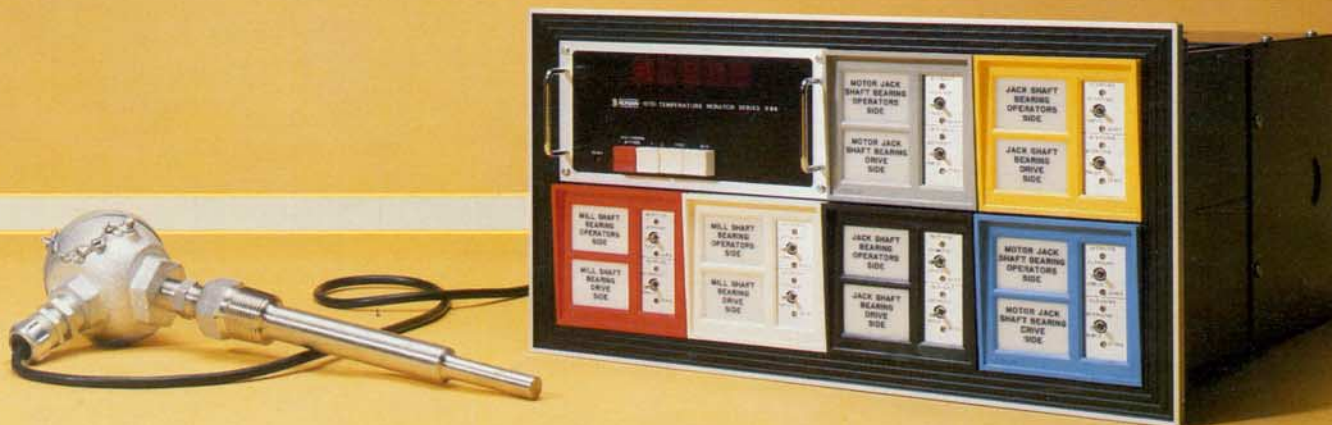


SERIES X84 RTD TEMPERATURE MONITOR



FEATURES:

- Three different types of RTD elements can be used in the same monitor. Example: Copper, Nickel and Platinum Resistance Probes.
- Front calibration adjustments.
- Shutdown bypass feature to permit monitor testing and verification of trip set points.
- Integral alarm sequence logic per channel.
- Modular construction to suit customer requirements. Any number of points high by wide.
- Available to meet Class 1, Division 2 locations.
- Available with isolated transmitter output signals on one or all inputs.
- Hybrid Systems - Combination with solid state or relay annunciator in one package.
- Colored bezels available to identify groupings or special application.
- Expandable from single channel, single setpoint to dual channel, single setpoint if specified at time of order.
- Integral 115VAC to 24VDC power supply for specific applications.
- Available in NEMA 4 or NEMA 12 enclosures.



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Instant Warning of Critical Temperature Changes

IMMEDIATELY

Sounds Audible Alarm
Identifies Alarm Source
Initiates Shutdown
Displays Temperature
Displays Setpoint

MONITOR

Compressors and Pumps
Turbine and Motors
Process Temperatures

The Ronan Series X84 RTD Temperature Monitor and Process Alarm System is designed to monitor temperatures from resistance bulb inputs.

FLEXIBILITY

Highly versatile, the X84 is capable of handling three different types of resistance elements in the same monitor such as copper, nickel and platinum. Three input module styles are available: single RTD input with high or low alarm settings, single RTD input with dual alarm settings for high or low, low or lower, high or higher alarm settings, dual RTD input modules with single alarm settings on each input for high or low alarm settings. Any of the three styles of input modules with their selected resistance element material can be installed in any monitor chassis position. All points can be optionally wired to cause a single shutdown or groups of points may be assigned to specific shutdowns. Some users find the X84 can be furnished to mate with essentially any customer furnished resistance bulb over a variety of temperature ranges. Standard resistance bulbs may be purchased from Ronan as part of your system or your Ronan Representative can assist you with non-standard requirements. Temperature indicator has switch selection for degrees, F or C. The X84 operates with either two-wire or three-wire resistance probes.

LOW INITIAL COST

The X84 is actually two systems in one since an RTD system and an alarm system have been combined in one package. You avoid the extra cost of purchasing two separate systems and the additional expense of wiring them together.

