KOS203P

PUSH BUTTON PT100

30727091 04-07-07

WARRANTY

The instruments are warranted against defective materials and workmanship for a period of three years from date of delivery.

If a product appears to have a defect or fails during the normal use within the warranty period, please contact the distributor from which you purchased the product.

This warranty does not apply to defects resulting from action of the buyer such as mishandling or improper interfacing.

The liability under this warranty shall extend only to the repair of the instrument. No responsability is assumed by the manufacturer for any damage which may result from its use.

SERIE KOSMOS

1.0 DESCRIPTION

The KOS203/P head mounted temperature transmitter connects to any standard pt100 resistance sensor and converts the linearised temperature to a (4 to 20)mA signal. The transmitter is a two wire device, and is fully configurable by the user, over a wide temperature range, with the aid of a simple push button. This new KOS203/P design incorporates additional configuration menus, allowing the user to push button trim the transmitter output at both zero and span, ideal for trimming out sensor errors. The transmitter advanced circuitry guaranties high stability over the wide operating ambient temperature ranges experienced by head mounted devices.
One of the transmitters features is the program LED, wich provides visual indication of sensor fault when in normal operation and is also used to guide the operator through the simple menus during configuration.

2.0 SPECIFICATION @20°C

2.1 INPUT

Sensor type	Pt 100 100Ω @ 0ªC 2 or 3 wire.
Sensor range	(-200 to 850) ºC (18 to 390) Ω
Sensor connection	Screw terminal
Minimum span (see note 1)	25ºC
Linearisation	BS EN 60751(IEC 751) standard / JISC1604
Accuracy (see note 2)	±0.1ºC ±0.05% of Reading
Thermal Drift	0.0025% / ºC
Excitation current	<200μA
Lead resistance effect	0.002 ºC/ Ω
Maximum lead Resistance	20Ω per leg

Note 1 Any span may be selected, full accuracy is only guaranteed for spans greater than the minimum recomended span.
Note 2 Basic measurement accuracy includes the effects of calibration, linearisation and repeatability.

2.2 OUTPUT

Type	Two wire (4 to 20) mA sink
Limits	Low 3.8 mA; high 21.5 mA
Accuracy	±(mA out/2000) or ± 5μA which ever greater
Loop effect	±0.2μA / V measured @ 50Hz 1V (peak to peak)
Thermal drift	±1μA/ºC typical; ±1.5μA Max
Max load	[(Vsupply-10)/20]KΩ

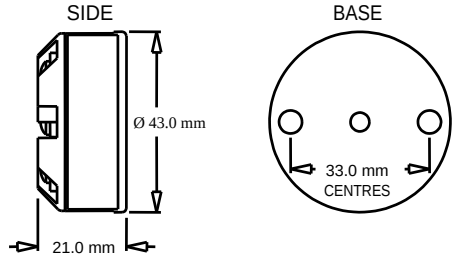
2.3 GENERAL

Update time	0.5 Seconds
Response time	1 Second to reach 90% of final value
Start up time	From power up typically 5 seconds
Filter factor	Adaptive
Ambient Temperature	(-40 to 85) ºC
Connection	Screw terminal
Approvals	BS EN 61326;1998 - Electrical equipement for measurement and control ANNEX A; ANNEX F
Factory Default	(0 to 100) ºC upscale burnout (0.0ºC user trim)

3.0 INSTALLATION

3.1 Mechanical

The KOS203P transmitter has been specifically designed to fit inside a DIN standard probe head enclosure, which provides adequate protection from moisture, dust, corrosive atmosphere, etc. All cable entries must be sealed using the correct size gland. Likewise any probe assembly fitted must be sealed. Care must be taken when locating the transmitter to ensure the working ambient temperature range of (-40 to 85)ºC is not exceeded. The KOS203P enclosure has a centre hole allowing the sensor wired to enter screw terminals from transmitter centre, ths is applicable when the sensor is mounted directly below the transmitter.

