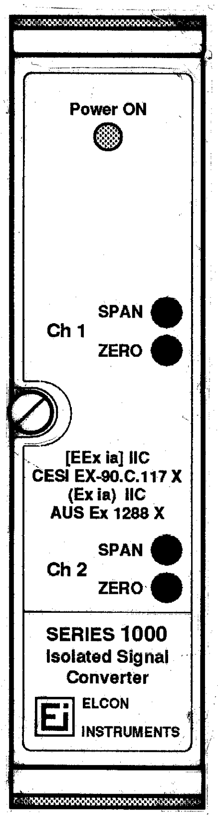
B2) *1061/1062*
Millivolt/TC calibrator range 0-70 mV resolution 10 µV accuracy ± 0.05%

B3) *1071/1072*
RTD: Precision Decade Resistance box range 0-400 Ohm, resolution 0.01 Ohm, accuracy ± 0.03%
Tx Pot: Two Precision Decade Resistance box range 0-10.000 Ohm, resolution 0.1 Ohm, accuracy ± 0.03%.

CALIBRATION CHECK



- Fig. 6 -

9.3 Types 1011 and 1012.

Power the converter at the proper terminals with the proper voltage (see section 7).
Connect the current or voltage (see converter label) calibrator at the input terminals B (+) and A (-) or E (+) and D (-).
Connect a current or voltage meter (see converter label) at the output terminals G (+) and H (-) for channel 1 or M (+) and N (-) for channel 2 (*See Figures 4*).
Set calibrator at low end of scale (i.e. 4 mA for a 4-20 mA range). Wait about 5 min. for warm-up then check the accuracy of output. It should also be at the low end of scale (i.e. 1.000 ± 5 mV for a 1-5 V output range).
If the output is not correct, adjust ZERO trimmer of the relevant channel *(See Fig. 6)*.
Set the full scale value on calibrator (20 mA in the example above) and check output accuracy (5.000 ± 5 mV in the example above). If necessary adjust SPAN trimmer of the relevant channel *(See Fig. 6)*.
NOTE: In case of Trouble in performing the calibration check refer to the Trouble Shooting section.

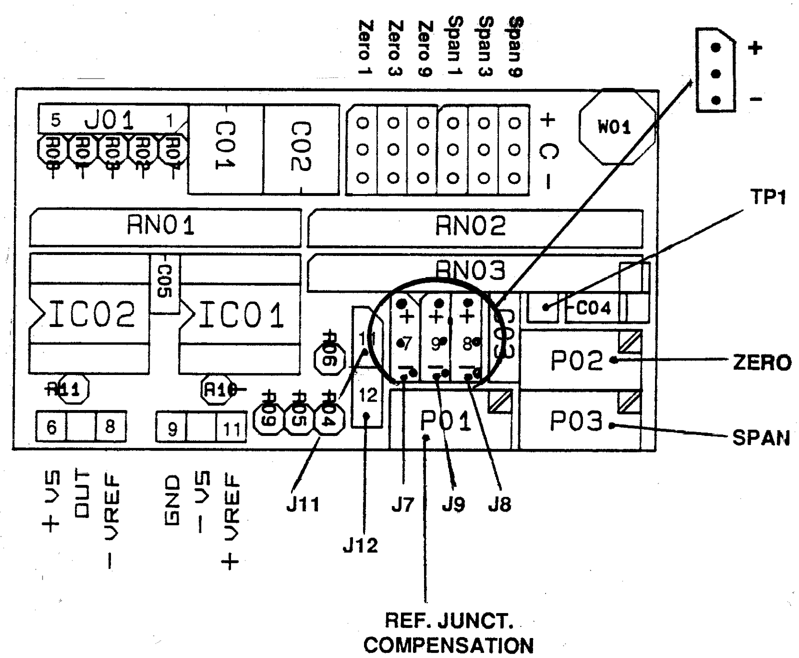
9.3.1 Calibration modification.

To modify the nature of input signal (i.e. from current to voltage input), the input shunt must be replaced with a voltage divider or vice versa for the opposite, as indicated on Table 10.
To alter the measuring range only, following Table 10 replace (if required) the shunt or voltage divider resistor values (use 1/4, 1%, 25 ppm/°C precision metal film resistors) on the base board (see Fig. 5). Reposition (if required) the zero and span programmable jumpers placed on the preamplifier module referring to Table 10 and Fig. 7.

INPUT mA-V

Jump. to be selected on input module		Components to be changed on base card		
INPUT	Zero and Span Jump. Posit.	C1 Fitted on Base Board *(see Fig. 5)*	R2	R1
0-20 mA	NONE	51Ω 1% 1/2 W	13 KΩ	1 MΩ
4-20 mA	Z1- / S1+	51Ω 1% 1/2 W	13 KΩ	1 MΩ
0-1 V	NONE	1000 pF	13 KΩ	1 MΩ
0-5 V	S3- / S9-	1000 pF	13 KΩ	1 MΩ
1-5 V	Z3- / S1- / S9-	1000 pF	13 KΩ	1 MΩ
0-10 V	S3- / S9-	1000 pF	6K8	1 MΩ
OMIT J12 - J11 - J7 OMIT J9 CLOSED J8-				

- TABLE 10 -



- Fig. 7 -

(mA/V/Tc/mV Preamplifier Module)

After this, proceed as described in the calibration check section adjusting ZERO and SPAN trimmers as required.

