

Level Sensing Products

TT Electronics offers several key level sensing products for a wide range of test and measurement related applications. These include our intrinsically safe multi-spot thermometer, specified for high-accuracy spot-temperature measurements in a wide range of applications. It also includes the maintenance-free Latis, a combined temperature and water-interface sensor for use in tanks storing a wide range of liquids. Our innovative contactless autopad linear position sensor utilises inductive technology, offering zero mechanical wear and excellent EMI resistance, as well as good tolerance to geometric offsets in a robust, cost-competitive package.

Multi-Spot Thermometers

REF: DS2102

Accuracy	±0.15 + 0.002 x l(t)C			
	Sheath Construction	Type	Wire insulation	Temperature range
	Thick-wall Nylon 12 (Rilsan) tube	Standard Nylon	PVC throughout	-20 to +90°C
	Thin-wall AISI 316 Convolute Tube	Standard Stainless	PVC throughout	-20 to +90°C
		Extended Temperature Stainless	PTFE internal PVC external	-50 to +120°C
		High Temperature Stainless	PTFE with high-temperature elements	-50 to +200°C
		Cryogenic	PTFE	-200 to +50°C
		Bitumen	Double glass on nickel/copper wire	-20 to +280°C
Other	Maximum pressure	6 bar		
	Termination	Top fitting with a 12" (305 mm) long stainless steel pipe with 10" (254 mm) length, 1/2" BSP thread, or to customer specification.		
	Fittings	1 locking ring and nut as standard. Other fittings and flanges can be supplied.		
	Tank height	2 m to 40 m		
	Cabling	Colour-coded sleeved wires (max 10 m) For high temps, (-20 to +280°C) wires are numbered		
	Active level-probe length	150 mm to 1.5 m (450 mm length is standard)		
Construction	Immersed parts: AISI 316 stainless steel, PTFE, FEP and VITON for maximum corrosion resistance			
Approvals	The stainless steel MST is certified to conform to the ATEX directive 94/9/EC. The type of protection is EExia IIC T3 (Tamb = +160°C), certificate number BAS No. EX97D2042X.			



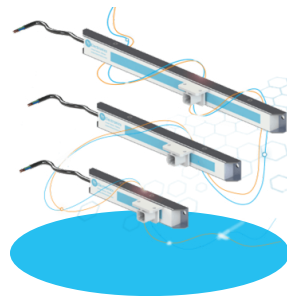
Latis

REF: DS2202

Accuracy	Water/Oil Level	Typically better than $\pm 1\%$ of probe length
	Temperature	$\pm 0.15 + 0.002 \times \text{ItI}^\circ\text{C}$
Repeatability	Water/Oil Level	Typically ± 0.5 mm or $\pm 0.1\%$ of active probe length, whichever is the greater
Output	Level Signal	4-20 mA (@ 10-30 Vdc)
Environmental	Operating Temperature	-20 to +80°C
	Maximum Pressure	6 bar
Construction	Immersed Parts: AISI 316 stainless steel, PTFE, FEP and VITON for maximum corrosion resistance	
Other	Active level-probe length	150 mm to 1.5 m (450 mm length is standard)
	Tank Height	2 m to 40 m
	Sleeved Wires Cabling	10 m maximum
Approvals	LATIS is certified to conform to the ATEX directive 94/9/EC. The type of protection is EExia IIC T4 (Tamb=80°C), certificate number BAS No.EX97D20242X.	

Autopad Linear Position Sensor

Interface	Analogue; 0-5 V ratiometric	Analogue; 0-5V	4-20 mA
Power Supply	4.5 – 5.5 Vdc	8-24V DC	8-24V DC
Current Consumption	20 mA	15 mA Max.	40 mA
Nominal Sensing Range (L) (mm)	75 mm/150 mm/250 mm		
Nominal Target - Sensor Separation	2 mm \pm 1.5 mm		
Sense Through Non-Conductive Material (eg: plastic, water, oil)	Yes		
Linearity	1 % full scale output		
Hysteresis	None		
Magnetic field resistance	Complete Immunity		
Resolution	12 bit		
Update Rate	250 μ s		
Operating Temperature Range	-20 to 70°C		
Electrical Connections	Brown: V+, Black: Output, Blue: Gnd		
Output Load	>1k Ω		
Reverse Polarity	Yes		
Overvoltage Protection	Yes, to 40 V		
Cable Length	0.5 m		
Sealing	IP67		
Approvals	CE, ROHS & WEEE		



OEM Pressure Sensors

OEM pressure sensors from TT Electronics are available in standard ranges from 100mbar to 600bar. All ranges are available in gauge or absolute format. It is ideal for continuous use in applications where the pressure medium is wet and corrosive and long term stability is of prime importance.

