Heater broken alarm
-FAL-10G-
RoHS correspondence

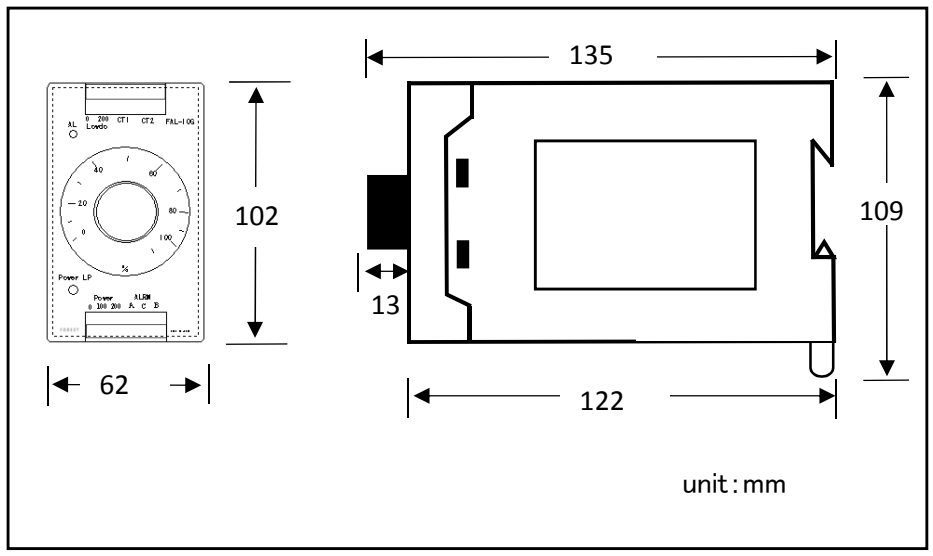
Instruction manual
Specification

FOREST INC.

■Characteristic

- Phase control,ON-OFF control,Zero cross control,etc can be used regardless of the total
- One heater burnout detection in parallel heater
- Detection points can be set arbitararily by dual scale
- When the detection point is reached,"ALARM LP"lights,and an output signal is emitted
- Three phase circuit is also OK with this one
- Panel mounting type(DIN rail only)
- RoHS compliant products

