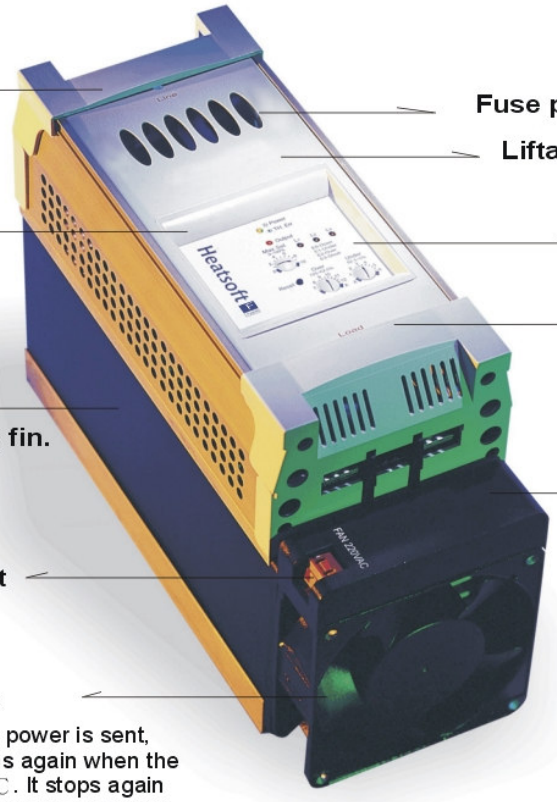
Exterior Description



Line safety protection cover

Fuse protection enclosed

Liftable cover

Cover window

Control Panel

Load safety protection cover

Overheat indicator & protection of cooling fin.

Output stops when temperature>80℃, TH, Err LED indicate

Fan running control box

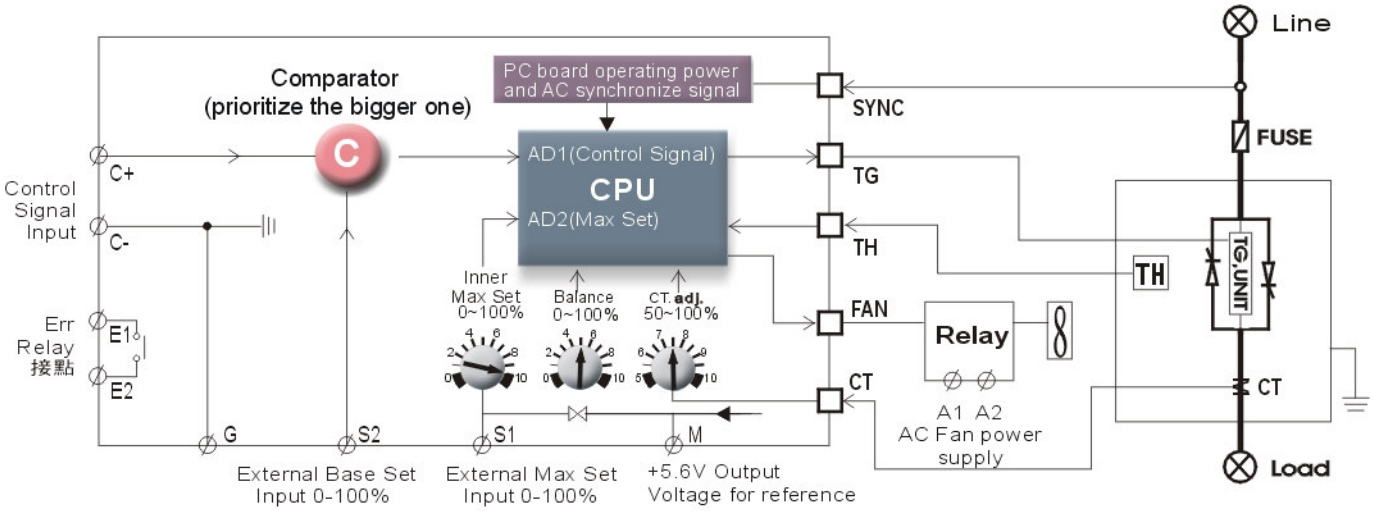
Cooing fan power input AC110/220V

Intelligent Cooling Fan

Fan cooling model. When line power is sent, fan runs for 10 seconds. It runs again when the cooling fin reaches above 55℃. It stops again when it is below 50℃. Press RESET button to repeat the above actions.

