WATER
SPECIALTIES

PROPELLER METER ™

INDICATOR-TOTALIZER RECORDER

MODEL IN48
12" Circular Chart
Single 4-20 mA Input

QUICK REFERENCE MANUAL

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* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

WIRING

INPUT WIRING PROCEDURES

Refer to Figure 2-9* and follow the procedure in Table 2-10 to connect the AC line power.

WARNING   **Be sure that the line voltage is OFF before connecting the power wires to the recorder or personal injury could result.**

Table 2-10   AC Line Power Wiring

| Step	Action
1	Open the recorder door. Loosen the captive screw in the chart plate and swing the plate out.
2	Locate connector J10 on the bottom edge of the main printed circuit board. (Refer to Figure 2-9.)
3	Remove the unwired plug from J10.
4	Run the power wires separately through second conduit from the right.
5	Strip 1/4-inch maximum of insulation from the end of each wire.
6	Loosen the screws in plug J10 terminals and position the plug as you would to plug it into J10.
7	Insert the *green* wire (G) into the first screw clamp from the right, the *white* wire (L2) into the second screw clamp from the right, and the *black* wire (L1) into the third screw clamp from the right. Tighten the screws to secure the wires. **CAUTION** **To avoid damaging the recorder, be sure that you install the power wires into the correct screw clamps. Make sure the fuse block is installed properly for the given supply rating—120 or 240 Vac. The fuse is in the 120 Vac location from the factory.**
8	Make sure the fuse block is installed in the proper location. Refer to Figure 2-9 for fuse block location. • **120 Vac** — Fuse block in location **F2** • **240 Vac** — Fuse block in location **F1**
9	Dress the wires as slack as possible. This keeps the noise signal on these wires from bypassing built-in suppression. Also, do not bundle any low level signal wires with the power wires. Refer to Table 2-9 for permissible wire bundling. • Refer to *Appendix B* for additional information concerning noise interference protection.
10	Insert the wired plug into J10. **WARNING** **Input line voltage will be present on the instrument ground plane if safety ground is not attached; personal injury and product damage could result.**

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.
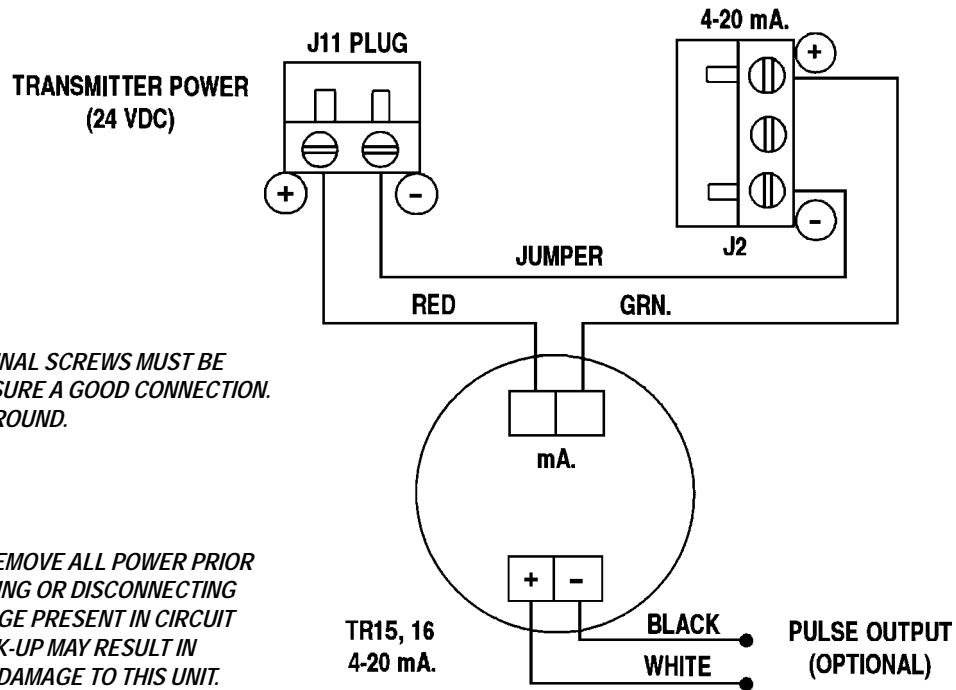
WIRING

Figure 2-9*   **AC Line Power Wiring**   **Factory Set 120 VAC.**

FUSE BLOCK

F1
240 Vac

F2
120 Vac

PLUG J10

L1   L2

H   N

120 or 240 Vac

21410
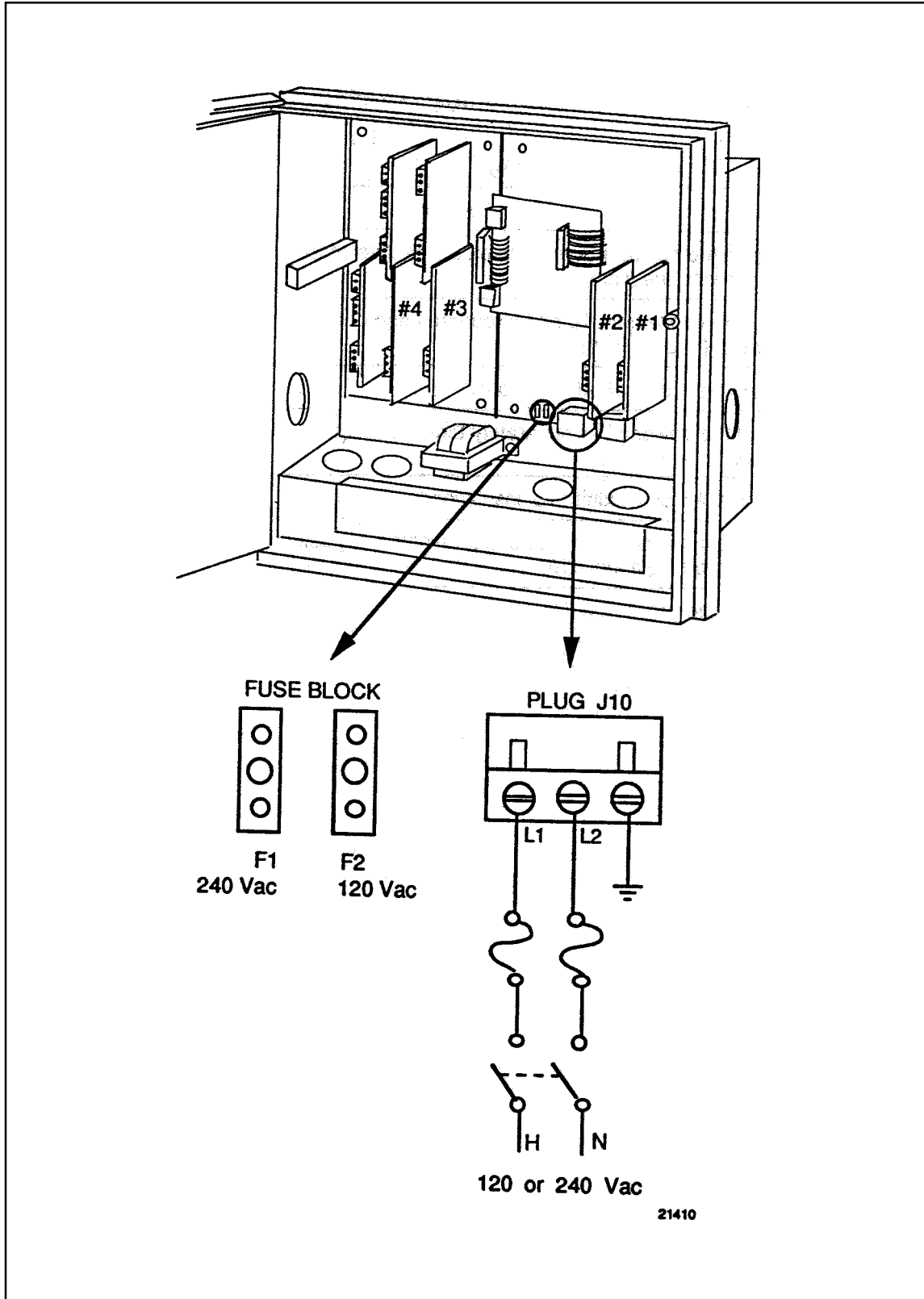
* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

