INDUMART Canada
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Electronic Circular Chart Recorder

SERIES: 90

MICROPROCESSOR BASED

- SINGLE, TWO OR THREE PEN RECORDER
- UNIVERSAL INPUT: THERMOCOUPLES, RTDs, mA, VDC
- HIGH ACCURACY AND STABILITY
- PANEL OR SURFACE MOUNTING
- MENU-DRIVEN SOFTWARE FOR CALIBRATION AND CONFIGURATION VIA FRONT PANEL KEYPAD
- MICROPROCESSOR CONTROL OF RANGING, CHART SPEED, RELAYS AND SENSOR LINEARISATION
- SIMULTANEOUS DIGITAL INDICATION OF ALL PROCESS VARIABLES
- LARGE-CHARACTER ALPHANUMERIC DISPLAY PANEL WITH BACKLIGHT
- SPECIAL 'ZOOM' FEATURE FOR EXPANSION OF RANGE
- COMPREHENSIVE ALARM FACILITIES
- ALARM STATUS SHOWN BY COLOUR-CODED LEDs
- IP-55 PROTECTION
- RETRANSMISSION OUTPUT (OPTION)
- TRANSMITTER POWER SUPPLY (OPTION)
- RS-232 OR RS-485 SERIAL COMMUNICATIONS (OPTION)
- HARDWARE AND PROGRAMMABLE SOFTWARE LOCKS FOR SECURITY

INTRODUCTION

The *90 Series* Circular Chart Recorders combine the simplicity and clarity of pen drawn traces together with the versatility of microprocessor control. These recorders continuously monitor the output of one, two or three industry-standard sensors such as thermocouples, RTDs, mA and VDC signals, and provide pen and digital indications plus ON/OFF control. RS-232 and RS-485 serial communications, re-transmission signal cards and transmitter power supply can be added to the standard instrument as options.

INPUT SIGNALS

Precise measurements of input signals are assured by the use of multi-slope integrating analogue-to-digital converters with 16-bit resolution which sample the input every 0.5 second. Multi-input versions include optoelectronic isolation of the input stages to eliminate troublesome installation of ground loops.

Low and high measurement ranges are provided for each input type and thermocouple and RTD characteristics are fully linearised by means of software. In addition, thermocouple measurements benefit from automatic cold-junction compensation which uses software correction in conjunction with a stable platinum resistance detector for cold-junction temperature sensing.

ALARMS

Alarm relay facilities are comprehensive. Up to 6 failsafe relays are available. That is, the relays are energized in the normal state and de-energized in the alarm state. In this way, if the power to the recorder is interrupted, the relays will automatically signal an alarm condition.

Single pen recorders are equipped with three 6A single-pole changeover relays, while six relays are standard on the two and three pen versions. Each relay may be programmed to operate with any channel (pen) of the recorder. Colour-coded light-emitting diodes show the status of each relay at a glance. All relay functions are configured by the means of the control software and via the keypad. Setpoints, hysteresis and the switching actions such as, high alarm, low alarm, deviation alarm, control low relay and control high relay are selected from user-friendly menus.

KEYPAD AND DISPLAY

Ease of operation is an important feature of the *90 Series* recorders. Configuration and calibration of the chart recorder is via a five-function keypad with associated 2-line liquid crystal display (LCD). Clear prompts and menus presented on the large-character display guide the operators through the setup procedure with confidence.

The input type, chart range, display units, chart speed, relays actions and setpoints are selected from the configurations menus. At each stage of the setup procedure, the display recalls the value of setting currently stored in memory, such as relay setpoints and measurement spans.

CASE AND CHART

The *90 Series* recorders are housed in a strong moulded case that can be panel or surface mounted. A gasketed lockable door protects internal components from harsh industrial environments and offers IP-55 protection. A sturdy acrylic window allows the chart trace, digital channel readings and alarm status to be viewed with the recorder's door closed.

Circuit precision is matched by the unique backlash-free pen drive mechanism which provides positioning resolution better than 0.1%. An integral feedback potentiometer enables closed-loop monitoring of each pen position.

The rotation speed of the 244 mm diameter chart is microprocessor-controlled and user programmable. The time for chart revolution may be set between 1 hour and 31 days in steps of 1 hour or 1 day. To ease chart changing, a motorized pen lifter parks the pens at the edge of the paper. The high speed chart advance / reverse facility allows the chart to be set quickly to the correct time mark.

Three levels of security including password, hardware jumper lock and lockable door are available to stop unauthorized access and alteration of the recorder's configuration. All configured data (type of input, chart range, chart speed, display units, setpoints, etc.) are stored in nonvolatile memory for security in the event of power failure.

Service engineers will appreciate the recorder's fully-modular construction which allow easy maintenance and upgrading in the field.

