

Q.ta 1 Manipolatore CFE USATO 4x4 Carro motorizzato



MANIPOLATORE Usato tipo Armco 4x4 realizzato in robusta carpenteria meccanica particolarmente indicato per tutte le applicazioni di saldatura automatica per l'esecuzione di saldature longitudinali e circonferenziali, interne ed esterne di corpi cilindrici, eolico e carpenteria in genere.

CARATTERISTICHE TECNICHE:

- Corsa utile verticale trave 4000 mm.
- Velocità di sollevamento fissa 1 mt. /min.
- Corsa utile orizzontale trave 4000 mm.
- Velocità di traslazione trave per A. S. - Mig./Mag da 0,2 a 2 mt./ min.

- Base in acciaio elettrosaldato sulla quale è sistemata una ralla a sfere per la rotazione manuale della colonna di 360° con relativi bloccaggi in posizione. La base con assale e ruote motorizzate è scorrevole su binari fissati al suolo.

Velocità di traslazione base per A.S. - Mig. / Mag. da 0,2 a 2 mt. / min.

Altezza fuori tutto del manipolatore 5730 mm. circa

Diametri minimi interni longitudinali e circolari con impianti A.S. - Mig./Mag. e slitte manuali o motorizzate con corse 100x 100 mm. 1200 mm.

Diametri massimi con altezza pezzo 300 mm dal suolo tenuto conto di 300 mm. per la regolazione verticale di sgombero della testa di saldatura. 4000 mm.

Tensione di alimentazione: 380 / 3 / 50 Hz. - 3 Kw.

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DIAMETRO FILO PIENO 0.8-5.6 mm

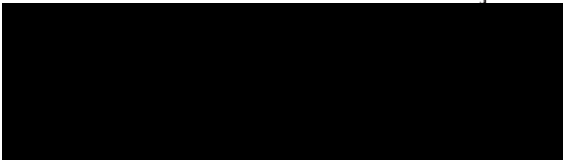
WIRE SPEED RANGE IPM 0.6-16.5 m/min
(M/MIN)

DIMENSIONI ALT X LA X 279 mm x 343 mm x 312 mm
LU (MM)

PESO NETTO 18.598 kg



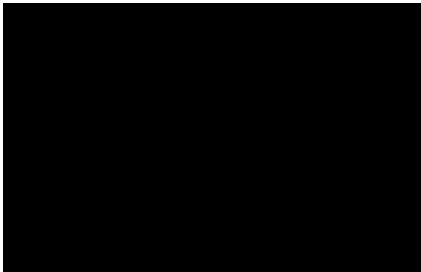
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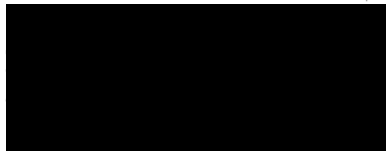
SAF-NEDERLAND BV **NL**



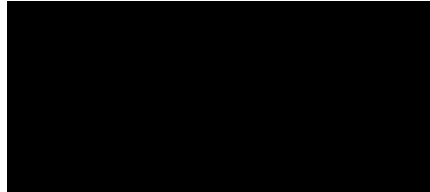
B SAF-BELUX S.A.



SAF-SCHWEISSAUTOMATIK GMBH **D**



SAF WELDING PRODUCTS LTD **GB**



INSTRUCTION D'EMPLOI N° 471.33.34.36 INSTRUCTION FOR USE
ET D'ENTRETIEN AND MAINTENANCE

STARMATIC 600 TH
STARMATIC 800 TH
STARMATIC 1250 TH

GEBRAUCHS- UND
WARTUNGSANLEITUNG



INSTRUKTIES VOOR GEBRUIK
EN ONDERHOUD

F And others countries

Mixed diode-thyristor rectifier unit (GRA)

The diodes and thyristors are mounted on boards and effectively cooled by a fan with multiple blades controlled by a "ventilation" safety device (S2), on the 600 TH and 800 TH; (S3,S4,S5,S6) on the 1250 TH.

Auxiliary source

The auxiliary source is a traditional selenium rectifier bridge (GR2) (600 TH only).

Auxiliary circuits

These circuits are supplied by two transformers, TR4 and TR5, or TR6, protected by fuses (f), and controlled by the "on-off" switch: the powers available at the outlet from the power source are 42 V for 420 VA and 24 V for 250 VA.

The auxiliary circuits include:

- the "ventilation" supplied with single phase, 220 V;
- 2 multi-pin connectors, EF 419 AR and 37 Y, for connection of automatic and semi-automatic welding installations;
- a multi-pin AMPHENOL connector, for the remote controls of U and current pulsation;
- the contactor controlling welding current, controlled from the welding installations;
- the white signal lamp indicating power on (LA1);
- the green signal lamp indicating "welding in progress" (LA2);
- the voltage-current pulsation control board;
- the current relay and voltage relay protection circuit board;
- the striking assistance circuit board.

<u>Dimensions - Weight</u>	<u>STARMATIC 600TH</u>	<u>800 TH</u>	<u>1250 TH</u>
Length mm	1300	950	1170
Width mm	600	670	750
Height mm	1050	1050	1290
Weight kg	260	430	750

1 - GENERAL

INTRODUCTION

The STARMATIC 600, 800 and 1250 TH, transformers-current rectifiers with constant potential, have been specially designed for the supply of welding installations using consumable wire processes.

