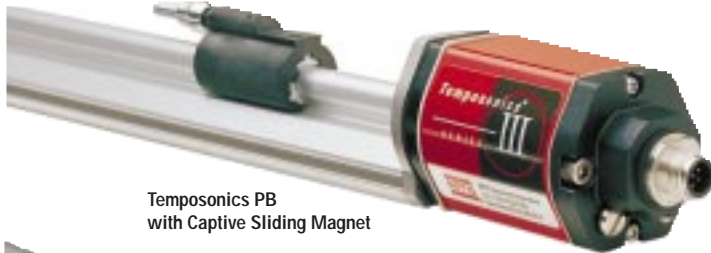
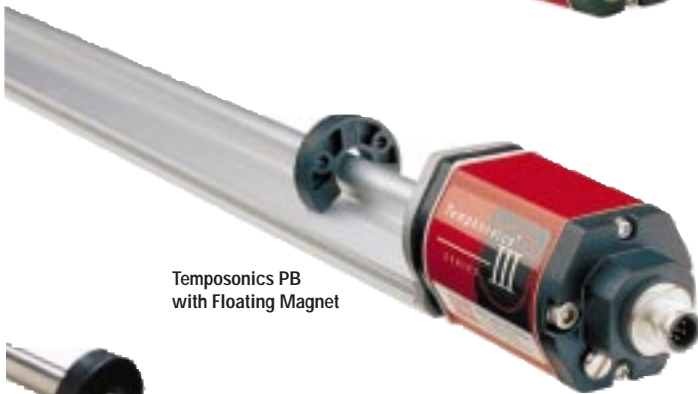


Product Specifications



Temposonics PB  
with Captive Sliding Magnet



Temposonics PB  
with Floating Magnet



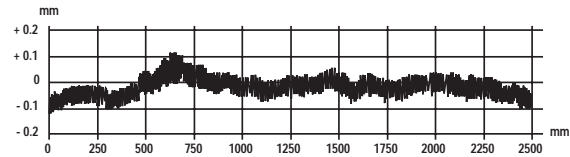
Temposonics RH

Features

- Digital communication architecture
- Sensor-based intelligence & diagnostics
- High-speed 2-wire data transmission
- Superior resolution and repeatability
- Modular, non-contacting design
- Field replaceable sensor cartridge (Model RH only)
- 2-year warranty
- CE Certified

PARAMETER SPECIFICATION

Measured Variable:	Displacement, velocity
Resolution:	Up to 0.002 mm
Non-Linearity:	< ± 0.01% of full stroke or ± 0.04 mm, whichever is greater



Example: Sensor Type: Temposonics PB  
Measuring Range: 2500 mm  
Non-linearity (measured): ± 0.116 mm

Repeatability:	< ± 0.001% of full scale or ± 0.0025 mm, whichever is greater
Hysteresis:	< 0.004 mm
Output:	CANbus
Data Protocol:	MTS protocol
Baud Rate:	1 Mbit/sec. maximum
Measuring Range:	Profile Style Sensors (PB): 50 to 5000 mm (2 to 196 in.) Rod Style Sensors (RH): 50 to 7600 mm (2 to 300 in.)
Operating Voltage:	+24 Vdc (+ 20%, - 15%)
Power Consumption:	100 mA typical
Operating Temperature:	Head Electronics: - 40 to 75°C (- 40 to 167°F) Sensing Element: - 40 to 105°C (- 40 to 221°F)
EMC Test:	DIN IEC 801-4, Type 4, CE Qualified DIN EN 50081-1 (Emissions), 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:	≤ 1 ms typical (length dependent)

PROFILE STYLE (PB MODEL)

Electronic Head:	Aluminum die-cast housing
Sensor Stroke:	Aluminum profile
Sealing:	Electronics Head: IP 67 Extrusion: IP 65
Mounting:	Adjustable mounting feet or T-slot M5 nut in base channel
Magnet Type:	Captive sliding magnet or floating magnet

ROD STYLE (RH MODEL)

Electronic Head:	Aluminum die-cast housing
Sensor Rod with Flange:	304L Stainless steel
Operating Pressure:	350 bar, 530 bar peak (5000 psi static; 10,000 psi spike)
Maximum Hex Torque:	45 nM (33.19 ft. lbs.)
Sealing:	IP 67
Mounting:	M18 x 1.5 or 3/4-16 UNF-3A
Magnet Type:	Ring magnet



Specifications are subject to change without notice. Consult the factory for specifications critical to your needs.

