MHB22-E01-A
Sep. 2024

HB22 Heater Breakdown Detector (For Phase-Control Circuit)

Instruction Manual

Thank you for purchasing the Shimaden HB22 Heater Breakdown Detector. Please ensure that this manual is delivered to the end user and read for safety before use.

Introduction

This instruction manual is meant for those who will be involved in wiring, installation, operation and routine maintenance of the HB22.
As this manual describes matters to be attended to in its operation, wiring and installation, you are requested to keep this manual at your work site when using the apparatus. You are also requested to follow the instructions provided herein.
For matters concerning safety, potential damage to equipment and facilities, additional explanation and instructions are given under the following heading:

⚠ WARNING This heading indicates that failure to follow instructions could cause injury or even death.

⚠ CAUTION This heading indicates that failure to follow instructions could cause damage to equipment and/or facilities.

⚠ WARNING

1. This apparatus must be housed, for example, in a control box to prevent the terminal board from coming into accidental physical contact with personnel.
2. Wiring should be carried out without energizing the apparatus. Otherwise, an electric shock is probable.
3. Once wired, do not touch the terminals or other charged parts while they are energized.

⚠ CAUTION

1. The alert mark on the plate affixed to the apparatus:
   On the nameplate affixed to the case of the apparatus, the alert mark is printed. This is to warn you of an electric shock which may result if the charger is touched while it is energized.
2. A means to turn power off, a switch or a breaker, should be installed in the external power circuit to be connected to the power terminals of this apparatus.
3. Note on Fuse
   This apparatus has no built-in fuse. Install a fuse in the power circuit to be connected to the power terminals. (0.5A, normal blow type)
4. In wiring, terminal connectors should be fastened properly.
5. Use power voltage and a frequency respectively within the ranges of their ratings.
6. Do not apply voltage and current which are out of the ranges of their ratings to the input terminals. Such an act may shorten the life of the product or cause trouble with the apparatus.
7. In case the system is equipped with output terminals, current and voltage of a load to be connected to the output terminals should be within the ranges of their ratings. If their ratings are exceeded, a rise in temperature may shorten the life of the product or cause trouble with the apparatus.
8. Be sure to cut the power supply OFF before pulling the apparatus out of its surface socket. Especially in case of using with an external CT, CT may be burnt out by pulling it out.
9. Users are prohibited from remodeling the apparatus or using it in an unauthorized manner.
10. You are requested to adhere to the matters to be attended to as described in the instruction manual in order to use the apparatus safely and correctly and to maintain its reliability.

1. Specifications

Model:	HB22
Power supply:	100 to 240V AC ±10% 50/60Hz
Rated control voltage (Heater voltage):	100, 110, 120, 200, 220, 240 V AC (Either one to be selected.)
Rated frequency:	50/60 Hz
Operation current:	0.5 to 5A AC (Depends on the external CT when the operating current is more than 5A.)
Continuous allowable current:	7A AC
Setting range:	10 to 100% (0.5 to 5A: When input voltage is rated value)
Sensitivity:	Approx. 3% of the current setting value (When input voltage is rated value)
Operation time:	0.5 sec. Max.(In case of the current changes from 150% to 0% of the operating value)
Effect of fluctuation of input voltage:	±5% FS or less of the theoretical value on operating current value with the rated voltage (In a range from 20% to 110% of the input voltage)
Alarm action output:	Relay contact (1c/SPDT)
Contact capacity:	240 V AC, 2A (Resisitive load)
Alarm action display:	Red LED lamp is on during alarm action.
Operating ambient temperature/humidity:	-10 to 50 ℃/90% RH max. (No dew condensation allowed.)
Temperature when kept unused:	-20 to 65 ℃
Insulation resistance:	500V DC 100MΩ Min. between each terminal of the power supply-heater voltage-heater current-alarm output.
Dielectric strength:	1 min. at 1500V AC between each terminal of the power supply-heater voltage-heater current-alarm output.
Material:	ABS resin molding.
External dimensions	H83.5×W50×D146.5mm (including socket terminal block)
Mounting:	11P plug-in panel or DIN rail
Weight:	Approx. 190g

Note: This apparatus is designed for single-phase circuits, that is, unusable for 3-phase circuits.
In case if it is used for a heater of which the amperage exceeds 5A, a CT (current detector) should be installed externally.

