GEMCO®

959CT Linear Displacement Transducer

Affordable Linear Position Solutions

Designed with the Hydraulic Cylinder Markets in Mind

AMETEK®
SENSORS, TEST & CALIBRATION

GEMCO

The Need for Automation is Greater Today Than Ever Before

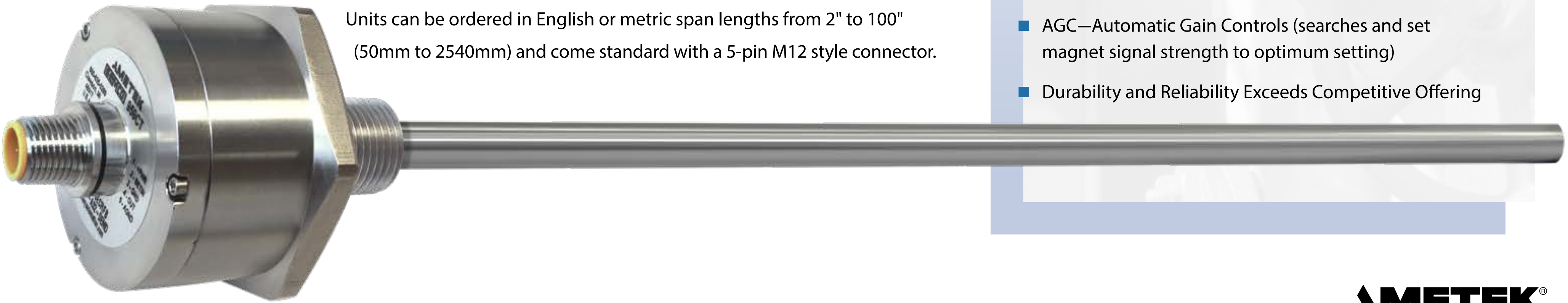
LINEAR DISPLACEMENT TRANSDUCERS (LDTs) play an important role in automation. They provide accurate, reliable, absolute position feedback to help automate today's sophisticated machinery. Sensors must deliver value, be easy to set up, and interface easily into the host controller.

We know today's industrial challenges 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 959CT Compact Housing Linear Displacement Transducer.

With this in mind, we designed the 959CT, focusing on the hydraulic cylinder markets. The 959CT utilizes our field proven Magnetostrictive technology to give absolute analog position, accurate to 0.04% of the programmable sensing distance. This Small Compact Threaded Housing is made entirely from Stainless Steel and is less than 2.0" in depth.

The non-contact design allows this device to be used in highly repetitive applications without mechanical wear. The sensor can operate over a wide range of power (8 to 30VDC at 1.6 watts). A variety of different analog outputs with field programmable Zero & Span points are available to meet your needs.

Units can be ordered in English or metric span lengths from 2" to 100" (50mm to 2540mm) and come standard with a 5-pin M12 style connector.



Key Features

- All Stainless Steel Construction
- IP68 Rated (per EN60529)
- High Vibration Resistance to 20 Gs—10Hz—2KHz (per IEC 60068-2-6)
- High Shock Resistance to 100 Gs, single hit (per IEC60068-2-27)
- Sensor Stoke Lengths from 2 to 100" (50 to 2540 mm)
- High Accuracy/High Resolution—16-bits
- Analog Output, 0 to 10 VDC, 0.25 to 4.75 VDC, 0.5 to 4.5 VDC, or 4-20 mA
- Diagnostics Over Analog Output
- Wide Input Power Range of 8 to 30 VDC
- Programmable Zero and Span Points
- AGC—Automatic Gain Controls (searches and set magnet signal strength to optimum setting)
- Durability and Reliability Exceeds Competitive Offering

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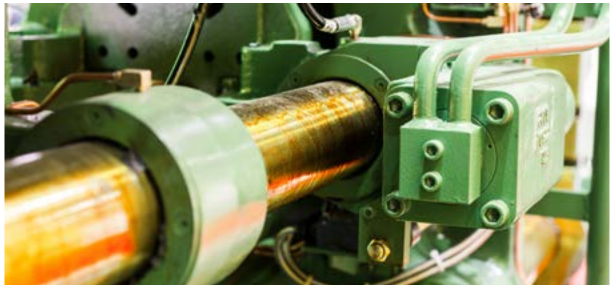
Affordable Position Sensing for Hydraulic Cylinders Continuous Vibration, High Cycle Rate, High Pressure, & Extreme Temperatures