WIRING DIAGRAM
FOR TR15/16 TO IN48

From transmitter receiving power from recorder
Page 29 - Product Manual

J11 PLUG

TRANSMITTER POWER
(24 VDC)

+   −

4-20 mA.

+

J2

−

JUMPER

RED   **GRN.**

NOTE: TERMINAL SCREWS MUST BE TIGHT TO ENSURE A GOOD CONNECTION. SHIELD TO GROUND.

mA.

WARNING: REMOVE ALL POWER PRIOR TO CONNECTING OR DISCONNECTING WIRE. VOLTAGE PRESENT IN CIRCUIT DURING HOOK-UP MAY RESULT IN PERMANENT DAMAGE TO THIS UNIT.

+   −

TR15, 16
4-20 mA.

BLACK

WHITE

PULSE OUTPUT
(OPTIONAL)

WIRING DIAGRAM FOR TR28 TO IN48
(FOR RECORDERS SOLD AFTER 5/93)

J11 PLUG

TRANSMITTER POWER
(24 VDC)

+   −

J2 PLUG

4-20 mA.

+

J2

−

JUMPER

RED

FROM TRANSMITTER RECEIVING POWER FROM RECORDER

Battery

4-20 mA Current Loop
PC Board Assembly

TR28

TB3   TB4

GREEN
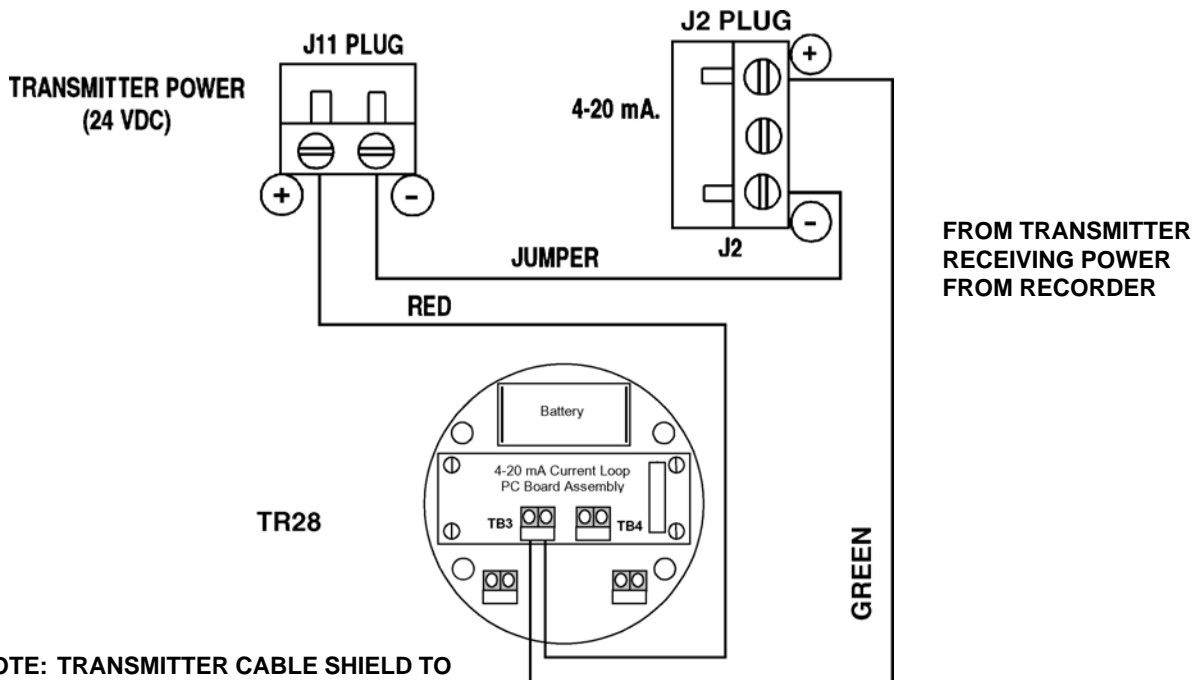
NOTE: TRANSMITTER CABLE SHIELD TO GROUND. GROUND LUG ON SIDE OF TRANSMITTER MOUNTING BASE SHOULD BE CONNECTED TO EARTH GROUND.

WIRING

4-20 mA Inputs and Transmitter Power

You can wire input 1, 2, 3, or 4 for 4-20 mA actuations.
The polarity for input #1, #2, #3, and #4 is identical.
The prerequisites are:
- Model Number - Table 1 = 1XXX, X1XX, XX1X, XXX1

