

WIRING

CONNECTIONS

Voltage Output:

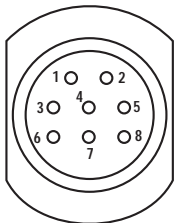
Pin No.	Wire Color	Function
1	Blue	0 to 10 Vdc (Note 1)
2	Green	Return for Pin 1
3	Yellow	10 to 0 Vdc (Note 2)
4	Orange	Return for Pin 3
5	Red	Customer Supplied Power (+ Vdc)*
6	Black	DC Ground
7	Drain Wire	Shield Drain Wire (Note 3)
8	N/C	N/C

Current Output:

Pin No.	Wire Color	Function
1	Blue	4 to 20 mA, 0 to 20 mA 20 to 4 mA, or 20 to 0 mA
2	Green	Return for Pin 1
3	Yellow	N/C
4	Orange	N/C
5	Red	Customer Supplied Power (+ Vdc)*
6	Black	DC Ground
7	Drain Wire	Shield Drain Wire (Note 3)
8	N/C	N/C

Digital Output:
(PWM or Start/Stop)

Pin No.	Wire Color	Function (PWM)
1	Blue	(-) Gate for PWM, (-) Stop for Start/Stop
2	Green	(+) Gate for PWM, (+) Stop for Start/Stop
3	Yellow	(-) Interrogation for PWM, (-) Start for Start/Stop
4	Orange	(+) Interrogation for PWM, (+) Start for Start/Stop
5	Red	Customer Supplied Power (+ Vdc)*
6	Black	DC Ground
7	Drain Wire	Shield Drain Wire (Note 3)
8	N/C	N/C



8-Pin Integral or Hanging Connector (male profile)
Connection Type 'C', 'H', or 'J'

- Mating Accessories:
- P/N 251135 Field Installable Connector
 - Extension Cables

* Power requirements are stroke length dependent.
+ 13.5 to 26.4 Vdc (± 0%): Stroke lengths ≤ 1525 mm (60 in.)
+ 24 Vdc (± 10%): Stroke lengths > 1525 mm (60 in.)

NOTES:

1. Output = 0 Vdc when reference magnet is positioned at the electronics housing end of the sensor (forward-acting sensors).
2. Output = 10 Vdc when reference magnet is positioned at the electronics housing end of the sensor (reverse-acting sensors).
3. Shield drain wire should be isolated from DC ground (black wire) at the controller end of the cable.

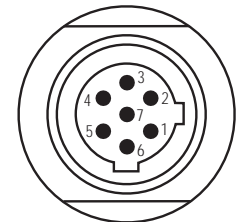
CONNECTIONS FOR 'G' STYLE MATING CABLES

RG Connector:
(PWM or Start/Stop)

Pin No.	Wire Color	Function
1	Gray	(-) Gate for PWM, (-) Stop for Start/Stop
2	Pink	(+) Gate for PWM, (+) Stop for Start/Stop
3	Yellow	(+) Interrogation for PWM, (+) Start for Start/Stop
4	Green	(-) Interrogation for PWM, (-) Start for Start/Stop
5	Red or Brown	Customer Supplied Power (+ Vdc)*
6	White	DC Ground
7	-	No Connection

RG Connector:
(Voltage or Current Output)

Pin No.	Wire Color	Function
1	Gray	0 to 10 Vdc 4 to 20 mA or 0 to 20 mA
2	Pink	Return for Pin 1
3	Yellow	10 to 0 Vdc 20 to 4 mA or 20 to 0 mA
4	Green	Return for Pin 3
5	Red or Brown	Customer Supplied Power (+ Vdc)*
6	White	DC Ground
7	-	No Connection



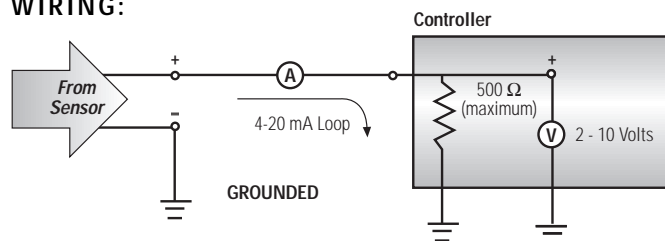
'G' Connector
(Molded Mating
Extension Cable Required)

NOTES:

1. When wiring Tempsonics L Series LP sensors equipped with a 'G' style connector, **do not connect DC ground to the cable shield or drain wire.**
- 2.) For single-ended interrogation, the unused interrogation lead must be connected to DC ground.
- 3.) When using PWM with internal interrogation, both interrogation leads must be connected to DC ground.
- 4.) Minimum load impedance for voltage outputs is 5K Ω.

