

# Magnetostrictive Level Transmitter

The Model KMD is an advanced, state-of-the-art, two-wire, Magnetostrictive-based level transmitter suitable for a wide range of process applications. The latest in microprocessor technology allows this instrument to consistently and reliably measure the level of your process fluid. Built-in HART® Communications allows for remote calibration and diagnostics. The optional onboard display and keypad is for local display and calibration.

The Model KMD can measure overall level, interface level and process temperature. Up to two 4-20mA output loops are available to track any two of these three variables. The standard single chamber, or optional dual chamber, enclosures are explosion-proof for hazardous locations. The Model KMD is also intrinsically safe when used with the appropriate safety barriers.



FEATURES	BENEFITS OF OWNERSHIP
Extremely High Accuracy and Resolution	Better process control
Multi-variable measurement through one process connection	Installation flexibility
Onboard display and keypad (optional)	Local viewing of process data
HART® Communications	Easy calibration and service
Explosion-proof / Intrinsically Safe	Increased safety in hazardous areas

## APPLICATIONS

- Hydrocarbons
- Solvents
- Water
- Acids
- Caustics
- Condensate
- Clean Liquids

## INDUSTRIES

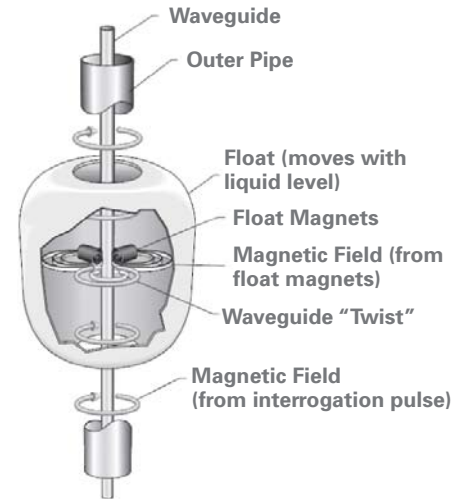
- Chemical
- Petroleum
- Water/Wastewater
- Pharmaceutical
- Pulp & Paper
- Power
- Aerospace



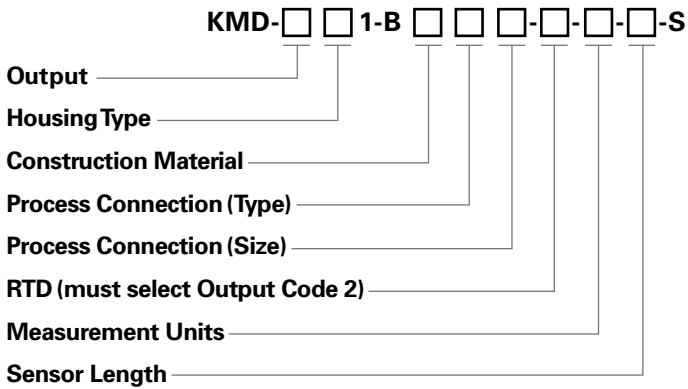
## PRINCIPLE OF OPERATION

The sensor portion of the Model KMD Transmitter consists of three concentric tubes. The outer tube (pipe) protects the inner tubes from the process environment. This outer tube is constructed of a material that is compatible with the process media being measured. The next tube contains a resistive temperature device (RTD) for accurate temperature measurement.

The inner most tube is the heart of the system. This tube is known as the waveguide. It contains a formed wire made of a proprietary Magnetostrictive material. The main electronics generates a low current pulse, creating an electromagnetic field around the waveguide. When this electromagnetic field interacts with magnetic field from the magnets in the float, a twist in the waveguide occurs. This twist is detected in the main electronics as a return pulse. The time between the initial pulse and the return pulse is measured, and is used to determine the exact position of the float, thereby providing a very accurate level measurement.