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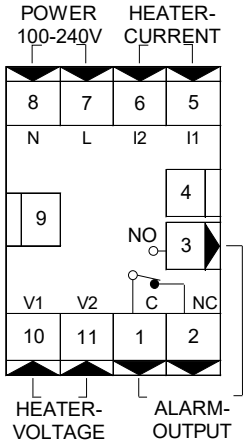
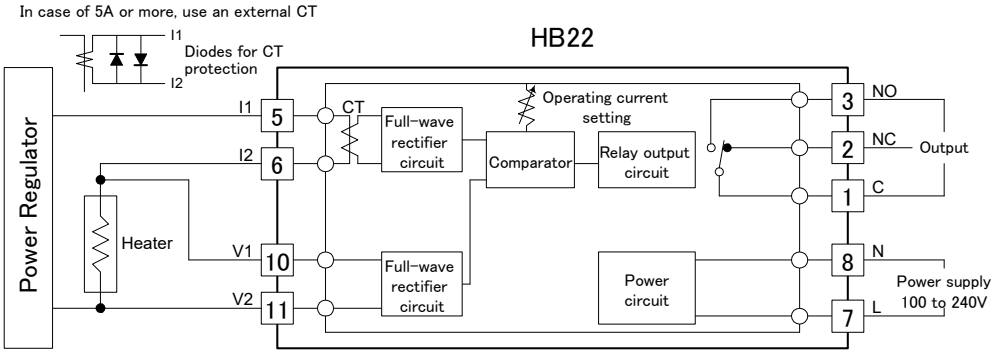
2. List of Model Codes

ITEMS	CODE	SPECIFICATIONS		
1. SERIES	HB22-	Heater Break Alarm For phase-controll circuit 0.5 to 5A		
2. CONTROL VOLTAGE (Heater voltage)		19-	100V AC	±10% 50/60Hz
		20-	110V AC	
		21-	120V AC	
		22-	200V AC	
		23-	220V AC	
		25-	240V AC	
		99-	Others	
3. REMARKS		0	Without	
		9	With	



3. Example of Wiring



⚠ CAUTION

In case of using this apparatus by 5A or higher of operating current, use it with an external CT which meets the load current. When you use the external CT, we recommend using diodes with it to prevent the CT from being burnt out when a power is applied under the situation that the apparatus is removed from the surface socket.
Use diodes of each rated current capacity is 10A.

Note: This apparatus is designed for single-phase circuits. It supports neither 3-phase circuit nor a heater control circuit to be phase-controlled by a thyristor.

4. Setting method

(1) Set the VR of the HB SET at the maximum.

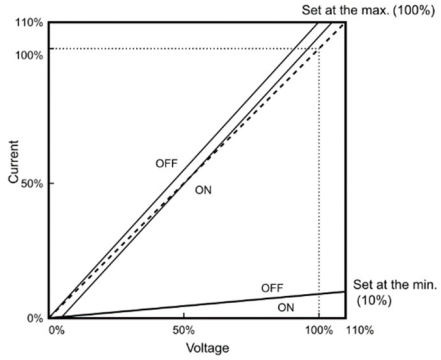
(2) Maximize the voltage to the heater. Then the lamp lights and alarm is output.

(3) Turn the VR of the HB SET to the left gradually and set it at the point where the lamp goes out.

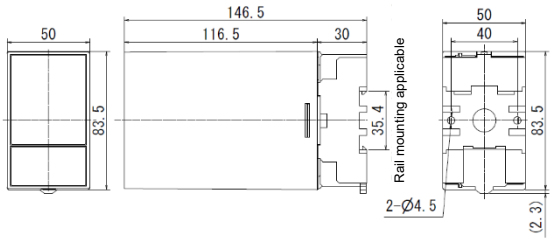
In this condition, detection of a 10% rise of the value of heater resistance (10% decrease of the heater current) is possible.

In the case of a heater in which the value of resistance is variable, set the VR in the middle between the point set in (3) above and the inimum value. The closer to the minimum value is set in this step, the lower the dynamic sensitivity.

5. Diagram of Performance Characteristics



6. External Dimensions



Unit: mm

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PRINTED IN JAPAN