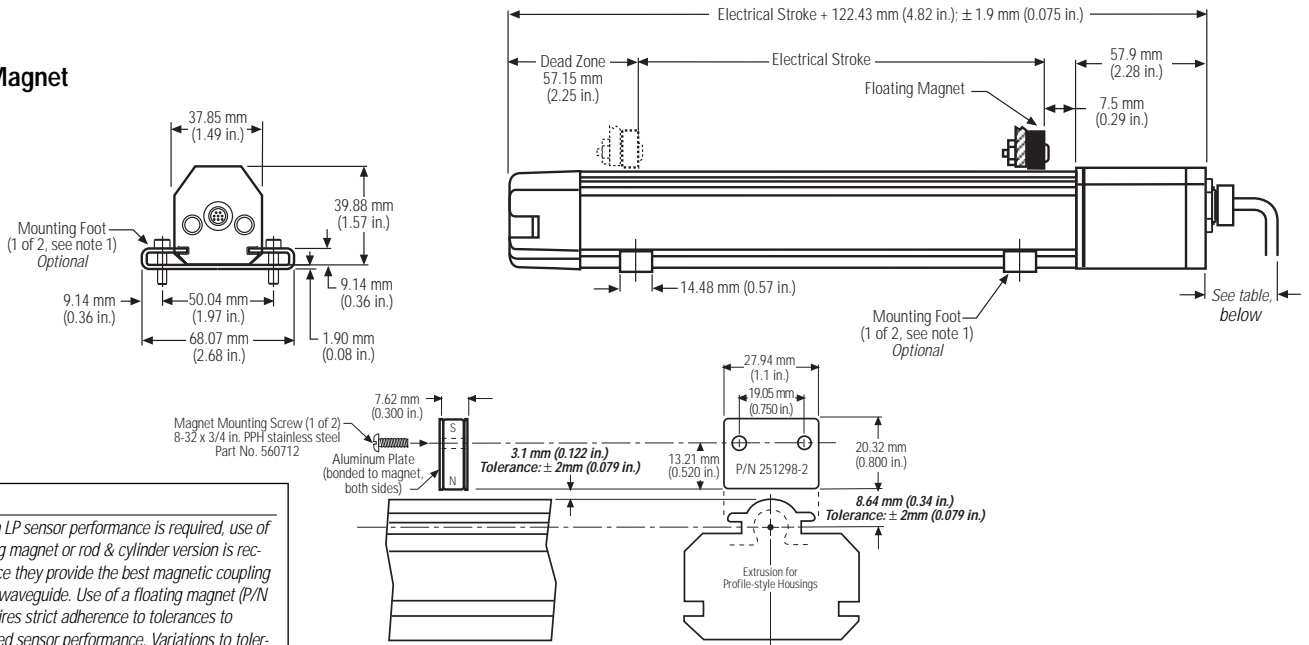
* Power requirements are stroke length dependent.
+ 13.5 to 26.4 Vdc (± 0%): Stroke lengths ≤ 1525 mm (60 in.)
+ 24 Vdc (± 10%): Stroke lengths > 1525 mm (60 in.)

TYPICAL 4-20 mA WIRING:



