



User manual

Edition: 2002

MANUAL SEALING MACHINE SYMS For CBS™ High Security straws and HSV High Security Vitrification kits

Read this manual carefully before using SEALING MACHINE SYMS

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1. INTRODUCTION

1.1 Applications

The SYMS welder is the tabletop device designed to weld by « thermal impulse » CBS™ High Security straws having a capacity of 0.3 ml & 0.5 ml and HSV High Security Vitrification kits for applications like:

- Epidemiology research departments;
- Biotheques;
- Serotheques;
- Cell and gene therapy units;
- Vaccine producing, pharmaceutical companies (living cells);
- Genetic heritage conservatories (animal, vegetable, microbiological); Laboratories and
- medical officers specializing in reproduction biology; Sperm banks.
-
-

1.2 Mechanical characteristics

☐ Size (in mm)

Length	230 mm
Width	220 mm
Height	170 mm

☐ Mass (in kg) 6 kg

1.3 Electrical characteristics

1.3.1 Equipment nominal value

❶ Welder model

UF 260000	fixed welding block
UF 410000 (ref.017060)	removable welding block

☐ Electric power

Power supply voltage	115 VAC +/- 10%
Power supply frequency	60 Hz
Consumed power	160 W max
Control circuit	12 V DC

☐ Thermal energy

Nature
Power

electrical
19 A at 6 VAC

☐ Protection by fuses
2 fuses

2.5 A.T / 250 VAC / glass tube 5x20
mm, as for standard by IEC 127-2.

② Welder model

UF 250000
UF 400000 (ref. 016399)

fixed welding block
removable welding block

☐ Electric power

Power supply voltage
Power supply frequency
Consumed power
Control circuit

230 VAC +/- 10%
50/60 Hz
120 W max
12 V DC

☐ Thermal energy

Nature
Power

electrical
19 A at 4 VAC

☐ Protection by fuses
2 fuses

2.5 A.T / 250 VAC / glass tube 5x20 mm,
as for standard by IEC 127-2.

1.3.2 Nominal environmental values

☐ Indoor use

☐ Operating temperature

from 5 to 30°C

☐ Maximum relative humidity

80%

☐ Atmosphere

The equipment must not be used at an altitude higher than 2000 m or in an explosive or corrosive environment.

1.3.3 Electrical safety

☐

Safety standard

- Product in class I requiring installation with suitably protected ground. Pollution degree
- 2

1.4 Precautions

We advise you to read this manual with care. It has been produced to help you discover our SYMS INDIVIDUAL STRAW WELDER and to help you make the most of it.

In chapter 3 of this manual, we include the various components of the welder, in particular the parts with their part numbers, essential whenever you are ordering spare parts.

2. HYGIENE AND SAFETY

2.1 Scope of application

The SYMS individual straw welder is designed to weld the CBS™ High Security straws and the HSV High Security Vitrification kits used in the laboratory. There are four models:

- 115V - UF260000 (fixed anvil)
- 115 V - UF410000 – ref. 017060 (mobile anvil)
- 230V - UF250000 (fixed anvil)
- 230 V - UF400000 – ref. 016399 (mobile anvil)

2.2 Protection, Safety

2.2.1 Safety indications



DANGER!

These indications refer to hazards due to electric voltages.



DANGER!

These indications refer to hazards due to risks of burns.



DANGER!

These indications refer to hazards concerning the user and the machine.

2.2.2 Installation safety rules

❑ Installation

- To be safe, this equipment must be connected to an installation that is in conformity (in France NFC 15-100), equipped with a ground connection, suitably protected against ground faults.
- Operation on alternating current. The voltage and frequency must comply with the indications given on the nameplate.
- In the event of damage to the mains cable, turn off the welder power supply immediately. "Mortal danger!" Have the cable replaced by a specialist or contact the after sales service at Cryo Bio System.

❑ Warning

- If the equivalent is used in a way that is not specified in the manual, this may have an effect on the protection offered by the equipment.
- All modifications and repairs of an electrical nature must only be carried out by qualified personnel, operating under the authority of the after sales service technician representing Cryo Bio System.

❑ Descriptions

The SYMS system consists of:

- the individual straw welder, the
- control pedal, a mains power
- cord and a set of spare parts.
- Energizing is carried out using the switch marked « U0 » on the back panel and is displayed by a green indicator light « D1 » on the front panel. The control push buttons or pedal will start the welding cycle.

The welding time is displayed by an orange indicator light.
The press time (cycle time) is displayed by a yellow indicator light.

- Notes:
- welding time (in seconds), factory setting: 2 s press
 - time (in seconds), factory setting: 4 s
 -

The protection trap provides total safety against burns when the welder is operating. Similarly, the opening of the protection trap will cause the cycle to stop and block the controls. However, the equipment will remain energized (indicated by the green power indicator light).

A fuse protection covers any fault current that might be generated.

☐ Recommendations

The CBS™ straw is guaranteed to be tight, because of the temperature, the pressure and the thermal impulse time, adapted to the raw material.

The user must not change any of the welding and press times.

The welding area must be clean and dry.

Guaranteed tightness depends on the systematic use of suitable filling end fittings.

The SYMS welder must never be used for welding conventional PVC or PETG straws.

Never operate the welder for more than 10 consecutive cycles. Allow at least 5 minutes between each series of 10 cycles.

Never operate the welder empty (without any straws in place).

