



ETS Series (-1001) Digital Temperature Sensors



Features

- **Outputs:**
 - **2 solid-state switch outputs provide a reliable alternative to mechanical temperature switches**
 - **One output can be configured as a scalable analog 4-20 mA signal, turning the unit into a combination temperature switch and transmitter**
- Ideal for industrial temperature measurement and indication in many applications
- RTD, measuring electronics, and process fitting combined in a single stainless steel probe
- Wide measuring range of -58 to 302°F
- Easily configured with pushbuttons or free ProSense XT-SOFT
- 30, 50, 100 or 150mm probe insertion lengths
- Integral 1/4" NPT or 1/2" NPT male process connection allows for direct installation without requiring extra fittings
- Built-in digital display provides indication of measured temperature and 2 yellow LEDs indicate output status
- The sensor housing can be rotated up to 310° and the digital display can be flipped 180° for installation flexibility
- Stainless steel housing provides a high IP65/IP66 ingress protection rating
- 4-pin M12 quick-disconnect electrical connection



For a variety of cable options see our website www.AutomationDirect.com



| ETS Series (-1001) Digital Temperature Sensors | | | | |
|--|--|---------|---------|----------|
| Part Number | Description | Pcs/Pkg | Wt (lb) | Price |
| <u>ETS50N-30-1001</u> | ProSense digital temperature sensor, 1/2in male NPT process connection, 30mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display. | 1 | 0.9 | \$213.00 |
| <u>ETS50N-50-1001</u> | ProSense digital temperature sensor, 1/2in male NPT process connection, 50mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display. | 1 | 0.9 | \$214.00 |
| <u>ETS50N-100-1001*</u> | ProSense digital temperature sensor, 1/2in male NPT process connection, 100mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display. | 1 | 0.9 | \$215.00 |
| <u>ETS50N-150-1001*</u> | ProSense digital temperature sensor, 1/2in male NPT process connection, 150mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display. | 1 | 0.9 | \$216.00 |
| <u>ETS25N-30-1001</u> | ProSense digital temperature sensor, 1/4in male NPT process connection, 30mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display. | 1 | 0.8 | \$210.00 |
| <u>ETS25N-50-1001</u> | ProSense digital temperature sensor, 1/4in male NPT process connection, 50mm insertion length, -58 to 302°F, output 1: switch PNP, N.O./N.C. selectable or 4-20 mA, output 2: switch PNP, N.O./N.C. selectable or 4-20 mA, 4-digit display. | 1 | 0.8 | \$211.00 |

* Thermowells available (see ETS Series Digital Temperature Sensor Accessories)



Note: Check the chemical compatibility of the sensor's wetted parts with the medium to be measured