| ATTENTION | Connector J11 on the main processor printed circuit board can be used to provide 24 Vdc power to up to two field transmitters (without power) which are supplying the 4-20 mA inputs signals to the recorder
(1.2W @ Vdc = 50 mA available).
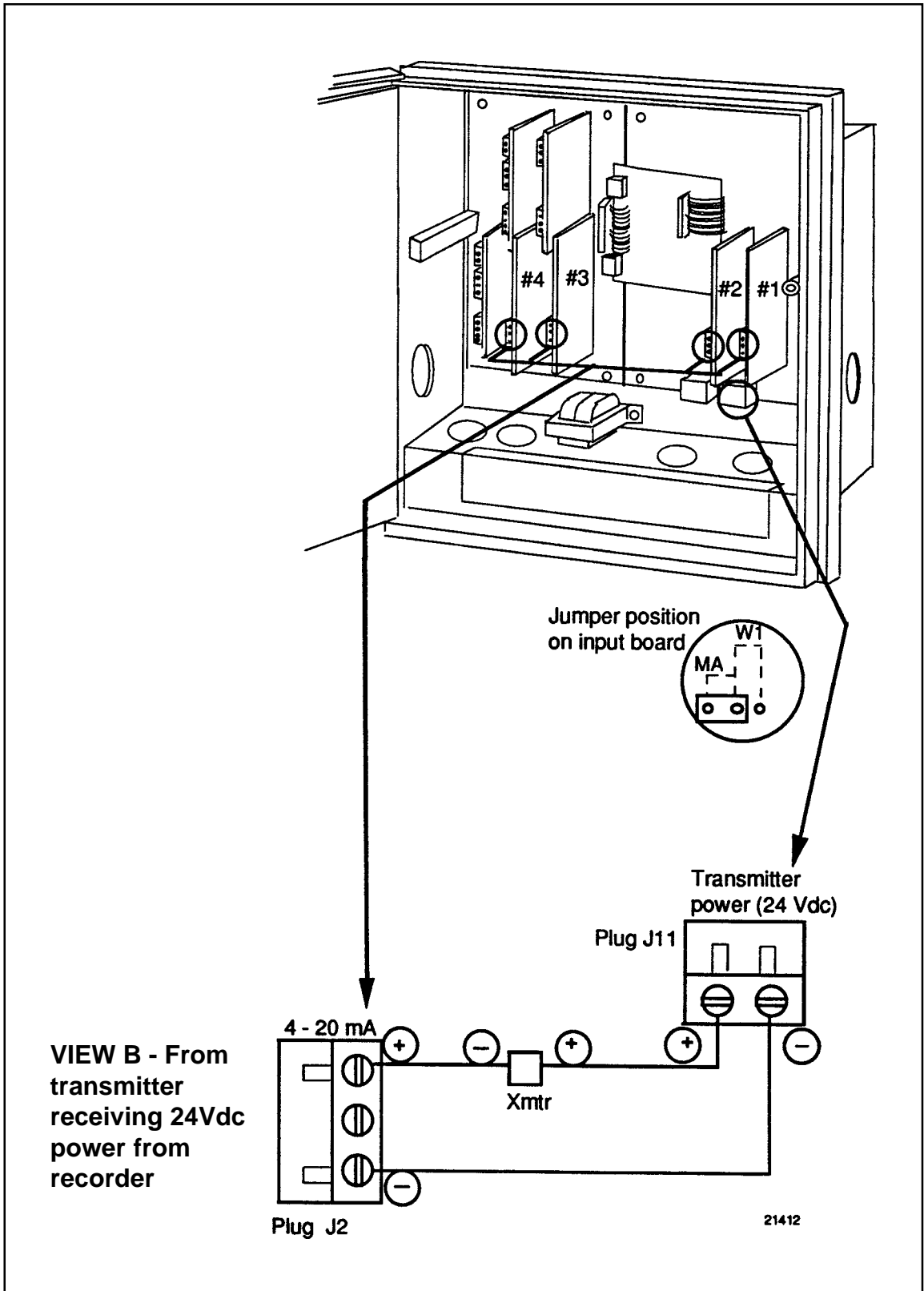Refer to Figure 2-11 and follow the procedure in Table 2-12 to wire 4-20 mA inputs.

Table 2-12   4-20 mA Input Wiring

Step	Action
1	Open the recorder door. Loosen the captive screw in the chart plate and swing the plate out.
2	Be sure that the jumper is installed in the position labeled "MA"; this connects an internal 250 ohm resistor across the 4-20 mA input terminals on J2. (Refer to Figure 2-11 for location of jumper.)
3	Locate connector J2 on the printed circuit board for input 1. (Refer to Figure 2-11.)
4	Remove the unwired plug from J2.
5	Run the input wires through the desired knockout. DO NOT bundle them with the power wires.
6	Strip 1/4-inch maximum of insulation from the end of each wire.
7	Loosen the screws in plug J2 terminals and position the plug as you would to plug it into J2.
8	• For transmitters with power: Insert the wires into the appropriate screw clamps and tighten the screws to secure the wires. | ATTENTION | The DR4500A Recorder inputs are protected from overvoltage by a protection diode. The wake up pulse on the ST3000 may not be recognized by the transmitter due to this clamping action. It may be necessary to add 100 ohms of additional loop resistance so the transmitter and SFC can communicate. • For transmitters which require power: Remove the unwired plug from J11, then wire the transmitter power to J11 and the input to J2. Tighten the screws in the plugs to secure the wires.
9	Insert the wired plug into J2 and J11 as applicable.
10	Repeat steps 2 through 9 for input 2, 3, and 4 printed circuit boards as applicable.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

Figure 2-11*   **4-20 mA InputWiring**   **Factory Set.**
See Special Wire Drawing - Page 5

Jumper position
on input board

W1

MA

Transmitter
power (24 Vdc)

Plug J11

4 - 20 mA

**VIEW B - From
transmitter
receiving 24Vdc
power from
recorder**

Xmtr

Plug J2

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* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

STEPS FOR MAXIMIZING PEN LIFE

1. Store chart paper in a cool, clean dry place where temperature does not exceed 40°C (104°F) and humidity is below 65% RH.

2. Do not expose pen tip and chart paper to abrasive chemicals or dust that cause excessive pen wear.

3. If recorder is used in a dusty atmosphere, provide a positive clean air purge to minimize dust particle accumulation on chart paper.

4. Periodically clean pen arm using cotton swab dipped in alcohol. This is more important when recorder is located in a dusty environment and no clean air purge is used.

5. Never let pen tip ride on chart plate when paper is not present. Use pen lifter to raise arm when changing paper.

6. Keep door closed while recording.

7. Always insert pen arm tip in shipping sponge when storing or shipping recorder.

8. Be sure chart paper lays flat against chart plate. Any ripple in paper will cause light pen printing.

9. Be sure chart hub assembly is pushed onto motor shaft so it is flush with chart plate.

OPERATING THE RECORDER

1. Apply power and wait for recorder to run its power up tests. Allow recorder to warm up approximately 15 minutes.

2. Install the chart. Press the (chart) key. The pen will move to and stop at the outer limit of pen travel near the edge of the chart. Also chart rotation will stop and prompt (Cht. Hold) will appear in the lower display.

3. Pull the pen lifter up to raise the pen from the chart.

4. Carefully remove the used chart from the hub and retaining clips. (DO NOT REMOVE HUB ADAPTER.)

5. Install the new chart so that its edges are under the four retaining clips and its small alignment hole are over the alignment pin on the hub. (Press chart down completely around hub adapter.) DO NOT turn chart hub adapter. Recorder will turn hub adapter automatically.

6. Push the pen lifter down to lower pen.

7. Press the (chart) key. The prompt (CHT HOLD) in the lower display will be replaced by the parameter prompt value that was last selected using the (lower DISP) key.

