



953A/953D/953SSI VMAX™ LDT Data Sheet

LINEAR DISPLACEMENT TRANSDUCERS

- Vibration Resistant to 30 Gs (Lab Tested)
- Shock Resistant to 1000 Gs (Lab Tested)
- SSI (Synchronous Serial Interface)
24, 25 or 26 Bit, Binary or Gray Code,
Synchronous or Asynchronous Mode
- Digital Outputs, Start/Stop,
Variable Pulse (PWM), Control Pulse
- Analog Outputs, 0-10 VDC, +/-10 VDC,
0-5 VDC, +/-5 VDC, 4-20mA
- Wide Input Power Range 7-30 VDC
- Low Power
- Diagnostic Tri-Color LED
- Removable Cartridge
- IP68 Rated





953A/D/SSI VMAX™ LDT

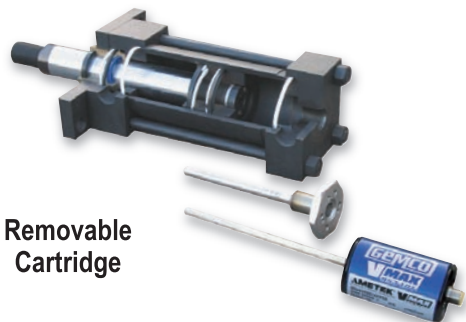
Mobile Equipment and Stationary Processing Systems demand absolute accuracy and reliability in linear position feedback . . . Regardless.

Innovation, proprietary technology and decades of experience were the key to the development of our 953 VMAX Linear Displacement Transducer.

We know the manufacturing challenges of today are extreme, so we designed and built a sensor to meet and exceed these demands, regardless of the application or environment.

Introducing the 953 VMAX LDT features:

- High Vibration Resistance to 30 Gs (lab tested)
- High Shock Resistance to 1000 Gs (lab tested)
- Wide Input Power Range of 7 to 30 VDC (no need to specify different models)
- High Accuracy with High Resolution
- Applications Include All Mobile/Stationary Equipment, or Both with the Same Sensor
- Sensor Lengths up to 300"
- Durability and Reliability Exceeds Competitive Offerings
- Tri-Color Diagnostic LED Indicator
- Gives Quick Indication on the Status of the LDT
- Very Low Power Consumption, 1 Watt Typical, Allows Direct Connection to Display and Control Interface Modules
- Removable Cartridge for Hydraulic Applications
- Digital Output, Start/Stop, Variable Pulse (PWM), Control Pulse
- SSI (Synchronous Serial Interface), 24, 25 or 26 Bit, Binary or Gray Code, Synchronous or Asynchronous
- Analog Output, 0-10 VDC, +/-10 VDC, 0-5 VDC, +/-5 VDC, 4-20mA
- Contaminant Resistant
- IP68 Rated
- Optional Stainless Steel Cover and Connector
- Multi-Magnet Option (Digital Start/Stop only)



Removable Cartridge



Applications Include
Absolute linear position feedback for equipment and process automation in extreme applications.

Process Automation

- Steel Mills, Primary and Secondary Metals Processing that includes Stamping, Roll Forming and Die-Casting
- Hydraulic & Pneumatic Cylinders
- Adaptive Housing Options to Withstand Extreme Temperatures and Contaminants (Gemco 950MD units)

Mobile Equipment

- Lumber and Forest Products Processing
- Refuse Collection, Vehicles, Recycling and Compaction
- Off Road

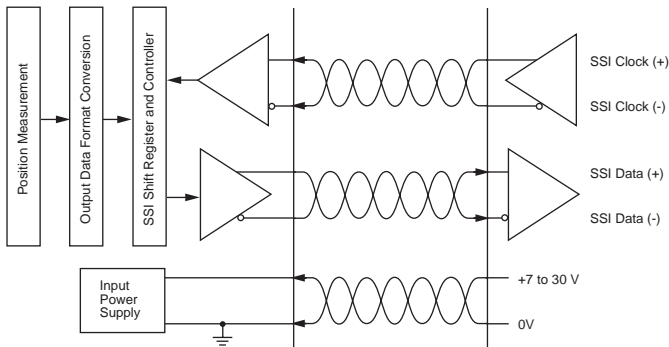
Stationary Machines

- Sawmill, Plastic, Rubber, Injection Molding, Extrusion Equipment, Material Handling, Nonwovens, Dancers and Accumulators

