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OPERATION MANUAL

IP2008-6-HW FULLY AUTOMATIC HEAT TREATMENT CONSOLE

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IP2008-6-HW FULLY AUTOMATIC HEAT TREATMENT CONSOLE

IP2008-6-HW Fully Automatic Six Way Heat Treatment Console:

DESCRIPTION:

The IP2008-6-HW Fully Automatic heat treatment console is designed to control various heat treatment processes by closely monitoring and adjusting the set point temperature and the ramp rate. It incorporates the latest microprocessor based technology and is simple to set up and operate. Control setting is by means of push switches and an LCD screen provides visual indication of the set point and the actual temperature.

The IP2008-6-HW is equipped with a digital amp meter and a 6 position switch, which is the utmost importance for checking the current to the ceramic pad heaters to make sure they are all operating.

SPECIFICATIONS – IP2008-6-HW Fully Automatic Six Way Heat Treatment Console:

Length: 33”
Width: 27”
Height: 44” to the top of the lifting lug
Weight: Approx. 940lbs
Material: 12 gauge stainless steel cabinet
Wheels: 900 lbs capacity each with brake (4) (or SS mounting brackets available upon request)
Handling: Two heavy duty top lifting eye lugs and forklift access.

Inputs:

- **Voltage:** 380-415-440-480-575, 3 Phase
- **Current:** 100 amp or optional 125 amps for 380/415 VAC
- **Power:** 75 KVA Isolated Copper Wound
- **Frequency:** 60 Hz / 50 Hz

Output Per Zone:

- **Zones:** 6
- **Voltage:** 65 or 85 VAC, single phase
- **Current:** 192 amps @ 65 V or 156 amps 85V
- **Power:** 12.5 KVA
- **Activation:** 200 amp contactor
- **Control per zone:** Digital temperature controller

Control Circuit:

- **Voltage:** 110 VAC, single phase
- **Current:** 5 amp circuit breaker
- **Power:** 1.2 KVA winding on power transformer
- **Auxiliary:** 110 VAC supply, single phase

Digital Temperature Controller (UDC2500):

- **Temperature Range:** **0-2200°F**
- **Thermocouple:** **Type "K"**

Digital Amp Meter:

- **Primary Amperage:** **Up to 200 amps**
- **Secondary Amperage:** **5 amps**

Protection:

- **120-VAC Control Circuit:** **5 amp circuit breaker**
- **Heater Power:** **Isolation contactor for each zone**
- **Console Power:** **100 amp main circuit breaker**
- **Power Transformer:** **392°F (200°C) over temperature thermostat per phase**
- **Cooling fan:** **340 CFM - Thermally protected**

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Maintenance Requirements:

Inspection and Cleaning:

ITEM	INSPECTION	FREQUENCY	ACTION
Contactors	Burned or Pitted	Every 6 months	Clean or replace contacts
Temperature Controllers	Calibration	Every 12 months	Check accuracy and adjust if required
System Cleanliness		Every 6 months	Vacuum with power disconnected
System Electrical	Loose connections	Every 6 months	Tighten all terminal connections
Air Vents and fan	Dust or dirt build up	Every 3 months	Clean with vacuum with power disconnected
Check bolts and screws	Loose	Every 6 months	Tighten

IP20085-6-HW Fully Automatic Six Way Heat Treatment Console Operating Instructions:

1. Switch 100 amp main circuit breaker to the "ON" position.

2. Make sure zones used are indicating the actual temperature on the controllers prior to start and then turn rocker switches to the "ON" position.

3. Decide on the heat treatment specification and set as follows:

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Programming a Heat Cycle

1. Turn switch on to power on controller — Upper Display: **(T.C. TEMP)**
   - controller will run a self test, when completed it will read: — Lower Display: **OUT 0.0**

2. Press **SETUP** button until you see: — Upper Display: **SET**, Lower Display: **SP RAMP**

3. Press **FUNCTION** button until you see: — Upper Display: **ENAB**
   (adjust Upper Display to **ENABLE** if required) — Lower Display: **SP PROG**

NOTE: This function must be set correct to continue programming and must be **RE-SET** to **ENAB** before every heat cycle in which the controller entirely completes it's program (if the controller is shut off before entirely completing the program **SP PROGRAM** will remain as **ENAB**). If **SP RATE** or **SP RAMP** appear in the Lower Display in this step the Upper Display must be set to **DIS** for both.

