Instructions for
Model 1400/1401 Digital Panel Indicators

P/N 974072
04/02 Rev. B
ECO # 26719

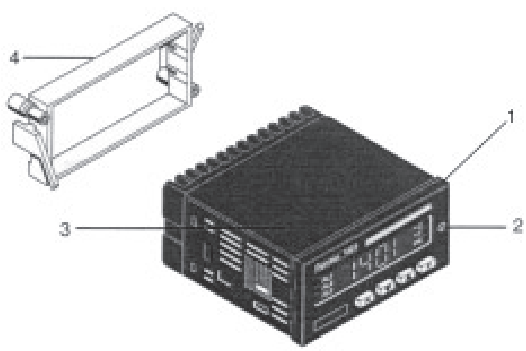
Dynisco
Instruments

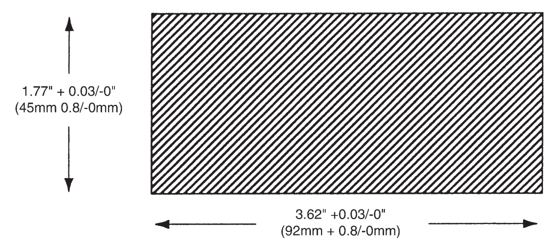
CONTENTS

MODEL 1400-4-3 QUICK START INSTRUCTIONS

1. MOUNTING

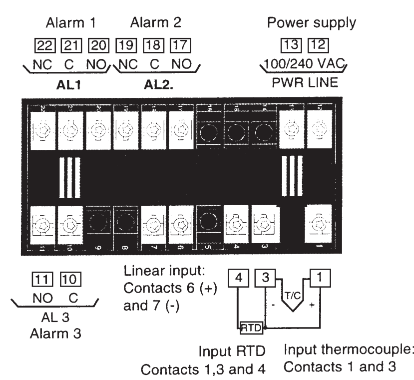
- Prepare panel cutout to dimensions shown below.
- Remove instrument from case by turning captive safety screw (2) counter clockwise.
- Grasp the bezel and slide the instrument out of its case.
- Slide the rubber gasket (1) over the case.
- Slide the instrument case (3) into the panel cutout.
- Slide the panel-mounting bracket (4) on to instrument case until it contacts back of panel.
- Tighten two Phillips screws on panel mounting bracket until case is securely mounted in panel cutout.
- Slide the instrument back into the case and tighten safety screw.





2. WIRING

- Connect an appropriate length of either thermocouple extension wire (e.g. Type J), 3 wire RTD leads, or in the instance of linear input option, signal wires to input terminals as shown below.
- Connect alarm(s) if applicable. Note that alarm defaults are High, Reverse Acting.
- Connect power to the appropriate terminals as shown below.



3. INSTRUMENT CONFIGURATION

- Remove instrument from case by loosening safety screw, grab bezel and slide out of case.
- Locate jumper V2 in Figure 20, page 21 and place in the open position.
- Slide instrument back in case and apply power. Display will now show COnF
- Press the F button until P1 is displayed.
- Refer to 3.2.3 Parameter List on page 22. Using the UP arrow, select appropriate P1 code for input type and standard range.
- Press F button until P6 is displayed.
- Using the UP arrow, select the appropriate Alarm 1 type (e.g. High alarm, etc.).
- Press the F button until P7 is displayed.
- Using the UP arrow, select the appropriate Alarm 1 action (e.g. reverse or direct acting)
- Press the F button until P8 is displayed.
- Using the UP arrow, select if alarm is inhibited at startup. Set to OFF or ON.
- If Alarm 2 is to be utilized, repeat the same process as above for parameters P12 through P17.
- Press the F button until ConF is displayed.
- Slide instrument out of case, return jumper V2 to the closed position.
- Slide instrument back into case, secure with safety screw.
- Apply power to instrument, unit will display process temperature.
- Press the F button to set Alarm 1 and 2 threshold and hysteresis values.
- Instrument is now ready for use.

PLEASE NOTE:
The preceding Quick Start instructions are the basic settings required to install, wire, and get the indicator operating. Please refer to the complete installation and operation manual for additional functions.

1. GENERAL INFORMATION

DIMENSIONS AND PANEL CUT-OUT

Fig. 1 Dimensions of the Panel Indicator

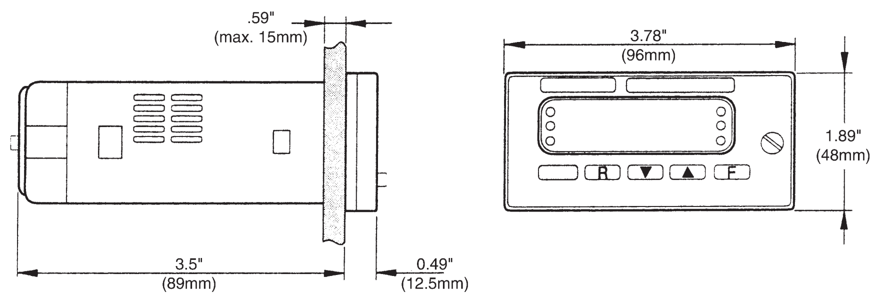
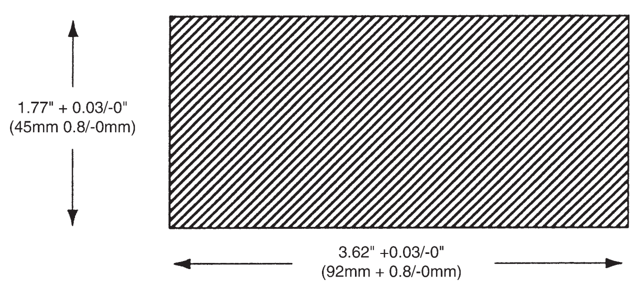


Fig. 2 Dimensions of the Panel Cutout



HORIZONTAL MOUNTING: Minimum distance between cutouts: 20 mm

PACKING OF MORE INSTRUMENTS IN A SINGLE CUTOUT (max. 10 instruments): The vertical dimension of the cutout is the addition of the front dimensions minus 3 mm. Vertical dimension of the cutout = (n x 48) - 3 mm where n is the number of instruments to be packed.

BEFORE PROCEEDING WITH INSTALLATION OF THE INSTRU–MENT READ CAREFULLY **SECTION 2** AND PARTICULARLY SECTION 2.2, E CONCERNING THE EXTERNAL LOADS.