Note: The cover can be lifted by pushing the load safety protection cover downwards. For wiring and fuse changing, if it is necessary, the aluminum side-on on top can be pulled open and away down the cover.

Inner Wiring Block Diagram

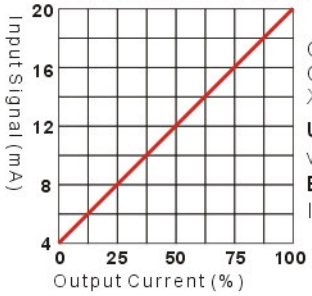


Output % value = Input signal value (C-C+)or Base Set % value (S2) (prioritize the large one) × Max Set % value × External Max Set % value

Output method and available load

Heatsoft-V type can switch between the following two modes:

Fixed current feedback control

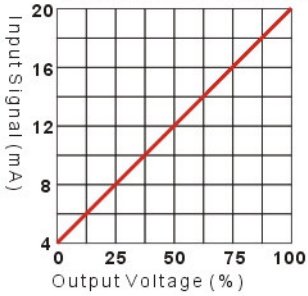


Output Current (A)= Output Current % X CT. ADJ% X Heatsoft-V Rated current

Useable: Fixed resistor、heater、variable、resistor heater.

Ex: Super heater、SIC heater、Infrared tube.

High linearity voltage ratio control



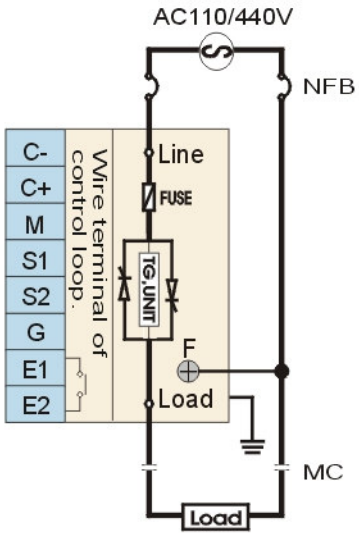
Output Voltage(V)= Output Voltage % X Line Voltage

Useable: General fixed resistor heater.

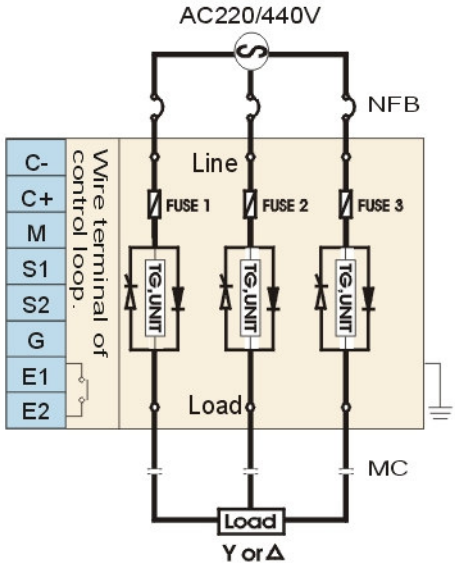
Wiring Diagram and Operation Instruction

- Heatsoft-V type model doesn't need any external auxiliary power. In operation, the PC board is powered by Line. Please ensure that the power voltage is within the operation voltage range.
- Please refer to the load current curve and select appropriate power specifications.
- Please refer to screw tightness chart and fasten Line, Load and power screws of fuse.
- Please install the isolation magnetic switch (MC) on the Load side (not on the Line side). Thus when MC goes off, Line is powered so that exception indicator light can keep glowing.
- Remember to wire F terminal of the single-phase (VB) model. Otherwise the Power LED will not turn on, and thus it is unable to operate.
- Heatsoft-V type model has embedded fuse as the protection against short current. If the fuse has fused, please replace it with another one with the same specification.
- Heatsoft-V type model has an Error Relay output connection. (output capacity: 3A/250V AC, 30V DC Resistive Load). It can be configured as the output for either A or B connection, used as alert or chain protection control.