- JUMPERS CONFIGURATION for mV INPUT -

ON MODULE OMIT J12

INPUT SPAN mV	SPAN JUMPERS			GAIN JUMPERS	
	S9	S3	S1	J8	J9
2	0	+	+	+	+
2.2	0	+	0	+	+
2.5	0	+	-	+	+
3	0	0	+	+	+
3.5	0	0	0	+	+
3.85	0	0	-	+	+
4.5	0	-	+	+	+
5	0	-	0	+	+
5.5	0	-	-	+	+
6.5	-	+	+	+	+
7	-	+	0	+	+
8	-	+	-	+	+
8	+	-	+	-	-
9	+	-	0	-	-
10	+	-	-	-	-
11.5	0	+	+	-	-
12.5	0	+	0	-	-
14	0	+	-	-	-
17	0	0	+	-	-
20	0	0	0	-	-
22	0	0	-	-	-
25	0	-	+	-	-
29	0	-	0	-	-
32	0	-	-	-	-
37	-	+	+	-	-
41	-	+	0	-	-
47	-	+	-	-	-
55	-	0	+	-	-
64	-	0	0	-	-
73	-	0	-	-	-
85	-	-	+	-	-
98	-	-	0	-	-
105	-	-	-	-	-

ZERO Suppress. (mV)	ZERO JUMPERS			GAIN JUMPERS	
	Z9	Z3	Z1	J8	J9
0	0	0	0	+	+
1.2	0	0	-	+	+
2.4	0	-	+	+	+
3.6	0	-	0	+	+
4.8	0	-	-	+	+
6	-	+	+	+	+
7.2	-	+	0	+	+
8.4	-	+	-	+	+
9.6	-	0	+	+	+
0	0	0	0	-	-
7	0	0	-	-	-
14	0	-	+	-	-
21	0	-	0	-	-
28	0	-	-	-	-
35	-	+	+	-	-
42	-	+	0	-	-
49	-	+	-	-	-
56	-	0	+	-	-
63	-	0	0	-	-
70	-	0	-	-	-
77	-	-	+	-	-
84	-	-	0	-	-

- TABLE 11 -

9.4 Types 1061 and 1062.

9.4.1 Millivolt Ranges.

For millivolt ranges follow the same procedure described above in 9.3 for type 1011/1012 using the calibrator millivolts values corresponding to the measuring range.

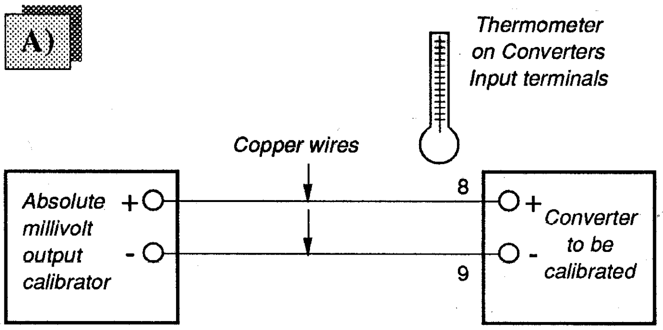
9.4.2 Calibration Modification.

Use Table 11 and position programming jumpers according to the desired input measuring range (see Fig. 7 for jumpers location).

9.4.3 Thermocouple Input Temperature Ranges.

Is well known that the thermoelectric e.m.f. of a thermocouple is the algebraic sum of all the emission of the thermoelectric junctions constituting it (usually the Measuring and Reference Junctions).
As seen in section 7.4.2 a compensating cable must be used for the input connection and a compensation of the junction potential at the converter's input cable must be accounted for.
This reference junction compensation feature is already built in the 1061/1062 converter by means of an automatic compensator consisting of an RTD arranged in a Calibrated Supply Wheetstone Bridge in such a way that the bridge output at any temperature counteracts the Ref. Junction potential.
When performing the converter calibration the mV signal supplied by the calibrator must account for the Ref. Junction emission potential for providing the correct calibrating potential in millivolt.
Normally three calibrating configurations are used:

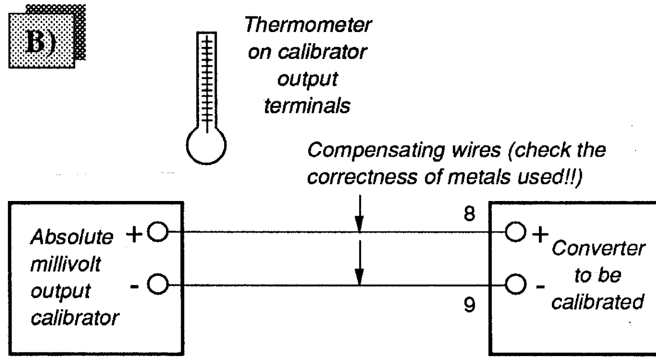
A)



