TRI-MET
MODEL TMA-880D-3
DIGITAL DEW POINTER

INSTRUCTION BOOK

INDUSTRONICS
SERVICE COMPANY

TRI-MET

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SERIAL #_____

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INTRODUCTION

The model TMA-880D-3 Dew Point Indicator is easily operated, and covers a wide range, from wet to super dry atmosphere (room temperature to -100F). The dew point is determined by water condensation at a given temperature. The sample gas is cooled until the saturation point is reached. This is dew point.

It is particularly effective in determining minus range dew points, a region where most types of methods lose accuracy or become inoperative. The direct reading feature, accuracy, portability, N.I.S.T. traceability, and non-technical background required for operation makes the model TMA-880D-3 unique.

TRI-MET MODEL TMA-880D-3 DEW POINTER

SPECIFICATIONS

Range:	Basic Range - 100°F to room temperature, using CO_2 as a cooling agent.
Accuracy:	±1% between Dew Points of -100°F to +70°F
Reproduceability:	2°F
Ambient Temp. Limits:	Sample gas up to +160°F, Instrument Components +32°F to 140°F
Max. Pressure Rating:	20 P.S.I.G.
Sample Flow:	Positive Pressure Required
Read Out:	Digital memory meter with a range of -100°F to +70°F using a 28 gauge chromel/constantan thermocouple
Voltage:	6 Volts DC with a computer designed battery charging system

CONNECTIONS

Connect the braided flexible hose to the needle valve and gauge assembly. Next, attach needle valve and gauge assembly to carbon dioxide tank. Place gasket between the mating surface of the carbon dioxide tank and the needle valve assembly. Be sure the large nut is securely fastened to carbon dioxide tank to prevent leakage. Check to see that both needle valve and tank valve are in the closed position (turned completely clockwise). Open carbon dioxide tank valve slowly, then close when maximum tank pressure is indicated on gauge. Observe pressure gauge to see if any drop in pressure is indicated. If pressure drops, retighten large nut attached to tank to properly seat gasket to prevent further leakage. Next, remove the plastic protective plug from the braided hose and discard. Attach this end of braided hose to coolant inlet fitting located on lower right side of the instrument. Next, attach one end of plastic hose to the sample inlet nozzle located on upper right side of the instrument. Connect the other end of the plastic hose to the source of the atmosphere to be checked. The sample line should be as short as possible to guard against moisture contaminating the gas sample. It is extremely important to have tight connections when installing the sample line. Any amount of atmosphere air leakage into the sample line will result in faulty dew point readings. The sample exhaust fitting may be connected to a discharge line. This is extremely important when sampling hazardous or harmful gases. A pressure reducing valve should be installed at the sample source when the sample gas is under high pressure.

OPERATION

Allow the sample atmosphere to purge through the chamber for 2-3 minutes to remove any residual condensation in instrument chamber and sample lines.

After sample chamber has been purged for the prescribed time, turn the chamber light switch to the on position.* Adjust focus of the optical telescopes for clear viewing of the polished mirror. The atmosphere being sampled is passed over the highly polished stainless steel mirror and is chilled by a jet of carbon dioxide. Slowly open the needle valve in the carbon dioxide line until a spot of moisture or frost appears on the mirror. Push the memory lock button, thereby locking the reading of dewpoint temperature, which is indicated directly on the digital memory meter. Determination of the dew point may be read either as the moisture or frost first appears, or just as the last trace of moisture or frost first disappears. Slowly operating back and forth through the dew point region, the operator can easily pinpoint the actual dew point temperature.

*Leave the power switch off while purging, as the digital meter will drain the power

OPERATING NOTES

When working with dry gases having low dew points, it should be remembered that extremely small quantities of water vapor are involved. It should be further remembered that the instrument can only give the results for the gas sample in the dew point chamber. It is for this reason that it is extremely important that the gas does not pick up or lose moisture in the process of being transferred from its source to the dew point chamber.

When working with high dew point gases, e.g. endothermic, exothermic, etc., it may be necessary to occasionally clean the polished stainless steel mirror surface due to high residue contaminants in these gases. Use a soft, clean, cotton swab. For difficult to remove residue, use a swab dipped in alcohol. Frequent cleaning may cause the mirror to become dull because of small scratches. This will not effect the operation of the instrument. However, do not attempt to polish the mirror in the field, or permanent damage to the mirror may result.

The sample pressure to the instrument is not critical, but a positive pressure is required to accurately determine the dew point. Pressure required will vary depending on type of sample gas. In cases where almost negative pressures are involved, a small vacuum pump may be attached to the sample outlet nozzle to aid in obtaining a positive flow.

The digital meter has been calibrated at the factory and will reflect minute changes in temperature. The meter will usually indicate a temperature lower than ambient due to the location and isolation of the Thermocouple to outside air or atmosphere.