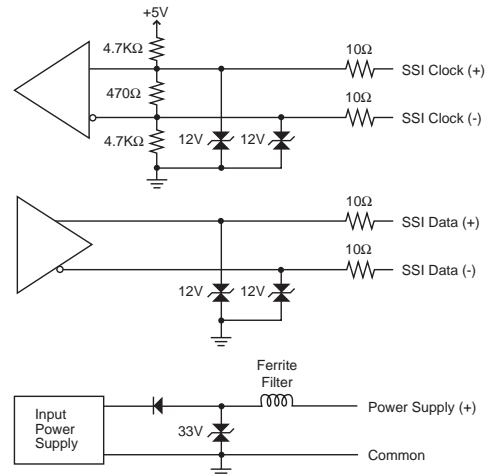
Specifications					
953SSI Connector Interface	6 Pin 12mm Euro micro, Integral cable ass'y, 7 Pin or 8 Pin DIN	Shock	1000 Gs (lab tested) IEC 60068-2-27	953SSI Output Type	24, 25 or 26 Bit, Binary or Gray Code (optional parity and error bit), Synchronous or Asynchronous
953D Connector Interface	6 Pin 12mm Euro micro, Integral cable ass'y, 6 Pin or 8 Pin DIN	Vibration	30 Gs (lab tested) IEC 60068-2-6	953D Output Type	RS = RS422 Start/Stop Pulse VP = RS422 Variable Pulse (PWM), Internal/External Interrogation CP = RS422 Control Pulse TP = TTL Start/Stop Pulse
953A Connector Interface	5 Pin 12mm Euro micro, Integral cable ass'y, 6 Pin or 8 Pin DIN	953SSI Update Time	Measuring Length 300 750 1000 2000 5000mm Measurements/ 3.7k 3.0k 2.3k 1.2k 0.5k sec.	953A Output Type Voltage Current	0-10 VDC, +/-10 VDC, 0-5 VDC, +/-5 VDC 4-20mA
Sensor Housing and Mounting Hex	Body length 3.2", hex base 1 3/4" dia., 3/4"x16x1" thread. Aluminum housing standard, stainless steel optional.	953D Update Time	Controller Dependant	953A Current Output	Max Load Resistance: 500 Ohms
Displacement	1" to 300"	953A Update Time	< 2mS Typical	953A Voltage Output	Minimum Load Resistance: 2K Ohm Output Current: Guaranteed 5mA minimum Analog Ripple: ≤1 mV maximum
Dead Band	2.50" (63.5 mm) standard	Guide Tube Pressure	5,000 psi continuous (10,000 psi spike)	Hysteresis	0.001"
Null Zone	2.00" (50.8 mm) standard	Approvals	CE (EMC)	Non-linearity	< 0.01% or +/- 0.005", whichever is greater, (+/- 0.002 Typical)
Enclosure Rating	IP68, IEC 600529	Input Voltage	7 to 30 VDC	Storage Temperature	-40° to 221° F (-40° to 105° C)
953SSI Resolution	English or Metric Units Metric: 1, 5, 10, 20 micron (5 micron standard) English: .00005", .0001", .0005", .001" Consult Factory for Others.	953A Zero & Span Adjustability	Factory set at Null & Dead Band locations Field re-settable at any location within active stroke	Operating Temperature Head Guide Tube	-40° to 185° F (-40° to 85° C) -40° to 221° F (-40° to 105° C)
953D Resolution	Controller Dependant	953D Repeatability 953A Repeatability	Equal to Resolution of Controller Equal to Resolution	Diagnostics	Tri-Color LED beside connector/cable exit, See 'LED Output Summary Table' on page 6
953A Resolution Internal Output	0.00006" 16-Bit	953SSI Measured Variables	Single Magnet Displacement, Consult Factory for Velocity or Differential Operation		

NOTE: Specifications subject to change and are based on a typical 48" stroke.
*One watt typical at 1ms interrogation time with no recirculations. Faster interrogation times and/or recirculations increase power consumption.