## TEMPOSONICS III SENSORS WITH CANBUS OUTPUT

“Smart” Temposonics® III Series position sensors with CANbus interface expand the functionality of position sensors. CANbus interface consists of multiple microprocessors distributed in a “Control Area Network” and built around a “bus” architecture in which several computer components share a

digital communications pathway. CANbus provides precise, fast, and reliable data processing for high-speed control in industrial automation applications—at a speed twice as fast as DeviceNet™ (1000 kbits/second vs. 500 kbits/second). Other benefits of CANbus include simplified wiring, sensor-based

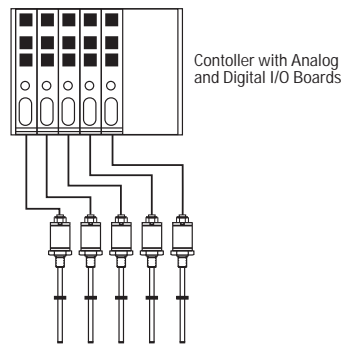
diagnostics, and easy expandability.

Temposonics III sensors offer modular construction and non-contacting magnetostrictive technology. Two application housings are available: rod-style (Model RH) and profile style (Model PB). With the RH sensors, the sensor cartridge can be quickly replaced in the field.

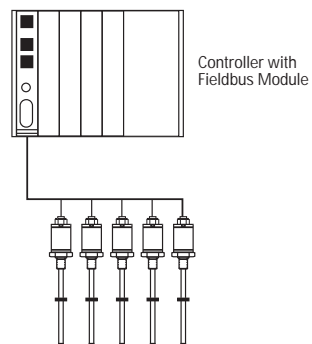
## CANBUS INTERFACE

Controller Area Network (CAN) is standard for device level communications. It provides high speed transmission appropriate for position indication and high-speed motion control in industrial applications. CAN is a serial bus system for networking smart sensors, actuators, and subsystems.

Temposonics III sensors with CANbus communication capability provide for fast, high-precision position measurements via a high speed, reliable bus system. The microprocessor in this smart sensor uses position values and their timebase to calculate velocity as well as to memorize set points.



**Conventional System:**  
Unidirectional communication,  
One cable per sensor



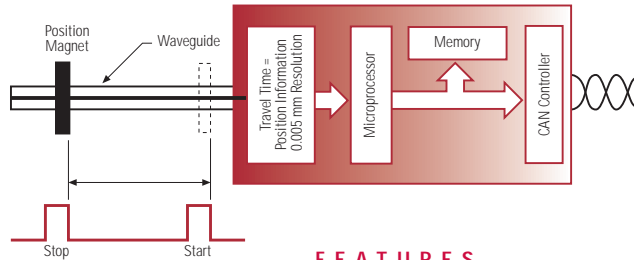
**CANbus System:**  
Bidirectional communication,  
one cable for all sensors (bus)

The synchronized position values are easily obtained via a broadcast message using the MTS CANbus protocol or Allen Bradley’s Device Net® protocol.

## FUNCTION

Temposonics III sensors with CANbus capability are microprocessor-based and transmit the complete displacement value data directly to a machine controller. CANbus functionality is used for position data, programmable set points, status, and velocity.

Resolution is 2 microns at a maximum of 7500 measurements per second (length dependent). Also, displacement outputs are absolute which means that position information is immediately available upon power loss recovery.