To set a calibrated signal at low (L) or high (H) end of scale:

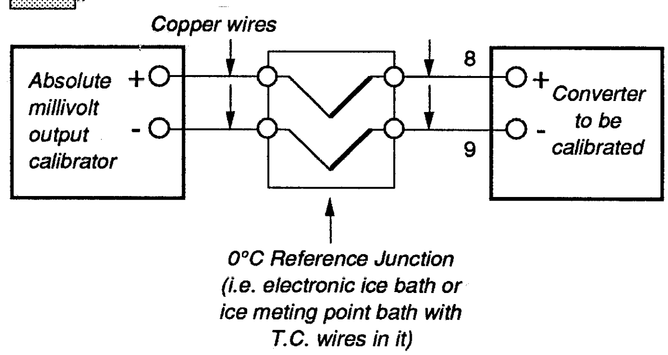
1) Look on the pertinent T.C. table for the desired temperature; read the corresponding e.m.f. voltage VT (L) or VT (H).
2) Using a thermometer, read the input connection cable temperature taken at the converters input terminals. Use the TC table to obtain the corresponding Reference Junction potential VR (the same supplied by the converter R.J. compensating circuit).
3) Compute the compensated potential VC.
   VC (L) = VF (L) - VR or VC (H) = VT (H) - VR
4) Set the computed value on an absolute millivolt calibrator.

B)



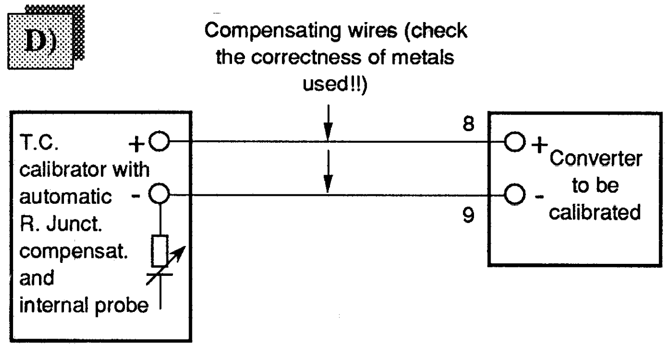
The procedure is as seen in A). In this case the temperature reading is taken at the calibrator end because there Ref. Junction compensation takes place.

C)



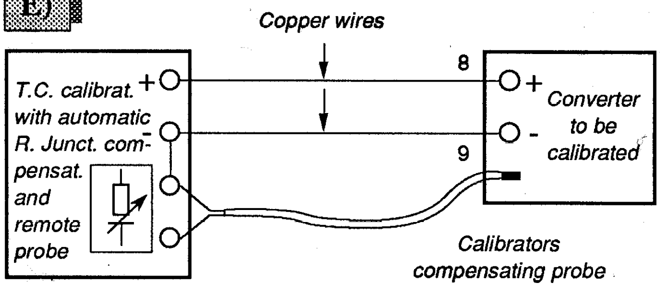
With this configuration the Ref. Junction is held at 0°C (Melting point of ice or electronic/electric device simulating the same effect).
The converter compensates the Ref. Junction at its terminals. The values VT (L) and VT (H) can be read directly from the T.C. table (see config. A) as calibrating signals VC (L) or VC (H) since the millivolt values are referred to a 0°C Ref. Junction.

D)



As in C) above, no signal correction is necessary since the calibrator internally compensates for its Ref. Junction as well as the converter.

E)



As in D) above, no signal correction is necessary since the calibrator has no thermoelectric junctions and compensates for the emission of the converters compensating circuit.
All configurations seen are equally useful but configuration C) is the most accurate and easy to handle
Configuration A) is the simplest to set-up but less accurate. It is difficult to exactly track input terminal temperature and its fluctuations.
Note that in config. A and B Ref. Junction potential subtraction becomes a sum of values with a negative sign if the calibrating temperature [i.e. VT (L)] is below zero.
After noting these necessary considerations on how to generate the calibrating signals, the calibration check follows the same scheme as section 9.3.
Allow five minutes for warm-up, then set low end of scale signal and check output value. Adjust if necessary, ZERO trimmer of the relevant channel.
Set calibrator for full scale, check output value and adjust, if necessary, SPAN trimmer of the relevant channel.
Trimmer P1 (see Fig. 7) on the input module (only for T.C. input) calibrates the Ref. Junction compensating bridge so that its output changes the same amount with temperature as the Ref. Junction potential of the specific Thermocouple type used. P1 calibration must not be disturbed except when modifying the type of T.C. input (as described below).
If a burnout feature is specified, open the measuring line and check that the output signal goes beyond full scale for UPSCALE burnout or below low end of scale for DOWNSCALE burnout.