A welding installation with a constant wire feed speed, supplied by a STARMATIC 600, 800 or 1250 TH, is characterized by:

- an arc voltage which is strictly maintained at the selected value;
- a very great ease of adjustment (adjustment of current voltage without any reciprocal interaction);
- an excellent uniformity in the shape and penetration of the weld bead;
- instantaneous striking of the adjustable and automatic arc;
- excellent arc stability;
- the possibility of selection the welding mode, with or without current pulsation (for the 600 TH only).

DESCRIPTION

They consist of:

Welding transformer

- This is a 3-phase type transformer.
- The primary is connected according to the main's voltage, with delta connection for 220 V and star connection for 380 V. Frequency: 50 Hz.
- The secondary always has a delta connection.

Voltage control

Voltage is controlled by the ES 601 board, catalogue n° 9114.0742 for the 600 TH, and with board ES 231 A, catalogue n° 9114.0730 for the 800 and 1250 TH.

- Welding voltage is adjusted by a potentiometer on the electrical box of the D4, D5 or D6 installations, or by the potentiometer located on the front panel of the power source.

ELECTRICAL CHARACTERISTICS

	STARMATIC 600 TH*		STARMATIC 800 TH*		STARMATIC 1250 TH*	
<u>Characteristics</u>	3-phase 50 Hz		3-phase 50 Hz		3-phase 50 Hz	
Power supply						
Supply voltage	220 V	380 V	220 V	380 V	220 V	380 V
Current consumption at 100%	90 A	52 A	135 A	78 A	207 A	120 A
Maximum power at 100%			51.3 KVA	51.3 KVA	79 KVA	79 KVA
Maximum power at 80%	39.5 KVA	39.5 KVA				
Fuses	80 A	50 A	100 A	63 A	200 A	100 A
Cable cross section	4x25	4x16	4x35	4x25	4x50	4x35
<u>Secondary characteristics</u>						
Welding current 100%	535 A		800 A		1 200 A	
Welding current 80%	600 A					
Mini. welding current	60 A		80 A		100 A	
Maxi. welding current	600 A		800 A		1 250 A	
No-load voltage	56 V		56.5 V		57.7 V	
Voltage during welding	16.5 to 44 V		16.5 to 48 V		24 to 44 V	
Voltage control	± 10% of supply voltage					
Protection index	IP23					
Insulation class	H					

* The STARMATIC 600 and 800 TH come in a multiple voltage version, 50 Hz
220/240/380/415/440/550 Volts.

2 - INSTALLATION AND START-UP

MAINS' CONNECTION

- Connect the 3 wires of the mains to the mains commutator (S1). For access, remove the connecting and coupling board.
- Remove the coupling strips, according to the mains voltage.
- Connect the 3-phases of the mains to the power supply terminals. The fourth conductor is for the earth of the power source.

Welding circuit

- Connect each of the secondary terminals of the set, 2 or 3 cables, 95 mm² cross-section each.

Cable reference : 1 X 95 mm² cat. n°0064-0005 - Length to be specified
Lug reference : n°0015-4100

Auxiliary circuits

- An automatic welding installation is connected:
 - * by way of standard harnesses to the connectors 419 AR and AMPHENOL;
 - * by way of a special harness to terminal board AP2.
- In the case of a manual installation:
 - * by way of standard harnesses to the connector 37 Y;
 - * by way of special harness to the terminal board AP2.

Start-up

- Turn the 0-1 commutator to 1.

The set will deliver current when the operator commands the closing of the contactor from the welding installation.

Adjustment of welding conditions

It is essential to note that:

- the STARMATIC 600, 800 and 1250 TH automatically deliver the necessary current to melt the wire which is fed. Current is adjusted by the wire feed speed;
- the adjustment potentiometer of the set or of the control boxes are used to adjust arc voltage, which is maintained strictly at the selected value, even if wire feed speed is changed.

In practical terms, adjustment takes place as follows:

- a) determine, according to the process scales, the welding current amperage and arc voltage;
- b) adjust wire feed speed in terms of desired current for the given wire diameter;
- c) turn on the welding installation, and fine tune the adjustment of current with the wire feed speed and adjust voltage with the adjustment potentiometer;
- d) adjust, and if necessary, start up, the automatic striking.

Utilization of generators with/without voltage control

This capability is provided on the STARMATIC for manual applications. It provides the possibility of welding with voltage control simply by acting on the switch located on the front.

NOTE: Special application = gouging.

- Connect the + cable on the outlet of coil n° 1. Electronic protection (board ES 29) limits short circuit currents which are too high or too long, and thus protects the power sources.

UTILIZATION OF CURRENT PULSATION FOR THE 600 TH ONLY

1) Controls on power source:

- select frequency in terms of application;
- adjust level of pulsation;
- approximate adjustment can be made by setting the commutator to 75 Hz, and by slowly increasing the level using the potentiometer.