ETS Series (-1001) Digital Temperature Sensors

| ProSense ETS (-1001) Series Specifications | | |
|--|--|--|
| Input | | |
| Measuring Element | Pt100 as per IEC 60751 | |
| Measuring Range | -50 to 150°C (-58 to +302°F) | |
| Min. Span | 20K/20°C (36°F) | |
| Output | | |
| Output Signal | 2 x PNP switch outputs or one PNP switch output and 1 x 4 to 20mA output (sourcing) | |
| Range of Adjustment | Switch output | Switch point (SP) and Switch-back point (RSP) in increments of 0.1°C (0.18°F) Min. distance between SP and RSP: 0.5°C (0.8°F) |
| | Analog output | Lower range value (LRV) and upper range value (URV) can be set anywhere within the sensor range (min. measuring range 20K (36°F)) LRV Factory Setting: 32°F (0°C) URV Factory Setting: 302°F (150°C) |
| | Damping | 0 (no damping) or 9 to 40s in increments of 1 second |
| | Unit | °C, K, °F |
| Analog Outputs | Output on Fault | MIN = ≤ 3.6 mA MAX = ≥ 21.0 mA HOLD = last value |
| | Load | Max. (V _{power supply} - 6.5 V) / 0.022A (current output) , 795Ω @ 24VDC |
| Switch Outputs | Switch status ON | I _a ≤ 250mA |
| | Switch status OFF | I _a ≤ 1mA |
| | Switching cycles | > 10,000,000 |
| | Voltage drop PNP | ≤ 2V |
| | Overload protection | Automatic testing of switching current; output is switched off in case of overcurrent, the switching current is tested again every 0.5 s; Max. capacitance load: 14μF for max. supply voltage (without resistive load); Periodic disconnection from a protective circuit in event of overcurrent (f = 2Hz) and indication of "Warning" |
| | Output on Fault | Switch opens |
| Inductive Load | Requires transient voltage suppression | |
| Display | Backlit LCD (7mm) | |
| Power Supply | | |
| Device Connection | M12 connector | |
| Supply Voltage | 12 to 30VDC (reverse polarity protection) | |
| Current Consumption | Without load < 60mA, with reverse polarity protection | |
| Power Supply Failure | Overvoltage | The device works continuously up to 34VDC without damage. No damage is caused to the device from a short-term overvoltage up to 1kV (as per EN 31000-4-5). The specific properties are no longer guaranteed if the supply voltage is exceeded |
| | Undervoltage | If the supply voltage drops below the minimum value, the device switches off (status as if note supply with power = switch open) |
| Performance | | |
| Reference conditions | As per DIN IEC 60770or DIN 61003 T = 25°C (77°F), relative humidity 45 to 75%, ambient air pressure 860 to 1060kPa (12.47 to 15.37 psi) | |
| | Supply voltage U | 24VDC |
| Max. Measured Error Switch Point and Display | Electronics | ± 0.2 K (0.36°F) |
| | Sensor | Total class A as per IEC 60751, -50 to +200°C (-58 to 392°F) Maximum measure error in °C = ± 0.15 + 0.002 · T (T = Process temperature in °C without taking sign into account.) |
| | Total error | Electronics error + sensor error, e.g. for process temperature: -50 to +75°C (-58 to +167°F) ≤ 0.5 K (0.9°F) +75 to +200°C (+167 to 392°F) ≤ 0.75 K (1.35°F) |
| Non-Repeatability Switch Point | 0.1 K (0.18°F) as per EN 61298-2 (without ambient temperature influence) | |
| Long-Term Drift | ≤ 0.1 K (0.18°F) per year under reference operating conditions | |