Comply with the protection indications given on the nameplate. See the explanation of the types of protection on pages 2 and 3.

Pay attention to the stability of the welder.

Never place the apparatus in such a way that it is difficult to operate the isolating switch.

2.3 Standardization

We the undersigned, Cryo Bio System - ZI n°1 Est - 61300 SAINT OUEN SUR ITON, certify that:

The individual straw welder, as per model ref.: ⇒ * - UF250000

- ☐ * - UF260000
- ☐ 016399 - UF400000
- ☐ 017060 - UF410000

Serial number:

- complies with the European directives in force:

- Low Voltage No. 73/23 EEC,
- EMC 89/336 EEC,

and to the standards:

- EN 61010-1
- EN 61326-1
- EN 61326/A1

CNL – Refers to coverage to the Canadian Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, CAN/CSA C22.2 No.1010.1-92.

In L'Aigle, 05/04/2002

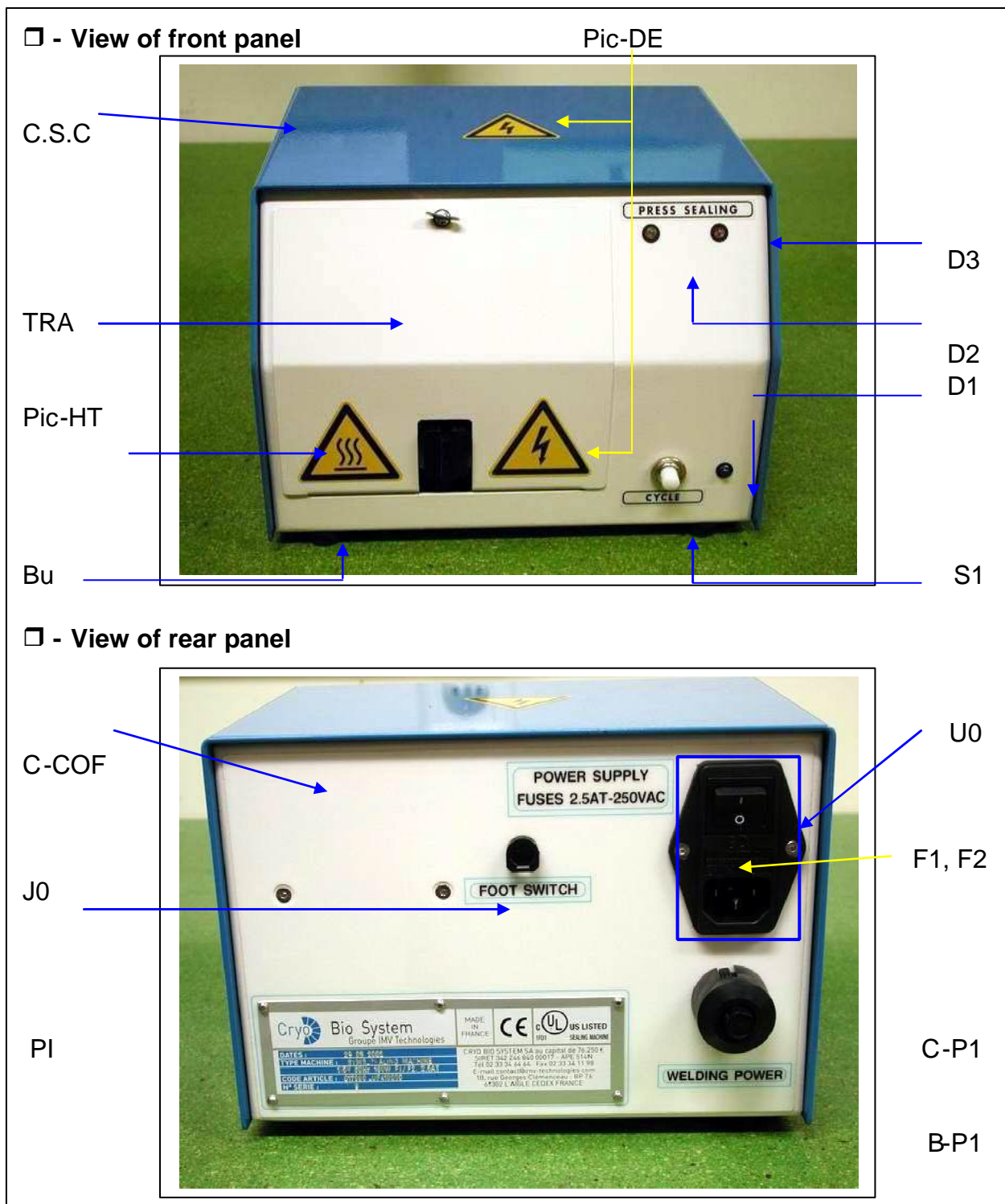
M. BEAU



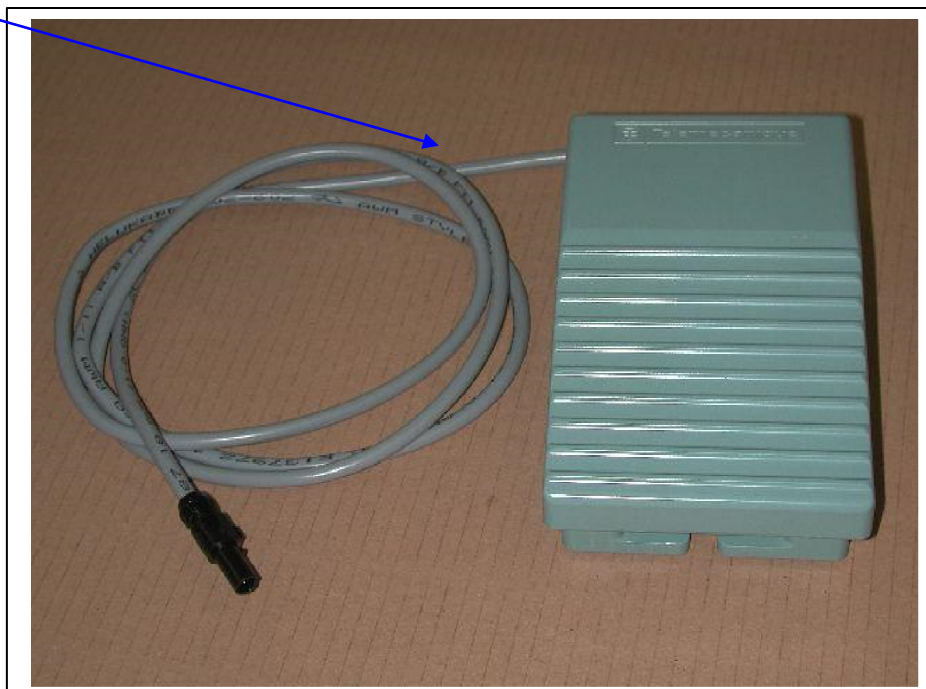
3.1 Overview

3.2 Description of devices

3.2.1 SYMS Manual Welding Machine



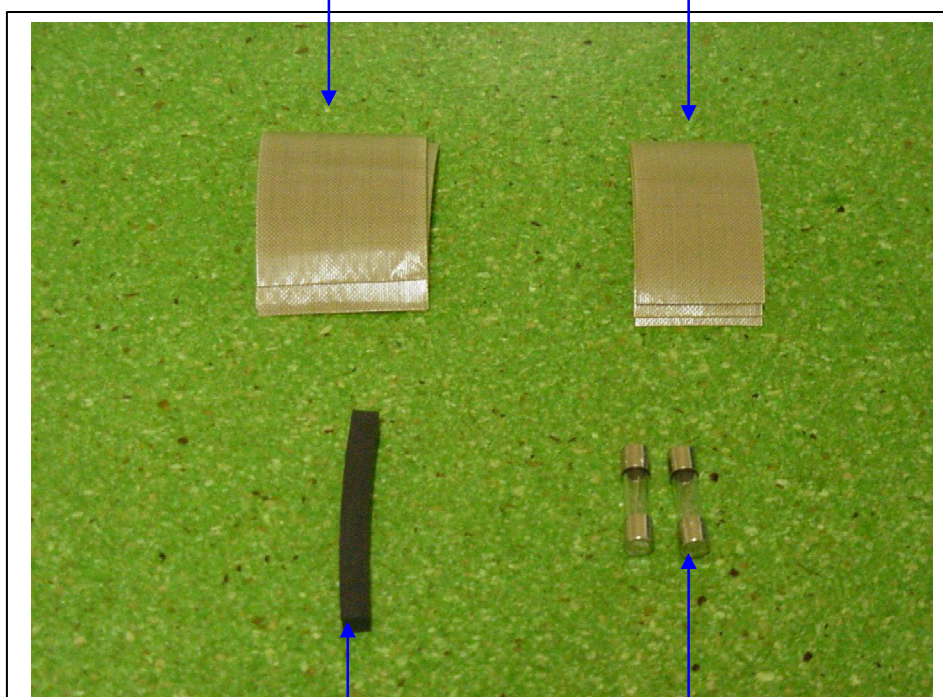
U2



COMP

G22

G9



A19

F1, F2

3.3 Parts list

3.3.1 SYMS individual straw welder

Callout	Quantity	Description	Item ref.	Drawing ref.
C.S.C	1	Complete Upper casing	017179	-UF400603
Bu	4	Black rubber screw stop	016416	
S-U1	1	Electronic board support with insert	017177	-UF400604
S-C1	1	Safety microswitch support	012574	-UF100027
C-COF	1	Case frame with inserts	017178	-UF400602
TRA	1	Trap ¼ turn	009844	-UF100710
