

## Series 800 SMARTStat

The Series 800 Smartstat is a microprocessor controlled pressure switch, transmitter and indicator, which enables several instruments to be replaced with a single device.

## General Specification

<b>Power Supply:</b>	24Vdc @ 3.5mA without 4 - 20mA transmission.
	24Vdc @ 22mA with 4 - 20mA transmission. Maximum supply voltage 30 Vdc.
<b>Switching :</b>	Relays have multi-layered contacts making them suitable for switching from 100mVdc 100µA to 30Vdc 3A or 250Vac 4A. Minimum switching life 10 <sup>8</sup> operations. EEx ia IIC T4/T5/T6 EN50 014 , EN50 020 & EN50 284.
<b>I.S. Certification:</b>	T4 = 80°C, T5 = 55°C, T6 = 40°C. Certificate No: Baseefa 03ATEX0504X
<b>Power Supply:</b>	24Vdc @ 3.5mA without 4 - 20mA transmission. 24Vdc @ 22mA with 4 - 20mA transmission. 24Vdc supply via any 28V 300ohm I.S. source certified by Baseefa or any EEC approved certification body to EEx ia IIC. For Smartstat supply C=0, L=0 Suitable barriers include MTL702+, MTL3041, MTL5041, etc.
	Each relay must be connected to a separate (or the same) I.S. source certified by Baseefa or any EEC approved certification body to EEx ia IIC whose output does not exceed 28Vdc.
<b>Switching:</b>	Umax IN = 28Vdc, Imax IN=3.33A. For relay outputs C=0, L=0. Suitable barriers include MTL707+, MTL2210B, MTL5016, etc.
<b>Ambient Temperature:</b>	-20°C to +85°C (I.S. may be lower)
<b>Accuracy:</b>	Linearity Error: +/- 0.2% typical Temperature hysteresis: +/- 0.1%
	This product satisfies the requirements of the Electromagnetic Compatibility Directive 89/336/EEC and amendments by compliance with standards EN50081-2 : 1993 and EN50082-2:1995. This product also complies with standard EN60947-5-1:1997 in addition to the standards listed for hazardous area certification.
<b>CE:</b>	



## FEATURES:

- PRESSURE RANGES FROM -1 TO 1000 BAR
- 24VDC SUPPLY, 4-20mA LOOP POWERED
- HIGH ACCURACY AND REPEATABILITY
- STANDARD ELECTRICAL AND I.S. CERTIFIED VERSIONS AVAILABLE
- REDUCE COSTS

## Main Applications

A **world leader** in temperature switches, Rototherm has become the standard for accurate and reliable measurement across the following industries:



Power  
Generation



Oil & Gas



Pharmaceutical



Chemical,  
Petrochemical &  
Refining

## ADDITIONAL BENEFITS

- \* Pushbutton calibration of set points and transmitter range enables calibration on site without tools.
- \* Programmable switching delays - the switching on or off (or both) of the relays may be delayed from 0.5 seconds to 15 minutes. This is particularly useful for preventing unwanted switching due to temperature transients.
- \* Display of maximum and minimum pressures recorded by the Smartstat.
- \* Display of transmitter output in mA.
- \* Displayed units of measurement - can be changed by the user as required.

## SMARTSTAT OPERATION

The input pressure applied to the Smartstat is converted to a proportional electrical signal by the silicon pressure sensor. After amplification this signal inputs directly into the analogue to digital (a/d) port on the microprocessor.

The microprocessor continuously calculates the pressure from the input signal, compares this to the switch setpoints and operates the relays as required. If the pressure rises above the UPPER switch point the relay changes over from normally closed (NC) to normally open (NO), as the pressure falls below the LOWER switch point the relay changes over from NO to NC.

In addition the microprocessor updates the LCD display of the pressure and the status of the relays. The typical response time of the relays to an alarm condition is about 125mSec.

Should the 24Vdc power supply fail (or fall below 12 volts) the relays can be configured to remain in their current position or switch to the NO or NC position. This is the 'Fail State' that is indicated on the LCD.

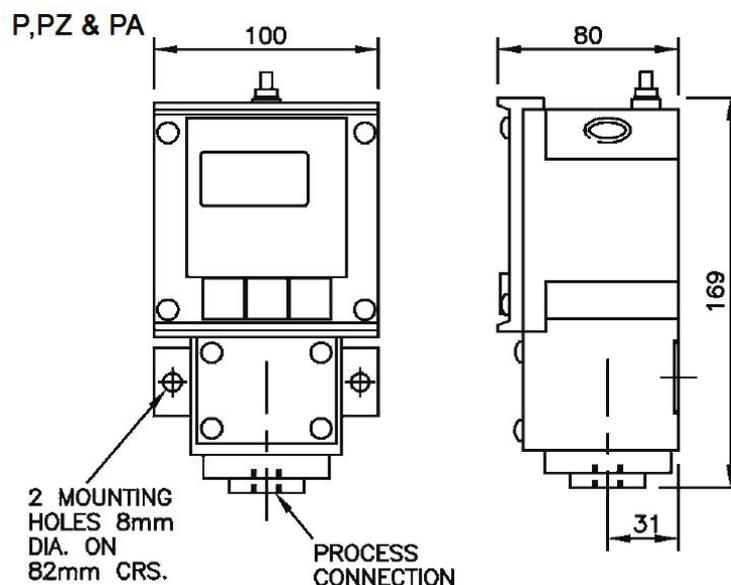
A separate watchdog timer (WDT) continuously monitors the operation of the microprocessor. In the unlikely event that the processor 'hangs' this is detected by the WDT which re-boots the processor, restoring normal operation within 3 seconds.

