



WELD THE WORLD

Cruiser Power Pulse

322
402
502

Instruction manual





ENG



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1 INTRODUCTION

 	<h2>IMPORTANT!</h2> <p><i>This handbook must be consigned to the user prior to installation and commissioning of the unit. Read the "General prescriptions for use" handbook supplied separately from this handbook before installing and commissioning the unit. The meaning of the symbols in this manual and the associated precautionary information are given in the "General prescriptions for use". If the "General prescriptions for use" are not present, it is mandatory to request a replacement copy from the manufacturer or from your dealer. Retain these documents for future consultation.</i></p>
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LEGEND

	<h2>DANGER!</h2> <p><i>This pictogram warns of danger of death or serious injury.</i></p>
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	<h2>WARNING!</h2> <p><i>This pictogram warns of a risk of injury or damage to property.</i></p>
---	---

	<h2>CAUTION!</h2> <p><i>This pictogram warns of a potentially hazardous situation.</i></p>
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	<h2>INFORMATION</h2> <p><i>This pictogram gives important information concerning the execution of the relevant operations.</i></p>
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- ➔ This symbol identifies an action that occurs automatically as a result of a previous action.
- ① This symbol identifies additional information or a reference to a different section of the manual containing the associated information.
- § This symbol identifies a reference to a chapter of the manual.
- *1 The symbol refers to the associated numbered note.

NOTES

The figures in this manual are purely guideline and the images may contain differences with respect to the actual equipment to which they refer.

1.1 INTRODUCTION

This professional and rugged welding power source for DC MMA and TIG welding with exceptional arc characteristics is designed to operate in harsh environmental conditions in the fields of professional maintenance, shipyards and offshore, building construction and heavy fabrication.

The combination of digital control and excellent welding with cellulosic electrodes is ideal for hydraulic applications and welding work on oil pipelines and in the petrochemical industry.

The ARC AIR function allows perfect de-seaming with carbon electrodes of up to 10mm in diameter.

Up to 6 mm diameter electrode welding is possible in MMA.

In MMA welding the Hot Start and Arc Force functions are adjustable and they allow improved arc striking, a flatter bead and more uniform weld.

The Anti Sticking function makes it possible to detach the electrode rapidly from the workpiece in the event of accidental sticking.

Thanks to its modular configuration, the power source can be configured for MIG/MAG welding by adding a wire feed unit, extension, and, if required, a cooling unit and power source transport trolley.

Fan. The fan is turned on only during welding, at the end of the welding process it remains on for a fixed period of time according to welding conditions.

The fan is nonetheless controlled by specific thermal sensors that guarantee a correct cooling of the machine.

Accessories/ancillary devices that can be connected to the unit:

- Manual remote controller for remote adjustment of the welding current.
- Foot-pedal remote controller for TIG torch arc striking and remote adjustment of welding current.
- Remote control for use with welding robot (combined with power source and wire feeder).
- Power source trolley.
- Power source trolley for multi-function configuration (MIG/MAG).
- Tool compartment.
- Liquid cooler for MIG/MAG-TIG torches.
- Wire feeder.

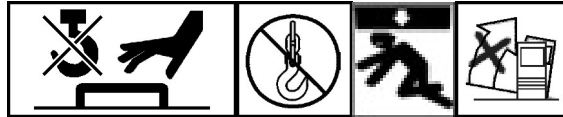
Consult your dealer for an updated list of accessories and the latest new products available.

2 INSTALLATION



DANGER! **Lifting and positioning**

Read the warnings highlighted by the following symbols in the "General prescriptions for use".

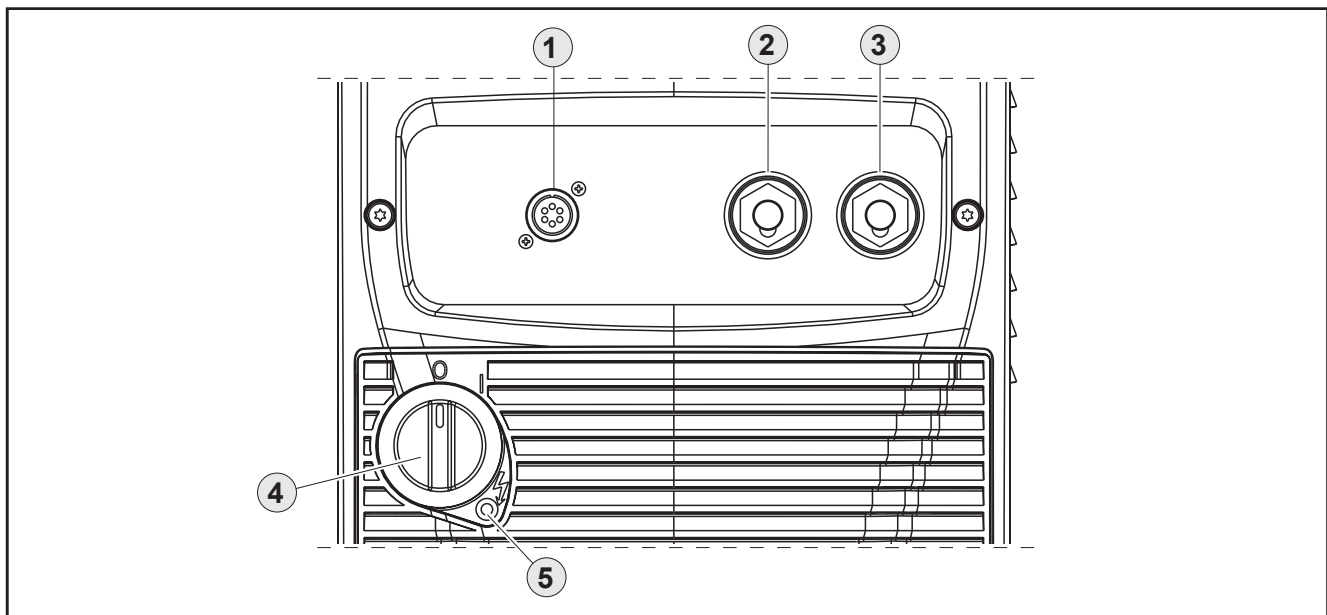


2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK

The mains power supply features to which the equipment should be connected are given in chapter "12 TECHNICAL DATA" at page 54.

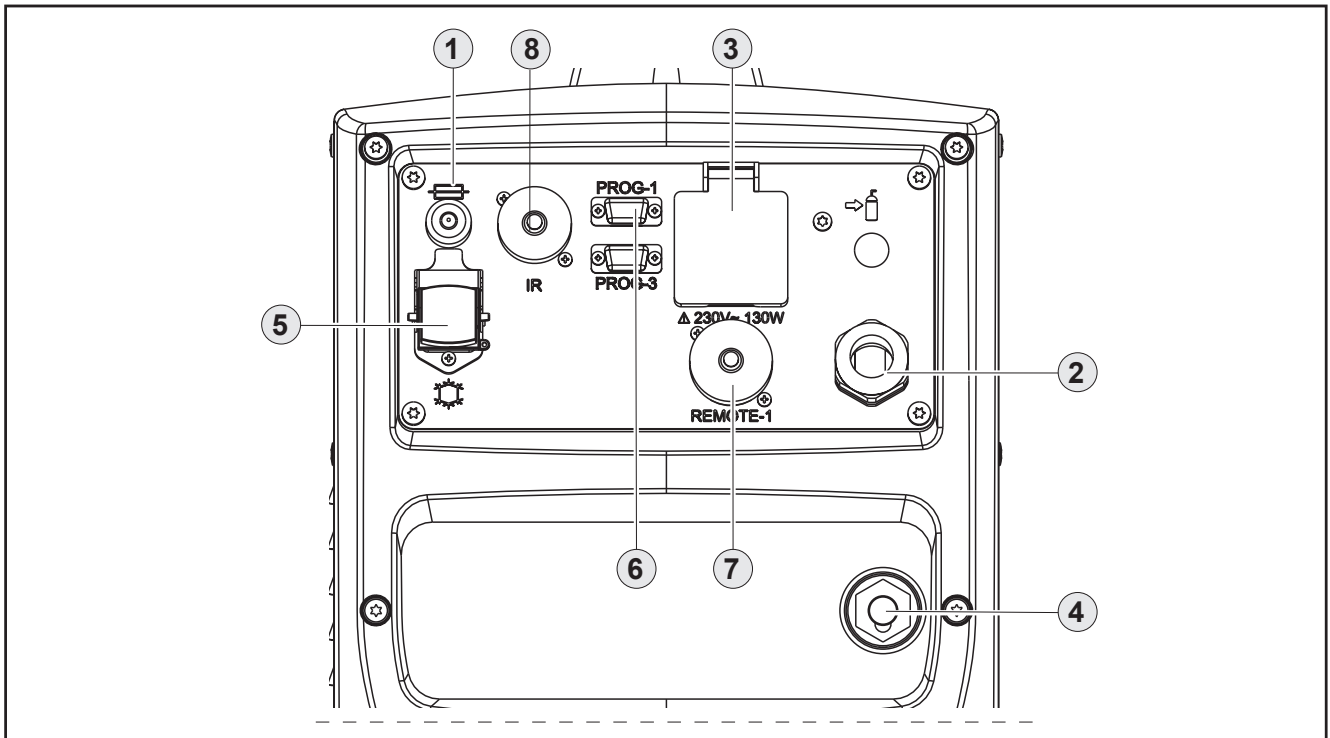
The machine can be connected to motorgenerators provided their voltage is stabilised.
Connect/disconnect the various devices with the machine switched off.

2.2 FRONT PANEL



- Remote controller connector [Item 1].
- Negative pole welding socket [Item 2].
- Positive pole welding socket [Item 3].
- Welding power source ON/OFF switch. Item 4].
- Mains protection ON LED [Item 5]. This LED illuminates if an incorrect operating condition occurs:
 - absence of a phase in the power supply line.

2.3 REAR PANEL



- Auxiliary power supply transformer safety fuse [Item 1].
 - Type: Delayed acting (T)
 - Amperage: 2 A (3.15 A for 322)
 - Voltage: 500 V a.c.
- Power cable [Item 2].
 - Total length (including internal part): 5,0 m
 - Number and cross section of wires: 4 x 6 mm² (4 mm² on 322)
 - Power plug type: not supplied
- Pre-heater supply socket (OPTIONAL on 322) [Item 3].

The socket is internally protected by a self-resetting fuse.

 - Power socket type: Schuko
 - Maximum power: 130 W
 - Voltage: 230 V a.c.
- Socket for connecting the power cable between the power source and the remote control device [Item 4].
- Cooler group power feeding connector [Item 5].
 - Voltage: 400 V a.c.
 - Current output: 1.0 A
 - IP protection rating: IP20 (cap open) / IP66 (cap closed)



DANGER!
High voltage!

If the socket is not connected to any devices always close cap 1

- (Only Power Pulse 322/402/502) Connector for connection to the programmer [Item 6]. Program-

ENGLISH

ming connector for the “pulsed” circuit board. You can update the software of the equipment using the programming kit.

- Connector of the bundle of cables for connecting the power source to the remote control device. [Item 7].
- Signals connector for automatic application [Item 8].

