



**Series 953 VMAX™**

**Linear Displacement Transducer**

**Ordering Guide and Technical Information**

**953 VMAX™**



**ABSOLUTE PROCESS CONTROL  
KNOW WHERE YOU ARE... REGARDLESS**



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### The Need for automation is greater today than ever before.

Linear Displacement Transducers (LDT) play an important role in factory 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.

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

The 953A VMAX is an accurate, programmable zero & span, auto-tuning, non-contact linear displacement transducer in a rod-style package. The transducer utilizes our field-proven Magnetostrictive technology to give absolute position, accurate to 0.01% of the programmable sensing distance. A variety of different outputs are available, including Analog (Voltage or Current), Digital (Start/Stop or PWM) and SSI (Serial Synchronous Interface). The 953 VMAX has a variety of truly unique features. The first one is the wide power range of 7 to 30 VDC @ 1 watt. The second is the LDT's auto-tuning capability, the ability to sense a magnet other than the standard ring magnet and adjust its signal strength accordingly. All units have a diagnostic LED to display the health of the unit and to help aid in troubleshooting. Our Analog units offer programmable Zero & Span points, the analog output is programmable over the entire active stroke length. Units can be ordered in span lengths from 25mm to 7.6M in 1mm increments.

### 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 for mobile applications)
- Very Low Power Consumption, 1 Watt Typical, Allows Direct Connection to Display and Control Interface Modules
- Applications Include All Mobile/Stationary Equipment, or both with the Same Sensor
- High Accuracy with High Resolution – Resolutions to 1 micron
- Sensor Lengths from 1" to 300" (25mm to 7.6M)
- Durability and Reliability Exceeds Competitive Offerings
- Tri-Color Diagnostic LED Indicator, Gives Quick Indication on the Status of the LDT
- Removable Cartridge for Hydraulic Applications
- SSI (Synchronous Serial Interface), 24, 25 or 26 Bit, Binary or Gray Code, Position Updates
- Analog Output, 0-10 VDC, +/-10 VDC, 0-5 VDC, +/-5 VDC, 4-20mA
- Digital Output, Start/Stop, Variable Pulse (PWM), Control Pulse
- Multi-Magnet Option (Digital Start/Stop only)
- Contaminant Resistant - IP68 Rated
- Optional Stainless Steel Cover and Connector
- Drop-in replacement for competitive model units – same Null, Dead bands, threads and connectors



## Series 953 VMAX™ Linear Displacement Transducer

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**AMETEK Factory Automation** markets, engineers, and manufactures sensors and controls for demanding and harsh industrial environments. Products include GEMCO® linear and rotary sensors. Our sensors are absolute and never require homing or calibrating in the event of a power loss and are built in the USA to meet global application needs.

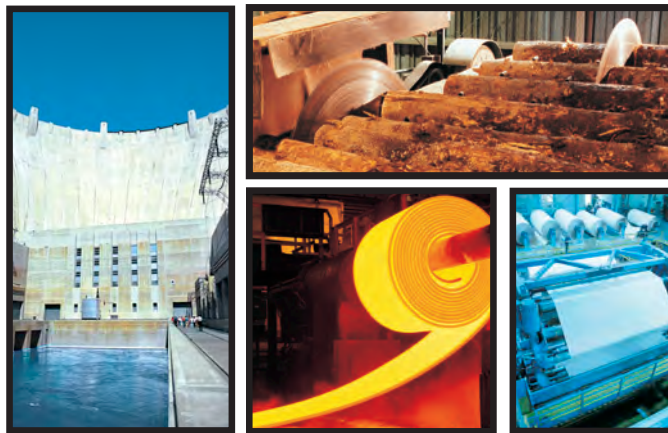
Our linear displacement transducer line utilizes advanced, proven Magnetostrictive technology to provide highly precise and absolute position feedback down to 1 micron resolution and repeatability. We package these sensors to survive in the most demanding and hostile environments. Our 950MD (mill-duty) housing offers an added layer of protection to rod-style LDT's and can help simplify replacement with its two point mounting. The 950MD is constructed of 304 stainless steel, has been used in steel mills throughout the world for over 25 years with tens of thousands of units in service at this time. We offer air purging, vortex air cooling and water cooled head jackets for LDT protection.

No one in the industry understands the mechanical link between steel mill machines and sensors like AMETEK APT. The reason is our commitment to get down on the plant floor and solve real problems with an impressive line of standard and special products designed for steel mill applications. No one else in our business can live up to that claim.

- We know what to measure for improved automation and efficiency
- We know where to measure for greatest accuracy and repeatability
- We know when to protect sensors in our unique mill-duty housings for long, maintenance-free life
- We know how to mount and interface our sensor packages for easy, fast, “seamless” installation
- We package our sensors to survive harsh Environments

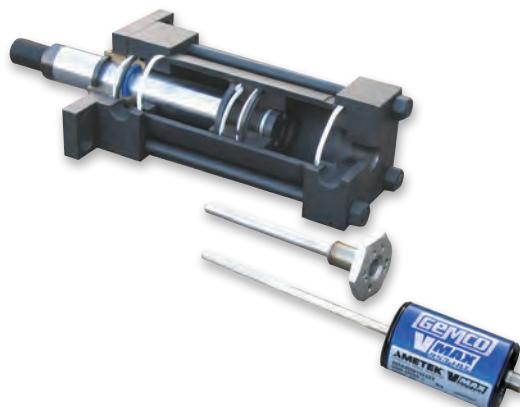
### Typical Industries

- Steel Mills
- Hydraulic & Pneumatic Cylinders
- Tire & Rubber
- Hydro Power Generation
- Sawmill & Woodworking
- Hydraulic Presses
- Plastic Injection Molding
- Material Handling
- Packaging Machinery
- Pulp & Paper
- Factory Automation



### Removable Cartridge

The removable cartridge feature allows for quick replacement of the electronics and sensing elements without disturbing the cylinders high pressure seal.



