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TEMPERATURE

Product Data Sheet **DS3002**

Smart Universal Temp Transmitter

GEN210 SERIES

The GEN210 is a second generation 'Smart' in head temperature transmitter that accepts any commonly used temperature sensor, Slidewire transducer or Millivolt signal and converts the output to the industry standard 4-20 mA transmission signal.

The sensor type and range are easily programmed using a software package running under 'Windows™' on a PC which communicates, via an interface adapter, down the same pair of wires that carry the 4-20 mA output signal. Sensor and span can be freely selected without the need for re-calibration.

Isolation is a standard feature, removing all ground loop effects as the input is electrically and physically isolated from the loop power supply (see the schematic below). The use of two micro-processors results in error-free data transmission across the isolation barrier.

The very small size coupled with the versatility of this universal transmitter make it the ideal choice for every temperature measurement application, resulting in lower stock holdings, greater operational flexibility and, in common with our other products, a low cost of ownership.

INPUTS

Pt100 Platinum resistance sensors, Thermocouples, millivolt or Slidewire sensors may be connected to the unit.

The Process Variable may be filtered to remove incoming signal noise using one of four settings. If the 'Adaptive' function is selected the filter continuously adjusts to the incoming signal to noise ratio in order to choose an appropriate level of filtering. In this way a slowly changing input can be heavily filtered but if the signal goes through a sudden change the filter quickly reduces allowing a rapid response, other settings are; off, 2 seconds and 10 seconds.

A user programmable offset is available to remove any system errors that may be present and sensor referencing enables the transmitter to be accurately matched to a particular sensor.

CURRENT OUTPUT

In normal operation the current output varies between 4 and 20mA. If the input sensor develops a fault, or the software in either of the two microprocessors detects an error, then the current output is driven either upscale (greater than 20mA) or downscale (less than 4mA) depending upon the sense of the burnout parameter selected.

COMMS OPERATION

The transmitter is accessed via the comms interface adapter for reprogramming or examination of the process variable and status information. The interface adapter converts the special communications signals on the transmitter power connection cables to the standard USB configuration in order to connect directly to a PC serial port. There are two methods of connecting the interface adapter to the transmitter i.e. using the adapter's own power supply or using the power from an existing loop.

ELECTRICAL CONNECTIONS

Connections to the transmitter are made via the screw terminals provided on the top face. The transmitter is protected against reverse connection so that incorrect connection of the output wires results in near zero current flow in the loop.

SPECIFICATION @ 20°C

RTD (Pt100 Sensors)

Sensor Range		-200 to 850°C (18-390ohm)
Linearisation		BS-EN60751/BS1904/ DIN43760/JISC 1604/Custom (X)[3]
Thermal Drift	Zero	0.008°C/°C
	Span	100 ppm/°C
Lead Resistance Effect		0.002°C/ohm
Minimum Span[1]		25°C
Basic Measurement Accuracy		±0.01% FRI ±0.05% rdg FRI=Full Range Input
Excitatation Current		300µA to 550µA
Max Lead Resistance		50 ohms/leg

Thermocouples

Thermocouple Type	**Measuring Range[4] °C**	**Minimum Span[1] °C**
TC Type K	-200 to 1370	50
TC Type J	-200 to 1200	50
TC Type T	-210 to 400	25
TC Type R	-10 to 1760	100
TC Type S	-10 to 1760	100
TC Type E	-200 to 1000	50
TC Type L only	-100 to 600	50
TC Type N	-180 to 1300	50
TC Type [X][3]	± 9999	Custom

Basic Measurement Accuracy[2]	0.04% FRI ±0.04% rdg or 0.5°C Whichever is greater
Linearisation	BS4937/IEC 584-3
Cold Junction Error	±0.5°C
Cold Junction	Tracking 0.05°C/°C
Cold Junction Range	-40 to +85°C
Thermal Drift Zero	0.1µV/°C
Span	0.01%/°C

Millivolt Inputs

Input		Voltage Source
Range		-10 to +75mV
Characterisation		Linear Custom [X][3] (4th Order Polynomial)
Minimum Span[1]		5mV
Basic Measurement Accuracy[2]		±10µV ±0.07% rdg
Input Impedance		10M ohm
Thermal Drift	Zero	0.1µV/°C
	Span	0.01%/°C