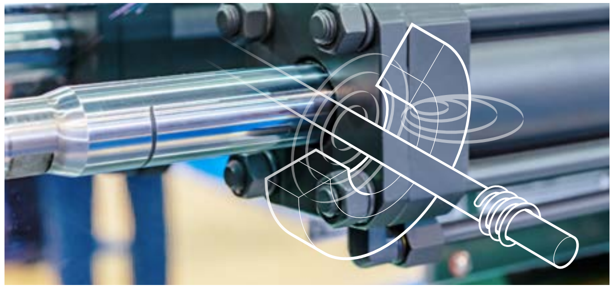
The 959CT Linear Position Sensor Performs Flawlessly in All Types of Hydraulic Cylinder Applications.



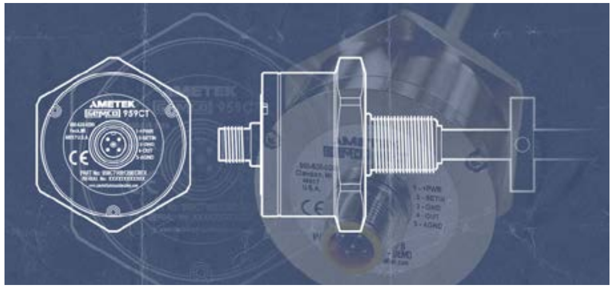
Shock and Vibration: The 959CT is designed to withstand extreme vibration of up to 20 G's, 10 Hz to 2 kHz (per IEC 60068-2-6); and shock up to 100 G's, single hit (per IEC 60068-2-27).

Accurate Feedback: High accuracy, combined with 16-bit output resolution provides reliable, absolute position feedback to help automate today's sophisticated machinery. Programmable zero and span points allow you to adjust the output to exactly match your requirements.

Electromagnetic Compatibility: Unwanted effects like electromagnetic interference (EMI) can generate inaccurate feedback and cause serious damage to your equipment. The 959CT sensor provides superior electrical noise and emissions immunity in all types of applications.



Magnetorestrictive Technology: Gemco's magnetorestrictive transducers have been a leader in industrial applications for over 30 years. Our field-proven technology delivers extreme accuracy and resolution, as well as unmatched reliability and durability.



Simplicity by Design: All Stainless Steel construction and easy installation help deliver accurate, reliable performance. The 959CT is absolute, and never requires annual calibration or field adjustments. A variety of Analog outputs are available for easy integration into the host controller.

Versatile Power Supply: A wide input power range (from 8 to 30 VDC) allows the 959CT to be used in a wide variety of industries and applications.

