

OZthermTM

Digital Power Controller

F-330

3 PHASE S.C.R. CONTROLLER

*

**FEATURING
PHASE ANGLE SWITCHING
FOR CONTROL OF
AC OR DC
OUTPUT**

*

DESIGNED
and
MANUFACTURED
by

Fastron
TECHNOLOGIES PTY. LTD.

Fastron first released their " X " Series of S.C.R. Power Controllers in 1980, progressively developing over 20 different models and selling over 1000 controllers worldwide.

These controllers were primarily designed as custom built, open frame, OEM assemblies sold directly to equipment manufacturers.

The **OZtherm™** range of controllers capitalize on our experience in this field to provide a reliable and robust design housed in a series of standard assemblies and enclosures.

- F100 SERIES** Contactors utilizing CRYDOM solid state relays mounted on a Heat Sink Assembly with fuses and transient suppressors.
- F200 SERIES** Solid State Contactors utilizing S.C.R.'s and control card mounted in standard enclosures.
- F300 SERIES** Phase Angle Controllers utilizing S.C.R.'s and control card mounted in standard enclosure`s
- F400 SERIES** Burst Controllers, similar to F300 in construction, featuring fast cycle, zero cross switching.

BENEFITS OF THE **OZtherm™** F330 PHASE ANGLE CONTROLLER

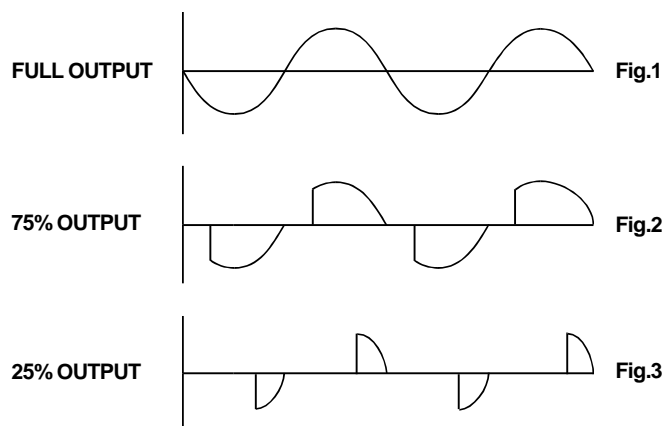
- Continuously variable control, 0 - 100%
- Digital Control eliminates the D.C offset into transformer loads which is commonly found on inferior controllers.
This also provides more precise and stable control whilst minimizing nuisance tripping of circuit breakers and blowing of fuses due to transformer saturation.
- Wide range of standard options to suit many applications
- Proudly Australian Designed and Manufactured in our Melbourne factory enabling us to provide complete local support for customer applications, engineering and service.

PHASE ANGLE SWITCHING

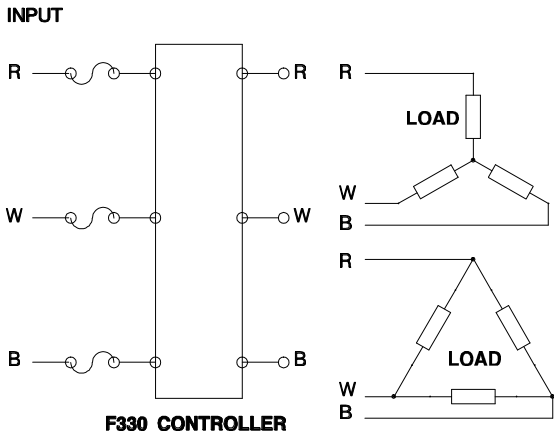
Phase Angle Control provides continuously variable power to the load.

The firing of the thyristors is determined by the controler circuitry which causes the thyristors to conduct for part of the A.C supply cycle. **Fig.2** shows the voltage waveform at 75% and **Fig.3** 25% for A.C loads.

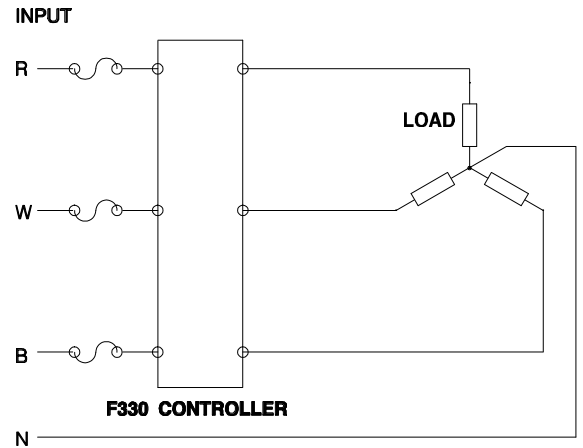
The more power that is required, the more the conduction angle is increased until 100% power when the full cycle is conducting. **Fig.1**