■Dimensions



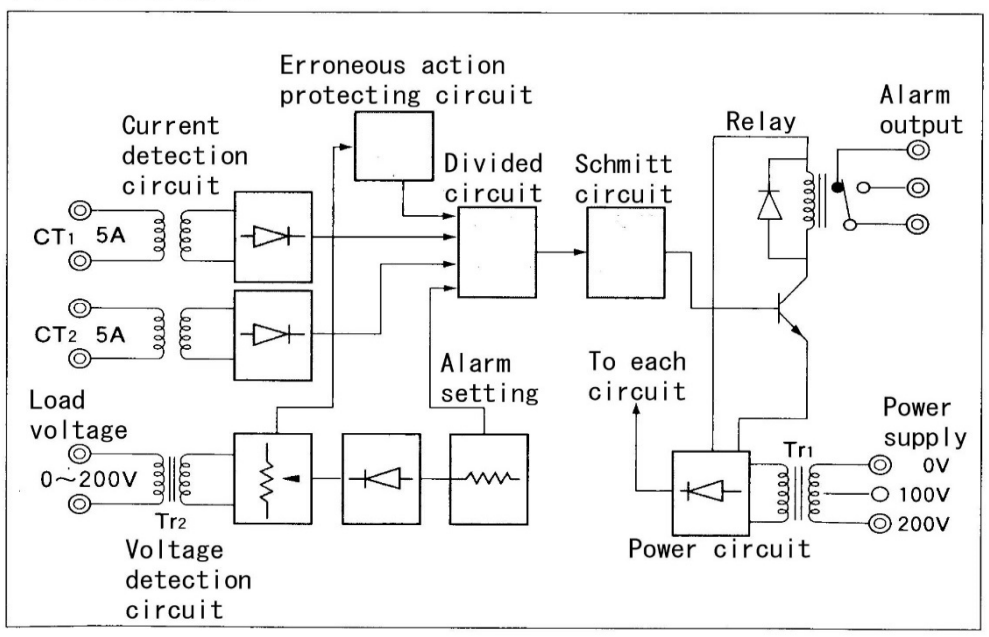
unit：mm

Heater broken alarm FAL-10G＜single phase,three phase dual use＞

■Operating priciple

1. Direct line current of load by current detector (C.T) convert it to voltage, and enter division circuit
2. The line voltage of the load is detected by the voltage detector(Tr2), and, it enters the division circuit through the current setting unit and the alarm setting unit
3. Divide circuit compares and divides both inputs, drives a relay through a Schmitt circuit , and issues an alarm output
4. Since voltage and current are detected even if the power suplly changes both increase and decrease at the same rate. Due to this change no warning will be issued even if the current decrease. Therefore this equipment can be applied even by using a power supply device by thyristor phase control or the like.
5. The malfunction prevention circuit operates when the load voltage is 15% (15V when rated 100V,30V in the case of 200V) or less and the alarm output does not come out.

■ Block diagram



Heater broken alarm FAL-10G＜single phase,three phase dual use＞

■Specification

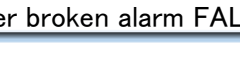
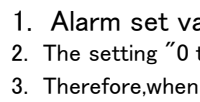
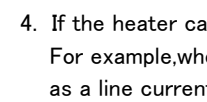
Item name:	Heater broken alarm
Model:	FAL-10G
Installation method:	DIN rail mounting
Installation power supply:	AC100V/200V ±10% 50/60Hz
Load current:	0.3～5A(When exceeding 5A,C.T external attachment)
Load voltage:	0～100V/0～200V
Heater capacity:	0.5KW for AC100V,1φ ┐ Below direct connection
:	1KW for AC200V,1φ ┤ (line current 5A or less)
:	1.7KW for AC200V,3φ ┘ In case other than the avobe C.T use
Adaptive load:	Linearity load such as Nichrome wire
Alarm setting range:	3～100%
Setting precision:	±1.5%(Full scale)
Detection sensitivity:	0.5%(Full scale)
Input:	Phase control, H-L control, Zero cross control
Detection method:	Load current and load voltage
Alarm output:	Relay contact 1C(rated 200V 0.1A resistive load)
Shape:	Inboard mounting(DIN rail only)
Insulation resistance:	50MΩ or more between each input/output terminal (DC 500V mega meter)
Withstand voltage:	Between each input/output terminal AC1500V/1minute
Terms of use:	-10℃～50℃(with no condensation)
Case material:	Polycarbonate PCN-6-3114(gray Flame retardance)
Weight:	490g

