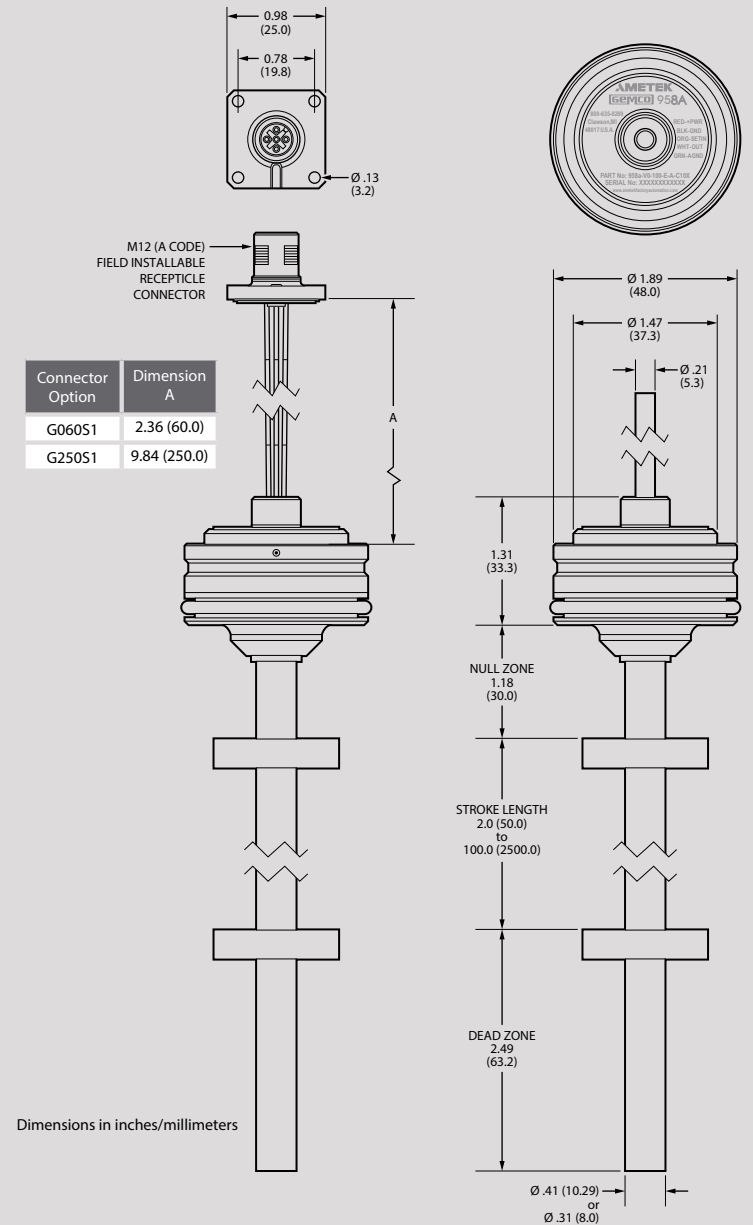
Power Consumption: **1.6 Watt maximum**

Input Voltage: **8 to 30 VDC**

PROTECTION

Polarity: **Reverse polarity protected**

Overvoltage: **Transient overvoltage protection to 33 VDC**



OUTPUT RESOLUTION

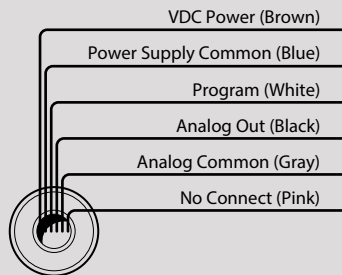
- 0 to 10 VDC: **16 bits (0.0015% of span)**
- 0 to 5 VDC: **15 bits (0.0031% of span)**
- 0.25 to 4.75 VDC: **~15 bits (0.0034% of span) (14.85 bits)**
- 0.5 to 4.5 VDC: **~15 bits (0.0034% of span) (14.68 bits)**
- 4 to 20 mA: **15.7 bits, calibrated for 3.5 to 21 mA (0 to 21 mA, 16 bits)**