8. Keep the door closed during operation to minimize dust accumulation on the chart.

9. To view the different inputs and totalizers use the (LOWR DISP) key.

10. Do not unplug the power to the recorder when the lockout mode is (<u>NONE</u>).
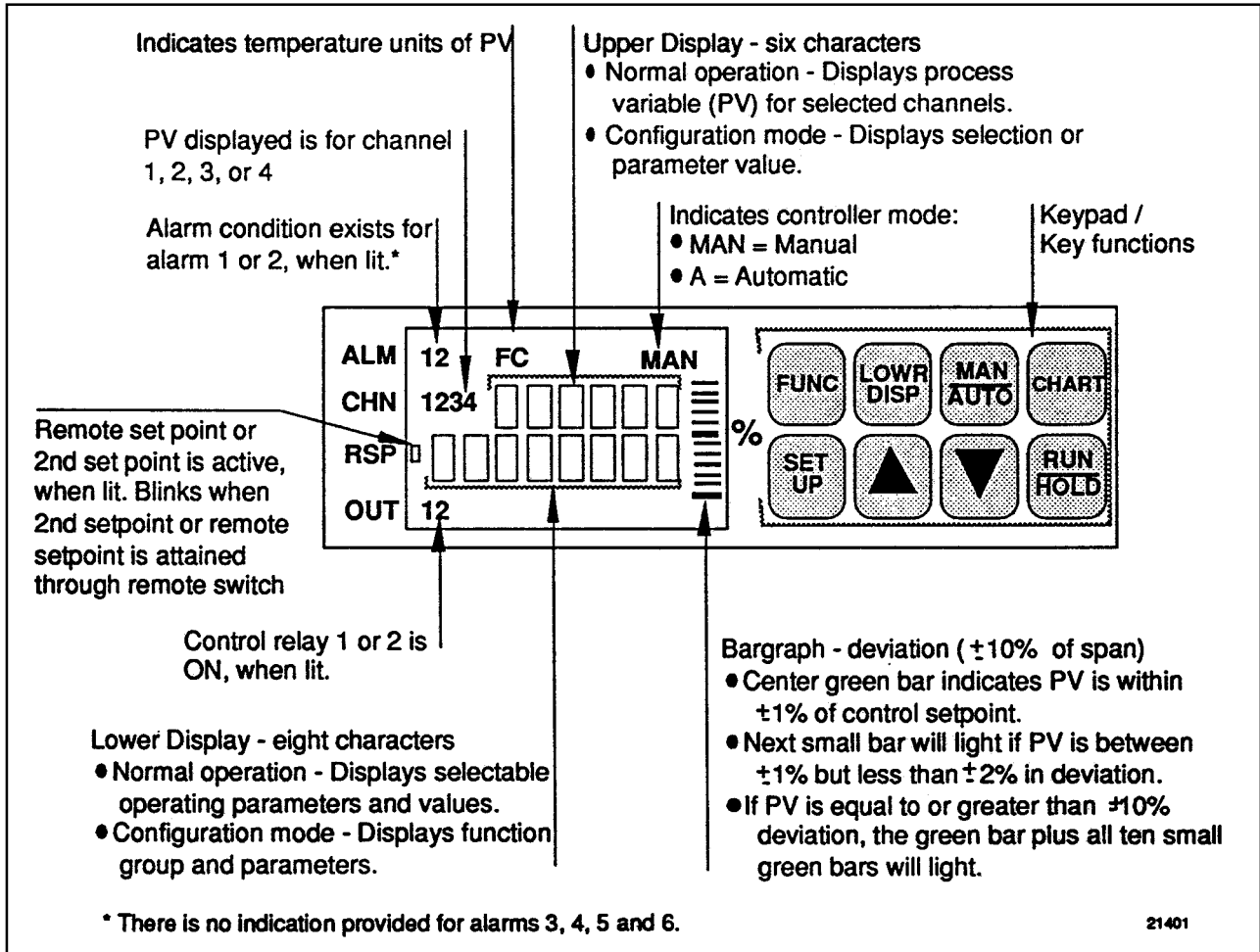
* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

DISPLAY AND KEY PAD DESCRIPTIONS

OPERATOR INTERFACE

Figure 1-1 shows the operator interface and defines the displays and indicators. The function of the keys is described in Table 1-1.*

Figure 1-1   Operator Interface

Indicates temperature units of PV

PV displayed is for channel 1, 2, 3, or 4

Alarm condition exists for alarm 1 or 2, when lit.*

Upper Display - six characters
* Normal operation - Displays process variable (PV) for selected channels.
* Configuration mode - Displays selection or parameter value.

Indicates controller mode:
* MAN = Manual
* A = Automatic

Keypad / Key functions

Remote set point or 2nd set point is active, when lit. Blinks when 2nd setpoint or remote setpoint is attained through remote switch

| ALM | 12 | FC | MAN |
| CHN | 1234 |
| RSP |
| OUT | 12 |

FUNC   LOWR DISP   MAN AUTO   CHART

SET UP   ▲   ▼   RUN HOLD

%

Control relay 1 or 2 is ON, when lit.

Lower Display - eight characters
* Normal operation - Displays selectable operating parameters and values.
* Configuration mode - Displays function group and parameters.

Bargraph - deviation (±10% of span)
* Center green bar indicates PV is within ±1% of control setpoint.
* Next small bar will light if PV is between ±1% but less than ±2% in deviation.
* If PV is equal to or greater than ±10% deviation, the green bar plus all ten small green bars will light.

* There is no indication provided for alarms 3, 4, 5 and 6.

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* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

KEY PAD DESCRIPTIONS

OPERATOR INTERFACE

Key Functions   Table 1-1 shows each key on the operator interface and defines its function.

TABLE 1-1   FUNCTION OF KEYS

Key	Function
SET UP	• Places the controller in the Configuration Set Up select mode. Sequentially displays Set Up groups and allows the FUNC key to display individual functions in each Set Up group.
FUNC	• Used in conjunction with the SET UP key to select the individual functions of a selected Configuration Set Up group. • Used to toggle between SP1 and SP2. • Used during field calibration procedure.
LOWR DISP	• Selects and operating parameter to be shown in the lower display: OUT = Output Value SP = Local Setpoint 1 2SP = Local Setpoint 2 RSP = Remote Setpoint 2IN = Input 2 3IN = Input 3 4IN = Input 4 DEV = Deviation EU = PV Engineering Units RH = % RH Value PIDSETX = Turning Parameter Set X=1 or 2 RAMP = Minutes remaining in Setpoint Ramp #RA = Minutes remaining in SP Prog Ramp #SK = Minutes remaining in SP Prog Soak RECYC = Number of recycles left in SP Program. ATTENTION The lower display can be configured to scroll through the operating parameters.
MAN AUTO	• Alternately selects: AUTO Lower display automatically displays setpoint value in engineering units. MAN Lower display automatically indicates output in %.
CHART	• Used to stop printing operation and move pen to outer limit for chart change. Display will revert to date and time.
RUN HOLD	• Alternate action switch initiates or holds the Setup Ramp or Setpoint Program. • In configuration mode, restores the original value or selection if you do not want to enter a change you are making to a parameter.
▲	• Increases the setpoint, output, or configuration values displayed.
▼	• Decreases the setpoint, output, or configuration values displayed.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