1.1 INTRODUCTION

The 1400 Series is a family of general purpose digital panel indicators developed with the latest technology available today and aimed to reduce costs and improve simplicity during installation and use. As part of the Dynisco background, this family also maintains a high standard in quality, reliability and man/machine interface simplicity.

Features like three independent alarms, alarm masking during start up, manual or automatic alarm reset, programmable alarm hysteresis, max. measured value data hold, min. measured value data hold, analog retransmission of the measured value and linear input scaling with programmable digital filter on the measured value, offer the wide range of possible applications.

The 1400 comes with a complete availability of ranges from thermocouple, RTD, mV, V and mA input and can also be supplied with three independent alarms.

1.2 Product Specifications

1.2.1 General Specifications

Case:	PC/ABS black color; self-extinguishing degree: V-0 according UL94
Front Protection:	Designed and tested for IP65 (*) and NEMA 4X (*) for indoor locations (when panel gasket is installed) (*) Tests were performed in accordance with IEC529, CEI 70-1 and NEMA 250-1991 STD.
Installation:	Panel mounting with mounting frame Instrument removable from case by safety screw
Rear Terminal Block:	With screw terminals and identification labels, connection diagrams and safety rear cover
Dimensions:	DIN 43700 1.89″ x 3.78″, depth 3.5″ (48 x 96 mm, depth 89 mm)
Cut-out:	1.77″ x 3.62″ + 0.32″-0.0″ (45 x 92 mm +0.8 mm -0.0 mm)
Weight:	2 lbs. (600 g max.)
Display:	High efficiency LED, 4 digits, 7 segments with decimal point, 12.7 mm height, from -1999 to +4000
Front Indicators:	AL1 - AL2 - AL3 - PK - °C - °F
Power Supply:	From 100 V to 240 V A.C. 50/60 Hz or 24 V AC/DC
Power Supply Variations:	From -15% to +10% of the nominal value
Power Consumption:	6 VA max.

Insulation Resistance: > 100 MΩ according to IEC 348

Isolation Voltage: 1500 V r.m.s. according to IEC 348

Conversion: Dual slope integration

Resolution: 30000 counts

Sampling Time: 500 ms typical

Accuracy: ± 0.2% fsv ± 1 digit @ 25°C ambient temperature

Common Mode Rejection Ratio: 120 dB @ 50/60 Hz

Normal Mode Rejection Ratio: 60 dB @ 50/60 Hz

Noise Rejection: High frequency electromagnetic noise: according to IEC 801-4 level 3
Electric discharge: 8 kV

Temperature Drift:

TC inputs:	≤ 200 ppm/°C on fxv (CJ excluded)
RTD input:	≤ 400 ppm/°C on fxv
Linear inputs:	≤ 300 ppm/°C on fsv

Ambient Temperature: From 0 to 50°C

Storage Temperature: From -30 to +70°C

Humidity: From 20% to 85% RH, non-condensing

Protection: WATCH DOG circuit for automatic restart
DIP SWITCHES for protection against tampering with configuration and calibration parameters

Approvals: UL, CSA (1400 only), CE

1.2.2 INPUTS

Three types of inputs are available:

A) THERMOCOUPLE: J, L, K, R, S, T, N
Type of TC and °C/°F programmable

Line Resistance: 100 V max, with maximum error 0.1% of span

Cold Junction: Automatic compensation from 0 to 50°C

Burn Out: Detection of an open input circuit (wires or sensor) with underrange or overrange selectable indication

Input Impedance: >1 M Ω

Ranges: See table

RANGE TABLE			
TC Type	**Ranges**		**Note**
J	-150/+1850°F	-100/+1000°C	IEC 584-1
K	-150/+2500°F	-100/+1370°C	IEC 584-1
L	-150/+1650°F	-100/+900°C	DIN 43710-1977
R	0/+3200°F	0/+1760°C	IEC 584-1
S	0/+3200°F	0/+1760°C	IEC 584-1
T	-150/+750°F	-100/+400°C	IEC 584-1
N	0/+2550°F	0/+1400°C	IEC 584-1

B) LINEAR INPUT

Input Type: See table

STANDARD RANGE TABLE		
Input Type	**Input Impedance**	**Accuracy**
0 - 20 mA	5 Ω	
4 - 20 mA	5 Ω	
0 - 60 mV	M 1 MΩ	
12 - 60 mV	M 1 MΩ	0.1% W 1 digit
0 - 5 V	M 200 k Ω	@ 25°C
1 - 5 V	M 200 k Ω	
0 - 10 V	M 400 k Ω	
2 - 20 V	M 400 k Ω	

Readout: Keyboard programmable between -1999 and +4000

Decimal Point: Programmable in any position

C) RTD (Resistance Temperature Detector)

Input: For RTD Pt100 Ω, 3 wire connection with °C/°F selectable.

Input Circuit: Current injection (100 µA)

Line Resistance: Automatic compensation up to 3 Ω/wire with no measurable error

Calibration: According to DIN 43760

Standard Ranges: See table

STANDARD RANGE TABLE		
Input Type	**Ranges**	
RTD Pt 100 Ω	-320/+1100°F	-200/+600°C
		199.9/+600.0

Burn Out: Up scale or down scale programmable for open circuit of one or more wires

1.2.3 Additional Functions

Peak Detection: Indication of the max. and min. value measured by the instrument

Digital Filter: Applied to the measured value with a time constant of 1, 2, 3, 4 or 5 s.

Offset On The Measured Value: It is possible to set an offset (engineering units) to the measured value

Safety Lock: For protection of the alarms threshold values

1.3 Options

1.3.1 Alarms

Number of Alarms: Up to 3 independent alarms

Threshold: From 0 to 100% of the readout span

Hysteresis: Programmable from 0.1 to 10.0% of the readout span

Type of Alarm: High or low alarms programmable

NOTE: The alarm becomes active at the alarm threshold value and will be reset at the alarm threshold value plus or minus the hysteresis value, according to the alarm type.