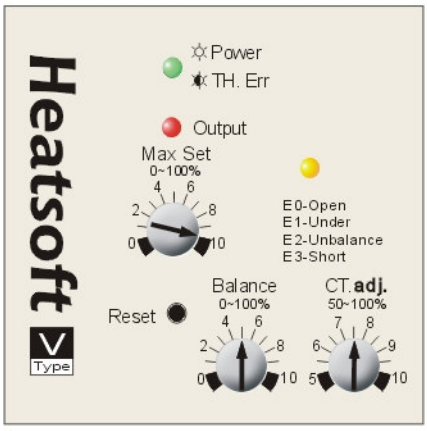
VB 1φ 1 Leg 1 Fuse Double Functions: Zero Crossing, Phase Angle



VG 3φ 3LEG 3FUSE PHASE ANGLE

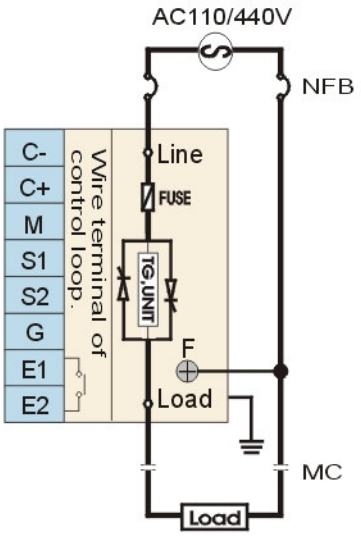


Panel Indicator Lamp and Operating Adjustment Description

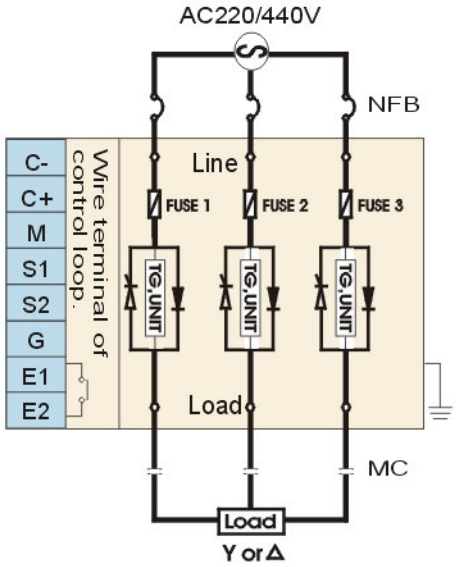


1. Power TH Err --- Indicator lamp (green)
   Green lamp is continuously lightened when line conveys power. It blinks when the cooling fin is overheated or the temperature detector of cooling fin breaks down or disconnected.
2. Output indicator lamp (red) Indicates the output condition of Heatsoft-V.
   ●Phase angle control: Brightness indication. Brighter lamp shows bigger output.
3. Max Set adjusting VR: Internal biggest output value adjusting VR(adjustable with in 0-100%). If the temperature of the facility increases too fast or the designed watt is too high, output % can be lowered with this VR.
4. Reset button manual resume button after unusual condition is resolved. By pressing this button, the machine will restart.
5. Balance configuration VR – It sets the trigger value for three-phase current unbalance Detection.
   Set to 100% - When three-phase current balance value is under 100%, unbalance exception occurs
   Set to 50% - When three-phase current balance value is under 50%, unbalance exception occurs
   Set to 0% - When three-phase current balance value equals 0%, unbalance exception occurs
6. CT adj. configuration VR – Set CT ratio. Alter this VR can change maximum output current and load current under detection threshold of Heatsoft-V. Please calibrate it according to the maximum allowed load current.
   Maximum Output Current (A) = CT adj. configuration VR value (%) x Heatsoft-V Rated Current
7. Error indicator light (yellow) – It indicates the following 4 error messages:
   E0 (Always on) – Load open or Fuse meltdown E1 (one flash) – Load current under
   E2 (two flashes) – Three-phase current unbalance E3 (three flashes) – Thyristor short circuited

