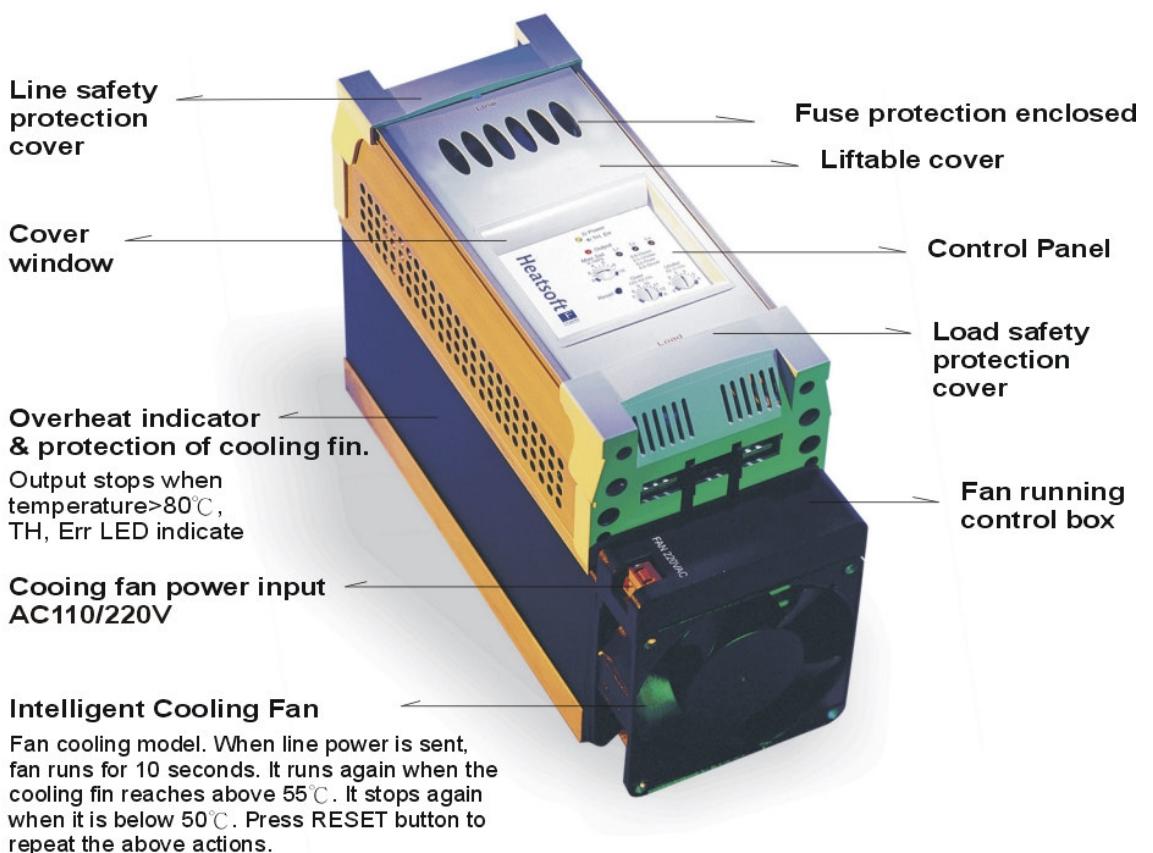


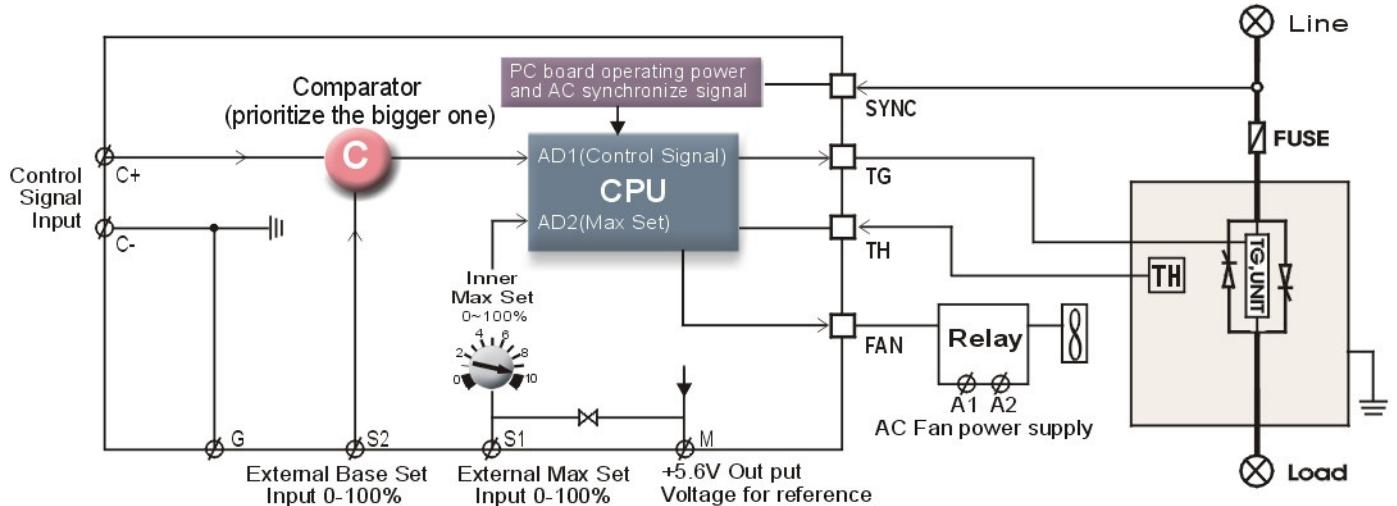
Exterior Description



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.



