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To avoid processing delays, also please be sure to include:

1. Returnee’s name, address, and phone number.
2. Model and Serial numbers.
3. Repair instructions.

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1.0 GENERAL DESCRIPTION

The OM-302 Thermocouple Datalogger is designed to read and record digitally, as temperatures, the microvolt inputs generated by either Types J, K, T or E thermocouples. Through use of the keyboard, the user is able to program print rate, High - Low limits, thermocouple type, engineering units (°C or °F), time, day of the year and many other useful functions. If power is lost during operation, important programming information is saved and accurate time information is maintained. Through the addition of optional multiplexers (MUX), up to 40 sensors can be continuously monitored.

2.0 SYSTEM OPERATION

The OM-302 and its options are diagrammed above. As can be seen, the system can be divided into a single or multiple channel input device and associated cold junction sensors (C/J); the analog to digital conversion section (A/D); the CPU; the keyboard; the printer; and the display.
2.1 THE INPUT DEVICE (SINGLE OR MULTICHANNEL)

The input device consists of a place to connect the thermocouple (T/C's) and a sensor to measure the temperature of this connection. In the case of the multichannel inputs switching relays and associated control logic are included to allow the CPU to select which thermocouple is being read. In the case of the single channel unit the cold junction is part of the single channel adapter assembly.

2.2 A/D

This section amplifies and conditions the analog thermocouple input voltages and the cold junction voltages into digital information the CPU can process. The CPU controls which reading is being taken and how often.

2.3 CPU

The CPU controls all the other parts of the system. It takes the digital thermocouple information from the A/D and mathematically linearizes and scales the output before sending them to the display and printing. The CPU monitors the keyboard for inputs, keeps time accurately (within 1 second) and performs limit checking, etc.

2.4 DISPLAY

The display's left two digit places show current channel number being read, and the right 6 digit places show the current temperature in °F or °C.

2.5 PRINTER

The printer records a hard copy of the input temperature(s) on demand or at preprogrammed intervals. It documents program changes as they are made, and alarm conditions when high and low alarm points are exceeded.

3.0 INSTALLATION AND SET-UP

3.1 QUICK HOOK-UP

Sections 3.3 through 3.5 provides most basic information on installing your Series OM-302 Datalogger. Section 6 describes how to program the unit.

3.2 SHIPPING BOX AND UNPACKING

Carefully inspect the Series OM-302 Datalogger for shipping damage. Report any damage immediately to the carrier, submit a claim to the carriers and notify OMEGA Customer Service Department at (203) 359-1660.
3.3 CONNECTING THE INPUTS

3.3.1 1 CHANNEL INSTALLATION

The unit is supplied with a white connector which plugs into the single channel adapter which plugs into the multiplexer connector in the rear of the OM-302.

Note: the system is supplied with a Copper-Copper connector. Slightly better performance may be realized if you use a connector specific to the thermocouple type you are using. The part numbers and color codes are listed below.

MALE INLINE THERMOCOUPLE CONNECTORS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Black</td>
</tr>
<tr>
<td>K</td>
<td>Yellow</td>
</tr>
<tr>
<td>T</td>
<td>Blue</td>
</tr>
<tr>
<td>E</td>
<td>Purple</td>
</tr>
<tr>
<td>Uncompensated</td>
<td>White</td>
</tr>
</tbody>
</table>

3.3.2 MULTICHANNEL INSTALLATION (10 and 40 CHANNEL)

Use cable connector supplied with the multiplexer to connect the MUX to the datalogger. This cable carries both analog and digital information. Basically, there are two types of wiring connections which have to be made for multiplexer operation.
1. ANALOG SIGNAL INPUT. To make these connections the top of the multiplexer case must be removed by loosening the four screws on the sides of the case. When the connections have been made, the top of the case is replaced and the wires are run out the slot on the back right side of the case. Connections for each channel are made via the 10 terminal blocks in the rear of the unit. For 10 channel installation, the terminal block has 10 sets of four connections each. Terminal 1 is positive and terminal 4 is negative (terminals 2 and 3 are not used). For 40 channel installation the terminal block has 40 sets of two connections each (one marked positive and one marked negative), each channel is clearly marked.