SIMPLICITY OF OPERATION

Operation of X84 is straightforward and simple. All controls and switches as well as calibration adjustments are located on the front panel for easy accessibility. To measure the temperature of a particular RTD, merely depress the corresponding point switch and the temperature is indicated on the digital meter in either F or C degrees, raise the point switch and the setpoint temperature is displayed. All models are furnished complete with Test, Silence, Bypass, F or C degrees pushbuttons which are self-contained. Remote pushbuttons can be supplied for customer mounting and wiring. Terminals on rear of master module are provided for customer input wiring.

ACCURACY

Basic accuracy of the X84 is ensured by the liberal use of the latest available integrated circuit amplifiers, regulators, military quality precision resistors, silicon transistors, as well as CMOS integrated logic circuitry.

Ronan advanced solid state design provides unusual reliability and uniformity of operation. Glass epoxy printed circuit boards are used to mount the latest ICS and other solid state circuitry which is used throughout the X84. Fifteen turn potentiometers, provide for calibration of the X84. 3-1/2 digit temperature indicator and alarm module setpoints, aid in achieving a level of accuracy and reliability which is difficult to find in competitive systems.

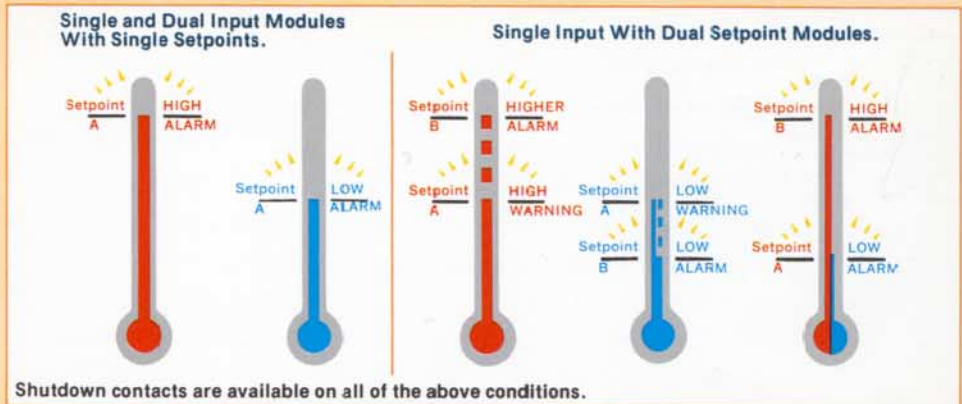
STANDARD INPUT RANGES

RTD	°F	°C
Copper	0 to +300	-20 to +150
Nickel	-50 to +550	-50 to +290
Platinum	-150 to +1,000	-100 to +550

Consult factory for other than standard ranges.

TYPICAL APPLICATION WITH TEMPERATURE MONITORING

New Dual Setpoint Modules may be mixed with Single Setpoint Modules to provide unequalled versatility for the monitoring and protection of valuable process equipment. The combinations possible are illustrated by the thermometers to the right.



The Model X84 may be supplied for standard flush mounting in Control Panels or standard EIA relay Racks. The unit consists of a master module and a number of dual or single setpoint alarm and monitor modules. The sensor inputs are continuously monitored and compared against one or two preset levels. If either of the setpoint levels are exceeded, instant visual and audible warning is provided by variable rate flashing alarm windows and the sound of an external horn or buzzer.

Each input has set or trip points that may be adjusted on the individual front panels using multiturn infinite resolution potentiometers and readout on the digital panelmeter in the master module. The digital meter permits reading temperatures in degrees Celsius or Fahrenheit selectable by a front panel-mounted pushbutton switch.

Each alarm monitor module is equipped with a shutdown relay contact output per setpoint allowing the control of single or multiple external circuits. The unique shutdown bypass switch in the master module, if depressed, prevents undesired shutdown during system start-up or the execution of the test sequence. The visual alarm of each monitored point follows the standard Ronan Alarm sequence as shown in the chart below. Other alarm sequences are optionally available. Fixed hysteresis on each

setpoint further enhances the flexibility of the system in control applications.