Slidewire

Input	3 Wire Potentioner
Resistance Range	10 ohm to 390 ohm [end to end] (larger values can be accommodated by fitting an external resistor)
Characterisation	Linear
Minimum Span[1]	5%
Basic Measurement Accuracy[2]	0.1% FRI
Temperature Drift	0.01%/°C

Output

Output Range	<3.8 to >20.2mA
Max Output	23mA
Accuracy	±5µA
Voltage Effect	0.2µA/V
Thermal Drift	1µA/°C
Supply Voltage	10 to 35V
Max Output Load	(V Supply -10) K ohms 20 eg (700 ohms @ 24V)

General

Input/Output Isolation	500 V AC rms
Update Time	250mS Maximum
Response Time (Filter OFF)	<1 second
Filter Factor Programmable	Off, 2 secs, 10 secs or Adaptive
Warm Up	2 mins to full accuracy
Stability	0.1% FRI or 0.1°C/year

Approvals

EMC	BS EN61326
ATEX	II 1G EEx ia IIC T4-T6

Environmental	
Ambient Operating Range	-40 to 85°C
Ambient Storage Temp	-50 to 100°C
Ambient Humidity Range	10 to 90% Non-condensing
Mechanical	
Material	NORYL™
Flammability	SEI UL94-V1
Enclosure	DIN std terminal block size
Weight	27g
Dimensions	43mm diameter x 21mm
Communications	
PC Interface	USB configuration
Minimum Output Load	250 ohms for 'In Loop' Programmable
Max Cable Length	1000m
Configuration	Sensor type: Burnout: °C/°F
Parameters	Output Hi/Lo: filter: Tag: User Offset

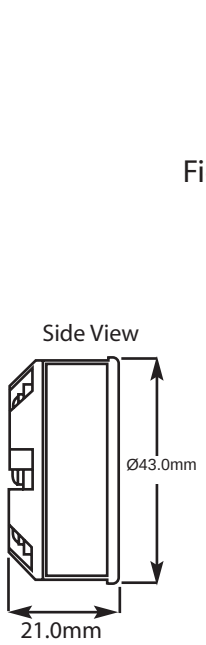
Notes

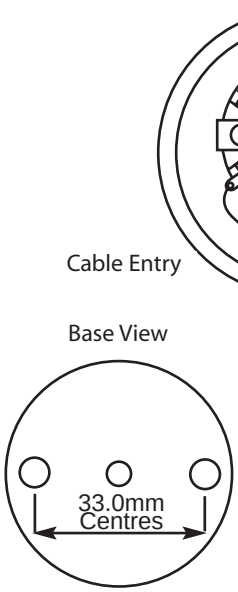
1. Any span may be selected but full accuracy is only guaranteed for spans greater than the minimum recommended.
2. Basic Measurement Accuracy includes the effects of calibration, linearisation and repeatability.
3. Customer linearisation is available pre-programmed at the factory, contact sales office for details.
4. Consult reference tables for Thermocouples Material Limitations.

ORDER CODES

Code	Description
SHX0023	Standard unit (default range 0 to 100°C).
SHX0024	Standard unit, factory set to customers required parameters. State when ordering.
SHX0025	EEx ia IIC T4…T6, (default range 0 to 100°C).
SHX0026	EEx ia IIC T4…T6, factory set to customers required parameters. State when ordering.
SHX0027	Programming kit for GEN210 units.

Fig 2





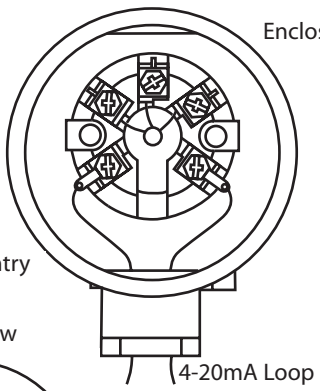
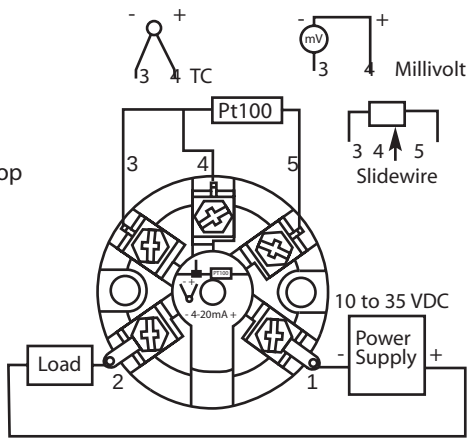


Fig 1



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