## INSTRUMENT MODEL CONFIGURATION



### Output

Description	Code
Single Loop	1
Dual Loop	2
MLG Version (Display)	3
MLG Version (No Display)	4

### Housing Type

Description	Code
Single Cavity	B
Dual Cavity	C
Single w/ Display	D
Dual w/ Display	E

### Construction Material

Description	Code
316L SS	1
Hastelloy-C®	3
Teflon® Sheathed 316L SS	A

### Process Conn. (Type)

Description	Code
Swaged NPT	1
Welded NPT	3
150# Flange	6
300# Flange	7
600# Flange	8
None	X

### Process Conn. (Size)

Description	Code
¾" (NPT)	A
1½" (Flange Only)	C
2" (Flange Only)	D
2½" (Flange Only)	E
3" (Flange Only)	F
4" (Flange Only)	G
6" (Flange Only)	J
None	X

### RTD

Description	Code
None	0
3" from Bottom Tip of Sensor	1
Customer Specified Location	2

### Measurement Units

Description	Code
Millimeters	M
Inches	U

### Sensor Length

Inches (xxx.x): (20-300 inches)
Millimeters (xxxxx): (508-7620 mm)

## FLOAT SELECTION

Kenco offers a wide variety of floats to meet the most demanding applications. Floats with specific gravities as low as 0.35 are available. Floats are available in the following materials: 316 SS, Hastelloy-C® and Nitrophyl. Due to the wide range of variables possible in process conditions, no single float can be used in all applications. Kenco will assist you in choosing the best float for your application.

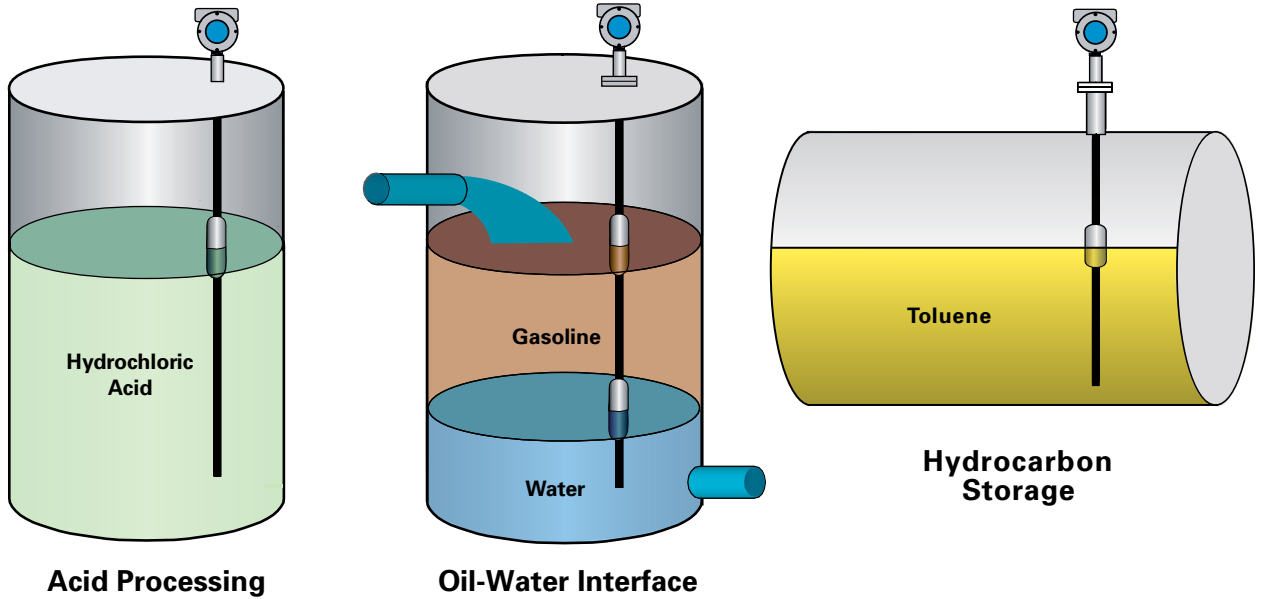
Kenco recommends selecting a float with a specific gravity at least 0.05 less than the fluid being measured. In addition, there must be a minimum difference of 0.05 S.G. between fluids for interface applications.

NOTE: In the following drawings, when the magnet is not shown, the magnet is positioned at the center of the float.