✳ Use the **FUNCTION** button to advance through the remaining programming steps.
✳ Use the **ARROW** buttons to change any Upper Display readouts.

STEP	LOWER DISPLAY	UPPER DISPLAY	SEGMENT	COMMENTS
4	**STR SEG**	**1**		Stage at which heat cycle will start
5	**END SEG**	**SOK 6**		# of stages required (standard c.s. heat cycle = 6)
6	**RPUNIT**	**EU/HR**		Degrees per hour
7	**RECYCL**	**0**		Has to be set at "**0**" or heat cycle will re-start
8	**SOK DEV**	**10.00**		Deviation must be set or soak time would start even if weld temps were not at soak temp.
9	**P END**	**F SAF**		Program will end on last segment set point (seg – 6)
10	**STATE**	**DISABL**		Disabled to shut down heat cycle at last segment
11	**ToBEGIN or KEYRESET**	**DIS**		Which Lower Display appears in this step is dependent on the manufacturers configurations, ensure the Upper Display is set to **" DISABL"** regardless of Lower Display read-out
12	**PV START**	**DIS**		(doesn't appear in all controllers)
13	**SG1RP**	**degrees/hr**	**1**	Ramp rate to SEG 2 set point (e.g. 450/hr)
14	**SG2 SP**	**TEMP**	**2**	Target temperature (e.g. 310 or 420)

15	**SG2TI**	**SOAK TIME**	**2**	0.0 soak time at this stage on standard heat cycles
16	**SG3RP**	**degrees/hr**	**3**	Ramp rate to SEG 4 set point (e.g. 220/hr)
17	**SG4 SP**	**TEMP**	**4**	Target temperature (e.g. 621)
18	**SG4TI**	**SOAK TIME**	**4**	(e.g. 1.00 hr)
19	**SG5RP**	**degrees/hr**	**5**	Ramp rate to SEG 6 set point (e.g. 275/hr)
20	**SG6 SP**	**TEMP**	**6**	Target temperature (e.g. 310 or 420)
21	**SG6TI**	**SOAK TIME**	**6**	0.0 soak time at this stage on standard heat cycles

NOTE: Your Heat Cycle will now stop at the end of this segment as **#6 END SEG** was chosen at the beginning of the set up. The remaining stages need not to be programmed, as they will not be used on a standard Heat Cycle. Press the **LOWER DISPLAY** button to exit programming, press the **AUTO/MANUAL** button to put controller to **AUTO**, you can now adjust your initial set points as required (controller must be in **HOLD & AUTO**), press the **RUN/HOLD** button to run program you have entered.

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Operating procedures

General Rules:

1. The controller must be in **AUTO** mode and on **HOLD** before you can make any changes to a program you have started running.

2. Once the controller has been put into **AUTO** mode (whether that is at initial start up of a program or after changes have been made to a running program), the set point (SP) is automatically set to the actual thermocouple reading. The controller will call for power output to hold this temperature unless it is adjusted or the program is started. To adjust the set point, put the controller in **AUTO & HOLD**, use the **DISPLAY** button to display the set point **"SP"** and use the **ARROW** buttons to increase or decrease set point as required.

3. To use the **ARROW** buttons effectively follow these instructions:
   - Press and hold the "up" **ARROW** button and the number will start to climb by the lowest denomination slowly and increase in speed and denomination with time held.
   - While holding the "up" **ARROW** button, press and release the "down" **ARROW** button and this will move the number increasing from "1's" to "10's" to "100's" and so on.

4. Pressing the **LOWER DISPLAY** button while running will display the following:

   - **SP "TEMP"** (set point temperature)
   - **OU "50%"** (output power in percentage)
   - **DE "-10"** (actual temp is 10 degrees below set point)
   - **"3 220 or 4 1.00"** (ramp or soak stage that program is in) – time will only be shown in soak stage

Adjusting Ramp rates & Target/Soak temperatures (eg. 310/420 or 621/732):

Ramp rates can be adjusted at any time during the heat cycle and will take effect immediately.