The master module contains, in addition to the 3-1/2 digit panel meter, signal conditioning and linearization circuitry. The linearization amplifier optimizes the readout accuracy of the nonlinear sensor inputs inherent in RTD's. The master module is capable of accepting up to two different linearization amplifier modules. Copper inputs are linear and, therefore, do not require a linearizing module. The system is powered from an unregulated external 24VDC power source or battery. On systems using ten or less inputs, the chassis can be supplied to accept 115VAC power input.

The master module's front panel-mounted pushbuttons allow selection of °C or °F, Shutdown Bypass, Acknowledge of alarm and execution of Test to functionally simulate alarm conditions.

The modular construction permits complete flexibility in the number of inputs monitored plus the free arrangement of units high by units wide. The unit may be flush mounted, or 19 inch EIA Relay Rack, as well as wall mounted in NEMA 4 or NEMA 12 type enclosures with safety glass window for front viewing and accessibility.

Operating Controls and Indicators

Master Module

Single Input
Single Setpoint

Single Input
Dual Setpoints

Dual Inputs Each With
Single Setpoint



A. Temperature - Setpoint Display

Digital Readout with Excellent Readability.

B. Zero Adjust

Permits precise screwdriver adjustment of the display's electrical zero.

C. Shutdown Bypass Indicator

Flashing when Shutdown Bypass Pushbutton is depressed.

D. Shutdown Bypass Pushbutton (Maintained Type)

If depressed, prevents undesired shutdown.

E. °C-°F Pushbutton (Maintained Type)

Readout selector for degrees celsius or fahrenheit.

F. Test Pushbutton (Momentary Type)

Causes all alarm lamps to flash and horn to sound. Active only when "Shutdown Bypass" is depressed.

G. Acknowledge Pushbutton (Momentary Type)

Causes flashing alarms to go to their acknowledged state and the horn to silence.

H. & K. Single and Dual Input Modules (with Single Setpoints)

Single and dual input modules may be set to indicate high alarm or low alarm conditions. The shutdown relay energizes when the alarm trips and remains energized during alarm condition (normally energized optional).

Input - Setpoint Switch

Up Position - Read setpoint setting on master module.

Center Position - Normal (spring return).

Down Position - Read input temperature on master module.

Setpoint and Zero Adjustment

Jeweler's screwdriver adjustable infinite resolution multi-turn potentiometer.

I. & L. Nameplates

Single Inputs — 1-1/2 inches wide x 3 inches high
(3.81 cm wide x 7.62 cm high)

Dual Inputs — 1-1/2 inches wide x 1-3/8 inches high
(3.81 cm wide x 3.5 cm high)

Standard White (Colored and sandwich lenses available optionally)

J. Single Input Module (with Dual Setpoints)

Dual setpoints may be set to indicate high/higher, low/lower or high and low alarm conditions. The shutdown relays energize when the associated alarm trips and remains energized during alarm condition. (Normally energized for fail safe operation optional).

Temperature - Set Point Switch

Up Position - Read setpoint setting on master module.

Center Position - Normal (spring return).

Down Position - Read input temperature on master module.

Setpoint Selector Switch

Up Position - A setpoint.

Down Position - B setpoint.

Setpoint and Zero Adjustment

Jeweler's screwdriver adjustable infinite resolution multi-turn potentiometer.

SINGLE SETPOINT ALARM SEQUENCE CHART

Temperature Versus Setpoint	Operator Action	Alarm Lights	Horn	Shutdown Relay
Alarm		Slow Flash	On	Energized
Alarm	Acknowledge	On	Off	Energized
Normal		Off	Off	Deenergized
Normal	Test	Slow Flash	On	*
Normal	Acknowledge	Off	Off	Deenergized

*Shutdown Bypass must be pressed to enable Test Switch. This feature avoids operating the Shutdown Relays.

Relays are shown Deenergized for Normal Operation: Optional Energized Relays for Normal Operation are available. In Selecting which Setpoints are used for High and Low Alarms the "B" Setpoint will operate with galloping flashing alarm lights independent of the state of the "A" Channel which may be normal. The "B" Channel can be selected for either the High or Low Setpoint. Shutdown Relays are supplied Standard as Lock-In. Optionally Available with Non-Lock-In Type Relays. Shutdown Bypass operates with either Normally Deenergized or Energized Shutdown Relays.