9.4.4 Calibration Modification.

To modify the type of T.C. input follow Table 12 (see Fig. 7).
Recalibrate Ref. Junction adjust trimmer P1 on the TC input module to obtain the correct compensating supply (± 0.1% accuracy) for the specific type of T.C. as per Table 12.
To modify the measuring range only use Tables 13 a, b, c and position programming zero and span jumpers according to the desired input measuring range (see Fig. 7 for jumpers location). Then perform the ZERO and SPAN trimmer calibration as above in the calibration check section 9.3.

9.5 Types 1071 and 1072 RTD and Transmitting Potentiometers Input.

9.5.1 Pt 100 DIN RTD Input Ranges.

Connect input and output wires as per Sect. 7.4.3 with a decade resistance box in place of the RTD.
Power the instrument, checking proper supply connections and voltage. Allow 5 minutes for warm up.
With any of the 3 input wires open (or any combination), the output must go beyond full scale (i.e. 21 mA for a 4-20 mA output range).
Connect the decade resistance box with the 3 wire arrangement and connect an output meter (Volt or mA as required) on output terminals.
Set resistance value at low end of temperature scale and check for output to be at low end of scale (i.e. 4.00 mA ± 0.02 mA for a 4-20 mA output).
Adjust, if necessary, ZERO trimmer of the relevant channel to obtain the correct low end output value *(See Fig. 6).*
Set resistance value at full scale and check for output to be at full scale value (in the example at 20 ± 0.02 mA). Adjust, if necessary, SPAN trimmer of the relevant channel to obtain the correct full scale output *(See Fig. 6).*
To obtain low level inputs on Pt 100 Din sensors (-50°C to -200°C) change R7 to 100K on input module M1 A and/or B. See Fig. 5 and Fig. 8 for M1 and R7 position.

Linearity check.
Set resistance value to the mid scale temperature and check output value to be at 50% (in the example 12 ± 0.02 mA). If this value is not correct there is no adjustment and the converter needs troubleshooting (see section 10.3 Repair).

TC TYPE SELECT

- TABLE 12 -

Module PN. 204138									
JUMPERS	E	J	K	R	S	B	T	J/L	K/L
J8	-	-	-	0	0	+	+	0	0
J9	-	0	+	0	0	+	0	0	+
J11	0	0	0	ON	ON	ON	0	0	0
J12	ON	ON	ON	ON	ON	0	ON	ON	ON
VR.J (mV) (*)	1731	1470	1151	170	173	0	1157	1470	1151

(*) Voltage measured on J12 .

LEGEND:

0 = Jumper Omitted
+ = Jumper on position +
- = Jumper on position -

TABLE 13a :

JUMPER CONFIGURATION FOR: TC **E** WITH RANGE -270 +1000 °C
TC **J** WITH RANGE -210 +1200 °C
TC **K** WITH RANGE -270 +1370 °C

ZERO MAX SUPPRESSION = 850°C SUPPRESSION STEPS = 85°C			*SPAN* STEP INCREASING = 1.142 MIN = 120°C MAX = 1300°C		
STEPS	**SUPPR. °C**	**JUMPERS Z**	**STEPS**	**SPAN °C**	**JUMPERS S**
-3	-255	3+	0	1300	1- / 3- / 9-
-2	-170	3+ / 1-	1	1130	3- / 9-
-1	-85	1+	2	990	1+ / 3- / 9-
0	0		3	869	1- / 9-
1	85	1-	4	760	9-
2	170	3- / 1+	5	665	9- / 1+
3	255	3-	6	583	9- / 3+ / 1-
4	340	3- / 1-	7	510	9- / 3+
5	425	9- / 3+ / 1+	8	447	9- / 3+ / 1+
6	510	9- / 3+	9	391	3- / 1-
7	595	9- / 1- / 3+	10	342	3-
8	680	9- / 1+	11	300	3- / 1+
9	765	9-	12	363	1-
10	850	9- / 1-	13	230	
			14	201	1+
			15	176	3+ / 1-
			16	154	3+
			17	135	3+ / 1+
			18	118	9+ / 3- / 1-

POSITION JUMPER J7	**+**	**-**	**0**
Condition Burn-out	Burn-out UP	Burn-out DOWN	NO Burn-out

TABLE 13b :

JUMPER CONFIGURATION FOR: TC **R** WITH RANGE 0 -1760 °C
TC **S** WITH RANGE 0 -1760 °C
TC **B** WITH RANGE 0 -1800 °C

ZERO MAX SUPPRESSION = 1400°C SUPPRESSION STEPS = 200°C			*SPAN* STEP INCREASING = 1.142 MIN = 100°C MAX = 1850°C		
STEPS	**SUPPR. °C**	**JUMPERS Z**	**STEPS**	**SPAN °C**	**JUMPERS S**
-1	-200	1+	0	1850	9-
0	0	0	1	1600	9- / 1+
1	200	1-	2	1400	9- / 3+ / 1-
2	400	3- / 1+	3	1250	9- / 3+
3	600	3-	4	1100	9- / 3+ / 1+
4	800	3- / 1-	5	960	3- / 1-
5	1000	9- / 3+ / 1+	6	840	3-
6	1200	9- / 3+	7	730	3- / 1+
7	1400	9- / 1- / 3+	8	640	1-
			9	560	
			10	490	1+
			11	430	3+ / 1-
			12	380	3+
			13	330	3+ / 1+
			14	290	9+ / 3- / 1-
			15	255	9+ / 3-
			16	220	9+ / 1+ / 3-
			17	195	9+ / 1-
			18	170	9+
			19	150	9+ / 1+
			20	130	9+ / 3+ / 1-
			21	115	9+ / 3+
			22	100	9+ / 3+ / 1+