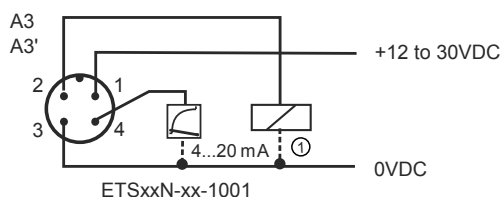
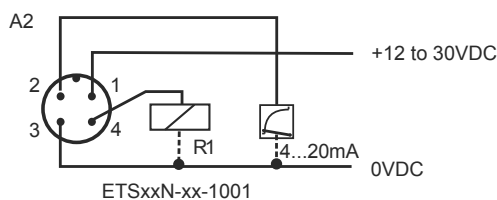
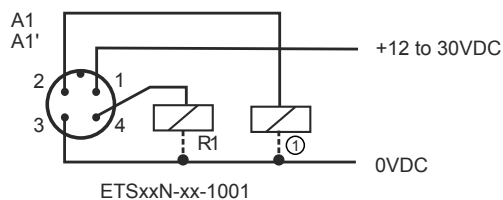
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| ProSense ETS (-1001) Series Specifications | | |
|--|--|--|
| Performance Continued | | |
| Sensor Response Time | Measured as per IEC 60751, in water flowing at 0.4 m/s (1.3 ft/s) t ₅₀ < 1.0 s t ₉₀ < 2.8 s | |
| Influence of Ambient Temperature | Switch output and display | 0.00003/K |
| | Analog output | 0.00005/K + influence of switch output and display |
| Switch Output Response Time | 100ms | |
| Analog Output | Maximum measured error | Switch point error and display error + 0.1% |
| | Rise time t ₉₀ | ≤ 200ms |
| | Settling time t ₉₉ | ≤ 500ms |
| Operating Conditions: Installation | | |
| Installation Instructions | Any orientation Housing can be rotated up to 310° | |
| Orientation | No restrictions | |
| Operating Conditions: Environment | | |
| Housing Material | Stainless steel (316L); ethylene propylene diene monomer (EPDM) | |
| Materials (wetted parts) | Stainless steel (316L) | |
| Ambient Temperature Range | -40 to +85°C (-40 to +185°F) | |
| Storage Temperature | -40 to +85°C (-40 to +185°F) | |
| Degree of Protection | IP65 | |
| Shock Resistance | 50g as per DIN IEC 68-2-27 (11ms) | |
| Vibration Resistance | 4g as per German Lloyd GL Guidelines | |
| Electromagnetic Compatibility | Interference emission as per IEC 61326 Series, class B electrical equipment Interference immunity as per IEC 61326 Series, appendix A (industrial use) and NAMUR Recommendation NE 21 EMC influence ≤ 0.5% | |
| Process Temperature Limits | -50 to +150°C (-58 to 302°F), Restrictions depending on process connection and ambient temperature | |
| | Max. ambient temperature | Max. process temperature |
| | Up to 25°C (77°F) | No restriction |
| | Up to 40°C (104°F) | 135°C (275°F) |
| | Up to 60°C (140°F) | 120°C (248°F) |
| | Up to 85°C (185°F) | 100°C (212°F) |
| Process Pressure | 100 bar (1450 psig) max. | |
| Approvals | CULus, File # E311366, CE | |

* To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

prosense® ETS Series (-1001) Digital Temperature Sensors

ETS Wiring Diagram



Cable Assembly Wiring

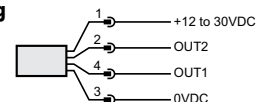
Colors:

Pin 1 - Brown

Pin 2 - White

Pin 3 - Blue

Pin 4 - Black



Note: Wiring colors are based on AutomationDirect CD12L and CD12M 4-pole cable assemblies.

Wiring diagram is based on user selected configuration

A1: 2x PNP switch outputs R1 and ① (R2)

A1': 2x PNP switch outputs R1 and ① (diagnosis/NC contact with "DESINA" setting)

A2: 1x PNP switch output and 1x analog output (4 to 20 mA)

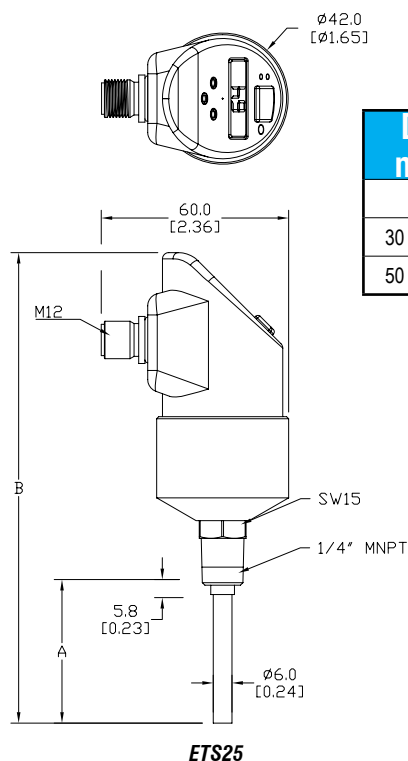
A3: 1x analog output (4 to 20 mA) and 1x PNP switch output ① (R2)