You **can not** adjust your first target temp (eg. 310/425) after you have started running the heat cycle. You must turn the controller off and on again and adjust **SEG2 SP (310/420)** as required.

You **can** adjust your soak temp (eg. 621/732) if your heat cycle program is still in the first stage **(SEG1RAMP 450/HR).**
You **can not** however change your soak temp if your heat cycle program is in **SEG3RAMP 220/HR.** In this case you would have to turn controller off and on again and adjust **SEG4 SP** as required (changing stages procedure may have to be followed as well).

Note: If you adjust your target/soak temp "out of proper sequence", the controller will run weld up to initially programmed target/soak temp and then automatically adjust to new target/soak temp and wait for actual temp to free fall or climb **without** any "rate" control.

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Operating procedures (continued)

Changing stages while running:

Step 1: Ensure controller is in **AUTO & HOLD**.

Step 2: Push the **LOWER DISPLAY** button until you see your **RAMP** (eg. 3 220/hr) or **SOAK** (eg. 4 1.00) readout, (depending on what stage you are in).

Step 3: Use **ARROW** buttons to adjust to required stage (you can go to any stage you need).

Step 4: Press the **LOWER DISPLAY** button until you see SP "TEMP" and adjust as required.

Note: If you adjust to a **SOAK** stage with a hold time programmed the set point will be automatically adjusted to desired soak temp.

If you adjust to a **RAMP** stage the set point will stay at actual thermocouple reading and must be adjusted to required set point value.

Step 5: Press RUN and heat cycle will continue from "Stage" and "SP" you adjusted.

EXAMPLE: You are in soak (621 C) and you have a burn-out 10 minutes into soak.

1. Fix burn-out (follow correct & safe procedures), the weld has now dropped to 500 C.
2. Ensure controller is in **AUTO & HOLD**, press **LOWER DISPLAY** button until you see "**4 0.50**", use **ARROW** buttons to adjust down to stage "**3 220**", press **LOWER DISPLAY** until you see "**SP 621**", adjust down to "**500**", press **RUN** and controller will run heat cycle from "500" to "621" at rate (220/hr) and re-start soak time for 1 hr, (soak time can be adjusted if required).

Adjusting Heat Cycle while running:

Step 1: Ensure controller is in **AUTO & HOLD.**

Step 2: Follow the steps for **Programming a Heat Cycle** and adjust functions as required.

Example: You are at 500 C and you have a burn-out.

1. Fix burn-out (follow correct & safe procedures), the weld has now dropped to 435 C.
2. Ensure controller is on **AUTO & HOLD**, adjust set point down to "435" and press **RUN**, controller will run through heat cycle from 435 C.

HONEYWELL UDC 2500
(USE FOR INITIAL SET UP OF CONTROLLERS ONLY)
FOR SERVICE DEPARTMENT ONLY

Complete Parameter Programming

1. Turn controller power on. Upper Display: **(T.C. TEMP)**
- controller will run a self test, when completed it will read: Lower Display: **OT 0.0**

✳ Press the **SETUP** button to advance to "parameter groups" (eg. TUNING, SP RAMP, etc.).
✳ Press the **FUNCTION** button to program the selected "parameter group" settings.
✳ Press the **ARROW** buttons to change any UPPER DISPLAY readouts.
✳ Follow instructions in **"COMMENTS"** column as required.

NOTE: The first two "parameter groups", (**INPUT 1, CONTROL**) have to be programmed in order. The remaining "parameter groups" must to be programmed after the first two are completed.