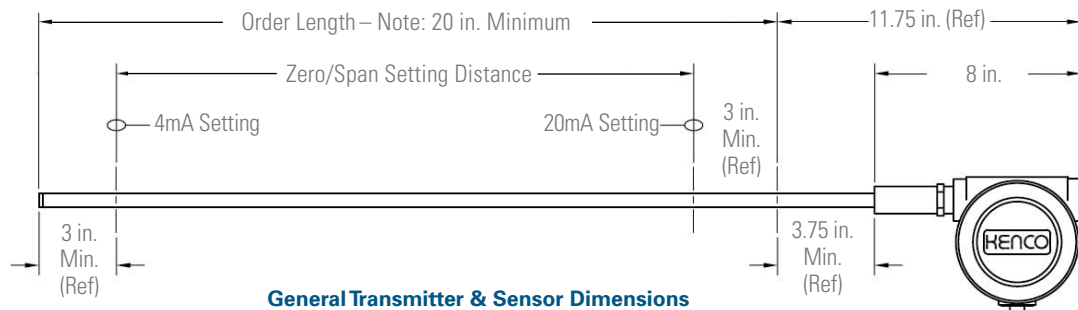
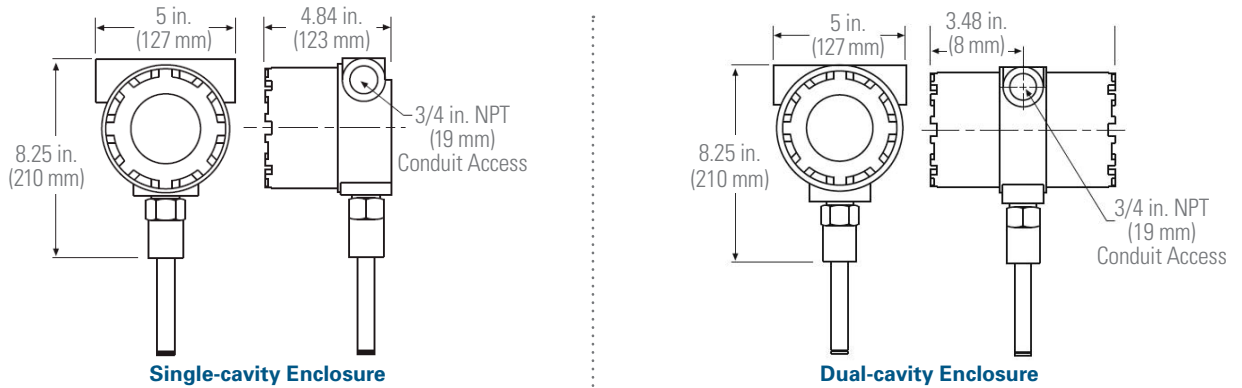
## AGENCY APPROVAL

Agency	Models	Protection Method	Approval
CSA	KMD-XX1-BXXX-X-X-X-S	Explosion-proof	Explosion-proof for: Division 1 Class I – Groups B, C, D; Class II – Groups E, F, G; NEMA 4X
		Intrinsically Safe	Intrinsically Safe for: Division 1 Class I – Groups A, B, C, D; Class II – Groups E, F, G; NEMA 4X

## APPLICATION EXAMPLES

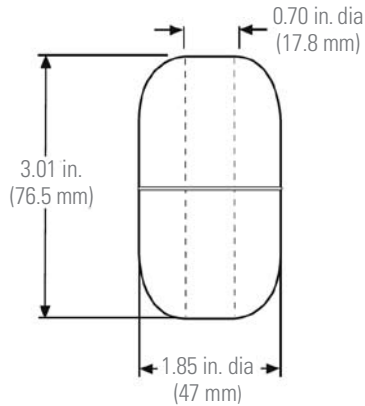


## DIMENSIONAL DRAWINGS – Inches (mm)



**General Transmitter & Sensor Dimensions**

## STANDARD FLOATS



**Maximum Pressure = 400psig**  
**Maximum Temperature = 257°F**

**Level Float**

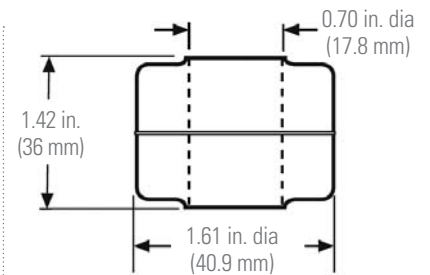
Part Number: 251981-1 (316L SS)  
 251981-3 (Hastelloy-C®)  
 Minimum Specific Gravity: 0.65 (316L SS)  
 0.70 (Hastelloy-C)

**Interface Float: (Sink ≤ 0.89 S.G.; Float ≥ 1.00 S.G.)**

Part Number: 251982-1 (316L SS)  
 251982-3 (Hastelloy-C)