Recommendation: MIG/MAG welding applications with current pulsation will vary with the grade and diameter of wire, current, and welding position. We thus recommend, as a first approach, to adjust the position of the commutator to 75 Hz, and to increase slowly the level of pulsation. Beforehand, carry out the basic adjustments of pulsation. With the characteristic change in arc crackling, the weld pool will become more stable, although hotter. It is therefore necessary to diminish slightly the basic voltage and increase movement speed.

On the basis of these adjustments, and in terms of particular cases of application, the 25/50 or 100 Hz frequencies may be tested.

A higher frequency gives a hotter weld pool, and inversely, around 12.5 or 25 Hz. Low frequencies are usually used for position assembly.

2) Controls on power source: Remote control:

- Connect the AMPHENOL connector.
- On the ES 601 board, connect the plug with its wires connected to the AMPHENOL connector in the place of the plug equipping the rack. Thereafter, the controls located on the front of the power source are inoperative.

STRIKING ASSISTANCE SYSTEM

PRINCIPLE

At each welding cycle start with the MIG/MAG or SUBMERGED ARC processes, the system, when it is in operation, delivers an energy greater than that used during the welding operation.

This voltage peak, which is adjustable, is mainly used with thick wires with a diameter greater than 1.6 mm, in particular with the SUBMERGED ARC process, or when working conditions are difficult (automatic striking at high speed).

Start-up is by way of the 0-1 commutator.

Adjustments: with the potentiometer. Both on the front side of the control rack of the 600, 800 and 1250 TH power source.

Operating and utilization recommendations

1) System in operation

Potentiometer: minimum adjustment or 0

During operation, the system automatically turns the control circuit during the striking phase. This procedure improves arc stability, and gives an arc voltage of approximately 2 volts greater than the average welding voltage.

The arc being struck, the current relay is actuated. It turns off the system and starts up the control circuit.

2) Role of potentiometer

It adjusts the voltage peak delivered at striking.

The 0 point corresponds to welding voltage for the working application, such as, for example, 28 volts with SUBMERGED ARC welding.

The maximum corresponds to the maximum no-load voltage of the power source "without control" (56 V).

The range of adjustment is therefore between a welding voltage of 28 V and 56 V.

NOTE

Adjustment is by way of a progressive and moderate movement of the potentiometer button in order to avoid too strong a supply of energy.

3 - SERVICING

In spite of the simplicity of its design and the ruggedness of the equipment, the STARMATIC require a minimum of maintenance to be kept in good working order.

The following information concerns procedures to be carried out by the user.

The scheduling of these procedures will depend upon conditions of use (room more or less dusty).

On an average, the simple procedures mentioned below are to be carried out every 6 months.

Transformer and coil

Blow out the coil with a stream of compressed air, not to exceed a pressure of 2 to 3 bars.

On-off switch

This switch is also to be cleaned with a stream of compressed air.

Radiators

Servicing concerns mainly the cleanliness of the radiators, which must ensure proper cooling of the diodes and thyristors.

Remove dust from radiators with a stream of compressed air at a maximum pressure of 2 to 3 bars.

If the boards are covered with a film of grease, it is necessary to clean them, using a cloth moistened with a non-chlorinated solvent:

- put cardboard or a piece of protective sheet metal underneath the radiators to prevent the solvent from dripping onto the transformer;
- if they are defective, replace them.

When replacing a diode, carefully wipe the support surface of the diode and radiator, and then spread in silicon grease between the diode and the radiator to improve cooling (grease SI 340 manufactured by the firm of Société Industrielle des Silicones, 10 avenue Franklin Roosevelt, PARIS 75008).

The diodes must be tightened with a torque of 3 meters-kilos.

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Power electric circuits- Primary circuit

Periodic servicing is limited to:

- a checking of the tightness of the primary supply cables;
- the connections of the main contactor and the on/off switch;
- check the condition of the contacts of the main contactor. If the contacts are in dubious condition, do not hesitate to replace them rather than to repair them.

- Secondary circuit

- Proceed in the same manner as for the primary circuit with scheduled checking of the tightening of various connections.

- Auxiliary circuit and electronic boards

- The auxiliary circuits do not require any special maintenance. By contrast, periodic removal of dust is recommended.
- The 2 power source electronic boards are adjusted in the factory. Consequently, there is no reason to check them as long as the power source operates normally.

4 - POSSIBLE OPERATING INCIDENTS

The STARMATIC power sources have been designed for fault-free service. Nevertheless, it is not to be excluded that minor incidents or errors, which have nothing to do with the condition of the apparatus, can cause a partial or complete stop of the set, especially in the absence of periodic servicing.

We give below the means to detect the causes of certain incidents and the corrective action to be taken.

The set does not deliver current

When the welding installation is operating, and even though the connection is correctly made and the auxiliary circuits connected:

- check, after having declutched wire feed, and starting of the welding installation, that maximum no load voltage is normal.

a) if this voltage does not appear on the voltmeter, check:

- the fuses (f), if the power on signal lamp is not lighted;
- that the primary contactor is indeed closed.

In the event of defective operation, check:

- the closure of the control circuit of the contactor in the welding installation;
- the coil of the contactor;
- the coupling of the primary of the transformer of the auxiliaries, in terms of voltage.

b) if this voltage is less than normal no-load voltage, check:

- the coupling of the set's primary panel;
- the condition of contacts and tightness of connections on the relays or commutator;
- the auxiliary rectifier bridge (600 TH);
- the power diodes and thyristors.