SPECIFICATIONS

General

Case	Glass filled polyester resin with Acrylic door window
Power Supply	115 or 230 VAC ±10%, switch selectable, 50 or 60 Hz
Power Requirement	<25 W
Chart Size	Round, 244 mm (9.6 inch) dia.
Chart Drive	DC stepper motor
Chart Speed	Software selectable, 1 to 24 hours in 1 hour increment and 2 to 31 days in 1 day increment
Pen	Disposable fiber-tipped; 1st pen: Red; 2nd pen: Green 3rd pen: Blue
Pen Positioner	DC stepper motor with feedback
Pen Response Time	Zero to full-scale in 4.5 sec.
Pen Lift	Motorized, activated from front panel
Display	2 line x 20 character dot matrix liquid crystal with backlight and automatic temperature compensation
Character Height	9.6 mm
Display Resolution	Temperature ranges: 0.1°C; Linear ranges: software selectable
Security	3-level; Software lock including password protection; Internal hardware jumper lock; Lockable door
Operating Temp.	0...55°C
Operating Humidity	0...90% RH
Protection Class	IP-55
Mounting	Surface or flush panel
Weight	Single pen: 7.0 kg Three pen: 7.7 kg

Inputs

Number of Input	1, 2 or 3
Input Signals	Thermocouple types J, K, B, E, R, S & T Pt-100, 3-wire RTD DC voltage ±2 V & ±20 V DC current ±2 mA & ±20 mA
Accuracy	Linear: ±0.2% f.s. T/C: ±0.25% f.s. RTD: for <200°C, ±0.2°C for >200°C, ±0.8°C (ambient 20°C)
Input Resistance	T/C: 10 MΩ ±2 mA: 200 Ω ±20 mA: 20 Ω ±2 V: >1 MΩ ±20 V: >1 MΩ
RTD Current	1 mA approximately

Continue...

RTD Lead Resist.	3-lead conn., compensated up to 10 Ω maximum per lead
Input Protection	±50 VDC on signal inputs
Input Isolation	Optoelectronic on 2 and 3 input versions, 500 Vrms channel-to-channel 500 Vrms channel-to-earth
Temp. Stability	±0.02% f.s. / °C
CJ Comp. Stability	±0.02% °C / °C
CJ Compensation	Automatic, using Pt-1000 sensor and software correction
Calibration Shift	±10°C user programmable
A/D Converter	Integrating, 16-bit resolution with 50/60 Hz noise rejection
Conversion Rate	2 per second
Noise Rejection	>120 dB common mode; 60 dB normal mode 50/60 Hz

Relays

Number of Relays	3 on single pen and 6 on two and three pen versions
Relay Actions	Software selectable; High alarm / Low Alarm / Deviation Alarm / Control Relay (high) / Control Relay (Low); Relays de-energize in alarm state
Alarm Display	Relay status shown by red and green front panel LEDs
Assignment	Relays freely assignable to any channel
Hysteresis Level	0 to 10% of span, selectable
Relay Contacts	SPCO silver alloy
Switched Load	DC Power: 150 W AC Power: 1660 VA
Switched Current	6 Amp. maximum
Switched Voltage	30 VDC, 250 VAC
Snubber Network	Standard

Retransmission (Option)

Output Current	0...20 mA or 4...20 mA
Resolution	12 bits (0.024%)
Output Compliance	20 V approximately
Isolation	Optoelectronic
Range	Software selectable anywhere within chart range
Action	Direct or reverse, selectable

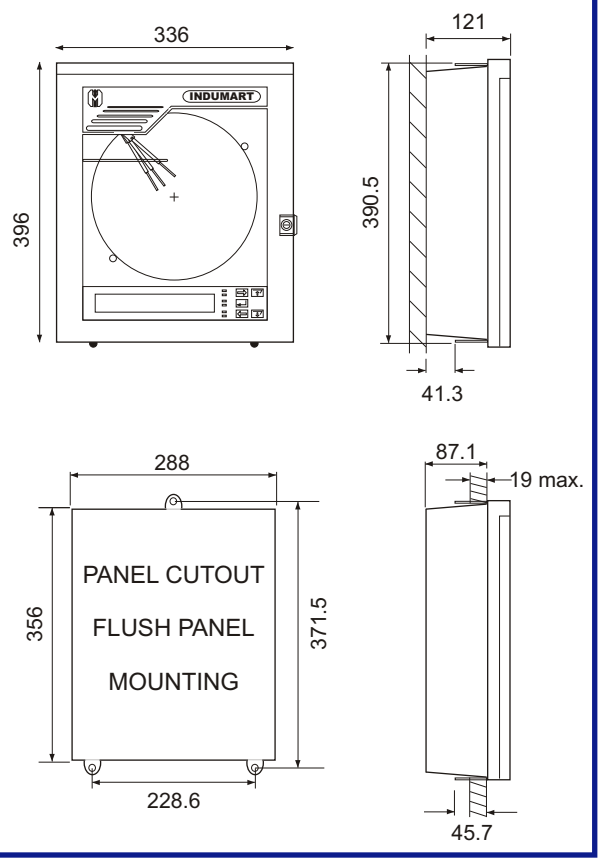
Communications (Option)

Interface	Serial RS-232 or RS-485
Isolation	Optoelectronic
Bud Rate	User selectable, 1200, 2400, 4800 & 9600
Format	8 bits, no parity

Transmitter Power Supply Unit (Option)

Input	Isolated output, voltage 12/24 V selectable

DIMENSIONS AND FIXING (mm)



ORDER CODES

Model **90–**

Second Pen

Third Pen

RECORDER
1 Pen
2 Pen
3 Pen

COMMUNICATIONS
Not Required
RS232
RS485

RETRANSMISSION
Not Required
Required

TRANSMITTER POWER SUPPLY
Not Required
Required

Note: *Input type, Input range,,Chart speed, Power supply, Alarm action, etc are selected by the user via the keypad.*

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PNEUMATIC CONTROLLERS AND TRANSMITTERS

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