CAUTION: The 691126 RTD Converter is certified for use in Class I, Groups C and D, Division 2 hazardous locations when installed in accordance with these instructions.

The sensor leads connected to this device operate at a very low voltage and power levels and MUST NOT CONTACT any external voltage source. Damage to the system will result from connection between the sensor leads and the ignition system or any AC or DC power source.

WARNING: DEVIATION FROM THESE INSTALLATION INSTRUCTIONS MAY LEAD TO IMPROPER OPERATION OF THE MONITORED MACHINE WHICH COULD CAUSE PERSONAL INJURY TO OPERATORS OR OTHER NEARBY PERSONNEL.

1.0 DESCRIPTION

1.1 The 691126 RTD Converter is an electronic instrument designed to monitor up to four industry standard 3-wire 100Ω Platinum RTD's (Resistance Temperature Detector) with an α = 0.00385. The output of the converter is 5 mV per degrees C in the range of 0 to 750°C or 32 to 1382°F. It is housed in a plastic enclosure and has open RTD protection - the output goes high. The RTD Converter is ideally suited to connect to the Altronic DSM-46xx or DSG-1601 series instruments, thus taking advantage of the features of these instruments including a LCD readout to display the temperature values in either °C or °F with a low and a high setpoint for each channel. See the sales brochure and the installation instructions form DSM4600 II or DSG1601 II for complete details on these instruments and their capabilities.

1.2 The power requirement for the RTD Converter is 5 to 30 Vdc, 50 mA maximum.

1.3 For proper operation, these installation instructions must be adhered to strictly.

2.0 RTD, RESISTANCE TEMPERATURE DETECTOR

2.1 An RTD is a resistance element made from a material that has a prespecified resistance value at a known temperature. Temperature is sensed by measuring the change in the resistance of that material. From the materials' temperature coefficient, a known repeatable resistance change per unit of temperature can be read and displayed.

2.2 SPECIFYING THE RTD PROBE - The 691126 RTD converter is designed to accept the most common RTD probe. The following describes the probe.

1. Platinum resistance element material.
2. A temperature coefficient with a standard European curve of α = 0.00385.
3. 100Ω nominal probe resistance.
4. 3-wire configuration.
5. The measurement temperature range of the 691126 RTD Converter is 0 to 750°C or 32 to 1382°F.

For reference, this probe will measure 100Ω at 0°C and 138.50Ω at 100°C.

3.0 MOUNTING

3.1 691126 RTD CONVERTER - Mount the RTD Converter inside a control panel or to a suitable flat surface close to the DSM or other display instrument. Mounting dimensions are enclosed. NOTE: The ambient temperature range of the converter is -40°F to +175°F (-40°C to +80°C).

3.2 RTD PROBE - Mount the RTD probe in a thermowell on the engine or machine. To ensure accuracy, make sure the actual element is surrounded by the measured media. Care should be taken to protect the wiring and connectors from contact with hot surfaces.

4.0 WIRING (SEE WIRING DIAGRAMS)

4.1 POWER WIRING - Connect power to the terminals marked 5-30 VDC SUPPLY, plus (+) and minus (-); power requirement is 5 to 30 Vdc (50 mA max.). **DO NOT** ground this device directly to the ignition system common coil ground.

4.2 RTD PROBE TO CONVERTER WIRING - For each input used, select a 3-wire RTD probe and mount as described above. A 3-wire RTD will require three connections, a single connection on one side (usually colored red) and two connections on the other side of the probe (both usually black in color). The single red connection must be connected to the RTD Converter on the single connection side as shown on the label. The two black connections for each RTD must connect separately to the other two corresponding terminals. For example, for RTD input 1, connect the red wire to terminal 1, one of the black wires to terminal 2 and the other black wire to terminal 3.

For accurate temperature measurements, all three wires must be of the same gauge, type and length for each probe; all three wires must have the same resistance. Standard copper wire may be used. Maximum lead resistance for each lead is 10Ω. The calculated maximum individual lead wire length for different wire gauge sizes from RTD probe to Converter is listed below.

