**Rear Terminal Wiring**

**CAUTION:** The instrument is double insulated. All external circuits should be isolated from the instrument. Interconnection instructions may impact the protection afforded by the unit. Refer to installation instructions for and/or accessories for any further combinations. The connections required depend on the options fitted. Use single strand (28awg = 0.4mm2) max except for the instrument terminals where the correct thermocouple or compensating cable and connectors should be used.

**CAUTION:** Check correct operating voltage on the sales lead before making connections. A.L.C. 110V AC, 24VDC 350mA has 125V supply for 0-240°C should be fitted close to the unit, in easy reach of the operator, and appropriately marked.

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**Intrumental Heating**

**CAUTION:** To access the option modules, first pull the instrument from the housing:
- a. Detach the main boards by lifting first the upper, and lower mounting strips.
- b. Pull out the required option modules into the correct connection, as shown below.
- c. Tap out the O-ring from slot B until it is visible.
- d. Hold the Power and input boards together while relocating on their mountings. Ensure that the correct connector connects to the Display board.
- e. Replace the option modules by aligning the guides with the O-rings in the housing, then slowly slide the option into position. The Power supply board must be correctly connected to the Display board.

**Note:** Option modules are automatically detected at power up.

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**Main Board Connectors**

- **Display Board, Connectors:**
  - Output 3 Slot Connector PL4B
  - Output 2 Slot Connector PL5, PL6 & PL2C
  - Output 1 Slot Connectors FPL & PL4
  - Power Supply Board Connectors PL5B, PLU & PL2C

- **Option Board Connectors:**
  - Note: Plastic pegs aligning housing of older non-coded relay modules – do not fit dual relay modules.

- **Auxiliary Input:**
  - Input Function: Socialize as Remote Setpoint (RSP) input between –9999 and +9999.
  - Sampling Rate: 10 per second.
  - Sensitivity: ±0.5% of input range, ±5 mV.
  - Isolation: reinforced safety isolation from inputs and other outputs.

- **Combined Outputs:**
  - Logical OR of alarming 1 & 2, 1 to 3, 1 to 4 or 1 to 5.

- **Digital Inputs:**
  - Type & Range: MA DC, ±10V, ±5V, ±10 mA
  - Response Time: 0.2 to 40.21 second.

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**Additional Options Terminals**

- **Thermocouple Calibration:** Linearity better than ±0.2°C (±0.5% typical) on range modules where the table above. Linearity for other ranges is better than ±0.5°C. 0 to 1399°C.

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**COMUNICATIONS**

**PC Configuration:**
- Connection: RS232 via PC Configuration Cable to RS1 socket under case.
- Protocol: Modbus RTU.
- Master/Slave Mode: Slave address 1-125 or Serpoint master mode.
- Supported Protocols: 4800, 9600, 19200 or 38400BPS.
- Data Format: 8 data bits and 1 stop bit. Even, or no parity.
- Isolation: 3400 volt safety isolation from all inputs and outputs.

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**ETHERNET**

**Connection:**
- Locate in Option Slot A. Connection via RJ45 connector on top of case.
- Protocol: Modbus TCP. Data Rate: 100Mbps or 100BaseFx.
- Isolation: 240 volt safety isolation from the supply, inputs and outputs (except SSR Driver). See the Supplementary Manual for extra options on USB/Reciever boarders.

**LOOP CONTROL BOARD**

- **Tuning Types:** Pre-Tune, Auto Pre-Tune, Self-Tune or Manual Tunning.
- **Proportional Bands:** Primary & Secondary as gain of 96 dB/60 Hz from input span ± 1% influence, or ON/Off control.

**Deadband Overlap:**
- 0% to 100% of Primary + Secondary Proportional Band.
- Differential: ON/OFF switching differential 0.1% to 10.0% of input span.

**Autoswitch:**
- Selectable with ‘bumpless’ transfer when switching between
- Control: Automatic and Manual control.
- Setpoint Ramping: Selectable from 0 to 510.

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**ALARMS**

**Alarm Types:**
- Up to 5 alarms selectable as Process High, Process Low, Band, Deviation, Rate of Signal Change (per minute).

**Alarm Hysteresis:**
- A deadband of 1.5% is essential for the alarm to ‘stick’ but not continuously activate no matter how fast the rate of rise.

**Combined Outputs:**
- Logic OR of alarm 1, 2, 3 or 4 to 5.

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**OPERATING CONDITIONS (FOR INDOOR USE)**

- **Temperature:** 0°C to 55°C (Operating), –30°C to 70°C (Storage).
- **Humidity:** Relative humidity: 20% to 90% non-condensing.