2.4 PREPARING FOR MMA WELDING

1. Set the welding power source ON/OFF switch to “O” (unit switched off).
2. Plug the power cable plug into a mains socket outlet.
3. Choose the electrode based on the type of material and thickness of the workpiece to be welded.
4. Insert the electrode in the electrode holder.
5. Connect the electrode holder cable to the welding socket based on the polarity requested by the type of electrode used.
6. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
7. Connect the earth clamp to the workpiece being processed.



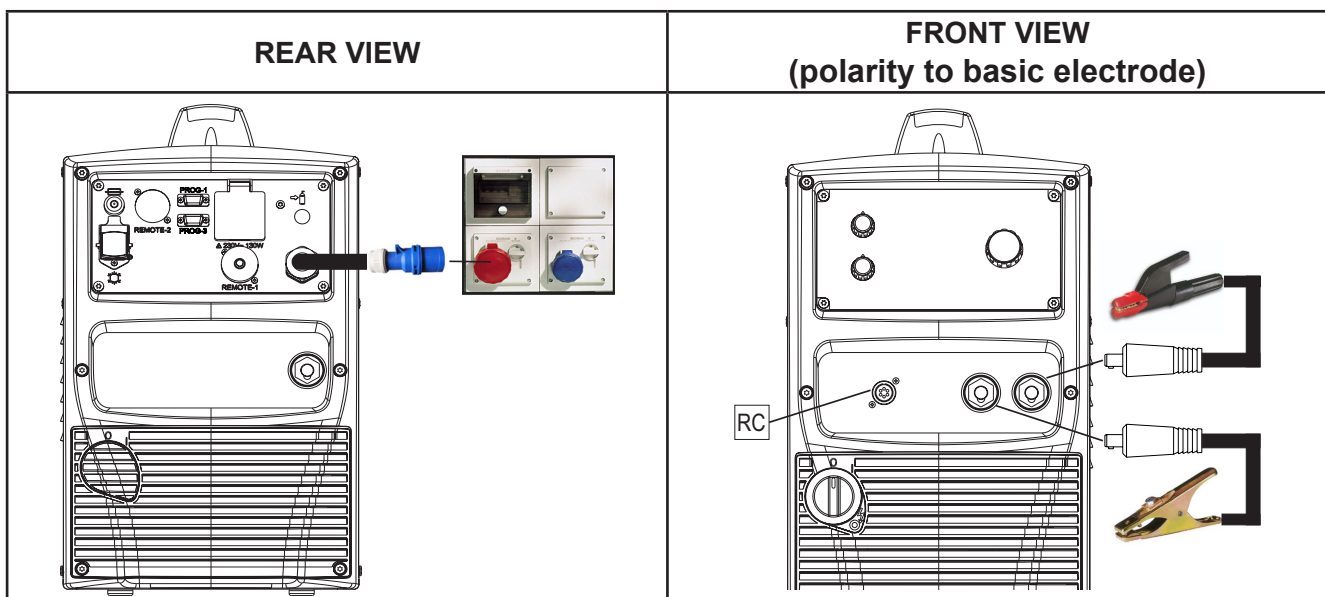
DANGER!

Electric shock hazard!

Read the warnings highlighted by the following symbols in the “General prescriptions for use”.



8. Set the welding power source ON/OFF switch to “I” (unit powered).
 9. Select the following welding mode on the user interface: MMA
 10. Set the required welding parameter values on the user interface.
- ➡ When the remote controller [RC] is connected and the relative locking screw is tightened, welding current can be adjusted using the remote controller.
The system is ready to start welding.

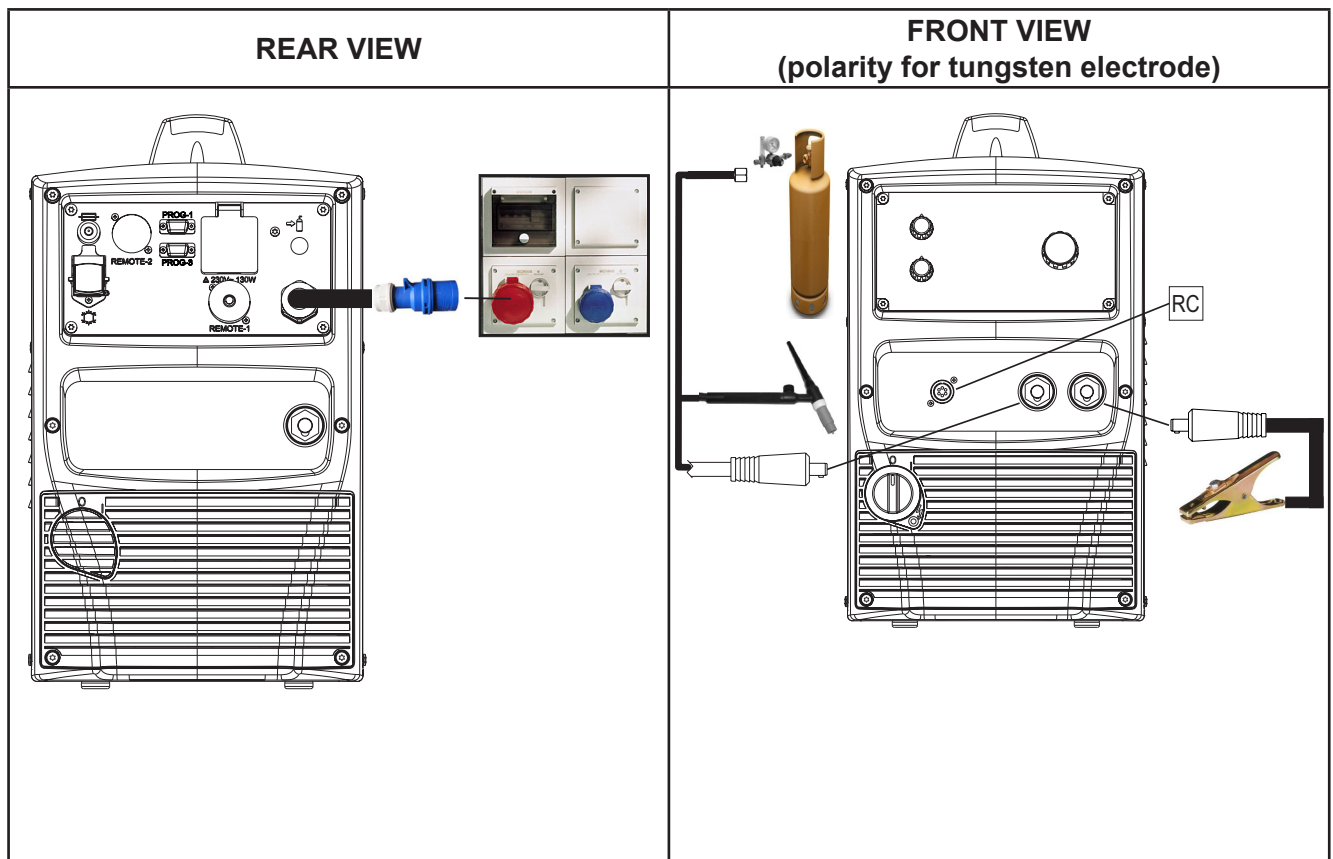


2.5 PREPARING FOR TIG WELDING

1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
 2. Plug the power cable plug into a mains socket outlet.
 3. Choose the electrode based on the type of material and thickness of the workpiece to be welded.
 4. Insert the electrode in the TIG torch.
 5. Connect the torch plug to the welding socket on the basis of the polarity required by the type of electrode in question.
 6. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
 7. Connect the earth clamp to the workpiece being processed.
 8. Set the welding power source ON/OFF switch to "I" (unit powered).
 9. Select the following welding mode on the user interface: DC TIG
- ⓘ This model of welding machine has not been provided either with the control for gas flow (solenoid valve) or with the torch trigger.
The system is ready to start welding.

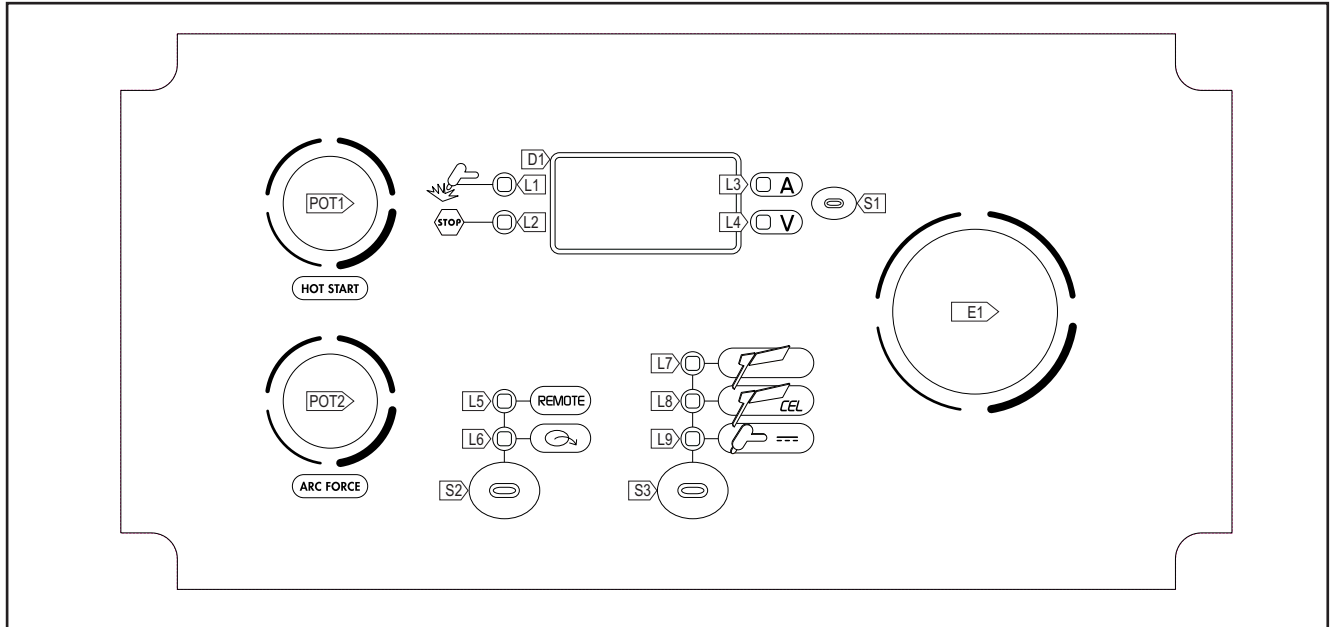
LIFT-ARC WELDING

1. Open the torch valve to let the gas out.
 2. Touch the workpiece with the torch electrode.
 3. Slowly lift the torch to strike the arc.
- ➡ The WELDING CURRENT reaches the preset value.
4. Quickly distance the torch from the workpiece to extinguish the welding arc.
 5. Close the torch valve to interrupt the gas flow.