## FEATURES

- High speed 2-wire data transmission
- Sensor-based intelligence, built-in diagnostics
- Priority adjustability
- 2 micron resolution
- Easy expandability
- Position and velocity data available

## CANBUS PROTOCOL

Basic CAN protocol is illustrated at right. The base protocol includes 44 bits of overhead with 8 bytes (64 bits) being allocated to variable or “applications” data.

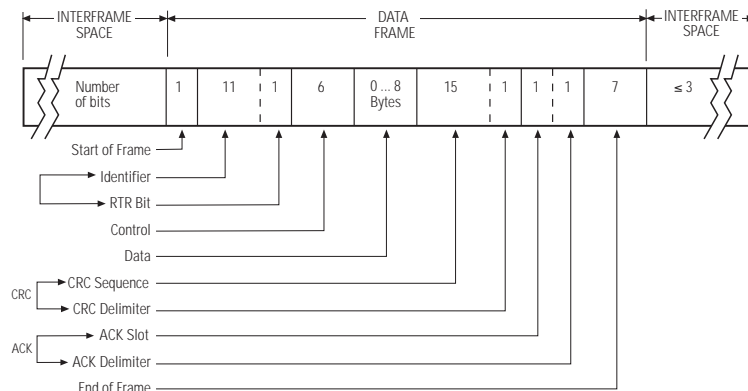
Standard MTS protocol\* includes:

- **Status**
- **5 Set Points**
- **Position, One (1) magnet**
- **Velocity, Via position magnet**

For OEM applications, the applications data can be customized from the following selections:

- **Position**  
*Resolution up to 0.002 mm*
- **Velocity**  
*Resolution 0.1 mm or 1 mm/s*
- **Point Control**  
*Five (5) set points maximum*
- **Motion Profile Capture (future)**  
*Displacement vs. time*

- **Velocity Profile Capture (future)**  
*Velocity vs. time*
- **Multiple Magnet Measurement**  
*The position of multiple magnets on a single sensor are detected and transmitted via CANbus. A distance of 3 inches (76.2 mm) between each magnet must be maintained. Resolution is up to 0.002 mm.*



**Abbreviations:**  
**RTR** - Remote Transmission Request  
**CRC** - Cyclic Redundancy Code  
**ACK** - Acknowledge

## BENEFITS

- High baud rate (up to 1Mbit/sec.)
- Up to 32 devices per bus system
- 2-wire data transfer
- Reliable data processing
- Mode selection

\* Programming details for MTS protocol are available in a separate document, contact your MTS Sensors Division representative.