Reset: Automatic or manual, programmable

Output of Alarm 1 and 2: Two relays, SPDT

Contact Rating: 3 A-30VDC on resistive load or 3 A-250V AC on resistive load

Relay Status: Relay energized in non-alarm condition (fail safe)

Alarm Indication: AL1, AL2 and AL3 indicators lit when alarm is in ON status

1.3.2 ANALOG RETRANSMISSION (1401 ONLY)

Analog Retransmission (option)

Type: 0-20mA, 4-20mA, 0-10V or 2-10V (programmable)
The output is galvanically isolated

Max. Load: 500 Ω max for mA output
5K Ω min for V output

$$\textbf{Output Resolution} = \left[\frac{\text{display resolution (in E.U.)}}{\text{retransmission span in (E.U.)}}\right] \bullet 20\text{ mA}$$

NOTE: The resolution cannot be better than 0.05% of output span (10 µA for 20 mA output or 5 mV for 10 V output).

Accuracy: ± 0.1% of f.s.v.

NOTE: The given accuracy is referred only to the retransmission circuit. It does not take into account all the other accuracy (input accuracy, linearization, etc.).

NOTE:
1) It is possible to change the standard output 0-20mA to 0-10V, by means of "CUT/SHORT" on retransmission PCB (see Section 3). The minimum load for Volt output is equal to 5kohm. The device is supplied with mA output calibration. For Volt output, it is necessary to re-calibrate the instrument.
2) The analog re-transmission is mutually exclusive with the relay AL3.

1.4 ORDERING GUIDE

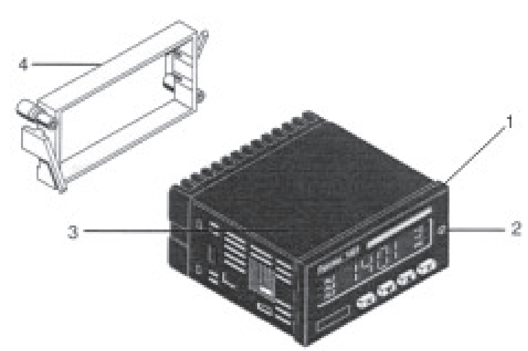
Model	Code	Options Description	Code	Power Voltage
1400	0	Thermocouple and RTD input	3	100 - 240 VAC (switching)
	4	Thermocouple and RTD input with dual alarm and linear input	1	24 V AC/DC
1401	5	Thermocouple/RTD and linear input with dual alarm and analog output	3	100 - 240 VAC (switching)

2. INSTALLATION

2.1 INSTALLATION

1) Make the instrument panel cut-out with the specified cut-out dimensions.
2) Undo the screw (2).
3) Remove the unit from the instrument case (3).
4) Slide the gasket (1) onto the instrument case (3).
5) Slide the instrument case (3) through the cut-out.
6) Slide the mounting frame (4) from the rear over the instrument case so that the snap-in elements of the mounting frame (4) engage in the recesses at the side.
7) Use a screwdriver to snug the mounting frame (4) and the instrument case (3).
8) Slide the instrument from the front into the instrument case (3).
9) Secure the instrument in the case with the screw (2).

Fig. 3 Installing the Digital Panel Indicator



2.2 WIRING GUIDELINES

Connections are to be made with the instrument housing installed in its proper location.

Fig. 4 Rear Terminal Block 1400

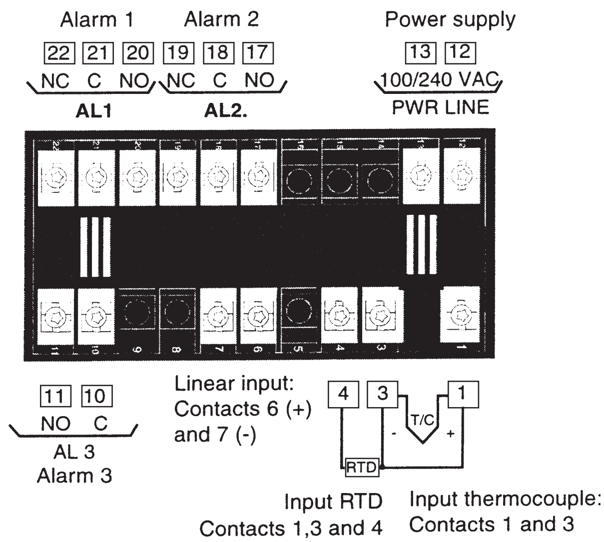
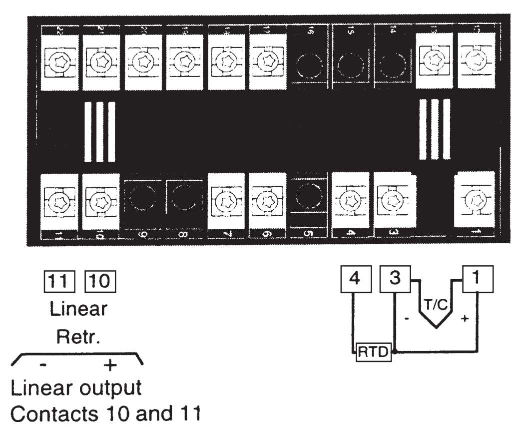
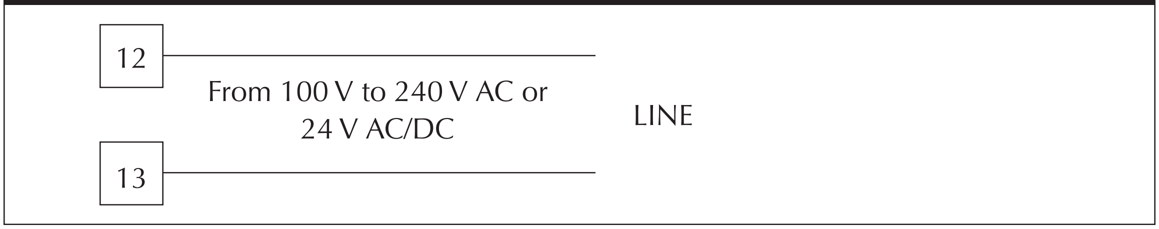


Fig. 5 Rear Terminal Block 1401



A) Power Line

Fig. 6 Power Line Wiring

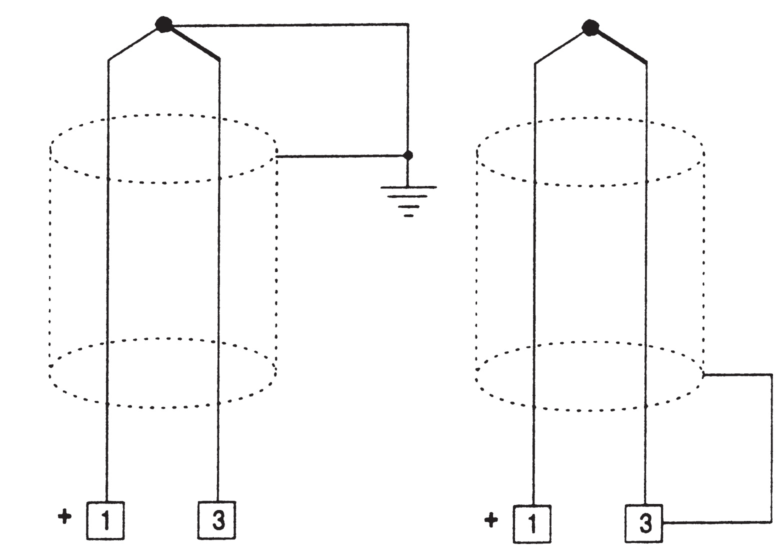


NOTE: 1) To avoid electric shock, connect power supply at the end of the wiring procedure only.
2) The power supply input has no fuse protection. Please provide it externally.