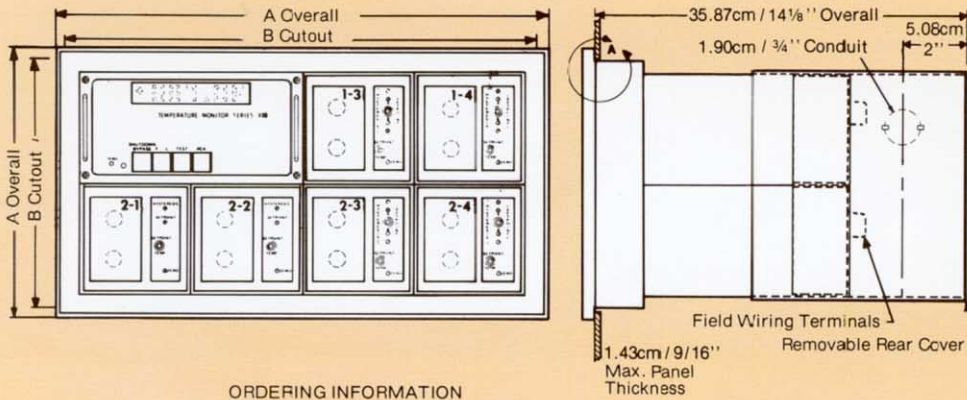
DUAL SETPOINT ALARM SEQUENCE CHART

Temperature Versus Setpoint		Operator Action	Alarm Lights	Horn	Shutdown Or Alarm Relays	
A Setpoint	B Setpoint				A Setpoint	B Setpoint
Normal	Normal		Off	Off	Deenergized	Deenergized
Alarm	Normal		Slow Flashing	On	Energized	Deenergized
Alarm	Normal	Acknowledge	Steady On	Off	Energized	Deenergized
Alarm	Alarm		Galloping Flashing	On	Energized	Energized
Alarm	Alarm	Acknowledge	Fast Flashing	Off	Energized	Energized
Alarm	Normal		Steady On	Off	Energized	Deenergized
Normal	Normal		Off	Off	Deenergized	Deenergized
Normal	Normal	Test	Galloping Flashing	On	*	*
Normal	Normal	Acknowledge	Off	Off	Deenergized	Deenergized

*Shutdown Bypass must be pressed to enable Test Switch. This feature avoids operating the Shutdown Relays.

Dimensional Information

FLUSH MOUNTING MODEL X84-1006

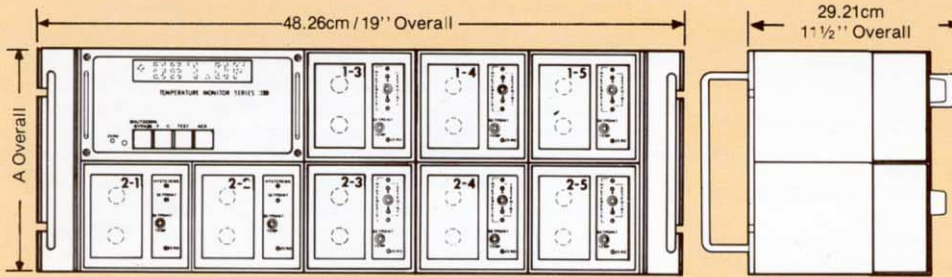


ORDERING INFORMATION
 ┌── UNITS HIGH
 └── UNITS WIDE
 24 X84-1006

Number of Alarm Cabinets High or Wide	A Overall		B Cutout	
	High	Wide	High	Wide
1	5.00"	12.70cm	4.38"	11.11cm
2	8.50"	21.95cm	7.88"	20.00cm
3	12.00"	30.48cm	11.38"	28.89cm
4	15.50"	39.37cm	14.88"	37.78cm
5	19.00"	48.26cm	18.38"	46.67cm
6	22.50"	57.15cm	21.88"	55.56cm
7	26.00"	66.04cm	25.38"	64.46cm
8	29.50"	74.93cm	28.88"	73.34cm
9	33.00"	83.82cm	32.50"	82.55cm
10	36.50"	92.71cm	36.00"	91.44cm
11	40.00"	101.60cm	39.50"	100.33cm
12	43.50"	110.49cm	43.00"	109.22cm

Note: Not limited to 12 Cabinet Modules high or wide.

