Temperature
process values
at a glance

Boiler t
135.7°c
Sensor 1

HART
COMMUNICATION FOUNDATION

TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

7501
Field mounted HART temperature transmitter
with display and optical buttons

PR
electronics

Easy configuration and diagnostics *from the front*

7501: The Ex d explosion proof / flame proof temperature transmitter with an innovative local operator interface

Now you can benefit from easy programming and quick, at-a-glance review and diagnostics of your process values with the 7501 Field mounted HART temperature transmitter. Using unique technology, you can configure the transmitter from the front of the housing in any environment by simply touching the optical buttons – even when wearing gloves.

You can also perform advanced HART programming from the front, and as a result, significantly reduce the need for handheld communicators (HHC).

Once installed, you never have to open the housing again. The easy-to-read 60 mm diameter display provides a clear indication of your process magnitude, supported by a radial bar graph. And the enclosure is Ex d explosion proof / flame proof to maintain safety and integrity at all times. The temperature transmitter delivers exceptionally high measurement accuracy and HART 7 functionality with HART 5 compatibility.
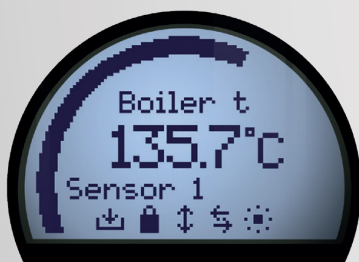
Configuration options

LOI*   PC with HART modem

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* Local Operator Interface

Monitoring view

Boiler t
135.7°c
Sensor 1

Through the glass, you can easily monitor the process value, and the radial bar graph indicates the process magnitude at a glance. A custom device tag, process value tag and unit fields make it easy to identify the displayed process point.

Diagnostics view

Boiler t
SE1.ER
Sensor 1 error…
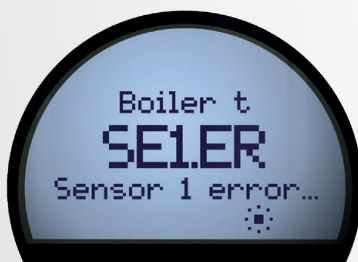
If a sensor or device error occurs, a red or white flashing backlight, specific error text, and scrolling error messages help you provide quick troubleshooting.

Programming view

Pt Type
Pt 50
Pt 100
Pt 200
Select Pt100 as…

PR's well-known user-friendly menu structure provides a guided configuration path that makes setting up the transmitter fast and intuitive.

The field display is equipped with many hazardous area and marine approvals for applications worldwide.

IEC   IECEx   DNV·GL DNVGL.COM/AF EU RO MR Type Approval   FM APPROVED   CSA   NEPSI   Segurança INMETRO   Ex   EAC   CE

Output Low
0.0
Max: 850.0
Min: -200.0
Set sensor val...

Unique capabilities
for high performance

Field mounted enclosure

With a single compartment Ex d explosion proof / flame proof design, the field mounted housing is perfect for Zone 0 with intrinsically safe Ex ia approval and Class 1, Division 1 applications. Metric and SAE threading make it usable in a wide range of applications worldwide.

HART programmable field display

Simply touch the enclosure window using the three optical buttons to configure the display and transmitter. This system is so robust and practical, you can even configure the display while wearing gloves. On top of that, our new technology is immune to extraneous light sources or shadows, and dynamically adapts to the accumulation of contaminants on the window.

- Digital interface between the transmitter and display
- High definition display with 5 digit read-out
- Easy-to-follow menus guide you through programming with scrolling help texts
- An energy-efficient backlight will flash if an error or fault occurs

Temperature transmitter

The built-in temperature transmitter has a proven track record with thousands of devices installed across multiple industries. It can be configured to measure 2, 3 and 4 wire RTDs, 13 different thermocouple types as well as bipolar mV and resistance signals, and provides an analog output. The transmitter also self-calibrates every few seconds for exceptional long-term stability, and exceeds the EN 61326-1 EMC immunity standard.