## Connector Option

The 953 VMAX LDT is available with multiple connector options. Refer to pictures below or part Numbering pages for desired connector option.



Stainless Steel  
Cover and Connector



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



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



**B Connector**  
8 Pin DIN, Fits  
Balluff S32



**C Connector**  
Integral Cable  
Assembly



**E Connector**  
10 Pin MS Connector,  
Fits Gemco 951 &  
952 Wiring

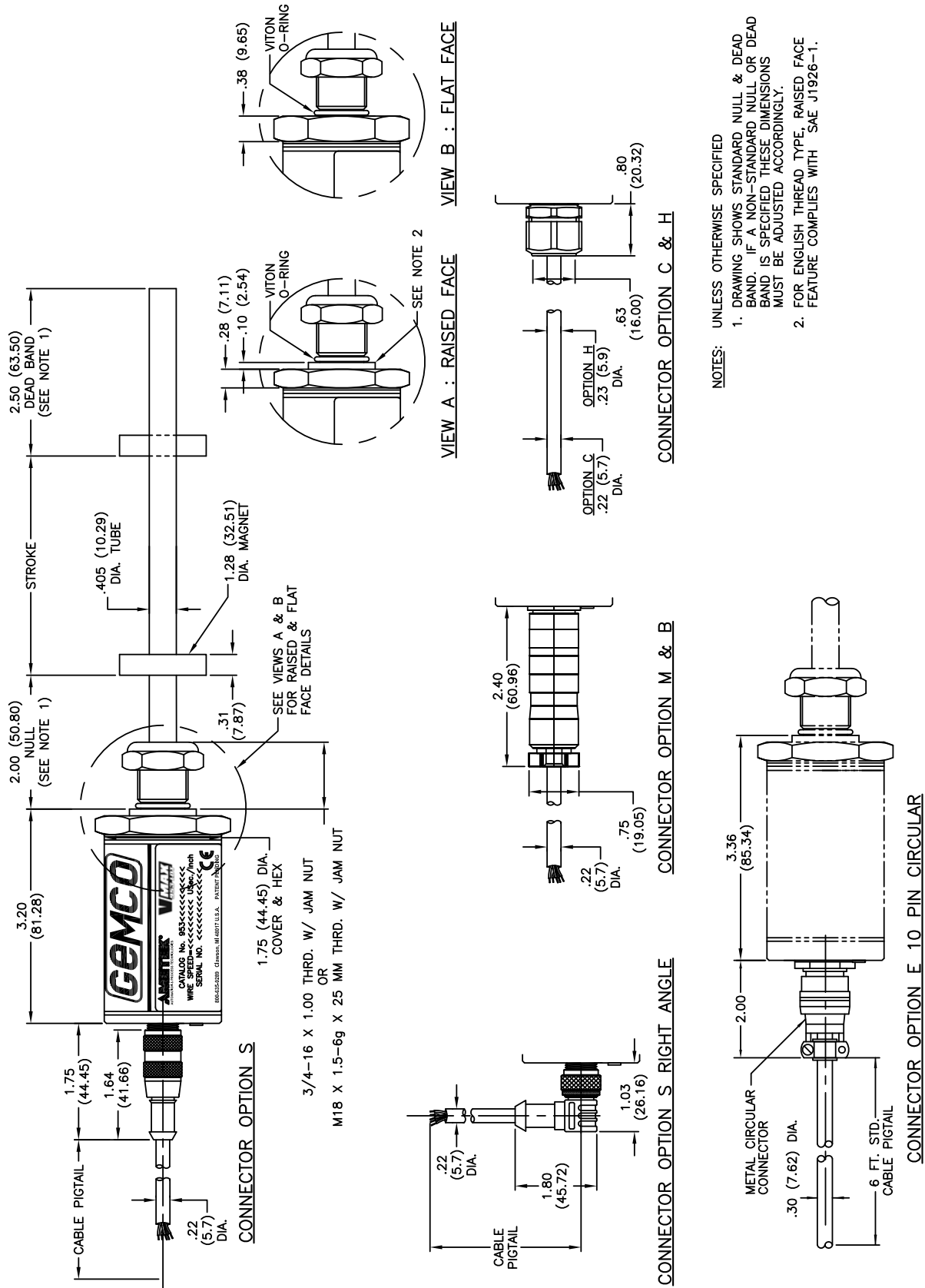
## Diagnostic LED

There is a diagnostic LED located at the connector end of the probe that will tell you the health of the unit and can help aid in troubleshooting.

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)

# Series 953 VMAX™ Linear Displacement Transducer

## Specifications



NOTES: UNLESS OTHERWISE SPECIFIED

1. DRAWING SHOWS STANDARD NULL & DEAD BAND. IF A NON-STANDARD NULL OR DEAD BAND IS SPECIFIED THESE DIMENSIONS MUST BE ADJUSTED ACCORDINGLY.
2. FOR ENGLISH THREAD TYPE, RAISED FACE FEATURE COMPLIES WITH SAE J1926-1.

## Product Specifications

### 953SSI Connector Interface

6 Pin 12mm Euro micro - Standard  
Integral cable ass'y, 7 Pin or 8 Pin DIN - Optional

### 953D Connector Interface

6 Pin 12mm Euro micro - Standard  
Integral cable ass'y, 6 Pin or 8 Pin DIN or 10 Pin MS- Optional

### 953A Connector Interface

5 Pin 12mm Euro micro - Standard Integral cable ass'y, 6 Pin or 8 Pin DIN or 10 Pin MS- Optional

### 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.

### Displacement

1" to 300"

### Dead Band

2.50" (63.5 mm) standard, (2.25" Minimum)

### Null Zone

2.00" (50.8 mm) standard, (1.5" Minimum)

### Enclosure Rating

IP68, IEC 600529

### 953SSI Resolution

Metric: 1, 5, 10, 20 micron (5 micron standard)  
English: .00005", .0001", .0005", .001"  
*Consult Factory for Others*