RELAY RACK MOUNTING MODEL X84-1006RR

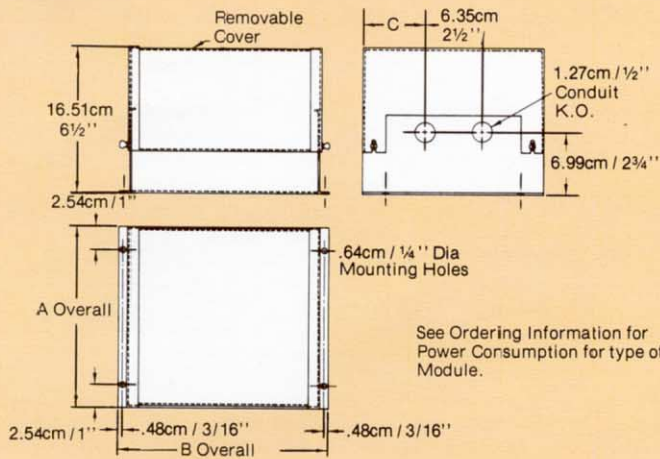


ORDERING INFORMATION
 ┌── UNITS HIGH
 └── UNITS WIDE
 25 X84-1006RR

Number of Alarm Cabinet Modules	A Overall	
	High	Wide
1	5	3.50" / 8.89cm
2	5	7.00" / 17.78cm
3	5	10.50" / 26.67cm
4	5	14.00" / 35.56cm
5	5	17.50" / 44.46cm
6	5	21.00" / 53.34cm
7	5	24.50" / 62.23cm
8	5	28.00" / 71.12cm
9	5	31.50" / 80.01cm
10	5	35.00" / 88.90cm

Note: Not limited to 10 Cabinet Modules high. Also available for 24 inch RETMA Cabinets.

POWER SUPPLIES



See Ordering Information for Power Consumption for type of Module.

Power Supplies			
Model	A	B	C
115-24-125	6" / 15.24cm	9 1/4" / 23.50cm	1 3/4" / 4.45cm
115-24-250	6" / 15.24cm	9 1/4" / 23.50cm	1 3/4" / 4.45cm
115-24-375	6" / 15.24cm	9 1/4" / 23.50cm	1 3/4" / 4.45cm
115-24-500	8" / 20.32cm	10 1/8" / 25.72cm	2 3/4" / 6.99cm
115-24-750	8" / 20.32cm	10 1/8" / 25.72cm	2 3/4" / 6.99cm

┌── Wattage Rating
 └── Output Voltage DC
 └── Input Voltage AC

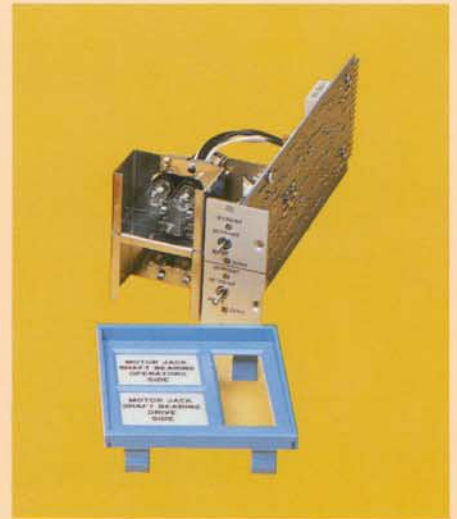
Note: For other output voltages please consult factory.



