

**Instruction Manual**  
**Constant Temperature Bath**  
**BT-15**



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**Instruction Manual**  
**Cole-Parmer Instrument Company**  
**Model BT-15 Constant Temperature Bath**

**Section 1 – General Information**

**1.1 Warranty**

The Cole Parmer Instrument Company warrants this product to be free from defects in material and workmanship for a period of six months from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the six-month period, please return - freight prepaid – and correction of the defect will be made without charge. Out-of-warranty products will be repaired on a charge basis. If a replacement unit is sent, the defective unit must be returned to the manufacturer within 30 days of receipt of the replacement unit. If the defective unit is not received within 30 days, the manufacturer reserves the right to bill for the replacement unit.

**1.2 Return of Items**

Authorization must be obtained from our Customer Service Department before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Cole-Parmer will not be responsible for damage resulting from careless or insufficient packing. A 15% restocking charge will be made on all unauthorized returns.

**Note:** The Cole-Parmer Instrument Company reserves the right to make improvements in design, construction and appearance of our products without notice.

**1.3 Breakage or Damage**

The procedures vary slightly depending on method or shipment.

Shipment by:

**AIR FREIGHT, EXPRESS OR TRUCK DELIVERY**

1. Notify your local agent of the transportation company immediately requesting examination.
2. Hold damaged goods with container and packing until examining agent has made an inspection report.
3. Send this inspection report to us.
4. We will replace the shipment immediately (subject to stock situation) and file claim from our end.

**UNITED PARCEL SERVICE (UPS)**

1. Contact local UPS office regarding damage.
2. Retain container and packing.
3. Each UPS office has different methods of handling these occurrences and will advise you of procedure.
4. Notify us with a copy of the damage report.

## 1.4 Shortage

1. Recheck the contents against the quantities shown on the packing list. The apparent shortage may have been marked as a backordered item.
2. Inspect all packaging, as small items may be loose in the packing materials.
3. Check for items which may be taped to the inside of the carton or inside of the unit.
4. Immediately notify us with details of any shortage and send a copy of the packing list.

**NOTE: Unless the above procedures are followed and we are notified within 15 days of date of receipt at your location, we cannot accept responsibility for your claim.**

## 1.5 BT-15 Water Bath Specifications

Operating Temperature Range	20 °C to 110 °C
Temperature Control Stability	+/- 0.2 °C
Time to Reach Maximum Temperature	50 Minutes
Temperature Control Method	Proportional
Heater	1 kW
Pumping Speed	7 or 15 Liters/minute
Safety Device	Over-Temperature Thermostat
Reservoir Capacity	10 Liters
Reservoir Interior	#304 Stainless Steel
Electrical Requirements	
120V	120V - 50/60Hz – 9A
240V	240V - 50/60Hz – 5A
Overall Dimensions (inches)	14 W x 15 L x 12 H
Internal Dimensions (inches)	11 <sup>3/4</sup> W x 12 <sup>5/8</sup> L x 5 <sup>7/8</sup> H
Weight	9.5 kg

## Section 2 - Operation

Remove the unit from its shipping container. Check to see that no loose materials remain in the reservoir of the bath. Place the ON/OFF switch in the OFF position. Switch the circuit breaker on the rear panel to the OFF position.

### 2.2 Filling the Reservoir

The maximum fill level, including any racks or samples, is one inch below the top of the reservoir. Minimum liquid depth is enough to fully cover the heater, pump, and one inch of the temperature sensor. If the proper fluid level is not maintained the heater coil may become exposed and possible damage to the heater may result. At higher temperatures, remember to add liquid lost due to evaporation. An optional gable cover is available to help reduce evaporation. Order Cole-Parmer Catalog No. 01095-50

**WARNING:** This unit is equipped with Over Temperature Protection (OTP). Failure due to low liquid level or failure to set OTP and properly immerse the heater may result in heater burnout and triac failure. While operating, do not allow the heater to contact any potentially flammable materials such as plastic products. A fire hazard may result.

## 2.3 Reservoir Fluids

Use distilled water for temperatures from 20 °C to 90 °C. For temperatures over 90 °C, a solution of at least a 50/50 mixture of lab grade ethylene glycol and distilled water should be used. At the 110 °C maximum temperature of this bath uses 100% ethylene glycol.

Warning: Do not use a flammable liquid as a fire hazard may result.
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### Do NOT use the following fluids:

1. Automotive antifreeze with additives\*\*
2. Hard tap water\*\*
3. Deionized water with a specific resistance > 1 meg ohm
4. Any flammable fluids
5. Concentrations of acids or bases
6. Solutions with halides: chlorides, fluorides, bromides, iodides or sulfur
7. Bleach (Sodium Hypochlorite)
8. Solutions with chromates or chromium salts
9. Glycerine
10. Syltherm fluids

## 2.4 Temperature Setting

1. Plug the line cord into a correctly wired, grounded outlet of the correct voltage.
2. Place the circuit breaker on the rear panel in the ON position. Switch the ON/OFF switch in the front panel to the ON position.
3. Set the safety Over Temperature Protection (OTP) knob on the rear panel to full clockwise position (Maximum +)
4. Turn the Temperature Adjust knob to the desired temperature. Once the bath has stabilized, some fine adjustment may be required. The temperature values on the front panel are for approximations of the actual control temperature.