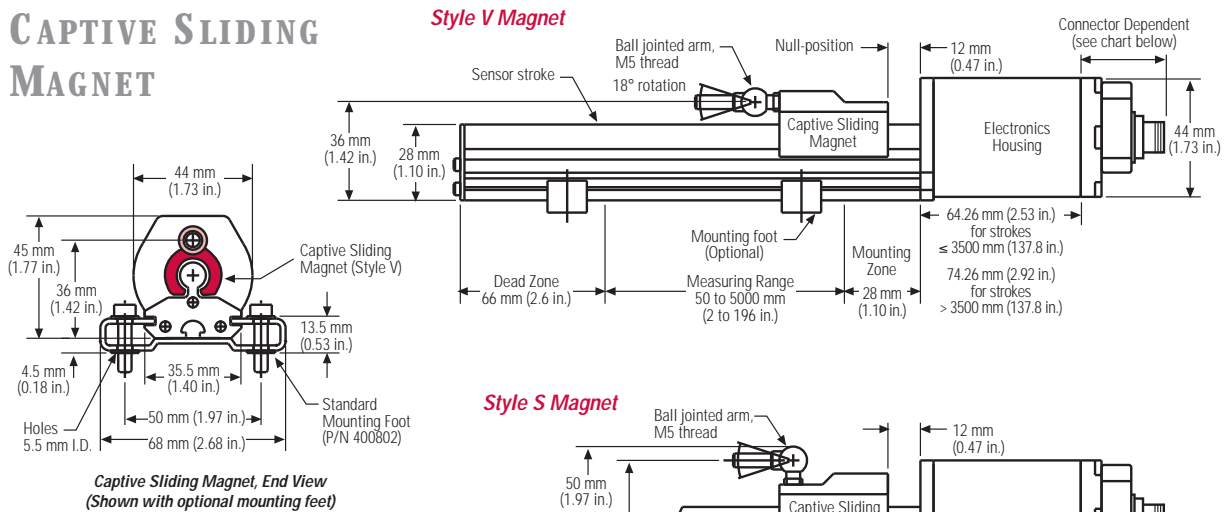
# DIMENSIONS / TEMPOSONICS PB

## PROFILE-STYLE (Model PB)

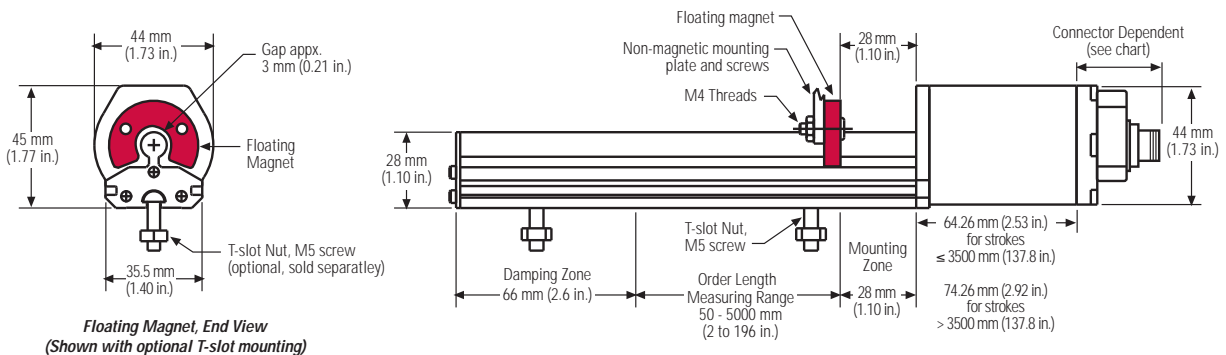
Tempsonics PB low profile-style position sensors offer modular construction, flexible mounting configurations, and easy installation. A choice of two magnet mounting configurations are available with the low profile housing: captive sliding magnet or floating magnet.

Tempsonics PB sensors are effective in applications where space is an issue and in environments where there are high levels of dust and contamination. In addition, low profile Tempsonics PB sensors are designed for external mounting on machines and can be configured with a variety of connector options.

## CAPTIVE SLIDING MAGNET



## FLOATING MAGNET

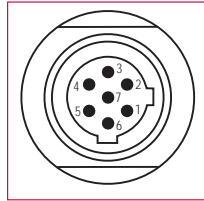


# WIRING

## CONNECTIONS

### RG Connector

Pin No.	Wire Color	Function
1	Gray	CAN-L
2	Pink	CAN-H
3	Yellow	No Connection
4	Green	No Connection
5	Red or Brown	Customer Supplied Power (+ Vdc)
6	White	DC Ground
7	-	No Connection



RG Connector

### P\_ \_ Integral Cable

Wire Color	Function
Gray	CAN-L
Pink	CAN-H
Yellow	No Connection
Green	No Connection
Red or Brown	Customer Supplied Power (+ Vdc)
White	DC Ground

### CAUTION!

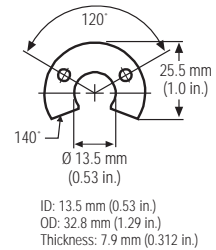
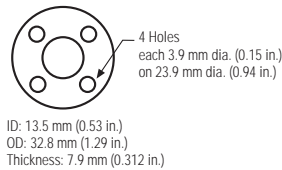
When wiring Temposonics III sensors, **DO NOT** connect DC ground to the cable shield or drain wire.