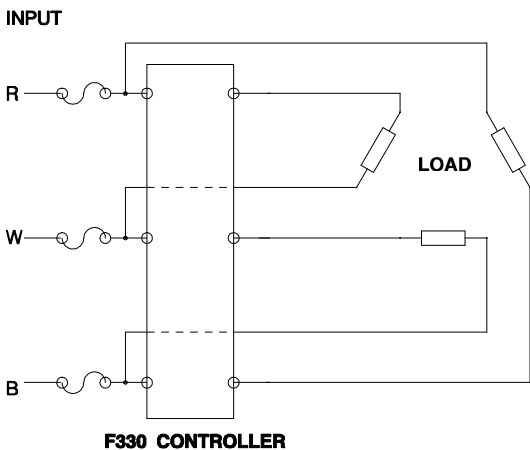
CIRCUIT CONFIGURATIONS



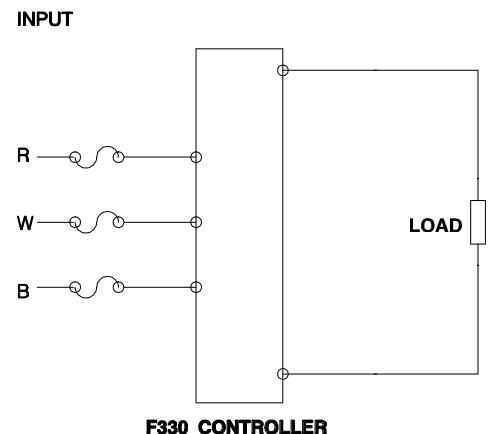
3 WIRE STAR OR DELTA



4 WIRE STAR



6 WIRE OPEN DELTA



3 PHASE D.C BRIDGE

APPLICATION LOAD / OPTION SELECTION

(Table 1)

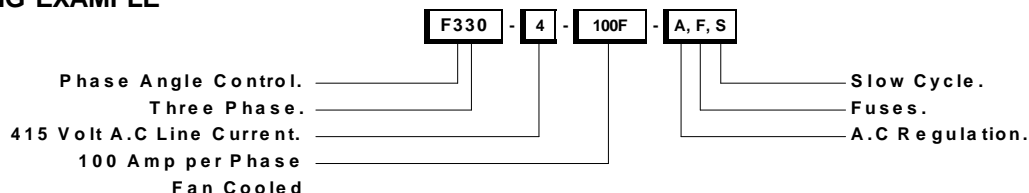
Series Name	Primary Control of Transformer	Number	Applicable Load	Option Selection
F330	YES	1	Load where resistance does not change. (Nichrome, Iron-chrome, Kanthal, etc.)	Standard type C option
		2	Load where resistance changes with temperature. (Tungsten, Molybdenum, Kanthal super and D.C plating rectifiers)	CC option
		3	Load where resistance changes over the elements lifetime. (Silicon Carbide, etc)	PW option
		4	Load which has peak in rush current. (Tungsten Halogen Lamp, Far infrared lamp etc.)	C option
		5	Battery Chargers and regulated D.C supplies.	C option

Option A. will add improved control to (1) and (4) (Refer Table 2 and 3 for Option Details)
 Option D. will add improved control to (5)

F330 -				DESCRIPTION	Fuse Rating	Case Size	Weight KG	Cable Termination mm ²	Dissipation Watts	I ² t Thyristor Rating
Line Voltage	1			110 volt A.C line input						
	2			240 volt A.C line input						
	4			415 volt A.C line input						
Rated Current at 50 deg. Celcius.		20		20 amperes A.C line current	25	fig.5	10	2.5 - 6.	119	610
		30		30 amperes A.C line current	35	fig.5	10	2.5 - 6.	134	2,300
		40		40 amperes A.C line current	45	fig.5	10	10 - 16.	165	5,000
		50		50 amperes A.C line current	55	fig.5	10	10 - 16.	188	9,100
		70		70 amperes A.C line current	75	fig.5	10	10 - 25.	232	16,200
		80		80 amperes A.C line current	90	fig.5	10	10 - 25.	241	97,000
		100F		100 amperes A.C line current - fan	100	fig.6	12	M6 bolt	333	16,200
		120		120 amperes A.C line current	125	fig.7	26	M10 bolt	393	24,000
		130		130 amperes A.C line current	150	fig.7	26	M10 bolt	386	97,000
		150F		150 amperes A.C line current - fan	150	fig.7	28	M10 bolt	505	24,000
		150		150 amperes A.C line current	175	fig.7	26	M10 bolt	502	168,000
		175		175 amperes A.C line current	200	fig.7	26	M10 bolt	482	245,000
		200F		200 amperes A.C line current - fan	250	fig.7	28	M10 bolt	657	84,000
		240F		240 amperes A.C line current - fan	250	fig.7	28	M12 bolt	755	97,000
		280F		280 amperes A.C line current - fan	300	fig.7	28	M12 bolt	995	168,000
		340F		340 amperes A.C line current - fan	375	fig.7	28	M12 bolt	1016	245,000
		400F		400 amperes A.C line current - fan	400	fig.8	60	M10 bolt	1600	106,000
		500F		500 amperes A.C line current - fan	500	fig.8	60	M10 bolt	1780	238,000
		650F		650 amperes A.C line current - fan	350x2	fig.8	60	M10 bolt	2384	781,000
	750F		750 amperes A.C line current - fan	400x2	fig.8	60	M10 bolt	2479	2x10 ⁶	
	900F		900 amperes A.C line current - fan	500x2	fig.9	98	M10 bolt	3523	781,000	
	1100F		1100 amperes A.C line current - fan	600x2	fig.9	98	M10 bolt	3810	2x10 ⁶	