### 953D Resolution

Controller Dependant

### 953A Resolution

Internal - 0.00006"  
Output - 16-Bit

### Shock

1000 Gs (lab tested)  
IEC 60068-2-27

### Vibration

30 Gs (lab tested)  
IEC 60068-2-6

### 953SSI Update Time

Measuring Length	300	750	1000	2000	5000mm
Measurements/sec.	3.7	3.0	2.3	1.2	0.5k

### 953D Update Time

Controller Dependant

### 953A Update Time

< 2mS Typical

### Guide Tube Pressure

5,000 psi continuous (10,000 psi spike)

### Approvals

CE (EMC)

### Input Voltage

7 to 30 VDC

### Current Draw

1 watt typical\*, 40mA at 24 VDC typical

### 953A Zero & Span Adjustability

Factory set at Null & Dead Band locations  
Field adjustable at any location within active stroke

### 953D Repeatability

Equal to Resolution of Controller

### 953A Repeatability

Equal to Resolution

### 953SSI Repeatability

Equal to Output Resolution

### 953SSI Measured Variables

Single Magnet Displacement, Consult Factory for Velocity or Differential Operation

### 953SSI Output

24, 25 or 26 Bit, Binary or Gray Code (optional parity and error bit), Position Update

### 953D Output

RS = RS422 Start/Stop Pulse  
VP = RS422 Variable Pulse (PWM), Internal/External Interrogation  
CP = RS422 Control Pulse  
TP = TTL Start/Stop Pulse

### 953A Output

Voltage - 0-10 VDC, +/-10 VDC, 0-5 VDC, +/-5 VDC  
Current - 4-20mA

### 953A Current Output

Max Load Resistance: 500 Ohms

### 953A Voltage Output

Minimum Load Resistance: 2K Ohm  
Output Current: Guaranteed 5mA minimum  
Analog Ripple: ≤1 mV maximum

### Hysteresis

0.001"

### Non-linearity

< 0.01% or +/- 0.005", whichever is greater, (+/- 0.002 Typical)

### Storage Temperature

-40° to 221° F (-40° to 105° C)

### Operating Temperature

Head -40° to 185° F (-40° to 85° C)  
Guide Tube -40° to 221° F (-40° to 105° C)

### Diagnostics

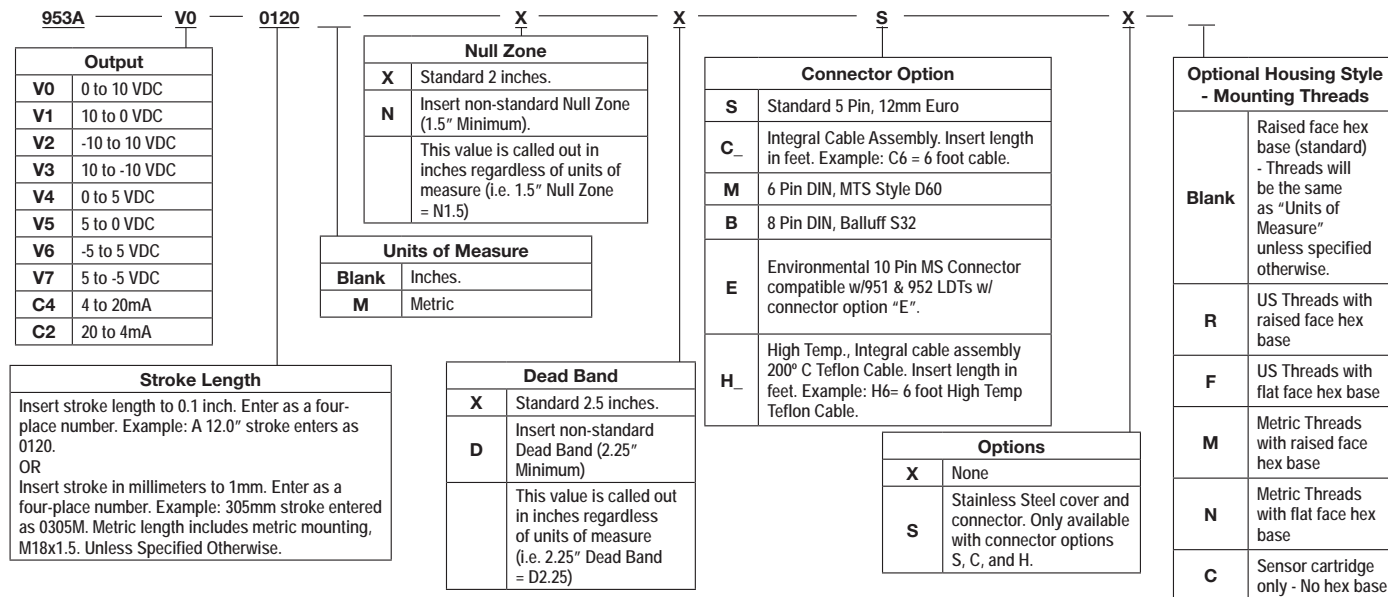
Tri-Color LED beside connector/cable exit,  
See 'LED Output Summary Table'

NOTE: Specifications subject to change and are based on a typical 48" stroke.