DIMENSIONS

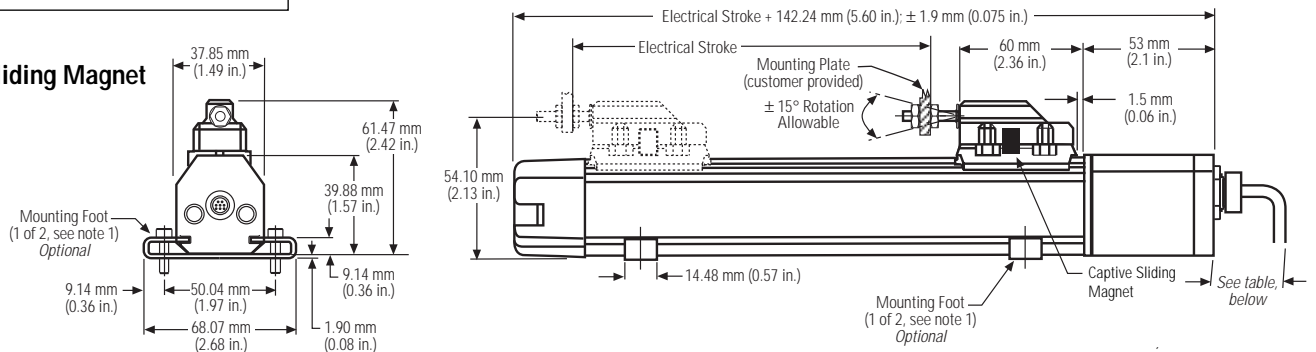
Floating Magnet



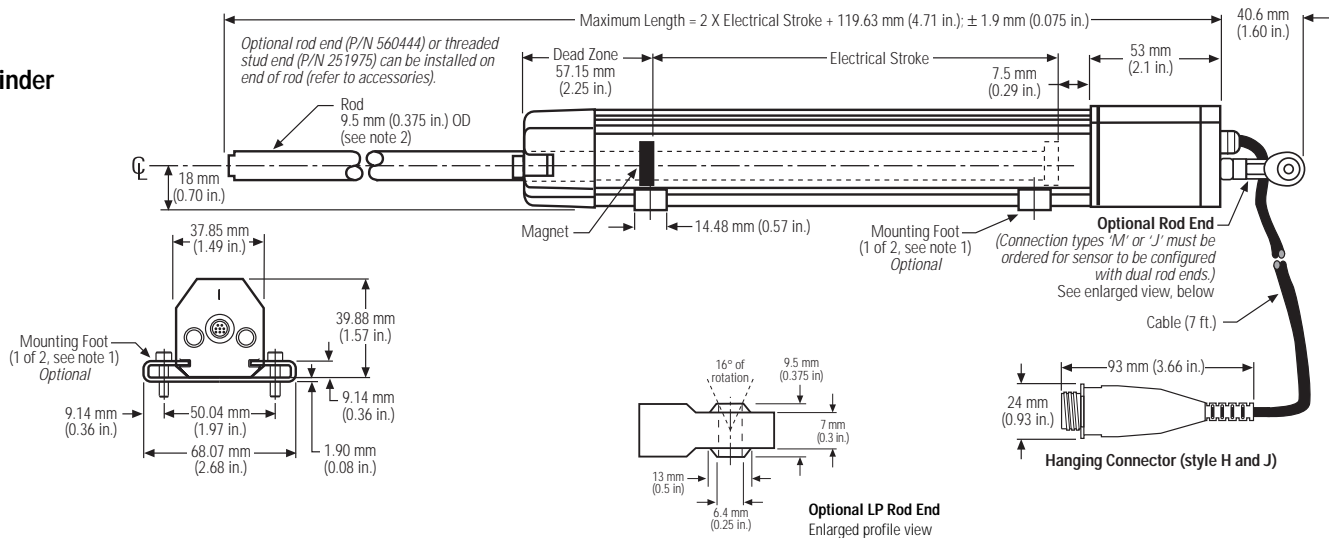
CAUTION:

When optimum LP sensor performance is required, use of a captive sliding magnet or rod & cylinder version is recommended since they provide the best magnetic coupling to the sensor's waveguide. Use of a floating magnet (P/N 251298-2) requires strict adherence to tolerances to achieve specified sensor performance. Variations to tolerances will result in reduced performance.

Captive Sliding Magnet



Rod & Cylinder



NOTES:

- Standard mounting feet shown. Low profile feet optional. Refer to P/N 400802 or P/N 400867 on the accessory page for detailed dimensional information.
- Proper mounting and alignment of sensor is critical to ensure normal operation.

CONNECTOR DIMENSIONS (includes cable bend)

- 'G' Connector w/ Straight Exit 'RG' Mating Connector: 61 mm (2.4 in.)
- 'G' Connector w/90° 'RA' Mating Connector: 34 mm (1.35 in.)
- 'C' Integral Connector w/Mating Connector: 114.3 mm (4.5 in.)
- 'H', 'J', 'L', and 'M' Integral Cables: 20 mm (0.8 in.)