Entry of the switching points, the Fail State and switching delays for each relay is carried out using the pushbuttons on the front of the Smartstat. An access code must be entered first to ensure that there are no unauthorised changes.

The pressure settings for each relay are adjustable throughout the range enabling the switching differential to be varied from just one digit, up to 100% of the range. All of the information entered is stored on an EEPROM so that it is retained when the power supply is off.

The pushbuttons on the front of the Smartstat are also used to calibrate the transmitter output. An access code must be entered first to ensure that there are no unauthorised changes. The 'start of range' and 'end of range' can be input and 4-20 mA or 20-4 mA selected. If the transmitter output is not required it can be disabled, resulting in a constant supply current of 3.5mA to the Smartstat. The maximum and minimum pressures applied to the Smartstat can be displayed by pressing the MAX or MIN pushbuttons. These values can be reset to the current pressure by holding down the appropriate pushbutton for 15 seconds.

The relays are optional on the Smartstat and can be obtained at a later date and easily fitted by the customer.



## Ordering Information

Pressure Switches	<b>STANDARD →</b>	<b>835P</b>	<b>1</b>	<b>1</b>	<b>21</b>	<b>00</b>	<b>5</b>	<b>5</b>	<b>03</b>
Range Code	Choose range code from table below	835P							
Certification	Standard Electrical		1						
	Certified Intrinsically Safe (I.S.)		7						
Housing Material	Aluminium Housing with Epoxy Hardened stoved enamel finish			1					
	Austenitic stainless steel housing with self finish			4					
Entry & Transmission	Two M20 x 1.50 ISO cable entries / 4-20 mA				21				
Output Switch	None					00			
	2 x SPDT relays					02			
Diaphragm Material	316 Stainless Steel						5		
	Hastelloy C						7		
Chamber Material	316 Stainless Steel							5	
	Hastelloy C							7	
Process Connection	1/4" NPT INT.								03
	1/2" NPT INT.								06
	1/2" NPT Male								08

For any other options, please contact us [sales@rototherm.co.uk](mailto:sales@rototherm.co.uk) or +44 (0)1656 740551

## NOTES:

- Dust and weatherproof ratings are IP65 to BS EN 60529 (IEC60529).
- Standard Pressure Smartstats have a viton 'O' ring seal.
- Transmission to the silicon pressure transducer is via a silicone oil fill, isolated from the process medium by a metal diaphragm.
- A large number of flanged and chemical seal connections are available as special options. Please contact Technical Sales for details.

## Table 1. Order Coding - Range Codes:

Series 800 Pressure Range Codes						
Range Code	Pressure Range	Proof Rating Standard (bar)	Proof Rating "H" Ranges (bar)	Min Span	Max Span	Absolute Range Code
825P	0 to 100 mbar	2	-	20 mbar	100 mbar	825PA
834P	0 to 200 mbar	2	-	40 mbar	200 mbar	834PA
835P	0 to 500 mbar	2.5	6	100 mbar	500 mbar	835PA
836P	0 to 1600 mbar	4	10	320 mbar	1600 mbar	836PA
825PZ	-50 to +50 mbar	2	-	20 mbar	100 mbar	-
834PZ	-100 to +100 mbar	2	-	40 mbar	200 mbar	-
835PZ	-250 to +250 mbar	2.5	6	100 mbar	500 mbar	-
836PZ	-800 to +800 mbar	4	-10	320 mbar	1600 mbar	-
845P	0 to 4 bar	7.5	16	800 mbar	4 bar	845PA
846P	0 to 10 bar	15	30	2 bar	10 bar	846PA
847P	0 to 20 bar	30	75	4 bar	20 bar	847PA
855P	0 to 50 bar	75	-	10 bar	50 bar	855PA
856P	0 to 16 bar	250	-	32 bar	160 bar	856PA
857P	0 to 400 bar	520	-	80 bar	400 bar	857PA
858P	0 to 1000 bar	1100	-	200 bar	1000 bar	858PA

## NOTES ON RANGE TABLE:

- Pressures quoted are gauges. If an absolute pressure range is required then add an 'A' to the range code e.g. 835P becomes 835PA.
- If a higher proof rating than the standard is available the figure is shown in the 'H' ranges column. To specify this option add 'H' to the range code. e.g. 835P becomes 835PH (835PA becomes 835PAH)
- Smartstat pressure sensors are capable of being subjected to full vacuum.

## Technical Certification

- Certificate of conformity
- Factory Test Certificate
- Factory Calibration Certificate (3 point)
- Factory Calibration Certificate (5 point)
- Material Certificate

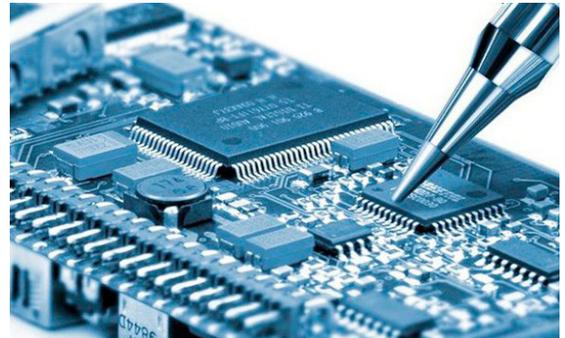
## Calibration and After-Sales Support

- Fully trained field service personnel
- Use of UKAS certified calibration equipment
- 5 day turnaround
- Fixed pricing
- Approved manufacturer parts
- Full post-service reports
- 12 month warranty



## Export Documentation

- Certificate of Origin
- EUR1
- ATR



For more information, please contact our service team  
[services@rototherm.co.uk](mailto:services@rototherm.co.uk)