

OPERATION MANUAL

DIGITAL PROCESS INDICATOR WITH RELAY OUTPUTS

JX-42 EX

DIGITAL PROCESS INDICATOR

WITH CONTROL OUTPUTS

MODEL : JX-42 EX

INTRODUCTION

The ASHE JX-42 EX is a micro-controller based Digital process Indicator with control output feature, offered in a highly compact, rugged and reliable execution. The instrument has three keys on the front panel, with which the operator can set the parameters and configure the instrument as desired. A four-digit red LED digital display is provided on the front panel which indicates the process value in real time. The display can indicate any scale range between –999 to +9999 units.

The instrument has non-volatile memory (i.e., in case of power failure, the set points and other settings are retained in memory and the indication and control actions resume after power is restored).

The instrument accepts a standard analog current loop signal of 4 to 20 mA DC (for optional analog input signals of 0 to 10 V DC or others, please revert to us) and displays the process value while providing control outputs, the set points of which are settable through the Membrane Keypad on the front panel. An analog signal retransmission output signal is also offered, which can drive upto 600 Ohm load. An optional feature is the setting of all set-points using an Infra-red remote Control unit.

The process display is factory calibrated to the desired operating range of the input through the instrument software and may be changed whenever desired.

A three-key infra-red Remote Control unit Model 8080MPR (optional purchase) may also be used to configure the instrument and for routine operations and settings. This Remote Controller functions as a parallel keyboard and is particularly useful in applications where the instrument is housed in Weather-proof or Explosion-proof enclosures, or is mounted at a height or at inaccessible field locations.

The input signal is suitably isolated and conditioned by the micro-controller, which displays the actual process value in real time on the digital display.

Two Relay outputs are offered in this model – each of which may be configured to operate on either High or Low setting, with its independent hysteresis value. These set points may be set through the Membrane Switch-pad on the front panel or by Remote Control [see *OPERATION & SETTINGS* section].

The micro-controller based process Indicating Controller Model : JX-42 EX is therefore an ideal instrument for process measurement applications because of its versatility and inherent accuracy in process measurement and control, besides other superior characteristics such as total immunity to shocks, dust, ambient temperatures, and humidity. It is available in field-mounting (weather-proof / explosion-proof executions) and standard panel mounting enclosures. It operates on 18–28 V DC power or 90-270 V AC mains power supply (preference to be pre-specified).

Further, the instrument is manufactured using selected high-grade components which guarantee it's functionality and long operational life. The instrument carries a performance guarantee against manufacturing defects and faults in workmanship.

INSTALLATION

Based on the execution, the instrument should be first mounted in a suitable location if field mounted, or in an appropriate cut-out on the panel, if panel mounted. [See *TECHNICAL SPECIFICATIONS*]. All interconnections to the instrument should be made with strong multi-strand wire of the order of 2.5 sq.mm. The ends of the wires should be properly ferruled and suitable lugs must be used for effective termination.




The cables carrying the input signal should be routed separately and properly isolated from the power line cables, to prevent any electromagnetic interference in the input signal readings from the mains power line. Use of shielded twisted pair cable is recommended for input signals. The shield must be connected to Earth only at the instrument end. The instrument should be earthed to a proper grounding point before connecting the Power Supply. The voltage between the Earth and Neutral terminals should be negligible (Approx. 1 V AC). The Relay contacts are potential free and any desired voltage may be used in conjunction with the same.

OPERATION & SETTINGS

The Digital Indicator Controller has a four-digit display window on the front panel for indicating the process value. Further, two LED indications show the over-range status of the two control Relays. A small window above the digital display window is provided for receiving Infra-red signals from the Remote Controller unit (optional).

CONTROL KEYS

The instrument has three keys on the front panel, the functions of which are described below :

	<p>The PROG or PROGRAM key is the central co-ordinating key to access the settings of the instrument. Pressing this Key allows the operator to sequentially view, change and save the parameters such as Zero and Span settings, Decimal position, Relay Set-points, Hysterisis, Relay Control Logic, etc.</p>
	<p>The INC or Incrementing key allows the operator to select the numeral in the digit being set on an increasing scale. The digit will sequentially display 0, 1, 2....9 on each pressing of the INC key. This may be used to set the Zero/Span of the display and Set-points of the Relays. The incrementing speed increases if the key is kept pressed.</p>
	<p>The DEC or Decrementing key allows the operator to select the numeral in the digit being set on a decreasing scale. The digit will sequentially display 9, 8, 7....1 on each pressing of the DEC key. This may be used to set the Zero/Span of the display and Set-points of the Relays. The decrementing speed increases if the key is kept pressed.</p>

SETTINGS & CALIBRATION

The following is the sequence of settings on the Digital Indicator / Controller :

CONTROL SETTINGS

All settings are to be done using Increment (↑) and Decrement (↓) keys.