WARNING

WHEN THIS EQUIPMENT IS USED IN THE "FLOATING MODE", METAL SURFACES MAY HAVE LETHAL ELECTRICAL POTENTIALS. THEREFORE, IT IS RECOMMENDED THAT THE UNIT BE USED ONLY IN THE GROUNDED CONFIGURATION AND THAT THE USER AVOIDS TOUCHING SUPPLIES OF HIGH POTENTIAL AND THE UNIT AT THE SAME TIME.

There is another purpose for the anodized aluminum bar located between the terminal strips. Aluminum is a thermally conductive material which is used in this unit to equalize temperature between terminals for thermocouple applications. It is in close proximity to the terminal strip and is thermally (but not electrically) connected to the circuit traces running between the terminal blocks and the relays. For thermocouple applications a cold junction sensor will be attached to the bar for common ice point compensation.

2. CONNECTION, DATALOGGER TO MULTIPLEXER. The connection is via a ribbon cable running from the back of the datalogger to the back of the multiplexer. Plug the ribbon cable into the socket located in the middle of the datalogger so that the cable extends straight out the back. The other end of this ribbon cable plugs into the back of the multiplexer.
3.4 CONNECTING POWER SOURCE

Connect supply cord to standard 110-120VAC, 60Hz, 3-wire outlet to datalogger and MUX (if used).

3.5 INSTALLATION OF PAPER ROLL

3.5.1 Locate the power switch on the right side of the data logger and turn it off by pressing the switch side opposite the dot.

3.5.2 Use OM-302-RP (Black) thermal print paper. Position the roll of paper behind the datalogger so that it unrolls from the bottom, loose end toward the unit. Fold over about 2 inches of paper and make a sharp crease as shown.

3.5.3 Insert the creased end of the paper into the printer slot located at the back of the unit until it meets resistance. Turn on the unit by pressing the switch side with the dot. Press the paper advance key twice until the paper is in printing position. Place the roll of paper in the paper holder and roll in the slack.

3.6 CONNECTING ACCESSORIES

Several external features are available through the accessories socket. With the plug provided, access to these features can be obtained. The chart below shows the configurations of these connectors.

3.6.1 ACCESSORIES CONNECTOR PORT

1. nc (+6)
2. nc (+6B)
3. (serial out)
4. (aux out 1)
5. (serial clock)
6. (aux input 1)
* 7. EXTERNAL TRIGGER INPUT (47K pull-up to +6v internal)
* 8. DIGITAL GROUND (use for trigger and alarm outputs)
9.
10.
11. (aux input 2)
12.
13. (aux output 2)
* 14. LOW ALARM OUTPUT (CMOS 6V, 5MA MAX)
* 15. HI ALARM OUTPUT (CMOS 6V, 5MA MAX)
16. (serial input)

NOTE: Only the "*" pin numbers are supported by the Series OM-302 software.
3.6.2 CONNECTING EXTERNAL TRIGGER

3.6.3 CONNECTING EXTERNAL ALARMS
4.0 CALIBRATION

4.1 METHOD A: uVOLT SOURCE (No Junction Compensation)

4.1.1 Select Type J (Iron-Constantan (-)) thermocouple wire no more than 3 feet long.

4.1.2 Connect the Iron to the (+) input terminal and the Constantan to the (-) input terminal.

NOTE: When calibrating the OM-302 Datalogger with a MUX option, set the datalogger to hold on channel #1 and make your connections through that channel.

4.1.3 Braze the other ends of the Type J wires to copper leads and cover the junctions with waterproof tubing.

4.1.4 Connect the copper leads to a precision uVolt source with the Iron-Copper junction to (+) and the Constantan-Copper junction to (-).

4.1.5 Immerse the test cable thermocouple junctions into an ice bath (or ice-point reference). Be certain that the wires remain separate and that the water temperature stays at 0°C by keeping fresh-water ice cubes stirred in.
4.1 METHOD A: uVOLT SOURCE (No Junction Compensation) cont.

4.1.6 Gain access to the OM-302 calibration pot by removing the two screws on the bottom of the case. (See diagram below.)