B) Inputs

Thermocouple Input

Fig. 7 Thermocouple Input Wiring

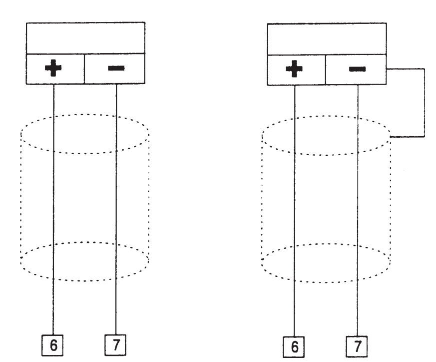


NOTE: 1) Don't run input wires together with power cables. Use proper thermocouple extension wire cable preferably shielded (see table).
2) If shielded cable is used, the shield must be grounded at one point only.
3) Pay attention to the line resistance; a high line resistance may cause measurement errors (see Product Specifications).

THERMOCOUPLE COMPENSATING CABLE COLOR CODES					
	Thermocouple Material	British BS 1843	American ANSI MC 96.1	German DIN 43710	French NFE 18-001
T	Copper Constantan	+ White - Blue Blue	+ Blue - Red Blue	+ Red - Brown Brown	+ Yellow - Blue Blue
J	Iron Constantan	+ Yellow - Blue Black	+ White - Red Black	+ Red - Blue Blue	+ Yellow - Black Black
K	Nickel Chromium Nickel Aluminum	+ Brown - Blue Red	+ Yellow - Red Yellow	+ Red - Green Green	+ Yellow - Purple Yellow
R	Platinum/Platinum 13% Rhodium	+ White - Blue Green	+ Black - Red Green	+ Red - White White	+ White - Green Green
S	Platinum/Platinum 10% Rhodium	+ White - Blue Green	+ Black - Red Green	+ Red - White White	+ White - Green Green
E	Chrome Constantan	+ Brown - Brown Brown	+ Violet - Red Violet	– – –	– – –
B	Platinum 30% RH Platinum 6% RH	– – –	+ Grey - Red Grey	– – –	– – –

Linear Inputs

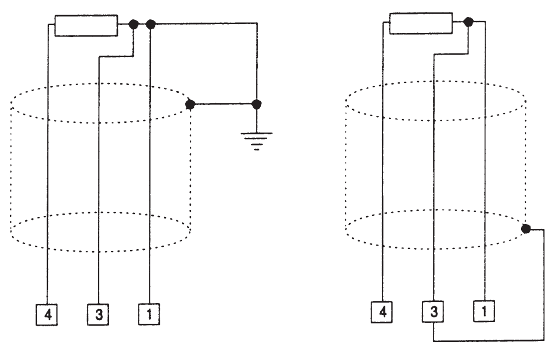
Fig. 8 Linear Input Wiring



NOTE: 1) Don't run input wires together with power cables
2) Use proper cable, preferably shielded
3) Pay attention to the line resistance; a high line resistance may cause measurement errors.
4) If shielded cable is used, the shield should be grounded at one point only (see Fig. 9)

RTD Input

Fig. 9 RTD Input Wiring



NOTE: 1) Don't run RTD wires together with power cables
2) If shielded cable is used, the shield must be grounded at one point only
3) Use copper wires with appropriate size (see Product Specifications)
4) The resistance of the 3 wires must be the same

Any external components (like zener barriers etc.) connected between sensor and input terminals may cause errors in measurement due to excessive and/or not balanced line resistance or possible leakage currents.

C) Alarm 1 and Alarm 2 Relay Outputs

Fig. 10 Alarm 1 Relay Wiring

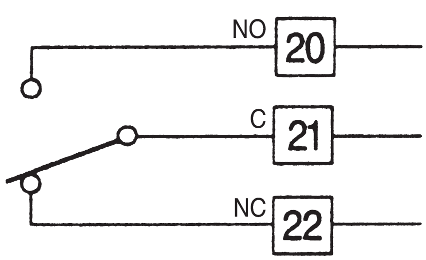
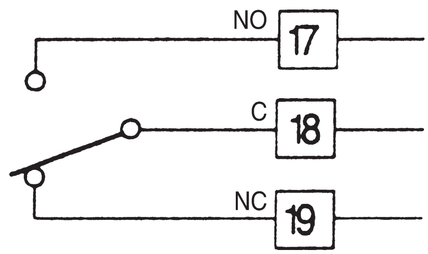


Fig. 11 Alarm 2 Relay Wiring



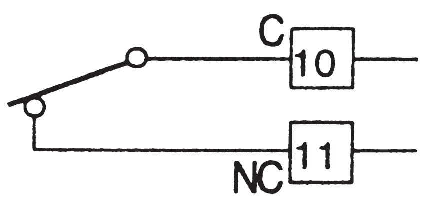
The relay output is an SPDT relay, without snubber network.

The contact ratings are: 3 A/30 V DC on resistive load or
3 A/250 V AC on resistive load.

The MTBF is 2 x 10^5 at specified rating.

D) Alarm 3 Relay Output

Fig. 12 Alarm 3 Relay Wiring



The relay output is an SPST relay, without snubber network.

