SYSTEM «C» INDUSTRIE
5, rue Saint-Sauveur
07700 BOURG-SAINT-ANDÉOL
☎ 04 75 54 86 00 - Fax · 04 75 54 86 09

THERMAL INSTRUMENT CO.

217 Sterner Mill Road, Trevose, PA 19053
Website:www.thermalinstrument.com Email:office@thermalinstrument.com
Telephone No. (215) 355-8400
FAX No. (215) 355-1789

INSTALLATION, OPERATION

AND CALIBRATION MANUAL

FOR

THERMAL FLOW METER

MODEL: 600-9 SAN NL

S/N: 2004149

P. O.NO: VI 2255

SERVICE: CARBON DIOXIDE

SYSTEM "C" INDUSTRIE
SARL AU CAPITAL DE 100 000 €
5. rue St Sauveur
07700 BOURG ST ANDEOL
Tél 04 75 54 86 00 – Fax 04 75 54 86 09
SIR 345 077 432 00028 RCS 92 B 92

THERMAL INSTRUMENT COMPANY

217 STERNER MILL ROAD, TREVOSE, PA 19053 U.S.A.

PHONE:215 355-8400 **FAX:215 355-1789**

Webiste:www.thermalinstrument.com **Email: office@thermalinstrument.com**

GENERAL PRECAUTIONS TO BE OBSERVED

IN INSTALLING FLOWMETER WIRING

When the Thermal Flowmeter or Probe is supplied with an explosion-proof condulet, it must be installed with approved wiring techniques. This calls for seals where the external wiring enters these condulets.

In the case where we have a large condulet on a Probe with multiple connections, we will have a fitting with as large as a 1 2" pipe connection. If the contractor is reducing this to 2" fittings, he must be sure that these reducers are sealed with a suitable electrical or Teflon tape. In like manner, the connectors he uses must be of the sealed conduit type.

Water entering the system from either the power wiring or the interconnecting cable system is very serious and can do damage to the metering system.

The explosion-proof type condulets are designed for that purpose only; they are not waterproof and if the system is submerged, water will enter. In applications where there is undue exposure, it may be well to go to auxiliary covering or sealing mechanisms. This may merely mean a plastic coating, a plastic bag, or in extreme cases a housing.

The same rules apply also where the external wiring enters the electronic housings. These can be either the explosion-proof type, or the NEMA 4 type. In either case adequate attention must be paid to sealing the electrical incoming lines. The cover on the NEMA 4 case is gasketed in a very adequate manner. However, in many cases the atmospheric and liquid leaks are at the point of entry of the external wiring or through the conduit from the external wiring itself.

In cases where the NEMA 4 units are used in very hazardous atmospheres or corrosive, it is advisable to purge the system to prevent corrosive attack on the electronics.

THERMAL INSTRUMENT CO.

217 Sterner Mill Road, Trevose, PA 19053

Telephone No. (215) 355-8400 FAX No. (215) 355-1789

OPERATION - MODEL 600-9NL AND 62-9NL

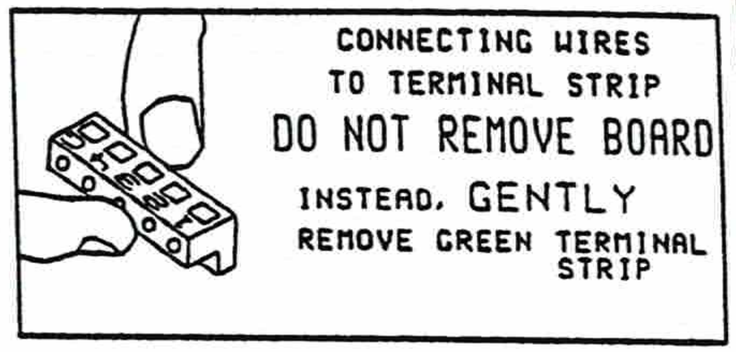
WITH ALL CONNECTIONS HAVING BEEN COMPLETED AND TESTED, A SHORT BUT FAST FLOW RATE SHOULD BE OBTAINED IN ORDER TO CLEAN GAS BUBBLES AND IMPURITIES FROM THE FLOW TUBE.

CAUTION: FLOW AND TRANSDUCER MUST BE WITHIN 50°C OF OPERATING TEMPERATURE BEFORE POWER IS APPLIED. SENSORS MAY BE DAMAGED IF TRANSDUCER TEMPERATURE IS LOWER THAN THIS LIMIT, OR CALIBRATION WILL NOT BE ACCURATE.

APPLY POWER AND ALLOW A TEN (10) MINUTE WARM-UP PERIOD.

FIGURE 6 IS A CALIBRATION CURVE CORRELATING FLOW VERSUS VDC.

IN THE CASE OF MULTIPLE CALIBRATIONS IT IS NECESSARY TO SET THE CALIBRATION DIALS AND SWITCHES FOR THE FLUID AND/OR RANGE DESIRED, IN ACCORDANCE WITH THE SETTINGS PROVIDED ON THE CALIBRATION CURVES (FIGURE 6).