## 2.5 Setting the Safety Thermostat

The Over Temperature Protection (OTP) safety thermostat feature prevents burnout in case of primary controller failure or a low liquid condition by switching off power to the heater. OTP has a range of 60 °C to 200 °C. To restart the bath after OTP shutdown, the OTP safety must be reset manually by pressing the OTP reset button.

For temperatures less than 60 °C:

1. Turn the OTP knob on the rear of the controller fully clockwise (-).

For temperatures higher than 60 °C:

1. Turn the OTP knob fully clockwise (+) until it stops.
2. Stabilize the bath at the desired control temperature.
3. Turn the OTP knob slowly counter-clockwise until you hear a click. The bath will stop stirring and heating.
4. Turn the OTP knob clockwise slightly above the position where the unit stopped, then press the red OTP reset button located below the OTP knob. The bath should

start functioning again. OTP is now set to a trip a few degrees over the stabilized fluid temperature.

## **2.6 Circulating Pump Speed**

The HI or LO speed selection switch on the rear panel allows a choice of pump speeds. The HI position will circulate at 15 liters/min. and the LO at 7 liters/min. Select the HI pump speed where changes in temperature vary and there is a need for fast recovery. The LO pump speed is adequate for most applications and provides quieter pumping.

## **Section 3.0 Service**

If this bath should require service, contact Cole-Parmer Instrument Company for instructions. Follow the procedure as indicated in Section 1.2 – Return of items.

## **Section 4.0 Maintenance & Replacement Parts**

### **4.1 Heater**

The heater coil should be kept clean. If deposits built up on the heater they may be removed by scouring with a non-metallic (plastic) abrasive pad. Do NOT use steel wool because it will cause stainless steel to rust.

### **4.2 Pump Motor**

The top and bottom bearings are permanently lubricated with a high temperature silicone grease. They should not require lubrication. The pump motor bearings are not available separately. If the bearings become noisy, the entire motor should be replaced a save cost in labor and maintain reliability. A replacement pump and motor mounting kit is available. See Replacement Parts.

### **4.3 Cleaning**

Use only mild detergent and water or an approved cleaner on the painted and stainless steel surfaces. Do not allow cleaning liquids or sprays to enter the controller head. A concentrated bath clean cleaner can be used to remove mineral deposits from the reservoir.

### **4.4 Maintaining Clear Water Bath**

Optimum temperature and moisture conditions for algae growth exist when using water as the bath fluid. To prevent algae contamination and to minimize frequency of draining the reservoir, an algaecide should be used. Cole-Parmer Catalog No. H-08796-00 Lab Algaecide should be used for this purpose.

#### 4.5 Replacement Parts

REF #	DESCRIPTION	PART #
U1	IC, UAA1016B, Motorola Temp. Control/Triac Driver	200-061
M1	Motor, pump, 120V	215-013
M1	Motor, pump, 240V	215-019
PCB1	PC Board, ASM with RTD probe, Tested, 120V	500-120
PCB1	PC Board, ASM with RTD probe, Tested, 240V	500-121
H1	Heater, Tubular, 3 ½ inch O.D. Coil, 1kw, 120V	215-067
H1	Heater, Tubular, 3 ½ inch O.D. Coil, 1kw, 240V	215-068
NE1	Lamp, Neon, Green, 120V	215-135
NE1	Lamp, Neon, Green, 240V	215-136
Neon (OTP)	Lamp, Neon, Red, 120V	215-137
Neon (OTP)	Lamp, Neon, Red, 240V	215-138
S1	Temp, Probe, RTD, 1855 Ohms @ 0°C	200-078
CB1	Circuit Breaker, Magnetic, 1-pole 12A, 120V	215-041
CB1	Circuit Breaker, Magnetic, 2-pole 15A, 240V	215-157
SW1, SW2	Switch, Main Power	215-041
OTP	OTP Safety Hydraulic Thermostat, Immersion, 120V	215-122
OTP	OTP Safety Hydraulic Thermostat, Immersion, 240V	215-185
SW3	Switch, Slide, for Pump High/Low Speed	235-008
D1	Rectifier, 1N4004, 1A, 400V	200-007
C1	Capacitor, Electrolytic, 300uF, 16V	205-035
C2	Capacitor, Tantalum, 1uF, 35V	205-034
R2	Resistor, 100k, ¼ W, 5%, CF (Two used At 240V)	210-107
R3	Resistor, 2.15k, ¼ W, 0.5%, MF	210-160
R4	Resistor, 10m, ¼ W, 5%, CF (Two used at 240V)	210-109
R5, R7	Resistor, 20k, ¼ W, 0.5%, MF (Two used at 240V)	210-111
R6	Resistor, 76k, ¼ W, 1%, MF (Two used at 240V)	210-177
R8, R9	Resistor, 4.7k, 5W, 5%, (Two used at 240V)	210-033
P1	Potentiometer, single turn, 1500V isolation, 5k	230-037

**Cole-Palmer Instrument Company  
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- 1) Power ON/OFF Switch
- 2) Temperature Control
- 3) Over temperature Warning Light
- 4) Heating Indicator
- 5) Heater & Circulating Pump Assembly