SINGLE INPUT MODULE-
Single Setpoint



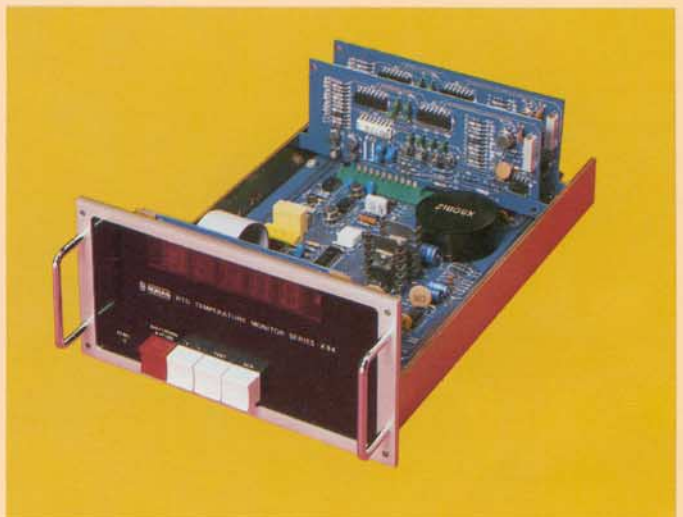
SINGLE INPUT MODULE-
Dual Setpoint



DUAL INPUT MODULE -
Single Setpoint per Input



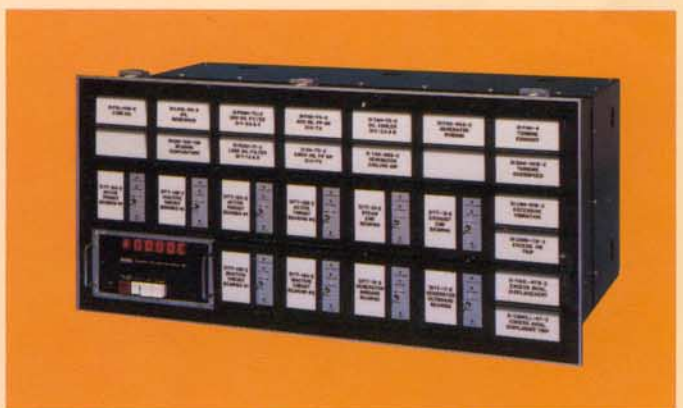
16 POINT SELECTOR SWITCH MODULE
Model X80-16-(RTD Element)



MASTER MODULE with option of linearizing up to two RTD
Elements.

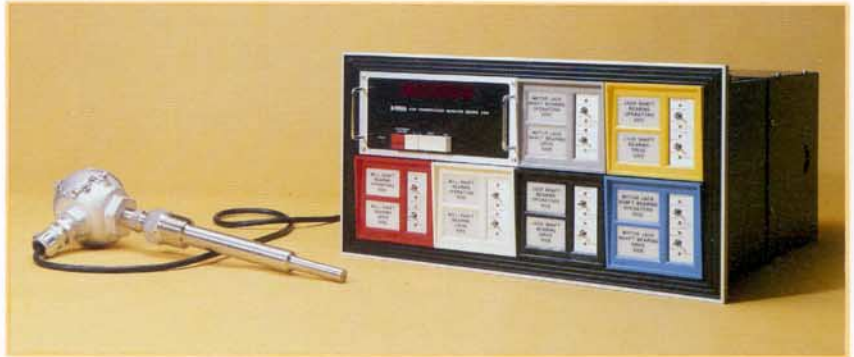


MODEL X80PS INTEGRAL POWER SUPPLY
115VAC Input 50 Watts max @ 24VDC

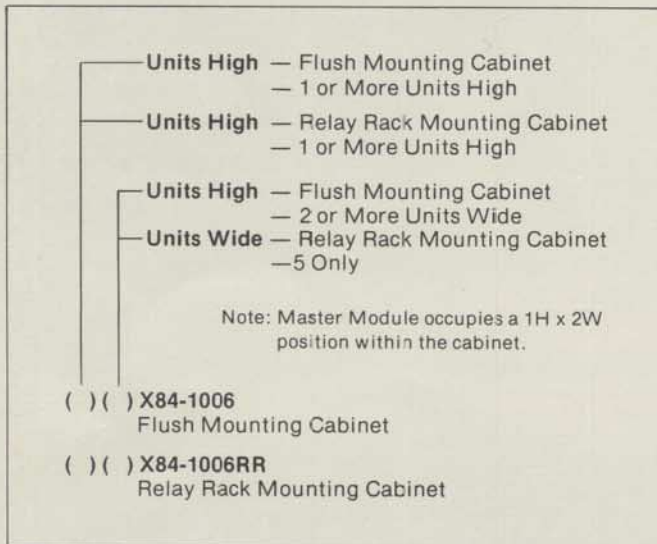


HYBRID SYSTEM - X2 Relay System, X12 Solid-State System
and LB lamp cabinets.