KEY PRESSED	INITIAL DISPLAY	ALTERNATING DISPLAY	FUNCTION
(POWER ON)	8.8.8.8.	- - - -	Initialization of internal controller and Lamp Test (self diagnostics).
-	Err		If Input Signal is not connected.
PROG P	Set1	(preset value)	The Set-point "Set1" for Relay-1 is displayed alternately with the factory preset value.
PROG P	hY1	000.5	The Hysteresis value for Relay-1 may be set (default value 0.5 counts).
PROG P	ht1	0001	Minimum Off time of Relay (in seconds) - to avoid chatter (applicable for Proportional control only).
PROG P	LG1	Hi	The Control Logic for Relay-1 may be decided. Options are "hi" (High) or "LO" (Low).
PROG P	Set2	0100	The Set-point "Set2" for Relay-2 is displayed alternately with the factory preset value.
PROG P	hY2	000.5	The Hysteresis value for Relay-2 may be set (default value 0.5 counts).
PROG P	ht2	0001	Minimum Off time of Relay (in seconds) - to avoid chatter (applicable for Proportional control only).
PROG P	LG2	Hi	The Control Logic for Relay-2 may be decided. Options are High (hi) or Low (LO)
PROG P	(process value)	-	(if Input Signal is connected)

CALIBRATION

All settings to be done using Increment (↑) and Decrement (↓) keys.

KEY PRESSED	DISPLAY	ALTERNATING DISPLAY	FUNCTION
Press and hold the Decrement (↓) key for 4 seconds			Instrument goes in "User" mode.
PROG P	Pt	0000	Enter the number of Relays actually being used in the application. <i>[Options are 0/1/2]</i> . This feature may be used to temporarily disable the use of one or more Relays in the instrument. e.g., if the User needs to use both Relays, select 2.
PROG P	Cnt	On	Type of Control Action may be set. Options are : On : On-off control PF : Proportional control
PROG P	LO	0000	The desired Zero (lower) range setting for the process being measured / controlled may be set using INC and DEC keys. The lowest Zero level possible is -999.
PROG P	hi	5000	The desired Span (upper) range setting for the process being measured / controlled may be set using INC and DEC keys. The maximum Span level possible is 9999.
PROG P	CYC	20	Duty Cycle time setting, i.e. [On+Off] time in seconds (will appear only if Proportional control action is selected).
PROG P	dP	0000	Set the Decimal Position. <i>[Options are : 0 / 1 / 2 / 3]</i> . These numbers indicate the position of the Decimal with respect to the Least Significant Digit (right-most digit). e.g., 0 indicates No Decimal Point.
PROG P	Set1	Default factory setting	Adjust the desired Set-Point for Relay-1 using INC and DEC keys. <i>[Range is -999 to 9999]</i> .
PROG P	hY1	0001	Process Value Hysteresis : Adjust the desired Hysteresis for Relay-1 using INC and DEC keys <i>[e.g. 0010 for a hysteresis of 10 degrees]</i> .
PROG P	ht1	0003	Time Hysteresis : Adjust the desired minimum off time (in seconds) between Relay resets (to avoid chatter) using INC and DEC keys.
PROG P	LG1	h l	Adjust the desired Control Logic for Relay-1 using INC and DEC keys. <i>[Options are HI / LO]</i> .
PROG P	Set2	Default factory setting	Adjust the desired Set-Point for Relay-2 using INC and DEC keys. <i>[Range is -999 to 9999]</i> .
PROG P	hY2	0001	Process Value Hysteresis : Adjust the desired Hysteresis for Relay-2 using INC and DEC keys <i>[e.g. 0010 for a hysteresis of 10 degrees]</i> .
PROG P	Ht2	0003	Time Hysteresis : Adjust the desired minimum off time (in seconds) between Relay resets (to avoid chatter) using INC and DEC keys.
PROG P	LG2	h l	Adjust the desired Control Logic for Relay-2 using INC and DEC keys. <i>[Options are HI / LO]</i> .
PROG P	(process value)		(if Input Signal is connected)

This completes the entire settings of the Digital Process Indicator / Controller.