A3': 1x analog output (4 to 20 mA) and 1x PNP switch output

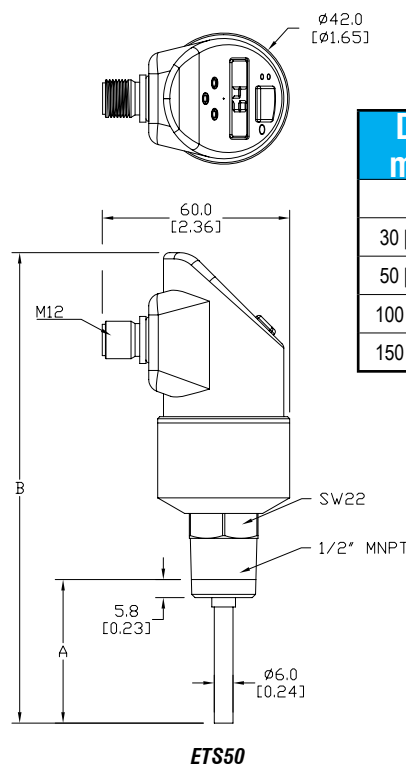
① (diagnosis / NC contact with "DESINA" setting)

Dimensions

mm [inches]



| Dimensions mm [inches] | |
|---------------------------|------------|
| A | B |
| 30 [1.18] | 131 [5.16] |
| 50 [1.97] | 151 [5.94] |

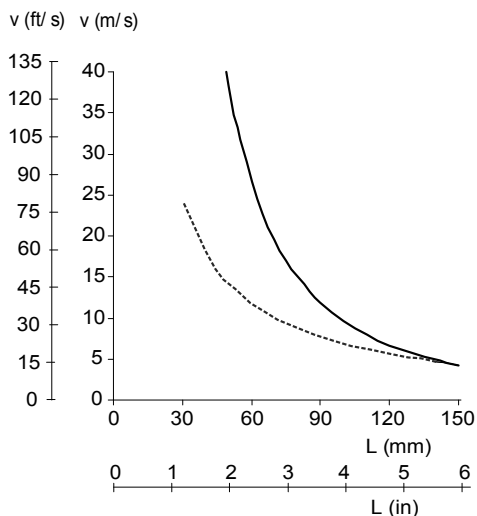


| Dimensions mm [inches] | |
|---------------------------|-------------|
| A | B |
| 30 [1.18] | 131 [5.16] |
| 50 [1.97] | 151 [5.94] |
| 100 [3.94] | 204 [8.03] |
| 150 [5.91] | 254 [10.00] |

See our website www.AutomationDirect.com for complete Engineering drawings.

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Maximum Flow Velocity



L = insertion length, during flow
v = flow velocity
Medium: ----- air; - - - - - water



Scan the QR Code above or click to view the ETS Series product insert.

prosense® ETS Series Digital Temperature Sensor Accessories

ETS Series Digital Temperature Sensor Accessories

**TW06-01****TW06-02**

| Part No. | Description | Use with Transmitter Probe | Pcs/Pkg | Price |
|-----------------------|---|----------------------------|---------|---------|
| <u>TW04-01</u> | Standard duty threaded thermowell with 1/2 inch NPT male process threads, 304 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length | ETS50N-100-XXXX | 1 | \$36.00 |
| <u>TW04-02</u> | Standard duty threaded thermowell with 3/4 inch NPT male process threads, 304 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length | | 1 | \$36.00 |
| <u>TW04-03</u> | Standard duty threaded thermowell with 1/2 inch NPT male process threads, 316 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length | | 1 | \$45.00 |
| <u>TW04-04</u> | Standard duty threaded thermowell with 3/4 inch NPT male process threads, 316 stainless steel, 4-1/4 inch overall length with 0.260 inch bore diameter, 2-1/2 inch insertion length | | 1 | \$45.00 |
| <u>TW06-01</u> | Standard duty threaded thermowell with 1/2 inch NPT male process threads, 304 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length | ETS50N-150-XXXX | 1 | \$49.50 |
| <u>TW06-02</u> | Standard duty threaded thermowell with 3/4 inch NPT male process threads, 304 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length | | 1 | \$49.50 |
| <u>TW06-03</u> | Standard duty threaded thermowell with 1/2 inch NPT male process threads, 316 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length | | 1 | \$57.00 |
| <u>TW06-04</u> | Standard duty threaded thermowell with 3/4 inch NPT male process threads, 316 stainless steel, 6-1/4 inch overall length with 0.260 inch bore diameter, 4-1/2 inch insertion length | | 1 | \$57.00 |



