YSI MODEL 43 TELE-THERMOMETER INSTRUCTIONS

GENERAL DESCRIPTION

The YSI Model 43 Tele-Thermometer is a precision temperature indicator produced in a number of ranges (See Range Chart), which comes to you tested and factory calibrated. With careful use and reasonable consideration of the meter movement and the temperature probes, years of trouble-free service may be expected.

The Model 43 is designed for direct reading with any of the interchangeable YSI Series 400 probes. YSI Series 500 probes can be used under special conditions (see below).

OPERATION

1. To ensure accuracy it is necessary to monitor meter and "red line" adjustments. Check these settings each time the instrument is used. With the instrument turned off, use a screwdriver to set the mechanical adjustment for the meter movement, located at the bottom center of the meter bezel, so that the pointer is aligned with the scale mark at the farthest right on the upper temperature scale. For maximum accuracy, all adjustments and readings should be made with the instrument in its normal operating position.

2. Turn switch to ON. Remove probe plug or interconnecting cable plug from the jack to the left of the meter. Turn the ADJ. TO RED LINE control so that the pointer is set at the red line. (If the pointer cannot be red-lined, replace the battery. See BATTERY REPLACEMENT below.) Replace probe plug or interconnecting cable plug. The instrument is now ready for use.

3. The output for the recorder is 0.000 volts at the highest temperature on the scale. At the lowest temperature on the scale it is 80 to 100 millivolts (50 to 70 millvolts in the TF range). The recorder must have a minimum input resistance of 50,000 ohms.

4. When temperature measurement applications require probes of fast response time and very small physical size, YSI Series 500 probes can be used with this instrument. These probes are not interchangeable and must be used with a conversion chart to correct the temperature indication which the instrument displays. A conversion chart is furnished with each Series 500 probe. The chart is unique to that probe and is identified by serial number. The conversion chart should be inspected to assure that the temperature of interest, when appropriately corrected, falls within the display range of the instrument.

5. Measurement accuracy using Series 500 probes is conditioned by errors associated with thermistor self-heating. Thermistors used in these probes have very low thermal dissipation, and therefore the measurement current itself can produce a small but significant temperature offset. Measurement currents differ with instrument range. The error due to self heating must be determined in the specific measurement circumstance.

WARNING: A patient who is not adequately grounded during electrosurgery at radio frequencies can be burned by current flow through a temperature probe. If you have any doubt about the adequacy of patient grounding, the probe should be removed from the patient before activating the electrosurgical unit.

Instrument reading errors induced by a high-intensity RF source are liable to appear only while the electrosurgical unit is operating.

PROBES

Should a probe fail completely, the meter pointer will move violently off-scale: to the right if the probe is shorted, to the left if it is open. Rarely, the base resistance of a probe may change sufficiently to cause the meter readings to be out of specification. If the accuracy of a probe is in question, it should be checked against other probes, or a standard of known accuracy. Probe failures are normally irreparable since thermistors are potted and sealed in their assemblies. Replacement probes may be purchased through your YSI dealer.

RANGE	Temp. Range		POT	POT	POT	Resistor 1% K = 1000					NOTE 3	NOTE 4	RED LINE		CHECK POINTS LOW		CHECK POINTS MED		CALIB PTS HIGH	
	°C	°F	R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9	R-10	CALIB.	TH RES	TEMP	RES	TEMP	RES	TEMP	RES
TA	20 to 42	68 to 108	100	100	1K	806	1.05K	806	806	2.37K	0	1K	74°F	2424	68°F	2814	88°F	1731	108°F	1098
TC	15 to 100	59 to 212	20	100	1K	1.21K	143	221	221	1.43K	0	100	35°C	1471	15°C	3539	57°C	625.	2100°C	153.2
TD	0 to 50	32 to 122	100	200	2K	3.01K	768	1.21K	1.21K	5.62K	0	680	5°C	5720	0°C	7355	25°C	2253	50°C	811.7
TF	35 to 46	95 to 115	500	500	1K	232	2.61K	750	249	1.21K	0	820	37°C	1355	95°F	1471	105°F	1174	115°F	942.5

RANGE CHART

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PROBE CARE

Some YSI probes are autoclavable and some are not. Refer to the YSI probe instructions sheets for further information and suggestions on cleaning and sterilization. 70% isopropanol or Dakin's solution are both effective for routine disinfection.