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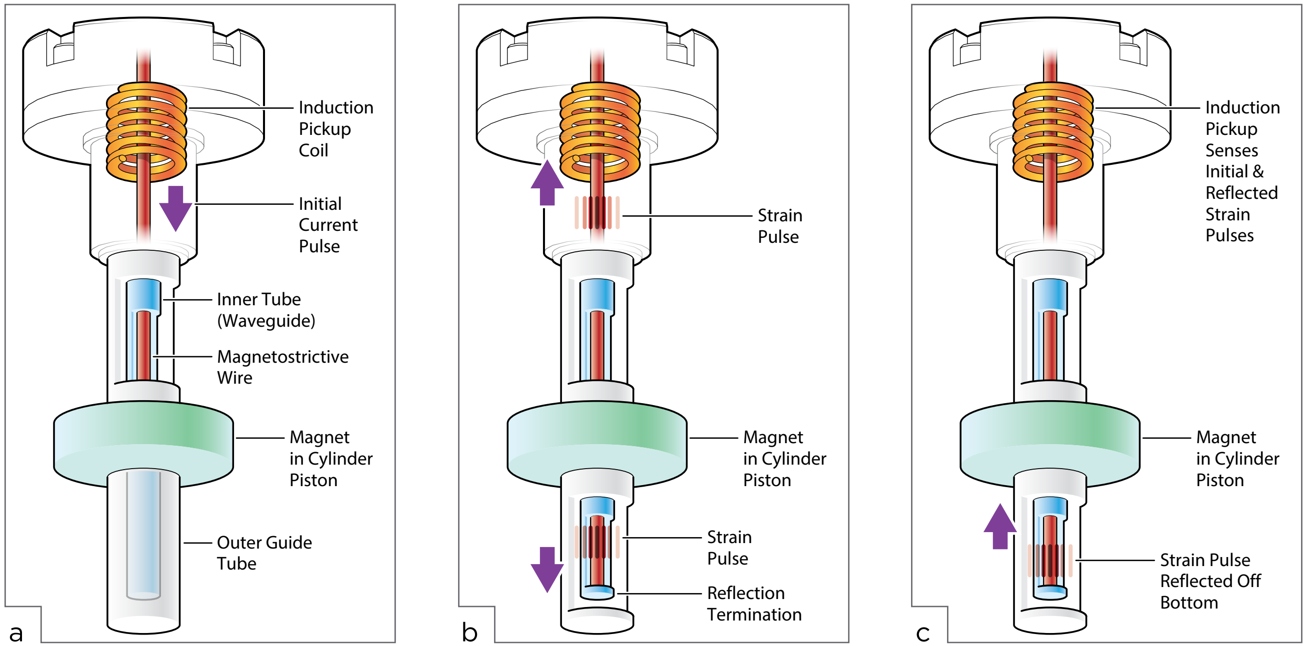
Technology and Performance

Benefits of Magnetostrictive Technology

MAGNETOSTRICTIVE TECHNOLOGY is the preferred feedback for hydraulic cylinders. The technology is absolute and can withstand the pressures and temperatures associated with hydraulic cylinders. Operating Pressures up to 5000 PSI and Spikes to 10,000 PSI with response times in the milliseconds. ***There is simply nothing to Wear out!***



a AMETEK / Gemco Linear Transducers use a Magnetostrictive time-based position sensing, where a current pulse is sent down a Magnetostrictive wire in a specially designed waveguide.

b The interaction of this current pulse within the magnetic field created by a movable magnet assembly produces a torsional strain pulse on the wire, which travels at sonic speed along the wire.

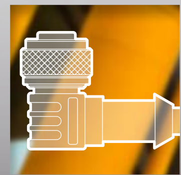
c The strain pulse traveling up the wire is sensed by a small induction pickup coil in the head assembly. The position of the movable magnet is determined with high precision by measuring the time between the launching of the current pulse and the arrival of the torsional strain pulse. The results are highly accurate, non-contact absolute position sensing with absolutely no wear to the sensing element.

Tools and Options

Diagnostics: Eliminate guesswork, and quickly identify the cause of unexpected readings. Diagnostics built into the analog output notify the host controller if the magnet signal is ever lost, or if the machine has moved beyond its programmed range.

Auto-Tuning: Auto-tuning allows the 959CT to sense a variety of position magnets, and then optimize the signal for improved performance. There are three magnet choices available for the 959CT.

Configuration: Select an output to directly match your controller's input. Analog voltage outputs of 0-10, 0.25-4.75, and 0.5-4.5 VDC are available; as are current outputs of 4-20 mA.



Connector Options: Multiple connector options are available to meet your wiring needs.

