

Temposonics®

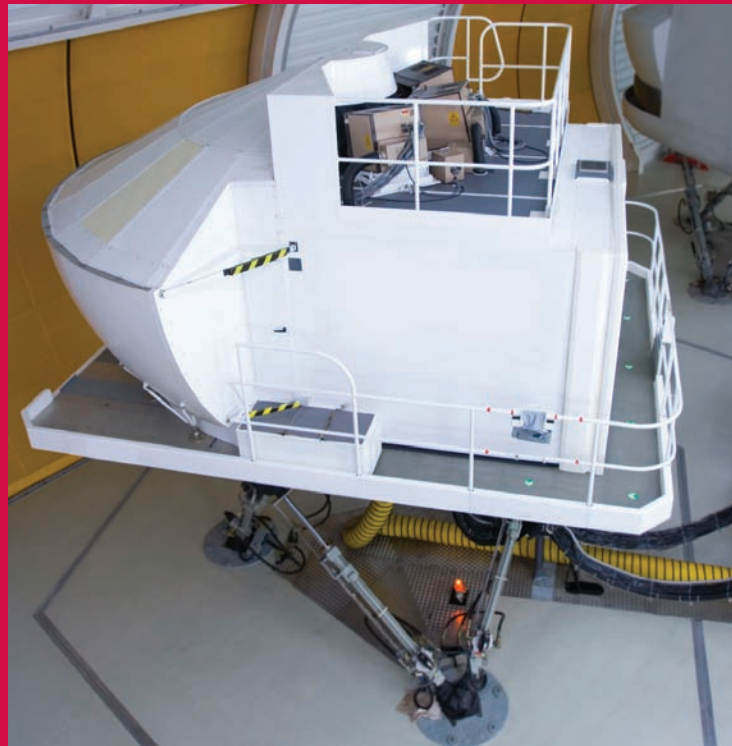
Magnetostrictive Linear-Position Sensors

Absolute, Non-contact Position Sensors for



FLIGHT SIMULATOR

TRANSDUCER REPLACEMENT



The Measurable Difference

Flight Simulation Feedback

As much as you depend on your flight simulators to train staff on the newest technology, flight simulators depend on quality position feedback. Realistic motion cues in flight simulation require high performance motion control systems with accurate and reliable feedback.

Keep a Good Thing Going

The most cost effective flight simulation solution is to keep your existing simulator running. After years of service even the best sensors eventually need replacing. MTS Sensors is pleased to introduce a proven replacement sensor from the brand that has served you well for so long. The R-Series Model RD4 sensor featuring Temposonics® technology is the ideal in-cylinder replacement for your original Temposonics sensor found in legacy flight simulators.



Temposonics R-Series Model RD4 in-cylinder Sensor

Product Overview

Model RD4 sensors with remote electronics were designed for installation into hydraulic cylinders, specifically for use in standard clevis mount cylinders or any space limited cylinder application. The pressure proof stainless-steel sensor rod with pressure-fit or threaded flange, protects the sensing element and fits into the bored piston rod. The external IP 67 industrial housing accommodates the modular electronic interface with active signal processing. The sensor rod is connected to the electronics by a very flexible cable. The cable connects either on the side, or up through the bottom of the electronics housing depending on the model used.

Model RD4 linear-position sensors provide high speed accuracy and the durability needed to provide years of quality feedback. During its introduction, the Temposonics I Series sensor was the sensor of choice for use in flight simulators because it offered good performance, superior repeatability and excellent protection against shock and vibration. The Model RD4 is much improved over Temposonics I Series, offering even more of what you have come to expect from the Temposonics brand.

Features

- Absolute linear measurement
- Diagnostic LEDs for rapid troubleshooting
- Non-contact sensing for highest durability
- Superior Accuracy: Linearity better 0.02%
- Repeatability < 0.001% of full stroke
- Direct output for displacement + velocity
- Direct Analog, SSI, CANbus, Profibus DP and EtherCAT® outputs

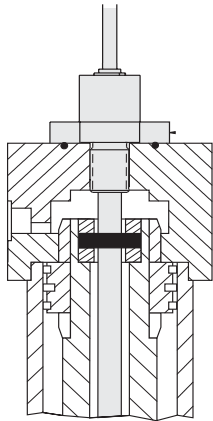
Temposonics R-Series RD4 Sensor Technical Data