CONNECTING WIRES
TO TERMINAL STRIP
DO NOT REMOVE BOARD
INSTEAD, GENTLY
REMOVE GREEN TERMINAL STRIP

FLOW TRANSDUCER

SHIELD

\+
NON LINEAR
FLOW SIGNAL

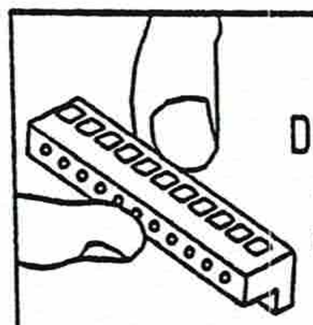
24 VDC −
POWER +

GREEN
BLACK
RED
WHITE

WHITE
RED
BLACK
GREEN
SHIELD

1 2 3 4 5 6

CIRCUIT BOARD

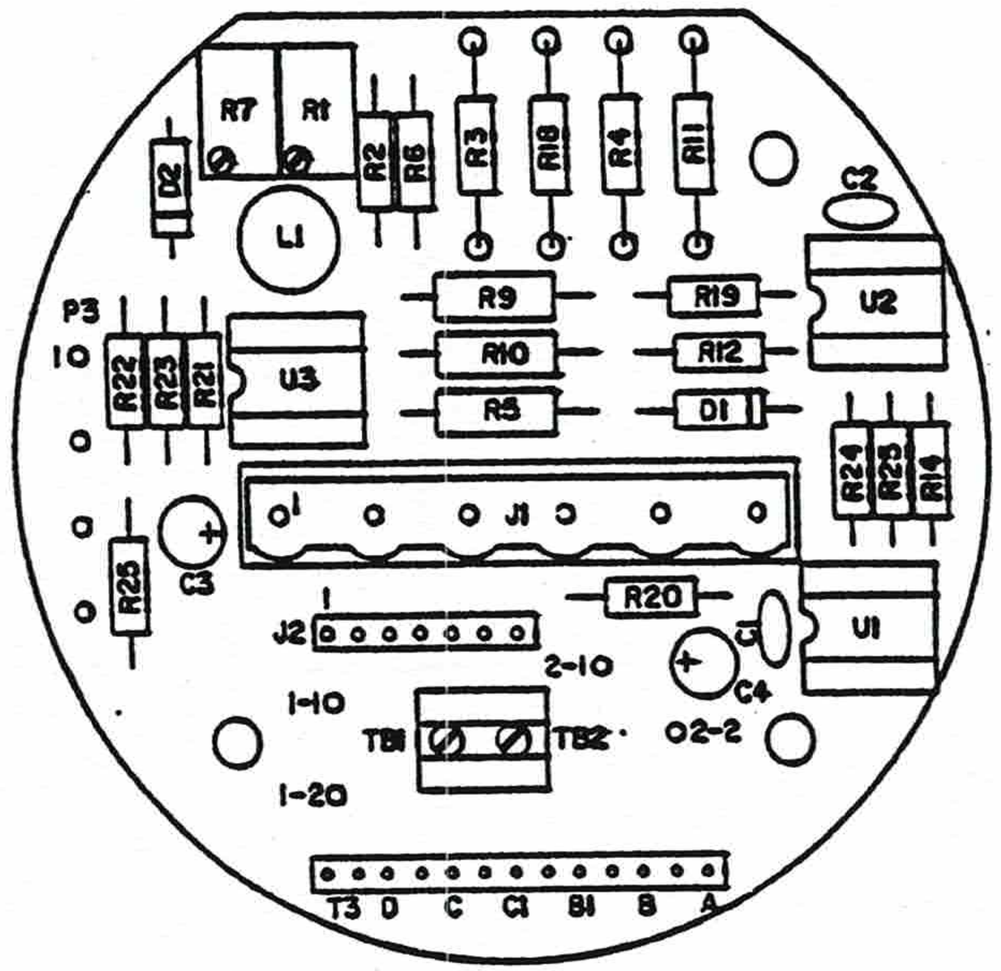


CONNECTING WIRES
TO TERMINAL STRIP
DO NOT REMOVE BOARD
INSTEAD, GENTLY
REMOVE GREEN TERMINAL STRIP

*NOTE:
POWER-UP CURRENT CAN BE 1 AMP FOR 5 to 10 seconds,
THEN .2 to .3 AMPS CONTINUOUS.

MODEL: 600-9SANNL	EXTERNAL WIRING DIAGRAM	THERMAL INSTRUMENT CO. TREVOSE, PA.
S/N 2004149		DATE: 5/04 TIC-437-9

2.



FOR SCHEMATIC REFER TO 100265A

MODEL: 600-9 SAN NL
S/N: 2004149
DATE: 5/04

THERMAL INSTRUMENT CO., INC. TREVOSE, PA. 19047 (215) 355-8400		
SCALE 2/1 DATE 6-3-93	APPROVED BY	DRAWN BY TB REVISED
ASSEMBLY TRANSDUCER BOARD		

SERIAL NUMBER 2004149 06-04-2004

COMPONENT VALUES DETERMINED AT CALIBRATION

PCB 100287		PB 100301	
R3	90.9	R9	56200
R4	825	R10	4420
R11	5900	R11	56200
R18	412	R13	4420
R15		DP	15800

FLOW SENSOR - 50 OHMS NI @75 ·F
TEMP SENSOR - 100 OHMS NI @75 ·F

CALIBRATION POTENTIOMETERS

TA 678 TC 590

OPERATING RANGE

	minimum	maximum	
FLOW	0	3000	SLPH CO2 GAS
TEMPERATURE	0	50	·C
PRESSURE	0	150	PSIA

METER OUTPUT SIGNAL CALIBRATION

SLPH CO2 GAS	EXC Volts
0	7.000
300	7.950
600	8.670
900	9.200
1,200	9.580
1,500	9.910
1,800	10.180
2,100	10.420
2,400	10.640
2,700	10.850
3,000	11.060