iPAK 600AW HV water cooled resistance welding inverter.

Typical Configurations:

Inverter module ready to be integrated into your existing or custom cabinet.

Complete engineered welding control in self contained easy to install cabinet, including safety screens, circuit breaker with door interlocking, optional isolation contactor, power supplies and earth leakage protection.

iPAK 600AW HV with typical suitable transformer/rectifier (Averaging Time 2 Seconds)				
Transformer type	TDC-5038	TDC-5515	TDC-5620	TDC-5705
kVA	85 kVA	100 kVA	170 kVA	185 kVA
Transformer primary V	800 volts	800 volts	800 volts	800 volts
Secondary Voltage	9.5 volts	9.1 volts	9.5 volts	13.0 volts
Turns Ratio	84:1	88:1	84:1	61:1
Sec. Current @ 3%	26,000 Amps (D)	26,000 Amps (D)	47,200 Amps (C)	36,000 Amps (C)
Sec. Current @ 10%	18,500 Amps (D)	18,500 Amps (D)	33,000 Amps (D)	33,000 Amps (D)
Sec. Current @ 20%	14,700 Amps (D)	14,700 Amps (D)	26,800 Amps (D)	26,800 Amps (D)
Sec. Current @ 50%	10,985 Amps (T)	11,000 Amps (D)	20,000 Amps (D)	17,362 Amps (T)
Sec. Current @ 100%	7,767 Amps (T)	9,573 Amps (T)	15,535 Amps (T)	12,276 Amps (T)
3 phase voltage	575v max	575v max	575v max	575v max

C=Limited by the inverter
T=Limited by transformer kVA
D=Limited by secondary diodes

Important note:-

The current values shown in the above tables take no account of the secondary resistance of the machine, which in most circumstances will have a significant effect on the maximum current available from the system. The figures given are only intended as a guide and to demonstrate the limiting factors.

General Power Specification	
Maximum output power @ 20% Duty Cycle @ 2 seconds averaging time	480 kVA @ 575 Volts line voltage
Maximum line input voltage	575 V ac +10%-20% @ 50/60 Hz
Maximum output current – Limited electronically	600 Amps
Maximum Continuous output current	268 Amps
Maximum line input current per phase	346 Amps
Continuous equivalent rms line current per phase (600A@20%DC)	155Amps
Power Factor	Leading
Current regulation and feedback	Primary and secondary
Current regulation accuracy	±2 %
Current regulation repeatability	±1%
Inverter switching frequency	1 kHz
Maximum averaging time	2 seconds
Water flow rate	5 litres per minute
Maximum inlet water temperature	30 degrees centigrade

Installation of water-cooled iPAK nnnAW inverter modules to qualify for warranty

These notes are provided to assist customers who are installing inverter modules into their own equipment. Failure to follow these rules will render the warranty void.

1. The inverter must be fitted into a customer cabinet which is sealed against ingress of dust.
2. There must be a free air space around all sides of the inverter module of at least four inches or 100mm.
3. The cabinet internal ambient temperature must not rise above 104 degrees Fahrenheit or 40 degrees Centigrade when under normal operating conditions.
4. All entry and exit conduits must be sealed with appropriate bulkhead fittings or glands.
5. All unused holes must be sealed.
6. The inverter must be supplied with three phase AC via an earth leakage circuit breaker (ELCB or GFI), suitably rated for the inverter (please see BF ENTRON Data sheet), with thermal and magnetic trips. This is required to provide protection for the inverter in the event of a device failure.
7. Maximum load/transformer primary current must not exceed the inverter rated current at the machine maximum duty cycle specified over the averaging time of two seconds (see BF ENTRON graph).
8. Duty cycle limits must not be exceeded beyond those specified in the BFE data sheet.
9. Water flow must be at least the following:
    I. iPAK 150AW 1 gal/min or 5 litres/min
    II. iPAK 360AW 1 gal/min or 5 litres/min
    III. iPAK 600AW 1.5 gal/min or 7.5 litres/min
    IV. iPAK 1000AW 2 gal/min or 10 litres/min
    V. iPAK 1500AW 2 gal/min or 10 litres/min
    VI. iPAK 3000AW 4 gal/min or 20 litres/min
    VII. iPAK 4500AW 6 gal/min or 30 litres/min
    VIII. iPAK 6000AW 8 gal/min or 40 litres/min
10. A water management system must be used which is independent of both the machine and the welding transformer cooling systems.
11. The water management system must have the following components in each flow path :
    I. A manual flow regulator or constant flow valve.
    II. A programmable flow switch which is monitored by the welding control or line PLC.
    III. A shut off valve.
    IV. The water flow must drain to atmosphere.
12. Inlet water temperature must not exceed 77 degrees Fahrenheit or 25 degrees Centigrade.
13. The water temperature must not be low enough to cause the formation of condensation inside the inverter.
14. Water savers may be used, but should be used on the water outlet of the inverter. Water flow should be started at least half a second before a weld commences and the water must remain flowing for at least one minute after the weld has finished.

If the above conditions cannot be met BFE can supply a self contained cabinet with earth leakage circuit breaker.

Important Notes

a. Excessive dust or moisture contamination may render the warranty void.
b. Excessive internal cabinet temperatures may cause the inverter to be damaged and the warranty will be void.
c. Evidence of significant inverter damage as a result of unprotected flash over as a result of no ELCB (GFI) being fitted will render the warranty void.

d.