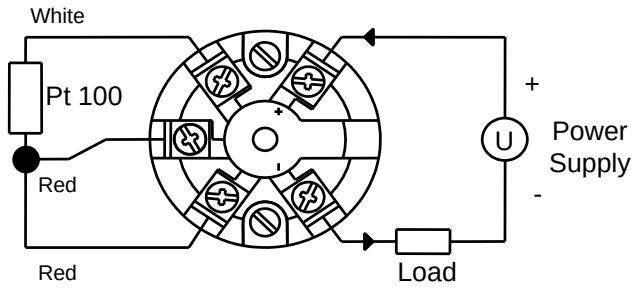


Mounting holes: two holes 5.5mm diameter, 33mm centres
Centre hole sensor wire entry: 4mm

3.2 Electrical

Electrical connections to the transmitter are made to the screw terminal provided on the top face. The sensor wires must be equal length and type for the lead compensation to work correctly. The screw terminals allow for wires to enter either inner oor outer direction. The transmitter is protected against reverse connection and over voltage. If no sensor (input) connection is made the transmitter will go into either up or down scale output current, depending on configuration.
Figure 2 gives connection details, the output is shown connected to a 24V supply. The load symbol represent any other device connected in the loop, such as Monitoring equipement, panel indicators and loop isolators. The load value can range from 0 ohms to the max loop load for given supply, refer to section 2.2 “Max load” for more information.
The transmitter comforms with EC directive BS EN 61326:1998 when correctly installed in a termination head proving at least IP20 protection and with sensor wires less than 3 metres. Screened or twisted pair wires are recommended for output wires. Always ensure the (4 to 20) mA loop is grounded at one point, ths would normally be at the monitoring equipement or loop power supply.
In normal operation the program LED act as over-range LED

Figure 2



4 USER CONFIGURATION

IMPORTANT
Read complete section before attempting configuration
Particular care should be taken regarding timeouts in menu 2 &3

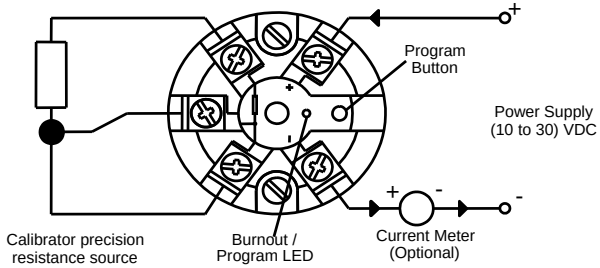


Figure 3 Configuration circuit

User configuration uses three menus, each menu sets a different parameter:

Menu 1 Set range
Menu 2 Set direction of output on sensor burnout
Menu 3 User trim at 4 mA and 20 mA.

The configuration menus are navigated using the push button and program LED, the push button is located Ander the hole in the keyhole shaped wiring label. To press the button use a 3mm screw driver (flan blade) inserted into the hole. The Buttonn has a sligth clic action.

Three types of button press are used:

Single button press = Advance
Double press within 0.5 seconds = Escape or change direction
Press and hold button > two seconds = Enter

When a menu is selected the Program LED will flash in bursts of one to three flashes, the number of flashes represents the menu number.

Navigating the menus

To access menus, press and hold button > 2 second, then program LED will start to flash, one flash every burst. This Indicates "menu 1" is selected.

Use single button press to advance selection to "menu 2", the program LED will now show two flashes per burst. The Next single presses will advance the selected menu to menu 3 and the next single press will advance selected menu back to menu 1. Repeated single presses will cycle the selected menu back around menus 1 to 3, in the above sequence.

Double press button to escape from menus, and return to normal. Normal operation can also be selected by turning transmitter power off and on. Note the transmitter will not time out and automatically escape from menus.