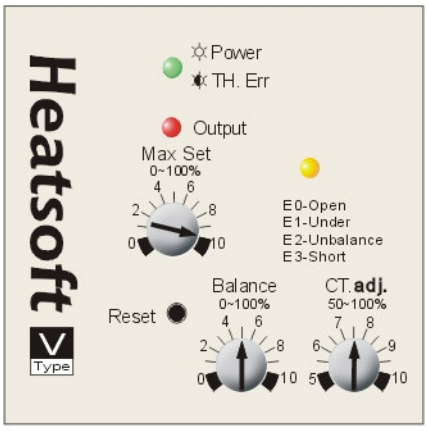
VB 1φ1 Leg 1 Fuse Double Functions: Zero Crossing, Phase Angle



VG 3φ 3LEG 3FUSE PHASE ANGLE



Panel Indicator Lamp and Operating Adjustment Description



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   E2 (two flashes) – Three-phase current unbalance E3 (three flashes) – Thyristor short circuited

Input signal and function switching

◆Lift the Heatsoft-V panel upwards. There are DIP.SW S1~S8 to switch functions on main control PC board.
Setting Code Example: * **APNAA** (Refer to the chart below, arrange 1 2 3 4 in sequence)

① Input Signal	A DC4-20mA	B DC1-5V	C DC2-10V	D DC0-20mA	E DC0-5V	F DC0-10V
S1	ON	OFF	OFF	ON	OFF	OFF
S2	OFF	OFF	ON	OFF	OFF	ON
S8	OFF	OFF	OFF	ON	ON	ON

② Model	S3			
		OFF	V	High linearity voltage ratio control
		ON	I	Fixed current feedback control

③ Output reaction speed	S7					
		Other model	OFF	N	Adjust reaction speed 15 seconds (0-100%), soft start speed 30 seconds (0~100%)	N1
			ON	S	Adjust reaction speed 10 seconds (0-100%), soft start speed 30 seconds (0~100%)	
		Real Time model	OFF	N	Adjust reaction speed 1 second (0-100%), soft start speed 10 seconds (0~100%)	
			ON	S	Adjust reaction speed 10 second (0-100%), soft start speed 30 seconds (0~100%)	

N1. Heatsoft-V will enter buffered boot-up mode automatically at power-on or when the input signal, including BASE SET signal, drop to 0% for more than 60 seconds.

④ Error reset	S6				
	OFF	A	Auto reset	When error happened, Power green lamp flash, after error is cleared, it runs auto reset, (error of heater & thyristor error detection can not run auto reset)
	ON	B	Manual reset	When error was happened, Power green lamp flash, after error is cleared, it must reset manual (press reset key or auxiliary power supply again, to re-start)

N2. When switched to connection B in NC mode, it can detect if LINE is powered. When there's no power in LINE, Relay connection will be closed due to the lack of power. If Relay is open at that time, it's an error signal.