- Up to 60 point linearization
- Custom Callendar Van Dusen RTD coefficients can be easily loaded into the 7501 for optimal sensor-to-transmitter matching
- A low temperature coefficient of 50 ppm / °C (0.005% / °C) ensures accurate measurement over a wide ambient temperature range
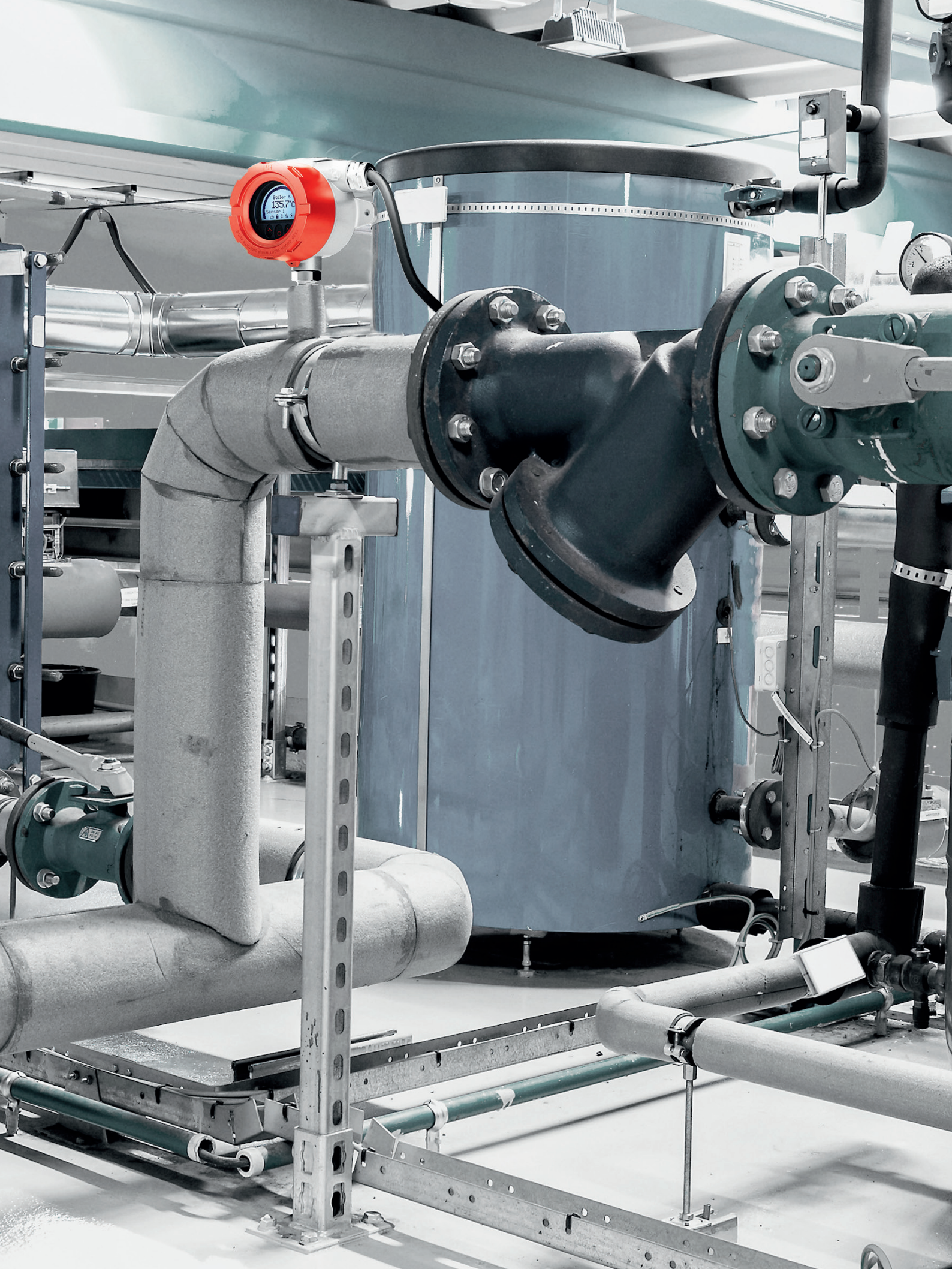
The details that
make the difference