## MAGNETS

Magnets must be ordered separately with Temposonics RH sensors. The standard ring magnet (P/N 201542) is suitable for most applications.

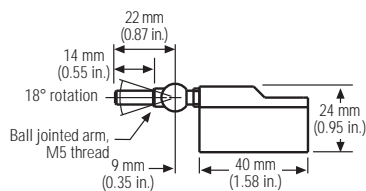
Magnets are included with the order of Temposonics PB sensors. Temposonics PB can be configured with one of two magnet configurations: captive sliding magnet or floating magnet. There are two styles of captive sliding magnet, and one style of floating magnet.

### Part No. 201542

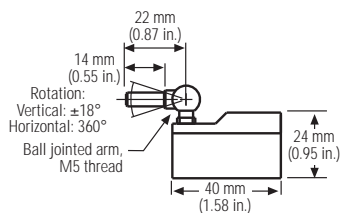


ID: 13.5 mm (0.53 in.)  
OD: 32.8 mm (1.29 in.)  
Thickness: 7.9 mm (0.312 in.)

**Floating Magnet**  
(May be used with  
Temposonics RH and PB  
Part No. 251416)



Captive Sliding Magnet, Style V  
Part No. 252111-1



Captive Sliding Magnet, Style S  
Part No. 252110-1

# HOW TO ORDER

When placing an order, build the desired model number using the model number guide (right). A wide range of Temposonics III sensor configurations are available to meet the demands of your particular application. See the next page for how to order extension cables and accessories.

If you have any questions about how to apply MTS Temposonics III position sensors, please contact one of our Application Engineers or your local MTS distributor—they are available to help you design an effective position sensing system to fit your application.

## POSITION SENSORS

**SENSOR MODEL** \_\_\_\_\_  
**RH** = Hydraulic Rod Style  
**PB** = Low-Profile Style

**HOUSING STYLE** \_\_\_\_\_  
*Temposonics RH only (magnet must be ordered separately):*  
**T** = US customary threads, raised-faced hex, and pressure tube  
**S** = US customary threads, flat-faced hex, and pressure tube  
**M** = Metric threads, flat-faced hex, and pressure tube  
**N** = Metric threads, raised-faced hex, and pressure tube  
**B** = Sensor cartridge only (*No application housing, stroke lengths ≤ 72 in.*)  
*Temposonics PB only (magnet included):*  
**M** = Floating Magnet, (Open ring: 140°)  
**S** = Captive sliding magnet with joint at top  
**V** = Captive sliding magnet with joint at front

**LENGTH** \_\_\_\_\_  
 - - - - - **U** = Inches and tenths (max stroke length: 300 in. (RH) or 196 in. (PB))  
 or  
 - - - - - **M** = Millimeters (max. stroke length: 7600 mm (RH) or 5000 mm (PB))  
 (Encode length in 0.5 in. or 5 mm increments)

**CONNECTION TYPE/CONNECTOR OR CABLE** \_\_\_\_\_  
*Connectors*  
**RG0** = Standard 7-pin micro connector  
*Integral Cables*  
**P** - - - = Integral Cable, Standard  
*Cable Length*  
 - - - = Encode in feet if using US customary stroke length,  
 encode in meters if using metric stroke length  
 Range: 1 (01) to 99 (99) ft. or 1 (01) to 30 (30) meters

**INPUT VOLTAGE** \_\_\_\_\_  
**1** = +24 Vdc (+20%, -15%)

**OUTPUT** \_\_\_\_\_  
**C** a b c d e f = CANbus Output (*Fill in the six blanks with the following codes*)

a) Hardware	b, c) CANbus Protocol Code	d) Baud Rate	e) Resolution	f) Cycle Time
1 = MTS Protocol	01 = MTS Protocol	1 = 1000 Kbits/s 2 = 500 Kbits/s 3 = 250 Kbits/s 4 = 125 Kbits/s	1 = 0.005 mm 2 = 0.002 mm	1 = Standard