SSI Logic Diagram



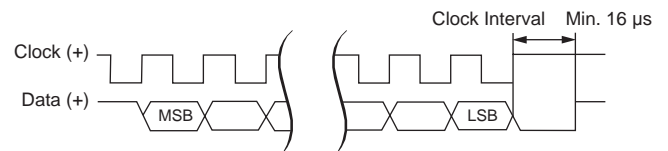
SSI Sensor Input



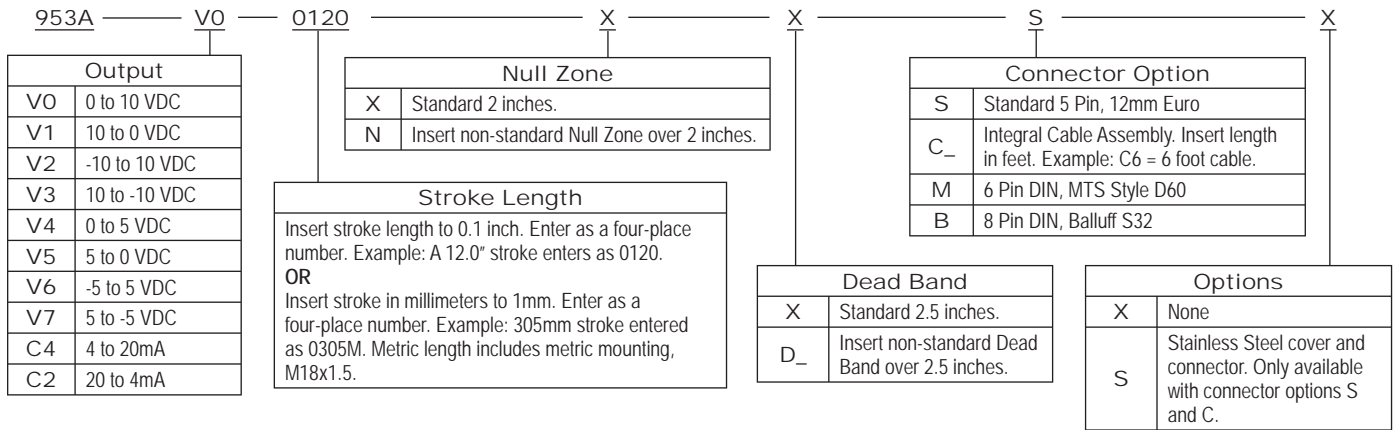
SSI (Synchronous Serial Interface)

Displacement value is encoded into a 24, 25 or 26 Bit format and transmitted at high speeds. Synchronization in a closed loop system is made easy. A clock pulse train from a controller is used to gate out sensor data: one bit of position data is transmitted to the controller per one clock pulse received by the sensor. The absolute position data is continually updated by the sensor and converted by the shift register into serial information. The sensors fulfill all requirements to the SSI standard for absolute encoders.