B.M-115V	1	Mechanical block 115V	017186	-UF410800
B.M-230V	1	Mechanical block 230V	017167	-UF400800
Pe.P	1	Power harness	017169	-UF400810
Pe.C	1	Control harness	017170	-UF400815
U2	1	Control pedal	017171	-UF400820
COMP-115v	1	Kit version 115V	017187	-UF410890
COMP-230v	1	Kit version 230V	017184	-UF400890
C-P1	1	Potentiometer cover	017328	-UF400019
U0	1	Wired mains socket	017168	-UF400801
S1	1	White NO push button	001593	
J0	1	Female socket, 3-pin	001394	
J7	1	Plug-in connector P+N+G	016694	
T1	1	Transformer 117-220V/ 4-6V 120VA	017174	
P1	1	Wound potentiometer MP10 E50- 25W-50Ω	017274	
B-p1	1	Rev counter knob, P/N:90-87742C/ 1rev	001550	
U1-115V	1	Electronic board H1296 –117V	017175	
U1-230V	1	Electronic board H1296 –230V	017176	
Cb1-115V	1	USA / Canada mains power cord	016452	
Cb1-230V	1	Mains power cord	000939	
F1, F2 –115V	2	Fuse 5x20 2.5A.T	017172	
F1, F2 - 230V	2	Fuse 5x20 2A.T	017173	
F3, F4, F5	3	Thermal cutoff 2A 250V 102°C	017281	
D1	1	Green LED T1 ¾ 4V	004815	
D2	1	Yellow LED T1 ¾ 4V	004814	
D3	1	Orange LED T1 ¾ 4V	004813	
C-Led	3	LED clip T1 ¾	004816	
P.I –115V	1	Identification plate -115V	017185	-UF410001
P.I – 230V	1	Identification plate -230V	017165	-UF400015
R.S	6	Sim rivet	000592	
C1	1	Microswitch V4	006741	
C.L	0.2	Letter card	003282	
C.C	0.2	Figure identifier card	003283	
C.R.T	0.01	Ground identifier card	003284	
Pic-DE	2	Electrical Hazard Pictogram	001970	
Pic-HT	1	High Temperature Pictogram	001967	