To do this, disconnect each diode and each thyristor and test them.

If, once welding has started, it is impossible to vary arc voltage:

- a) Check the adjustment potentiometer and its wiring, from the welding head up to the power source;
- b) If the circuit is good, change the control board.

AUXILIARY CIRCUITS - FUNCTION TABLE

<u>N° 600 800 AND 1250 TH</u>	<u>N° SOCAPEX PLUG 419 AR</u>	<u>FUNCTIONS</u>
9	7	- Voltmeter
11	17	- Ammeter
10	16	+ Common. Voltmeter Ammeter
18	15	Current relay function
19	14	Voltage relay function
1		
2		
3		
4		
14	3	Gate main control
15	9/8	0 of 42 volts
16		
7		
12	10	42 Volts
13		
22	5/6	0 V of 24 V circuit
24	1/2	24 Volts
8		
20	12	Exterior controlled emergency shutdown circuit
21	13	
17	4	Gate main control
5		
6		

NOTE: Connection between 23 of the terminal boards and 18 of the SOCAPEX 419 AR is not made.

N° 600 800 AND 1250 THN° SOCAPEX PLUG
37 YFUNCTIONS

14	3	Gate
17	4	main control
24	7	24 Volts
22	6	0 Volts common
13	5	42 Volts

AUXILIARY CIRCUITS - FUNCTION TABLE (Con'd)

TERMINAL BOARD	AMPHENOL J8 CONNECTOR	ELECTRIC FUNCTIONS	
N° 2	A	0 V	Voltage remote control
N° 1	B	common	Middle point
N° 3	C	+ 10	
<u>J3C PLUG</u>			
N° 1	G	0 V	Remote of 5 pulsation frequencies and remote control
N° 3	J	earth	
N° 4	H	+ 10	
N° 5	I	open	
N° 7	E		
N° 8	F		
N° 9	D		

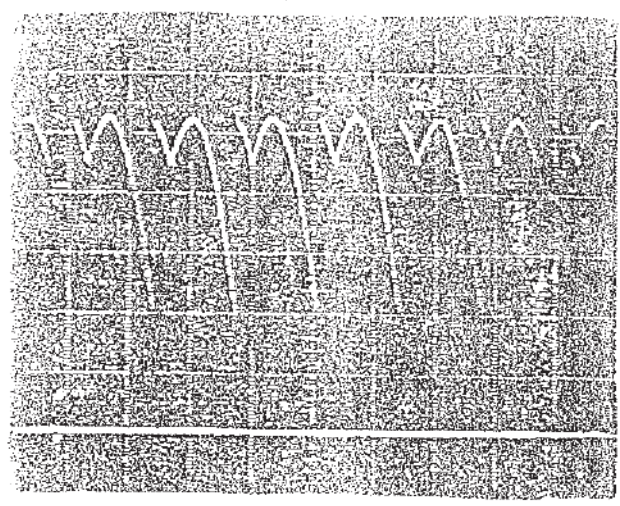
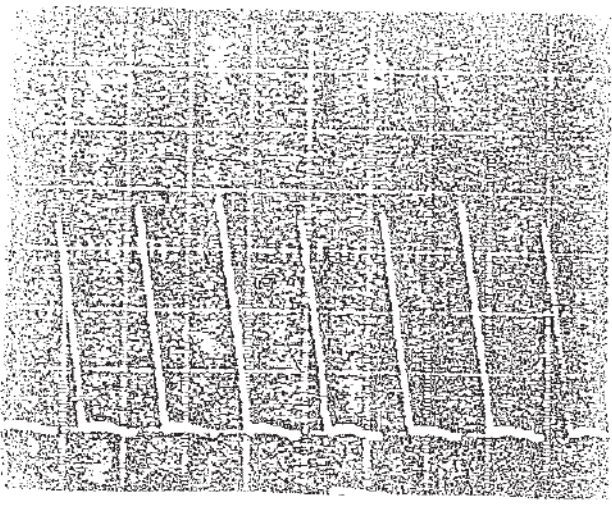
OSCILLOSCOPE READINGS OF CURVES
with the pen placed to + and - terminals of power