**Interface Float: (Sink ≤ 1.00 S.G.; Float ≥ 1.12 S.G.)**

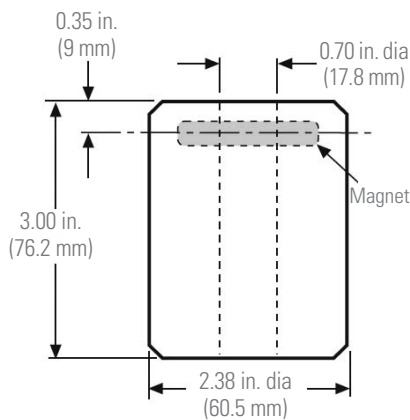
Part Number: 251983-1 (316L SS)  
 251983-3 (Hastelloy-C)



**Maximum Pressure = 100psig**  
**Maximum Temperature = 257°F**  
**Material: 316L SS**

**Level Float**

Part Number: 200938-1  
 Minimum Specific Gravity: 0.74



**Maximum Pressure = 15psig**  
**Maximum Temperature = 100°F**  
**Material: Teflon®**

**Level Float**

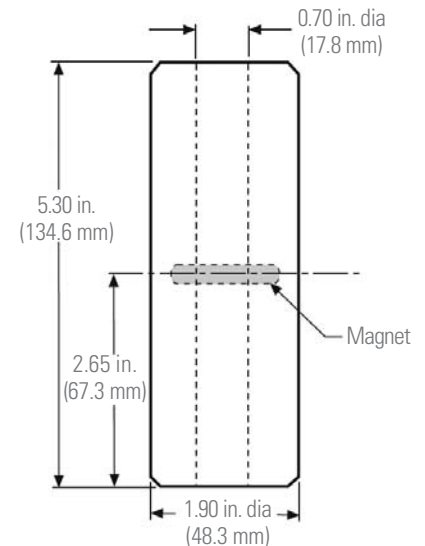
Part Number: 201109  
 Minimum Specific Gravity: 0.86

**Interface Float: (Sink ≤ 0.89 S.G.; Float ≥ 1.00 S.G.)**

Part Number: 251115

**Interface Float: (Sink ≤ 1.00 S.G.; Float ≥ 1.12 S.G.)**

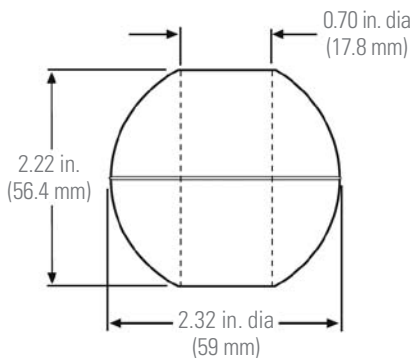
Part Number: 251116



**Maximum Pressure = 15psig**  
**Maximum Temperature = 100°F**  
**Material: Teflon®**

**Level Float**

Part Number: 251939  
 Minimum Specific Gravity: 0.86

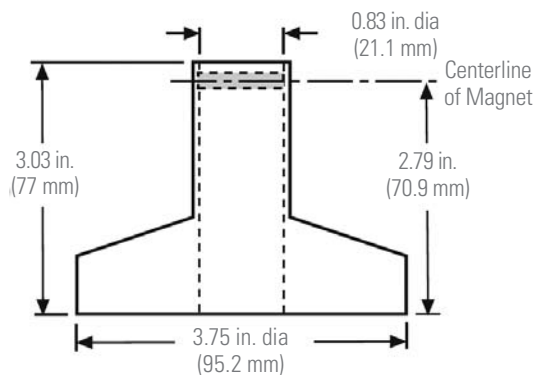


**Maximum Pressure = 300psig**  
**Maximum Temperature = 257°F**  
**Material: 316L SS**

**Level Float**

Part Number: 251387-1  
 Minimum Specific Gravity: 0.48

## NITROPHYL FLOATS



**Maximum Pressure = 275psig**  
**Maximum Temperature = 220°F**  
**Material: Nitrophenyl**

**Level Float**

Part Number: 251239-1 *(Use with refined motor fuels, butane, propane, & LPG)*

Minimum Specific Gravity: 0.35

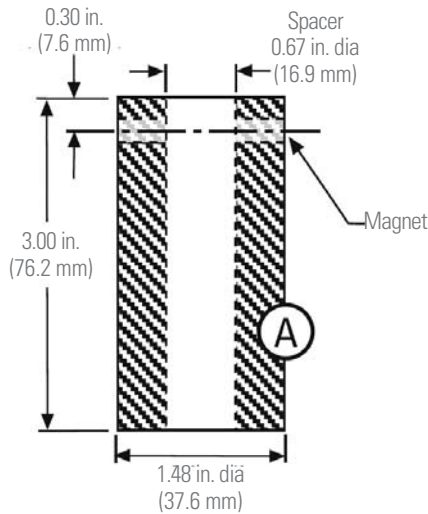
**Interface Float: (Sink ≤ 0.78 S.G.; Float ≥ 1.00 S.G.)**