PARAMETER GROUP	*LOWER* DISPLAY	*UPPER* DISPLAY	COMMENTS
INPUT 1	INPUT 1	SET	There are two "INPUT 1" parameter groups, ensure you are at this "SETUP" group to avoid confusion. The other "INPUT 1" parameter group does not show up during initial programming.
	IN1TYP	K H	
	IN1 HI	1316	
	IN1 LO	- 17.8	
	RATIO1	1.0	
	BIAS1	0.0	
	FILTR1	20	
	BRNOUT	NONE	
CONTRL	CONTRL	SET	
	PIDSET	ONE	
	LSP'S	ONE	
	SP TRK	PROC	
	PWR UP	MAN	
	SP Hi	1316	
	SP Lo	-17.8	
	ACTION	REV	
	OUT Hi	100	
	OUT Lo	0.0	
	FAILSF	0.0	
	FSMODE	NO L	
	PBorGN	PB	
	MINRPM	MIN	
COM	COM	SET	
	ComADR	3	
	ComSTA	DIS	
	IRENAB	ENAB	
	BAUD	19.2K	
	TX DLY	1	

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Complete Parameter Programming (continued)

PARAMETER GROUP	*LOWER* DISPLAY	*UPPER* DISPLAY	COMMENTS
ALARMS	ALARMS	SET	
	A1S1TY	IN 1	
	A1S1VA	1300	This function does not show up until the rest of the "ALARM" functions are programmed
	A1S1 H L	HIGH	
	A1S2TY	NONE	
	A2S1TY	NONE	
	A2S2TY	NONE	
	ALHYST	5.0	
	ALARM1	NO L	
	BLOCK	DIS	Go back and set A1S1 VAL after this step
	DIA AL	DIS	
DISPLAY	DISPLAY	SET	
Program this parameter first	DECIMAL	NONE	
	T UNITS	C	
	FREQ	60	
	NOLDSP	DIS	
	LNGUAG	ENGL	
INPUT 1	INPUT 1	CAL	There are 2 INPUT 1 groups, ensure you are in the correct group setting.
	CALIN 1	DIS	
STATUS	STATUS	READ	Read Only (Important to cycle thru steps)
TUNING	TUNING	SET	
	PB	2.50	
	RATE T	1.04	
	I MIN	4.16	
	CYCT1	5	
	SECURITY	Don't set anything	
	LOCKOUT	VIEW	
	AUTOMA	ENAB	
	A TUNE	ENAB	
	RN HLD	ENAB	
	SP SEL	ENAB	