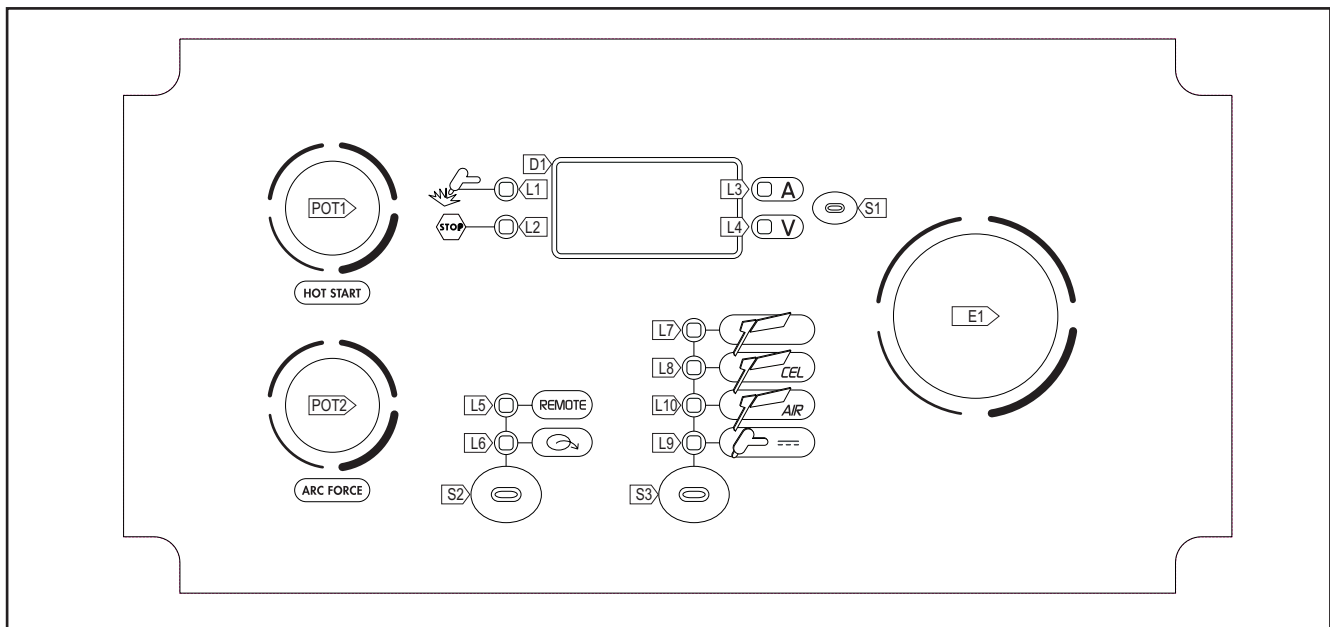



















3 USER INTERFACE

Cruiser 322 - Power Pulse 322



Cruiser 402-502 - Power Pulse 402-502



CODE	SYMBOL	DESCRIPTION
L1		This LED illuminates to confirm the presence of power on the output sockets.
L2		This LED illuminates to show an anomaly in the operating conditions.
L3		Illuminates to indicate a value in the following unit of measurement: AMPERES (A)
L4		Illuminates to indicate a value in the following unit of measurement: VOLTS (V)
L5		Illuminates to signal activation of a connected remote control unit, if available.
L6		This LED indicates that the current reference setting is imposed by the remote controller.
L7		This LED illuminates to show that the following welding mode is selected: MMA
L8		This LED illuminates to show that the following welding mode is selected: DESEAMING MODE
L9		This LED illuminates to show that the following welding mode is selected: CONTINUOUS DC TIG
L10		This LED illuminates to show that the following welding mode is selected: GOUGING ELECTRODE (Only on 402-502)
D1		Data setting: The display shows the acronym of the parameter to be set. Welding: The display shows the effective amperes or volts value during welding.
S1		Welding: This button selects the parameter to be shown on the following display: D1 Possible choices: (A) Effective welding current - (V) Effective welding voltage Parameters/functions setting: This button selects the parameter to be shown on the following display: D1 Possible choices: (A) Effective welding current - (V) Effective welding voltage
S2		Press and release: the button enables the device to receive the welding current control signal from a remote controller. Hold down for 3 seconds: the button activates a connected remote controller, if available, which is then used to manage all functions of the welding power source from a distance.
S3		This button selects the welding mode.
POT1		MMA: The potentiometer sets the value of the following parameter: HOT START
POT2		MMA: The potentiometer sets the value of the following parameter: ARC FORCE
E1		Data setting: The encoder sets the value of the selected parameter. Welding: The encoder sets the value of the following parameter: WELDING CURRENT

4 UNIT POWER-UP

Set the welding power source ON/OFF switch to “I” to switch on the unit.
AL.H. The message appears on the following display: **D1**.

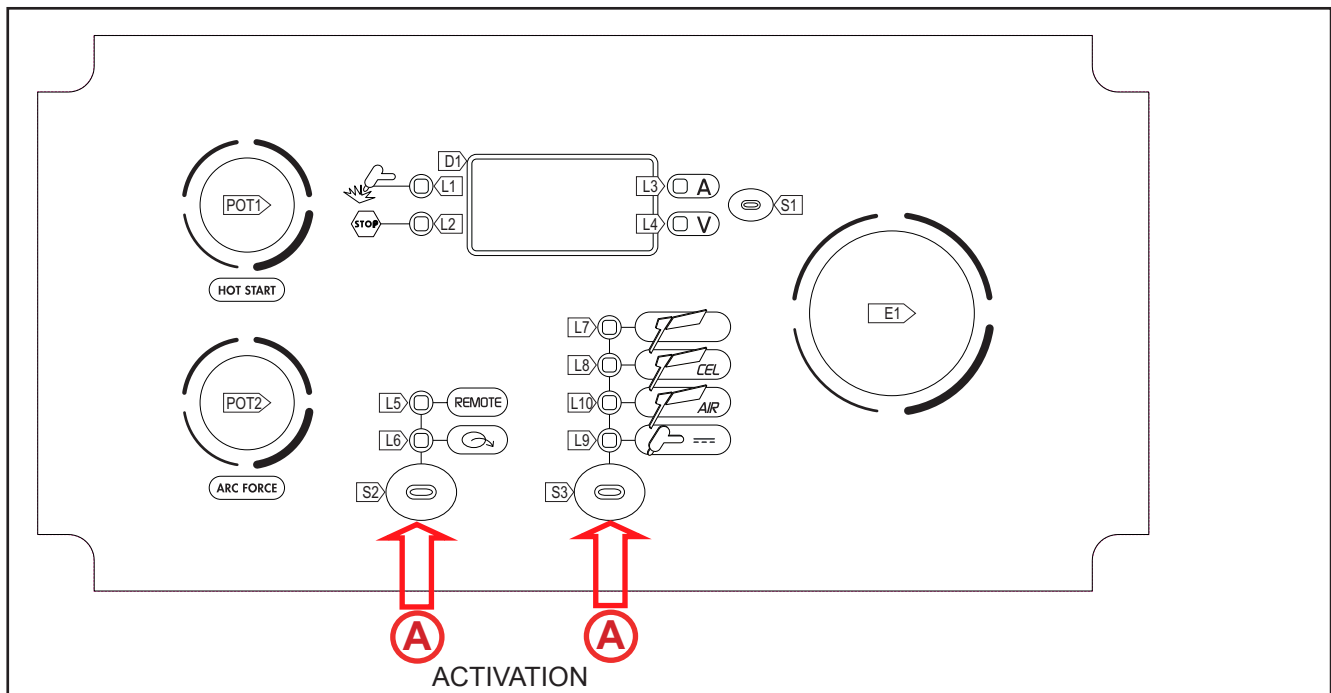
First power-up or power-ups following a RESET procedure

The welding power source sets up for welding with the factory pre-sets.

Subsequent power-ups

The welding power source sets up for welding in the latest stable welding configuration that was active at the time of power-off.




5 RESET (LOAD FACTORY SETTINGS)




The reset procedure involves complete restoration of the default values, parameters and memory settings set in the factory.

The reset procedure is useful in the following cases:

- Too many changes made to the welding parameters so user finds it difficult to restore defaults.
- Unidentified software problems that prevent the welding power source from functioning correctly.

A	<ul style="list-style-type: none"> o Set the welding power source ON/OFF switch to “O” to switch the unit off. o Keeping both the S2  and S3  buttons pressed, set the generator power source switch to “I” to turn on the equipment [ SIMULTANEOUS ACTIONS] <ul style="list-style-type: none"> - rEC : The message appears on the following displays: D1. - Wait for the memory clear procedure to terminate.
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6 ALARM MANAGEMENT

 This LED illuminates if an incorrect operating condition occurs. An alarm message appears on the following display: **D1**.

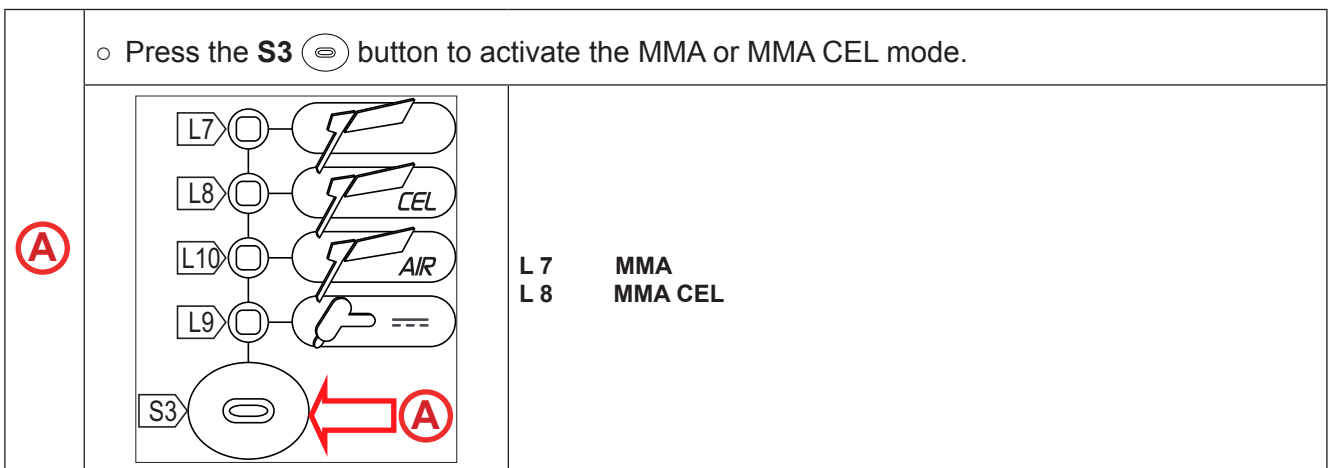
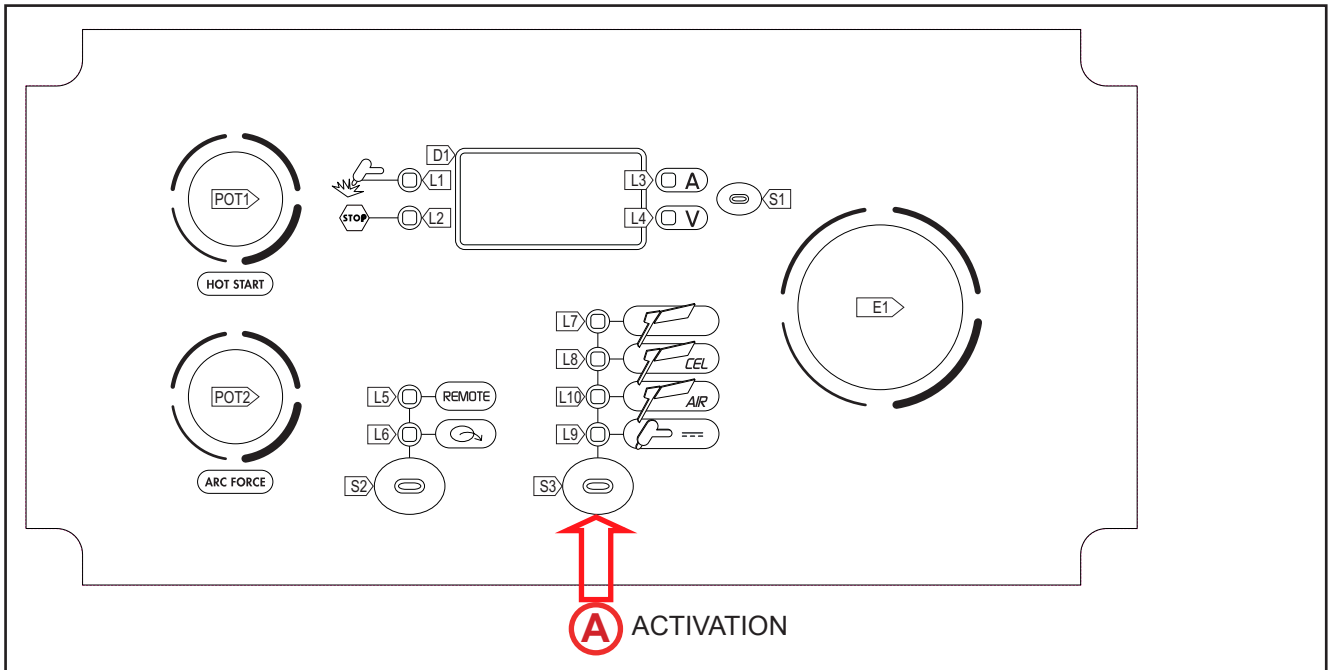
Tab. 1 - Alarm messages

