



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.

Features

- 5 digit 0.56" Display
- 21 selectable input types (TC, RTD, mV, mA, V, Ω)
- Transmitter Power Supply
- RS485 serial communication (optional)
- PV write facility via Serial input
- Programmable retransmission output (optional)
- Two independent programmable alarm 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

TECHNICAL SPECIFICATIONS

Input

Input Type	Thermocouple (E, J, K, T, B, R, S), RTD (Pt100), Current, Voltage, Resistance
Display Range	Table-1
Accuracy	±0.1% of FS ± 1Digit
ADC Resolution	17 bits
Display Resolution	0.1°C/ 1 Count
Sampling Rate	4 Samples/Sec
CJC Error	±2.0 °C
Sensor open	All inputs except 0-5V, 0-10V, ± 10V, 0-20mA
Sensor Burnout current	0.5uA (Approx.)
RTD excitation current	0.8 mA (Approx.)
NMRR	> 40 dB
CMRR	> 100 dB
Temp-co	< 100ppm for Input to Display < 150ppm for retransmission output
Input Impedance	> 1MΩ for TC, 0-2V, 0.4-2V, 0-75mV, ± 75mV >840 kΩ for 0-5V, 1-5V, 0-10V, ±10V
Max Voltage	20VDC

Display & Keys

Process Value	0.56" Five-digit Seven segment Red LED
Status Indication	4 Red LED's for (Alarm and Tx/Rx)
Keys	Menu, Enter, Increase, Decrease

Output

Alarm Output

Relays	2 Nos.
Type	Single Change over (C, NO, NC)
Rating	5A @ 230VAC / 30VDC

Retransmission Output (Optional)

Current	0/4-20mA @500Ω Max.
Voltage	0/1-5V, 0-10V @2KΩ Min.
Accuracy	0.25% of FS

Communication (Optional)

Interface	RS485 (2 Wire)
Protocol	Modbus-RTU
Baud rate	4800, 9600, 19200, 38400

Transmitter Power Supply

24VDC (±10%) @26mA

Power Supply

Standard	85-265VAC/ 125-300VDC
Optional	18 to 36VDC
Power consumption	<10 VA

Isolation (Withstanding voltage)

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

Physical

Enclosure Protection	IP20
Mounting	Panel Mount
Enclosure material	ABS Plastic
Dimensions(in mm)	96(W) x 48(H) x 112(D)
Panel Cutout(in mm)	92 x 46
Weight	260 g (Approx.)
Terminal Cable Size	2.5 mm ²
Standard Accessories	2 Nos. Clamp,

Environmental

Operating temperature	0-55 °C
Storage temperature	0-80 °C
Humidity	20-95 %RH non-condensing

Table-1: Display Range

Input Type	Range	
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
RTD	S	0 to 1750°C
	Pt-100	-199.9 to 850.0°C
Resistance	0 - 400Ω	-1999 to 9999
	0 - 6000Ω	
Linear	1-5V /4-20mA	-1999 to 9999
	0-5V/0-20mA	
	0-2V	
	0.4-2V	
	±10 V	
	0 - 10 V	
	-10-20mV	
±75 mV		
Serial (RS485)	0-75mV	1999 to 9999
	PV write Facility	

ORDERING CODE										
Model	Input		Digital Input*		Power Supply		Communication		Retransmission o/p	
409	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, RS485 o/p needs to be selected