ERROR MESSAGES

SELF DIAGNOSTICS

Error message prompts

Table 9-4

Lower Display Indication	Test Group	Reason For Failure	How to Correct the Problem
IN1RNG **IN2RNG** **IN3RNG** **IN4RNG**	Background	Input out of range. The process input is outside the range limits.	1. Make sure the range and actuation are configured properly. 2. Check the input source. 3. Restore the factory calibration: 　　a. Disconnect the wiring from the terminals on plug J2 on the input board. (See Figure 2-10.) Place a jumper across these terminals. The controller should read room temperature if it is configured for a thermocouple input. 　　b. If it does not read room temperature, see *Section 3 - Configuration* and change the IN1TYP prompt in the INPUT 1 group to another type of thermocouple. 　　c. After the change, press FUNC key, then the LOWER DISPLAY key. The controller should read the correct room temperature. If it does not, the unit has an input failure. 　　d. Repeat step b. This time switch the IN1TYP back to the originally selected thermocouple. 　　e. Repeat step c. The controller is restored with factory calibration. 　　f. Remove the jumper and reconnect the thermocouple to plug J2. 4. Field calibrate. See *Section 7 - Input Calibration*. 5. Replace the input card. 6. Call Customer Support 　　1-800-423-9883　　USA 　　1-800-461-0013　　Canada

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

ERROR MESSAGES

SELF DIAGNOSTICS

Error message prompts

Table 9-4

Lower Display Indication	Test Group	Reason For Failure	How to Correct the Problem
CAL Test (Note 1)	Power-up	The working calibration constants in the recorder are in error.	1. Change to a different input type. • See *Section 3 - Configuration*. 2. Check the "Device Status" (Table 9-3) to see if FACT CRC=PASS. • If PASS—return to original input type. • If FAIL—field calibrate. Refer to *Section 7 - Input Calibration*.
CAL1 ERR	Background	Working CAL TEST failure (Control 1, Input 1, Input 2).	1. Change to a different input type. • See *Section 3 - Configuration*. 2. Check "Device Status" (Table 9-3) to see if FACT CRC=PASS. • If PASS—return to original input type. • If FAIL—field calibrate Control Output #1, Input 1, or Input 2. Refer to *Section 7 - Input Calibration* and *Section 8 - Output Calibration*.
CAL2 ERR	Background	Working CAL TEST failure (Control 2, Output).	1. Field calibrate Control Output 2. • Refer to *Section 8 - Output Calibration*.
FACT CRC	Check "Device Status." See Table 9-3.	Factory-set input constants have been changed due to the change in input type.	1. Check background test error message being displayed. 2. Recalibrate Input or Output. • Refer to *Section 7 - Input Calibration* or *Section 8 - Output Calibration*.
EE FAIL	Background	Unable to write to nonvolatile memory. Any time you change a parameter and it is not accepted, you will see EE FAIL.	1. Check the accuracy of the parameter and reenter. 2. Try to change something in configuration. 3. Call Customer Support 1-800-423-9883 USA 1-800-461-0013 Canada

NOTE 1: Will appear in "STATUS" Set Up Group—See Table 9-3
NOTE 2: Will also appear in rotation with other background test failure error messages.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

ERROR MESSAGES

SELF DIAGNOSTICS

Error message prompts

Table 9-4

Lower Display Indication	Test Group	Reason For Failure	How to Correct the Problem
IN1FAIL **IN2FAIL** **IN3FAIL** **IN4FAIL**	Background	Two consecutive failures of input 1 integration (for example, cannot make analog to digital conversion).	1. Be sure the range and actuation are configured properly. 2. Check the input source. 3. Recalibrate. Refer to *Section 7 - Input Calibration*. 4. Replace the input card. 5. Call Customer Support 1-800-423-9883 USA 1-800-461-0013 Canada
BATTERY	Power-up or Status	Battery test failure.	1. Replace battery. 2. Call Customer Support 1-800-423-9883 USA 1-800-461-0013 Canada
BATT LOW	Background		
PV LIMIT	Background	Process Variable is out of range. ±10% of range	1. Be sure pen input configuration is correct. 2. Check the displayed PV value to see if it is outside limits. 3. Call Customer Support 1-800-423-9883 USA 1-800-461-0013 Canada
RV LIMIT	Background	The result of the formula shown below is beyond the range of the remote variable. RV = INP2 X RATIO + BIAS	1. Make sure the input signal is correct. 2. Make sure the ratio and bias settings are correct. 3. Go to CONTROL prompt REMOTE SOURCE and change REMOTE to 1LOCAL.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

ERROR MESSAGES

SELF DIAGNOSTICS

Error message prompts   The messages listed in Table 9-4 may appear during the power-up test or status test, or they may blink in the lower display as the result of ongoing background tests that verify data and memory integrity.

In the case of more than one simultaneous malfunction in the background tests, only the one with the highest priority will appear in the lower display.

Table 9-4 lists the error message, the test group that prompted the message, the reason for the failure, and how to correct the problem.

Table 9-4

Lower Display Indication	Test Group	Reason For Failure	How to Correct the Problem
FAILSAFE (Note 1) (Note 2)	Status or Background	This error message shows whenever the recorder goes into a failsafe mode of operation. This will happen if control is enabled and: • a power-up test fails, • a specific background test fails. (Failsafe will be displayed in rotation with other failure messages, except BATTERY, only if control is enabled.)	1. Run through the "Device Status" check to determine the reason for the failsafe indication. See Table 9-3. 2. Identify the other failure message in the display and correct the problem according to the recommendations given in this table for that particular error message.
RAM TEST (Note 1)	Power-up	RAM failure	1. Cycle power. 2. Check "Device Status" (Table 9-3) to see if error clears. 3. If error doesn't clear, replace the main printed circuit board.
CONFTEST (Note 1)	Power-up	Configuration data is in error.	1. Check all the configuration prompts for accuracy. • See *Section 3 - Configuration* for selections and limits. 2. Change *any* configuration item, check "Device Status" to see if CONFTEST=PASS, return configuration item to original value. • See *Section 3 - Configuration* for instructions to change a configuration item.
CNFG ERR	Background	Configuration data is in error.	1. Check all the configuration prompts for accuracy. • See *Section 3 - Configuration* for selections and limits. 2. Change *any* configuration item, then return it to the original value. • See *Section 3 - Configuration* for instructions to change a configuration item.