Manufactured from high purity alumina ceramics, the OEM pressure sensor possesses superb chemical and abrasion resistance, making it unrivalled for use with virtually any pressure medium. The diaphragm of the sensing element has a four active-arm strain gauge bridge fused to its inner face. This direct fusion ensures excellent long term stability and repeatability, which, coupled with the matched bridge network, provides excellent linear thermal characteristics.

15 mm OEM Pressure Sensor REF: DS2902

Sensor Range (bar)	0.4	1.0	2.0	3.0	4	5	10	20	50	150	200
Thickness (mm normal)	6.20	6.20	6.26	6.26	6.31	6.31	6.38	6.49	6.49	7.06	7.28
Sensitivity mV/V $\pm 30\%$	1.3	3.7	2.8	4.3	3.4	4.2	4.5	4.8	6.4	5.4	5.4
Burst Pressure	3X sensor range minimum										
Sensor Diameter (mm)	14.80 mm - 15.00 mm										
Supply Voltage	1 - 30 Vdc										
Operating Temperature	-25°C to +125°C										
NL&H (% FRO.BSL)	< ± 0.25 (< ± 0.1 available)										
TZS (% FRO/°C)	< ± 0.07										
TSS (% FRO/°C)	<-0.04 typical										
Zero Output Laser Trim	< ± 0.2 mV/V										
Bridge Resistance	10K $\pm 30\%$										
Long Term Stability	< $\pm 0.1\%$ /y@25°C										
Material	96% AL ₂ O ₃ ceramic										



19 mm OEM Pressure Sensor

Sensor Range (bar)	0.1	0.4	1.0	2.0	3	5	10	20	50	100	200	400	600
Thickness (mm normal)	6.2	6.2	6.2	6.3	6.4	6.4	6.5	6.6	6.8	7.3	7.8	8.6	9.5
Sensitivity mV/V $\pm 30\%$	0.7	1.8	3.0	3.0	3.0	3.5	4.5	5.0	5.0	4.5	5.0	4.0	3.0
Burst Pressure	3X sensor range minimum												
Sensor Diameter (mm)	18.60 - 19.00												
Supply Voltage	1 - 30 Vdc												
Operating Temperature	-40°C to +120°C												
NL&H (% FRO.BSL)	< ± 0.25 (< ± 0.1 available)												
TZS (% FRO/°C)	<1 bar(g)		<0.2% span/°C										
	1-3 bar(g)		<0.07% span/°C										
	>5 bar(g)		<0.04% span/°C										
	<3 bar(a)		<0.2% span/°C										
	5-10 bar(a)		<0.07% span/°C										
	>20 bar(a)		<0.04% span/°C										
TSS (% FRO/°C)	<-0.04 typical												
Zero Output Laser Trim	< ± 0.2 mV/V												
Bridge Resistance	10K $\pm 30\%$												
Long Term Stability	< $\pm 0.1\%$ /y@25°C												
Material	96% AL ₂ O ₃ ceramics												



Pressure Sensors and Transducers

Pressure transmitters and transducers from TT Electronics offer superb chemical and corrosion resistance. A choice of either gauge or absolute pressure is detected using a four active arm strain gauge bridge sensor, fused to a high-purity ceramic diaphragm. Models are available in several classes of accuracy and compensation specified below, with ranges from 100 mbar to 600 bar or scaled to customer requirements. Industry specific certifications may also be available. Please consult the factory for details.

TPL Series OEM Pressure Sensor

Gauge Pressure Range	0-4 to 0-10 bar
Output Type	Voltage (0.5 V to 4.5 V ratiometric)
Output Span	4.0 Vdc \pm 1% of span
Output Zero	0.5 Vdc \pm 1%
Non Linearity, Hysteresis & Repeatability	\pm 0.25% of span (best fit straight line)
Compensated Temperature Range	0°C to +80°C
Operating Temperature Range	-20°C to 125°C
Thermal Zero Shift	\pm 0.04% of span /°C
Thermal Span Shift	\pm 0.015% reading /°C typical
Long Term Stability	\pm 0.1% /12 months typical
Power Supply	5 Vdc \pm 0.25 Vdc
Over Pressure	21 bar for 15 seconds @ +20°C
Burst Pressure	>35 bar
Pressure Connection Options	G 1/4" BSP male or female G 1/2" BSP male 1/4" NPT male or female 1/2" NPT male Vernon Morris QR Metric threads (M10, M14, M16, M18 & 20) Contact factory for additional pressure connections
Electrical Connection Options	IP65 mini-DIN (40050) plug & socket IP65 cable & ferrule IP65 large-DIN (43650) plug & socket IP68 glanded cable IP6K9K DIN Bayonet Contact factory for additional electrical connections
Housings	316L Stainless Steel (Brass upon request; contact factory for additional options)
Seals	Viton (Nitrile, EPDM, Chemraz upon request)