MESSAGE	MEANING	EVENT	CHECKS
AL. HEA.	In start-up phase	Appears for 2-3 seconds	
	Overheating alarm Indicates tripping of the welding power source thermal protection. Leave the unit running so that the overheated components cool as rapidly as possible. When the unit has cooled, the welding power source will reset automatically.	All functions disabled. <u>Exceptions:</u> • Cooling fan. • Cooler (if switched on).	<ul style="list-style-type: none"> • Make sure that the power required by the welding process is lower than the maximum rated power output. • Check that the operating conditions are in compliance with the welding power source data plate specifications. • Check for the presence of adequate air circulation around the welding power source.
	Phase missing alarm Indicates the absence of a phase in the power supply line. The message appears at the same time as the mains protection activation LED switches on.	All functions disabled. <u>Exceptions:</u> • Cooling fan.	<ul style="list-style-type: none"> • Check if the equipment power supply line has all the phases. <p><u>If the problem persists:</u></p> <ul style="list-style-type: none"> • qualified technical personnel are required for repair/maintenance jobs.
AL. Coo.	Cooler alarm Indicates insufficient pressure in the torch liquid cooling circuit.	All functions disabled. <u>Exceptions:</u> • Cooling fan. The alarm message persists on the display until the first operation is performed on the user interface. <u>Signalling of the alarm depends on the following settings:</u> • Coo = on: the alarm is signalled if the cooling unit is connected to the power source and if it is running. • Coo = oFF: the alarm is never signalled, irrespective of the circumstances. • Coo = Aut: the alarm is signalled if the cooling unit is connected to the power source and if it is running.	<ul style="list-style-type: none"> • Check that the connection to the cooler is correct. • Check that the "O/I" switch is set to "I" and that it illuminates when the pump is running. • Check that the cooler is filled with coolant. • Check that the cooling circuit is liquid tight, notably the torch hoses, the fuse and the internal connections of the cooler.
E. 69	Software compatibility error Indicates that the welding power source has a software version that is not compatible with the remote device connected to it (remote controller, wire feed unit).	All functions disabled. <u>Exceptions:</u> • Cooling fan.	<ul style="list-style-type: none"> • Update the remote device software. • Contact support

MESSAGE	MEANING	EVENT	CHECKS
E. 04	Alarm, no-load voltage failure	All functions disabled. <u>Exceptions:</u> • Cooling fan	<ul style="list-style-type: none"> • Check to ensure the welding torch is not resting on the work-piece connected to ground. • Check that when the power source is switched on there is no short circuit between the sockets (voltage must be greater than/equivalent to U_r). <u>If the problem persists:</u> <ul style="list-style-type: none"> • Qualified technical personnel are required for repair/maintenance jobs.
CAn Err.	No communication alarm Indicates the presence of problems in data communication between the power source and wire feeder. When the unit has cooled, the welding power source will re-set automatically. Exit the alarm state by performing one of the following actions: Switch the power source off.	All functions disabled. <u>Exceptions:</u> • cooling fan. • cooler (if switched on).	<ul style="list-style-type: none"> • Check that the connecting cable between power source and wire feeder is intact and make sure the connectors are securely tightened. <u>If the problem persists:</u> <ul style="list-style-type: none"> • qualified technical personnel are required for repair/maintenance jobs.

7 WELDING

7.1 MMA WELDING/MMA CEL



Tab. 2 - Parameters of the 1st level menu: MMA/MMA CEL mode

SETTING	MIN	DEFAULT	MAX	NOTES
WELDING CURRENT MAXIMUM CURRENT WITH REMOTE CONTROLLER	10 A	80 A	MAX A	MAX: Maximum value of welding current
HOT-START	0 %	-	100 %	The value is calculated as a percentage of the preset welding current. The value is limited to 250A max.
ARC FORCE	0 %	-	250 %	The value is calculated as a percentage of the preset welding current.

ENGLISH

- WELDING CURRENT

- o This parameter regulates the primary welding current value.

- MAXIMUM CURRENT WITH REMOTE CONTROLLER

- o The maximum output current value that can be achieved with foot pedal controller external reference.

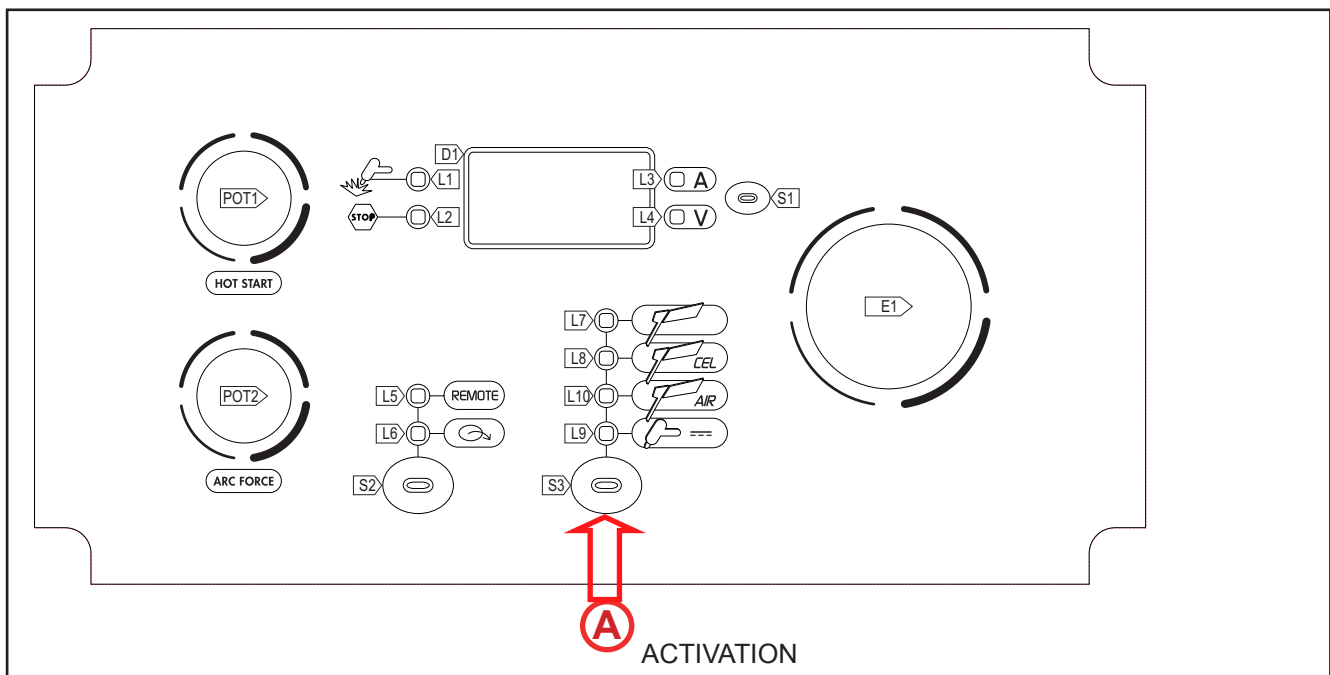
- HOT-START

- o This parameter aids electrode melting at the time of arc striking. It is set as a percentage referred to the value of the following parameter: **WELDING CURRENT**. The value is limited to 250A max.
- Consequences of a higher value:
 - Ease of activation; Greater starting spatter; increase in the activation area.
- Consequences of a lower value:
 - Difficulty of activation; Less starting splatter; Reduction in the activation area.

- ARC FORCE

- o This parameter helps to avoid electrode sticking during welding. It is set as a percentage referred to the value of the following parameter: **WELDING CURRENT**
- Consequences of a higher value:
 - Fluency factors in welding; Arc welding stability; Increased melting of the electrode within the workpiece; More weld spatter.
- Consequences of a lower value:
 - The arc is extinguished more easily, less welding spatter.

7.2 ARC AIR (ELECTRODE GOUGING)



o Press the **S3** button to activate the ELECTRODE GOUGING mode.

(A)

L 10 ELECTRODE GOUGING

The parameters are automatically set to their maximum values. The value cannot be adjusted.

7.3 TIG DC WELDING

o Press the **S3** button to activate the CONTINUOUS DC TIG mode.

