4.0 CALIBRATION

Calibration is only recommended when the user has access to suitable equipment, together with a reasonable knowledge of instrumentation calibration techniques. The following instructions act as a guideline to calibration.

4.1 A precision calibrator will be required, to simulate the type of sensor the transmitter is designed for, together with a set of tables giving the sensor output against process variable, (e.g. resistance against temperature for a PT100 sensor). A precision digital current meter together with a 24V DC supply will also be needed. Read the SEM108 label to establish the transmitter range i.e. the process variable input for 4mA and 20 mA. The side label also indicates the location of the span and zero pots.

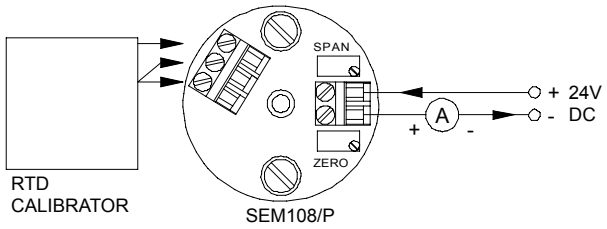
4.2 Connect calibrator to input terminals, using the correct compensation wire for thermocouples inputs and three wire connection for RTD inputs. Connect the output positive to +24V, negative to 0V via current meter. Turn power on.

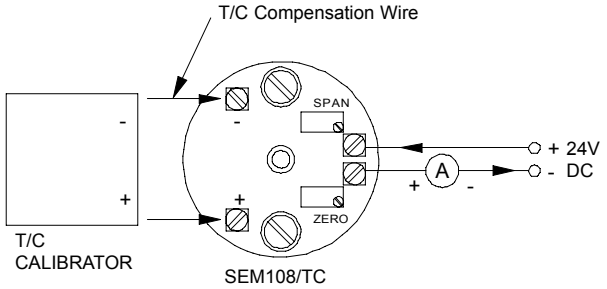
4.3 Set simulator to 4mA process variable and adjust ZERO trimmer for 4.000 mA output. ±0.002mA

4.4 Set simulator to 20mA process variable and adjust SPAN trimmer for 20.000 mA output ±0.002 mA.

4.5 Repeat steps 4.3 and 4.4 until both points are in calibration.

4.6 Turn power off and remove calibration equipment.





SEM108 Series Temperature Transmitter

Designed, manufactured and supported by :

STATUS INSTRUMENTS

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Stock code : 52-214-2163-01 Issue :02

1.0 DESCRIPTION

The SEM108 series is a range of high performance two wire 4-20mA transmitters, designed to accept most standard industrial resistance/ temperature sensors and operate over most common ranges. Automatic thermocouple cold junction compensation is provided on thermocouple versions where the output is directly referenced to the mV input, allowing linearisation to be carried out by the loop monitoring instrumentation, if required. The device is housed inside a plastic enclosure, suitable for head mounting into any DIN style enclosure. Screw terminals are provided for wire connections. Measuring range is specified at time of order. (Trim potentiometers are provided to allow calibration adjustments).

2.0 SPECIFICATION @20ºC

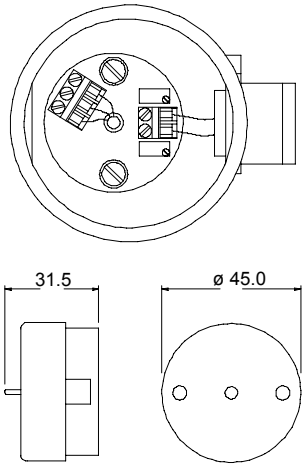
Part Number	Input Type
SEM108TC	Isolated (Ungrounded) Thermocouple types K,T,J,R,S
SEM108P	PT100, DIN 43760, BS1904, BS EN 60751
Output	4-20 mA two wire (Max 30 mA)
Supply Voltage	10 to 33 V DC reverse connection protected.
Ambient Temperature	0 to 70 ºC operation, -40 to 100 ºC storage
Ambient Humidity	0 to 95 % (non condensing)
Connection	Screw Terminal, Maximum recommended cable size 2.5mm sq.
Max Loop Resistance	700R (24V)
EMC	Conforms to EN50082-1

3.0 INSTALLATION

3.1 Mechanical

The transmitter is mounted using two 5.5mm diameter holes, on standard 33mm fixing centres. This transmitter has been specifically designed to be mounted inside a DIN standard probe head, which must provide adequate protection to moisture, corrosive atmospheres etc. All cable entries should be sealed using the correct size cable gland.

Care must be taken when locating the transmitter to ensure the ambient temperature remains inside the specified range of 0 to 70ºC. The diagram shows the mechanical layout with a typical application of the transmitter mounted inside a probe head enclosure.



Mounting holes: 2 holes 5.5mm diameter, 33mm centres

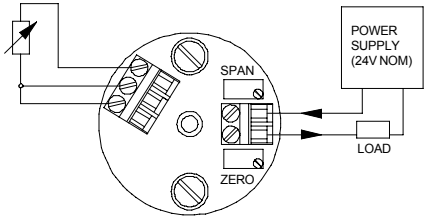
3.2 Electrical

Connections to the transmitter are made to the screw terminals provided on the top face. To maintain EMC compliance input/sensor wires must be less than 3 metres long and output wiring must use screened twisted pair cable with the screen earthed at one end only.

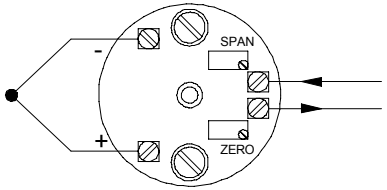
All three input wires must have the same core diameter to maintain equal lead resistance in each wire. T/C sensors must be ungrounded. The transmitter is protected against reverse connection by means of a series diode, therefore incorrect connection of the output wires will result in near zero current flow in the loop. Incorrect connection or failure of the sensor wires will result in the transmitter saturating, T/C versions go upscale, whilst resistance sensor inputs go either upscale or downscale dependant upon which wire breaks. The most common failure would be a total sensor burnout, in which case the transmitter will go upscale.

3.3 Connections

Pt100, 3 Wire



T/C, Isolated Junction Only



The diagram shows the method of connection to provide a 4-20 mA current loop output.

The Pt100 sensor shown as an example would normally take the form of a probe assembly with a three wire output. The output loop shows a 24V DC power supply, used to provide loop excitation, the transmitter, and a load all connected in series. The load symbol represents other equipment in the loop e.g. indicators, controllers, loggers etc. Sometimes these instruments come with the 24V supply built in as standard, this simplifies wiring and reduces cost. Care must be taken when designing the 4-20mA circuit to ensure that the total burden of the loop, that is the total voltage requirements of all the equipment in the loop added together, does not exceed the power supply voltage. If a number of instruments are connected in the loop, ensure that only one instrument is tied to ground. Grounding the loop at two points will result in shorting out part of the loop and therefore any instruments in that part of the loop will not operate.