

## Smart Indicator (Model 409)



Model-409 is a powerful micro-controller based process indicator, designed to accept multiple input types and two programmable set points with individual relays. Model-409 accepts 21 different types of inputs (all industry standard input) which are field configurable, facilitates plant operator to use in any application. Model-409 is easy to operate and configuration is user friendly. CJC compensation for thermocouple input is done through software for higher accuracy. Provision for range setting is provided to restrict usage band for process safety.

Model-409 is equipped with transmitter power supply, two relays, retransmission output and serial communication RS485 as standard, making this model a benchmark product in the international market. Model-409 uses 5 digit LED display to address process flow rate, weighing measurement application with a high accuracy of  $\pm 0.1\%$  FS. Model-409 is a stable & rugged indicator, the first choice of OEMs and end users. 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.

Digital input facility is available to reset process value logged for min & max value as 'PV Hi' & 'PV Lo' parameters respectively. Importantly this retransmission output is isolated from other input/ output and internal circuit. Model-409 uses SMPS power supply to cover wide range of power supply from 85 to 265 VAC at 50 Hz to survive in industrial power fluctuation conditions.

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 model can also be used as single point RTU, using its serial communication data transfer capability through RS485 on MODBUS protocol. Model-409 is packaged in 96(W) x 48(H) x 112(D) mm industrial standard ABS plastic enclosure (panel mounted) with front facia & enclosure rated to general purpose.

## Features

- *Micro-controller based advanced process indicating alarm unit*
- *21 selectable input types*
- *LED brightness control*
- *Transmitter Power Supply built-in*
- *Standard serial communication*
- *Digital Input-Reset PV min/max value*
- *Two independent programmable alarm output*
- *Can be used as remote terminal unit (RTU)*
- *Easy configuration front keys*

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409

## Technical Details 409

**Display**  
**PV** Red LED 5-digit, character size 0.56".  
**LED** for status indication (Alarm and Tx/Rx)  
**Operation keys** Escape, Enter, Increment, Decrement.

Input	Type	Range	Accuracy
TC	E	-200.0 to 1000.0 °C	±0.1 % Of Full span ± 1 digit
	J	-200.0 to 1200.0 °C	
	K	-200.0 to 1350.0 °C	
	T	-200.0 to 400.0 °C	
	B	450.0 to 1800.0 °C	
	R	0.0 to 1750.0 °C	
	S	0.0 to 1750.0 °C	
RTD	Pt 100	-200.0 to 850.0 °C	
DC * Current	4-20 mA	-19999 to 19999	
	0-20 mA		
DC Voltage	0-5 V	-1999.9 to 1999.9	
	1-5 V		
	0-2 V		
	0.4 – 2V	-199.99 to 199.99	
	± 10V		
	0-10 V		
	-10-20mV		
	± 75 mV	-19.999 to 19.999	
	0-75 mV		
Resistance Input	0-400?	-1.9999 to 1.9999	
	0-6000?		

\* For DC Current input, 250? shunt resistor (sold separately) must be externally installed.

For DC current and voltage input, scaling is possible and decimal point can be changed.

**Burn out current** 0.5 uA  
**Reference Junction compensation error** ±2 °C  
**Noise Rejection Ratio**  
 Common mode > 100 dB (50Hz)  
 Normal mode > 40 dB (50Hz)  
**RTD** Allowable lead wire resistance 15 ? or less.  
**Input Impedance** 1M ? (Approx.) for TC, RTD, 0-2V,0.4-2V,0-75mV, ±75mV,0-400 ? .  
 220 k? for 0-10V, ±10V  
 440 k? for 0-5V, 1-5V, 0-6000 ? .  
**TEMPCO** < 100 ppm for input to display  
 <150 ppm for retransmission output.  
**Input Sampling period** 4 Sample/Sec

**Alarm**  
 Alarm AL1 Momentary Alarm  
 Condition – high/low/vlow  
 Lamp – on/flash/latch  
 Relay – on/off  
 Alarm AL2 Momentary Alarm  
 Condition – vhigh/high/low  
 Lamp – on/flash/latch  
 Relay – on/off

**Note:** The possible combinations are explained in the operational manual.

**Re transmission output(Factory set for current or voltage)**

DC Current 0 to 20 mA DC, 4 to 20 mA  
 DC Voltage 0 to 5V DC, 0 to 10 VDC, 1 to 5V.  
 Accuracy ±0.25% of full Span

Load Resistance for current O/P 600 ? or less  
 Load Resistance for Voltage O/P 2 K? or more  
**Supply voltage** 85 to 265V AC, 50Hz.  
 Optional 18 - 32 VDC available  
**Power Consumption** Max. 10VA  
**Insulation resistance** Between Power supply terminal and ground terminal, 500V DC 50 M? .  
**Environment**  
 Ambient 0 to 55 °C.  
 Humidity 20 to 95% RH (Non-condensing).  
**Case**  
 Material ABS Plastic.  
 Color Black.  
**Mounting method** Panel mounting.  
**Dimension** 96(W)\*48(H)\*112(D).  
**Panel Cutout** 92(W)\*46(H)  
**Weight** 260 grams (Approx.)  
**Communication**

<b>Communication Interface</b>	Based on EIA RS-485.
<b>Communication method</b>	Half-duplex communication start stop synchronous.
<b>Communication Speed</b>	4800/9600/19200/38400bps selectable by key.
<b>Parity</b>	None.
<b>Communication Protocol</b>	Modbus RTU.
<b>Connectable number of unit</b>	Max.32 unit per host computer.
<b>Communication error detection</b>	CRC check

**Contact Input** 1-Channel (Isolated) Non- voltage contact input, Maximum reverse voltage 6V, Maximum Forward voltage 50V, Capacity 24V DC, 10mA

**Transmitter Power Supply** 24V DC ±10% @26mA (±10 % accuracy)

**Isolation specification**

Measured input terminal - Isolated from other input/output terminals.  
 24V DC supply for transmitter - Isolated from other input/output terminal and internal circuit.  
 Retransmission output terminal - Isolated from other input/output terminal and internal circuit  
 Relay contact output terminal/RS-485 communication terminal/Power supply terminal/Ground terminal - Isolated from other input/output terminal and internal circuit.

## ORDERING CODE

Model 409	Retransmission O/p	
409	APS	X
	A1 85-265 VAC	1 4-20 mA
	A3 18-32 VDC	2 0-20 mA
		3 1-5 VDC
		4 0-5 VDC
		5 0 - 10VDC

All specifications are subject to change without notice due technology reasons.  
 Doc.ref.CB-2/409/R2/0110