Many advanced features in one device

The Field mounted HART temperature transmitter can be mounted in 3 ways: on the temperature sensor, on a pipe, or on a bulkhead. The display can be rotated in 90-degree increments for easy vertical or horizontal viewing.
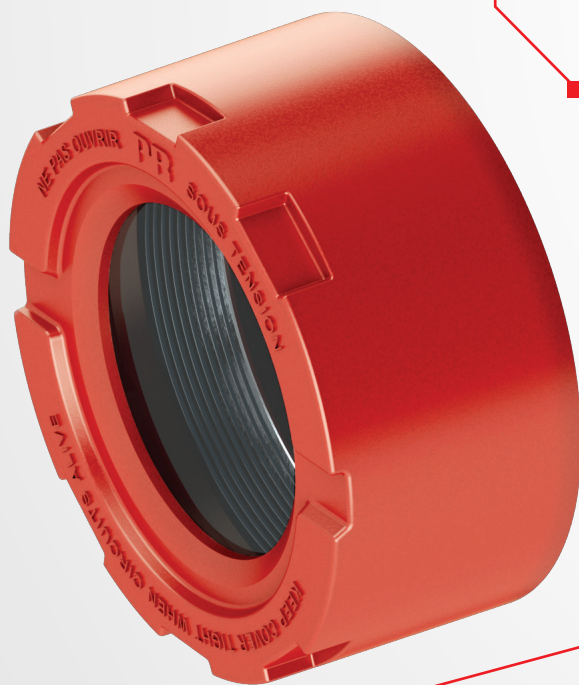
Selectable white/red backlight
The selectable backlight enables you to view process values in all lighting conditions without a flashlight, and can flash if an error occurs.

Radial bar graph
The clearly visible radial bar graph indicates the process magnitude at a glance.

Explosion proof glass
The unique optical buttons enable programming through the 10 mm thick explosion proof glass.

Optical buttons
Configuration is easy and logical with scrolling help texts and three optical buttons: up arrow, down arrow and OK. Thanks to the user-friendly PR Menu Guide, it is possible to configure the device directly from the front in less than 1 minute. Password protection prevents unauthorized access.

Low loop voltage requirement
The programmable field display requires only 1.5 volts when the backlight is off and 3.5 volts when the backlight is on. Combined with the transmitter, the total is 10 and 12 volts respectively.

PR
M·E·N·U
G·U·I·D·E

Durable housing

The housing is available in low copper aluminum (ADC3), coated with either epoxy or epoxy with polyurethane overcoating, or in stainless steel (SST316) and can be used in both indoor and outdoor applications.

Conduits

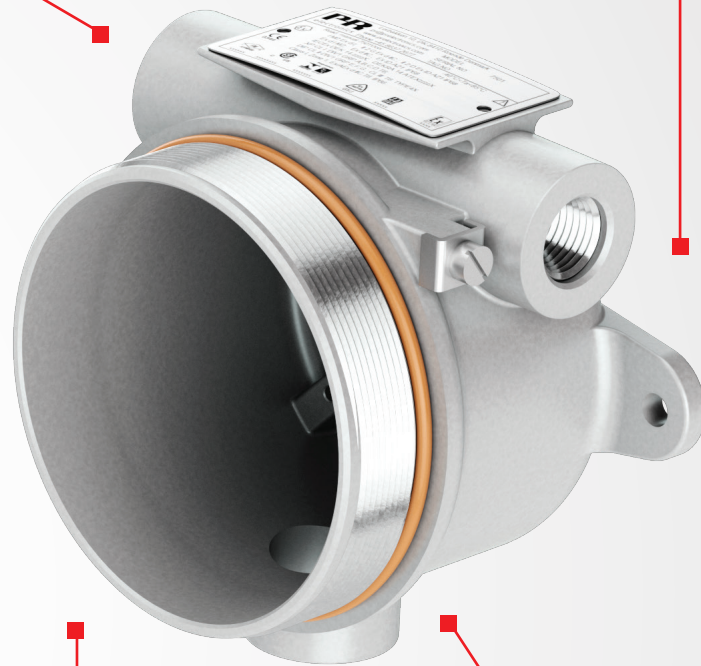The 7501 supports the following conduits: M20x1.5 6H and ½ NPT.

Proven in use

PR's 5337 Ex ia temperature transmitter is proven in use and provides exceptionally high measurement accuracy.

One HART address

The digital interface uses one HART address between the transmitter and the display. HART 7 functionality with HART 5 compatibility.

Single compartment housing

With an affordable, single compartment design, the field mounted enclosure enables fast installation and configuration.

Ex d explosion proof / flame proof

Perfect for Zone 0 (Ex ia) Class 1, Division 1 hazardous applications.