4.1.6 CALIBRATION POT

4.1.7 Turn power on to the OM-302 first, then the uVolt source.

4.1.8 Adjust uVolt Source to 42,744 uV.

4.1.9 Set the OM-302 to type J thermocouple range and F. scale. (See Programming Instructions)

4.1.10 Adjust the OM-302 Calibration Pot to read 1395 F.

4.1.11 Wait approx 10 seconds. If reading changes (after 10 seconds) without adjustment of calibration source or the OM-302 calibration pot, then repeat steps 4.1.10 and 4.1.11. Be sure to wait at least 10 seconds between adjustments of the OM-302 Calibration Pot. This allows programming to adjust to the new calibration. When no changes occurs after 10 seconds, then the calibration is complete.
4.2 METHOD B: JUNCTION COMPENSATED THERMOCOUPLE SIMULATOR

4.2.1 Using Type J (Iron-Constant) thermocouple wire, connect the Iron conductor from (+) output to (+) input of the OM-302 Datalogger. Connect Constantan conductor from (-) output of calibrator to (-) input of OM-302.

NOTE: When calibrating the OM-302 Datalogger with a MUX option, set the datalogger to hold on channel #1 and make your connections through that channel.

4.2.2 Set Calibrator for 0°F, Type J Thermocouple range in the calibration mode.

4.2.3 Gain access to the OM-302 calibration pot by using a small screwdriver (1/8" or less) through the hole in the right side of the OM-302.

4.2.4 Turn power on to the OM-302 first, then calibrator.

4.2.5 Adjust calibrator to 1395°F.

4.2.6 Set the OM-302 to Type J thermocouple range and °F scale. (See Programming Instructions)

4.2.7 Adjust the OM-302 Calibration Pot to read 1395°F.

4.2.8 Wait approx. 10 seconds. If reading changes (after 10 seconds) without adjustment of calibration source or the OM-302 calibration pot, then repeat step 4.2.7.

4.2.9. Be sure to wait at least 10 seconds between adjustments of the OM-302 Calibration Pot. This allows programming to adjust to the new calibration. When no changes occur after 10 seconds, then the calibration is complete.
5.0 THE FRONT PANEL

5.1 PRINTER OUTPUT

5.1.1 LIST

(1)    == OM-302-J-F ==

(2)    001    DAY
(3)    0009   TIME
(4)    +0150. HI LIMIT
(5)    +0<<<. LO LIMIT
(6)    +0143. MAX
(7)    -1>=>. MIN
(8)    0100.00 INTERVAL
(9)    10.03 CH.DWELL

1. Model #: T/C Type - Scale
   The model is OM-302.
   The thermocouple type set by the user as J, K, T, or E.
   The scale set by the user as C or F.

2. DAY of the year set by the user from 000 to 999.

3. TIME of day (hours, minutes) set by the user from 0000-2359.

4. HI LIMIT set by the user from -1999 to +1999.
   +0<<< indicates no alarm flag set.

5. LO LIMIT set by the user from -1999 to +1999.
   +0<<< indicates no alarm flag set.

6. MAXimum data value seen on any channel since the last list.
   ±1>>> shows that the T/C temperature was beyond its
   calibrated range.
   ±1>=> shows that the A/D converter reached its maximum
   count.

7. MINimum data value seen on any channel since the last list.
   ±1>>> shows that the T/C temperature was beyond its
   calibrated range.
   ±1>=> shows that the A/D converter reached its maximum
   count.

8. INTERVAL time (hours, minutes, seconds) set by the user
   from 0000.00 to 2359.59. The time between printout of
   temperature data.

9. CHannel.DWELL
   Channels set by the user from 1-10 or 1-40.
   DWELL time set by the user from 2 to 9 seconds.
5.1.2 INTERVAL PRINTOUT

(1) 001:1722
(2) 01+0048. °F
(3) 02+0140. °F
(4) 03+0021. °F

1. Day and time of the print interval.
2. Channel 1 and its data value.
3. Channel 2 and its data value.
4. Channel 3 and its data value.

5.1.3 ALARM PRINTOUT

(1) 001:2134
(2) 01-0058. 𝜇L
(3) 001:2134
(4) 01+0214. 𝜇H

1. Day and time the low alarm limit was reached.
2. Channel and value which caused the alarm.
3. Day and time the high alarm limit was reached.
4. Channel and value which caused the alarm.

5.2 DISPLAY

03 +0143°F

Left two digits indicated the channel selected.
Right digits indicated temperature and scale.