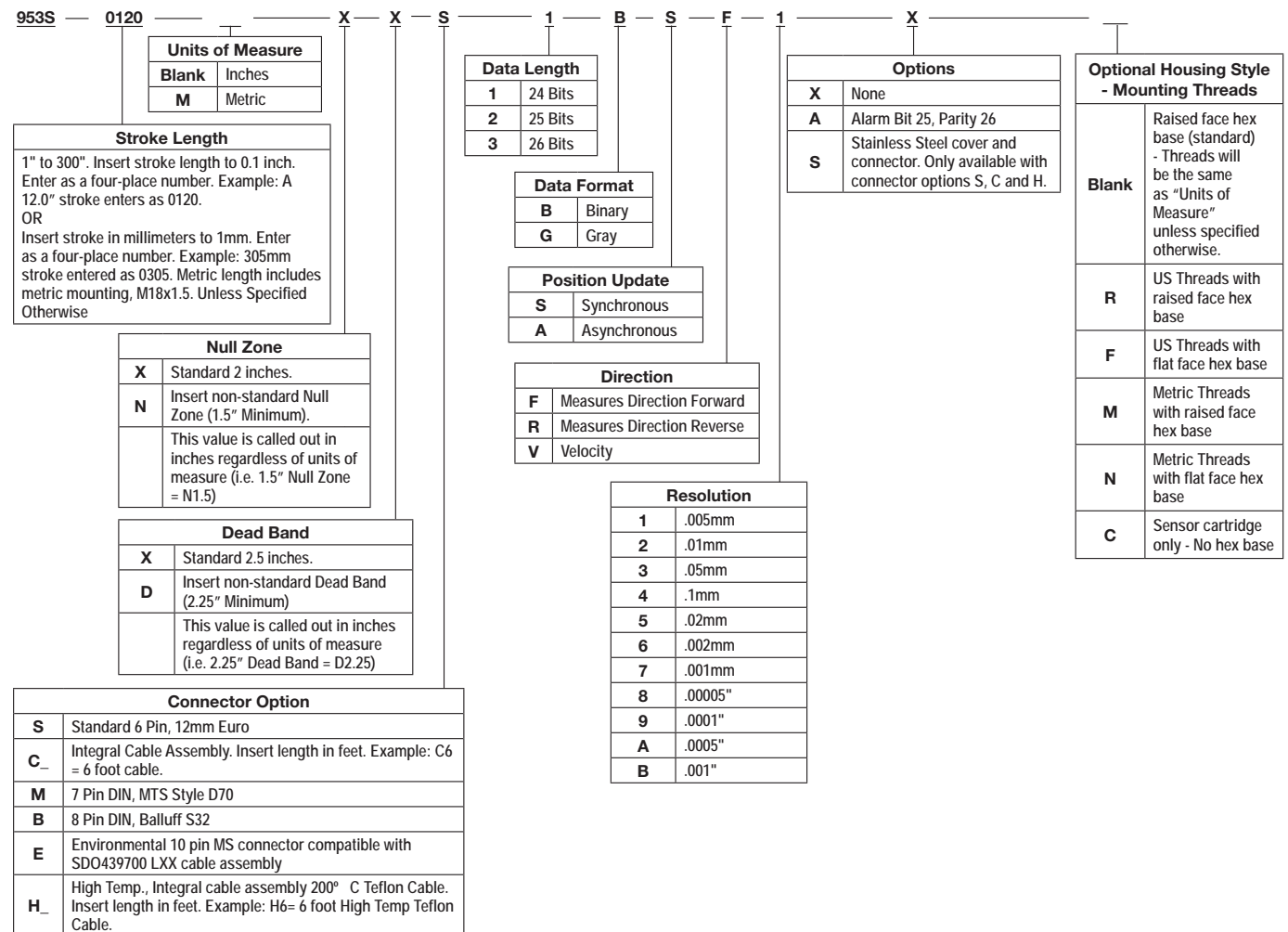
\*One watt typical at 1ms interrogation time with no recirculations. Faster interrogation times and/or recirculations increase power consumption.