POSITION JUMPER J7	**+**	**-**	**0**
Condition Burn-out	Burn-out UP	Burn-out DOWN	NO Burn-out

TABLE 13c :

JUMPER CONFIGURATION FOR:	TC	JLOW	WITH RANGE	-180 +500 °C
	TC	KLOW	WITH RANGE	-180 +500 °C
	TC	T	WITH RANGE	-180 +400 °C

ZERO MAX SUPPRESSION = 280°C SUPPRESSION STEPS = 35°C			SPAN STEP INCREASING = 1.142 MIN SPAN = 40°C MAX SPAN = 520°C		
STEPS	SUPPR. °C	JUMPERS Z	STEPS	SPAN °C	JUMPERS S
-5	-175	9+ / 3- / 1-	0	520	1- / 3- / 9-
-4	-140	3+ / 1+	1	455	3- / 9-
-3	-105	3+	2	400	1+ / 3- / 9-
-2	-70	3+ / 1-	3	350	1- / 9-
-1	-35	1+	4	305	9-
0	0		5	270	9- / 1+
1	35	1-	6	235	9- / 3+ / 1-
2	70	3- / 1+	7	205	9- / 3+
3	105	3-	8	180	9- / 3+ / 1+
4	140	3- / 1-	9	158	3- / 1-
5	175	9- / 3+ / 1+	10	138	3-
6	210	9- / 3+	11	120	3- / 1+
7	245	9- / 1- / 3+	12	105	1-
8	280	9- / 1+	13	93	
			14	81	1+
			15	71	3+ / 1-
			16	62	3+
			17	55	3+ / 1+
			18	48	9+ / 3- / 1-
			19	42	9+ / 3-

POSITION JUMPER J7	+	-	0
Condition Burn-out	Burn-out UP	Burn-out DOWN	NO Burn-out

Other types of RTD (to be specified when ordering).

On specific request, different types of RTD sensors can be configured, for linear temperature output in the converter (i.e. Pt 100 ANSI or Ni 100 or Cu 10).

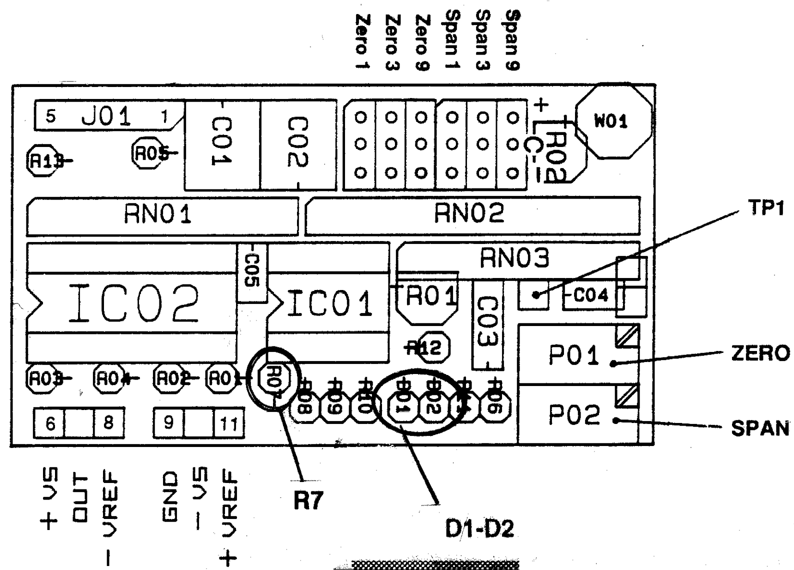
Differences from Pt 100 DIN mainly stems from some component values on the base board bridge circuit and/or some values on the input module. The calibration procedure is very similar to that described above.

9.5.2 Calibration Modification.

To modify the measuring range reposition programmable zero and span jumpers according to Table 14.

(See Fig. 8 for their positioning).

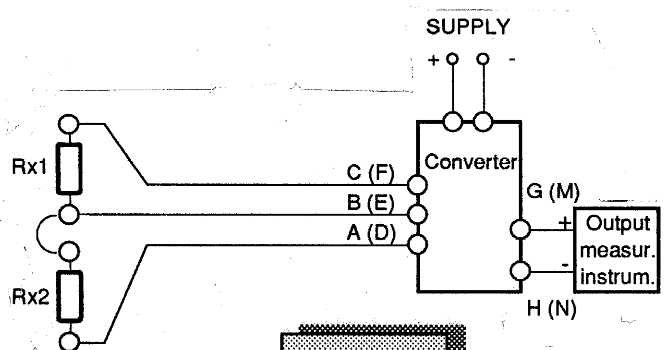
After this, follow the same procedure as for calibration check. Adjust ZERO trimmer and SPAN trimmer to calibrate the output (see section 9.5.1).