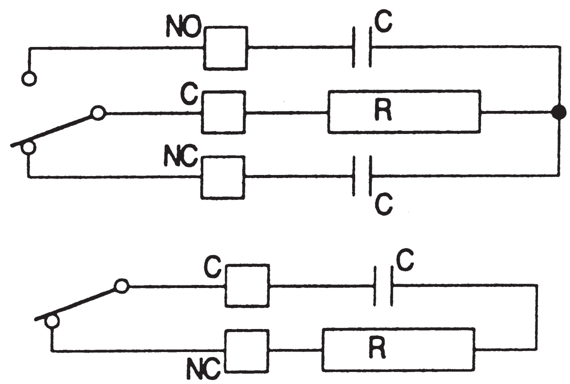
The contact ratings are: 2 A/30 V DC on resistive load or
2 A/250 V AC on resistive load.

The MTBF is 2 x 10^5 at specified rating.

E) Inductive Loads

Switching inductive loads, high voltage transients may occur. These transients may damage the internal contacts, PCB or affect the performance of the instrument. In this case an external snubber should be connected across the terminals as near as possible to the terminals (see Fig. 13).

Fig. 13 External Protection for Inductive Load Greater than 40 mA AC

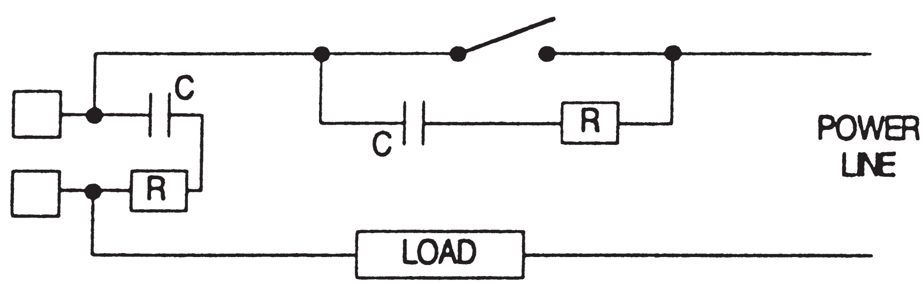


The value of capacitor (C) and resistor (R) are shown in the following table.

INDUCTIVE LOAD	C (µF)	R (Ω)	RESISTOR POWER (W)	OPERATING VOLTAGE
<40 mA	0.022	100	1/2	260 V AC
<150 mA	0.1	22	2	260 V AC
<0.5 A	0.33	47	2	260 V AC

The same problem may occur when a switch is used in series with the internal contacts as shown in Fig. 14.

Fig. 14



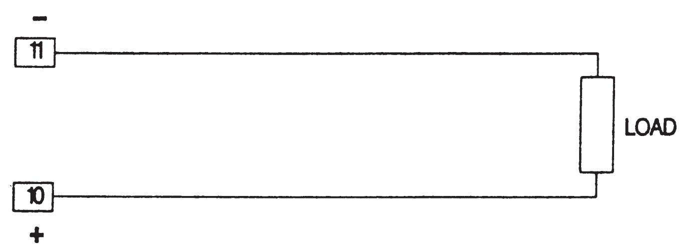
In this case it should be better to protect the switch also as shown in Fig. 14. Anyway the cable involved in relay output wiring must be as far away as possible from input or communication cables.

F) Analog Retransmission Output Wiring

For mA output the maximum load is equal to 500 V.

For V output the minimum load is equal to 5 kV.

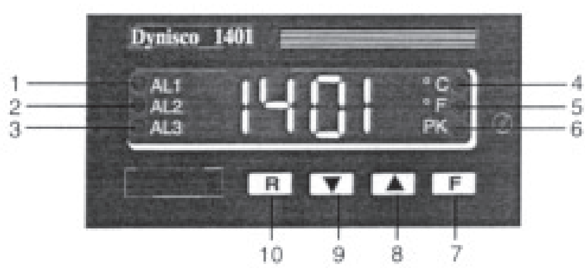
Fig. 15 Analog Retransmission Output Wiring



3. Instrument Configuration

3.1 Front Panel Description

Fig. 16 Front View Digital Panel Indicator



3.1.1 Indicators

AL1 - AL2 - AL3

Indicator OFF	=	no alarm condition
Indicator ON	=	alarm condition
Indicator flashing	=	the alarm condition has disappeared but the instrument is waiting for a manual reset of the alarm.
PK Indicator OFF	=	instrument shows the measured value
Indicator ON	=	instrument shows the "Peak high" value
Indicator flashing	=	instrument shows "Peak low" value

3.1.2 Display

The display continuously shows the measured value in eng. units. During configuration and calibration set up, this display is used to show parameter's name and the relative value.

3.1.3 Keyboard Description

▲ Increases the parameter value or to display the peak high value.

▼ Decreases the parameter value or to display the peak low value.

F Selects all the parameters. By pushing the F button the parameters will be shown sequentially on the display and, at the same time, the value of the previous parameter will be stored.

R During configuration and calibration procedures and alarm threshold setting, it is used to scroll back to the parameter without storing a new value.

R + ▼ Manual reset of alarms.

R + F Used to reset peak high and peak low and restart the peak detection procedure.

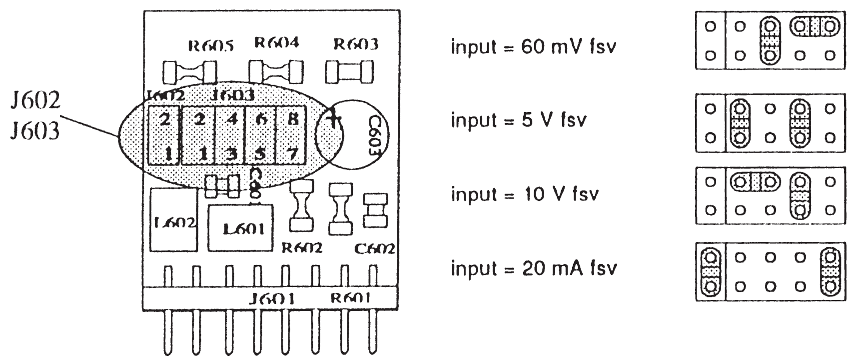
▲ + ▼ Used to start the default parameters loading procedure.

3.2 Instrument Configuration

3.2.1 Preliminary Hardware Settings

1) When an analog input different from factory setting (0-20mA) is desired, the jumpers J602 and J603 should be properly set, in accordance with Fig. 17.