# Series 953 VMAX™ Linear Displacement Transducer

## Part Numbering - Analog

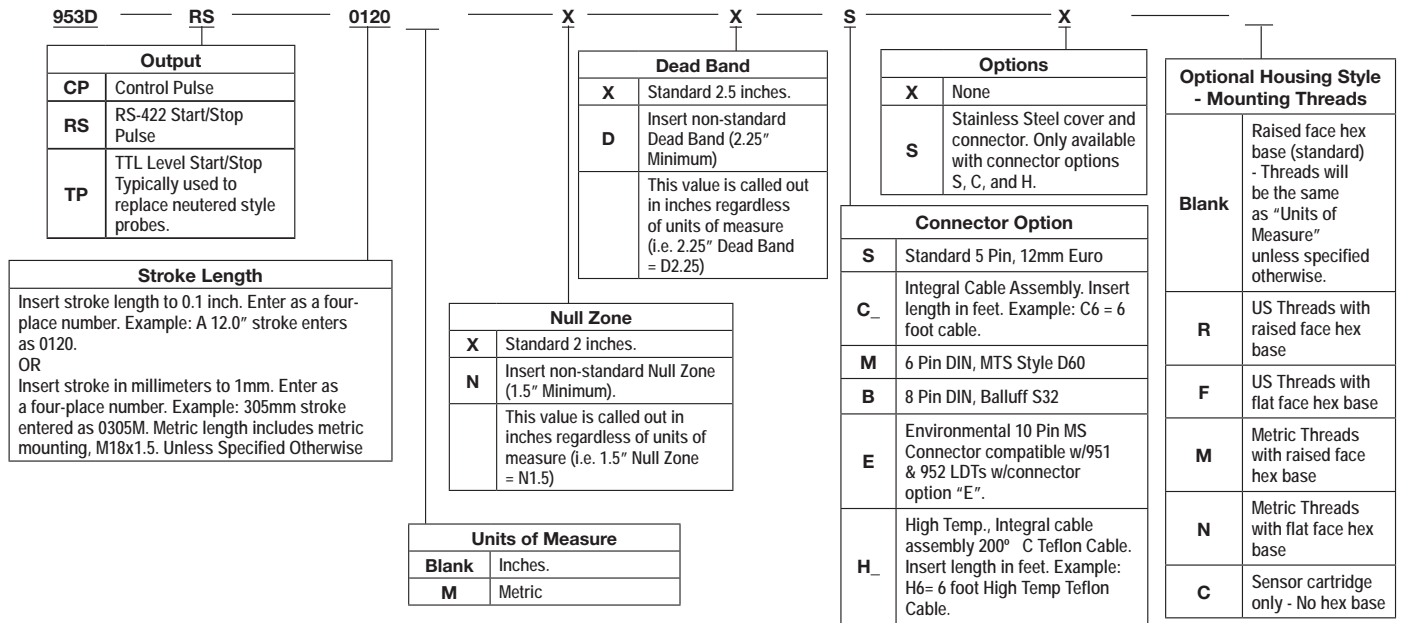


## Part Numbering - SSI

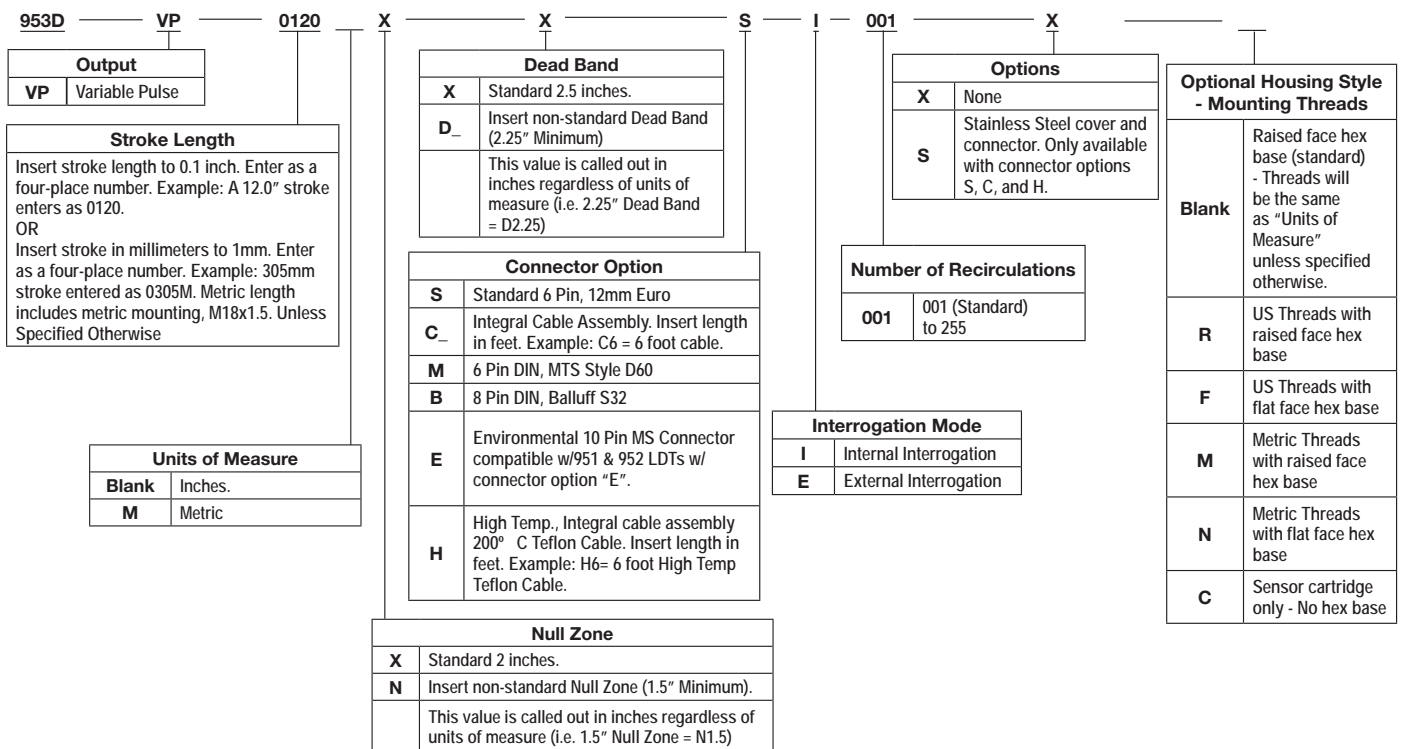




Part Numbering - Digital, CP and RS



Part Numbering - Digital, VP (PWM)



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

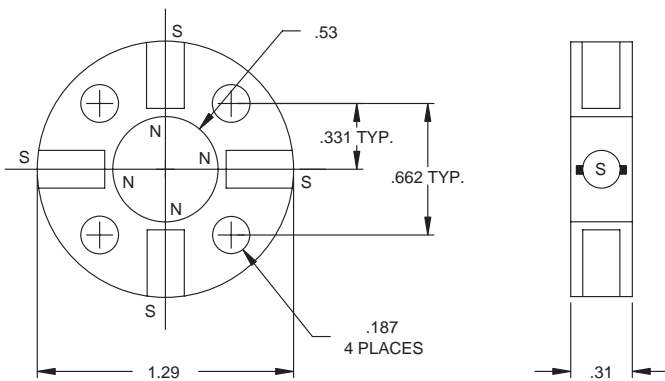
# Series 953 VMAX™ Linear Displacement Transducer

## Accessories

Magnets	
Part Number	Description
SD0400800	Standard Four Hole Magnet
SD0480900	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 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.

### Series 950MD Mill-Duty Housing

The series 950 Mill-Duty Housing (950MD) was designed for applications where mounting a stand-alone rod style linear displacement transducer (LDT) is prohibitive. Potential physical damage, environmental conditions or mounting limitations are all elements that are involved in specifying a linear position feedback system that will perform flawlessly for many years to come. The 950MD housing has been designed to eliminate all of the above problems by protecting the LDT from physical and environmental damage such as temperature, corrosives, shock & vibration, or dust and debris. Additionally, the 950MD offers a simple two point mounting scheme that can compensate for lateral and/or horizontal movement of the machine while in operation. Mounting bolts are provided for both the trunnion mount and rod ends in either standard steel or optional Stainless Steel when specified.

The 950MD housing is also perfect for retrofitting existing cylinders with an LDT providing a continuous position feedback signal. The 950MD allows for a convenient way to mount the 950MD and internal LDT parallel to the cylinder. This eliminates the need to tear down and gun drill the cylinder to accommodate an LDT simply for providing position feedback that had not previously been available.