Options.		
A	A.C. Voltage regulation.	
C	Current limit and trip.	A.C. current measurement.
CC	Voltage limit and current trip. Current source	A.C. current measurement.
CCE	Voltage limit and current trip. Current source.	D.C. current measurement.
CE	Current limit and trip.	D.C. current measurement.
D	D.C. Voltage regulation.	
DE	D.C. Voltage regulation.	
DS	Demand sharing.	
F	High speed fuses.	
FW	4 wire load.	Three phase and neutral.
MD	Meter output of input control signal.	
MI	Meter output of average current.	Requires C, CC, CCE or CE option.
MP	Meter output of average power.	Requires PW option.
MV	Meter output of average voltage.	Requires A, D or DE option.
PH	Phase loss output.	
PW	Power limit.	Requires A and C option.
S	Slow cycle.	
T	Thermal cutout.	Standard on fan models.

ORDERING EXAMPLE

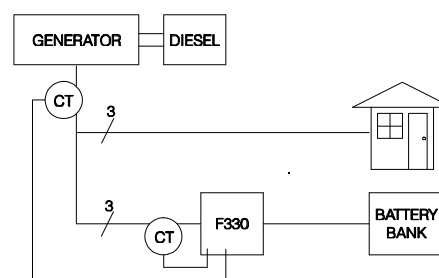


DESCRIPTION OF OPTIONS (Table 3)

OPTION	DESCRIPTION	APPLICATION
A	Regulates output voltage when input voltage fluctuates. The red / white output voltage is monitored.	Used where significant supply fluctuations can cause;- nuisance current limit / trip operation; excessive power to the load and erratic control.
C	Maintains current output to a predetermined level for A.C systems. Current limit can be set by internal or external potentiometer. LED indicates current limit operation. Current trip is adjustable " on board " and volt free output contact is provided for external indication. The trip function inhibits operation until manually reset. (A.C. Current transformers supplied loose.)	Typically used with constant resistance and transformer loads. Reduces output to match and protect lower rated loads. (Control input controls output voltage)
CC	Current source operation. Voltage limit and current trip independently adjustable by internal potentiometer. Maintains constant current under variable resistance loads for A.C systems. (A.C. Current transformers supplied loose.)	Particularly suitable for plating rectifiers via primary A.C transformers. (Control input controls output current)
CCE	Similar to CC. option but for use with D.C systems. (D.C. Hall Effect Sensor not included.)	
CE	Similar to C. option but used with D.C systems. (D.C. Hall Effect Sensor not included)	
D	Regulates D.C output voltage when the input voltage fluctuates Effective for loads from 20% - 100% of rated output voltage.	Used for D.C supplies such as battery charger applications with constant output.
DE	Similar to D. option but effective for loads from 0% - 100% of rated output voltage, using a Hall Effect Voltage Sensor. (Not included)	
DS	An adjustable auxiliary current limit which operates when an external load monitored by a current transformer exceeds a preset level. (Current Transformer not included)	Especially useful for generator load sharing in remote area power supplies. See fig.4

Fig. 4

If the house draws too much load from the supply the OZTHERM Power Controller reduces the battery charging current so as not to overload the generator.