MODEL NUMBER GUIDE

Optional



SENSOR MODEL _____
LP = Profile Style Sensor (mounting feet included, Note 1)

MAGNET CONFIGURATION _____
S = Captive Sliding Magnet
 (provided with #10-32 threads when stroke length is defined in inches;
 provided with M5 threads when stroke length is defined in millimeters)
D = Captive Sliding Magnet (for Die Cast)
 Additional rod end (P/N 560444) is required, order separately
Consult Applications Engineering before ordering.
M = Floating Magnet (P/N 251298-2, included with sensor)
R = Rod & Cylinder

CONNECTION TYPE _____
C = Integral Connector (mating connector ordered separately)
G = 7-pin Micro connector (CE approved)
L = Cable (7 ft.) with pigtail connection
M = Cable (7 ft.) with pigtail connection; configured for dual rod ends,
 kit included - P/N 251411
H = Cable (7 ft.) with attached connector
J = Cable (7 ft.) with attached connector; configured for dual rod ends,
 kit included - P/N 251411

OUTPUT _____
S = Start/Stop
P = Pulse-width Modulated (See 'PWM Output' for options, below)
V = Voltage (0 to +10 Vdc or +10 to 0 Vdc)
A = 4 to 20 mA
B = 20 to 4 mA
C = 0 to 20 mA
D = 20 to 0 mA

UNIT OF MEASURE _____
U = US customary (inches and tenths: xxx.x in.)
M = Metric (millimeters: xxxx mm)

LENGTH (see Notes 2 & 3) _____
 ___ . ___ = Inches and tenths (Encode length in 1.0 in. increments)
 or
 ___ ___ millimeters (Encode length in 5 mm increments)

INPUT VOLTAGE _____
1 = +13.5 to 26.4 Vdc ($\pm 0\%$): Strokes ≤ 1525 mm (60 in.)
2 = +24 Vdc ($\pm 10\%$) for strokes > 60 inches

PWM OUTPUT _____
 Complete the following only if Output style 'P' is selected, above
00 $\frac{\text{a}}{\text{b}}$ $\frac{\text{c}}$ = PWM Output (Fill in the three blanks with the following codes)

a) Interrogation **b, c) Circulations**
E = External ___ = desired number of circulations (see tables A and B)
I = Internal

NOTES:

- Standard mounting feet (P/N 400802) are included with Temposonics LP sensors with connection types C, L, or H (not provided with connection types M or J).
- Standard Temposonics LP stroke lengths: 3, 6, 9, 12, 15, 18, 21, 24, 30, 36, 42, 48 inches.
- Non-standard lengths are available in 1 inch increments up to 144 inches (analog units are limited to 78 inches) except for rod and cylinder versions which are limited to a maximum stroke length of 48 inches (1225 mm). Additional lead time may be required for non-standard lengths.
- Standard extension cable lengths available.

RETROFIT NOTE:

Please consult an MTS applications engineer before retrofitting an original Temposonics LP that is being used with a Temposonics accessory product such as an AOM, TDU100, MK292, etc.

Stroke Length Limitations:

Sensors with analog output: 78 in. (2000 mm).
 Sensors with digital output: 144 in. (3650 mm).
 Rod & Cylinder sensors: 48 in. (1225 mm).

Table A

Circulation Count vs. Resolution for PWM Output (Based on 28 MHz counter)	
Resolution	Circulation Count*
0.00026	15
0.0005	8
0.001	4
0.002	2
0.004	1

Table B

Maximum Stroke per Circulation Count for PWM Output w/Internal Interrogation	
Maximum Stroke	Circulation Count
84 inches	15
96 inches	4
108 inches	2
144 inches	1

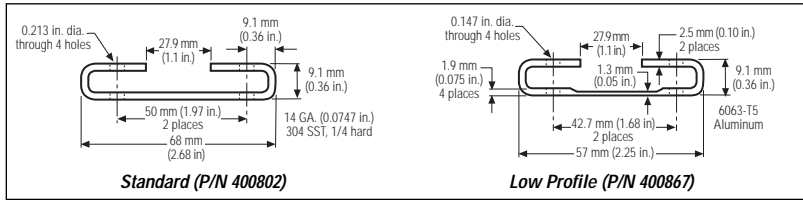
* Maximum circulation count is limited by stroke length for sensors configured for internal interrogation. (Refer to Table B for stroke length limitations.)