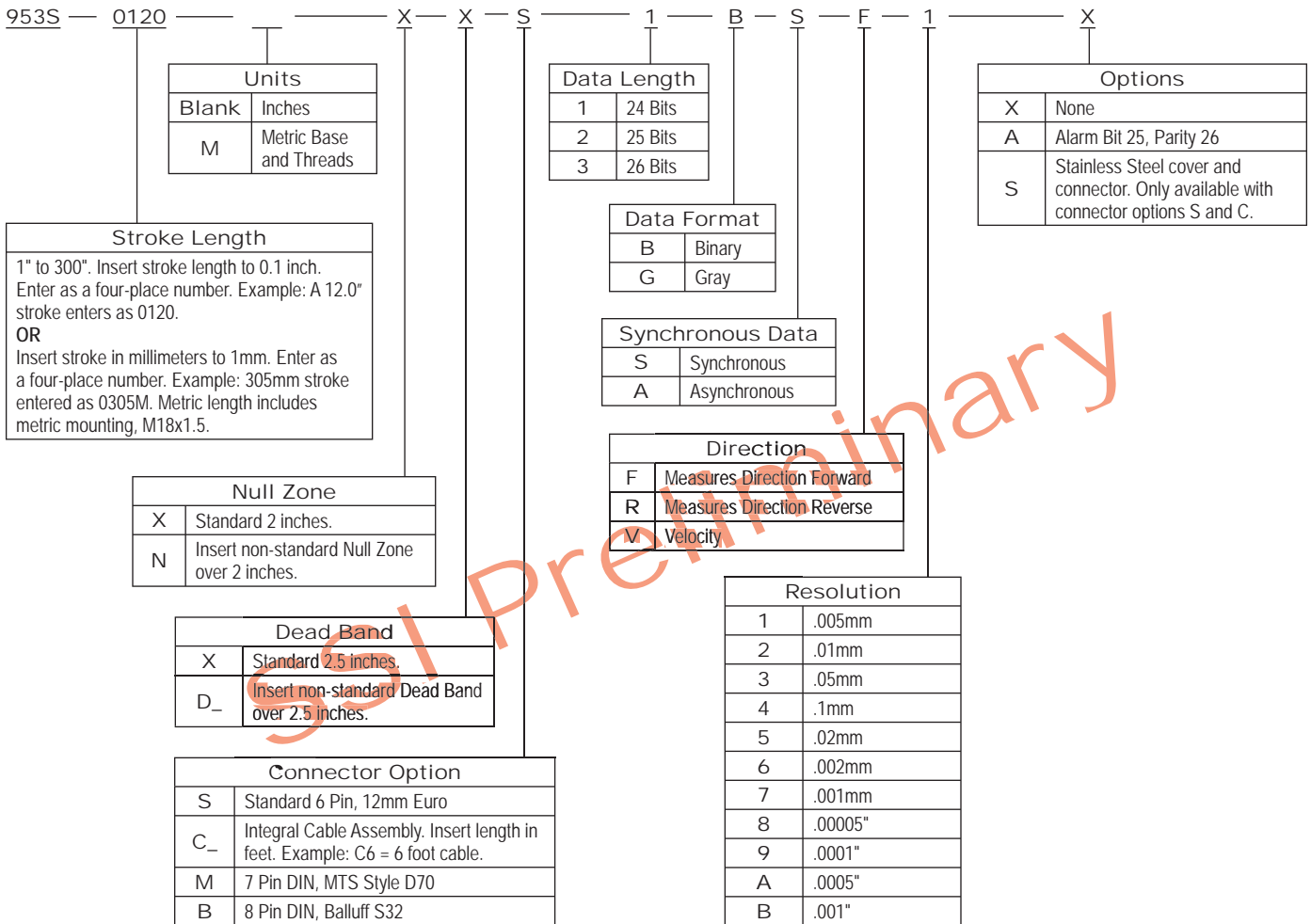
SSI Timing Diagram



Analog Part Numbering



SSI Part Numbering