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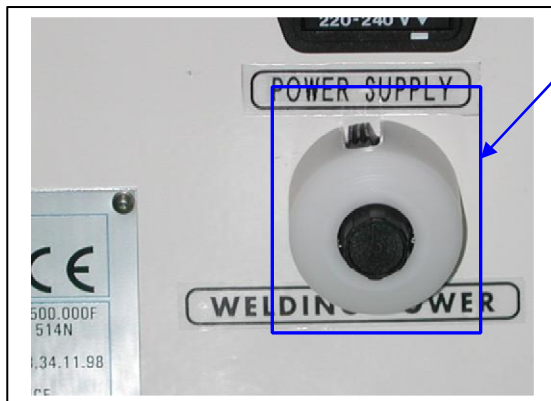
Callout	Quantity	Description	Item ref.	Drawing ref.
ET1	1	Front label Syms	009282	
ET2-115V	1	Back label Syms 115V	016777	
ET2-230V	1	Back label Syms 230V	016776	
CAI.	1	Case Syms	015676	
Man-1	3	Thermoretractible Sleeve	017570	
Man-2	9	Sleeve	003353	
E.C.D	1	Right-hand side protective bracket	017160	-UF400010
E.P	1	Protective screen	017157	-UF400007
E.A	5	Adhesive base plate	017312	
V2	3	Stainless steel FHC screw M3x6	000470	
V3	9	Stainless steel CHC screw M4x10	000438	
V4	4	Stainless steel TRL screw M4x10	002039	
V5	4	Stainless steel CHC screw M3x16	000432	
V6	2	Stainless steel TCB screw M2x10	016697	
V7	2	FHC screw M3x10	004352	
V8	4	TRL screw M4x12	002040	
R0-1	12	Stainless steel MU washer decol 4	000512	
R0-2	1	Stainless steel ZU washer decol D10	004593	
R0-3	6	Galvanized AZ star washer bichro. D4	004543	
E1	2	Stainless steel bolt Decol. HU4	000559	
E3	4	Stainless steel bolt Decol. HM3	004627	
E4	6	Stainless steel bolt Decol. HM4	004628	
C0-1	20	Wire clamp 94V2	017291	
Gi	0.1	HT insulating sheath Ø 3	017280	

☐ Remarks: Cf. « 8 MECHANICAL DIAGRAM » for the layout of the components

3. ASSEMBLY & ADAPTATION

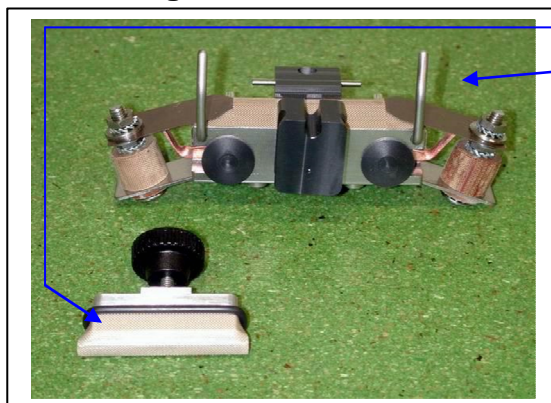
Recommendation: On exit from the factory, the SYMS welding machine is configured for use with 0.5 ml and 1 ml straws.

❶ - Welding power



- ⇒ The welding power is pre-set in the factory and is accessible on the potentiometer on the rear face.
- ⇒ This setting is specific to the machine.
- ⇒ You are strongly advised not to modify this setting.
- ⇒ However, and only on the advice of a maintenance technician, the user may be called upon to modify this setting if the welding is judged inadequate.

❷ - Cleaning



The removable parts are:

- the cooling jig,
- the welding electrode assembly.

They may be removed without difficulty and decontaminated, provided that there is:

⊗ **no immersion.**

Decontamination can be carried out with:

- Sanytex diluted to 5% or another equivalent product,
- a phase of rinsing with distilled water,
- drying with alcohol.

❶



❷



❸



❹



❶ Open the protective flap using the rapid nut, turning it anti-clockwise.

❷ Loosen the knurled nut and remove the cooling jig.

❸ Remove the welding electrode assembly.

❹ Remove the straw guide by pulling it and the end stop.



⇒ Carry out your decontamination procedure.

