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Model TC-1 & TC-D
TEMP. CONTROLLERS
DATA SHEET 710

- **OVENS**
- **MODEL OC-50 and OC-200**
- **TEMPERATURE CONTROLLERS**
- **MODEL TC-I and TC-D**

Quantum Technology manufactures a variety of ovenized SHG cells for temperature tuning of non-critically phase-matched Crystals, such as Models OC-50 and OC-200. The Model OJ-50 is an oven jacket (O.D. 50 mms) for maximum operating temperature up to 100° C. The Model OC-50 oven is modular in construction and consists of a crystal housing, AT-2, which slides inside the jacket OJ-50 and is held there by two snap rings. This feature offers a quick and easy interchange of crystal housings for different wavelength operation, using several crystals.
The Model OC-200 oven is specially designed for maximum temperature up to 200° C. The phase matching temperatures required for KTP or Lithium Borate or Potassium Niobate can be in the range 100° C to 200° C and therefore this oven OC-200 is ideally suited for such crystals. The outside diameter is also 50 mms, and adequate insulation is provided by a thick teflon sleeve. The crystal heat sink consists of a ceramic holder which can be placed inside after mounting the crystal. The ceramic holder is held in place by a teflon end plate with a shoulder..
There are **two** types of temperature controllers. **1) Analog type 2) Digital type.** The analog temperature controller Model TC-1 will normally operate up to 100° C for oven OC-50. However for oven OC-200, this Model TC-I is modified at the factory to operate up to 200° C. When this modification is carried out, the Model number is TC-200, and operates with a special 50 Kohm high temperature thermistor placed inside OC-200. We recommend the digital Model TC-D controller for the OC-200 oven. A calibration graph is supplied with the oven-temperature controller combination. Temperature is obtained by easy interpolation of dial setting vs temperature graph. We recommend the digital Model TC-D controller for the OC-200. Model TC-2 is a miniature proportional controller, requiring 28 V DC input power.
A digital temperature controller, Model TC-D is microprocessor driven and is completely programmable. It features an RTD input for high stability and a 3 Amp nominal output capability. It has a 5° C per minute ramp control so it is very gentle to sensitive crystals which may suffer damage due to thermal shock. A precision, calibrated temperature monitor is also provided for chart recorder monitoring. It mates with all of the above oven series when an RTD in the oven is used as the sensor.
Quantum Technology has pioneered in the growth and characterization of many crystals of KDP family, such as ADA, KDA, RDA and CDA and their deuterated Isomorphs. These crystals can be non-critically phase matched at a variety of wavelengths in the visible region. When the crystal is 90° phase-matched, the angular acceptance improves considerably, and higher efficiencies are obtained by focussing the beam. Two well known crystals are 1) Crystal RDA which phase-matches non-critically at Ruby wavelength (694 nm) at a temperature of 92° C, producing maximumm efficiency of over 25 % without beam walk-off. 2) Crystal CD*A phase-matches non-critically at Nd:YAG (1064 nm) at a temperature of 110° C with efficiencies of over 50 %. Crystal LBO also 90° phase-matches the same wavelength at 149° C. These ovens and controllers are extremely useful for generating SHG from the Non-Linear doubling crystals.

OVEN SPECIFICATIONS:

MODEL:	OC-50	OC-200
TEMPERATURE STABILITY:	---- +/- 0.1 deg C --------	
MAX CRYSTAL LENGTH:	60 mm	30 mm
MAX CRYSTAL X-SECTION:	15 mm	10 mm
CRYSTAL CELL MODEL:	AT-1.5	N/A
HEATER WATTAGE:	25 W	50 W
MAXIMUM TEMP (deg C):	100	180
HEATING RATE (deg C/min):	5	5
SIZE (dia X length mm):	50x75	50X63
CONNECTOR TYPE:	---- D-SUB 9 PIN MALE ---	

TC-1 CONTROLLER SPECIFICATIONS:

TEMPERATURE STABILITY:	+/- 0.05 deg C long term
TEMPERATURE SETTING:	DIAL TYPE
CONTROL TYPE:	FULL PROPORTIONAL
INDICATORS:	POWER (controlling) Ten Turn Pot
AC INPUT:	100/117/220 VAC
CONNECTOR:	D-SUB 9 PIN FEMALE
SIZE:	100 X 100 X 56 MM^3 (4 x 4 x 2.25 IN^3)

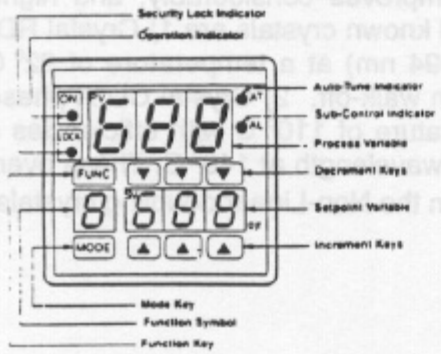
TC-2 CONTROLLER SPECIFICATIONS:

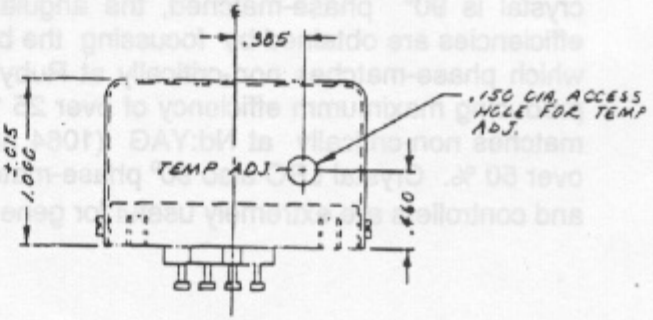
INPUT:	26-30 VDC
TEMPERATURE SETTING	SCREW DRIVER ADJUSTMENT
CONTROL TYPE	FULL PROPORTIONAL
ACCURACY	+/- 0.001° C/ Volt input voltage change
MAX. INPUT TRANSIENT	60 V peak for 1 sec.
MAX. OUTPUT POWER	50 Watts at load
INERNAL DISSIPATION	12.5 Watts Max
HEAT SINKING	Sufficient cooling required.

TC-D CONTROLLER SPECIFICATIONS:

TEMPERATURE STABILITY:	+/- 0.05 deg C long term
TEMPERATURE SETTING:	3 DIGIT PUSH BUTTON
CONTROL TYPE:	FULL DIGITAL PID TYPE
TEMPERATURE SENSOR:	RTD (DIN TYPE)
TEMPERATURE RANGE:	PROGRAMMABLE
TEMPERATURE RANGES:	-100 TO 50 DEG C
	0 TO 99.9 DEG C
	0 TO 200 DEG
TEMPERATURE TRIM:	0 TO 1 DEG C ANALOG
TEMPERATURE RATE:	5 DEG C/MIN (DEFEATABLE)
INDICATORS:	PROCESS TEMPERATURE
	SET TEMPERATURE
	AUTO TUNE LED
	ALARM LED
AC OUTPUT	100-220 VAC, 3A
AC INPUT:	100-220 VAC
CONNECTOR:	D-SUB 9 PIN FEMALE
SIZE:	140 X 65 X 190 MM^3 (5.6 x 2.5 x 7.25 IN^3)

FRONT PANEL





TC-2