※Two connectors ane not included
OMRON"XW4B-06C1-H1"sold separately

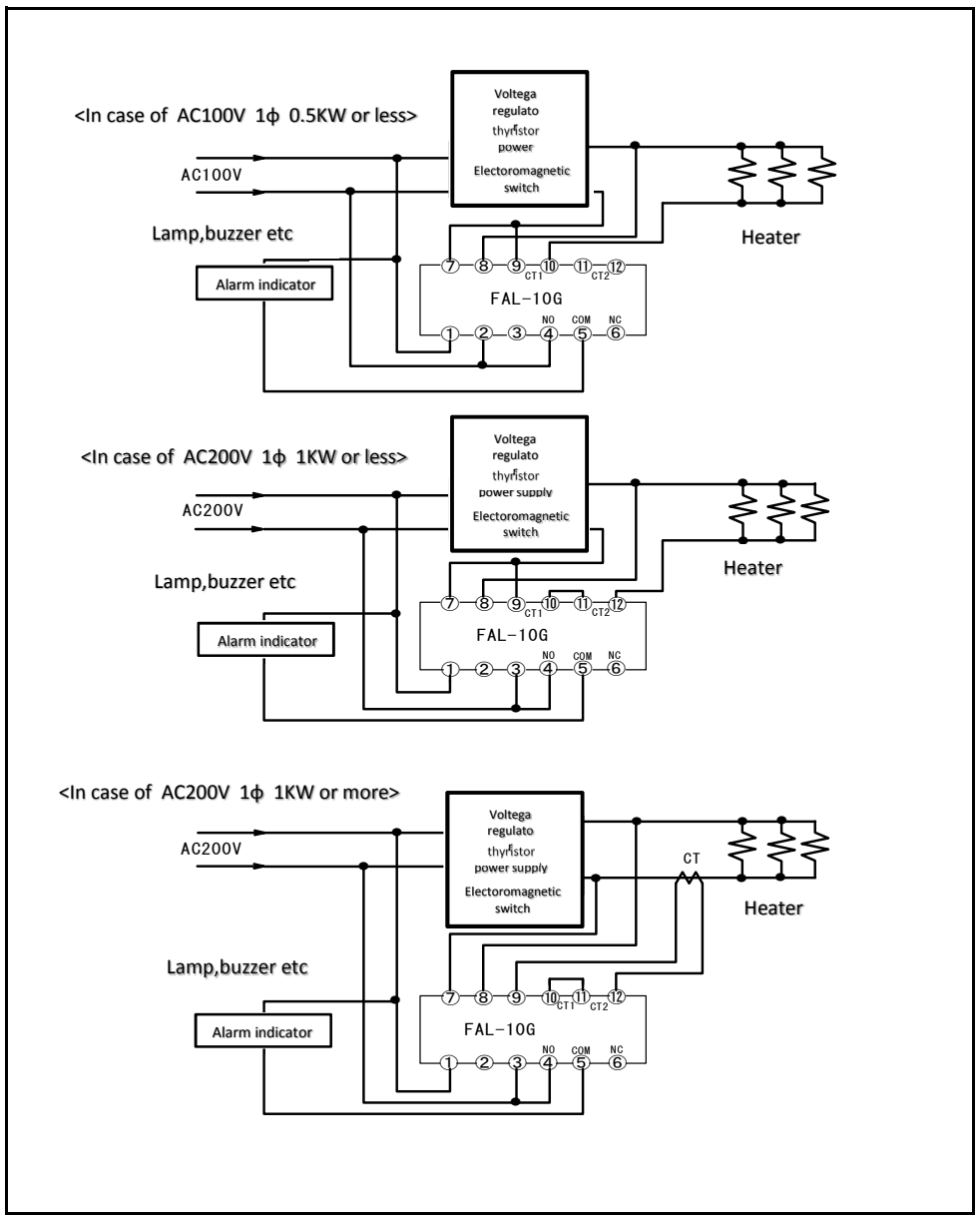
■Setting method

1. Alarm set valueis gratuated with "%"
2. The setting "0 to 100" corresponds to the line current "0 to 5" of the load(heater)
3. Therefore,when the heater capacity is"AC100V 1φ 0.5KW, AC200V 1φ 1KW, AC200V 3φ 1.7KW" the line current is "5A",so"0 to 100% directrly corresponds to 0 to 5A"
4. If the heater capacity is smaller than 3. it becomes as follows.
   For example,when the heater capacity is"AC200V 1φ 0.5KW", it bocomes "2.5A" as a line current and corresponds to 50% of the setting scale.
   ※ If it is set to 51% or more, an alarm will be issued after terning on the power.
   If you wont issue an alarm when "1/10" of all heaters are disconnected, set it between "50 × 9/10 = 45% ∴ 45% to 50%"
   "50×9／10＝45%∴45%～50%"の間に設定します。
5. If the heater capacity larger than 3. it becomes as follow.
   For example,if the heater capacity is "AC200V 3φ 10KW (delta connection)" the line current will be "87A" and C.T will be used.
   Considering the case of using "100/5A" C.T, the secondary side of C.T becomes "4.3A" for the line current "87A", which corresponds to "87%" of the setting scale.
   Therefore use "0 to 87%" setting.
   ※ If you set it to 88% or more, an alarm will be issued after turning on the power.
   If you want to issue an alarm when 1/9 of all heaters are disconnected, set it between "73 and 87%"