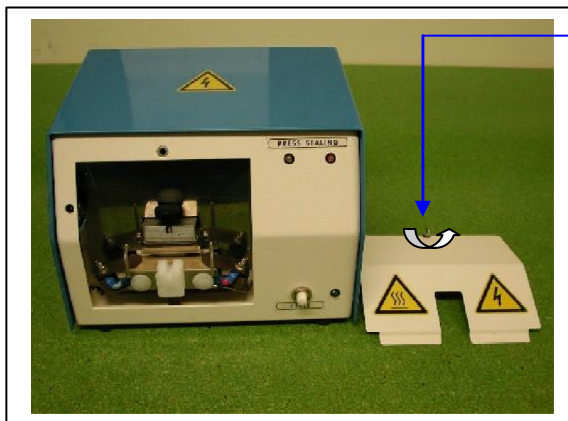
Recommendation :

Dry the decontaminated elements before reassembly.

⇒ Reassemble the equipment and check manually that the cooling jig comes into contact to the welding band, otherwise check the positioning of the end stop and adjust the cooling jig with the help of the knurled nut.

⇒ Close the protective flap using the rapid nut, turning it clockwise.

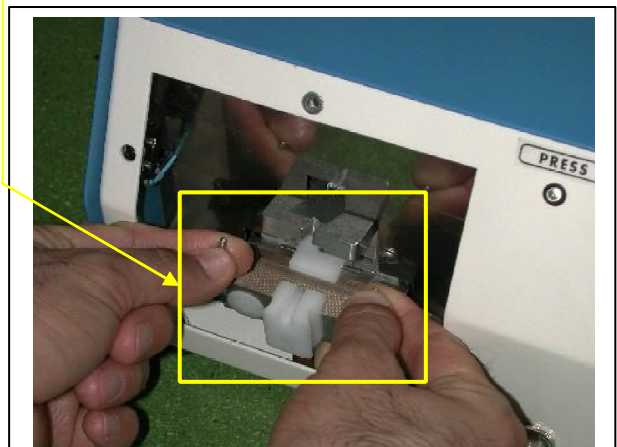
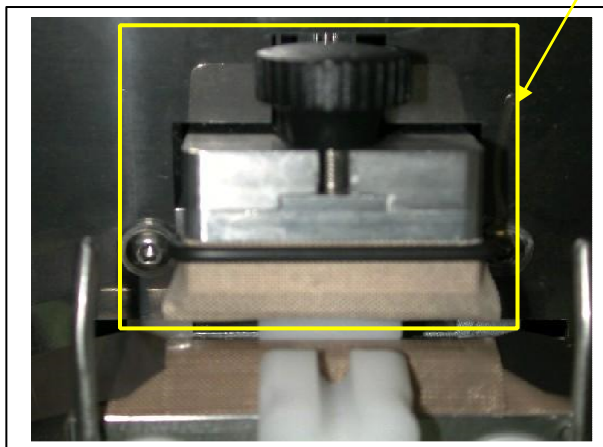
③ - Replacing the bands



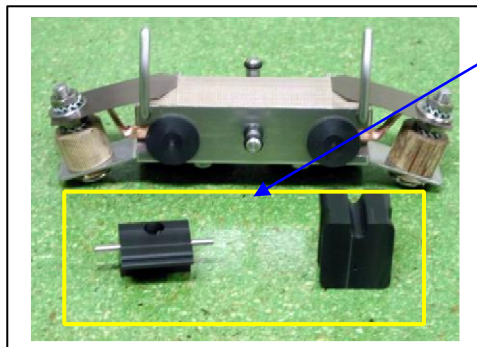
⇒ Open the protective flap using the rapid nut, turning it anti-clockwise.

⇒ Loosen the knurled nut and remove the cooling jig.

⇒ Remove the welding electrode assembly by pulling it.



❑ Changing the welding tape band

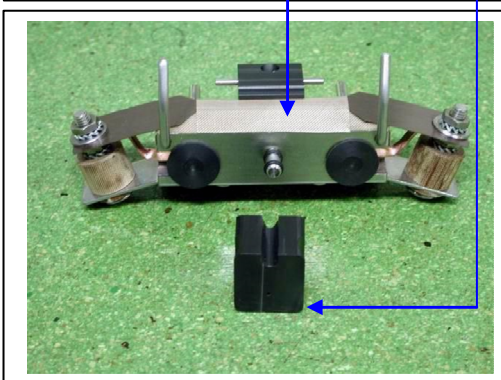
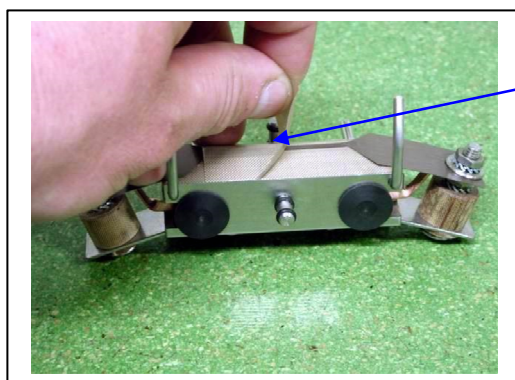


⇒ Remove the straw guide by pulling it and the end stop.

⇒ Remove the adhesive Teflon band covering the sealing tape.

⇒ Cover the sealing tape with the "G9" adhesive Teflon band supplied in the composition. Make sure that the adhesive is correctly applied.