(A)

L 9 CONTINUOUS DC TIG

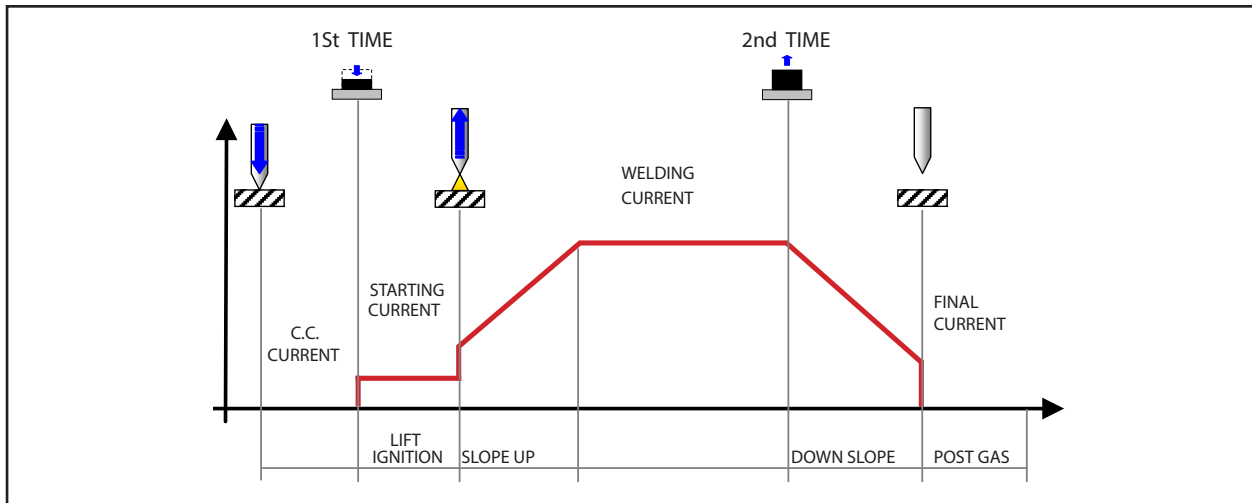
Tab. 3 - Parameters of the 1st level menu: CONTINUOUS DC TIG mode

SETTING	MIN	DEFAULT	MAX	NOTES
WELDING CURRENT	5 A	80 A	MAX A	MAX: Maximum value of welding current





8 TORCH TRIGGER PROCEDURE

- 2 STROKE LIFT:




- Touch the workpiece with the torch electrode.
- Press (1T) and keep the torch trigger pressed.
- Slowly lift the torch to strike the arc.
- The welding current reaches the pre-set value, by way of an up slope time, if programmed.
- Release (2T) the trigger to start the weld completion procedure.
- The current reaches the end current value in the time set in the down slope time parameter.
- The arc is extinguished.
- Gas delivery continues for the time set in the post gas parameter.



9 TECHNICAL DATA




Directives applied	Waste electrical and electronic equipment (WEEE)
	Electromagnetic compatibility (EMC)
	Low voltage (LVD)
	Restriction of the use of certain hazardous substances (RoHS)
Construction standards	EN 60974-1; EN 60974-10 Class A
Conformity markings	 Equipment compliant with European directives in force
	 Equipment suitable in an environment with increased hazard of electric shock
	 Equipment compliant with WEEE directive
	 Equipment compliant with RoHS directive

9.1 CRUISER 322 – POWER PULSE 322




Supply voltage	3 x 400 Va.c. ± 15 % / 50-60 Hz			
Mains protection	25 A 500 V Delayed			
Zmax	This equipment complies with IEC 61000-3-12 provided that the maximum permissible system impedance is less than or equal to 27 mΩ at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with maximum permissible system impedance less than or equal to 27 mΩ.			
Dimensions (L x D x H)	690 x 290 x 450 mm			
Weight	45 kg			
Insulation class	H			
Protection rating	IP23			
Cooling	AF: Air-over cooling (fan assisted)			
Maximum gas pressure	0,5 MPa (5 bar)			
Static characteristic	MMA	 Falling characteristic		
	TIG	 Falling characteristic		
	MIG/MAG	 Flat characteristic		
Welding mode		MMA	TIG	MIG/MAG
Current and voltage adjustment range		10 A / 20.4 V 300 A - 32.0 V	5 A / 10.2 V 320 A - 22.8 V	10 A / 14.5 V 320 A / 30.0 V
Welding current / Working voltage	40% (40° C)	--	--	--
	60% (40° C)	300 A - 32.0 V	320 A - 22.8 V	320 A / 30.0 V
	100% (40° C)	250 A - 30.0 V	260 A - 20.4 V	260 A / 27.0 V
Maximum input power	40% (40° C)	--	--	--
	60% (40° C)	14.3 kVA – 11.0 kW	11.6 kVA – 8.5 kW	15.2 kVA – 11.6 kW
	100 % (40° C)	11.4 kVA – 8.7 kW	8.8 kVA – 6.4 kW	11.6 kVA – 8.5 kW
Maximum supply current	40% (40° C)	--	--	--
	60% (40° C)	20.9 A	16.6 A	22.0 A
	100 % (40° C)	16.7 A	12.7 A	16.5 A
Maximum Effective Supply Current	40% (40° C)	--	--	--
	60% (40° C)	16.2A	12.8 A	17.0 A
	100 % (40° C)	16.7 A	12.7 A	16.5 A

No-load voltage (U ₀)		73 V
Reduced no-load voltage (U _r)		10 V

9.2 CRUISER 402 – POWER PULSE 402

Supply voltage	3 x 400 Va.c. ± 15 % / 50-60 Hz			
Mains protection	32 A 500 V Delayed			
Z _{max}	This equipment complies with IEC 61000-3-12 provided that the maximum permissible system impedance is less than or equal to 27 mΩ at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with maximum permissible system impedance less than or equal to 27 mΩ.			
Dimensions (L x D x H)	690 x 290 x 450 mm			
Weight	49.5 kg			
Insulation class	H			
Protection rating	IP23			
Cooling	AF: Air-over cooling (fan assisted)			
Maximum gas pressure	0,5 MPa (5 bar)			
Static characteristic	MMA	 Falling characteristic		
	TIG	 Falling characteristic		
	MIG/MAG	 Flat characteristic		
Welding mode		MMA	TIG	MIG/MAG
Current and voltage adjustment range		5 A / 20.2 V 400 A / 36.0 V	5 A / 10.2 V 400 A / 26.0 V	20 A / 15.0 V 400 A / 34.0 V
Welding current / Working voltage	50% (40° C)	--	--	--
	60% (40° C)	--	--	--
	100% (40° C)	400 A / 36.0 V	400 A / 26.0 V	400 A / 34.0 V
Maximum input power	50% (40° C)	--	--	--
	60% (40° C)	--	--	--
	100 % (40° C)	18.4 kVA – 16.8 kW	14.3 kVA – 12.9 kW	17.7 kVA – 16.1 kW
Maximum supply current	50% (40° C)	--	--	--
	60% (40° C)	--	--	--
	100 % (40° C)	25.5 A	18.4 A	24.3 A
Maximum Effective Supply Current	50% (40° C)	--	--	--
	60% (40° C)	--	--	--
	100 % (40° C)	25.5 A	18.4 A	24.3 A
No-load voltage (U ₀)		83V		
Reduced no-load voltage (U _r)		9V		