Using Menus

Menu 1 Range configuration (No Timeout)
Configuration will require the following tools and equipment :

- DC Supply (12 to 30) V @ 30 mA
- Precision resistance decade box to simulate PT100 sensor.
- Screw driver flat blade 3mm wide
- Pt100 resistance tables
- Current meter (user trim)

To re-range the temperature scale follow the following instructions:

Refer to figure 3, connect resistance box to KOS203P input terminals using three wire connection. Connect output to a DC supply, observe polarity. Turn power on and allow 1 minute warm up period.

Set calibrator to the equivalent resistance of the pt100 sensor, at required low range temperature. If the program LED is on at this stage the input is out of range, check resistance and connection.

Press and hold button > 2 seconds to enter menus, menu 1 will then be selected, indicated by one flash every burst.

Whilst menu 1 is selected, press and hold button > 2 seconds to enter menu 1, at which stage the program LED toggle on and off at a slow rate.

Allow ten seconds then single press button to store low range setting, the program LED will now flash at a fast rate.

Set calibrator to the equivalent resistance of the pt100 sensor, at required high range temperature and allow ten seconds.

Press button to store high range setting, the program LED will flicker for one second before the transmitter returns to normal operation. The transmitter is now re-ranged.

Menu 2 Burnout Selection (Timeout is 3 Seconds)

Refer to figure 3, Connect output to a DC supply, observe polarity. For this menu the input can be connected or open circuit. Turn power on.

Press and hold button > 2 seconds to enter menus, menu 1 will then be selected, indicated by one flash every burst.

Single press button to advance selection to menu 2, indicated by two flashes of the program LED every burst.

Whilst menu 2 is selected, press and hold button > 2 seconds to enter menu 2, at which stage the program LED will either toggle on and off at a slow indicating low scale burnout or fast rate indicating upscale burnout.

To change burnout direction single press button. The Program LED toggle rate will change to the other setting. Repeated single presses will toggle between up and down scale.

To store setting allow 3 seconds with no button action, the program will then timeout, store new setting then return to normal operation.

Menu 3 User trim (Timeout is 20 Seconds)

This menu allows the user to trim the output current at 4 mA and 20 mA points, (similar function to trim potentiometers) and is very useful for trimming out sensor errors.
The input of the transmitter must be connected to either a calibrator or a temperature sensor held at a known temperature. The (4 to 20) mA loop current will also need to be monitored with a current meter.

Refer to figure 3, connect sensor or resistance box to KOS203P input terminals using three wire connection. Connect output to a DC supply, observe polarity, connect current meter in series with loop. Turn power on and allow 1 minute warm up period.

Set calibrator to the equivalent resistance of the pt100 sensor, at required trim point. Alternatively ensure sensor temperature is at the required calibration point.

The transmitter will automatically trim the 4 mA end if the output is within the active band of (3.8 to 6) mA, and trim the 20 mA end if the output is within the active band of (18 to 21.5) mA . No setting adjustment is performed if the output current is not within these two bands. Ensure your calibration points are within these bands.

Press and hold button > 2 seconds to enter menus, menu 1 will then be selected, indicated by one flash every burst.

Single press button to advance selection to menu 2, and single press again to select menu 3 indicated by three flashes of the program LED every burst.

Whilst menu 3 is selected, press and hold button > 2 seconds to enter menu 3, at which stage the program LED toggle on and off at either a slow rate indicating downward trim direction or fast rate indicating upwards trim direction.

To change trim direction double press button. The Program LED toggle rate will toggle to the opposite direction. Repeated double presses will toggle between up and down trim direction

To trim output current, single press button to advance current 2 uA in set direction, or press and hold button to auto advance in set direction release button to stop advance. Note after approximately 20 seconds of continuous button press, the auto trim rate will speed up. Monitor the current change on the current meter.

To store new setting allow 20 seconds with no button action, the program will then timeout, store new setting then return to normal operation.

Reset to factory default settings
If required the KOS203P can be reset to factory default setting, this procedure also removes any user trim adjustment. Factory default settings are :

Range	(0 to 100) °C
Burnout	up-scale
User trim	All user adjustment cleared

To reset to factory setting, hold the button down whilst the KOS203P is power up.

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