DISPLAY MESSAGE EXPLANATIONS

The explanation of the various Displays and Messages that would be visible on the instrument Menu are as follows :-

SR.	MESSAGE	DESCRIPTION
1.	Set1 / Set2	Set-Point for Relay-1/2. <i>[Range is -999 to 9999].</i>
2.	hY1 / hY2	Hysterisis for Relay-1/2 <i>[e.g. 0010 for a hysteresis of 10 counts].</i>
3.	ht1 / ht2	Time Hysterisis : To adjust the desired minimum off time (in seconds) between Relay resets (to avoid chatter).
4.	LG1 / LG2	Control Logic for Relay-1/2. <i>[Options are HI / LO].</i>
5.	Pt	The number of Relays actually being used in the application. <i>[Options are 1/2].</i> This feature may be used to temporarily disable the use of one or more Relays in the instrument. e.g., if User needs to use both Relays, select 2. <i>[This parameter must not be changed by user unless essential].</i>
6.	Cnt	Type of Control Action required. Options are : On : On-off control PΓ : Proportional control
7.	LO	Zero (lower) range setting for the process being measured / controlled may be set using INC and DEC keys. The lowest Zero level possible is -999.
8.	hi	Span (upper) range setting for the process being measured / controlled may be set using INC and DEC keys. The maximum Span level possible is 9999.
9.	CYC	Duty Cycle time setting , i.e. [On+Off] time in seconds (only if Proportional control action is selected).
10.	dP	Decimal Position . <i>[Options are : 0 / 1 / 2 / 3].</i> These numbers indicate the position of the Decimal with respect to the Least Significant Digit (right-most digit). e.g., 0 indicates No Decimal Point.

TERMINAL DIAGRAM

Terminal Details Block No.1

1	2	3	4	5	6	7	8
L	N	E	X	+	-	+	-
90-270 VAC, 50 Hz				24 VDC		4 to 20 mA (I/P)	

Terminal Details Block No.2

9	10	11	12	13	14	15	16
No Conn		NC	C	NO	NC	C	NO
		RELAY-2			RELAY -1		

TERMINAL DETAILS

TERMINAL BLOCK	TERMINAL NO.	NOTATION	DETAILS
TERMINAL BLOCK - 1	1	L	90-270 VAC, 50 Hz
	2	N	
	3	E	
	4	X	NO CONNECTION
	5	+	24 VDC (Output)
	6	-	
	7	+	4 to 20 mA DC INPUT
	8	-	
TERMINAL BLOCK - 2	9	X	NO CONNECTION
	10	X	
	11	NC	RELAY-2
	12	C	
	13	NO	
	15	NC	RELAY-2
	15	C	
	16	NO	

TECHNICAL SPECIFICATIONS

Model	:	JX-42 EX.
Type	:	Microcontroller based Digital Process Indicator with Control option and retransmission.
Input Signal	:	4 to 20 mA DC.
Display	:	Seven-segment, red LED display.
Indications	:	Four-digit display.
Scale Range	:	-999 to +9999 [Fully configurable].
Calibration Range	:	May be calibrated as required.
Decimal point	:	Selectable.
Response time	:	Typically 100 mS.
Output	:	Two control relay change-over contacts – Control logic selectable
Contact rating	:	10 Ampere @ 230 V AC (Res. Loads).
Memory	:	Non-Volatile (on EEPROM).
Settings	:	By Membrane Switchpad on front panel. Optionally by Remote Control (optional)
Features	:	Configurable for Scale Calibration, Decimal position, No of active Relays, Control Logic, Set points, Hysterisis.
Accuracy	:	$\pm 0.1\%$ FS.
Power Supply	:	90-270 VAC, 50 Hz
Enclosure	:	Explosion-proof, Die-cast Aluminum Alloy LM6 suitable for Gas groups IIA/IIB.
Weight	:	Approximately 1.2 kgs.
Execution	:	Explosion-proof as per IS:2148-2004 (IEC60079-1/2001) Weatherproof IP65 as per IS:12063-1987 (IEC60529-1989) Design, Rating & Temp Class as per IS:13346-2004.

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