When not in use, probes and probe leads may be formed in loose loops for storage. Probe leads should never be wrapped around the instrument case, since permanent indentations might be impressed in the sheathing. Moreover, a lead which has been repeatedly wrapped tightly, pulled taut or stretched could develop stresses sufficient to cause mechanical failure.

SERVICE

Normally, service on the Model 43 will be limited to occasional battery replacement. Battery life should be approximately 2000 hours. The battery should be inspected for leakage at regular intervals and replaced yearly. Use Panasonic "Super-top Extra Duty" UM-1N or equivalent.

BATTERY REPLACEMENT

1. Loosen the four knurled thumbscrews on the front panel (do not remove them; they are designed to remain attached), and remove the meter-panel assembly from the case.
2. Steady the instrument to avoid jolting it while removing or installing a battery.
3. Observe polarity. The battery must be installed with the center or positive terminal in the direction indicated by the + sign on the printed circuit board.
4. Make certain that the battery is firmly seated and that good electrical contact is made.
5. DO NOT disturb the potentiometers inside the instrument. To do so will destroy the caliabrated accuracy.
6. Replace the meter-panel assembly. The thumbscrews should be drawn only finger-tight.
7. See note on schematic for battery types.

CALIBRATION

With proper instrument care, recalibration will rarely be necessary. If it is definitely determined that recalibration is needed, it is preferable that the instrument be returned to the factory.

Recalibration in the field may be accomplished as follows:

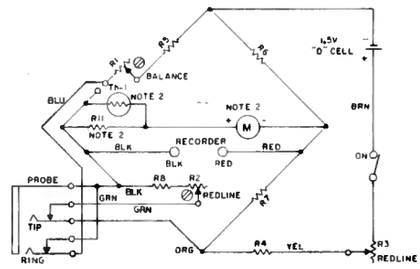
1. With the instrument turned off, set the mechanical adjustment for the meter movement so that the pointer is aligned with the mark at the extreme right on the °F scale.
2. Remove the instrument from its case by loosening the knurled screws at each corner of the front panel. Install a fresh battery and turn the switch to ON.
3. Rotate the ADJ. TO RED LINE control fully counterclockwise. Do not force.
4. Insert the probe into a constant temperature bath which is at a temperature corresponding to the high end of the range of the instrument. (Note: only Series 400 probes may be used for calibration procedures.) Allow one minute for the probe to stabilize at the bath temperature. Carefully adjust the internal control R1 so that the meter pointer is aligned with the scale mark corresponding to the bath temperature. (Controls R1 and R2 are indicated on the underside of the printed circuit board.)

A decade resistance box with 0.5% or better tolerance can be used instead of the probe and a constant temperature bath. Set decade box to HIGH resistance (see chart on reverse) and adjust R1 so that pointer is aligned with extreme right hand mark on the °F scale.

5. When calibrating with a probe, insert the probe into a constant temperature bath at the temperature corresponding to the Red Line mark on the meter face. Allow time for the probe to stabilize, then carefully turn ADJ. TO RED LINE control so that meter pointer is aligned with the red line on the meter.

If the decade box is being used, set it to Red Line resistance (see chart) for the temperature range of your instrument and adjust until pointer is aligned with the red line on the meter face.

6. Repeat steps 4 and 5.
7. Remove probe plug or interconnecting plug and adjust the inside variable resistance R2 so that the meter again reads red line.
8. Verify calibration by using CHECK POINTS noted in the calibration table on the reverse side of this sheet.
9. Replace the instrument in its case.



This schematic is representative only, and may be slightly different from the circuit in your instrument.

NOTES

1. All TF range 1% resistors: metal film, 100 ppm/°C

2.

	Range TF	All ranges
R-11	1.5K	825 Ohms
Th-1	A-44040 100 Ohms at 25°C	A-44042 1.2K at 40°C
Meter	25µA	50µA

SCHEMATIC

WARRANTY

All YSI products are warranted for one year against defects in workmanship and materials when used for their intended purpose and maintained according to instructions. Damages from accidents, misuse, tampering or lack of prescribed maintenance are not covered. This warranty is limited to repair or replacement at no charge.

RETURN INSTRUCTIONS

Contact the dealer from whom you bought the instrument.

If recalibration only is required, contact
Product Service Department
YSI Scientific
Yellow Springs, Ohio 45387
Telephone: (513) 767-7241 Telex: 20-5437
(800) 343-4357

Report the date or purchase, serial number, model-range designation and the nature of the failure. If the repair is not covered by the warranty, you will be notified of the charge for repair or replacement.

When shipping any instrument, be sure it is properly packaged for complete protection.

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