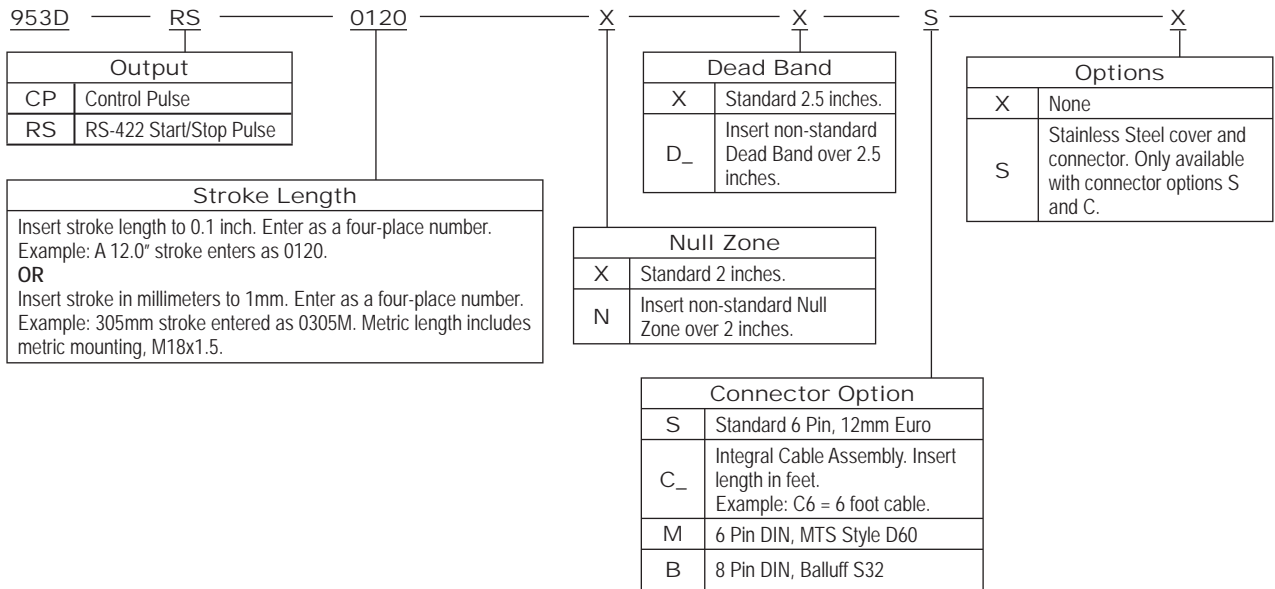


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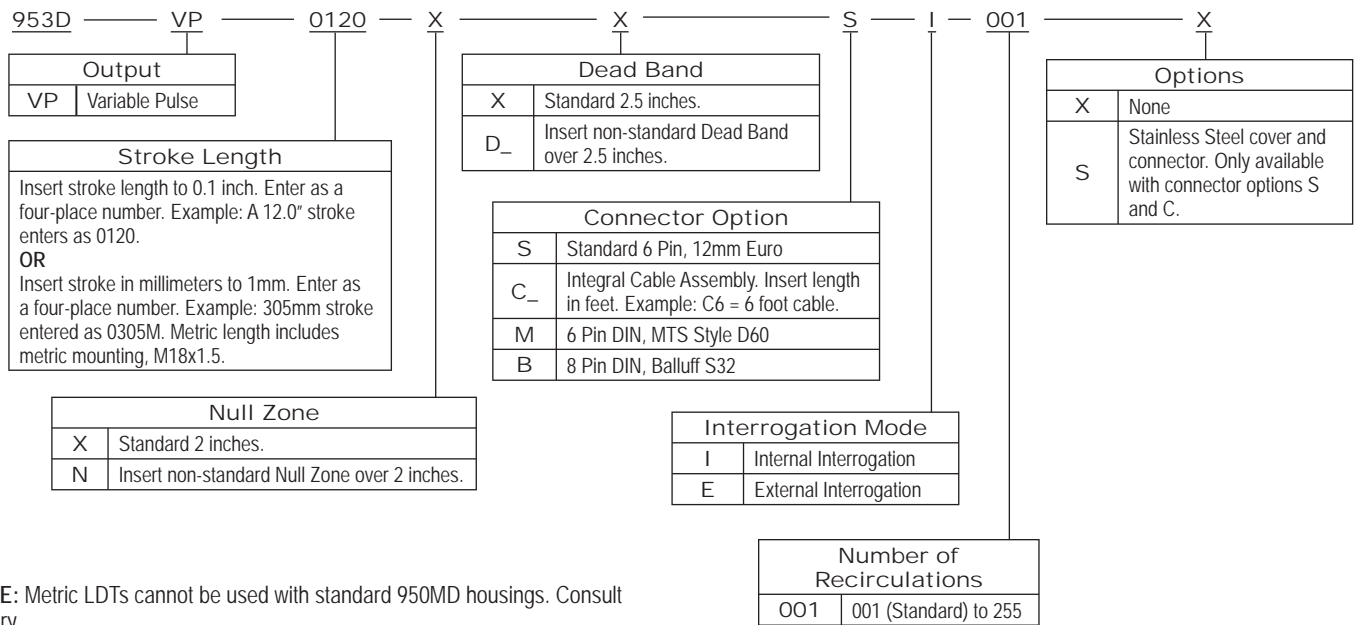