IP66 enclosure

The field mounted enclosure is rated IP66 for protection against strong jets of water, allowing the field display to be used in harsh environments.

Performing with *an advantage*

Benefit from high accuracy and cost savings

The state-of-the-art, patent-pending 7501 Field mounted HART temperature transmitter has many unique features, plus the added benefit of having a lower cost than comparable solutions.

Patent for: Optical buttons combined with 10 mm explosion proof window

By combining highly advanced, patent-pending optical sensing and adaptive filtering technologies, PR electronics has managed to create very robust optical buttons. They are immune to false triggering caused by extraneous light sources, shadows, contaminants, etc. And they ensure easy and fast configuration, even when wearing gloves, simply by touching the 10 mm thick explosion proof window.

Patent for: Extremely power-efficient digital communication

The 7501 features new patent-pending technology that allows for simultaneous operation of a large backlit graphical display in combination with a high speed digital communication interface, all with very low power consumption. This unique technology also ensures an extremely low overall loop voltage drop.
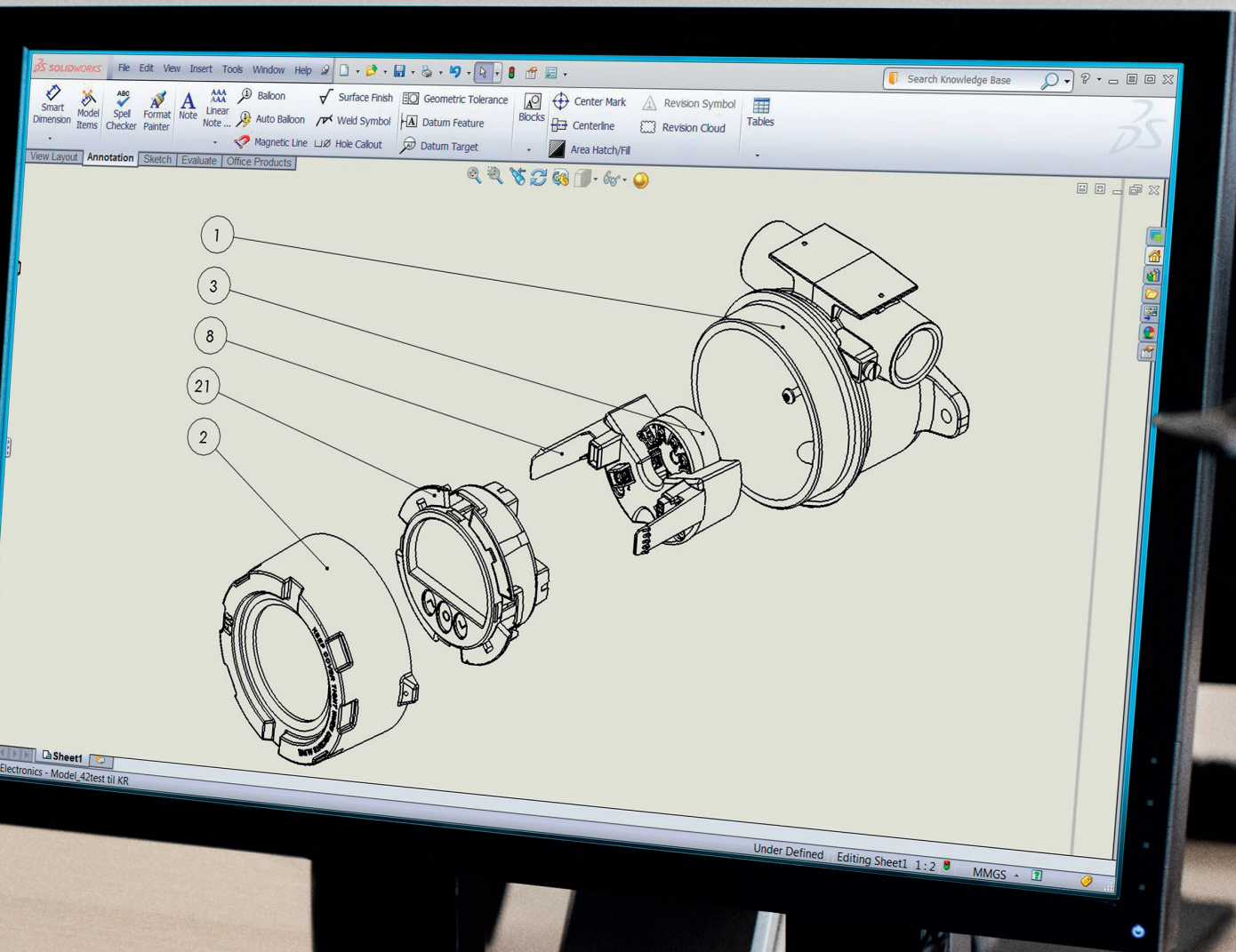
Unique specifications