6.0 PROGRAMING THE DATALOGGER

PLEASE NOTE: When entering data or functions into OM-302 Recorder, be certain that upon pressing a key a "beep" is heard. This signals that the CPU has responded to the key stroke. Before entering the next key stroke, be certain the "beep" has stopped. If the "beep" has not stopped before the next key is pressed the CPU does not recognize this next entry causing incorrect data to be entered. However, do not delay more than 2 seconds otherwise the CPU will assume an error has been made and will resume according to the previous programming. ALL programming changes will be followed by a list function automatically documenting the change. Programming steps may be chained together to save time.
6.0 PROGRAMING THE DATALOGGER cont.

6.1 TIME OF DAY

The time of day is a 1 to 4 digit entry. The Series OM-302 Datalogger keeps time in the 24 hour format. The entry procedure is as follows:

Example: to enter 15:23 (3:23 pm)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Hours* (tens)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LSD Hours* (units)</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>MSD Minutes* (tens)</td>
<td>2</td>
<td>152</td>
</tr>
<tr>
<td>LSD Minutes (units)</td>
<td>3</td>
<td>1523</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td></td>
<td>1523</td>
</tr>
<tr>
<td>Store in time counter</td>
<td>TIME</td>
<td>1523</td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered. Example: to enter 0059 (12:59 am) press 5, 9, "arrow", TIME.

6.2 DAY OF YEAR

The day of the year is a 1, 2, or 3 digit entry. The Series OM-302 Datalogger will increment this counter upon passing from 23:59 to 0:00 hours. This counter will continue to 999 where it will then reset to 000. The entry procedure is as follows:

==============================================================================
NOTE: MSD = most significant digit
NSD = next significant digit
LSD = least significant digit
==============================================================================

12
6.2 DAY OF YEAR cont.

Example: to enter 205 as day of the year

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESS ED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Day * (hundreds)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>NSD Day * (tens)</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>LSD Day (units)</td>
<td>5</td>
<td>205</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td></td>
<td>205</td>
</tr>
<tr>
<td>Store in day counter</td>
<td>DAY</td>
<td>205</td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered. Example: Day 002
Enter 2, "arrow", DAY.

6.3 PRINT INTERVAL

The print interval is a 1 to 6 digit entry. The Series OM-302
Data Logger will log on intervals from 1 second to 23
hours, 59 minutes, 59 seconds. (2 seconds is probably the
lowest useful interval due to settling time of the A/D con-
verter.) Entry procedure is as follows:

Example: to enter 11 hours and 45 minutes as print interval

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESS ED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Hours*</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LSD Hours*</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>MSD Minutes*</td>
<td>4</td>
<td>114</td>
</tr>
<tr>
<td>LSD Minutes*</td>
<td>5</td>
<td>1145</td>
</tr>
<tr>
<td>MSD Seconds*</td>
<td>0</td>
<td>11450</td>
</tr>
<tr>
<td>LSD Seconds</td>
<td>0</td>
<td>114500</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td></td>
<td>114500</td>
</tr>
<tr>
<td>Store in interval counter INTERVAL</td>
<td></td>
<td>114500</td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered. Example: 1 hour,
10 seconds. Enter 1, 0, 0, 1, 0, "arrow", INTERVAL.

6.4 NUMBER OF CHANNELS

The number of channels is a 1 or 2 digit entry. The Series
OM-302 Datalogger will allow you to select from 1 to the
number of channels available on the MUX. The Series OM-302
Datalogger always scans from 1 to the number of channels
selected and returns to 1. The entry procedure is as fol-
 lows:
6.4 NUMBER OF CHANNELS cont.

Example: to enter channels 1 to 34 to be scanned

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD # of channels*</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>LSD # of channels</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Store in channels counter</td>
<td>CHANNELS</td>
<td>34</td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered.

6.5 DWELL TIME PER CHANNEL

The dwell time per channel is a 1 digit entry. The Series OM-302 Datalogger can be programmed to dwell on each channel in order to allow the A/D to settle on the new reading being taken after switching to a new channel. Minimum recommended dwell time is 2 seconds. Maximum dwell time is 9 seconds. The entry procedure is as follows:

Example: to enter 6 seconds as dwell time

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Dwell time in seconds</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Store in dwell register</td>
<td>DWELL</td>
<td>6</td>
</tr>
</tbody>
</table>

6.6 HI ALARM LIMIT

NOTE: for negative limits refer to 6.8

The HI alarm limit is a 1 to 4 digit entry. The OM-302 Data Logger will allow you to set any value from -1999 to +1999 as a HI limit. The entry procedure is as follows:

Example: to enter 140 as a HI Limit

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Limit*</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>NSD Limit*</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>LSD Limit</td>
<td>0</td>
<td>140</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Store in HI Limit register</td>
<td>HI</td>
<td>140</td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered.
6.7 LOW ALARM LIMIT

Note: for negative limit refer to 6.8

The LOW alarm limit is a 1 to 4 digit entry. The OM-302 Data Logger will allow you to set any value from -1999 to +1999 as a LOW limit. The entry procedure is as follows:

Example: to enter 36 as a LOW Limit

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Limit*</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>LSD Limit</td>
<td>6</td>
<td>36</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Store in LOW Limit register LOW</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered.

6.8 CHANGING (-)SIGN OR NEGATIVE LIMITS

Sign changes may be made on data values being entered to the HI and LOW limit registers. The entry procedure is as follows:

Example: to enter -140 as a LOW Limit

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Limit*</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>NSD Limit*</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>LSD Limit</td>
<td>0</td>
<td>140</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Change sign (-)SIGN</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Store in LOW Limit register LOW</td>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>

* Leading zeros do not need to be entered.

6.9 T/C TYPE SELECTION

The Series OM-302 allows you to select any of 4 common thermocouple types (J, K, E, and T). The entry procedure is as follows:

Example: to select thermocouple type J

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Select T/C Type</td>
<td>Type J</td>
<td>N/A</td>
</tr>
</tbody>
</table>
6.10 CHANGING TEMPERATURE SCALE (°C/°F)

The Series OM-302 allows you to select from °C to °F temperature scales. The entry procedure to change scales is as follows:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Switch temp. scales</td>
<td>°C/°F</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6.11 FUNCTIONS

The Series OM-302 Data Logger offers several functions which are not part of the programming steps but increase overall usefulness of the Series OM-302 Data Logger.

6.11.1 CLEAR

The Clear function allows resetting all registers to default values. This is useful when an entirely new program is desired or when improper data is stored due to battery failure. The entry procedure is as follows:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Clear command</td>
<td>CLEAR</td>
<td></td>
</tr>
</tbody>
</table>

6.11.2 HOLD

The Hold function allows the user to stop or hold the MUX at any available channel within the range of channels selected by the user during the NUMBER OF CHANNELS programming (section 6.4). To hold on one channel, the entry procedure is as follows:

Example: to hold on channel 14

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY PRESSED</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSD Channel #*</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LSD Channel #</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Enter Hold mode</td>
<td>HOLD</td>
<td>14</td>
</tr>
</tbody>
</table>

* Leading zero does not need to be entered.
6.11.2 **HOLD cont.**

The Hold mode will be released when print interval is reached or can be released by the following procedure:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY Pressed</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Release Hold mode</td>
<td>HOLD</td>
<td></td>
</tr>
</tbody>
</table>

6.11.3 **LIST**

The list function allows the user to print out all current programmed values, alarm points, and channel alarms. A list will occur upon any change in programmed values, alarm points, or channel alarms automatically.

**NOTE:** Executing the LIST function, clears the minimum and maximum registers. To execute a list, the key entry procedure is as follows:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY Pressed</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Execute List</td>
<td>LIST</td>
<td></td>
</tr>
</tbody>
</table>

6.11.4 **PAPER ADVANCE**

The Paper Advance function allows approximately 1" of paper to be feed out to allow easy tear off without destroying any documentation. It's also useful when loading paper to start it through the shuttle. To advance paper, the entry procedure is as follows:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>KEY Pressed</th>
<th>DISPLAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to alternate keyboard &quot;arrow&quot;</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Paper Advance</td>
<td>PAPER</td>
<td></td>
</tr>
</tbody>
</table>

6.11.5 **PRINT**

Pressing the PRINT key causes a forced print interval. Timed intervals will not be affected by the function.