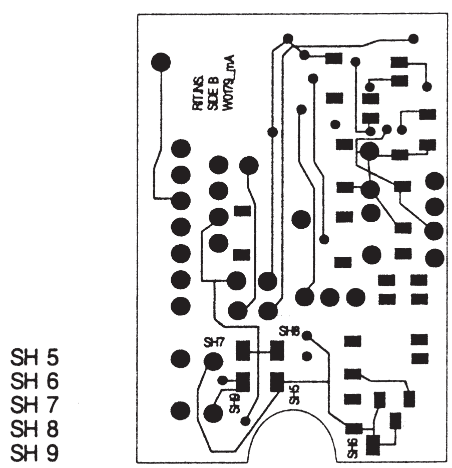
Fig. 17 Jumpers for Analog Input



2) The instrument is shipped with a 20mA (standard) analog retransmission (when fitted). When it is desired to use a 10 V analog retransmission, the solder jumpers should be set properly in accordance with the table below.

Output Type	SH 5	SH 6	SH 7	SH 8	SH 9
20 mA	open	open	open	open	open
10 V	close	close	close	close	close

Fig. 18 Jumpers for Analog Output

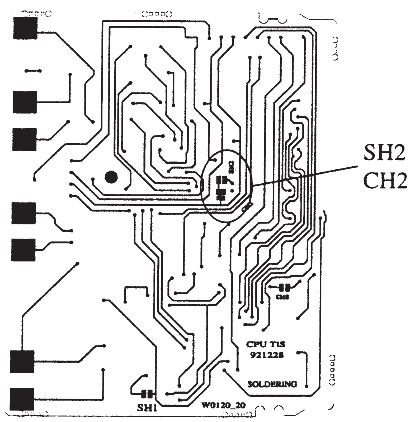


3) This device is capable of detecting lead breaks indicating overrange condition as the factory

setting. Set SH2 and CH2, for thermocouple input only, in accordance with the following table if underrange is desired.

SH2	CH2	Indication
open	close	overrange (STD)
close	open	underrange

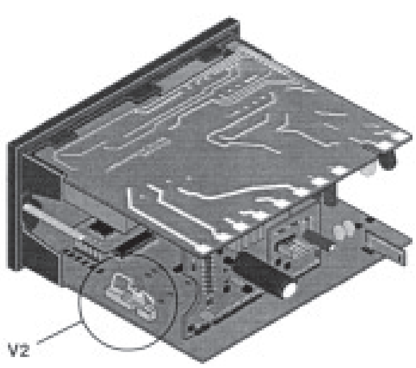
Fig. 19 Jumpers for Lead Break Indication



Configuration Procedure

1) Remove the instrument from its case.
2) Set the internal switch V2 (see Fig. 20) in the open position.

Fig. 20 View of the PI, open



3) Re-insert the instrument.
4) Switch the instrument “ON”, the display will show “CONF”. **NOTE:** If “CAL” indication is displayed, press the ▲ push-button to return to the configuration procedure.
5) Push the F button.

The instrument will show the parameter code and its value alternately on the display.

3.2.2 CONFIGURATION PROCEDURE

Once the internal jumper V2 has been positioned proceed as follows:

1. The display will show “COnF”.

NOTE: At this point it is possible to start the default parameter loading procedure as detailed at Section 6.

2. Push F push-button. The instrument shows the first parameter code and the relative value.
3. To modify this value push ▲ or ▼ to obtain the desired setting.

When the display shows the new desired setting, push the F push-button to store the value and go to the next parameter. It is possible to go back in the parameter sequence by using the R push-button but, after parameter modification, push the F push-button. Otherwise the new value will not be stored (storage is done only when the F push-button is depressed).

3.2.3 PARAMETER LIST

The following is the complete parameter sequence. Some parameters may not be shown according to a previous parameter setting.

P1 - Input type and standard range

0	=	TC type	L	range	-100/+900°C
1	=	TC type	J	range	-100/+1000°C
2	=	TC type	K	range	-100/+1370°C
3	=	TC type	T	range	-100/+400°C
4	=	TC type	N	range	0/+1400°C
5	=	TC type	R	range	0/+1760°C
6	=	TC type	S	range	0/+1760°C
7	=	RTD type Pt 100		range	-200/+600°C
8	=	RTD type Pt 100		range	-199.9/+600°C
9	=	Linear	0 - 20 mA		
10	=	Linear	0 - 60 mV		
11	=	Linear	0 - 5 V		
12	=	Linear	0 - 10 V		
13	=	Linear	4 - 20 mA		
14	=	Linear	12-60 mV		

15	=	Linear	1 - 5 V		
16	=	Linear	2 - 10 V		
17	=	TC type	L	range	-150/+1650°F
18	=	TC type	J	range	-150/+1850°F
19	=	TC type	K	range	-150/+2500°F
20	=	TC type	T	range	-150/+750°F
21	=	TC type	N	range	0/+2550°F
22	=	TC type	R	range	0/+3200°F
23	=	TC type	S	range	0/+3200°F
24	=	RTD type Pt 100		range	-320/+1100°F

P2 = Decimal point position (for linear inputs)
Not present when input is thermocouple or RTD.

0	=	no decimal place	xxxx
1	=	one decimal place	xxx.x
2	=	two decimal places	xx.xx
3	=	three decimal places	x.xxx

P3 = Initial scale value (for linear inputs only)
Not present when input is thermocouple or RTD.
Set the readout value for the initial range value (i.e. if P1 = 13 (4-20 mA) and P3 is set to 100; the instrument shows 100 when the input signal is equal to 4 mA).
P3 is programmable between -1999 and 4000.

P4 = Full scale value (for linear input)
Not present when input is thermocouple or RTD.
Set the readout value for the full range value (i.e., if P1 = 13 and P4 is set to 3500; the instrument shows 3500 when the input signal is equal to 20 mA).
P4 is programmable between -1999 and 4000.

NOTE: By setting a P3 value greatest than P4 value, the readout scale will be reversed.

P5 = Digital filter on the measured value
This parameter sets the desired time constant of a digital filter applied to the measured value. This filter will also be operative on alarm functions and analog retransmission.