ETS Series Digital Temperature Sensors

Overview



AutomationDirect's ProSense ETS Series of Digital Temperature Sensors is ideal for industrial temperature measurement and indication in a wide variety of applications. The ETS series conveniently combines a precision RTD sensing element, measuring electronics, and process fitting all in a single stainless steel temperature transmitter probe. They have a wide measuring range of -58 to 302°F. Choose from four standard probe insertion lengths and two integral male NPT process threads that allow direct mounting to the process or thermowells, eliminating the need for separate probe mounting or adapter fittings. With no moving parts the two solid state switch outputs provide a reliable alternative to mechanical temperature switches. Available models allow an output to be configured as a scalable analog signal, turning the unit into a combination temperature switch and transmitter. The built-in digital display provides indication of the measured temperature. Two

yellow LEDs indicate output switch status. For optimum visibility the sensor housing can be rotated up to 310° after installation and the digital display can be electronically flipped 180° for inverted installations. Simple pushbutton setup allows the ETS to be easily and quickly configured prior to installation without the need for a separate temperature reference. Or, use our free ProSense XT-SOFT software to program the ETS parameters. Electrical connection is made with a 4-pin M12 quick-disconnect cable. The compact and robust design and construction of the ProSense ETS series withstands shock and vibration, and provides high accuracy and reliability required to excel in industrial temperature sensing applications.

ProSense ETS Digital Temperature Sensors Selection Guide

| Part Number | Price | Measuring Range* | Thread Size | Length | Outputs |
|---|----------|--------------------------------|-------------|--------|--|
| <u>ETS50N-30-1001</u> | \$213.00 | -58 to 302°F (-50 to 150°C) | 1/2" MNPT | 30mm | Output 1: switch PNP, N.O./N.C. selectable or 4-20 mA ¹ Output 2: switch PNP, N.O./N.C. selectable or 4-20 mA ¹ |
| <u>ETS50N-50-1001</u> | \$214.00 | | | 50mm | |
| <u>ETS50N-100-1001</u> ** | \$215.00 | | | 100mm | |
| <u>ETS50N-150-1001</u> ** | \$216.00 | | | 150mm | |
| <u>ETS25N-30-1001</u> | \$210.00 | | 1/4" MNPT | 30mm | |
| <u>ETS25N-50-1001</u> | \$211.00 | | | 50mm | |
| <u>ETS50N-30-1003</u> | \$150.00 | -58 to 302°F (-50 to 150°C) | 1/2" MNPT | 30mm | Output 1: switch PNP, N.O./N.C. selectable Output 2: switch PNP, N.O./N.C. selectable |
| <u>ETS50N-50-1003</u> | \$152.00 | | | 50mm | |
| <u>ETS50N-100-1003</u> ** | \$153.00 | | | 100mm | |
| <u>ETS50N-150-1003</u> ** | \$154.00 | | | 150mm | |
| <u>ETS25N-30-1003</u> | \$150.00 | | 1/4" MNPT | 30mm | |
| <u>ETS25N-50-1003</u> | \$152.00 | | | 50mm | |

* Pushbuttons or free ProSense XT-SOFT software can be used to program custom measuring ranges and change other configuration parameters. An XT-USB programming cable may be required and purchased separately.

** Thermowells available (see ETS Series Digital Temperature Sensor Accessories)

¹ Only one output can be configured as analog.