**Power Considerations:**
- Supply Voltage and Variations: 100 to 240VAC ±10%, 50Hz, 50W.
- Power Consumption: 20W to 48W, 25VA or 22-66VA, 120W.

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**CONFORMANCE NORMS**

**EM: CE:** Complies with EN61326.
- **Safety:** CE: Complies with EN61010-1, 2, 3, IEC, to UL61010-1, 3.
- **Conformity:** CE Marking Degree 2. Installation Category II.

**Front Panel Sealing:**
- To IP65 (IP65 front USB connector). IP66 behind the panel.
- To IP69 (IP69 rating recommended by/ approval by users).

**Display:**
- **LED Display Areas:** 65x50mm (21 x 21mm).
- **Display Characters:** 0 to 9, A to Z, P, L, - and 0.

**Trend View:**
- 120 of 240 data points shown in a scrollable window. Data is not retained when supply is removed or if time of day is changed.

**Data Recorder:**
- **Data Recording:**
  - 50 points per channel from data logger with a dual color (red/green) background.
  - **Data Area:** 56.5x50mm (2.21 x 2.0mm).
  - **Data Characters:** 0 to 9, A to Z, P, L, - and 0.

**PROFILER:**
- **Profiler Option can be purchased from your supplier if required. See the Supplementary Manual for product information.**

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**Dimensions:**
- **Weights:** 0.65kg maximum.
- **Size:** 46 x 93mm (Front-Bace), 117 (Depth Behind Panel).
- **Mounting Panel:** Panel must be rigid. Maximum size 46 x 93mm (Front-Bace), 117 (Depth Behind Panel).
- **Panel Cut-out Size:** 32 x 32mm. Tolerance ±0.5 ±0.0mm.
- **Ventilation:** 20mm gap required above, below and behind.
Product Manual for information about the additional screens when Data Recorder is fitted.

Displayed value at which the retransmission output = minimum. Adjustable from -1999 to 9999.

Enables/disables writing via RS485 or Ethernet (or Time values shown (-1999 to 9999) when input is at minimum and maximum values. Min span = 100 units. If Multi-Point Scaling is enabled, up to 15

Display resolution with 0; 1; 2 or 3 decimal places. Temperature inputs are limited to 1 decimal place.

Voltage required if Output

Caution: Manual power level is not restricted by the output power limits. Over/Under Range & Input Fail Indications

If the pressure or inputs are ±4% above or below the scale maximum, their displayed value is replaced with the word "HIGH" or "LOW". If a signal break is detected, their retransmission output = OFF. In ORDER or ERROR conditions, the Control configuration (see Control Configuration).

Correct the problem before continuing normal operation.

Enables/disables internal Thermocouple Cold Junction Compensation. The default value is Enabled.

Filter unwanted noise from input signal. Adjustable from 0.1 to 100.0 seconds or OFF (default = 2s).

Caution: Correct the problem before continuing normal operation.

If Outputs Configuration menu is entered without any output modules fitted.

Alarm activation point. – if enabled in Control Configuration.

Manual Loop Alarm Time Time allowed (after PID power output reaches min or max), for process to begin responding. Alarm activates if no response. If Outputs Configuration menu is entered without any output module.

Inputs Configuration menu is entered without any output module selected.

Where adjustment is possible*, press  to continue.

The symbols are shown to the right of the lists when more menu options are available above *if adjustment is not disabled in Configuration.

Controller Only; USB Port; Data Recorder (or Time values shown (-1999 to 9999) when input is at minimum and maximum values. Min span = 100 units. If Multi-Point Scaling is enabled, up to 15

Displays scalars for 10 samples per marker (10 samples per hour) on a linear scale with a secondary axis. Allows for up to 20 data points.

Over/Under Range & Input Fail Indications

If the pressure or inputs are ±4% above or below the scale maximum, their displayed value is replaced with the word "HIGH" or "LOW". If a signal break is detected, their retransmission output = OFF. In ORDER or ERROR conditions, the Control configuration (see Control Configuration).

Displayed value at which the retransmission output = maximum. Adjustable from -1999 to 9999.

Display resolution with 0; 1; 2 or 3 decimal places. Temperature inputs are limited to 1 decimal place.

Use with care!

When disabled, all parameters are read only.

User must reconfigure all required settings before using the instrument following a reset.

User mode (the power level is ±4% applied to the PV input for all output RSP). Default value is OFF (000).

Over/Under Range & Input Fail Indications

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Enables/disables writing via RS485 or Ethernet (or Time values shown (-1999 to 9999) when input is at minimum and maximum values. Min span = 100 units. If Multi-Point Scaling is enabled, up to 15

Display resolution with 0; 1; 2 or 3 decimal places. Temperature inputs are limited to 1 decimal place.

Voltage required if Output

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