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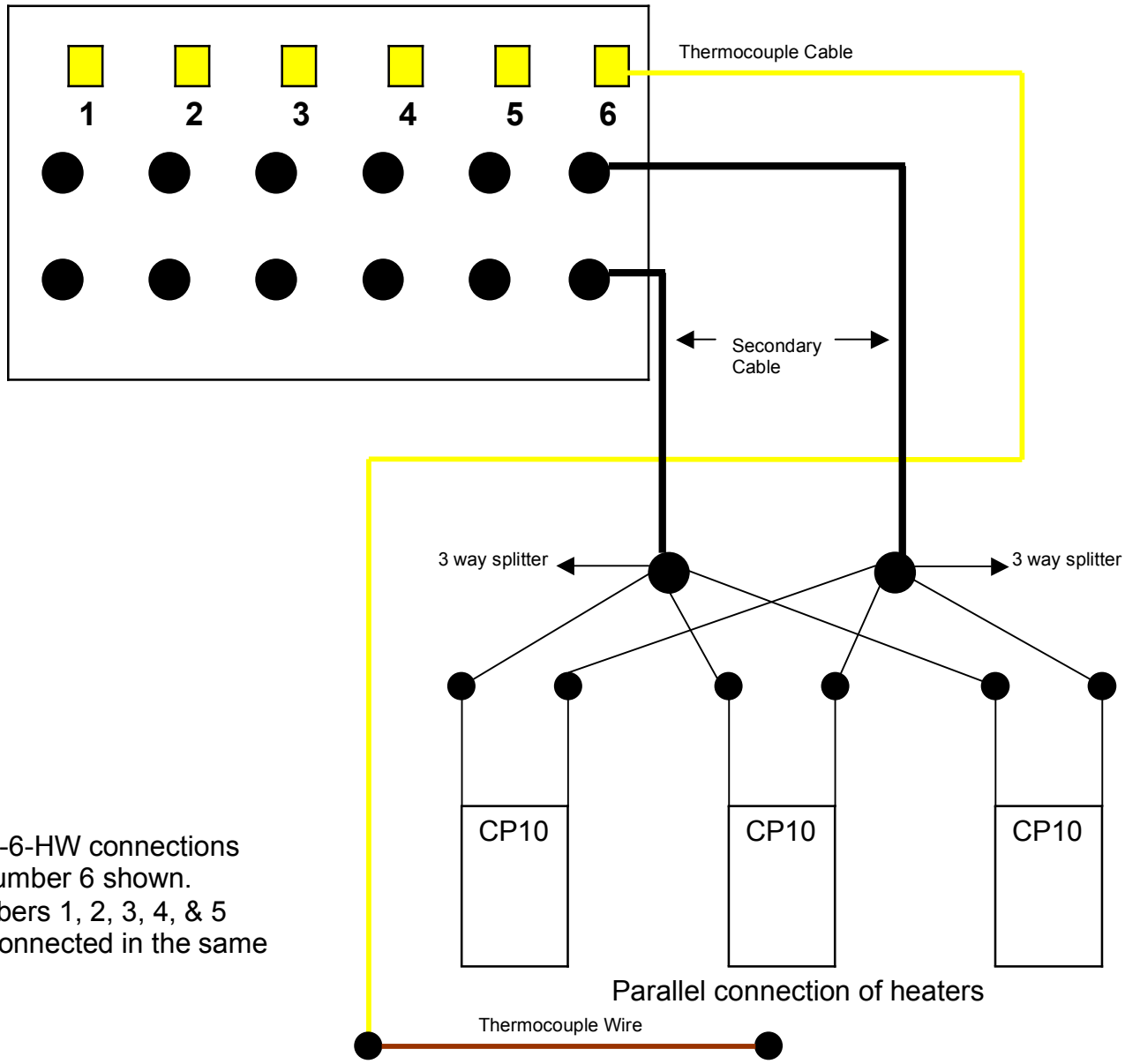
Complete Parameter Programming (continued)

PARAMETER GROUP	*LOWER* DISPLAY	*UPPER* DISPLAY	COMMENTS
SP RAMP	SP RAMP	SET	REFER TO PROGRAMMING HEAT CYCLES
ATUNE	ATUNE	SET	
	FUZZY	ENAB	
	TUNE	DIS	
ALGOR	ALGOR	SET	
	CTRALG	PID A	
	TIMER	DIS	
OUTALG	OUTALG	SET	
	OUTALG	RLY	
	RLY TYP	MECH	

IP2008-6-HW Fully Automatic 6 Way Heat Treatment Console System

FRONT VIEW

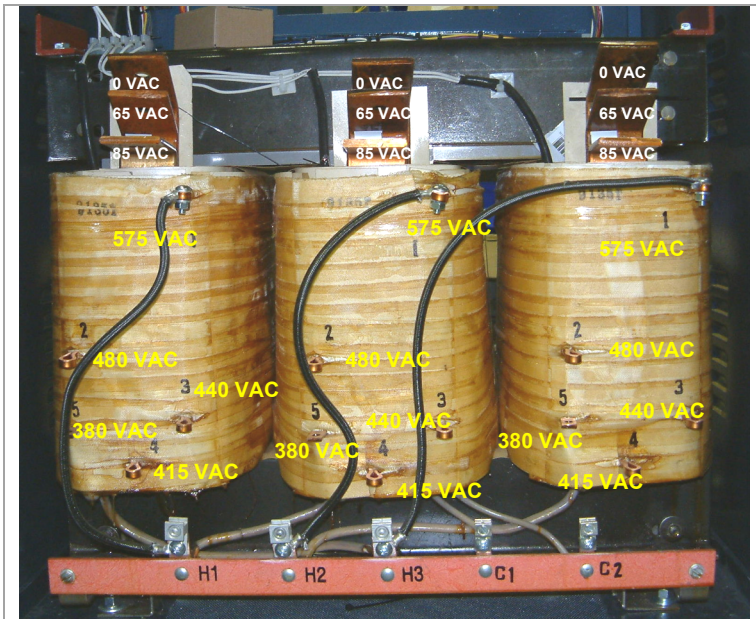


Note:

The IP2008-6-HW connections for circuit number 6 shown. Circuit numbers 1, 2, 3, 4, & 5 should be connected in the same

TO CHANGE SECONDARY AND PRIMARY CONNECTIONS FOLLOWS THESE INSTRUCTIONS:

1. Switch off main breaker and disconnect primary power cable supply.
2. Loosen the primary power cable clamp.
3. Remove panel labelled “Back Panel” to change secondary and primary connections.
4. Change connections as per requirements and make sure the connections are tight.
5. Make sure nothing is left inside the enclosure.
6. Put the “Back Panel” back on.
7. Tighten the primary power cable clamp.
8. Hook up primary power cable supply and then switch on main breaker when ready.



- 75 KVA/60 KW
- Primary 380/415/440/480/575, 3 Phase
- Secondary 0/65/85, Single Phase
- (1 P.H.) 110 volt @ 1200 VA, Single Phase
- Isolation
- Copper wound
- Over temperature thermostat per phase

Transformer:

Weight: 660 lbs (approx.)
Dimensions: 24” L x 17” W x 21” H

Features:

- All connections in back for easy access.
- Class 220 insulation.
- 150 degrees C. temperature rise.
- CSA certified.
- UL listed.
- Manufactured to ISO9001 quality certification.

ORDERING INFORMATION:

MSPART# - 75KVA #7 - 3 phase *isolated* copper wound power transformer. Primary 380/415/440/480/575, 50/60 Hz secondary 0/65/85 (Thermal trips per phase to prevent overload).

CHANGING TAPPINGS:

PRIMARY VOLTAGE	CURRENT 18 x 80V Heaters	CONNECTION
575 VAC	76 amps	1-1-1
480 VAC	91 amps	2-2-2
440 VAC	99 amps	3-3-3
415 VAC	105 amps	4-4-4
380 VAC	114 amps	5-5-5

SECONDARY VOLTAGE	CURRENT	CONNECTION
65 volts	384 amps per phase	65-65-65 as marked
85 volts	312 amps per phase	85-85-85 as marked

****NOTE:** Optional 125 amp circuit breaker required for 380VAC/415 Primary Voltage

SPARE PARTS FOR IP2008-6-HW HEAT TREATMENT CONSOLE

MS Part No.	Description Of Part
IP2008-6-HW	Stainless Steel Cabinet for IP2008-6-HW
900Wheel	Wheel Swivel Caster (900 lb Capacity with brake)
UDC2500	Fully Automatic Digital Temperature Controller
75KVA #7	75 KVA - 3 Phase *Isolated* copper wound power transformer: Primary 380/415/440/480/575, 50/60 Hz Secondary 0/65/85 (Thermal trips per phase to prevent overload)
Amp Meter	Digital Amp Meter 0-200 amps
Selector Switch	Six Channel Selector Switch with Plate & Knob
CT	Current Transformer 0-200 amps
A10	300 amp Female Panel Mount Socket Complete
PP-20-KX	Thermocouple Extension Cable
A37-EL	200 amp contactor (100% Duty Cycle)
A38	110 Volt Neon
46F4171	ON/OFF Rocker Switch
Merlin 100 amp	100 amp - 3 phase Circuit Breaker with 120 volt uv Release
Merlin 125 amp	Optional for 380/415: 125 amp - 3 phase Circuit Breaker with 120 volt uv Release
56F874	5 amp Circuit Breaker
56F876	10 amp Circuit Breaker
F-A18	Female Thermocouple Panel Mount (Type “K”)
Fan	340 CFM Cooling Fan
120 V	120 VAC Ground Fault Receptacle
96F4496	3 Pole Terminal Block
#1 Tinned	#1 Tinned Cable with lugs (please specify length)
#4 Tinned	#4 Tinned Cable with lugs (please specify length)
90F7177	Lug 1/0 - 3/8 Hole
AL1/4	Aluminium Lugs 1/4" Hole