Maximum Copper lead wire length for each wire from RTD probe to Converter.

Lead-wire AWG	Max. Length ft.	Lead-wire AWG	Max. Length ft.
12	6250'	22	617'
14	3846'	24	389'
16	2439'	26	242'
18	1538'	28	153'
20	970'	30	97'

Take care not to damage the insulation when installing and take precautions against later damage from vibration, abrasion, or liquids in conduits. In addition, it is essential that the following practices be adhered to:

A. Never run sensor wires in the same conduit with ignition wiring or other high energy wiring such as AC line power.
B. Keep secondary wires to spark plugs and other high voltage wiring at least eight inches (200mm) away from sensor and sensor wiring.

NOTE: Each unused RTD input must have all three of its input terminals shorted together. Short each of the three inputs for each channel separately.

4.3 RTD CONVERTER OUTPUT WIRING - The RTD Converter converts the RTD probe temperature signal to a 5 mV per °C output signal with 0°C being 0 volts and 500°C being 2.5 volts. Each RTD channel has its own plus and minus output terminals. Wire each output from the plus and minus of the RTD Converter to the input of a DSM-46xx or other instrument.

4.4 HAZARDOUS AREA OPERATION - The RTD Converter is CSA certified for CLASS I, DIVISION 2, GROUPS C AND D areas when mounted in a suitable enclosure.

In addition, the following requirements must be met (see NFPA standard no. 493):

1. The sensor wires within the panel enclosure must be kept at least two (2) inches away from other wiring. Run the sensor wires leaving the panel in a separate conduit from all other wiring and keep them separate throughout the installation.
2. Wiring to the sensors must have a grade of insulation capable of withstanding an AC voltage of 500 volts RMS.
3. Sensor wires must be run in separate conduits and junction boxes from high voltage wires such as ignition, fuel valve, and other high voltage wiring.