Reading at minimum of power
source output voltage

Reading at maximum of power
source output voltage

$t = 5 \text{ ns/cm}$
 $V = 10 \text{ v/cm}$

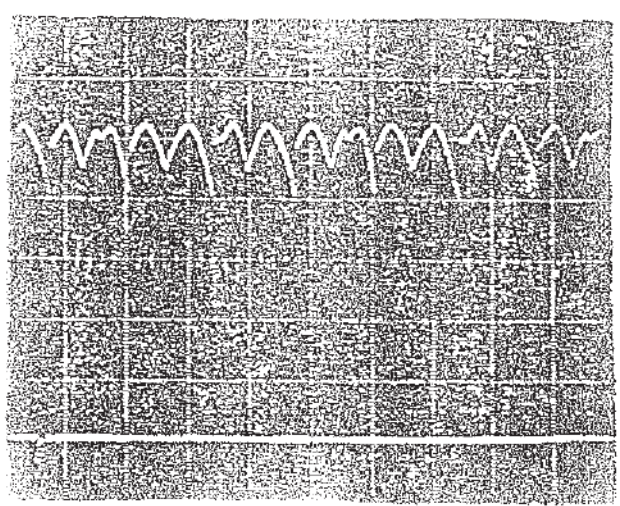
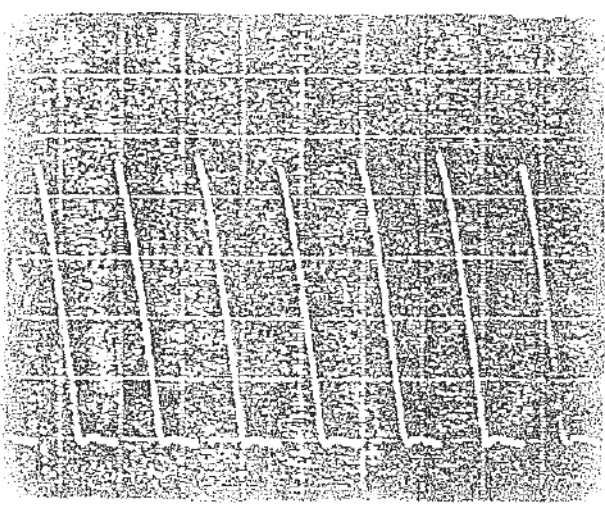
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 $V = 10 \text{ v/cm}$



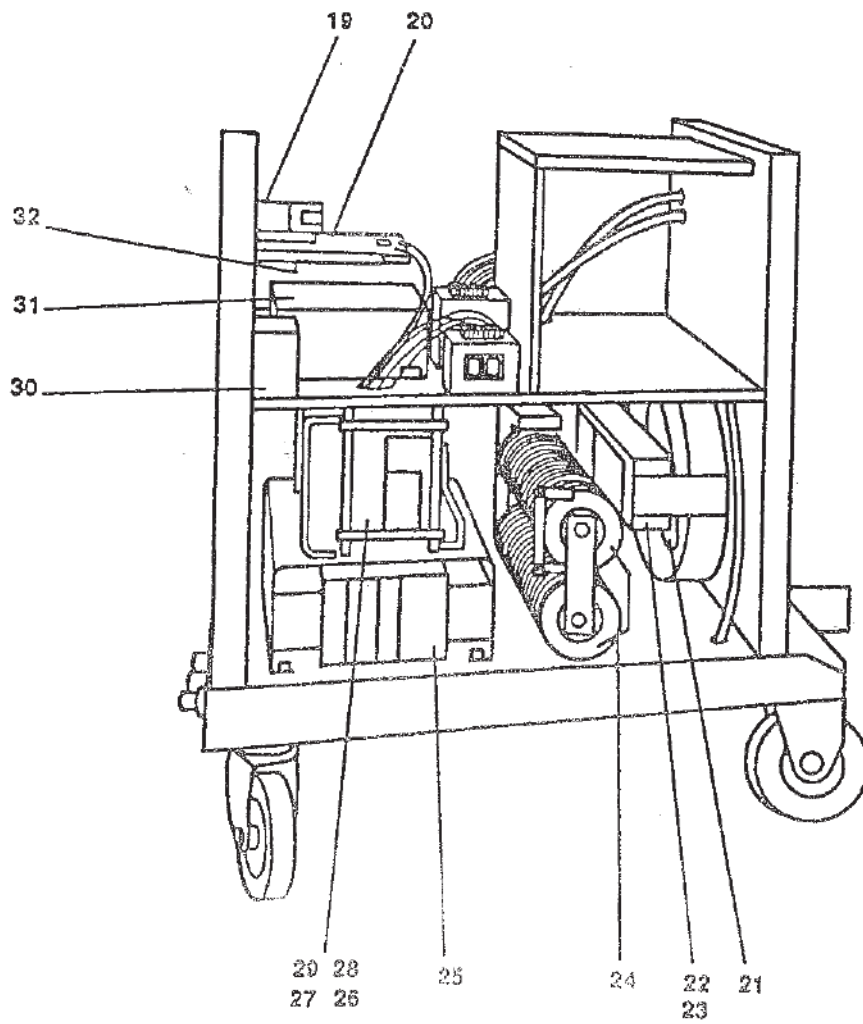
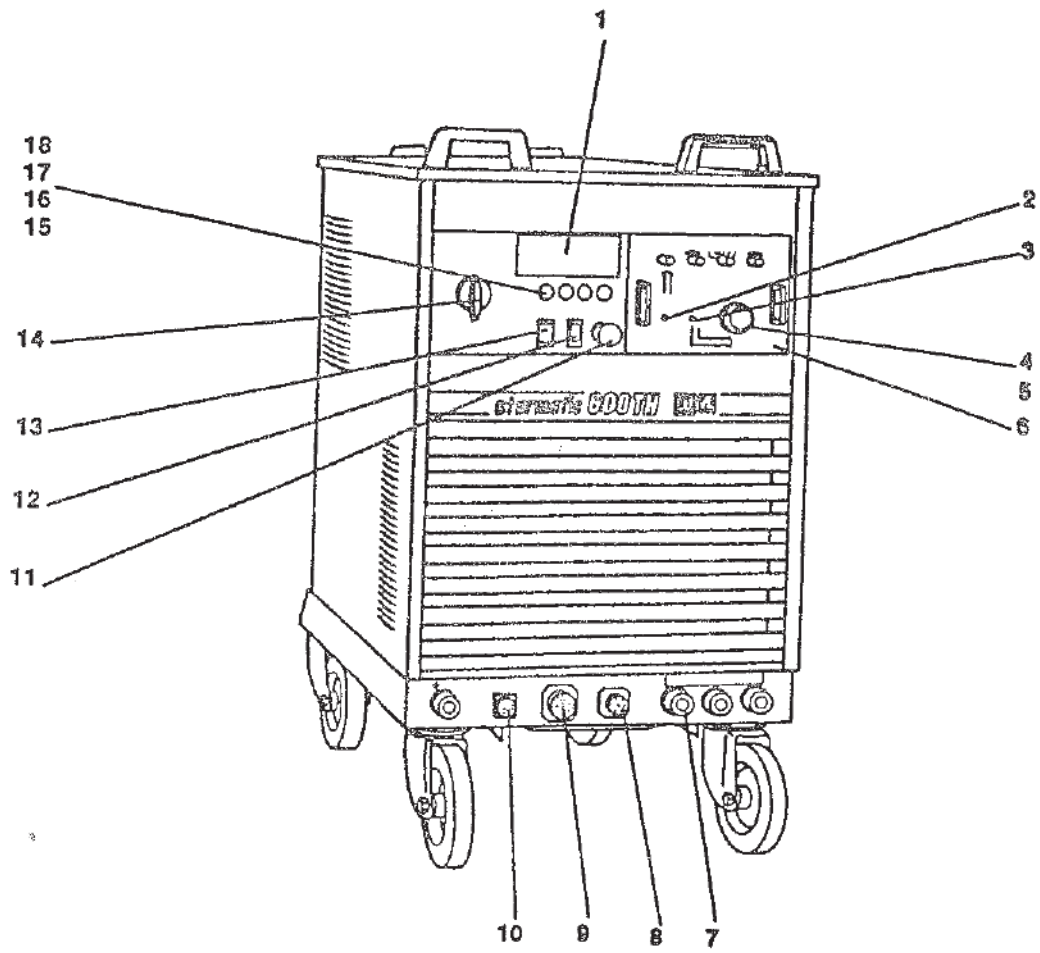
WITHOUT CONTROL