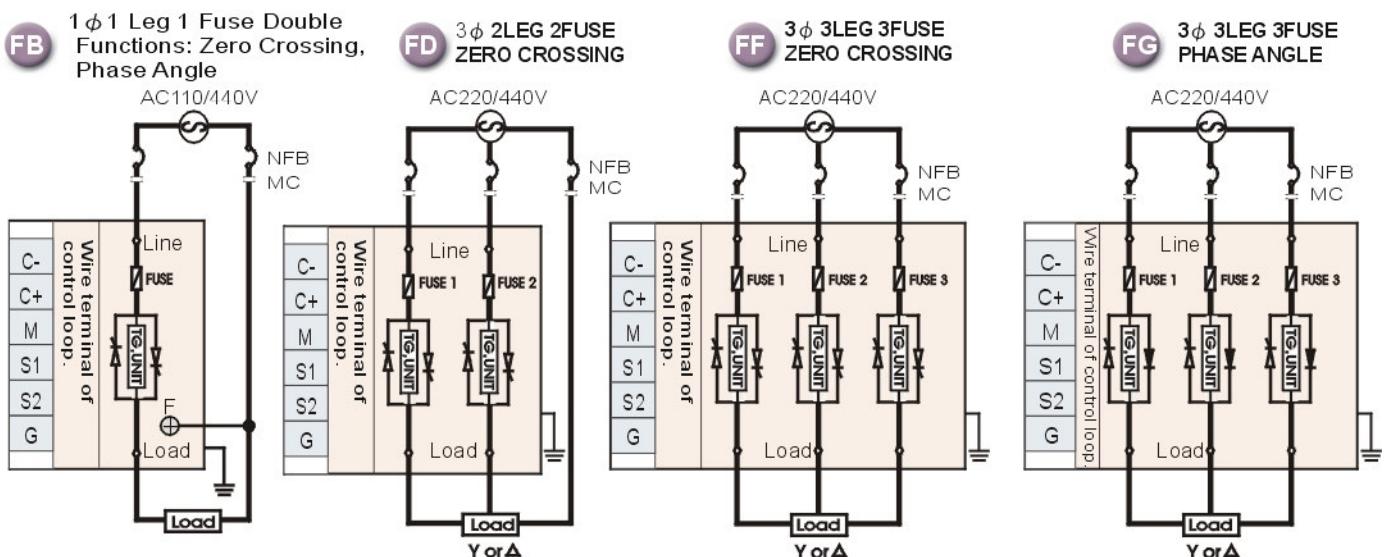
Inner Wiring Block Diagram



$$\text{Output \% value} = \frac{\text{Input signal value } (C - C +) \text{ or} \\ \text{Base Set \% value } (S2)}{\text{(prioritize the large one)}} \times \text{Max Set \% value} \times \text{External Max Set \% value}$$

Wiring Diagram and Operation Instruction

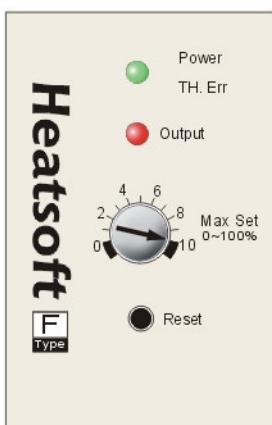
- Heatsoft doesn't need any supplementary power. PC board operating power is supplied by Line. Please ensure that power voltage matches the usage ranges.
- Please refer to load current curve, select the appropriate power specifications.
- Please refer to screw tightness chart. Fasten Line, Load and power screw of fuse.
- Remember to do the wiring for Single-phase (FB model) F terminal. Otherwise, the Power light is not on and unable to operate. There is fuse enclosed with Heatsoft-F type as for short circuit protection. When fuse fusing, please change the fuse of same specification. For three-phase (FD, FF, FG) models, when there is just one fuse fusing, output is done with single-phase power.





Type

Panel Indicator Lamp and Operating Adjustment Description



1. Power --- Indicator lamp (green)
 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-F.
• Zero crossing control: Blinking indication.
The lamp blinks faster, the output is bigger.
• Phase angle control: Brightness indication. Brighter lamp shows bigger output.
3. Max Set adjusting VR: Internal biggest output adjusting VR (adjustable within 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.

Input signal and function switching

Setting Code Example: *APNA (Refer to the chart below, arrange ① ② ③ ④ in sequence)

◆ Lift the Heatsoft-F panel upwards. There are DIP.SW S1~S8 to switch functions on main control PC board. The main control board PBF01, PBF02 use on 3φ zero crossing phase angle and 3φ zero crossing models. PBF03 use on 3φ phase angle model.