NOTE 1: Will appear in "STATUS" Set Up Group—See Table 9-3
NOTE 2: Will also appear in rotation with other background test failure error messages.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

SETTING START-UP (WAKE) TIME

PREREQUISITE:
LOCKOUT CONFIGURATION MUST BE CHANGED TO NONE. (SEE PAGE 22)

1. Press (SET UP) key until (CHART-SET UP) prompt appears in display.

2. Press (FUNC) key successively until (REM CHRT-NONE) appears.

3. Press (RAISE) or (LOWER) key until (REM CHRT-TIME) appears in display.

4. Press (SET UP) key until (SET UP-TIME) appears in display.

5. Press (FUNC) key successively until (WAKE MIN) prompt appears in display.

6. Press (RAISE) or (LOWER) key to set minutes for wake time. Setting range: (1-59)

7. Press (FUNC) key until (WAKE HR) prompt appears in display.

8. Press (RAISE) or (LOWER) key to set hours for wake time. Setting range: (1-23)

9. Press (FUNC) key until (WAKE-DAY) prompt appears in display.

10. Press (RAISE) or (LOWER) key to set day for wake time. Setting range: (1-31)

11. Press (FUNC) key until (WAKE-MON) prompt appears in display.

12. Press (RAISE) or (LOWER) key to set month for wake time. Setting range: (1-12)

13. Press (FUNC) key to enter present selection.

14. Press (LOWER DISP) to return to Operating Mode.

FOR MORE DETAILED INFORMATION, SEE PAGE 82 OF OWNER'S MANUAL

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

CHANGING CHART RANGE

PREREQUISITE:
  LOCKOUT CONFIGURATION MUST BE CHANGED TO NONE. (SEE PAGE 22)

1. Press (SET UP) key successively and call up (PEN 1) prompt in lower display.

2. Press (FUNC) key successively until (CHART 1 HI) appears in lower display. (If 2 inputs are used there will be a chart 2 HI and LO in the pen 2 configuration group.)

3. Use (RAISE) or (LOWER) key to set desired high range value for chart in upper display. Setting Range: (-999.9 - 9999)
    NOTE: If display blinks, you are trying to select an unacceptable value. You can change the value more quickly by holding in one key (RAISE) or (LOWER) and pressing the other one (LOWER) or (RAISE) at the same time. Adjustment will move one digit to the left with each press.

4. Press (FUNC) key until (CHART 1-LO) appears in lower display. (This will be needed to set chart low.)

5. Use (RAISE) or (LOWER) key to set desired low range value for chart in upper display. Setting range: (-999.9 - 9999)

6. Press (FUNC) key successively until (RANGE 1 TAG) appears in lower display.
    NOTE: For alphanumeric entries, the display will cycle from left to right, with highlighting (increased brightness) of each digit. The value of each digit can be changed only when it is highlighted.

7. Use (RAISE) or (LOWER) key to enter high scale range in upper display.
    NOTE: You must also change (INPUT 1 HI) and (INPUT 1 LO) when changing range.

8. Press (SET UP) key until (INPUT 1) prompt appears in lower display.

9. Press (FUNC) key successively until (INPUT 1 HI) appears in lower display.

10. Use (RAISE) or (LOWER) key to set high range value for linear input.
    Setting range: (-999.9 - 9999)

11. Press (FUNC) key until (INPUT 1 LO) prompt appears in lower display.

12. Use (RAISE) or (LOWER) key to set low range value for linear input.
    Range: (-999.9 - 9999)

13. Press (FUNC) key to enter present selection.

14. Press (LOWER DISP) to return recorder to Operating Mode.

NOTE: If 2 inputs are used, repeat these procedures for pen 2.

15. To put back in Lockout Mode, see instructions on Enabling Lockout Mode on Page 22.

FOR MORE DETAILED INFORMATION, SEE PAGES 84 - 85 OF OWNER'S MANUAL

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

CHANGING CHART SPEED

PREREQUISITE:
   LOCKOUT CONFIGURATION MUST BE CHANGED TO NONE. (SEE PAGE 22)

1. Press (SET UP) key successively and call up (CHART) prompt in lower display.

2. Press (FUNC) key until (CHRT SPD) prompt appears in lower display.
    NOTE: Hold key in if you want to scroll through all the function prompts associated with this group.

3. Use (RAISE) or (LOWER) key to select desired chart speed. Selections: (8HR, 24HR, 7DAYS, X-HR)
    NOTE: If you select (X-HR), go to step 4; otherwise, go to step 6.

4. Press (FUNC) key to call up next parameter and enter present selection.

5. Use (RAISE) or (LOWER) key to set desired chart speed value in upper display or go to step 6.
    Range (6-744 HRS)

6. Press (FUNC) key until (TIME DIV) prompt appears in lower display.

7. Use (RAISE) or (LOWER) key to set desired number of time periods into which chart record is to be divided.
    Setting range: (8-24)

8. Press (FUNC) key to enter present selection.

9. Press (LOWER DISP) to return to Operating Mode.

10. To put back in Lockout Mode, see instructions on Enabling Lockout Mode, Page 22.

FOR MORE DETAILED INFORMATION, SEE PAGES 80 - 81 IN OWNER'S MANUAL.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

CHANGING TIME

PREREQUISITE:
    LOCKOUT CONFIGURATION MUST BE CHANGED TO NONE. (SEE PAGE 22)

1. Press (SET UP) key successively and call up (TIME) prompt in lower display.

2. Press (FUNC) key until (MINUTES) prompt appears in lower display.
    NOTE: Hold key in if you want to scroll through all the prompts associated with this
    group.

3. Use (RAISE) or (LOWER) key to set present time in minutes. Range: (1-59)

4. Press (FUNC) key until (HOURS) prompt appears in lower display.

5. Use (RAISE) or (LOWER) key to set hour in 24 HR clock format. Range: (1-23)
    NOTE: If display blinks, you are trying to select an unacceptable value. You can
    change value more quickly by holding in one key (RAISE) or (LOWER) and pressing the
    other one (LOWER) or (RAISE) at the same time. Adjustment will move one digit to the
    left with each press.

6. Press (FUNC) key to enter present selection.

7. Press (LOWER DISP) key to return to Operating Mode.

8. To put back in Lockout Mode, see instructions on Enabling Lockout Mode, Page 22.

FOR MORE DETAILED INFORMATION, SEE PAGE 83 OF OWNER'S MANUAL.

RESETTING TOTALIZER

LOCKOUT:
    THE LOCKOUT MODE IS USED TO KEEP UNQUALIFIED PERSONNEL FROM
    ENTERING CONFIGURATION MODE AND MAKING CHANGES OF CONFIGURA-
    TION.

PREREQUISITE:
    LOCKOUT CONFIGURATION MUST BE CHANGED TO NONE. (SEE PAGE 22)

1. Press (SET UP) key successively until (TOTAL 1) prompt appears in display.

2. Press (FUNC) key successively until (RST TOT) prompt appears in display. (If 2 inputs
    are used there will be a chart 2 HI and LO in the pen 2 configuration group.)