⇒ Reinstall the end stop and the straw guide.



❑ Changing the cooling jig band



⇒ Remove the 'O' ring weld.

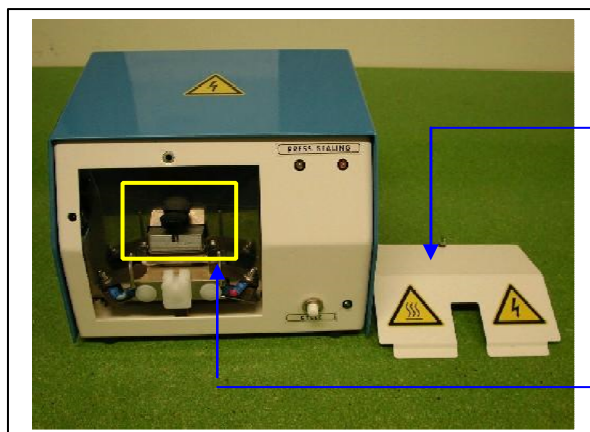
⇒ Remove the adhesive Teflon band covering the cooling jig.

⇒ Cover the cooling jig with the "G22" adhesive Teflon band of size 45mm x 30 mm supplied in the composition. Make sure that the adhesive is correctly applied.

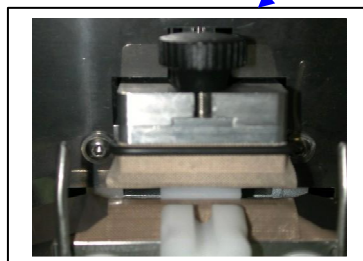
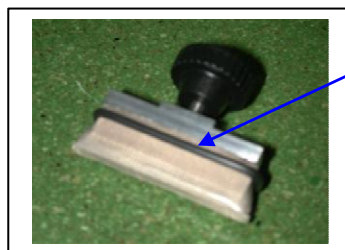
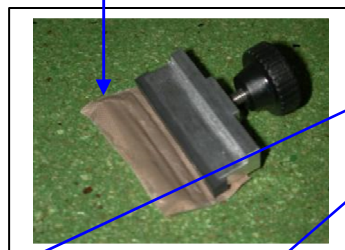
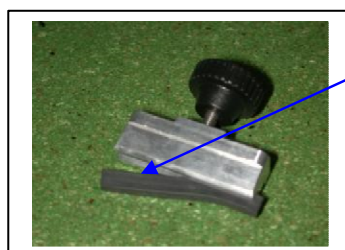
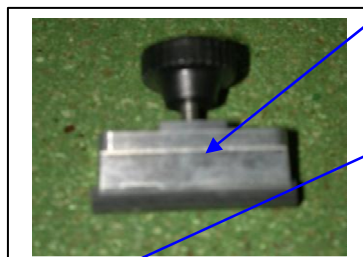
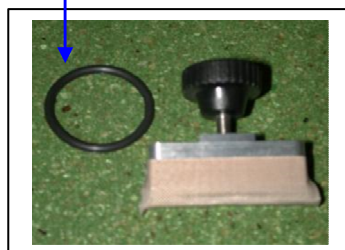
⇒ Reinstall the 'O' ring weld.

⇒ Reassemble the equipment and check manually that the cooling jig comes into contact to the welding band, otherwise check the positioning of the end stop and adjust the cooling jig with the help of the knurled nut.

4 elastomer mat



- ⇒ Open the protective flap using the rapid nut, turning it anti-clockwise.
- ⇒ Loosen the knurled nut and remove the cooling jig.



- ⇒ Remove the 'O' ring weld.
- ⇒ Remove the adhesive Teflon band covering the cooling jig.
- ⇒ Change the elastomer mat supplied in the composition by inserting it in the groove of the cooling jig.
- ⇒ Cover the cooling jig and the elastomer mat with the "G22" adhesive Teflon band of size 45 mm x 30 mm supplied in the composition (apply the adhesive correctly).
- ⇒ Reinstall the 'O' ring weld.
- ⇒ Reinstall the cooling jig, then check manually that the cooling jig comes into contact to the welding band, otherwise check the positioning of the end stop and adjust the cooling jig with the help of the knurled nut.
- ⇒ Close the protective flap.

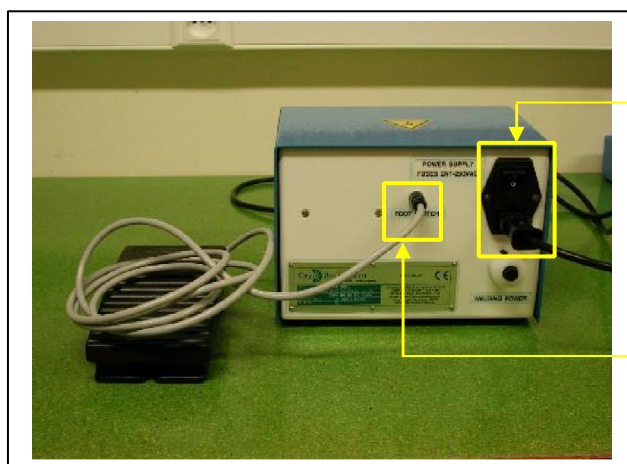
5 PROCEDURE

5.1 Operation of the individual straw welder

The welding machine does not require any heating up time. It can be used without any problem in a laminar flow hood or a controlled temperature environment, because the thermal pulse welding principle limits the release of calories.