Part Number: 251240-1 *(Gasoline & Water)*

**Interface Float: (Sink ≤ 0.88 S.G.; Float ≥ 1.00 S.G.)**

Part Number: 251241-1 *(Diesel & Water)*

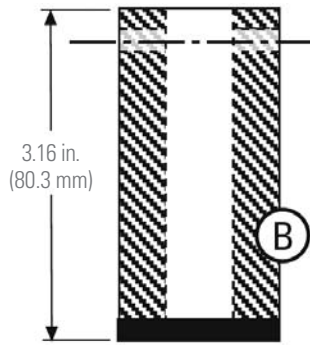
## NITROPHYL FLOATS



**Maximum Pressure = 200psig**  
**Maximum Temperature = 220°F**  
**Material: NitroPhyl**

### (A) Level Float

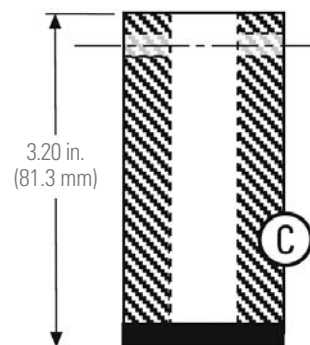
**Part Number: 201643-1**  
**Minimum Specific Gravity: 0.39**  
*Use with refined motor fuels, butane, propane, and LPG*



**Maximum Pressure = 200psig**  
**Maximum Temperature = 220°F**  
**Material: NitroPhyl**

### (B) Interface Float

**Part Number: 201650-1**  
**Sink  $\leq 0.88$  S.G.; Float  $\geq 1.00$  S.G.)**  
*Use with diesel and water*

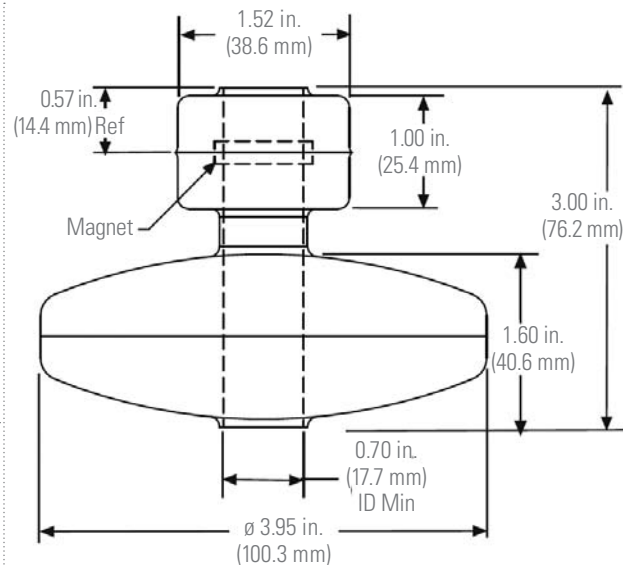
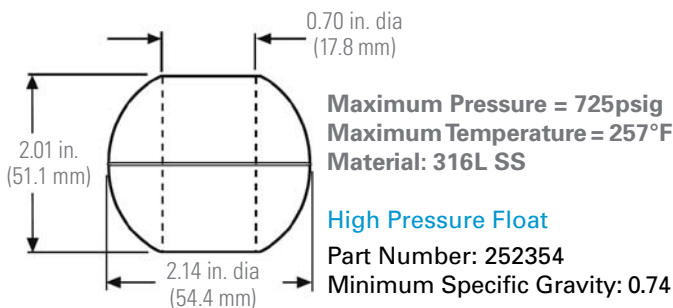
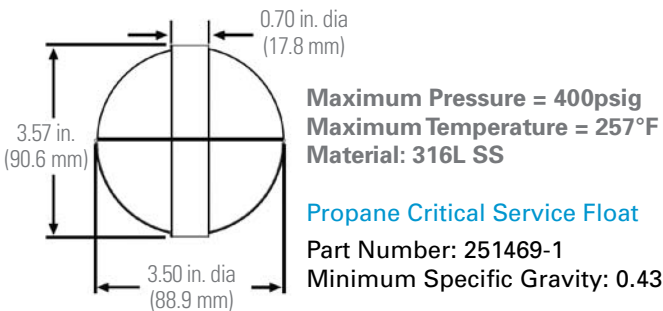