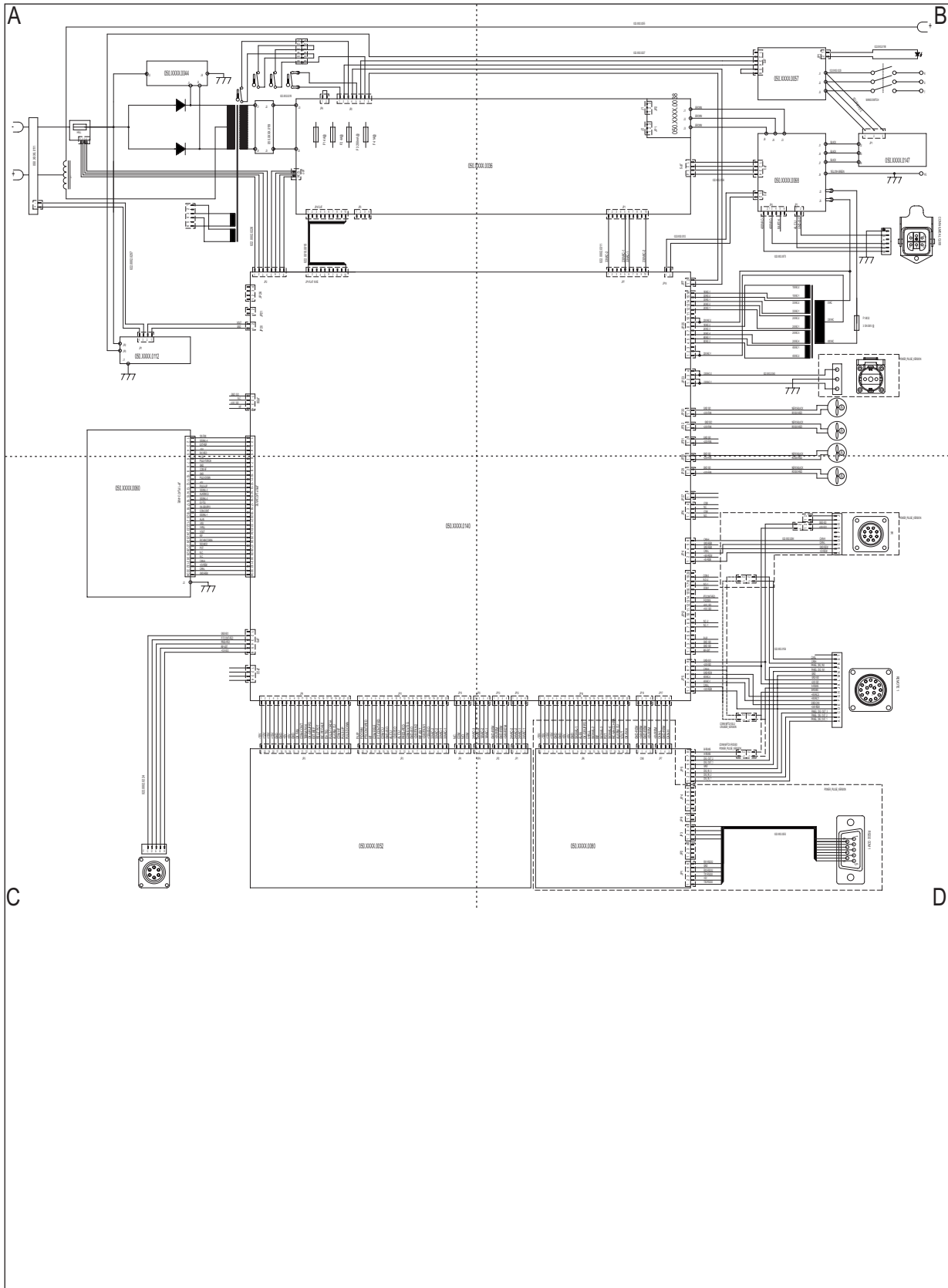
9.3 CRUISER 502 – POWER PULSE 502

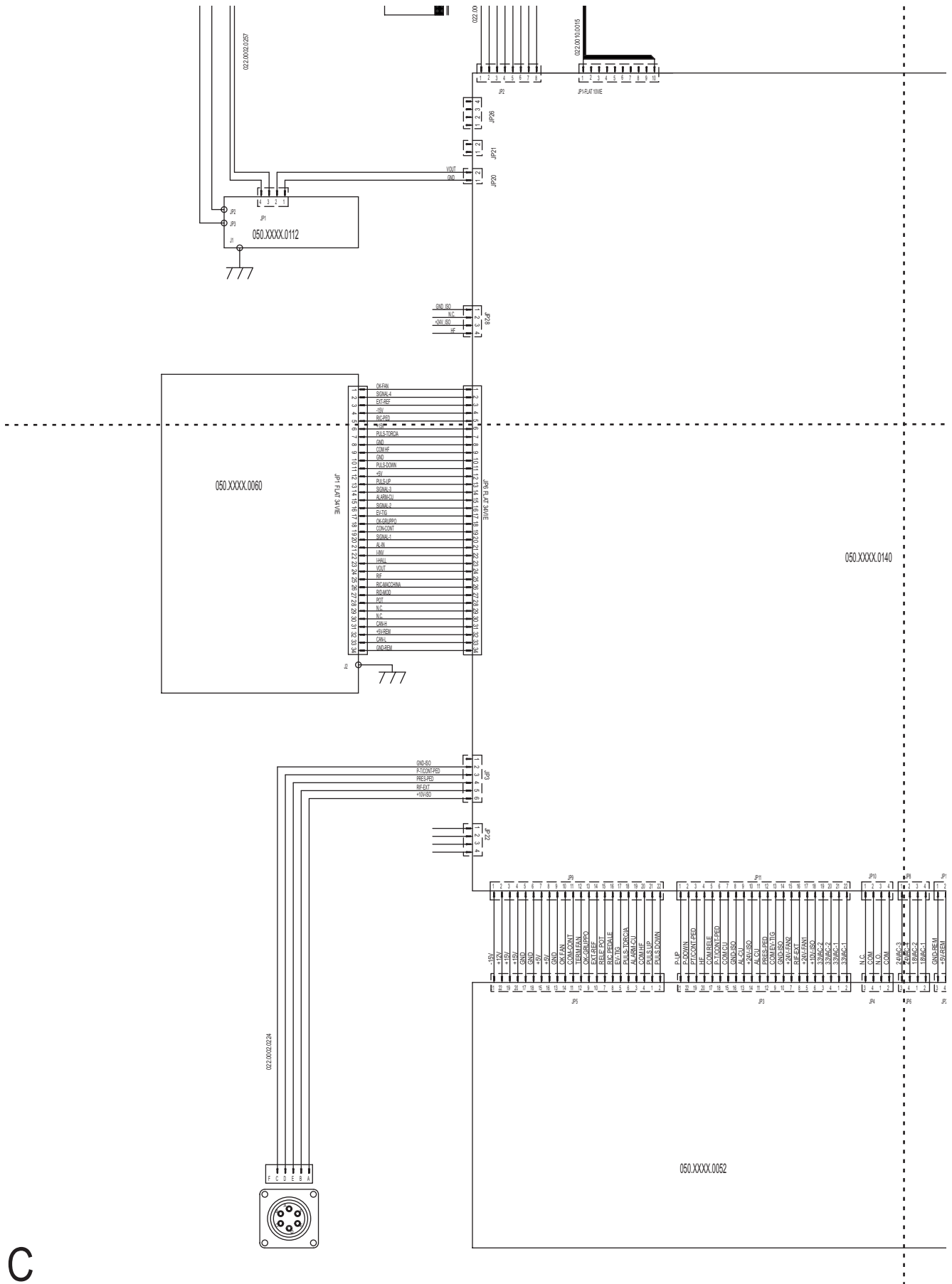
Supply voltage	3 x 400 Va.c. ± 15 % / 50-60 Hz			
Mains protection	40 A 500 V Delayed			
Zmax	This equipment complies with IEC 61000-3-12 provided that the maximum permissible system impedance is less than or equal to 49 mΩ at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with maximum permissible system impedance less than or equal to 49 mΩ.			
Dimensions (L x D x H)	690 x 290 x 450 mm			
Weight	49.5 kg			
Insulation class	H			
Protection rating	IP23			
Cooling	AF: Air-over cooling (fan assisted)			
Maximum gas pressure	0.5 MPa (5 bar)			
Static characteristic	MMA	 Falling characteristic		
	TIG	 Falling characteristic		
	MIG/MAG	 Flat characteristic		
Welding mode		MMA	TIG	MIG/MAG
Current and voltage adjustment range		10 A / 20.4 V 500 A / 40.0 V	5 A / 10.2 V 500 A / 30.0 V	20 A / 15.0 V 500 A / 39.0 V
Welding current / Working voltage	30% (40° C)	500 A / 40.0 V	500 A / 30.0 V	500 A / 39.0 V
	60% (40° C)	450 A / 38.0 V	460 A / 28.4 V	450 A / 36.5 V
	100% (40° C)	400 A / 36.0 V	400 A / 26.0 V	400 A / 34.0 V
Maximum input power	30% (40° C)	24.3 kVA – 22.2 kW	18.2 kVA – 16.6 kW	23.7 kVA – 21.7 kW
	60% (40° C)	21.2 kVA – 19.0 kW	16.1 kVA – 14.5 kW	20.3 kVA – 18.3 kW
	100 % (40° C)	18.1 kVA – 15.9 kW	13.0 kVA – 11.4 kW	17.5 kVA – 15.3 kW
Maximum supply current	30% (40° C)	35.1 A	26.3 A	34.3 A
	60% (40° C)	30.0 A	22.8 A	28.5 A
	100 % (40° C)	25.5 A	18.4 A	24.3 A
Maximum Effective Supply Current	30% (40° C)	24.8 A	18.6 A	24.2 A
	60% (40° C)	23.2 A	17.7 A	22.1 A
	100 % (40° C)	25.5 A	18.4 A	24.3 A
No-load voltage (U0)		83V		
Reduced no-load voltage (Ur)		9V		