3. Press (RAISE) or (LOWER) key to select YES to reset totalizer value to zero.
    Selections: (YES - NO)

4. Press (FUNC) key to enter present selection.

5. Press (LOWER DISP) key to return recorder to operating mode.
    NOTE: Totalizer (RSETABLE) prompt must be configured to (YES) before totalizer can
    be reset. It leaves the factory set for (YES).

NOTE: If the recorder has two totalizers, repeat these procedures for total (2) configuration.

6. To put back in Lockout Mode, see instructions on Enabling Lockout Mode, Page 22.

FOR MORE DETAILED INFORMATION, SEE PAGE 138 OF OWNER'S MANUAL

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

CONFIGURATION RECORD SHEET

Keep a Record   Enter the value or selection for each prompt on this sheet so you will have a record of how your recorder was configured.

Group Prompt	Function Prompt	Value or Selection	Factory Setting	Group Prompt	Function Prompt	Value or Selection	Factory Setting
TUNING 1	PROP BD	_____	1.0	CHART	CHRTSPD	_____	XHR
	or				HOUR/REV	_____	12
	GAIN	_____	1.0		TIME DIV	_____	24
	RATE MIN	_____	0.00		CONTINUE	_____	NO
	RSET MIN	_____	1.0		CHART NAM	_____	TRULIN
	or				HEADER	_____	NO
	RSET RPM	_____	1.0		REMSW	_____	NONE
	or				WAKEMIN	_____	0
	MAN RSET	_____	0.0		WAKE HR	_____	0
	CYCSEC	_____	20.0		WAKE DAY	_____	0
	PROP BD2	_____	1.0		WAKE MON	_____	0
	or						
	GAIN 2	_____	1.0	TIME	MINUTES	_____	Set
	RATE2MIN	_____	0.00		HOURS	_____	to
	RSET2MIN	_____	1.0		DAY	_____	local
	or				MONTH	_____	time
	RSET2PRM	_____	1.0		YEAR	_____	
	CYC2SEC	_____	20.0		DAY	_____	
TUNING 2	PROP BD	_____	1.0	PEN 1	PEN 1	_____	ENABLE
	or				PEN1IN	_____	INPUT1
	GAIN	_____	1.0		CHART1HI	_____	302.0
	RATE MIN	_____	0.00		CHART1LO	_____	292.0
	RSET MIN	_____	1.0		PEN1ON	_____	91.0
	or				PEN1OFF	_____	93.0
	RSET RPM	_____	1.0		MAJORDIV	_____	10
	or				MINORDIV	_____	10
	MAN RSET	_____	0.0		RNG1TAG	_____	RNG1
	CYCSEC	_____	20.0				
	PROP BD2	_____	1.0	PEN 2	PEN 2	_____	ENABLE
	or				PEN2IN	_____	INPUT2
	GAIN 2	_____	1.0		CHART2HI	_____	302.0
	RATE2MIN	_____	0.00		CHART2LO	_____	292.0
	RSET2MIN	_____	1.0		PEN2ON	_____	91.0
	or				PEN2OFF	_____	93.0
	RSET2PRM	_____	1.0		MAJORDIV	_____	10
	CYC2SEC	_____	20.0		MINORDIV	_____	10
					RNG2TAG	_____	RNG2
SP RAMP1	SP RAMP	_____	DISABL				
	TIME MIN	_____	0	PEN 3	PEN 3	_____	ENABLE
	FINAL SP	_____	100.00		PEN3IN	_____	INPUT3
	SP RATE	_____	ó		CHART3HI	_____	302.0
	EU/HR UP	_____	ó		CHART3LO	_____	292.0
	EU/HR DN	_____	ó		PEN3ON	_____	91.0
	SP PROG	_____	DISABL		PEN3OFF	_____	93.0
					MAJORDIV	_____	10
SP RAMP2	SP RAMP	_____	DISABL		MINORDIV	_____	10
	TIME MIN	_____	0		RNG3TAG	_____	RNG3
	FINAL SP	_____	100.0				
	SP RATE	_____	ó				
	EU/HR UP	_____	ó				
	EU/HR DN	_____	ó				
	SP PROG	_____	DISABL				

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

CONFIGURATION RECORD SHEET

Group Prompt	Function Prompt	Value or Selection	Factory Setting	Group Prompt	Function Prompt	Value or Selection	Factory Setting
PEN 4	PEN 4	_____	ENABLE	INPUT 4	DECIMAL	_____	XXX.X
	PEN4IN	_____	INPUT4		UNITS	_____	DEGF
	CHART4HI	_____	302.0		ENGUNITS	_____	ó
	CHART4LO	_____	292.0		IN4 TYPE	_____	100PT
	PEN4ON	_____	91.0		XMITTER	_____	LINEAR
	PEN4OFF	_____	93.0		IN4 HI	_____	900
	MAJORDIV	_____	10		IN4 LO	_____	-300
	MINORDIV	_____	10		CUTOFF 4	_____	0
	RNG4TAG	_____	RNG4		INPTCOMP	_____	0
					FILTER 4	_____	0
INPUT 1	DECIMAL	_____	XXX.X		BURNOUT	_____	UP
	UNITS	_____	DEGF				
	ENGUNITS	_____	ó	TOTAL 1	(Value)	_____	E0 GAL
	IN1 TYPE	_____	100PT		RSETTOT	_____	NO
	XMITTER	_____	LINEAR		TOTAL 1	_____	DISABL
	IN1 HI	_____	900		TOTALEU	_____	GAL
	IN1 LO	_____	-300		RATE	_____	SECOND
	CUTOFF 1	_____	0		SCALER	_____	1
	INPTCOMP	_____	0		RSETABLE	_____	NO
	FILTER 1	_____	0				
	BURNOUT	_____	UP	TOTAL 2	(Value)	_____	E0 GAL
					RSETTOT	_____	NO
INPUT 2	DECIMAL	_____	XXX.X		TOTAL 2	_____	DISABL
	UNITS	_____	DEGF		TOTALEU	_____	GAL
	ENGUNITS	_____	ó		RATE	_____	SECOND
	IN2 TYPE	_____	100PT		SCALER	_____	1
	XMITTER	_____	LINEAR		RSETABLE	_____	NO
	IN2 HI	_____	900				
	IN2 LO	_____	-300	CONTROL 1	PID SETS	_____	1ONLY
	CUTOFF 2	_____	0		SW VALUE	_____	0.0
	INPTCOMP	_____	0		SP SOURC	_____	1LOCAL
	FILTER 2	_____	0		RATIO	_____	1.0
	BURNOUT	_____	UP		BIAS	_____	0
					SP TRACK	_____	NONE
INPUT 3	DECIMAL	_____	XXX.X		POWER UP	_____	MANUAL
	UNITS	_____	DEGF		SP HILIM	_____	500
	ENGUNITS	_____	ó		SP LOLIM	_____	0
	IN3 TYPE	_____	100PT		ACTION	_____	REVERSE
	XMITTER	_____	LINEAR		OUT HILIM	_____	100.0
	IN3 HI	_____	900		OUT LOLIM	_____	0
	IN3 LO	_____	-300		DROPOFF	_____	0.0
	CUTOFF 3	_____	0		DEADBAND	_____	2.0
	INPTCOMP	_____	0		OUT HYST	_____	0.5
	FILTER 3	_____	0		FAILSAFE	_____	50
	BURNOUT	_____	UP		REM SW	_____	NONE
					MAN KEY	_____	ENABLE
					PBorGAIN	_____	GAIN
					MINorRPM	_____	MIN
					CONT1ALG	_____	PIDA
					OUT1ALG	_____	CURRENT
					4-20 RNG	_____	50PCT
					SHEDMODE	_____	LAST
					SHED SP	_____	TOLSP