0	=	no digital filter
1	=	digital filter with 1 second time constant
2	=	digital filter with 2 seconds time constant
3	=	digital filter with 3 seconds time constant
4	=	digital filter with 4 seconds time constant
5	=	digital filter with 5 seconds time constant

P6 = Alarm 1 configuration

OFF	=	Alarm not used
HA	=	High alarm with automatic reset

LA = Low alarm with automatic reset
HL = High alarm with manual reset
LL = Low alarm with manual reset

P7 = Alarm 1 action
Available only when P6 is other than OFF.
rEV = reverse (relay de-energized in alarm condition)
dir = direct (relay energized in alarm condition)

P8 = Stand by of alarm 1
Available only when P6 is other than OFF.
OFF = stand by disabled
ON = stand by enabled

NOTE: The alarm stand by function operates as follows: It inhibits an alarm condition at start up. The alarm will resume its functionality after the initial alarm condition has disappeared. (See P18 parameter as variation of this alarm masking procedure)

P9 = Threshold and hysteresis of alarm 1 are programmable during configuration procedure
nO = Threshold and hysteresis of alarm 1 are programmable during the operating mode
YES = Threshold and hysteresis of alarm 1 are programmable during the configuration procedure

P10 = Threshold of alarm 1
Available only when P9 = YES
Insert the desired value in engineering units.

P11 = Hysteresis of alarm 1
Available only when P9 = YES
Insert the desired value in % of the readout span.
P11 is programmable between 0.1 and 10.0% of the readout span.

P12 = Alarm 2 configuration
OFF = Alarm not used
HA = High alarm with automatic reset
LA = Low alarm with automatic reset
HL = High alarm with manual reset
LL = Low alarm with manual reset

P13 = Alarm 2 action
Available only when P12 is other than OFF
rEV = reverse (relay de-energized in alarm condition)
dir = direct (relay energized in alarm condition)

P14 = Stand by of alarm 2
Available only when P12 is other than OFF
OFF = stand by disabled
ON = stand by enabled

NOTE: The alarm stand by function operates as follows: It inhibits an alarm condition at start up. The alarm will resume its functionality after the initial alarm condition has disappeared. (See P18 parameter as variation of this alarm masking procedure.)

P15 = Alarm 3 configuration or analog retransmission enabling
OFF = analog retransmission enabled or alarm 3 not used
HA = High alarm with automatic reset
LA = Low alarm with automatic reset
HL = High alarm with manual reset
LL = Low alarm with manual reset

P16 = Alarm 3 action
Available only when P15 is other than OFF
rEV = reverse (relay de-energized in alarm condition)
dir = direct (relay energized in alarm condition)

P17 = Stand by of alarm 3
Available only when P15 is other than OFF
OFF = stand by disabled
ON = stand by enabled

NOTE: The alarm stand by function operates as follows: It inhibits an alarm condition at start up. The alarm will resume its functionality after the initial alarm condition has disappeared. (See P18 parameter as variation of this alarm masking procedure)

P18 = Delay on the alarm stand by
This parameter will appear on the display if at least one of the alarms is configured as a “stand by” alarm. It is programmable between 0 and 120 seconds; when P18 = 0 no delay is applied. This is a delay (during this time alarm is OFF) which occurs from “start up” to the beginning of the inhibit procedure.

P19 = OFFSET on the measured value
This parameter allows adding an OFFSET (in engineering units) to the measured value.
P19 is programmable:
a) from -200 to +200 eng. units for
   - linear inputs (mA and V)
   - TC with °C readout
   - RTD with °C readout
b) from -360 to +360 eng. units for TC and RTD with °F readout

P20 = Safety lock

0 = Device unlocked. All the parameters can be modified during operating mode.

1 = Device locked. No parameter can be modified.

2 to 999 = Select a code (to be remembered) and during the “operating mode” and scrolling the “software key” parameter, the display will show one of the following figures:

A) $\boxed{\text{nnn}}$ and $\boxed{\text{OFF}}$ alternately.
The device is “Unlocked” and the alarm parameters can be modified. To make the device “Locked” insert a number different from the selected code. Now no parameter can be modified.

B) $\boxed{\text{nnn}}$ and $\boxed{\text{ON}}$ alternately.
The device is “Locked” and none of the parameters can be modified. To “Unlock” the device, insert the selected code.

P21 = Retransmission type (1401 only)

This parameter is available only if P15 = OFF

OFF = Retransmission not provided

0-20 = 0-20 mA retransmission (or 0-10V)

4-20 = 4-20 mA retransmission (or 2-10V)

P22 = Initial scale value for analog retransmission (1401 only)

This parameter is available only if P15 = OFF and P21 different from OFF

Between -1999 and 6000 eng. units

P23 = Full scale value for analog retransmission (1401 only)

This parameter is available only if P15 = OFF and P21 different from OFF

Between -1999 and 6000 eng. units

NOTE: It is possible to reverse the retransmitted signal by setting a full scale value lower than the initial scale value.

The configuration procedure is completed and the instrument shows “COnF”.

4. Operating Instructions

4.1 Preliminary

1) Remove the instrument from its case.
2) Set the internal switch V2 (see Fig. 1) in closed position.
3) Re-insert the instrument.
4) Switch the instrument “ON”.

The instrument shows the measured value.

4.2 OPERATING MODE

The alarm parameters and set-up procedure are checked by a time out of approximately 10 seconds. If during this time no other push-button has been pushed, the display will return to show the measured variable and the changes will not be stored.

NOTE: The R push-button is used to scroll back to parameters without storing the new values. A wrong setting may be detected by pressing the R push-button.

4.2.1 ALARM SETTING

To display the alarm settings push the F push-button, the instrument will show alternately the alarm threshold code and its value. Push the F push-button again, the display will show the alarm hysteresis and its value.

The sequence will continue with all the programmed alarms.

NOTE: When alarm 1 is programmed for setting during configuration procedure, the alarm 1 parameters will not be displayed.

To modify the alarm settings proceed as follows:

1) Using the F push-button select the desired alarm parameter
2) Using the ▲ and ▼ push-buttons, it is possible to set the desired value.
3) When the desired value is reached, push the F push-button, the new value will become operative and the display will show the next parameter.

If, during this procedure, there is no interest in storing the new value, do not push any push-button for more than 10 seconds; the instrument automatically returns to the normal display mode without having stored the new value.

4.2.2 ALARM INDICATIONS

The instrument front display will perform in 4 different ways as follows:

1) If no alarm conditions are detected the alarm indicators are OFF.
2) If an alarm condition is detected, the LED of the specific alarm lights up to show the alarm condition.
3) The alarm condition disappears and the alarm is configured for automatic reset; the LED of the alarm goes OFF to show that the alarm condition is not present any more. The alarm condition disappears but the alarm is configured for manual reset; the LED of the alarm start flashing to show that the alarm condition is not present any more but the alarm has not been reset.

4.2.3 Manual Reset of the Alarms

To perform manual reset of the alarm, depress the R push-button and the ▼ push-button simultaneously.