ISOLATION

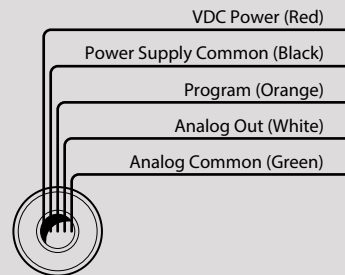
Housing to Any Signal: **500 V**

WIRING DIAGRAMS

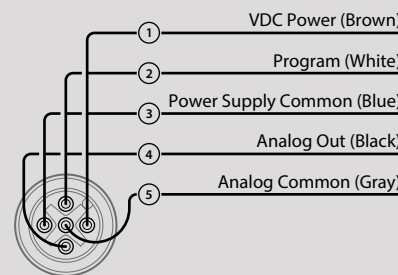
► Pinouts and Wiring



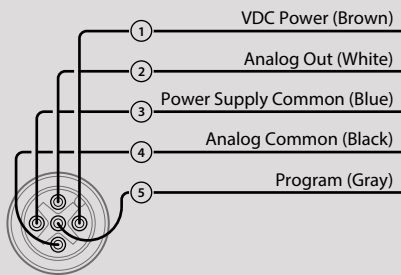
(C*) Integral Cable



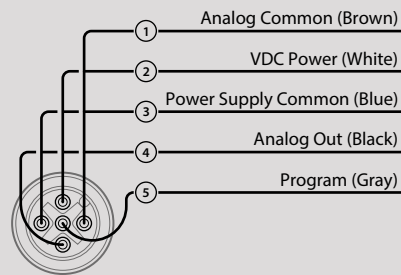
(W*) Wire - Bare Leads



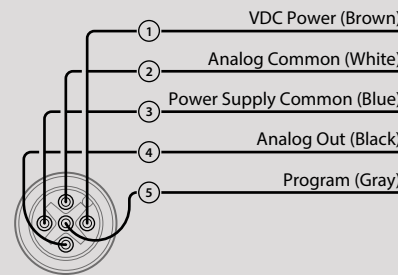
(G*S1) M12 - 5 Pin (A Code)



(M*S1) M12 - 5 Pin (A Code)



(M*S2) M12 - 5 Pin (A Code)



(M*S3) M12 - 5 Pin (A Code)

* Insert length of wire.

OUTPUT LOADING

- Voltage: **2k Ω minimum**
- Current: **500 Ω maximum**

CONNECTION OPTIONS

- Integral Cable: **Multi-conductor, 26 AWG, shielded, PUR jacket**
- 5 Pin - M12: **A-Code, Shell installed from "outside" cylinder (IEC 61076-2-101)**
- Wire - Bare Leads: **Multi-conductor, 26 AWG**

APPROVALS

- CE (Electromagnetic Compatibility)—**2014/30/EU**
- RoHS 2—**2011/65/EU**
- Electromagnetic compatibility - Part 6-4: Generic standards - Emission standards for industrial environments—**EN61000-6-4**
- Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments—**EN61000-6-2**
- Agricultural and forestry machinery—**ISO 14982:1998**
- Road vehicles - electrical disturbances from narrowband radiated electromagnetic energy — Part 5: Stripline—**ISO 11452-5**
- Road vehicles - Electrical disturbances from conduction and coupling—**ISO 7637-1/2/3**
- Earthmoving Machinery—**ISO 13766**
- Industrial Trucks—**EN 12895**
- Railway Applications—**EN 50121-3-2**