Exception Detection

Exceptions	Indication Light	Output and Relay Connection Status	
		S6 Off Auto Reset	S6 On Manual Reset
Open Open Load or Fuse fused **(N3)**	Yellow Light Always On	Keep updating output. Err. Relay will be enabled for 30 seconds. Auto reset after exception is eliminated.	The red light for output goes off. Output is suspended. Err. Relay is enabled. You have to reboot or press Reset button to reset.
Under Load current under load (N4)	Yellow Light One Flash	Keep updating output. Err. Relay is enabled. Auto reset after exception is eliminated.	
Over Load current under load	Yellow Light One Flash	The red light for output goes off. Output is suspended. Relay is enabled. You have to reboot or press Reset button to reset.	
Short Thyristor shorted	Yellow Light Three Flashes		
TH Err. Heat sink overheat at >80℃	Yellow Light Flashing	The red light for output goes off. Output is suspended. Err. Relay is enabled. Auto reset after the temperature of the heat sink drops below 75℃	

(N3) There has to be open circuit in two phases for a three-phase model. It will be defined as "unbalance exception" if there's only one-phase open circuit.

(N4) Load Current Underload Detection Function is only available in Fixed Current Control mode. Load Current Underload occurs when the output voltage of Heatsoft-V reaches 100% while the load current is under expected value. Increasing load power, decreasing input signal magnitude or lowering CT ADJ. value (%) can solve this exception.

Output Modes and Appropriate Load

Linear type phase angle

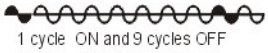
10%  50%  90% 

High power stability, stable output, ampere meter runs stably. But, there is one harmonic interruption for every half wave. Weaker in power factor COSθ.

Features of heating / Fixed resistor heater, variable resistor heater, and inductive load (Special requirement when making order)

Application/ Vacuum furnace, high temperature box furnace, lighting control, infrared tube. A facility with fast and sensitive in temperature changes

Distribute type zero crossing

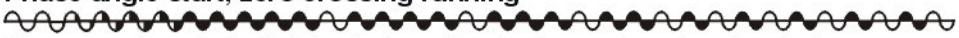
10% 
1 cycle ON and 9 cycles OFF

50% 
1 cycle ON and 1 cycle OFF continuously

90% 
9 cycles ON and 1 cycle OFF

Zero crossing control is in the unit of a whole wave. Without component of half wave, highest power factor COSθ can be reached, saving power and no interruption of harmonics.

Phase angle start, zero crossing running



After progressive output soft start under low voltage in phase angle mode, automatically switched to the zero crossing output mode to swiftly adjust temperature.
This control mode combines the advantages of phase angle and zero crossing control, enabling phase angle soft start to protect heater and also featuring low power consumption and interruption free in zero crossing.

Features of heating element

CR heating element (cannot be used for impedance, rheostat heating element and inductive load that follow rapid temperature changes)

Application

Constant temperature control. General heating, baking oven, heat treat furnace, plodding machine, injection machine)

★**The control precision of the above output modes is accurately calculated. High linear is available ±1%, resolution is 0.4%, 0-99% of output range, and posses intelligent soft start function (Refer to P5~N1).**

Model no. Identification

F Type

Model No.	Type Number	Main power supply voltage	Auxi. Power supply	Rated current
F	B	2	0	750

F Type

B–1φ 1 leg Zero Crossing, Phase Angle
D–3φ 2 legs Zero Crossing,
F--3φ 3 legs Zero Crossing,
G--3φ 3 legs Phase Angle

1-- 95~125VAC
2--180~250VAC
4--330~480VAC

FB 160A model,
FD 60A,80A models and
FG all models
Main power rated voltage are:
1--100~120VAC
2--200~240VAC
3--340~420VAC
4--400~480VAC

Note.1

0–NA
1–AC110V ±10%
2–AC220V ±10%

025-- 25A
035-- 35A
045- 45A
060-- 60A
080-- 80A
100--100A
125--125A
160--160A
225--225A
300--300A
400--400A
560--560A
750--750A

K Type

Model No.	Type Number	Main power supply voltage	Auxi. Power supply	Rated current
K	D	4	2	750

K Type

D--1ϕ 1 leg Zero Crossing, Phase Angle
D--3ϕ 2 legs Zero Crossing,
F--3ϕ 3 legs Zero Crossing,