The housing may also be of benefit in this same configuration when you have an existing cylinder in operation that does not allow for an easy removal of the LDT. Old machines and even some existing machines or newly designed machines did not take into consideration the need for continuous position feedback. Certain machines may require that the entire cylinder be removed in order to replace the LDT.

The actuator contains a 1/2" spherical rod end with approximately 1" of adjustment (length). This spherical rod end allows mechanical movement in a horizontal and/or vertical motion to compensate for any mechanical slop or misalignment between the housing and machine. A rear trunnion mount is provided for mounting either directly in front of the head assembly or on the rear of the head. An optional 3/4" spherical rod end can be supplied on the rear of the unit (see drawing for details).

The back cap is supplied with threaded and plugged holes that allow for field installation of the 3/4" diameter trunnion mount bracket to the back cap.



The trunnion mount bracket is positioned at the point where the head and barrel connect. A simple exchange of hardware is all that is necessary to move the trunnion mount bracket to the back cap and plug the no longer required bracket mounting holes. When ordering the 3/4" rear rod end option, the trunnion mount bracket is not supplied since it would not be required.

The actuator rod is supported by two bearings within the guide tube. The front piston bearing contains a wiper assembly to keep contaminants from entering the guide tube. The rear, or movable, bearing assembly is manufactured from Rulon®. This high-temperature polymer material provides low wear and smooth operation.

The transducer magnet is mounted within the rear bearing assembly. The magnet is a 1" O.D. cylinder magnet (SD0410300). The magnet is positioned 2" from the end of the transducer hex when the actuator is fully retracted and 5" from the end of the transducer guide tube when the actuator is fully extended.

The 950MD is designed to incorporate an LDT which has a minimum 2" Null Zone and 5" Dead Band.

### 950MD Mill-Duty Housing

Due to the fact that the standard Mill-Duty Housing has a mechanical stroke identical to the LDT active stroke, no physical over-stroke exists. If it is possible that the machine being coupled to can extend/retract beyond the stroke supplied, damage to the Mill-Duty Housing and possibly to the machine might occur. To compensate for this we call out fully retracted/fully extended over-stroke dimensions for the Mill-Duty Housing. These values are essentially the additional stroke length added to the Mill-Duty Housing. The reason they are called out separately is to alert the user that when entering these areas, they are out of the LDT active stroke area. If an extended over-stroke is specified, the LDT must be ordered with a Dead Band of 5" + X (extended stroke value). If a retracted over-stroke is specified, the LDT must be specified with a Null value of 2" + Y (retract over-stroke value).

The Mill-Duty Housing offers either a conduit entrance for hard wiring directly to the LDT within the head or an external connector and mate. The connector attaches to the LDT inside of the housing via a small pigtail connector within the head.

#### Detailed Product Description and Materials of Construction

The 950MD consists of a 304 Stainless Steel body, barrel, piston, head and trunnion mount bracket.

The standard 1/2" diameter rod end with mounting bolt, the 3/4" diameter trunnion mounting bolt, and some of the optional MS connectors on the head are the only items that are not Stainless Steel on the standard assembly. This is also true of the optional 3/4" diameter front and rear rod ends with their mounting bolts. These rod ends and all mounting bolts can be ordered in Stainless Steel as an option. The 12mm Euro connector options C3 and C4 come standard in Stainless Steel. Consult the factory for further details.

The 950MD head assembly is removable to allow installation of a rod style LDT that will screw into the standard 3/4" - 16 x 1.00 mounting thread. An optional Metric thread of M18 X 1.5 can also be supplied upon request. The head contains a 1/2" NPT conduit port for wiring to the LDT or optionally



an MS connector can be installed for the external wiring. Use of the MS connector will require that the LDT also have a connector on it in lieu of a potted cable. This will allow for a quick connect at the LDT head internally and on the 950MD head externally. The 950MD head is sealed with O-rings and also contains two threaded air purge openings that are plugged but available for use to air cool the LDT head with filtered and regulated air. By removing the plugs and installing the proper size air fittings, you can cool the head electronics for high temperature applications. An optional Vortex air cooler may also be specified for the head and/or barrel or an optional water jacket for the LDT can be supplied. See the 950MD dimension drawings for further details.

**Consult Factory if installing  
950IS into 950MD Housing**

### 950MD Mill-Duty Housing

#### Applications

The 950MD was originally designed for use in steel mill applications but has proven to be reliable in many applications where ruggedness, environmental protection and ease of mounting are required. Some of these applications include:

**Steel Mills** - Tundish car (Tundish height), turret height (Caster), hydraulic coil cars, torch cutoff machine (torchhead monitoring), furnace tilt, electrode positioning, side guide positioning, ladle slide gate positioning, louver or roof position, etc.

**Foundries, Forging and Casting** – Linear transducers with 950MD housings have been used on sand mold compactors, furnace or oven doors and material transfer systems.

**Injection Molding and Die Casting** – Proven effective in monitoring/controlling the position of the clamp and/or shot cylinder. The two point connection of the 950MD housing allows for a simple retrofit by replacing limit switches with an LDT for position feedback over the entire range movement. Linear potentiometers can also be replaced, thus eliminating their problems with drift, temperature, and short life span.

**Hydraulic Servo Applications** - Ideal for installing parallel to hydraulic cylinders including new applications and retrofits. The major advantage to using the 950MD housing versus gun drilling the cylinder for an LDT is that the cylinder fluid flow is not compromised. If an LDT fails within a cylinder it cannot be removed without having to deal with the hydraulic fluid lines, pressure etc. Some cylinders may be difficult to remove once installed, thus inhibiting the removal of the LDT. The 950MD housing is typically mounted parallel to the cylinder, the same as a slave cylinder would be, so removal is greatly simplified under these conditions.

**Lock and Dam Sites** - Miter gate and Tainter valve position feedback systems have both benefited from the 950MD and LDT combination.