POWER SOURCE OPERATION

The TRI-MET model TMA-880D-3 has a unique battery charging system. This system is a 115-130 volt A.C. 15 watt power charger with a 6 volt D.C. bulk output to a lead-acid sealed battery.

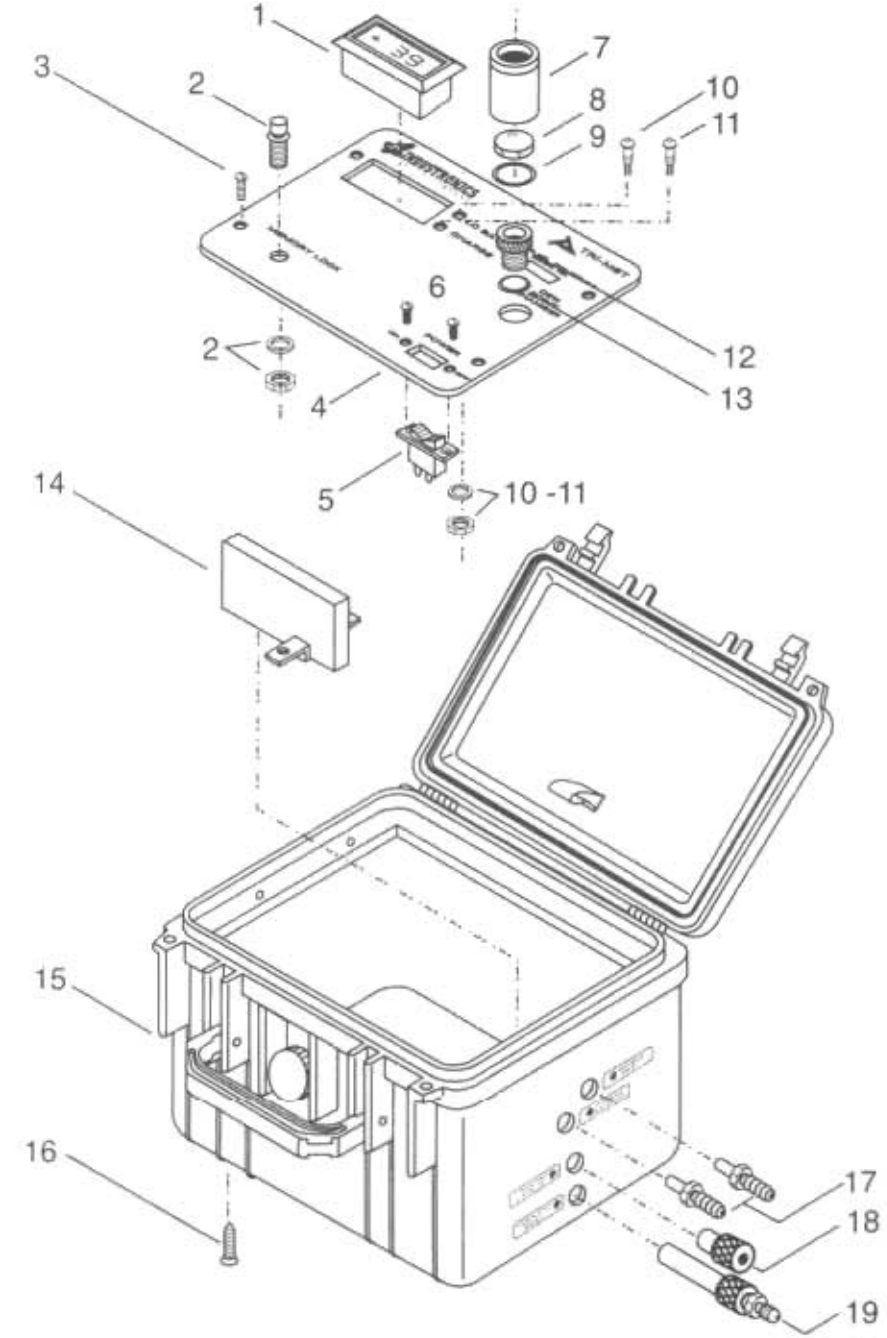
There are two lights on the instrument panel. The red light is the lo-battery. The yellow light is the charge light.

CHARGING: Plug the AC line cord into a 115-130 volt outlet. For full charge, wait until yellow light goes out.

NOTE: The red light may stay on longer if the unit has been left on for long periods of time. The yellow light will come on, indicating the battery is being charged. It will take about 6 hours for a full charge.

NOTE: Deep discharge of the battery could cause damage to the battery.