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	PBF01、PBF02					PBF03	
	FB			FD	FF	FG	
	P 1φ 1W phase angle (standard mode)	R 1φ 1W phase angle (Real Time model)	Y 1φ 1W Phase angle start, zero crossing running	Z 1φ 1W zero crossing	Z 3φ 3W zero crossing	Z 3φ 3W zero crossing	P 3φ 3W phase angle (Standard mode)
S3	ON	OFF	OFF	OFF	OFF	OFF	ON
S4	OFF	ON	ON	OFF	OFF	N/A	
S5	OFF	ON	OFF	ON	OFF	ON	

③ Output reaction speed	S7	Other model	OFF	N	Adjust reaction speed 0.6 seconds (0-100%), soft start speed 8 seconds (0~100%)	N1
			ON	S	Adjust reaction speed 10 seconds (0-100%), soft start speed 30 seconds (0~100%)	
		Real Time model	OFF	Q	Adjust reaction speed 0.1 second (0-100%), no soft start function	N1
			ON	R	Adjust reaction speed 0.1 second (0-100%), soft start speed 8 seconds (0~100%)	

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 or thyristor error detection can not run auto reset)	N1
		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)	

Soft Start

At N1 Heatsoft-F initial startup or signal input (include BASE SET signal), it enters into soft start mode automatically when it drops to 0% for more than 60 seconds as to protect heating element.

Output Modes and Appropriate Load

● Linear type phase angle



High power stability, stable output, ampere meter runs stably. But, there is one harmonic interruption for every half wave. Weaker in power factor $\text{COS}\theta$.

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



Zero crossing control is in the unit of a whole wave. Without component of half wave, highest power factor $\text{COS}\theta$ 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 $\pm 1\%$, 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	FB 160A model, FD 60A,80A models and FG all models	1-- 95~125VAC 2--180~250VAC 4--330~480VAC	0-NA 1-AC110V $\pm 10\%$ 2-AC220V $\pm 10\%$	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
D-3φ 2 legs Zero Crossing,	Main power rated voltage are:		Note.1	
F-3φ 3 legs Zero Crossing,	1--100~120VAC 2--200~240VAC 3--340~420VAC 4--400~480VAC			
G-3φ 3 legs Phase Angle				



Outer dimension and Power screw torque table.

Various of rated current		Case	Length (mm)	Width (mm)	Height (mm)	Weight (kg)	Power and Fuse screw fasten torque		Cooling Type
1φ FB type	25A,35A	A	195	80	123	1.2	M6	40~50 KGfCM	Natural cooling
	45A	A	195	80	136	1.5	M6	50~60	
	60A	C	195	80	178	2.0	M6	50~60	
	80A	E	195	80	220	3.2	M6	70~80	
	100A	E	217	80	220	3.8	M6	80~90	
	125A	E	270	80	220	4.2	M8	150~170	
	160A	F	305	80	220	4.6	M8	180~200	
	225A	G	316	120	243	7.6	M10	240~260	
	300A	H	370	120	243	9.0	M10	260~280	
	400A	H	370	120	243	9.8	M10X2	260~280	
3φ 2 Legs FD type	560A	H	436	120	243	12	M10X2	280~300	AC FAN X1
	750A	H	558	120	243	15	M10X2	300~320	
	25A	A	195	80	136	1.5	M6	35~40 KGfCM	
	35A	C	195	80	178	2.0	M6	40~50	
	45A	E	195	80	220	3.2	M6	50~60	
	60A	F	230	80	220	3.4	M6	60~70	
	80A	F	230	80	220	3.4	M6	70~80	
	100A	G	240	120	223	6.0	M6	80~90	
	AC110& 220V	125A	G	263	120	223	6.0	M6	90~100
	AC380& 440V	125A		316	120	223	7.5	M8	170~200
3φ 3 Legs FF.FG type	225A	H	436	120	243	12	M10	240~260	AC FAN X2
	300A	I	370	240	243	17	M10	260~280	
	400A	I	370	240	243	19	M10X2	260~280	
	560A	I	436	240	243	24	M10X2	280~300	
	750A	I	558	240	243	30	M10X2	300~320	
	25A	B	195	120	125	2.2	M6	35~40	
	35A	D	195	120	168	3.2	M6	40~50	
	45A	D	195	120	223	5.0	M6	50~60	
	60A	G	240	120	223	5.8	M6	60~70	
	80A	G	263	120	223	6.2	M6	70~80	
3φ 3 Legs FF.FG type	100A	G	316	120	223	7.6	M6	80~90	AC FAN X1
	125A	H	370	120	223	9.3	M8	150~170	
	160A	I	316	240	243	14	M8	180~200	
	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	
	560A	J	436	360	243	36	M10X2	280~300	
	750A	J	558	360	243	45	M10X2	300~320	AC FAN X3

DC FAN---80x80x25mm DC12V 165mA

AC FAN---120x120x38mm AC110V 250mA/AC220V 125mA