Ordering Information



CHASSIS



MASTER MODULE X84-100

Temperature Range: See standard ranges. X84-101A same as X84-100 but with integral 115VAC to 24VDC Power Supply for maximum of 10 channels.

LINEARIZING BOARDS

One or Two Maximum per Master Module.

Model	Description	Range
X84-200-100	100 Ohm Platinum RTD	- 150°F to 1000°F
X84-200-120	120 Ohm Nickel RTD	- 50°F to 550°F

Note: Copper RTD Linear Inputs therefore Linearizing Board not required.

INPUT MODULES

(Single Setpoint - One Input Channel per Chassis Position.)

Model No.	Input	Range
X84-300-9	9 Ohm Copper RTD	See Standard Ranges
X84-300-10	10 Ohm Copper RTD	
X84-300-100	100 Ohm Platinum RTD	See Linearizing Board
X84-300-120	120 Ohm Nickel RTD	

INPUT MODULES

(Single Setpoint - Two Input Channels per Chassis Position.)

Model No.	Input	Range
X84-302-9	9 Ohm Copper RTD	See Standard Ranges
X84-302-10	10 Ohm Copper RTD	
X84-302-100	100 Ohm Platinum RTD	See Linearizing Board
X84-302-120	120 Ohm Nickel RTD	

INPUT MODULES

(Dual Setpoint - One Input Channel per Chassis Position.)

Model No.	Input	Range
X84-400-9	9 Copper RTD	See Standard Ranges
X84-400-10	10 Ohm Copper RTD	
X84-400-100	100 Ohm Platinum RTD	See Linearizing Board
X84-400-120	120 Ohm Nickel RTD	

General Apply for both Single and Dual Setpoint Input Modules. RTD Module Upscale Burn-Out Standard - Downscale Burn-Out optional. Use Dual Module with Low Setpoint for Short Circuit Detection on RTD Probes. Specify GP or HS for Shutdown Relays.

TRANSMITTER

(Use with Single or Dual Setpoint Units. One Per Chassis Module Only.)

Model	Description
X80-600-TM	All Standard listed Inputs. 4 to 20 MA Output Input to Output Isolation Standard

When ordering specify position(s) and temperature ranges(s).

HORN RELAY

X23DC-24GP General Purpose
X23DC-24HS Hermetically Sealed
Contact Rating 3 Amp, 115VAC, Non-Inductive, Mounted on Rear of Master Module.

SPARE CHASSIS WIRING

Specify Single Input Modules, Dual Single Setpoint Modules, Dual Setpoint Modules and Transmitter Operation.

POWER SUPPLIES

Model No.	Rating
115-24-125	115VAC Input 24VDC Power Output - 125 Watts
115-24-250	115VAC Input 24VDC Power Output - 250 Watts
115-24-375	115VAC Input 24VDC Power Output - 375 Watts
115-24-500	115VAC Input 24VDC Power Output - 500 Watts
115-24-750	115VAC Input 24VDC Power Output - 750 Watts

220VAC, 50Hz Input Power supplies available.

POWER CONSUMPTION

Master Module	10	Watts
Single Input Modules with 10 Ohm RTD	6	Watts Per Point
Dual Single Input Module (Except 10 Ohm RTD)	9	Watts Per 2 Points
Dual Single Input Module (10 Ohm RTD)	10	Watts Per 2 Points
Dual Setpoint Modules Except 10 Ohm RTD	5.6	Watts Per Point
Dual Setpoint Modules with 10 Ohm RTD	6.6	Watts Per Point
Horn Relay	1	Watt
Transmitter	1.2	Watt
16 Point Plug-in Pushbutton Station	6	Watts

16 POINT PLUG-IN PUSHBUTTON STATION

Complete input amplifier to feed directly into master module. One amplifier per sixteen point plug-in module.

Model X84-16-9	9 Ohm Copper RTD
Model X84-16-10	10 Ohm Copper RTD
Model X84-16-100	100 Ohm Platinum RTD
Model X84-16-120	120 Ohm Nickel RTD



Refer to chart for Standard Temperature Ranges.

Note: Each system requires one Interface Module X80-16-IF to disengage the input to the Master Module when reading temperature and set points on X84 input modules.

