



# 409

## Smart Indicator

Model 409 is a micro-controller based 5 digit process indicator, designed to accept multiple input types and two programmable set points with individual relays. Model 409 is a stable & rugged indicator, the first choice of OEMs and end users.

Model 409 accepts 21 different industry standard inputs with high accuracy of 0.1% to measure temperature, pressure and other process variables. It is easy to operate and configuration is user friendly. CJC compensation for thermocouple input is done through software for higher accuracy.

It can be interfaced with SCADA/PLC using optional RS485 communication and analog retransmission output for process automation. It has two-way communication facility allowing user to read and write PV over Modbus between any Master device and Indicator.

Alarm can be configured for two set points which are indicated on front Status LEDs. Model 409 has a powerful watchdog circuit with close monitoring of software loop that ensures the proper instrument operation in case of power spikes that are very common in industrial environment. This Indicator has SMPS power supply for smooth and reliable performance. It is also equipped with transmitter power supply.

Model 409 utilizes its unique feature of LED brightness control which enables plant engineers/ operators to adjust intensity of controllers' LED display in order to achieve comfort for eyes.

Model 409 is equipped with advanced functions like digital filtering, password setting, input and output protection and square root function for optimum process functionality

Digital input facility is available to reset process value logged for min & max value as 'PV Hi' & 'PV Lo' parameters respectively.

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### Features

- 5 digit 0.56" Display
- 21 selectable input types (TC, RTD, mV, mA, V,  $\Omega$ )
- Transmitter Power Supply
- RS485 serial communication (optional)
- PV write facility via Serial input
- Programmable retransmission output (optional)
- Two independent programmable alarm/trip output
- Digital Input-Reset PV min/max value
- Display brightness control
- Serial RS485 Input (Modbus Slave Read/Write)
- Input Scalability for Linear input type
- Square Root Extraction for linear input type.
- Selectable Digital Filter 0-60 Sec

### Applications

- Temperature & process indication
- Pressure/ Level/ Flow Monitoring
- Plastics molding/extrusion temperature monitoring
- Heat treatment - furnace temperature monitoring
- Weighing Measurement

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# TECHNICAL SPECIFICATIONS

Input		Physical	
Input Type	Thermocouple (E, J, K, T, B, R, S), RTD (Pt100), Current, Voltage, Resistance	Enclosure Protection	IP20
Display Range	Refer Table-1	Mounting	Panel Mount
Accuracy	±0.1% of FS ± 1digit	Enclosure material	ABS Plastic
ADC Resolution	17 bits	Dimensions(in mm)	96(W) x 48(H) x 112(D)
Display Resolution	0.1°C/ 1 Count	Panel Cutout(in mm)	92 x 46
Sampling Rate	4 Samples/Sec	Weight	260 g (Approx.)
CJC Error	±2.0 °C	Terminal Cable Size	2.5 mm <sup>2</sup>
Sensor open	All inputs except 0-5V, 0-10V, ± 10V, 0-20mA	Standard Accessories	2 Nos. Clamp,
Sensor Burnout current	0.5uA (Approx.)	<b>Environmental</b>	
RTD excitation current	0.8 mA (Approx.)	Operating temperature	0-55 °C
NMRR	> 40 dB	Storage temperature	0-80 °C
CMRR	100 dB	Humidity	20-95 %RH non-ondensing
Temp-co	< 100ppm for Input to Display < 150ppm for retransmission output	<b>Table-1: Display Range</b>	
Input Impedance	> 1MΩ for TC, 0-2V, 0.4-2V, 0-75mV, ± 75mV >840 kΩ for 0-5V, 1-5V, 0-10V, ±10V	<b>Input Type</b>	<b>Range</b>
Max Voltage	20VDC	Thermocouples	E -200 to 1000°C J -200 to 1200°C K -200 to 1350°C T -200 to 400°C B 450 to 1800°C R 0 to 1750°C S 0 to 1750°C
<b>Display &amp; Keys</b>		RTD	Pt-100 -199.9 to 850.0°C
Process Value	0.56" 5 digit Seven segment Red LED	Resistance	0 - 400Ω -19999 to 99999 0 - 6000Ω
Status Indication	4 Red LED's for Alarm and Tx/Rx	Linear	1-5V /4-20mA 0-5V/0-20mA 0-2V 0.4-2V ±10 V -19999 to 99999 0 - 10 V -10-20mV ±75 mV 0-75mV
Keys	Menu, Enter, Increase, Decrease	Serial (RS485)	PV write Facility -19999 to 19999
<b>Output</b>			
<b>Alarm/Trip Output</b>			
Relays	2 Nos.		
Type	Single Change over (C, NO, NC)		
Rating	5A @ 230VAC / 30VDC		
<b>Retransmission Output (Optional)</b>			
Current	0/4-20mA @500Ω Max.		
Voltage	0/1-5V, 0-10V @2KΩ Min.		
Accuracy	0.25% of FS		
<b>Transmitter Power Supply</b>			
24VDC (±10%) @26mA			
<b>Power Supply</b>			
Standard	85-265VAC/ 125-300VDC		
Optional	18 to 36VDC		
Power consumption	<10 VA		
<b>Isolation (Withstanding voltage)</b>			
Between primary terminals* and secondary terminals**: At least 1500 V AC for 1 minute			
Between primary terminals* and grounding terminal: At least 1500 V AC for 1 minute			
Between grounding terminal and secondary terminals**: At least 1500 V AC for 1 minute			
Between secondary terminals**: At least 500 V AC for 1 minute			
* Primary terminals indicate power terminals and relay output terminals.			
** Secondary terminals indicate analog I/O signal and Communication O/P.			
Insulation resistance: 20MΩ or more at 500 V DC between power terminals and grounding terminal. Between secondary terminals**: At least 500 V AC for 1 minute			

## ORDERING CODE

Model	Input	Digital Input*	Power Supply	Communication	Retransmission o/p
409	X	X	X	X	X
	1 E	N None	U1 85-265 VAC	N None	N None
	2 J	Y Yes	U2 18-36 VDC	Y RS485	C 4-20mA
	3 K				D 0-20mA
	4 T				E 1-5V
	5 B				F 0-5V
	6 R				G 0-10V
	7 S				
	9 Pt-100				
	C 4-20mA				
	D 0-20mA				
	E 1-5V				
	F 0-5V				
	G 0-10V				
	H 0-2 V				
	I 0.4-2V				
	R ±75mV				
	U 0-75mV				
	V 0-400Ω				
	W 0-6000Ω				
	M Serial RS485#				
	S Special				

\* If Digital input is Yes, Retransmission o/p is not possible  
# When Serial input type is selected then RS485 port is used