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

CONFIGURATION RECORD SHEET

Group Prompt	Function Prompt	Value or Selection	Factory Setting	Group Prompt	Function Prompt	Value or Selection	Factory Setting
CONTROL 2	PID SETS	_____	1ONLY	ALARMS	A1S1 VAL	_____	90
	SW VALUE	_____	0.0		A1S2 VAL	_____	95
	SP SOURC	_____	1LOCAL		A1S1TYPE	_____	INPUT1
	RATIO	_____	1.0		A1S2TYPE	_____	INPUT1
	BIAS	_____	0		A1S1 H L	_____	LO
	SP TRACK	_____	NONE		A1S1 EV	_____	ó
	POWER UP	_____	MANUAL		A1S2 H L	_____	HI
	SP HILIM	_____	500		A1S2 EV	_____	ó
	SP LOLIM	_____	0		A2S1 VAL	_____	80
	ACTION	_____	REVERSE		A2S2 VAL	_____	85
	OUT HILIM	_____	100.0		A2S1TYPE	_____	INPUT2
	OUT LOLIM	_____	0		A2S2TYPE	_____	INPUT2
	DROPOFF	_____	0.0		A2S1 H L	_____	LO
	DEADBAND	_____	2.0		A2S1 EV	_____	ó
	OUT HYST	_____	0.5		A2S2 H L	_____	HI
	FAILSAFE	_____	50		A2S2 EV	_____	ó
	REM SW	_____	NONE		AL HYST	_____	0.1
	MAN KEY	_____	ENABLE				
	PBorGAIN	_____	GAIN	EVENT	EVENT 1	_____	NONE
	MINorRPM	_____	MIN	MSG	MESSAGE1	_____	EVENT1
	CONT1ALG	_____	PIDA		POSITION1	_____	87.3
	OUT1ALG	_____	CURRENT		EVENT 2	_____	NONE
	4-20 RNG	_____	50PCT		MESSAGE2	_____	EVENT2
	SHEDMODE	_____	LAST		POSITION2	_____	85.5
	SHED SP	_____	TO LSP		EVENT 3	_____	NONE
					MESSAGE3	_____	EVENT3
OPTIONS	INPUT 1	_____	ENABLE		POSITION3	_____	83.6
	INPUT 2	_____	ENABLE		EVENT 4	_____	NONE
	INPUT 3	_____	ENABLE		MESSAGE4	_____	EVENT4
	INPUT 4	_____	ENABLE		POSITION4	_____	80.0
	CONTROL 1	_____	ENABLE		EVENT 5	_____	NONE
	CONTROL 2	_____	ENABLE		MESSAGE5	_____	EVENT5
	REJ FREQ	_____	60		POSITION5	_____	78.2
	AUX OUT	_____	DISABL		EVENT 6	_____	NONE
	4 mA VAL	_____	0.0		MESSAGE6	_____	EVENT6
	20mA vAL	_____	100.0		POSITION6	_____	76.9
	HF REJ	_____	ENABLE				
	RELHUMID	_____	NO	LOCKOUT	PASSWORD	_____	XXXX
	ATMPRES	_____	ó		LOCKOUT	_____	CALIB
	DEVIATION	_____	NONE		CHANGE	_____	XXXX
	DEVSETPT	_____	0				
	SCROLL	_____	NONE		TRACE LN	_____	MEDIUM
	INP ALG	_____	NONE		GRID LN	_____	MEDIUM
	COEFF	_____	1.0	ADJUST	PEN TYPE	_____	NORMAL
	PV HIGH	_____	0.0				
	PV LOW	_____	0.0				
	RATIO A	_____	1.0				
	BIAS A	_____	0.0				
	RATIO B	_____	1.0				
	BIAS B	_____	0.0				
	RATIO C	_____	1.0				
	BIAS C	_____	0.0				
	GRANDTOT	_____	DISABL				
	ComSTATE	_____	DISABL				
	ComADDR	_____	0				
	SHEDTIME	_____	0				
	UNITS	_____	PERCENT				

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

ENABLING AND DISABLING LOCKOUT MODE[‡]

LOCKOUT:

THE LOCKOUT MODE IS USED TO KEEP UNQUALIFIED PERSONNEL FROM ENTERING CONFIGURATION MODE AND MAKING CHANGES OF CONFIGURA-TION.

ENABLING LOCKOUT MODE:

1. Press (SET UP) key until (LOCKOUT-SET UP) appears on display.

2. Press (FUNC) key until (PASSWORD) appears.

3. When each unit is highlighted, press (RAISE) key to enter code (3544).

4. Press (FUNC) key until (LOCKOUT-NONE) appears.

5. Press (RAISE) or (LOWER) key to change to (LOCKOUT-MAX).

6. Press (FUNC) key to enter present selection.

7. Press (LOWER DISP) to return to Operating Mode.

DISABLING LOCKOUT MODE:

1. You must enter the Lockout Code (3544) and enter Lockout Configuration Mode.

2. Press (SET UP) key until (SET UP-LOCKOUT) appears on display.

3. Press (FUNC) key until (PASSWORD) appears.

4. When each unit is highlighted, press the (RAISE) key until the code (3544) is entered.

5. Press (FUNC) key, you are in Lockout Configuration Mode. (LOCKOUT-MAX) appears on display.

6. Press (RAISE) or (LOWER) key until display reads (LOCKOUT-NONE).

7. Press (FUNC) key to enter present selection.

8. Press (LOWER DISP) key to return to Operating Mode.

9. To put back in Lockout Mode, see instructions on Enabling Lockout Mode.

[‡] NOTE: All recorders are preset with lockout code 3544. You may change the lock-out code if desired.

FOR MORE DETAILED INFORMATION, SEE PAGE 111 IN OWNER'S MANUAL.

* ALL FIGURES AND TABLES REFER TO THE PRODUCT MANUAL.

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