- Fig. 8 -

(RTD-POT Preamplifier Module)

9.6 Types 1071 and 1072 Transmitting Potentiometer Input.



- Fig. A -

9.6.1 Calibration Check.

Connect input and output wires per Fig. A Connect power supply wires (check connections and voltage!).

Power the instruments allowing 5 min. for warm-up.

Set Zero ohms on Resistance Box R x 2 and the pot value on Resistance Box R x 1 (i.e. 250 Ohms); check for output to be at low end of scale (i.e. 4.00 ± 0.02 mA).

Adjust, if necessary, ZERO trimmer of the relevant channel *(see Fig. 6)* to obtain the correct low end output value.

Set Resistance R x 1 to zero and R x 2 to the pot value (in the example 250 Ohm); check for output to be at full scale (in the example 20.00 ± 0.02 mA).

Adjust, if necessary, SPAN trimmer of the relevant channel *(see Fig. 6)* to obtain the correct full scale output.

Linearity check.

Set R x 1 and R x 2 at 50% of Pot value (in the example 125 Ohms) then check for output to be at mid scale (in the example 12.00 ± 0.02 mA).

If the output is not correct there is no possible adjustment; the converter requires troubleshooting (see section 10.3 Repair).

9.6.2 Calibration Modification.

Transmitting pot. ranges from 50 Ω to 200 Ω are implemented without an input shunt resistor R3 on base board (see Fig. 5) by adjusting coarse Span an Zero as required (see sec. 9.6.1 above).

Potentiometer values from 200 Ω to 10 KΩ can be accommodated by inserting R3 a 200 Ω ± 0.5% 25 ppm °C 1/4 W resistor on base board and calibrating Zero and Span as above. Refer to Table 15 for jumper setting.

- TABLE 15 -

JUMPERS CONFIGURATION FOR TRANSMITTING POT INPUT

POT Ω	ZERO JUMPERS	SPAN JUMPERS	R3 on Base Card
0 - 50	9+ 3- 1-	1-	OMIT
0 - 100	9+ 3- 1-	9- 3+ 1-	OMIT
0 - 200	9+ 3- 1-	9- 3-	OMIT
0 - 500	9+ 3- 1-	9-	200Ω ±0.5% 25ppm°C 1/4W
0 - 1000	9+ 3- 1-	9- 1-	200Ω ±0.5% 25ppm°C 1/4W
0 - 2000	9+ 3- 1-	9- 3- 1+	200Ω ±0.5% 25ppm°C 1/4W
0 - 5000	9+ 3- 1-	9- 3- 1+	200Ω ±0.5% 25ppm°C 1/4W
0 - 10000	9+ 3- 1-	9- 3- 1+	200Ω ±0.5% 25ppm°C 1/4W

ON PREAMPLIFIER MODULE OMIT R7-D1-D2 (see Fig. 8)

TABLE 14 :

JUMPER CONFIGURATION FOR: **Pt 100 DIN RTD INPUT**

ZERO MAX SUPPRESSION = 650°C SUPPRESSION STEPS = 50°C			*SPAN* STEP INCREASING = 1.14 MIN SPAN = 24°C MAX SPAN = 760°C		
STEPS	**SUPPR. °C**	**JUMPERS Z**	**STEPS**	**SPAN °C**	**JUMPERS S**
-4	-200	3+ / 1+	0	760	1- / 3- / 9-
-3	-150	3+	1	665	3- / 9-
-2	-100	3+ / 1-	2	580	1+ / 3- / 9-
-1	-50	1+	3	505	1- / 9-
0	0		4	445	9-
1	50	1-	5	390	9- / 1+
2	100	3- / 1+	6	340	9- / 3+ / 1-
3	150	3-	7	300	9- / 3+
4	200	3- / 1-	8	260	9- / 3+ / 1+
5	250	9- / 3+ / 1+	9	230	3- / 1-
6	300	9- / 3+	10	200	3-
7	350	9- / 1- / 3+	11	175	3- / 1+
8	400	9- / 1+	12	153	1-
9	450	9-	13	134	
10	500	9- / 1-	14	117	1+
11	550	9- / 3- / 1+	15	102	3+ / 1-
12	600	9- / 3-	16	90	3+
13	650	9- / 3- / 1-	17	78	3+ / 1+
			18	69	9+ / 3- / 1-
			19	60	9+ / 3-
			20	53	9+ / 1+ / 3-
			21	46	9+ / 1-
			22	40	9+
			23	35	9+ / 1+
			24	31	9+ / 3+ / 1-
			25	27	9+ / 3+
			26	24	9+ / 3+ / 1+

10. Maintenance

10.1 Introduction.

Elcon Instruments Series 1000 barrier modules do not require any particular maintenance under normal operating conditions. They are designed to operate trouble free and with high stability for long time.
Periodic checks (yearly based) can be scheduled to check their performance over time. If a unit is found not meeting specifications or in a failure condition then it requires recalibration or servicing.
Refer to section 9 for recalibration; servicing information is provided in this section.