**Maximum Pressure = 200psig**  
**Maximum Temperature = 220°F**  
**Material: NitroPhyl**

### (C) Interface Float

**Part Number: 201649-1**  
**Sink  $\leq 0.77$  S.G.; Float  $\geq 1.00$  S.G.)**  
*Use with gasoline and water*

## SPECIAL FLOATS



**Maximum Pressure = 100psig**  
**Maximum Temperature = 257°F**  
**Material: 316L SS**

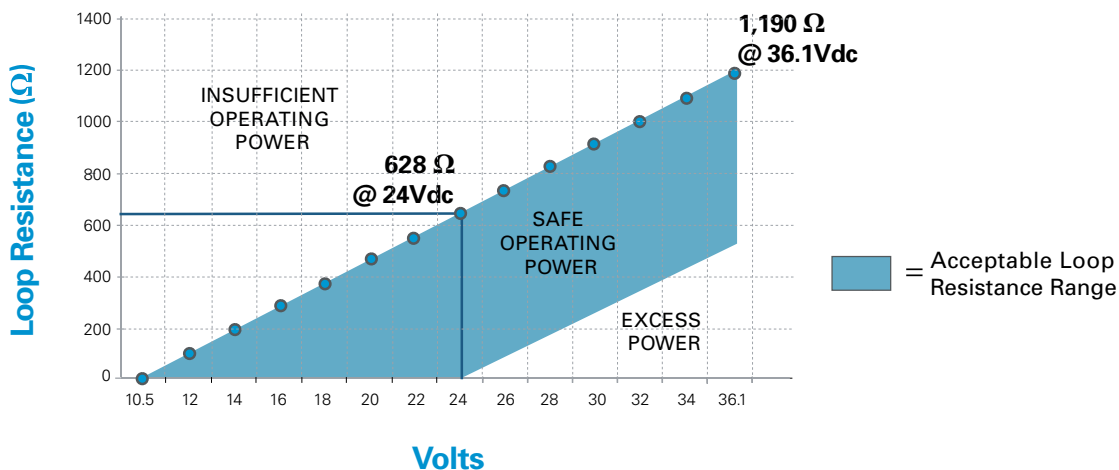
### Low Lift-Off Float

**Part Number: 252228-3**  
**Minimum Specific Gravity: 1.00**

## PRODUCT SPECIFICATIONS

Description		Specification
Measured Variables		Level, Interface, Temperature
Power Supply		10.5 – 36.1Vdc; 24Vdc nominal
Operator Interface (Optional)	Data Entry	3-button keypad
	Display	16 character
Output		One or Two 4-20mA loops; HART® Communications
Error Indication		3.8mA or 21.5mA; field selectable
Humidity		0 – 100%; non-condensing
<b>Level / Interface Measurement</b>		
Repeatability		±0.01% of span or 0.015", whichever is greater
Linearity		±0.020% of span or 0.032", whichever is greater
Measurement Range (Sensor Length)		20" – 300" (508mm – 7620mm)
Zero Adjust Range		Anywhere within the sensor active length
Temperature Range	Electronics	-30°F to 160°F (-34°C to 71°C)
	Sensor	-40°F to 257°F (-34°C to 125°C)
Span Adjust Range		Span ≥ 6.00" from zero. Zero + Span ≤ 300" (7620mm)
<b>Temperature Measurement</b>		
Type		1,000Ω Platinum RTD @ 0°C
Accuracy		±2.7°F (±1.5°C)
Repeatability		±0.18°F (±0.1°C)
Drift		±0.9°F (±0.5°C) per year
Zero Adjust Range		-40°F to 255°F (-40°C to 124°C)
Span Adjust Range		45°F (7.2°C) minimum; 255°F (124°C) maximum

## LOOP RESISTANCE



### HOW TO PROCEED

Selecting a new KENCO Magnetostrictive Transmitter for your application is a snap!

1. Contact your local Kenco Engineering Representative.
2. Discuss your application.
3. Request a quote

An experienced Applications Engineer will evaluate your application, and select the best transmitter to meet your needs.

Represented by:

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