However, after a series of 10 weldings, it is recommended to comply with a rest time of five minutes in order to obtain optimum operation.

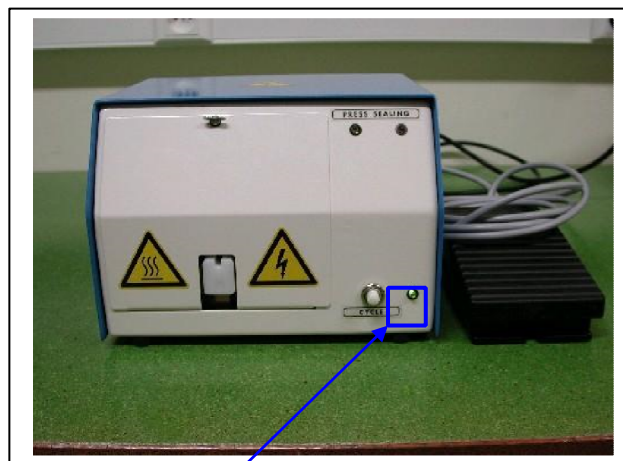
❶ Connection



⇒ Connect the mains cable "Cb1" to the socket of the input filter "U0" identified by:
POWER SUPPLY

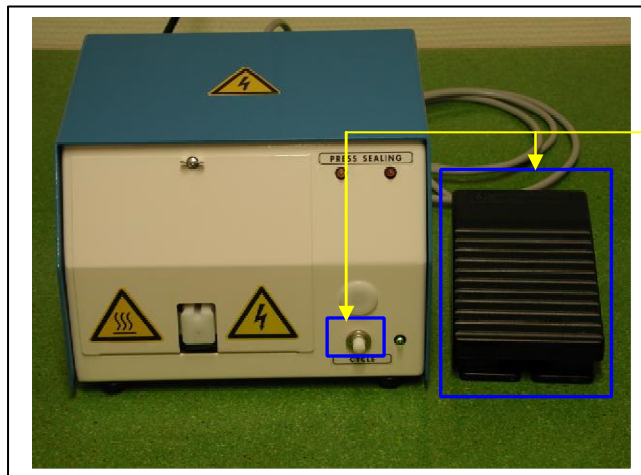
⇒ Connect the cable to the control pedal to the socket "J0" identified by
FOOT SWITCH

❷ Heating selection

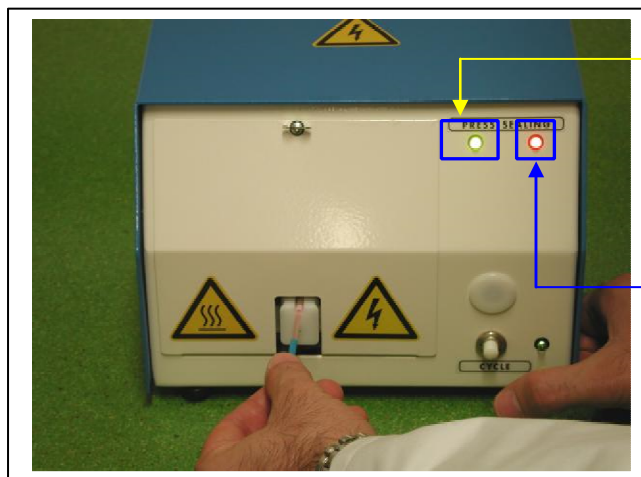


- ⇒ - Set the "U0" main switch to the "ON" position.
- ⇒ - Check that the green "D1" Power On indicator is lit.

③ Starting the cycle



⇒ Pressing the white "S1" pushbutton or the control pedal "U2" activates a welding cycle.

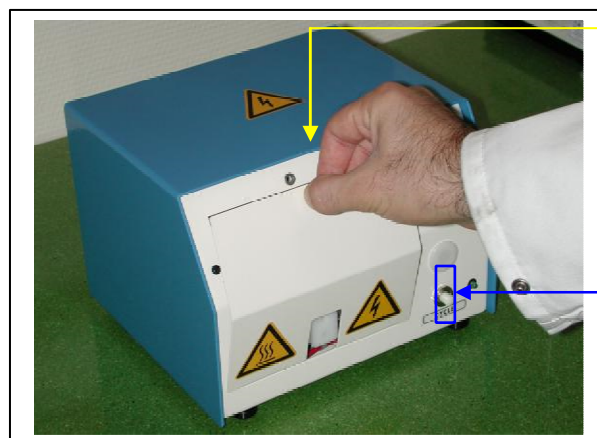


⇒ The welding cycle lasts 4 seconds and is indicated by the yellow indicator.

⇒ The orange indicator corresponds to the thermal pulse .

Remark: Each pressing of the pushbutton or the control pedal causes a welding cycle.

④ Opening of flap



⇒ The opening of the protective flap causes:

- the stopping of the cycle,
- the clocking of the controls.

⇒ The equipment remains switched on. This is indicated by the presence of the green Power On indicator.

6 MAINTENANCE

6.1 Precautions

⚠ Maintenance on the individual straw welding machine must be carried once the machine has been disconnected. In case of accidents, Cryo Bio System cannot be held responsible.

6.2 Maintenance

The main mechanical and electrical parts of the welding machine do not require any particular maintenance.