W A R N I N G.
ANY REPAIR MADE BY UNAUTHORIZED PERSONNEL MAY COMPLETELY INVALIDATE THE SAFETY CHARACTERISTICS OF THE CARD.
REPAIR NOT MADE BY ELCON INSTRUMENTS IS FULLY AT USER'S RISK AND RESPONSIBILITY.
IN ADDITION, THE WARRANTY TERMS OF THE CARD WILL BE NULL AND VOID TO ALL EFFECT.

10.2 First aid Troubleshooting.

Before going deeper into a board troubleshooting, check for proper supply connections and line voltage as well as for a good line fuse.
Also check for correct input and output connections and loads and integrity of output and supply protecting fuses on the card.
If a barrier failure condition is actually found, replace the defective card with a good one and send it for repair to the nearest authorized representative of Elcon Instruments.

10.3 Repair.

- The personnel performing maintenance should refer to the specific documentation. They should be qualified with the technical background that in some countries is a prerequisite to obtain the license for repairing certified equipment.

- Intrinsic safety components are identified by hatching, both on the circuit diagram and on the circuit board itself.

In case replacement is needed, components must be substituted only with equivalent ones in order to maintain the same quality and reliability standard.
For reasons of certification the following components must be supplied only by Elcon Instruments:

- *Supply transformer*

- Other components (typically fuses, resistors, diodes, etc.) can be replaced with equivalent ones, providing they have the identical characteristics of tolerance, power, isolation etc. The following specifications shall be considered generally applicable:

- Protective Fuses: time lag type.
  Can be replaced only by equivalent ones having the same current rating and breaking capacity specified for the applicable power supply, as specified in the components list (see also specification data).

- Resistors: Must be of the wire wound or film type and have the same value and power.

- Zener diodes: Must be exactly equivalent and have the same value and power.

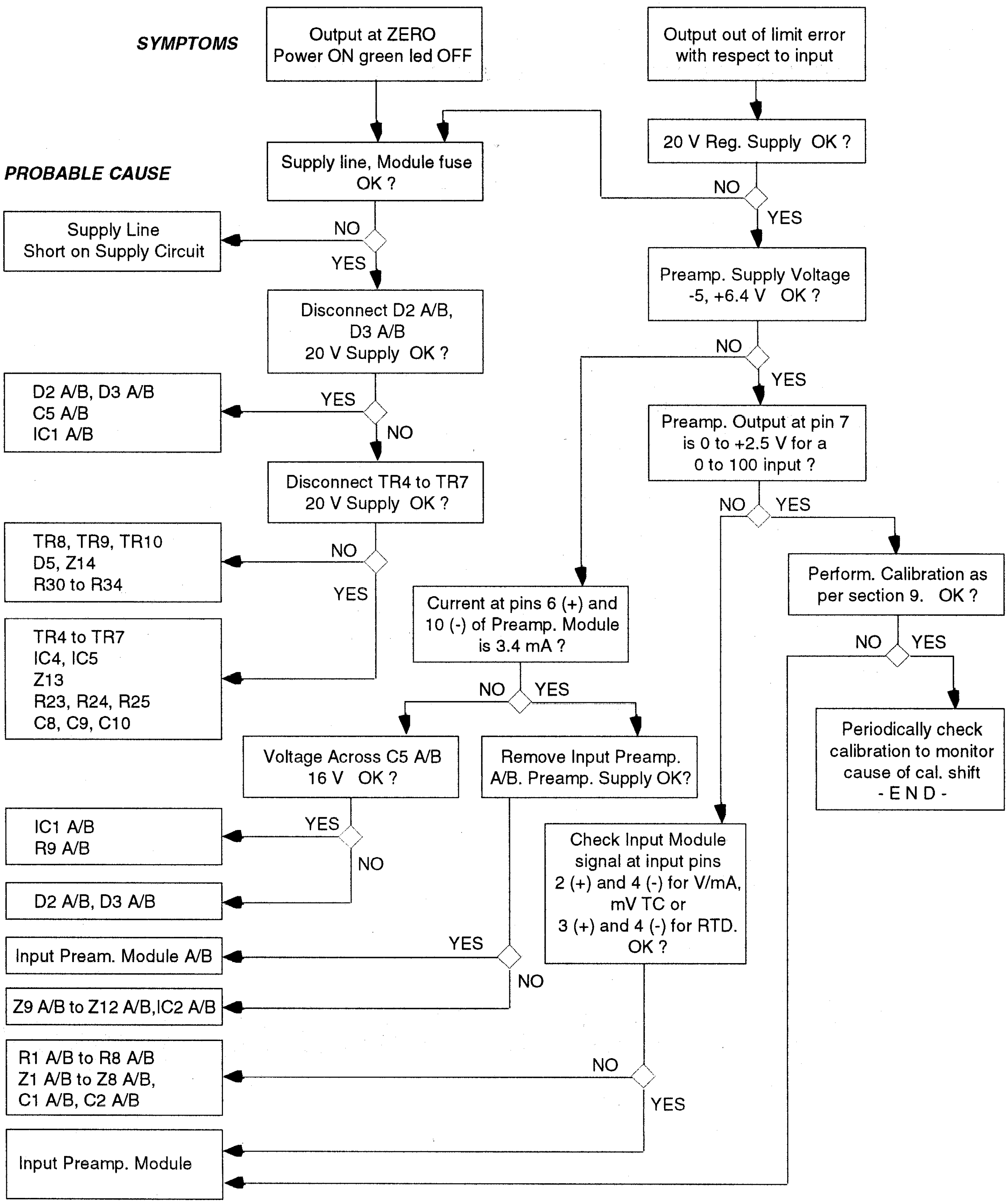
- The same isolation degree between components and the board shall be always strictly maintained, as well as the physical layout and distance from the printed circuit board.