Input	
Measured Variables	Displacement Velocity Multi-Position Measurement
Output	
Interfaces	Analog, SSI, CANbus, Profibus DP and EtherCAT
Accuracy	
Linearity	<± 0.02% Full Scale (Min ± 50 µm)
Repeatability	<± 0.001% Full Scale (Min ± 2.5 µm)
Operating Conditions	
Protection	Sensor electronic IP 67 (with professional mounted housing and connectors) Measuring rod with connecting cable for side cable entry IP 65 Measuring rod with single wire and flat connector with bottom cable entry IP 30
Shock Test	100 g (single shock IEC Standard 68-2-27)
Vibration Test	10 g/ 10 to 2000 Hz (IEC Standard 68-2-6)
Standards, EMC Test	Electromagnetic emission EN 500081-1 Electromagnetic immunity EN 500081-2 EN 61000-4-2/3/4/6, Level 3/4 criterion A, CE qualified
Electrical Connection	
Input Voltage	24 Vdc (-15 ± 20%)
Polarity Protection	Up to -30 Vdc
Overvoltage Protection	Up to 36 Vdc
Current Drain	100 mA typical

Implementation

The Model RD4 position sensor offers a retrofitting solution for existing simulators with increased capability and features. Most pistons bored for the Temposonics I Series will accommodate the Model RD4 and the sensor can reliably function with the existing embedded MTS magnet depending on the original installation. The legacy Analog Output Module (AOM) is no longer necessary for analog signals as the interface electronics are now contained inside the sensor electronic housing.

A variety of mounting options are available including external or internal to the cylinder with pressure-fit or threaded flange.



R-Series Model RD4 mounting example for threaded hex flange

Service and Support

Save time and energy by replacing your sensors with the brand that has been proven to work. Why replace your sensor with anything but Temposonics technology? MTS Sensors provides the knowledge and support you need to get up and running quickly. Over the years, MTS Sensors has developed numerous custom solutions for flight simulators using Models GH and RH hydraulic style sensors. Now with the flexibility of the Model RD4 sensor for tight spaces, a solution exists for most any application. Contact our application engineering technical support line at 1-800-633-7609 for more details.



R-Series Model RD4 Sensor rod installed in cylinder end cap with minimal available clearance.

e-mail: flightsim@mts.com
Telephone: 1-800-633-7609

Legacy Product Replacement Guide

Installation Type	Legacy Sensor	Solution	Outputs
External 60 in.	DCTM-0135-1 DCTM-V-0135-1 081060070900 TTNR1U0645	Models GH and RH	Digital Pulse, Analog
Internal 60 in.	DCTM-0115-1 DCTM-115SP-1 011060070109 TTR1U0645	Models GH, RH & RD4	Digital Pulse, Analog
External 42 in.	DCTM-0187-1 081042070900 TTNR1U0465	Models GH & RH	Digital Pulse, Analog
Internal 54 in.	DCTM-0250-1 011054070109	Model RD4	Analog

We have retrofit solutions for the following flight simulators:

CAE
FlightSafety® International
L-3 Communications

Rediffusion Simulation
Rockwell Collins
Singer-Link

Other options are available upon request. Please contact the factory for implementation assistance.

How To Order

R	D	4														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 up to 26	

SENSOR ROD STYLE (4)

- S** = Pressure-fit flange
- M** = Threaded M18 x 1.5 head, wrench flats for 23 mm
- C** = Threaded M18 x 1.5 hex flange for 46 mm wrench
- T** = Threaded, 3/4-16 in. head, wrench flats for 1.06 in. wrench
- D** = Threaded, 3/4-16 in. hex flange for 1 1/4 in. wrench

INTEGRAL CABLE FROM SENSOR ROD (5, 6)

For side connection to electronics housing

- D1** = 10.5 in. / 250 mm, PUR jacket cable, M16 style hanging connector
- D2** = 15.7 in. / 400 mm, PUR jacket cable, M16 style hanging connector
- D3** = 23.6 in. / 600 mm, PUR jacket cable, M16 style hanging connector

For bottom connection to electronics housing

- R4** = 6.7 in / 170 mm, PUR jacket cable, with single wires connecting to flat connector
- R5** = 15.7 in. / 230 mm, PUR jacket cable, with single wires connecting to flat connector
- R6** = 13.8 in. / 350 mm, PUR jacket cable, with single wires connecting to flat connector

SENSOR ELECTRONICS HOUSING STYLE (7)

- S** = Side connection to electronics housing
- B** = Bottom connection to electronics housing

STROKE LENGTH (8 - 12)

___ _ **M** = Millimeters (25 to 2540 mm, encode in 5 mm increments)

or

___ . _ **U** = Inches and tenths (1 to 100 in., encode in 0.1 in. increments)

ELECTRONICS CONNECTION STYLE (13 - 15)

Connector or integral cable options are dependent on the output style selected

OUTPUT (16 up to 26, number of characters depends on the output style selected)

See R-Series Data Sheets

Analog/SSI/CANbus/Profibus/EtherCAT

Part Number: 551174 Revision A, 04-09

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All Temposonics sensors are covered by US patent number 5,545,984. Additional patents are pending.

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