MODEL NUMBERING

Model	Available Analog Outputs	Stroke	Unit of Measure	Housing Type	Connector **	Options
958A						
	Voltage Output 0-10 V0	Strokes are indicated from 2" to 100" in either 0.1" or 5 mm increments.	English (inches) E	48 mm Housing-10 mm Rod ... A	Integral cable-Insert length in meters C *	No options X
	Voltage Output 10-0 V1		Metric (millimeters) ... M	48 mm Housing-8 mm Rod B	Wire-Bare Leads-Insert length in millimeters W * Available lengths are 50, 100, 200, and 300 mm.	Programmable Zero P and Span
	Voltage Output 0-5 V2					
	Voltage Output 5-0 V3	ie: 12" Stroke 0120			M12-5 Pin (A Code)-Field installable-Pin 1 Power (**). G * S1 Available lengths are 60 and 250 mm.	
	Voltage Output 0.25-4.75 V4	ie: 100 mm Stroke. 0100				
	Voltage Output 4.75-0.25 V5				M12-5 Pin (A Code)-Field installable-Pin assignment 1-2-3 (**). M * S1 Available lengths are 60 and 250 mm.	
	Voltage Output 0.5-4.5 V6					
	Voltage Output 4.5-0.5 V7				M12-5 Pin (A Code)-Field installable-Pin assignment 2-3-4 (**). M * S2 Available lengths are 60 and 250 mm.	
	Current Output 20-4 mA C2					
	Current Output 4-20 mA C4				M12-5 Pin (A Code)-Field installable-Pin assignment 1-3-4 (**). M * S3 Available lengths are 60 and 250 mm.	

SAMPLE PART NUMBERS

958AV00120EAC5P 0-10 volt output; 12" stroke; 10 mm rod; 5 meter integral cable; and programmable zero and span.

958AV60100MBM60S1X 0.5-4.5 volt output; 100 mm stroke; 8 mm rod; and 60 mm, M-12-5 pin connector (pin assignment 1-2-3).

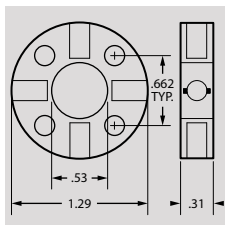
* Insert length of wire.

** Refer to the Wiring Diagrams on the previous page for Connector details.

ACCESSORIES

► Magnets

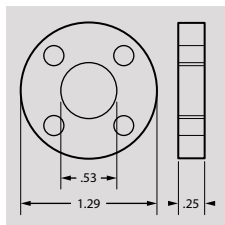
There are four magnet choices available for the 958 Series. Magnets and magnet spacers must be ordered as separate line items. The standard 4 hole (SD0400800) is suitable for most applications.



Standard 4 Hole Magnet

Standard P/N:
SD0400800

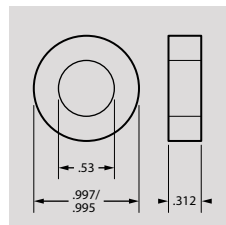
Stainless Steel P/N:
SD0480900



Non-Ferrous Spacer for 4 Hole Magnet

Standard P/N:
M0822400

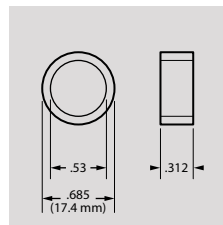
Teflon Cylinder Bushing P/N:
M0822401



1" Cylinder Magnet

Standard P/N:
SD0410300

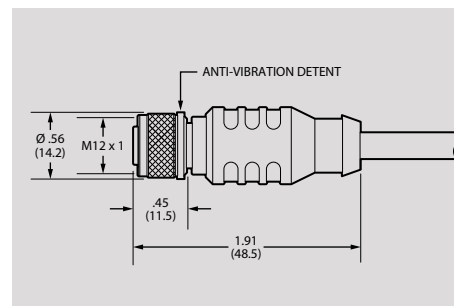
Teflon Coated P/N:
SD0410301



17.4 mm Cylinder Magnet

Standard P/N:
04-588105

► Cable Assemblies



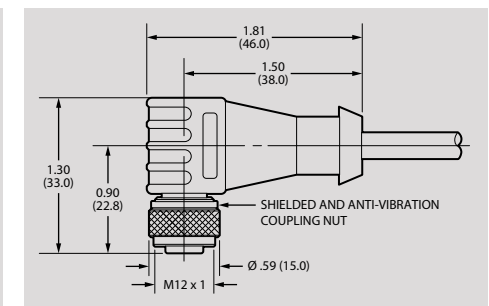
Straight Connector

Power Cable M12-A Straight to flying leads - Shielded

2 meter: **949045L2M**

5 meter: **949045L5M**

10 meter: **949045L10M**



Right Angle Connector

Power Cable M12-A Right Angle to flying leads - Shielded

2 meter: **949046L2M**

5 meter: **949046L5M**

10 meter: **949046L10M**