Pushbutton station occupies two cabinet positions. The X84 chassis and position of switch module must be specified at time of order.

TYPICAL EXAMPLE

- 16—RTD 3-Wire Nickel Probe with Dual Setpoints
- 4—RTD 3-Wire Platinum Probe with Single Setpoints

Note: Any spare position must accept single input modules with single or dual setpoints.

Flush Panel Mounting Cabinet
Electrical Classification—General Purpose

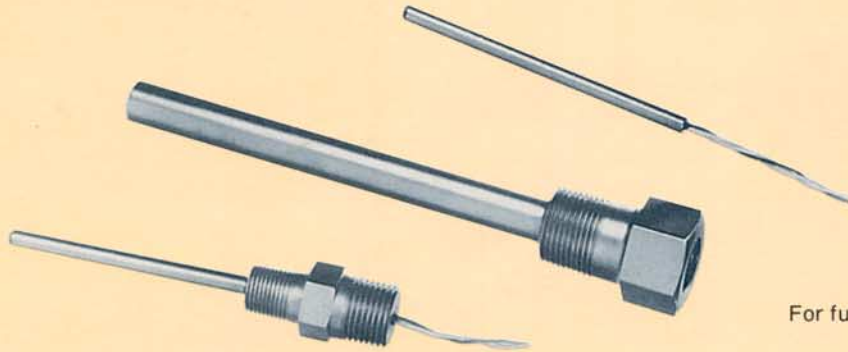
- QTY—1** 46X84-1006 Monitor complete with:
- 1—X84-100A Master Module
 - 1—X84-200-120 Linearizing Board (Nickel)
 - 1—X84-200-100 Linearizing Board (Platinum)
 - 16—X84-400-120 GP Input Modules (Nickel)
 - 4—X84-300-100 GP Input Modules (Platinum)
 - 2—Spare Chassis Positions (wired for Single Input Modules with Single or Dual Setpoints)
 - 1—X23DC-24GP Horn Relay
 - 1—115-24-125 Power Supply
 - Optional: 1—350N-115VAC Horn

Note: Specify module type and chassis position.

HYBRID SYSTEMS:

The X84 can be custom assembled with either Solid State or Relay Annunciators.

RTD PROBES AND ACCESSORIES



For full details of RTD Probes and Accessories, see Catalog RTP-100.

WARRANTY

Ronan warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will replace any component found to be defective, on its return, transportation charges prepaid, within one year of its original purchase. This warranty carries no liability, either expressed or implied, beyond our obligations to replace the unit which carries the warranty.

OTHER RONAN PRODUCTS

SOLID STATE ALARM SYSTEMS
RELAY ALARM SYSTEMS
MOTION DETECTORS
FAULT FINDER
MOTOR STOP-START STATIONS
TWO-WIRE MOTOR CONTROL SYSTEMS
EXPLOSION PROOF ALARMS
ELECTRONIC TRANSMITTERS AND TRIP MODULES
TRI-COLOR & ENGRAVABLE PANEL LIGHTS
SEQUENTIAL EVENTS RECORDER
GRAPHIC DISPLAYS



Represented by:

SPECIFICATIONS

POWER:	24VDC \pm 10%
POWER CONSUMPTION:	See Ordering Information
ACCURACY:	Total systems error (includes curve fitting and meter to 1000 degrees): \pm 2°F or °C + 1 Digit
AMBIENT TEMPERATURE EFFECT:	75° \pm 40°F Gain: \pm .01% of reading / °F Offset: \pm .05 degree / °F
HORN RELAY CONTACT RATING:	3 Amp @ 115VAC
SHUTDOWN RELAY CONTACT RATING:	1 Amp Rating at 24VDC, resistive 0.5 Amp rating at 115VAC, resistive
RESOLUTION:	1° Standard
SETPOINT RANGE:	Same as standard input range (Range may be reduced optionally)
SETPOINT RESOLUTION:	Better than .1% of Setpoint Range
HYSTERESIS:	Fixed standard is 5°F (Other Values Optional.)
INPUT IMPEDANCE:	Copper > 3K Ohm Nickel > 20K Ohm Platinum > 20K Ohm
BURNOUT RESPONSE:	Positive Overscale