Reading at minimum of power
source output voltage

Reading at maximum of power
source output voltage



$t = 5 \text{ ns/cm}$
 $V = 10 \text{ v/cm}$

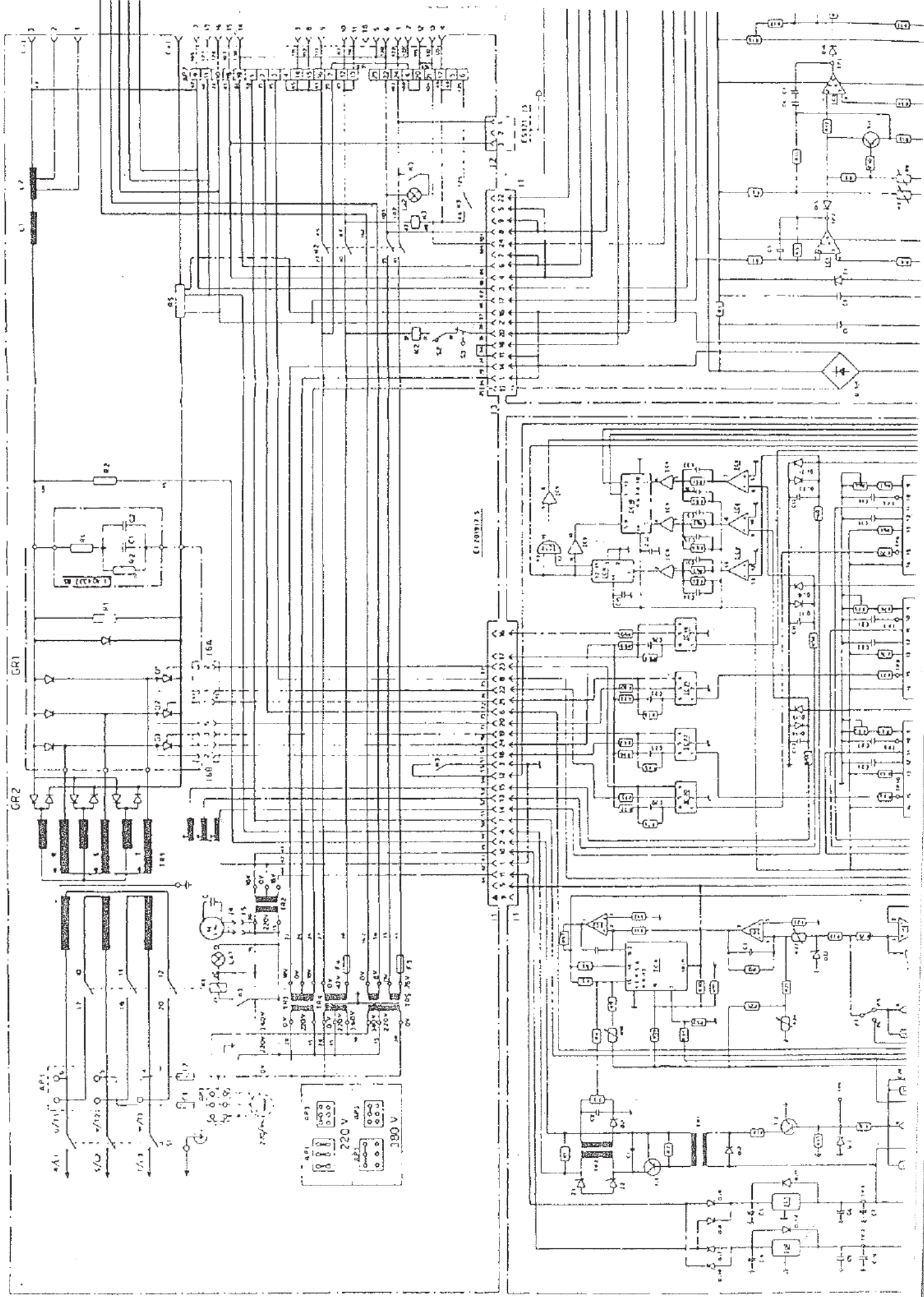


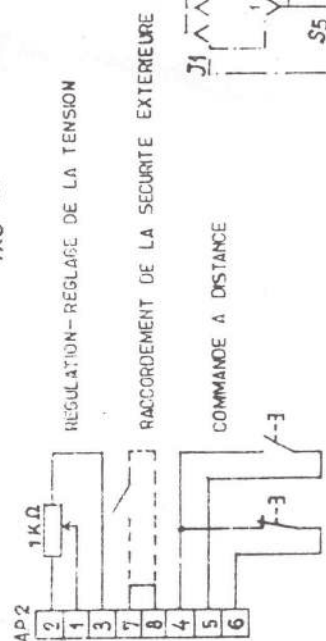
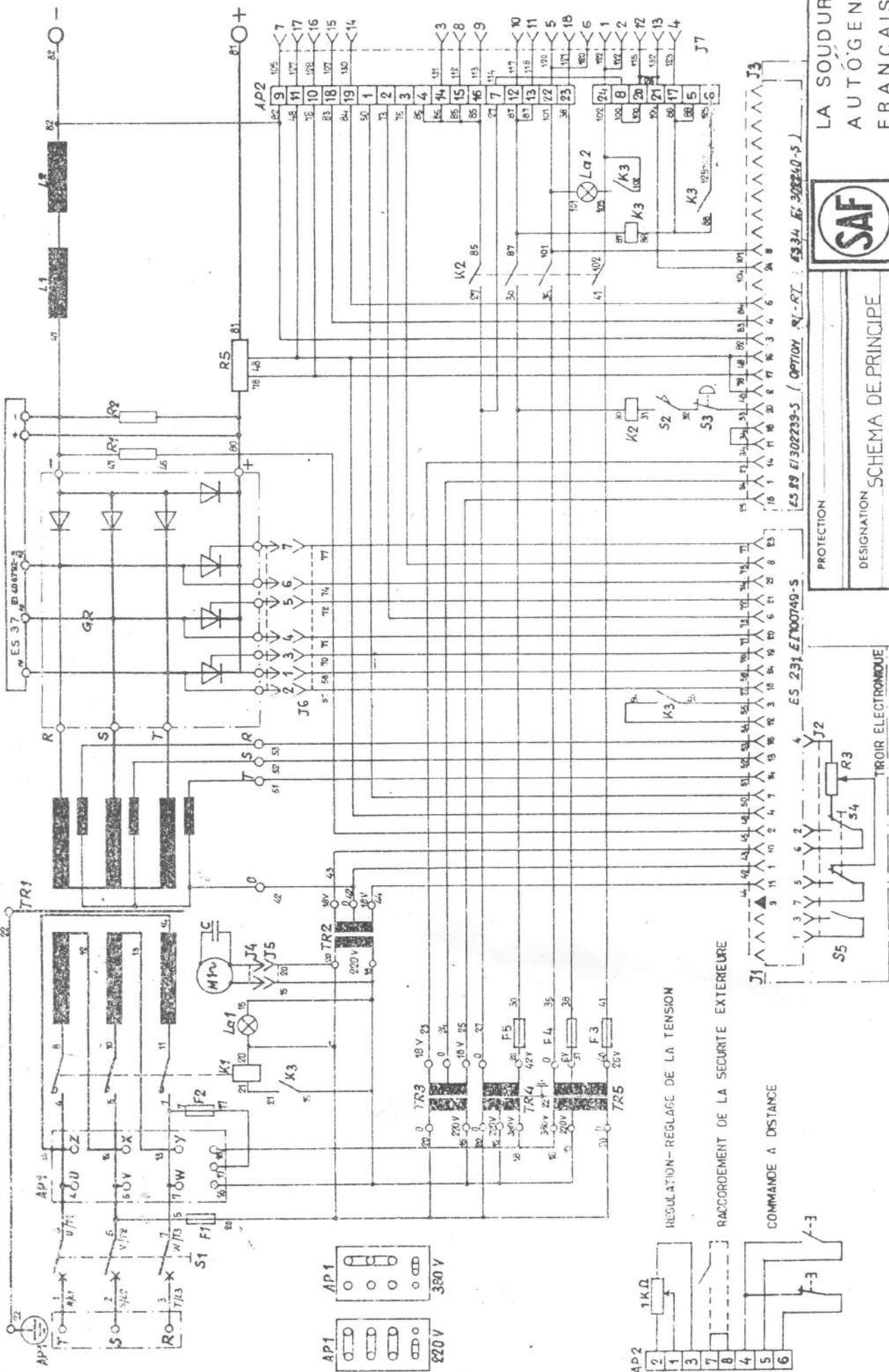
STARMATIC 600 TH POWER SOURCE
 List of spare parts