Suggested Minimum Installation Data for iPAK 600AW HV:

Important Note:-

All the calculations for cable sizing assume that the inverter will be used at maximum permissible current and maximum permissible duty cycle, but within the inverter specification.

WARNING

The calculations given below are intended as a guide, and should therefore be checked by a professional electrical engineer to ensure that local installation regulations are met.

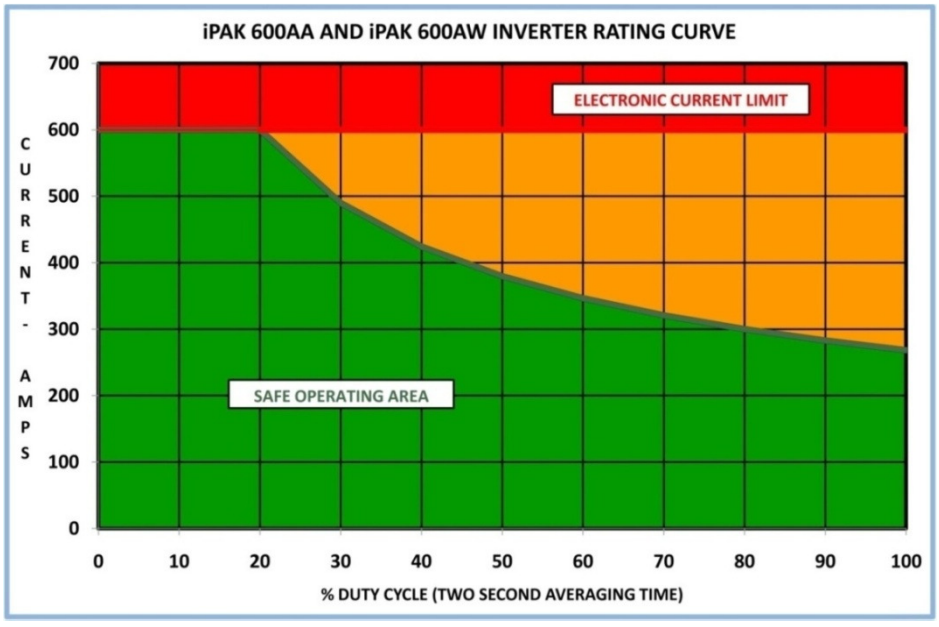
Assumptions for three phase supply feed:

Ambient temperature	= 30°C (86°F)
Cable Insulation	= Butyl
Conductor temperature	= 85°C (185°F)
Maximum volts drop at full load	= 5% of nominal supply voltage.
Continuous current rating for cable sizing	= 155 Amps (thermal equivalent current)
Current rating for volts drop	= 346 Amps
Recommended fusing	= 200 Amps HRC
Recommended thermal/magnetic circuit breaker	= 160 Amps
Minimum cable size for 10 metre feed cable	= 35 sq. mm (70 kMCM) (flat spaced)
Volts drop over 10 metres of cable @ 346 Amps	= 6.9 volts/10 metre length of run

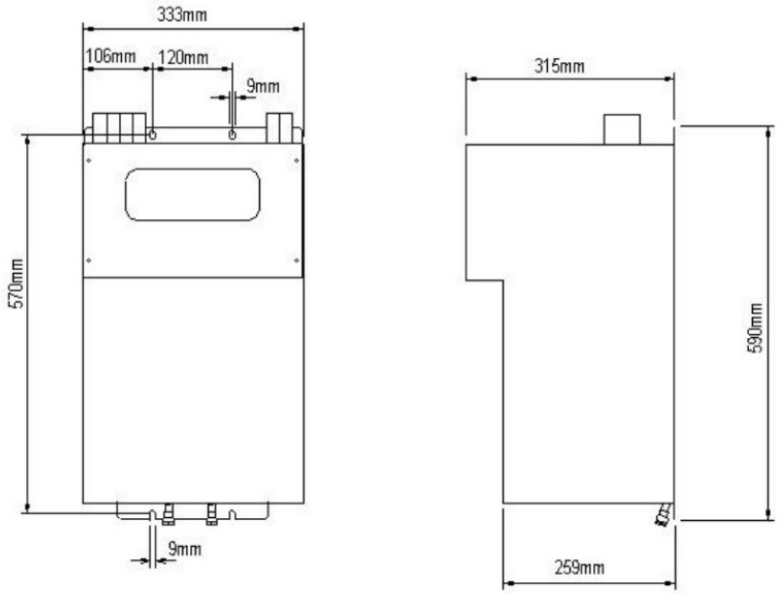
Assumptions for Welding transformer feed:

Ambient temperature	= 30°C (86°F)
Cable Insulation	= Butyl
Conductor temperature	= 85°C (185°F)
Maximum volts drop at full load	= 5% of nominal supply voltage.
Continuous current rating for cable sizing	= 268 Amps (thermal equivalent current)
Current Rating for volts drop	= 600 Amps
Minimum cable size for 10 metre feed cable	= 70 sq. mm (138 kMCM) (flat spaced)
Volts drop over 10 metres of cable @ 600 Amps	= 3.42 volts/10 metre length of run

Rating Curve



Outline Drawings – Inverter module:-



Outline Drawings – Typical Combination Case:-