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

DO NOT DISCONNECT EQUIPMENT IN DIV. 2 ENVIRONMENT UNLESS POWER IS SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

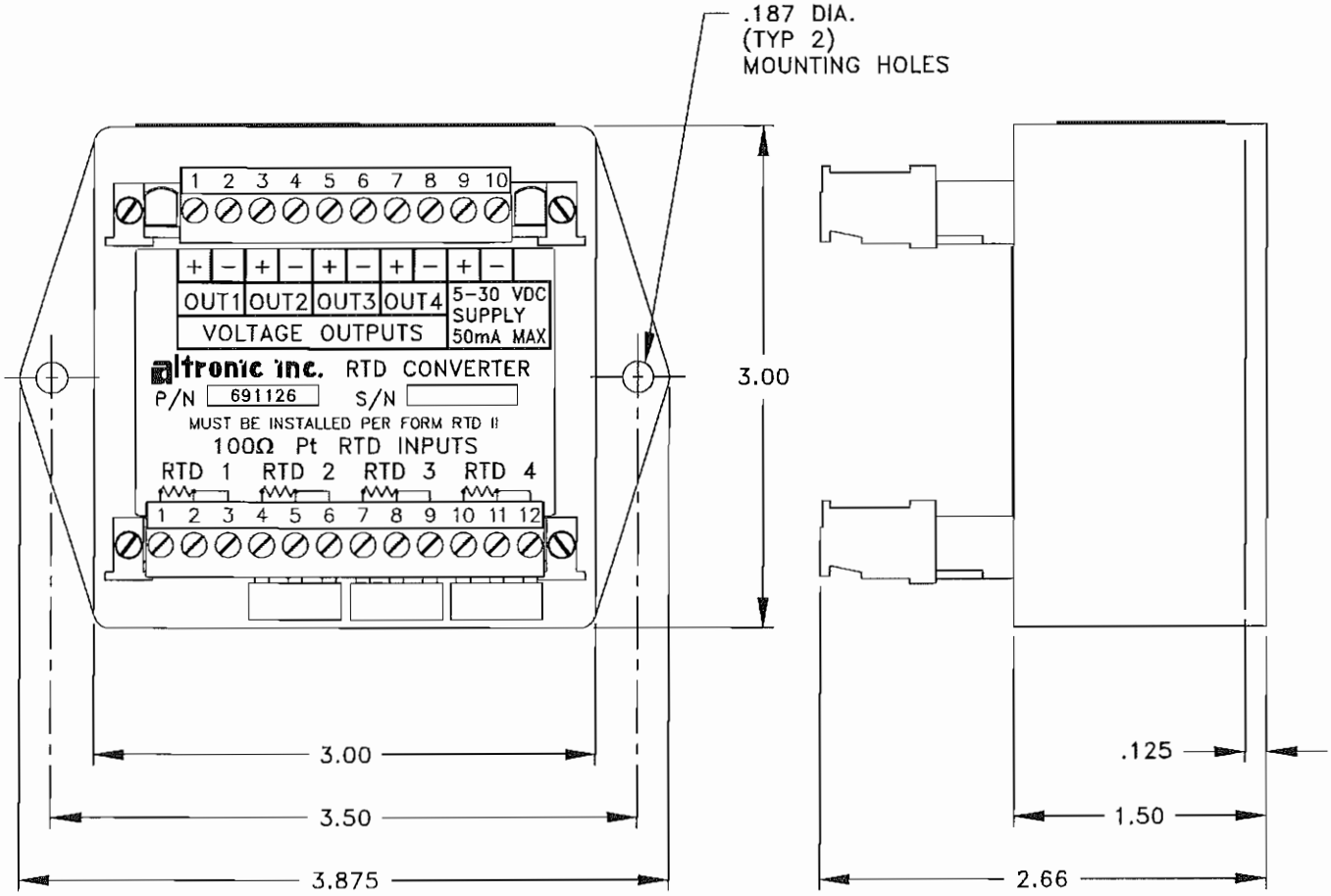
4.5 TESTING SENSOR LEADS - If it becomes necessary to check wiring with an ohmmeter or other checker, first unplug the connectors on the RTD Converter and the monitor. This will prevent possible damage to sensitive low voltage detection circuitry in both the RTD Converter and the DSM monitor.

DRAWINGS SECTION:

MOUNTING DIMENSIONS AND SPECIFICATIONS

WIRING DIAGRAM - GENERAL HOOK-UP

MOUNTING DIMENSIONS AND SPECIFICATIONS



SPECIFICATIONS:

POWER REQUIRED: 5–30 VDC, 50mA MAX.

MEASUREMENT RANGE: 0° TO 750°C OR 32° TO ~~1382°F~~ 1832°F NOMINAL.

SENSOR TYPE: 3 WIRE 100Ω PLATINUM RTD α = 0.00385.

OUTPUT VOLTAGE: 5mV PER DEGREES C.

EXCITATION CURRENT: 1mA NOMINAL.

MAXIMUM LEAD WIRE RESISTANCE: 3–WIRE: 10Ω MAX.