ITEM	CAT. N°	DESCRIPTION	QTY	WEAR	REPAIR	MAINTENANCE
1	9114.0750	U and I measuring instrument	1	X		
2	"	2 position, 1 pole switch (S5)	1			X
3	"	2 position, 2 pole switch (S4)	1			X
4	0019.1057	Potentiometer, 1000 ohms 2W (R3)	1			
5	0023.6002	Potentiometer control button	1			X
6	9114.0741	Complete electronic rack (generator manufactured before 08/87)	1			X
	9114.0743	Complete electronic rack (generator manufactured after 08/87)	1			X
7	9114.0728	Connector, 120 mm ²	4			X
8	0013.3094	Connector AMPHENOL (J8) 1			X	
9	0013.3032	Connector, Socapex 419 AR (J7)	1			X
10	0013.3018	Connector, Socapex 37 Y 1			X	
11	"	Emergency shutdown button (S3) TELEMECANIQUE	1			X
12	0387.4057	Green signal lamp 24 V (LA2)	1			X
13	0387.4056	White signal lamp 220 V (LA1)	1			X
14	9114.0709	On/off switch (S1)	1	X	X	
15	0020.0014	Fuse 10A (F4)	1	X		
16	0020.0066	Fuse 10A (F1-F2)	2	X		
17	0020.0025	Fuse 5A (F3)	1			
18	0020.0069	Fuse holder	4		X	
19	9114.0727	Complete ES62 circuit (generator manufactured before 08/87)	1		X	
	9114.0732	Complete ES121 circuit (generator manufactured after 08/87)	1		X	
20	9114.0720	Circuit relay/voltage relay protection circuit	1			
21	0387.4022	Propeller of fan motor	1			X
22	0387.4021	Fan motor (M1)	1			X
23	0387.4070	Ventilation safety miniswitch	1		X	
24	9114.0723*	Coil assembly (L1-L2)	1			X
25	9114.0724*	Power transformer (E1 404 337 AS)	1			X
26	9114.7026	Protection circuit (E1 404 337 AS)	1		X	
27	9114.0703	Diode SKN 240/S	4		X	
28	9114.0725	Auxiliary rectifier (GR2)	1		X	
29	9114.0722	Thyristor DCR 704	3	X	X	
30	9114.0714	Main contactor 220 V 50 HZ (K1)	1			
31	9114.0718	Auxiliary contactor 42 V 50 Hz (KZ.K3)	2	X	X	
32	9114.0742	Control/pulsation circuit	1			
	9114.0729	Plug +/- for welding cable	1			X
	9114.0705	THY connecting circuits (not shown)				
		* = Listed item not kept in stock				
		** = Part found in the commerce and not supplied by SAF				

STARMATIC 800 and 1250 TH POWER SOURCES
 List of spare parts

ITEM	CAT. N°	DESCRIPTION	QTY	WEAR	REPAIR	MAINTENANCE
	9114.0733	Equipped thyristor (1250 TH)	3		X	
	0387.4029	Equipped thyristor	3		X	
	9114.0703	Diode SKN 240/S	7		X	
	9114.0734	Diode AR 904 (1250 TH)	4		X	
	0387.4021	Fan motor	1			X
	0387.4022	Propeller of fan motor	1			X
	9114.0705	Thyristor connection PCB	1			
	9114.0708	Equipped ES37 protection PCB	1		X	
	9114.0709	Complete ON/OFF switch	1		X	
	0020.0069	Fuse holder	5		X	
	0020.0025	Fuse F1-F2-F3	3	X		
	0020.0028	Fuse F4	1	X		
	0020.0014	Fuse F5	1	X		
	0387.4056	White signal lamp 220 Volts	1	X		
	0387.4057	Green signal lamp 24 Volts	1	X		
	0013.3094	Connector, AMPHENOL, male 10c	1			
	0013.3032	Connector EF 410 AR	1			
	0387.4019	Revolution counter potentiometer button	1		X	
	0019.1057	Potentiometer, 1 Kohm, 3 watts, 10 turns	1	X		
		* Item not kept in stock				





SAF

**LA SOUDURE
AUTOGÈNE
FRANÇAISE**

75, QUAI D'ORSAY · 75321 PARIS CEDEX 07

DESIGNATION **SCHEMA DE PRINCIPE
SAFMATIC 800 IH**

PROTECTION **ES 89 E1302239-5 / OPTION R1-R2 ES34 E1302240-5**

ES 231 E700749-5

ECHELLE DESSINE PAR
VERIFIE PAR
DATE

PLAN N°