**Gate Position Feedback** - For hydro-electric plants, water control structures, water and wastewater treatment and managing, wicket gate position feedback for Turbine speed control.

#### Optional Items

The standard Mill-Duty Housing includes the complete housing assembly with provisions to accept an LDT and all bolts, nuts and mounting hardware required for a complete installation. There are also several optional items available.

**Vortex Air Cooler** - The standard 950MD is equipped with air purge ports. In many cases, running clean shop air through the head is sufficient to cool the electronics. For severe temperature applications a Vortex Air Cooler may be desired. A Vortex Air Cooler accepts standard shop air (80 - 100 PSIG). The air is ejected through a generator in a Vortex spin chamber where the air stream revolves in a tube at up to 1,000,000 RPM. In simplest terms the inner stream gives off energy in the form of heat to the outer stream and the inner stream exits the opposite end as hot air. The Vortex Cooler is capable of generating air flows as cold as -40° F.

**Protective Boots** - To give added protection to the actuator rod, protective boots are available. These boots attach between the end of the Mill-Duty guide tube and the end of the actuator rod assembly. The boots are offered in neoprene coated nylon for most standard applications. They offer -60° F to 250° F operating range with resistance to water and oil. Also, silicone coated fiberglass offers high temperature resistance from -100° F to 550° F; Teflon-coated fiberglass offers -100° F to 500° F operating range with a high degree of corrosion resistance and optional stainless steel boots for rugged applications.

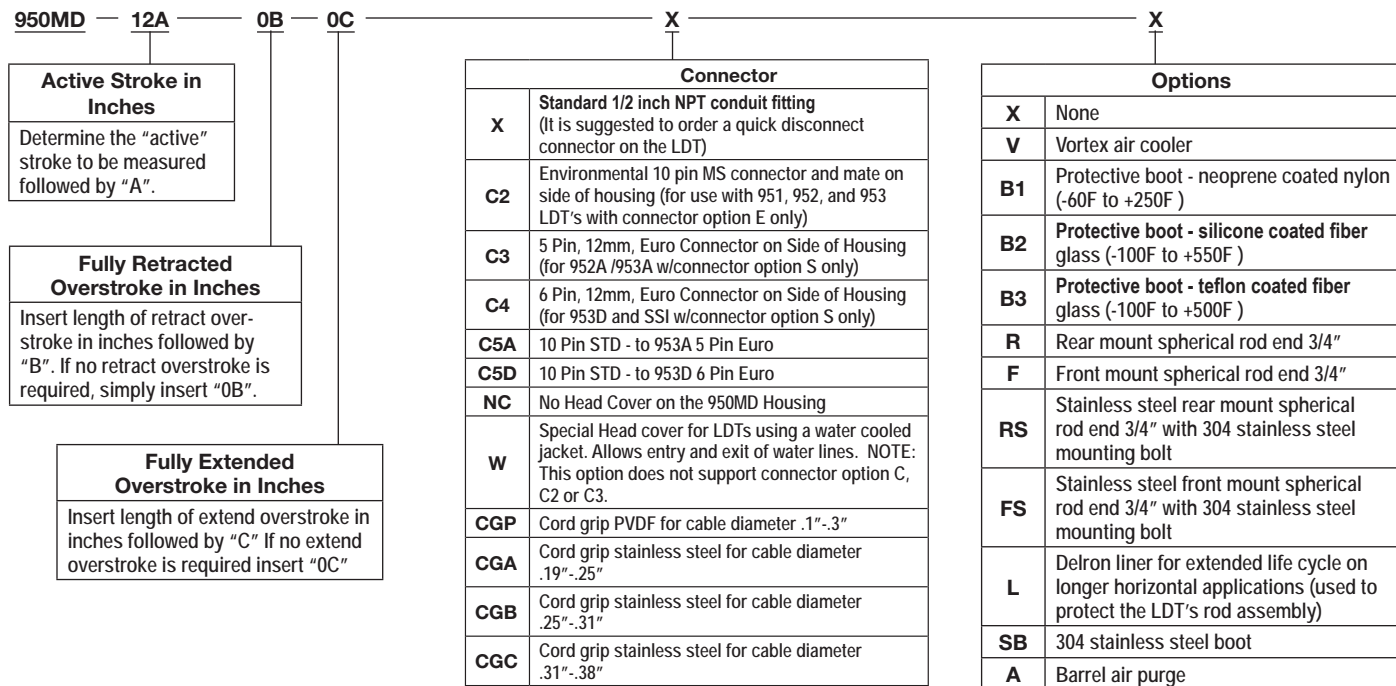
**Water-Cooled Head Assemblies** - In applications where extreme temperatures are present and air cooling is not appropriate, water-cooled head assemblies are available. Cooling jackets within the head assembly allow water to flow around the electronics.

**Front and Rear Mount Spherical Rod Ends** - In applications where two spherical rod ends are required, rear mount spherical rod ends are available. The 3/4" rear rod end attaches to a threaded bolt extending from the rear of the head. The 3/4" front rod end is threaded into the piston rod. An optional stainless steel version is available. Mounting bolts are supplied with both versions.

**Delrin Liner** - Used in longer horizontal applications, typically 60" or longer to prevent wear on the LDT's guide tube as the 950MD housing is stroked. The Delrin liner is installed inside of the 950MD barrel and prevents sag of the LDT's guide tube.

# Series 953 VMAX™ Linear Displacement Transducer

## Part Numbering - 950MD Mill-Duty Housing



**Note 1:** Guide tube support brackets are supplied as standard for strokes of 72" or greater.

**Note 2:** Special high temperature, abrasion resistant and oil resistant cables are available. Consult your Customer Service Representative.