1-- 95~125VAC
2--180~250VAC
4--330~480VAC

KB 160A model,
Main power rated voltage are:
1--100~120VAC
2--200~240VAC
3--340~420VAC
4--400~480VAC

Note.1
註1

0--NA
1--AC110V ±10%
2--AC220V ±10%

015-- 15A
025-- 25A
035-- 35A
045- 45A
060-- 60A
080-- 80A
100--100A
125--125A
160--160A
225--225A
300--300A
400--400A
560--560A
750--750A

V Type

Model No.	Type Number	Main power supply voltage	Auxi. Power supply	Rated current
V	G	3	2	750

V Type

B--1ϕ 1 leg Phase Angle

G--3ϕ 3 legs Phase Angle

1--100~120VAC
2--200~240VAC
3--340~420VAC
4--400~480VAC

Note.1

0--NA
1--AC110V ±10%
2--AC220V ±10%

015-- 15A
025-- 25A
035-- 35A
045- 45A
060-- 60A
080-- 80A
100--100A
125--125A
160--160A
225--225A
300--300A
400--400A
560--560A
750--750A

Note.1 For those models using compulsive cooling fans (please refer to the "cooling method" column in the shape/size table), ones with LINE voltage differ from AC 110V or AC 220V must equip with an external AC power for cooling fans.

Various of rated current			Case	Length (mm)	Width (mm)	Height (mm)	Weight (kg)	Power and Fuse screw fasten torque		Cooling Type
1Ø VB type	AC110 & 220V	15,25,35A	A	195	80	123	1.2	M6	35~50KGfCM	Natural cooling
		45A	A	195	80	136	1.5	M6	50~60	
		60A	C	195	80	178	2.0	M6	60~70	
		80A	E	195	80	220	3.2	M6	70~80	
	AC380 & 440V	15,25,35A	A	217	80	123	1.4	M6	35~50	
		45A	A	217	80	136	1.8	M6	50~60	
		60A	C	217	80	178	2.4	M6	60~70	
		80A	E	217	80	220	3.8	M6	70~80	
		100A	E	217	80	220	3.8	M6	80~90	
		125A	E	270	80	243	4.2	M8	150~170	
		160A	F	305	80	243	4.7	M8	180~200	DC FAN X1
		225A	G	316	120	243	7.6	M10	240~260	AC FAN X1
		300A	H	370	120	243	9.0	M10	260~280	
		400A	H	370	120	243	9.8	M10X2	260~280	
		560A	H	436	120	243	12	M10X2	280~300	
		750A	H	558	120	243	15	M10X2	300~320	
3Ø 3 Legs VG type	AC110 & 220V	15A,25A	B	195	120	145	2.3	M6	35~40	Natural cooling
		35A	D	195	120	188	3.3	M6	40~50	
	AC380 & 440V	15A,25A	B	217	120	145	2.5	M6	35~40	
		35A	D	217	120	188	3.6	M6	40~50	
		45A	D	217	120	243	5.6	M6	50~60	
		60A	G	263	120	243	7.0	M6	60~70	AC FAN X1
		80A	G	263	120	243	7.0	M6	70~80	
		100A	G	316	120	223	7.8	M6	80~90	
		125A	H	370	120	243	9.5	M8	150~170	
		160A	I	316	240	243	14	M8	180~200	AC FAN X2
		225A	I	370	240	243	18	M10	240~260	
		300A	I	370	240	243	20	M10	260~280	
		400A	J	370	360	243	28	M10X2	260~280	AC FANX3
		560A	J	436	360	243	36	M10X2	280~300	
		750A	J	558	360	243	45	M10X2	300~320	

DC FAN--80x80x25mm DC12V 165mA
AC FAN--120x120x38mm AC110V 250mA/AC220V 125mA


FOCUS
G
H
I
J
B
D
F
E
A
C