Accuracy	Better than 0.05% of selected range
Response time (analog)	1-60 seconds
Temperature coefficient	50 ppm / °C (0.005% / °C)
Input types	RTD: Pt50, Pt100, Pt200, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000 Thermocouple: B, E, J, K, L, Lr, N, R, S, T, U, W3, W5 Bipolar mV signals Resistance signals
Output types	4-20 mA
Voltage drop	10 VDC (backlight off) 12 VDC (backlight on)
Operating temperature	-40°C to +85°C
Humidity	0-100% relative humidity
EMC	EMC immunity influence < ±0.1% of selected range Extended EMC: NAMUR NE21 burst, A criterion – as well as NE43 and NE89 EN 61326-1 certification
Configuration types	LOI, PC with HART or HART terminal
Display type / diameter	Dot matrix / 60 mm
Number of process value digits	5
Buttons	Three optical buttons: up arrow, down arrow and OK
Backlight color	Selectable red or white

Order form

Type	Housing	Local operator interface		O-ring		Conduit thread (D1, D2 & D3)	
		Optical buttons	Display				
7501	Low copper aluminum (AL) : A	No	No : 1	-40 to +85°C silicone rubber : A		M20x1.5 6H : 1	
		No	Yes : 2	-20 to +85°C FKM rubber : B		½ NPT mod. : 2	
		Yes	Yes : 3				
		Yes	Yes : 3				
7501	316 Stainless steel (RF) : B	No	Yes : 2	-40 to +85°C silicone rubber : A		M20x1.5 6H : 1	
		Yes	Yes : 3	-20 to +85°C FKM rubber : B		½ NPT mod. : 2	

Paint type	Transmitter	Approvals	Cover color	Additional approvals	
Epoxy : A	Yes : 1	General purpose : 1	Red : -	Marine	: M
Epoxy + poly-urethane : B	No (comes with a connection kit) : 2	Hazardous area (I.S.) : 2			
	Yes : 1	Hazardous area (I.S.) : 2	Gray : GY		
None : N	Yes : 1	General purpose : 1	Steel : -	Marine	: M
	No (comes with a connection kit) : 2	Hazardous area (I.S.) : 2			

Examples

7501A1B1A22 = Aluminum, blind cover, FKM rubber O-ring, M20x1.5 6H conduit, epoxy, connection kit, hazardous installation, red
7501B3A1N12M = 316 Stainless steel, Local Operator Interface, silicone rubber O-ring, M20x1.5 6H conduit, HART TT, hazardous installation, marine approval

Accessories

8550 = 7501 M20 plug text alu encl. silicone O-ring
8550-F = 7501 M20 plug text alu encl. FKM O-ring
8550-S = 7501 M20 plug text stainless steel encl. silicone O-ring
8550-SF = 7501 M20 plug text stainless steel encl. FKM O-ring
8551 = 7501 NPT plug alu encl.
8551-S = 7501 NPT plug text stainless steel encl.
8552 = Pipe-mounting bracket P5-B-N (1½"-2")
8555 = Display spare part with LOI
8556 = Display spare part without LOI
1117 = 5-point calibration certificate

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PERFORMANCE MADE SMARTER**

PR electronics is the leading technology
company that specializes in making
industrial process control safer, more
reliable and more efficient. Since 1974
we have been dedicated to perfecting
our core competence of innovating
high-precision technology with low
power consumption. This dedication
continues to set new standards for
products that communicate, monitor
and connect our customers' process
measurement points to their process
control systems.

Our innovative, patented technologies
are derived from our extensive R&D
facilities and our thorough under-
standing of our customers' needs
and processes. We are guided by
principles of simplicity, focus, courage
and excellence, enabling some of the
world's greatest companies to achieve
PERFORMANCE MADE SMARTER.

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