10 ELECTRICAL DIAGRAM

10.1 CRUISER 322 - POWER PULSE 322



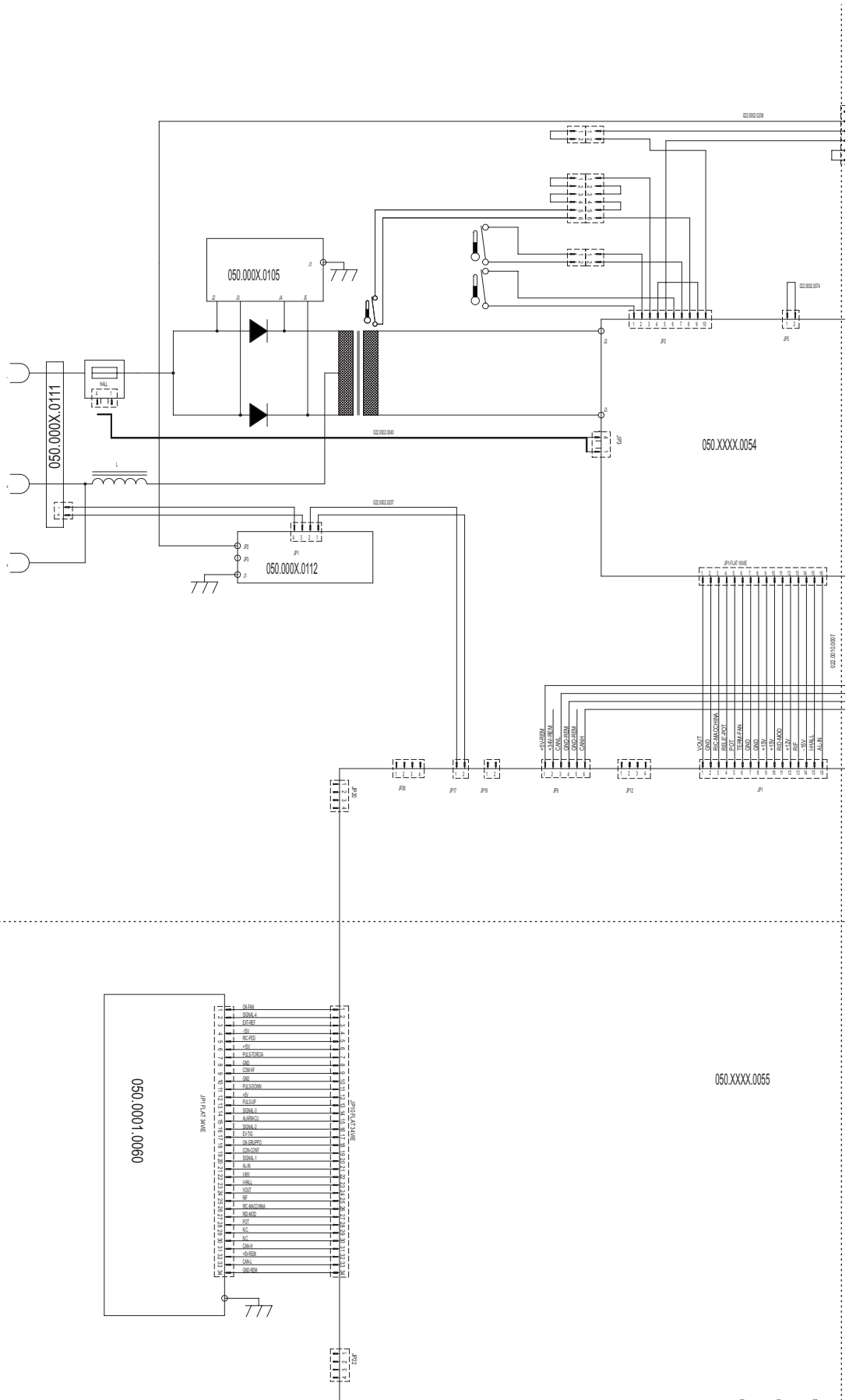


C



WELD THE WORLD

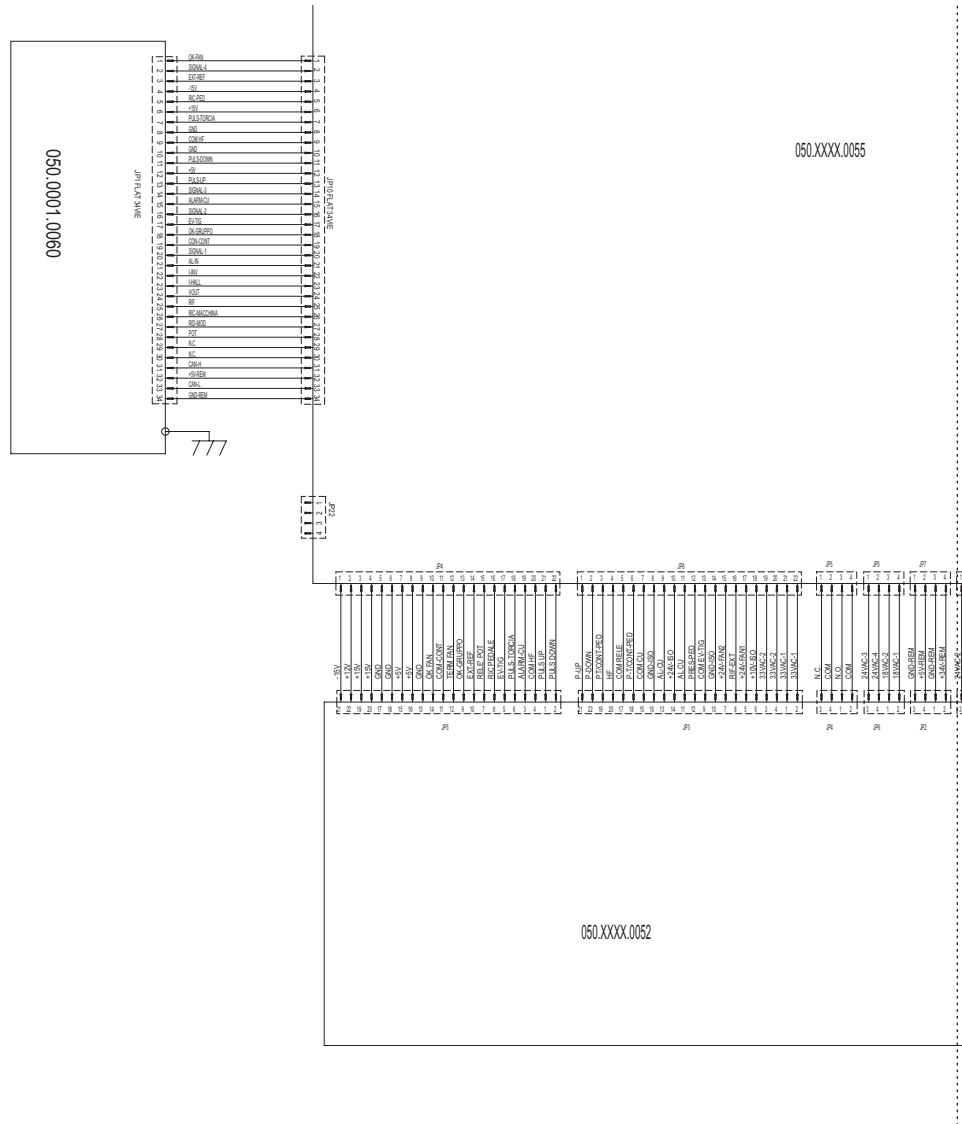
A





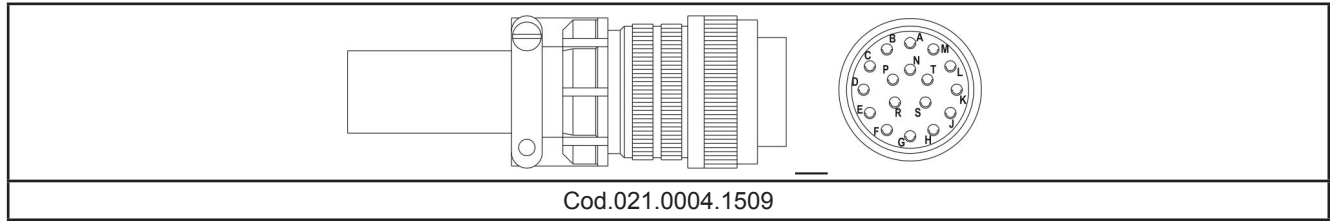
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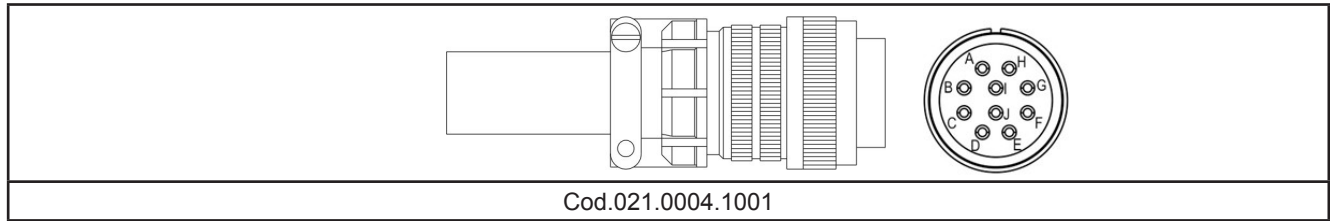


C

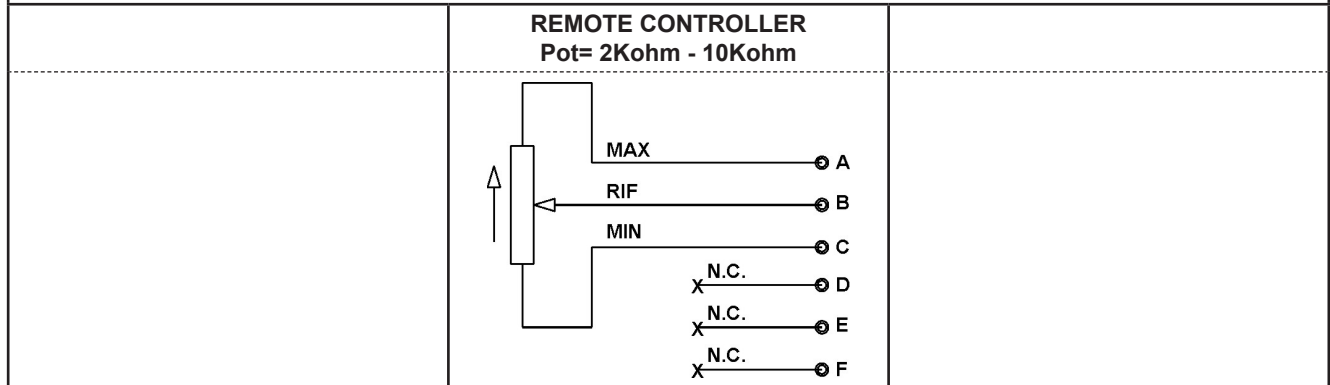
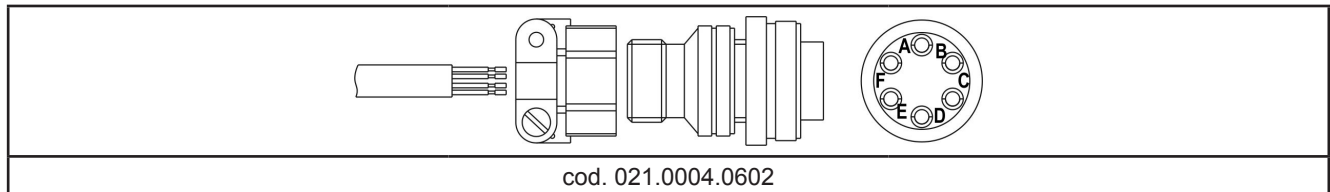
10.3 "REMOTE 1" CONNECTOR