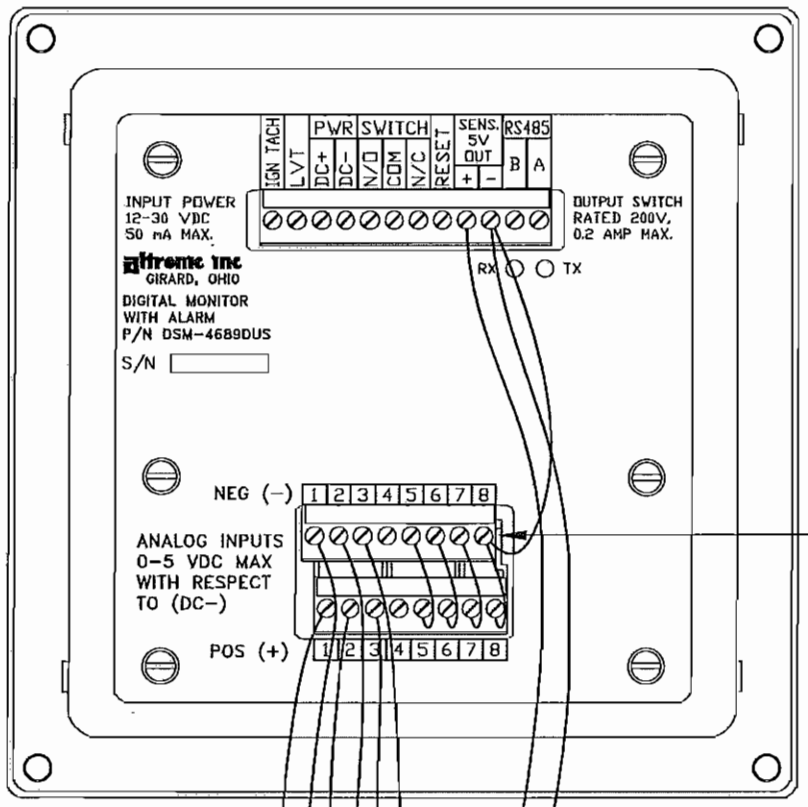
ACCURACY: ACCURACY OVER RANGE OF 0° TO 500°C IS ±15mV OR ±3°C MAXIMUM EXCLUSIVE OF RTD ERROR.

AMBIENT TEMPERATURE RANGE: –40° TO 80°C (–40° TO 175°F).

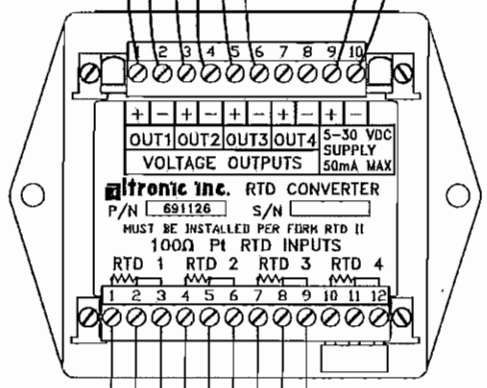
ENCLOSURE: 94–VO FLAME RETARDENT ABS PLASTIC.

HAZARDOUS AREA CLASSIFICATION: CLASS I, GROUPS C & D, DIV. 2.

WIRING DIAGRAM – GENERAL HOOK–UP

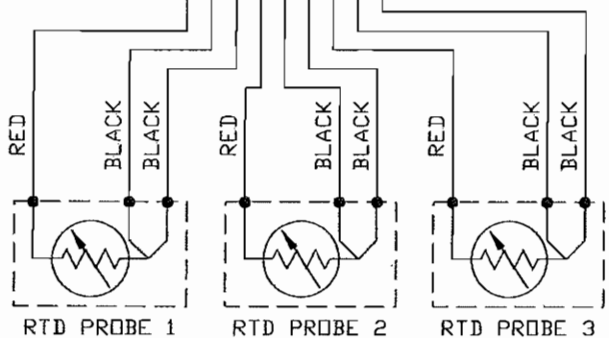


JUMPER COMB ACROSS
NEG (–) TERMINALS 1–8
MUST BE USED.
NOT SHOWN FOR CLARITY.



NOTES:

1. 3 RTD PROBES SHOWN. PLACE 3–PIN JUMPER ACROSS ALL UNUSED RTD INPUTS. RTD 4 SHOWN NOT USED.
2. ALL THREE WIRES FROM RTD TO CONVERTER MUST BE OF THE SAME GAUGE, TYPE AND LENGTH FOR EACH PROBE; ALL THREE WIRES MUST HAVE THE SAME RESISTANCE. MAXIMUM LEAD RESISTANCE FOR EACH LEAD IS 10Ω. STANDARD COPPER WIRE MAY BE USED.



100Ω 3–WIRE
RTD PROBES