7.0 **SPECIFICATION**

7.1 **DIMENSIONS**

7.5 inches wide x 8.0 inches deep x 2.5 inches high
19.0 cm wide x 20.3 cm deep x 6.4 cm high

7.2 **WEIGHT**

2.5 pounds
1.14 kg.
7.3 POWER REQUIREMENTS

110/120 VAC, 50-60 Hz
Export Power Options available

7.4 ENVIRONMENTAL

7.4.1 OPERATING TEMPERATURE:

32° to 122° F
0° to 50° C

7.4.2 HUMIDITY

0 to 90%, non-condensing

7.5 INPUT TERMINATIONS

Rear-panel connector with cold-junction compensation

7.6 PRINTER

16 column alpha-numeric
Full ASCII character set
5x7 dot matrix
2.25 inch wide thermal print paper
1 line/second maximum print rate

7.7 KEYBOARD

19 key - 16 hexadecimal, 3 special function

7.8 DISPLAY

8-digit vacuum fluorescent - 2-digit, channel #; 5-digit, ± sign and temperature; 1-digit, °C/°F display

7.9 PRINTING INTERVAL:

Programmable, infinitely variable in 1-second steps from 2 seconds to 2359 hours - or, initiated by external trigger or manual print key.

7.10 PRINTED OUTPUT DATA

Julian Date (1-999, programmable)
Real-time clock (0000 to 2359, programmable)
Current temperature (see range table)
High and Low alarm times
Minimum and Maximum values (on demand)

7.11 BATTERY BACK-UP

24-hour hold time for program and timekeeping
15 hour charging
7.12 THERMOCOUPLE INPUTS

Thermocouple Types: J, K, T, and E
Input Impedance: >50 Megohms
External (Lead) Resistance Effect: <25mV/350 ohm lead resistance
Cold Junction Compensation Error: ±0.5°C max. (10-40°C)
Open Thermocouple: +1E0E Display

7.13 DIGITAL OUTPUTS

High Alarm: (5 volts CMOS)
Low Alarm: (5 volts CMOS)

7.14 DIGITAL INPUTS

External Trigger
External Power (+28 Volts)

7.15 ACCURACY

Temperature Resolution: 1°C/1°F
Readout Accuracy: ±1/2 digit + conformity error (see table)
Conformity error: (See Table)

7.16 RANGE TABLE

<table>
<thead>
<tr>
<th>THERMOCOUPLE TYPE</th>
<th>°F</th>
<th>°C</th>
<th>CONFORMITY in °C ERROR @25°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>-265</td>
<td>-165</td>
<td>.8</td>
</tr>
<tr>
<td></td>
<td>+1400</td>
<td>+760</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>-150</td>
<td>-101</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>+2282</td>
<td>+1250</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>-158</td>
<td>-105</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>+752</td>
<td>+400</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>-220</td>
<td>-140</td>
<td>.9</td>
</tr>
<tr>
<td></td>
<td>+1400</td>
<td>+760</td>
<td></td>
</tr>
</tbody>
</table>

7.17 MUX SPECIFICATIONS (Optional)

7.17.1 FUNCTION

Accepts voltages from ±10 microvolts to ±10 volts full scale, and currents to one ampere full scale. Thermocouple junctions are temperature equalized and ice-point compensated.

7.17.2 CHANNELS

10 or 40 switched channels with relay-isolated closures for high and low terminals.
7.17 MUX SPECIFICATIONS (Optional) cont.

7.17.3 INPUTS
Sensors must be similarly scaled, since all inputs will be switched through a common signal conditioning circuit. Sensors can be grounded or floating, thermocouple or copper wire.

7.17.4 WIRE ATTACHMENT
Segmented vise-jaw terminals receive up to #14 AWG wires. Additional terminals for current shunts and input attenuators are available on the 10 channel models.

7.17.5 SCAN RATE
Programmable between 2 and 9 seconds per channel. Scan rate will be determined by user requirements and the settling time of the signal for the specific application.

7.17.6 RELAY LIFE
$3 \times 10^8$ cycles.
PINOUTS FOR K1 ARE TYPICAL
ALL DIODES 1N4004

10 Channel Thermocouple MUX Board
40 Channel Power Supply
OMEGA® ... Your Source for Process Measurement and Control

TEMPERATURE
- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors

PRESSURE/STRAIN
- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Instrumentation

FLOW
- Rotameters & Fl owmeter Systems
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Vortex Meters and Flow Computers

pH
- Electrodes & Transmitters
- Benchtop/Laboratory Meters
- Controllers, Calibrators & Simulators

DATA ACQUISITION
- Data Acquisition and Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Data Logging Systems
- Recorders, Printers & Plotters

HEATERS
- Heating Cable
- Strip Heaters
- Cartridge Heaters
- Immersion Heaters
- Tubular & Band Heaters

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