NOTE: If the battery is deeply discharged, the yellow charge light may not come on for the first hour of charging.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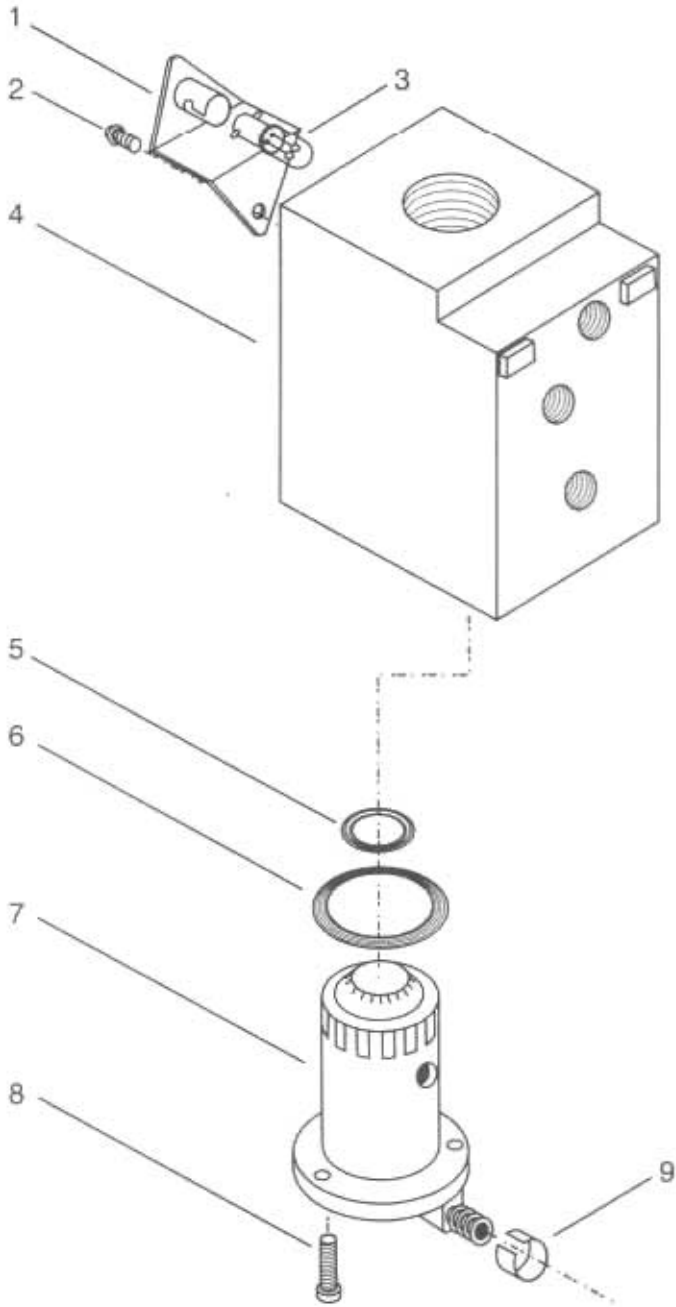
COMPLETE ASSEMBLY

ITEM # & DESCRIPTION	PART #
1. DIGITAL MEMORY METER - COMPLETE	T250-2E
2. MEMORY LOCK SWITCH	EL-40
3. PANEL SCREWS (4 REQUIRED)	RO-610
4. TOP PANEL	AT-64
5. ON/OFF SWITCH	EL-35
6. SCREWS - SWITCH (2 REQUIRED)	RO-610
7. OPTICAL TELESCOPE (TWO PIECES)	TE-60
8. OPTICAL LENS	TL-61
9. OPTICAL LENS RETAINING RING	TG-62
10. LO BATTERY LIGHT	EL-38
11. CHARGE LIGHT	EL-48
12. SIGHTING PLUG	SS-20
13. "O" RING FOR SIGHTING PLUG	SO-22
14. BATTERY PACK 16.20	EL-49
15. INSTRUMENT CASE	W260-3
16. SCREWS (5 REQUIRED)	RO-930
17. INLET & EXHAUST NOZZLE (2 REQUIRED)	SS-28
18. COOLANT EXHAUST PLUG	SS-26
19. COOLANT INLET SLEEVE - COMPLETE	SS-24
20. RECHARGE CIRCUIT AND HARNESS (NOT SHOWN)	EL-51



SUB - ASSEMBLY

CHECKS

Turn chamber light switch to the "on" position. The chamber should be illuminated. If light fails to operate, remove sighting plug and four screws at the corners of the face panel, and carefully lift the panel up using care not to put a strain on the Thermocouple leads attached to the back of the digital meter. Check both connections. Replace lamp as necessary, using comparable quality and type replacements. DO NOT attempt to service instrument in the field (except for normal lamp replacement).
The digital meter and chamber assembly are sealed at the factory, and warranty is in effect only if seal is unbroken.

When the carbon dioxide tank is nearly empty, and pressure too low, sample cooling will not be sufficient to form condensation or frost in the mirror. Therefore, cylinder should be recharged. Low dew points require large quantities of carbon dioxide. Low pressure in the cylinder will cause problems.