4.2.4 Peak High and Peak Low

The Model 1400 stores the maximum and the minimum measured values continuously:

To display the maximum measured value, push the ▲ pushbutton, the “PK” LED will light up and the display will show the maximum measured value.

To return to display the actual measured value, push the ▲ push-button again.

To display the minimum measured value, push the ▼ pushbutton, the “PK” LED will flash and the display will show the minimum measured value.

To return to display the actual measured value, push the ▼ pushbutton again. *To reset the peak and valley values, push the R pushbutton and, at the same time, push the F pushbutton.*

4.2.5 Operating Parameters

Push the F push-button, the display will show alternately the code of the selected parameter and the programmed value.

	CODE DESCRIPTION	PARAMETER RANGE LIMITS
nnn	Software key to enable parameter modification	2/999

NOTE: The indication of the software key “nnn” will be shown only if the software key was enabled in configuration with parameter P20 and one alarm, at least, has been configured.

A1	Alarm 1 threshold	Range limits (P1 for TC and RTD, P3 and P4 for linear input)
A2	Alarm 2 threshold	Range limits (P1 for TC and RTD, P3 and P4 for linear input)
A3	Alarm 3 threshold	Range limits (P1 for TC and RTD, P3 and P4 for linear input)
H1	Alarm 1 hysteresis*	0.1%/10.0% of span
H2	Alarm 2 hysteresis	0.1%/10.0% of span
H3	Alarm 3 hysteresis	0.1%/10.0% of span

*Alarm 1 threshold and alarm 1 hysteresis may be omitted from the display by programming P9 = yes during configuration.

5. Loading Default Parameters

5.1 Preliminary

The instrument is supplied with a default parameter set (already stored) which can override all parameters at any time.

There are parameter sets for configuration mode and parameter sets for operating mode.

Only the corresponding parameter set may be loaded at any one time.

5.2 Loading Default Configuration Parameters

1) Display shows “COnF”, it is possible to load default parameters.
2) Push ▲ and ▼ at the same time; the display will show “dF.OF”.
3) Push the ▲ push-button; the display will show “dF.ON”.
4) Push F to load the default data; during the loading procedure the display will show “LOad”.

Default Configuration Parameter Load

P1	=	1	Input thermocouple J (-100 - 1000°C)
P2	=	0	no decimal point
P3	=	-1999	Low scale value for linear input
P4	=	4000	Full scale value for linear input
P5	=	0	Digital filter disabled
P6	=	OFF	Alarm 1 function: disabled
P7	=	rEv	Alarm 1 type: reverse
P8	=	OFF	Alarm 1 stand by
P9	=	No	Alarm 1 threshold and hysteresis are displayable and modifiable during run time
P10	=	LSV	Alarm 1 threshold: low scale value
P11	=	0, 1%	Alarm 1 hysteresis
P12	=	OFF	Alarm 2 function: disabled
P13	=	rEv	Alarm 2 type: reverse
P14	=	OFF	Alarm 2 stand by: disabled
P15	=	OFF	Alarm 3 function: disabled
P16	=	rEv	Alarm 3 type: reverse
P17	=	OFF	Alarm 3 stand by: disabled
P18	=	0	Delay on the alarm stand by: disabled
P19	=	0	Offset on the measured value: no offset
P20	=	0	Safety lock: unlocked
P21	=	OFF	No analog output
P22	=	-100	Analog output - initial scale value
P23	=	1000	Analog output - full scale value

5.3 LOADING DEFAULT OPERATING PARAMETERS

During the run time, when the display shows the measured value, it is possible to load the default data for operative parameters:

1) Push ▲ and ▼ push-button at the same time; the display will show “dF.OF”
2) Push the ▲ push-button; the display will show “dF.ON”
3) Push F to load the default data; during the loading procedure the display will show “LOad”

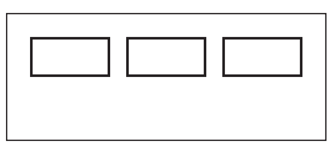
Default Operative Parameter List

A1	Alarm threshold 1	=	low scale value
A2	Alarm threshold 2	=	low scale value
A3	Alarm threshold 3	=	low scale value
H1	Alarm 1 hysteresis	=	0.1%
H2	Alarm 2 hysteresis	=	0.1%
H3	Alarm 3 hysteresis	=	0.1%

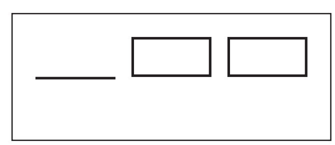
6. ERROR MESSAGES

Overrange or Underrange Indication

The instrument shows the OVERRANGE and UNDERRANGE conditions with the following indications:



Overrange



Underrange

Burn-out conditions will be shown as an overrange condition. For TC input it is possible to select underrange indication.

NOTE: When an overrange or an underrange condition is detected, the instrument indicates the maximum measurable value or the minimum measurable value respectively.

Error Messages

E100	Write EEPROM error
E150	CPU error
E200	Tentative to write on protected memory
E201	2xx Configuration parameter error. The two less significant digits show the number of the wrong parameter (e.g. 209 Err shows an Error on P9 parameter)

E301 RTD input calibration error
E305 TC input calibration error
E307 RJ input calibration error
E310 Linear input calibration error
E400 Error in alarm settings
E500 Auto-zero error
E502 RJ error
E510 General error during calibration procedure

NOTE:
1) When a configuration parameter is detected (ERROR 200), repeat the configuration procedure of the specified parameter.
2) If an error 400 is detected, simultaneously push the ▲ and ▼ push-buttons to load the default parameters; then repeat operating parameter setting.
3) For all other errors, contact Dynisco.

7. Repair

Questions concerning warranty, repair cost, delivery, and requests for a RA# should be directed to the Dynisco Repair Department, 508-541-9400 or email: repair@dynisco.com. Please call for a return authorization number (RA#) before returning any product. Damaged products should be returned to:

DYNISCO INSTRUMENTS
Attn: RA # _______________
38 Forge Parkway
Franklin, MA 02038

For technical assistance please call 800-221-2201 or 508-541-9400 or fax 508-541-9436.

8. Warranty

This Dynisco product is warranted under terms and conditions set forth in the Dynisco Web Pages. Go to www.dynisco.com and click on “Warranty” at the bottom of any page for complete details.

NOTES:

NOTES:

NOTES:

WARRANTY REGISTRATION CARD

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