953A/D/SSI VMAX™ LDT

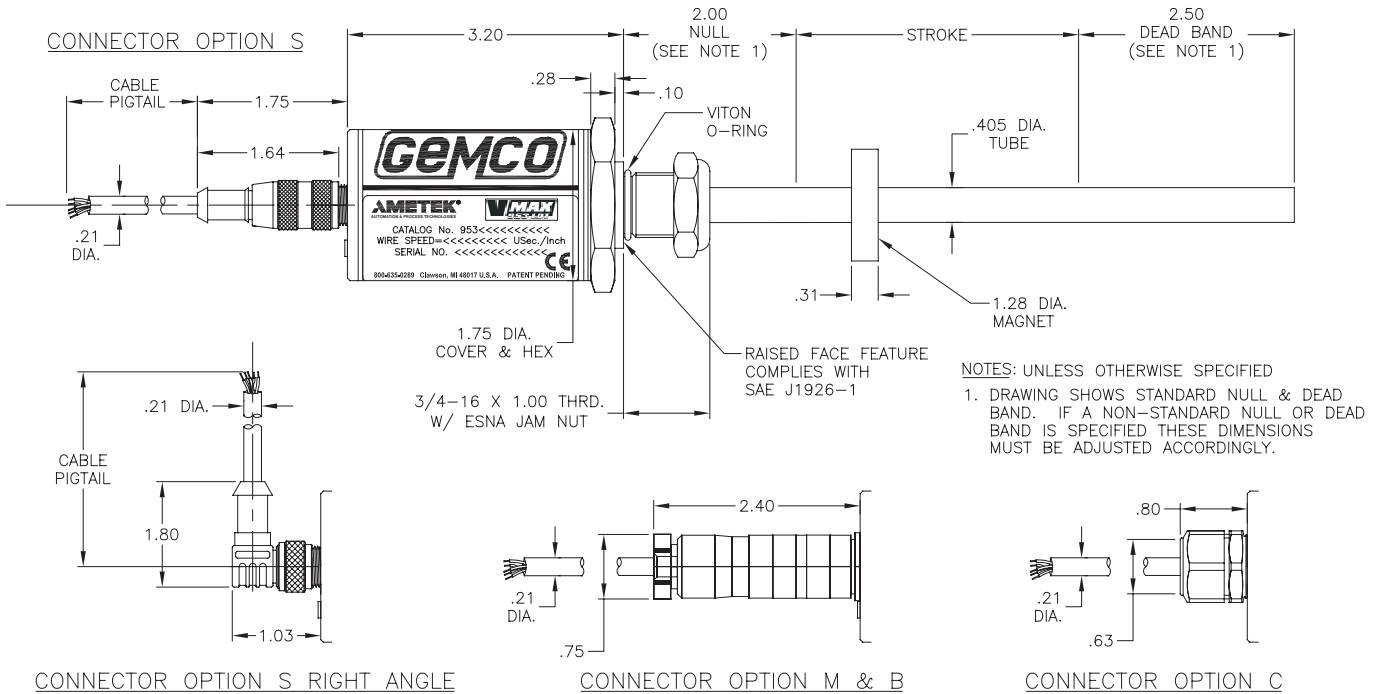
Digital, CP and RS Part Numbering



Digital, VP (PWM) Part Numbering



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



953 LED Output Summary			
Output	953A	953D	953SSI
Flashing Red	Flash memory corrupt	Flash memory corrupt	Flash memory corrupt
Flashing Red/Green	EE memory corrupt	EE memory corrupt	EE memory corrupt
Flashing Green	N/A	N/A	N/A
Flashing Yellow	Communication/programming mode	Communication/programming mode	Communication/programming mode
Fast Flashing Yellow	Programming input held asserted	Interrogation input held asserted	Clock input held asserted
Solid Red	No magnet signal detected	No magnet signal detected	No magnet signal detected
Green/Red Blip (1s to 0.12s)	N/A	Max Gain but signal detected and within range	Max Gain but signal detected and within range
Solid Green	Magnet signal detected and within the programmed range	Normal probe operation; magnet signal and interrogation pulse detected	Normal probe operation; magnet signal and SSI clock operational
Solid Yellow	Magnet signal detected outside of the programmed range	No external interrogation pulse detected	No SSI clock pulses detected
Yellow/Red Blip (1s to 0.12s)	N/A	N/A	SSI clock pulses do not match LDT SSI data length
Green/Yellow Blip (1s to 0.12s)	N/A	N/A	LDT data not synchronous with controller (if LDT is programmed for synchronous mode)