SPECIFICATIONS

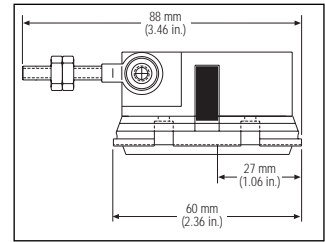
PARAMETER	SPECIFICATION
Measured Variable:	Displacement
Resolution:	<i>Analog:</i> Infinite <i>Digital:</i> $1 \div [\text{gradient} \times \text{crystal freq. (mHz)} \times \text{circulation}]$; maximum resolution: 0.006 mm or 0.00025 in.
Non-Linearity:	<i>Captive Slide:</i> $\pm 0.02\%$ or ± 0.127 mm (0.005 in), whichever is greater <i>Rod & Cylinder and Floating Magnet:</i> $\pm 0.02\%$ or ± 0.152 mm (0.006 in), whichever is greater
Repeatability:	Equal to resolution
Hysteresis:	< 0.02 mm (0.0008 inches)
Outputs:	<i>Analog:</i> Voltage or Current; <i>Digital:</i> Start/Stop or PWM
Measuring Range:	<i>Analog:</i> 25 to 2000 mm (1 to 78 in.); <i>Digital:</i> 25 to 3650 mm (1 to 144 in.) [Rod & Cylinder version: max length = 1220 mm (48 in.)]
Operating Voltage:	+ 13.5 to 26.4 Vdc ($\pm 0\%$); Strokes ≤ 1525 mm (60 in.); + 24 Vdc ($\pm 10\%$); Strokes > 1525 mm (60 in.)
Power Consumption:	100 mA
Operating Temperature:	<i>Head Electronics:</i> - 40 to 70°C (- 40 to 158°F); <i>Sensing Element:</i> - 40 to 105°C (- 40 to 221°F)
EMC Test:	DIN EN 50081-1 (Emissions); (<i>G' style connector only</i>) DIN EN 50082-2 (Immunity)
Shock Rating:	100 g (single hit)/IEC standard 68-2-27 (survivability)
Vibration Rating:	5 g/10-150 Hz/IEC standard 68-2-6
Update Time:	<i>Analog:</i> < 1 ms; <i>Digital:</i> Minimum = [Stroke (specified in inches) + 3] x 9.1 μ s
Housing Style/Enclosure:	Aluminum profile; drip, dust, and rust resistant; 'G' style connection meets IP 67 rating
Magnet Type:	Floating magnet, captive sliding magnet, rod & cylinder

The above specifications are assuming that output ripple is averaged by the measuring device as with any typical analog device. Specifications are subject to change without notice. Contact MTS to confirm specifications that are critical to your application.

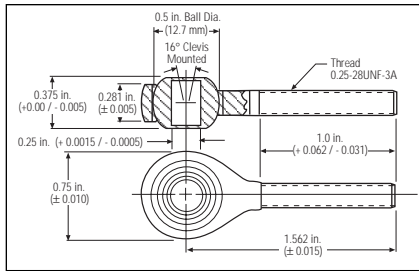
ACCESSORIES



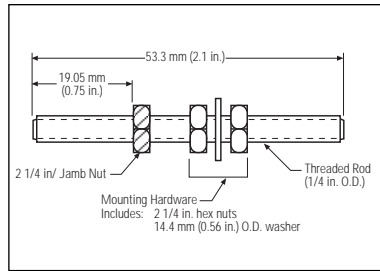
Mounting Feet



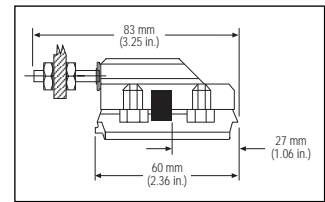
Captive Sliding Magnet (P/N 252092) for die cast applications



Threaded Rod End (P/N 560444)



Threaded Stud End (P/N 251975)



Captive Sliding Magnet (P/N 252052 & 252053)



SENSORS
GROUP

Pioneers,
Innovators,
Leaders in
Magnetostrictive
Sensing

UNITED STATES
MTS Systems Corporation
 Sensors Division
 3001 Sheldon Drive
 Cary, NC 27513
 Tel: 800.633.7609
 Fax: 919.677.0200
 Email: info@tempsonics.com
 Web: www.tempsonics.com

GERMANY
MTS Systems Corporation
 Sensors Technologie
 Auf dem Schuffel 9, D-58513 Lüdenscheid, Germany
 Postfach 8130 D-58489 Lüdenscheid, Germany
 Tel: + 49.2351.95870
 Fax: + 49.2351.56491
 Web: www.mtssensor.de

JAPAN
MTS Systems Corporation
 Sensors Technologie, Japan
 Ushikubo Bldg.
 737 Aihara-cho, Machida-shi
 Tokyo 194-0211, Japan
 Phone: + 81 (42) 775.3838
 Fax: + 81 (42) 775.5512