HPS-A Series Active Voltage Output Pressure Transducer REF: DS2806

Output Span	4V \pm 0.5%
Output Zero	1V \pm 0.5% of span
Non Linearity, Hysteresis & Repeatability (NLH)	\pm 0.1% of span (best fit straight line)
Compensated Temp Range	-20°C to 125°C
Operating Temp Range	-20°C to 125°C
Thermal Zero Shift	0 to 100°C, \pm 0.01% of span / °C < 0°C & > 100°C, \pm 0.015% span / °C
Thermal Span Shift	\pm 0.015% reading /°C typical
Long Term Stability	0.1% /12 months typical
Power Supply	10 to 32 Vdc



HPS - C Series Rationalised mV Output Pressure Transducer



Output Span	Dependent on range, ± 1 mV
Output Zero	0 mV \pm 0.1 mV/V
Non Linearity, Hysteresis & Repeatability (NLH)	$\pm 0.2\%$ of span (best fit straight line)
Compensated Temp Range	-20°C to 125°C
Operating Temp Range	-20°C to 125°C
Thermal Zero Shift	<0 to 100°C, $\pm 0.01\%$ span / °C < 0°C & >100°C, $\pm 0.015\%$ span / °C
Thermal Span Shift	$\pm 0.015\%$ reading/°C typical
Long Term Stability	0.1%/12 months typical
Power Supply	2-10 Vdc regulated

HPS - A Series 4-20 mA Pressure Transmitter REF: DS2805



Output Span	16 mA $\pm 0.5\%$
Output Zero	4 mA $\pm 0.5\%$ of span
Non Linearity, Hysteresis & Repeatability (NLH)	$\pm 0.1\%$ of span (best fit straight line)
Compensated Temp Range	-20°C to 125°C
Operating Temp Range	-20°C to 125°C
Thermal Zero Shift	0 to 100°C, $\pm 0.01\%$ of span / °C < 0°C & >100°C, $\pm 0.015\%$ span / °C
Thermal Span Shift	$\pm 0.015\%$ reading/°C typical
Long Term Stability	0.1%/12 months typical
Power Supply	10 to 32Vdc
Loop Resistance	1.1k Ω max @32Vdc supply

HPS-A Series Active mV Output Pressure Transducers REF: DS2807

Class A



Output Span	200 mV $\pm 0.5\%$ (others available)
Output Zero	0 mV $\pm 0.5\%$ of span
Non Linearity, Hysteresis & Repeatability (NLH)	$\pm 0.1\%$ of span (best fit straight line)
Compensated Temp Range	-20°C to 125°C
Operating Temp Range	-20°C to 125°C
Thermal Zero Shift	0 to 100°C, $\pm 0.01\%$ of span / °C <0°C & >100°C, $\pm 0.015\%$ span / °C
Thermal Span Shift	$\pm 0.015\%$ reading/°C typical
Long Term Stability	0.1%/12 months typical
Power Supply	10 to 32 Vdc

Class B



Output Span	200 mV $\pm 1\%$ (others available)
Output Zero	0 mV $\pm 1\%$ of span
Non Linearity, Hysteresis & Repeatability (NLH)	$\pm 0.15\%$ of span (best fit straight line)
Compensated Temp Range	0°C to 100°C
Operating Temp Range	-20°C to 125°C
Thermal Zero Shift	$\pm 0.015\%$ span / °C
Thermal Span Shift	$\pm 0.015\%$ reading/°C typical
Long Term Stability	0.1%/12 months typical
Power Supply	10 to 32 Vdc

Class C



Output Span	200 mV $\pm 1\%$ (others available)
Output Zero	0 mV $\pm 1\%$ of span
Non Linearity, Hysteresis & Repeatability (NLH)	$\pm 0.25\%$ of span (best fit straight line)
Compensated Temp Range	0°C to 80°C
Operating Temp Range	-20°C to 125°C
Thermal Zero Shift	$\pm 0.04\%$ span / °C
Thermal Span Shift	$\pm 0.015\%$ reading/°C typical
Long Term Stability	0.1%/12 months typical
Power Supply	10 to 32 Vdc