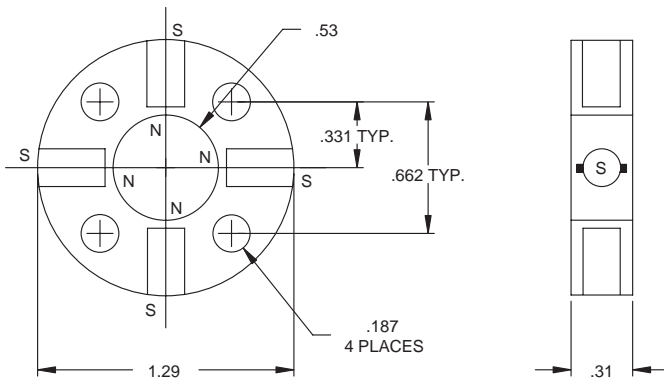


953A/D/SSI VMAX™ LDT

Magnets	
Part Number	Description
SD0400800	Standard Four Hole Magnet
SD0400900	Standard Four Hole Magnet, Stainless Steel
SD0403900	Aluminum Split Magnet
SD0411201	Large Split Magnet, Stainless Steel
SD0411200	Large Split Magnet, Standard
SD0410300	Cylinder Magnet, Standard
SD0410301	Cylinder Magnet, Teflon Coated
M0750500	Non-Ferrous Spacer for Split Magnet
M0822400	Non-Ferrous Spacer for Four Hole Magnet

953A Accessories		
Part Number	Description	Use With Connector
949011L6	6 Foot, 5 Pin, Straight, 12mm Euro Cable	S
949011L12	12 Foot, 5 Pin, Straight, 12mm Euro Cable	S
949012L6	6 Foot, 5 Pin, Right Angle, 12mm Euro Cable	S
949012L12	12 Foot, 5 Pin, Right Angle, 12mm Euro Cable	S
SD0553200LXX	6 Pin DIN	M
SD0553300LXX	8 Pin DIN Voltage	B
SD0553400LXX	8 Pin DIN Current	B
SD0400800	Standard 4 Hole Magnet	All

Consult factory for complete accessory offerings. XX = Length in Feet.



Standard 4 Hole Magnet
 Standard P/N: SD0400800
 Stainless Steel P/N: SD0480900

953D/953SSI Accessories		
Part Number	Description	Use With Connector
949029L6	6 Foot, 6 Pin, Straight, 12mm Euro Cable	S
949029L12	12 Foot, 6 Pin, Straight, 12mm Euro Cable	S
949030L6	6 Foot, 6 Pin, Right Angle, 12mm Euro Cable	S
949030L12	12 Foot, 6 Pin, Right Angle, 12mm Euro Cable	S
SD0554500LXX	6 Pin DIN (953D)	M
SD0558500LXX	7 Pin DIN (953SSI)	M
SD0554600LXX	8 Pin DIN	B
SD0400800	Standard 4 Hole Magnet	All

Consult factory for complete accessory offerings. XX = Length in Feet.

SSI Cable Length Limits		
Baud Rate	Max. Cable or Bus Length	
1 MBd	10 ft.	3 m
400 kBd	160 ft.	50 m
300 kBd	320 ft.	100 m
200 kBd	650 ft.	200 m
100 kBd	1300 ft.	400 m

NOTE: The maximum cable length recommendation is 10 meters or 33 feet. Longer cables are available, but extra care must be taken while handling and installing.



S Connector Style
 5 or 6 Pin Micro, 12mm Euro



M Connector Style
 6 Pin DIN, Fits MTS D60
 7 Pin DIN, Fits MTS D70 (for SSI only)



B Connector Style
 8 Pin DIN, Fits Balluff S32



C Connector Style
 Integral Cable Assembly



Other Products



- GEMCO**
- LINEAR DISPLACEMENT TRANSDUCERS
- PLC INTERFACE PRODUCTS
- ROTARY POSITION PRODUCTS
- PROGRAMMABLE LIMIT SWITCHES
- EXTREME DUTY CABLE REEL PRODUCTS
- ROTARY LIMIT SWITCHES
- RESOLVERS
- MILL DUTY ENCLOSURES
- ULTRA HIGH SPEED PLS
- SAFETY PRODUCTS



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1080 N. Crooks Road, Clawson, MI 48017-1097
Phone: 248.435.0700 Toll Free: 800.635.0289
Fax: 248.435.8120 www.ametekapt.com

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