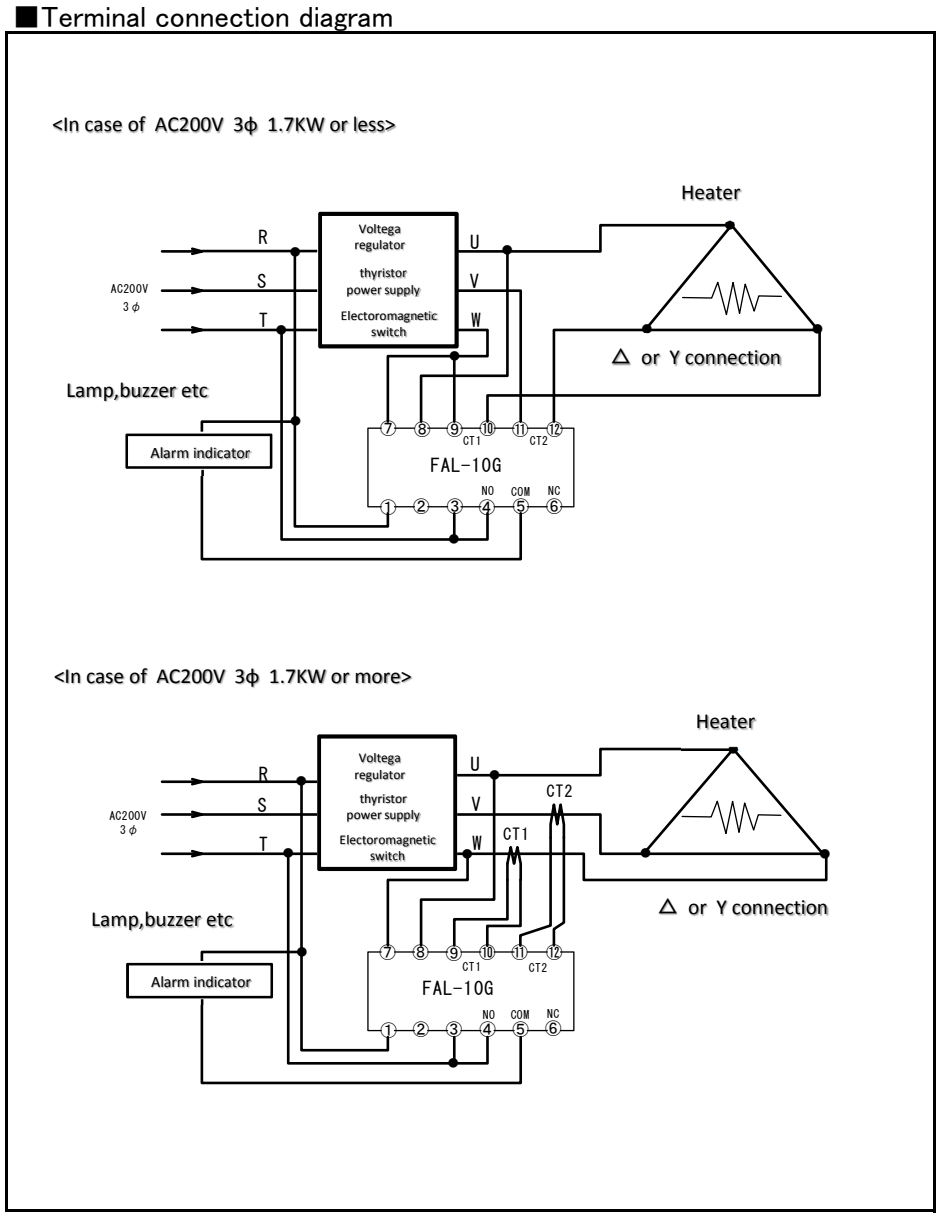
The table below shows the current change rate when one of the heater is disconnected in case of multiple parallel connections under a balanced load.
Please refer to the alarm setting.

Method for connection		n=1	n=2	n=3
1φ 		100%	50%	33%
3φ star connection 	Current reduction rate of disconnected phase	100%	40%	25%
	Current reduction rate of other two phases	13%	8%	5%
3φ delta connection 	Current reduction rate of the two phases connected to the disconnected heater	42%	23%	16%
	Current reduction rate of other phases	0%	0%	0%

■Terminal connection diagram



■Terminal connection diagram



■Business Item

●Heater broken alarm

●DC accumuted ammeter

●Thyristor power reggulator

●Various temperature detection terminals

●Other electronic appliances

Attention	●Please carefully read each item of precautions on use in the catalog or instruction manual and use it propsrly.

ISO9001
Q3223

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