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Ordering Information

Model Numbering

Model	Available Analog Outputs	Stroke	Unit of Measure	Housing Type	Connector	Options
959CT	____	____	____	____	____	____
	Voltage Output 0–10 .... V0	Strokes are indicated from 2" to 100" in either 0.1" or 5 mm increments.	English (inches)........ E	Raised Face .... CR 10 mm Rod Mounting threads match unit of measure Inch stroke = U.S. threads Metric stroke = metric threads	M12 - 5 Pin Connector .... F	Non-programmable.......... X 1.18" (30 mm) Null
	Voltage Output 10–0 .... V1		Metric (millimeters) . . . M			
	Voltage Output 0–5 .... V2					Non-programmable.......... A 2.0" (50.8 mm) Null
	Voltage Output 5–0 .... V3	ie: 12" Stroke.........0120				
	Voltage Output 0.25–4.75...... V4	ie: 100 mm Stroke.....0100		Flat Face........................CF 10 mm Rod Mounting threads match unit of measure Inch stroke = U.S. threads Metric stroke = metric threads		Programmable Zero & Span . . . P 1.18" (30 mm) Null
	Voltage Output 4.75–0.25...... V5					
	Voltage Output 0.5–4.5........ V6					Programmable Zero & Span . . . B 2.0" (50.8 mm) Null
	Voltage Output 4.5–0.5........ V7					
	Current Output 20–4 mA....... C2					
	Current Output 4–20 mA....... C4					

Sample Part Numbers

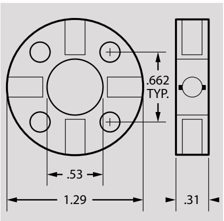
959CTV00120ECRFP. . . . 0-10 volt output; 12" stroke; 10 mm rod, raised face; M12-5 pin connector; and programmable zero and span.

959CTV60100MCFFX . . . 0.5-4.5 volt output; 100 mm stroke; 10 mm rod, flat face; M12-5 pin connector; and non-programmable.

Accessories

▸ Magnets

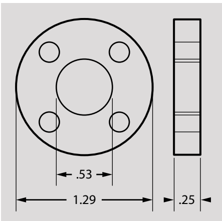
There are three magnet choices available for the 959CT Series. Magnets and magnet spacers must be ordered as separate line items. The standard 4 hole (SD0400800) is suitable for most applications.



Standard 4 Hole Magnet

StandardP/N:
SD0400800

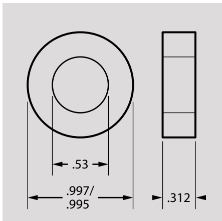
Stainless Steel P/N:
SD0480900



Non-Ferrous Spacer for 4 Hole Magnet

StandardP/N:
M0822400

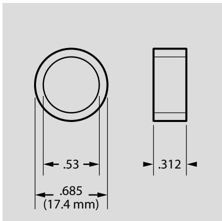
Teflon Cylinder Bushing P/N:
M0822401



1" Cylinder Magnet

StandardP/N:
SD0410300

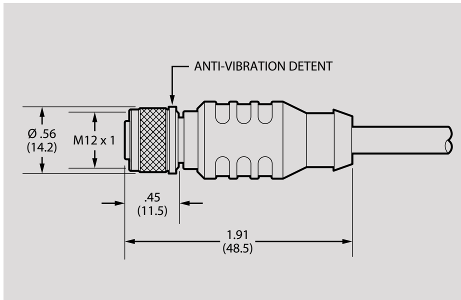
Teflon Coated P/N:
SD0410301



17.4 mm Cylinder Magnet

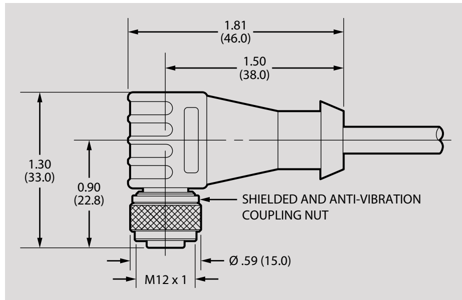
StandardP/N:
04-588105

▸ Cable Assemblies



Straight Connector
5-pin, M12-A Straight to flying leads – Shielded

Nickle Plated Brass		Stainless Steel	
6 ft:	**949019L6**	6 ft:	**949047L6**
12 ft:	**949019L12**	12 ft:	**949047L12**



Right Angle Connector
5-pin, M12-A Right Angle to flying leads – Shielded

Nickle Plated Brass		Stainless Steel	
6 ft:	**949020L6**	6 ft:	**949048L6**
12 ft:	**949020L12**	12 ft:	**949048L12**