10.4 "IR" CONNECTOR

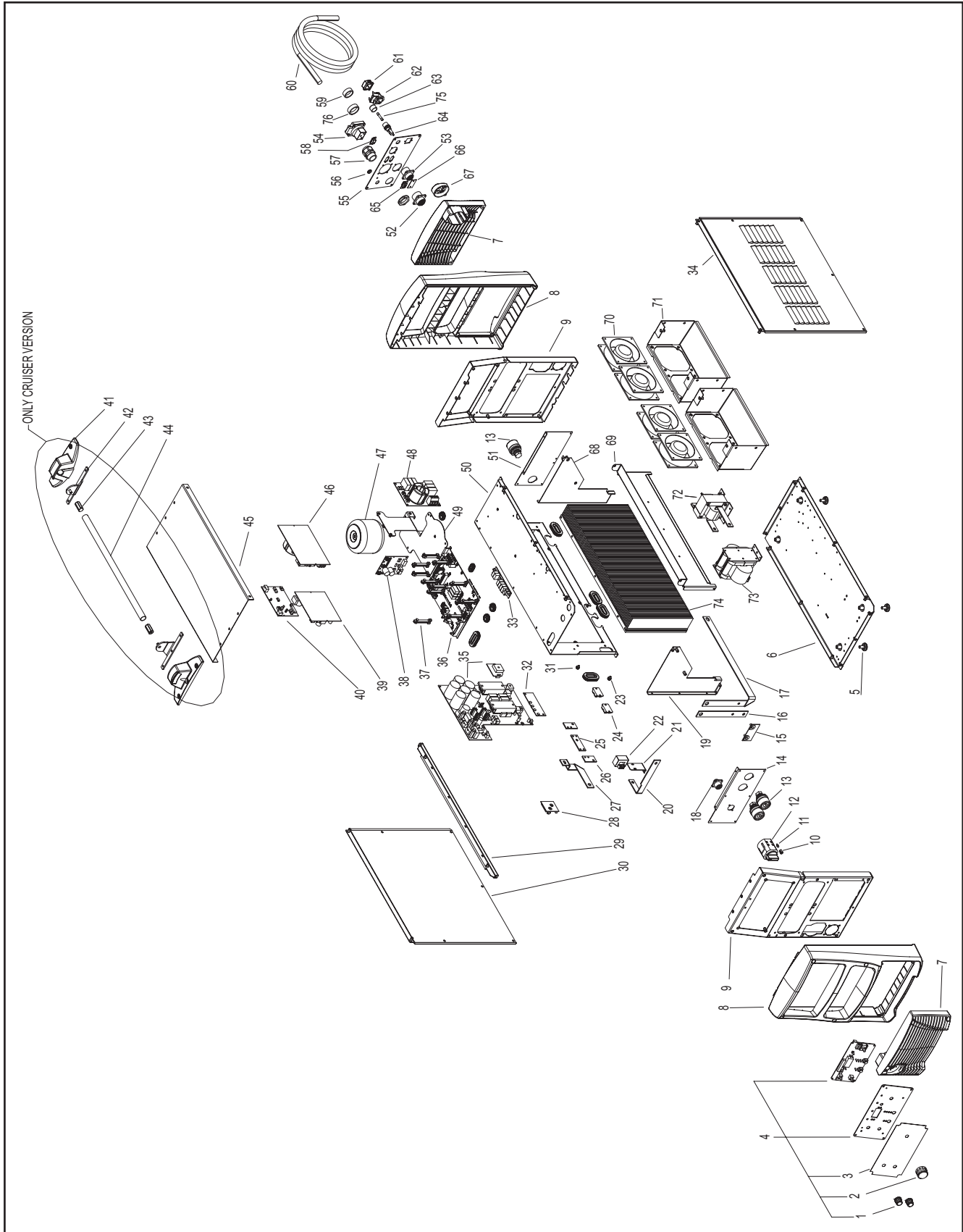


10.5 REMOTE CONTROL CONNECTOR (back panel)



11 SPARE PARTS

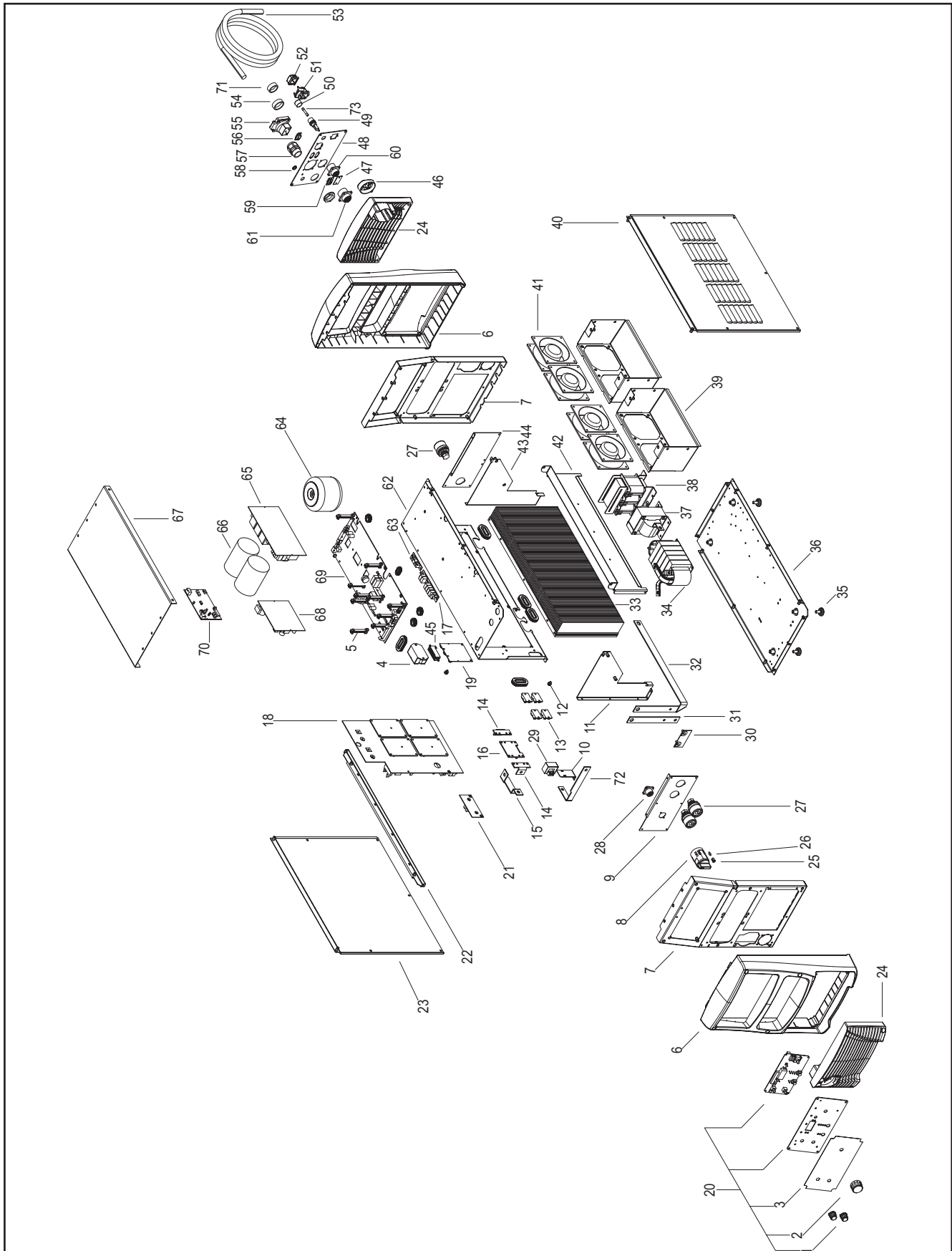
11.1 CRUISER 322 - POWER PULSE 322



N°	CODE	DESCRIPTION
1	014.0002.0008	KNOB WITH CAP + INDICATOR
2	014.0002.0016	KNOB WITH CAP
3	013.0023.0601	FRONT PANEL LABEL
4	050.5143.0000	COMPLETE LOGIC FRONT PANEL
5	016.0009.0003	RUBBER FOOT
6	011.0013.0020	LOWER COVER
7	012.0007.0020	PLASTIC LOUVRE
8	012.0007.0010	FRONT/REAR PLASTIC PANEL
9	011.0013.0021	FRONT/REAR PLATE
10	016.4107.0001	LED HOLDER
11	022.0002.0190	LED WIRING
12	040.0001.0017	THREE-POLE SWITCH
13	021.0001.0279	OUTPUT SOCKET
14	011.0013.0038	FRONT SOCKETS PLATE
15	050.0001.0111	OUTPUT BOARD
16	045.0006.0085	(-) DIODE COPPER BRACKET
17	045.0006.0084	(+) DIODE COPPER BRACKET
18	022.0002.0224	REMOTE LOGIC BOARD WIRING
19	011.0013.0039	LEFT TUNNEL SUPP. PLATE
20	045.0006.0098	HALL SENSOR COPPER BRACKET
21	011.0013.0041	HALL SUPPORT PLATE
22	041.0004.0501	HALL EFFECT SENSOR
23	040.0003.1080	TERMAL SWITCH 80°C L=130mm
24	032.0002.2403	ISOTOP DIODE
25	045.0006.0071	(-/+) DIODE COPPER BRACKET
26	045.0006.0088	DIODES-TRANSFORMER COPPER BRACKET
27	045.0006.0086	DIODES-MODULE SHORT BRACKET
28	050.0003.0044	SNUBBER BOARD
29	011.0013.0037	COVER PANEL SUPPORT PLATE
30	011.0000.0911	LEFT COVER
31	040.0003.1002	TERMAL SWITCH 75°C L=200mm
32	050.0001.0119	PRIMARY CAPACITOR BOARD
33	050.0001.0112	OUTPUT FILTER BOARD
34	011.0000.0921	RIGHT COVER
35	050.0003.0036	COMPLETE POWER BOARD
36	050.0001.0140	BUS BOARD
37	016.0010.0001	BOARDS SUPPORT GUIDE
38	050.0002.0057	POWER SUPPLY CONTROL BOARD
39	050.0002.0052	SUPPLIES BOARD
40	050.0028.0080	PULSE BOARD (ONLY 322 POWER PULSE VERSION)
41	012.0000.0005	PLASTIC COVER HANDLE TUBE SUPPORT PLATE

N°	CODE	DESCRIPTION
42	011.0009.0047	HANDLE TUBE SUPPORT PLATE
43	016.0002.0001	PIN
44	011.0013.0013	HANDLE TUBE
45	011.0000.0901	UPPER COVER
46	050.0002.0068	LINE FILTER BOARD
47	041.0006.0006	TOROIDAL TRANSFORMER
48	050.0001.0147	LINE FILTER BOARD
49	011.0013.0044	BOARD SUPPORT PLATE
50	011.0013.0023	UPPER PLATE
51	011.0013.0034	REAR PLATE
52	022.0002.0156	17 PIN CABLE
53	022.0002.0284	10 PIN CONNECTOR CABLE (ONLY POWER PULSE VERSION)
54	021.0005.0001	230V SOCKET
55	013.0000.7000	REAR PANEL
56	016.0011.0002	PLASTIC CAP
57	045.0000.0017	COMPLETE CABLE CLAMP
58	021.0014.0303	RS-232 CONNECTOR CAP
59	021.0004.2993	10 PIN CONNECTOR CAP
60	045.0002.0014	SUPPLY CABLE
61	021.0013.0007	ILME CONNECTOR CAP
62	022.0002.0073	CU SUPPLY CABLE
63	016.0011.0004	FUSE HOLDER CAP
64	040.0006.1880	FUSE HOLDER
65	022.0002.0152	RS-232 CABLE
66	011.0014.0069	COVER PLATE (2)
67	012.0007.0040	CAP
68	011.0013.0040	RIGHT TUNNEL SUPP. PLATE
69	011.0013.0032	VENTILATION SHROUD
70	003.0002.0017	FAN
71	011.0013.0033	INTERNAL FAN SUPPORT
72	044.0004.0027	OUTPUT INDUCTOR
73	042.0003.0041	POWER TRANSFORMER
74	015.0001.0017	HEAT SINK
75	040.0007.1315	FUSE
76	021.0004.2994	17 PIN CONNECTOR CAP

11.2 CRUISER 402/502 - POWER PULSE 402/502



N°	CODE	DESCRIPTION
1	014.0002.0008	KNOB WITH CAP + INDICATOR
2	014.0002.0016	KNOB WITH CAP
3	013.0018.1001	FRONT PANEL LABEL (502)
	013.0018.0901	FRONT PANEL LABEL (402)
4	032.0001.8216	THREE PHASE RECTIFIER BRIDGE
5	016.0010.0001	BOARDS SUPPORT GUIDE
6	012.0007.0010	FRONT/REAR PLASTIC PANEL
7	011.0013.0021	FRONT/REAR PLATE
8	040.0001.0016	THREE-POLE SWITCH
9	011.0013.0038	FRONT SOCKETS PANEL
10	011.0013.0041	HALL SUPPORT PLATE
11	011.0013.0039	LEFT TUNNEL SUPP. PLATE
12	040.0003.1007	THERMAL CUT-OUT
13	032.0002.2403	ISOTOP DIODE
14	045.0006.0090	DIODES-TRANSFORMER COPPER BRACKET
15	045.0006.0091	ISOTOP/Socket COPPER BRACKET
16	045.0006.0089	DIODE-DIODE BRACKET
17	050.0001.0112	OUTPUT FILTER BOARD
18	050.0002.0054	COMPLETE POWER BOARD
19	050.0002.0057	POWER SUPPLY CONTROL BOARD
20	050.5080.0000	COMPLETE FRONT LOGIC PANEL (502)
	050.5079.0000	COMPLETE FRONT LOGIC PANEL (402)
21	050.0001.0105	SNUBBER BOARD
22	011.0013.0037	COVER PANEL SUPPORT PLATE
23	011.0000.0911	LEFT COVER PANEL
24	012.0007.0020	PLASTIC LOUVRE
25	016.4107.0001	LED HOLDER
26	022.0002.0190	LED WIRING
27	021.0001.0279	OUTPUT SOCKET
28	022.0002.0239	REMOTE LOGIC CABLE
29	041.0004.0501	HALL EFFECT SENSOR
30	050.0001.0111	OUTPUT FILTER BOARD
31	045.0006.0085	(-) SOCKET COPPER BRACKET
32	045.0006.0084	(+) SOCKET COPPER BRACKET
33	015.0001.0017	HEAT SINK
34	042.0003.0042	POWER TRANSFORMER
35	016.0009.0003	RUBBER FOOT
36	011.0013.0020	LOWER COVER
37	044.0004.0016	OUTPUT INDUCTOR

N°	CODE	DESCRIPTION
38	044.0004.0022	INPUT INDUCTOR
39	011.0013.0033	INTERNAL FAN SUPPORT
40	011.0000.0921	RIGHT COVER PANEL
41	003.0002.0017	FAN
42	011.0013.0032	VENTILATION SHROUD
43	011.0013.0040	RIGHT TUNNEL SUPP. PLATE
44	011.0013.0034	REAR PLATE
45	030.0017.2202	RESISTOR
46	012.0007.0040	CAP
47	011.0014.0069	COVER PLATE (2)
48	013.0000.7000	REAR PANEL
49	040.0006.1880	FUSE HOLDER
50	016.0011.0004	FUSE HOLDER CAP
51	022.0002.0073	C.U. POWER SUPPLY WIRING
52	021.0013.0007	ILME CONNECTOR CAP
53	045.0002.0009	SUPPLY CABLE
54	021.0004.2994	17 PIN CONNECTOR CAP
55	021.0005.0001	230V SOCKET
56	021.0014.0303	RS-232 CONNECTOR CAP
57	045.0000.0017	CABLE CLAMP
58	016.0011.0002	CAP Ø=13
59	022.0002.0152	RS-232 CABLE
60	022.0002.0284	10 PIN CONNECTOR CABLE (ONLY POWER PULSE VERSION)"
61	022.0002.0240	17 PIN CABLE
62	011.0013.0023	UPPER PLATE
63	050.0002.0061	FAN AND C.U. CONTROL BOARD
64	041.0006.0006	AUXILIARY TRANSFORMER
65	050.0002.0053	MAINS FILTER BOARD
66	031.1005.0228	CAPACITOR
67	011.0000.0901	UPPER COVER
68	050.0002.0052	SUPPLIES BOARD
69	050.0003.0055	BUS BOARD
70	050.0021.0080	PULSE BOARD (ONLY 402 POWER PULSE VERSION)
	050.0022.0080	PULSE BOARD (ONLY 502 POWER PULSE VERSION)
71	021.0004.2993	10 PIN CONNECTOR CAP
72	045.0006.0098	HALL SENSOR COPPER BRACKET
73	040.0007.1200	FUSE





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