OPTION	DESCRIPTION	APPLICATION
F	Supplied loose with isolated stand-offs for external mounting.	
FW	This option must be specified when the load is a three phase plus neutral configuration.	
MD	0 -1 milliamp retransmission of input control signal.	Suitable for 1 milliamp moving coil meter.
MI	Single 0 -1 milliamp D.C output signal proportional to the average of the summation of the output current of each of the three phases.	Suitable for 1 milliamp moving coil meter.
MP	Similar to MI. option but indicating average red / white output power (VA).	Suitable for 1 milliamp moving coil meter.
MV	Similar to MI. option but indicating average red / white output voltage.	Suitable for 1 milliamp moving coil meter.
PH	For indication of loss of a phase including momentary loss. A latched volt free contact is provided which will stay latched until manually reset.	
PW	Red / White phase is monitored to maintain a preset average VA limit, common to all three phases. A balanced load and a unity power factor is assumed. (This function can be used on current source or D.C. systems. Consult factory.)	Designed for critical loads such as silicon carbide elements which require a watts density limit for maximizing element life.
S	A slow cycle form of control providing " bursts " of full power to the load on a time proportioning basis as set by the control signal. Phase angle ramp up and down is standard.	Suitable for applications where supply harmonics generated by phase angle switching needs to be minimized.
T	Thermal switches are mounted on the heatsink to ensure the controller is shut off, and automatically resets when an over temperature condition is reached within the unit. This option is standard on fan cooled units. It automatically resets when temperature falls below the trip level.	

PLEASE NOTE;- If your application requires the Power Controller to function differently to our standard specifications or you are uncertain about the choice of options please contact the factory.

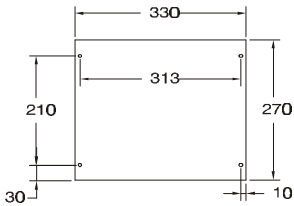
STANDARD SPECIFICATIONS (Table 4)



Control Mode	Phase angle. (soft start provided as standard)
Control Range	0 - 100%
Maximum Current	20 - 1100 amperes per phase (higher currents available on request)
Power Supply	110/240/415 volts A.C . 50 HZ. +/- 10% (60 HZ. and other voltages available on request)
Transient Protection	Internal R.C snubber 68 ohms / .1 micro-farad
Control Input	4 - 20 milliamps (receiving impedance 100 ohms) 0 - 10 volts (receiving impedance 10K ohms) 10K ohms potentiometer
Adjustments	Ramp (soft start time) 1-20 seconds Zero (- 20% to +20%) ; span (0 - full scale)
Ambient Temperature	0 - 50 degrees Celsius (Maximum temperature of cooling air)
Ambient Humidity	0 - 85% relative humidity
Power Factor	Unity

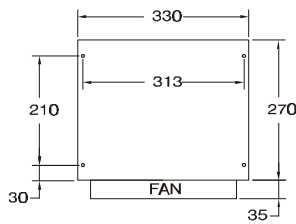
DIMENSIONS / MOUNTING DETAILS

Shown mounted vertically in cabinet



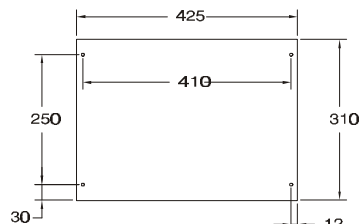
DEPTH 226mm
M6 MOUNT

Fig.5



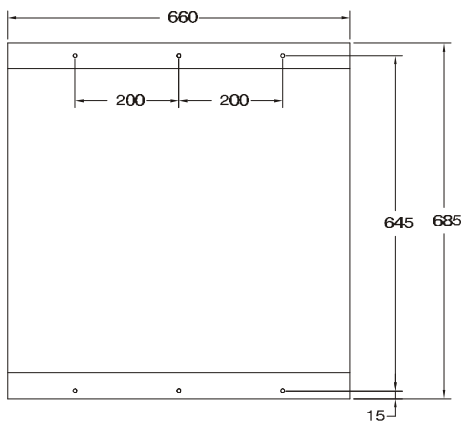
DEPTH 226mm
M6 MOUNT

Fig.6



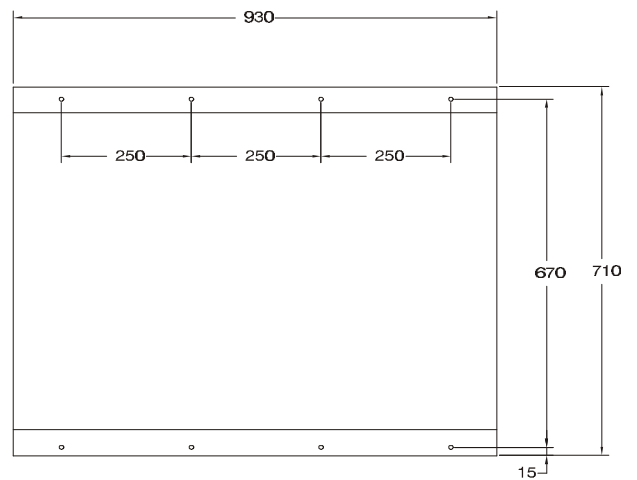
DEPTH 336mm
M6 MOUNT

Fig.7



DEPTH 400mm
M8 MOUNT

Fig.8



DEPTH 465mm
M8 MOUNT

Fig.9

FASTRON TECHNOLOGIES PTY LTD reserve the right to modify the design without notice.



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