950MD Compatibility Guide	
940	Yes
950IS	Consult Factory
951	Yes (Must be ordered w/2" Null Zone & 5" Dead Band)
952	Yes (Must be ordered w/2" Null Zone & 5" Dead Band)
953	Yes (Must be ordered w/2" Null Zone & 5" Dead Band)
955	See 956 Section
7330	Consult Factory

Accessories	
Item	Part Number
Vortex Cooler	04578009
Muffler for Cooler	04578010
Replacement 1/2" Spherical Rod End	04570140
Guide Tube Support Bracket (See note 1)	C0903400
Replacement (Male Connector) for Option "C2" Connector	04521407
Female Mating Connector for Option "C2" Connector	04521372
Replacement (Male Connector) for Option "C3" Connector	04521568
Replacement Piston & Magnet Sub Assembly	SD0452400
Replacement Housing bushing & Seal Sub Assembly	SD0563300

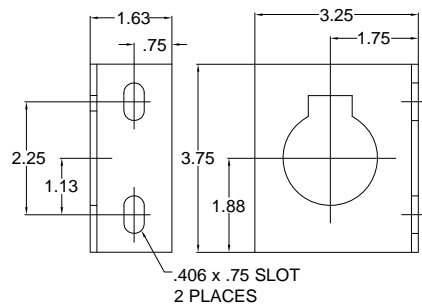
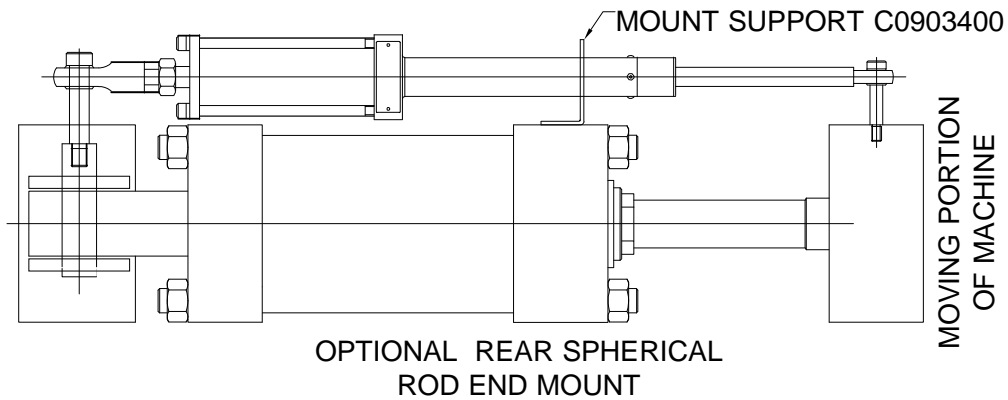
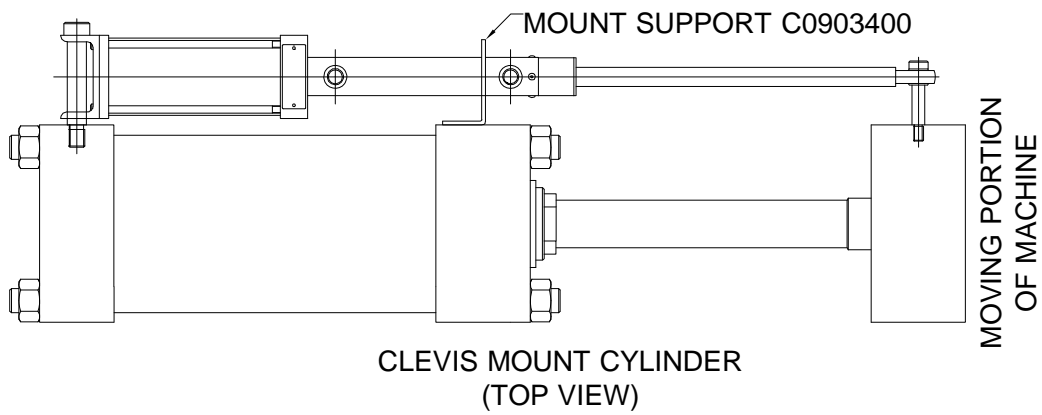
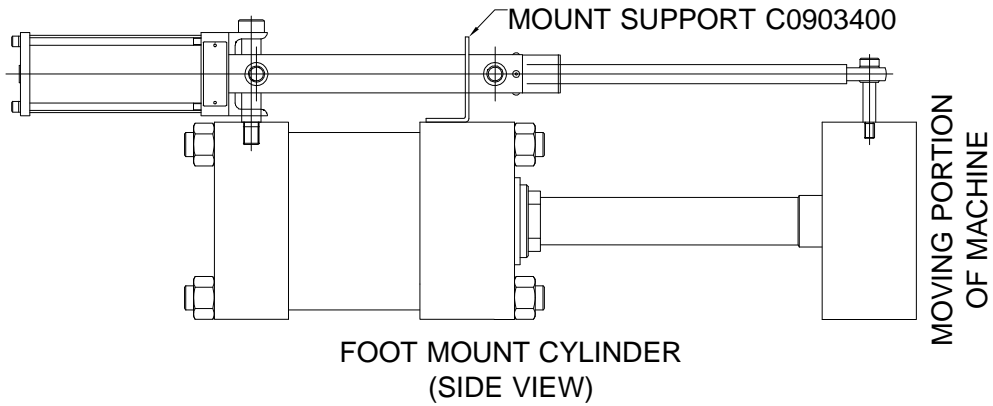


**Caution Standard 950MD is designed for LDT's with 3/4" x 16 US mounting thread. Consult factory for metric mounting options**

951, 952 and 953 LDT Cable Assemblies	
Item	Part Number
Cable Assembly with Mate for Option "C2", C5S, and C5D Connector Styles, 6 Feet	SD0439700L6
5 Pin, Straight, Stainless Steel Cable Assembly with Mate for Option "C3" Connector Style, 6 Feet	949013L6
6 Pin, Straight, Stainless Steel Cable Assembly with Mate for Option "C4" Connector Style, 6 Feet	949031L6



Conceptual Mounting of 950MD to Hydraulic Cylinders



OPTIONAL MOUNTING SUPPORT  
PART NUMBER C0903400





## Other Products



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



MADE IN AMERICA

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