## PRESSURE HOUSING (RH Only)

**SENSOR CONNECTION TYPE** \_\_\_\_\_  
**S** = US customary threads, flat-faced hex  
**T** = US customary threads, raised-face hex  
**M** = Metric threads, flat-faced hex  
**N** = Metric threads, raised-face hex

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

**LENGTH** \_\_\_\_\_  
 - - - - - = Inches and tenths (2 to 72 inches) or  
 - - - - - = Millimeters (50 to 1825 mm)

## EXTENSION CABLES

**SENSOR CONNECTION TYPE** \_\_\_\_\_  
**FG** = Mating connector for Temposonics III sensors with RG connector (straight exit)  
**FA** = Mating connector for Temposonics III sensors with RG connector (90° exit)

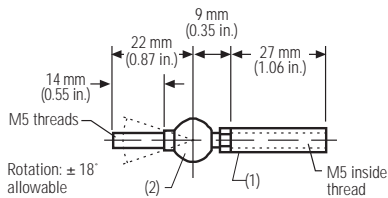
**CABLE LENGTHS** \_\_\_\_\_  
**005** = 5 ft.  
**015** = 15 ft.  
**025** = 25 ft.  
**050** = 50 ft.  
**100** = 100 ft.

**CABLE TERMINATION** \_\_\_\_\_  
**P0** = Pigtail connection

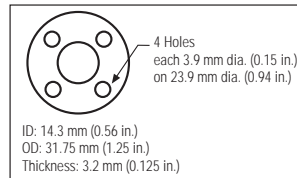
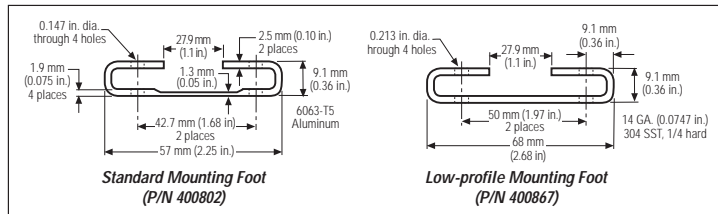
# HOW TO ORDER (cont.)

## ACCESSORIES

Description	Part No.	Notes
O-Ring (spare)	560315	For use with Temposonics RH sensors
Hex Jam-nut (w/ 3/4-16 UNF threads)	500015	For use with Temposonics RH sensors
Hex Jam-nut (w/ M18x 1.5 threads)	500018	For use with Temposonics RH sensors
RG Field-installable Connector	401366	
Magnet Spacer	400633	For use with standard ring magnet P/N 201542
Magnet Mounting Screws	560357	Used to mount standard ring magnet P/N 201542 (4 screws required) and 90° cutout magnet 201552 (2 screws required)
140° Cut-out Floating Magnet	251416	Spare for Temposonics PB sensors
Captive Sliding Magnet, Style V	252111-1	Spare for Temposonics PB sensors, Rod joint at front of magnet
Captive Sliding Magnet, Style S	252110-1	Spare for Temposonics PB sensors, Rod joint at top of magnet
Joint Rod Sleeve	401603	Optional accessory for Temposonics PB sensors
Ball Jointed Arm	401600-1	Optional accessory for Temposonics PB sensors
Power Supply (24/28 Vdc, 0.5 A)	380009	
Mounting Feet, Standard (spares for PB sensors)	400802	Temposonics PB position sensors are provided with a set of mounting feet
Mounting Feet, Low Profile (spares for PB sensors)	400867	
T-slot M5 Nut	401602	Optional accessory for mounting Temposonics PB sensors
Cable	530026	Specify length in feet at time of order



**Joint Rod**  
 (1) Sleeve, Part No. 401603  
 (2) Ball Jointed Arm, Part No. 401600-1



**Magnet Spacer (P/N 400633)**



**Pioneers, innovators, leaders in magnetostrictive sensing**

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 Fax: 919-677-0200  
 Website: www.temposonics.com

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