Specifications

General Specifications

Displacement	2 to 100" (50 to 2540 mm) in 0.1" or 5 mm increments

Performance Specifications—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 4 ms

Null and Dead Bands

Null	1.18" (30 mm) or 2.0" (50.8 mm)—Part number dependent
Dead	2.49" (63.25 mm) from end to end

Mechanical Specifications—Housing

Housing Material	Stainless Steel 1.4404/AISI 316
Housing Diameter	2.25" (57.15 mm) / 2.00" (50.8 mm) Across Hex Flats
Length (width)	1.89" (47.93 mm)
Guide Tube Material	Stainless Steel 1.4404/AISI 316/316L
Guide Tube Diameter	0.405" (10 mm—10.29 mm actual)
GUIDE TUBE PRESSURE	
Continuous	5076 psi (350 bar)
Spike	10 000 psi (689 bar)

Temperature

Head Electronics	-40 to 85°C
Guide Tube	-40 to 105°C
Storage	-40 to 105°C

Shock and Vibration

Shock	100 Gs, single hit (per IEC 60068-2-27)
Vibration	20 Gs, 10Hz-2kHz (per IEC 60068-2-6)

Ingress Protection

Protection Level	IP68 (per EN 60529)

Electrical Specifications

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 3.5-21 mA (0-21 mA, 16 bits)

Output Loading

Voltage	2k Ω minimum
Current	500 Ω maximum

Connection Options

5 Pin - M12	5 pin - A-Code

Isolation

Housing to any signal	500 V

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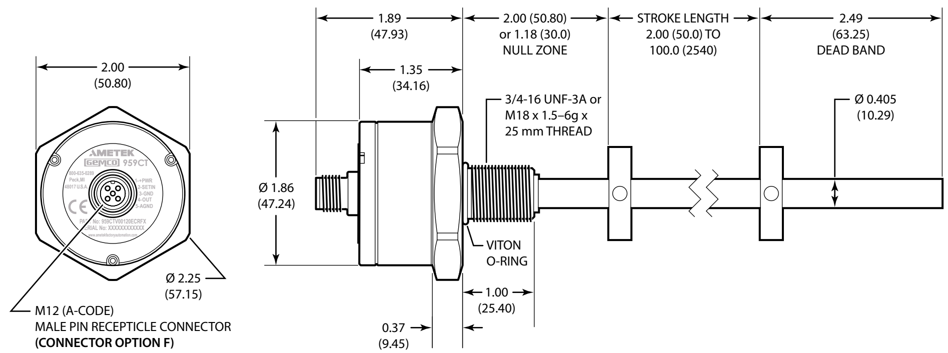
Specifications

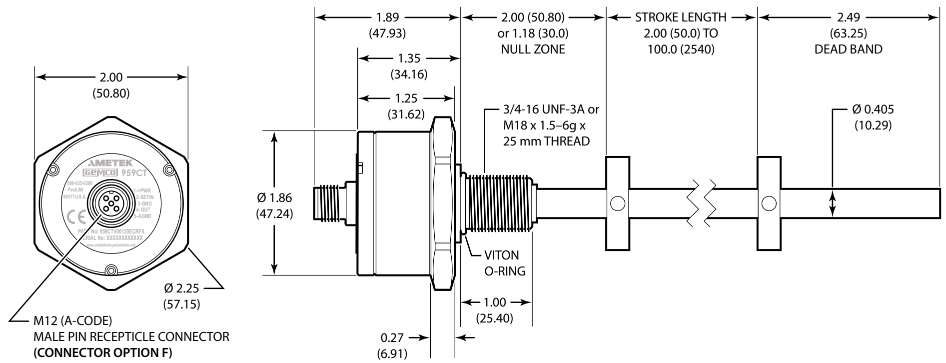
Approvals

CE (Electromagnetic Compatibility)	2014/30/EU – When installed in grounded metal housing
RoHS	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
Earth Moving Machinery	ISO 13766
Industrial Trucks	EN 12895
Railway Applications	EN 50121-3-2

Dimensions — With Flat Face Housing



Dimensions — With Raised Face Housing



NFPA Member

FPDA Motion & Control Network Member

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