- Clean the printed circuit tracks adequately and restore all isolation protections so that the original isolation specifications, as certified, are met.

- Follow troubleshooting diagram, to trace probable cause of fault.

- For a deeper Troubleshooting or maintenance the electrical schematics and components list of instruments are made available by Elcon upon written request.

1011/1012 - 1061/1062 - 1071/1072
TROUBLESHOOTING DIAGRAM



11. Warranty

Elcon offers an extended period of warranty assistance performed at their factory. Each instrument to be repaired is thoroughly analyzed to locate the cause and mode of possible faults and correlate them with the initial, intermediate, and final testing documentation.
This allows Elcon to trace with more accuracy the fault causes, thus obtaining valuable indications, reliability statistics, and qualitative evaluation for the purpose of maintaining the quality and reliability of their products under strict control.

WARRANTY CONDITIONS.
Elcon Instruments certifies that all the instruments of their manufacture are immune from defects or loss of essential quality, and whenever they are apparatus, Elcon also guarantees proper operation. The duration of the warranty period is clearly indicated in the order confirmation and starts from the date of delivery or on site test (if required). Unless otherwise specified the warranty is for 12 months, from delivery date.
The warranty does not cover consumable items.

TERMS - CONDITIONS - WARRANTY LIMITS.
1. Form of report
The action due to the customer for vices, defects, or loss of quality is subject to the terms of articles 1495, 1497 C.C. (Italian Civil Code).
The denunciation of the, defect or quality loss must be made by the customer by registered mail, telex, fax, or equivalent written form to be sent to the main office of Elcon Instruments.

2. Limit - burden - obligation of the customer to conserve the warranty

a) The warranty is limited to repairing and substitution, FOB Elcon Instruments factory, of the useless parts, for a confirmed defect of materials and/or workmanship, free of charge, and the remaining, shipping, dismounting and mounting expenses (operations that in any case must be done in accordance with the supplier), at the customer's charge.
In no case Elcon Instruments will be held responsible for expenses, for loss of profit and/or damage, direct or indirect, that can be incurred by the customer due to a fault or defect of the material.

b) The warranty ends for instruments or materials damaged by:
- shipment
- storage non conforming to the instruction manual specifications
- incorrect installation
- loss of adequate protection for the type of installation (mechanical, climatic, etc.)
- incorrect application of power supply voltage
- erroneous wiring of the power supply line (applied on input or output measuring circuits)

c) The warranty ends for instruments or materials if repaired, modified, or simply tampered with, even if only in part, by personnel not authorized by Elcon Instruments and also ends if used in improper way and/or not conforming with the given instructions.

d) The warranty is valid only if payment has been received from the customer in a timely fashion, as per the original agreement; otherwise it is void.

e) All parts that are subject to normal wear and inevitable deterioration are excluded from this warranty.

f) In case of having to return the instrument to one of the Elcon Instruments authorized labs for repair, the customer shall obtain a written authorization with shipping instructions from Elcon Instruments.
Shipment expenses, all the concerned burdens, and the risk of loss or damage of the returned instrument are exclusively born by the customer.
The same rules apply also when the instrument needs to be replaced.

g) During the warranty period, the customer will allow any personnel appointed by Elcon Instruments to execute control of the instruments and materials.

h) The customer cannot require cancellation of the contract in reason of vices or defects, but only their elimination or, when they cannot be repaired, the replacement of the instruments, if available on the market. In case the replacement is for any reason impossible, Elcon Instruments has the faculty to offer instruments of the same or equivalent type, quality and efficiency, suitable to the same use.
If the customer refuses such offer without justified motivation he is entitled to reimbursement of the money already paid or a refund of the real incurred expenses.

i) For items subsupplied by Elcon Instruments the standard warranty terms as given by the original manufacturer are applicable.

l) The warranty must be considered for material repaired, substituted on ex works basis.

Such warranty replaces and supersedes any other declared or implicit warranty.