⚠ Repairs must be carried by a specialist, approved by Cryo Bio System.
However, it is recommended to regularly clean the welding jaws, particularly if they got accidentally dirty when welding the straws.
If burn marks show on the Teflon bands, they need to be replaced (see composition).

6.3 Spare parts

Ident.	Qty	Designation	Item ref.	Drawing ref.
G22	3	Cooling Teflon	016397	
G9	3	Welding band sup Teflon	016398	
F1, F2 – 115V	2	Fuse 5x20 2.5AT	017172	
F1, F2 – 230V	2	Fuse 5x20 2AT	017173	
A19	1	Elastomer mat	014024	

6.4 Transport and storage

- ❶ Disconnect the equipment from the mains.
- ❷ To prevent damage, always store and transport the equipment and related parts in their original packaging.
- ❸ Store the equipment in a dry place.

⚠ When transporting the Syms, avoid shocks or brisk movements.

6.5 Recycling of worn parts



Please dispose of old equipment (transformer, electromagnet) at a specialized centre.



Separate the old pieces of equipment as per their composition: metal, plastic, etc...

6.6 Non-responsibility clause



The Cryo Bio System company cannot be held responsible for any damage due to external effects or to inappropriate handling or usage.

See the paragraphs on scope of application and electrical specifications on page 2 of these instructions for use.

7 ELECTRICAL DIAGRAM

7.1 SYMS – 115V WELDING MACHINE

7.2 SYMS parts list – 115V WELDING MACHINE

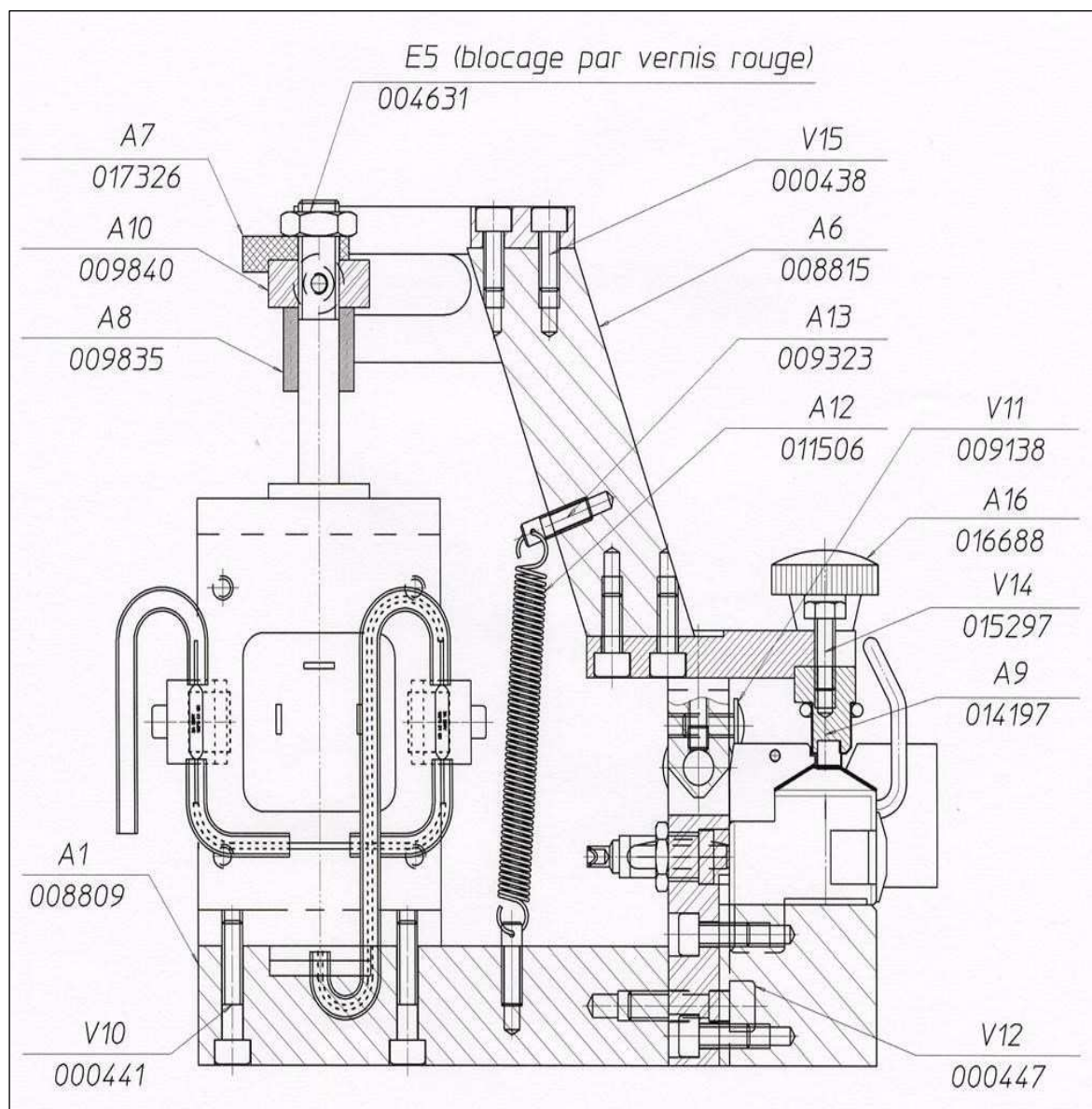
7.3 SYMS – 230V WELDING MACHINE

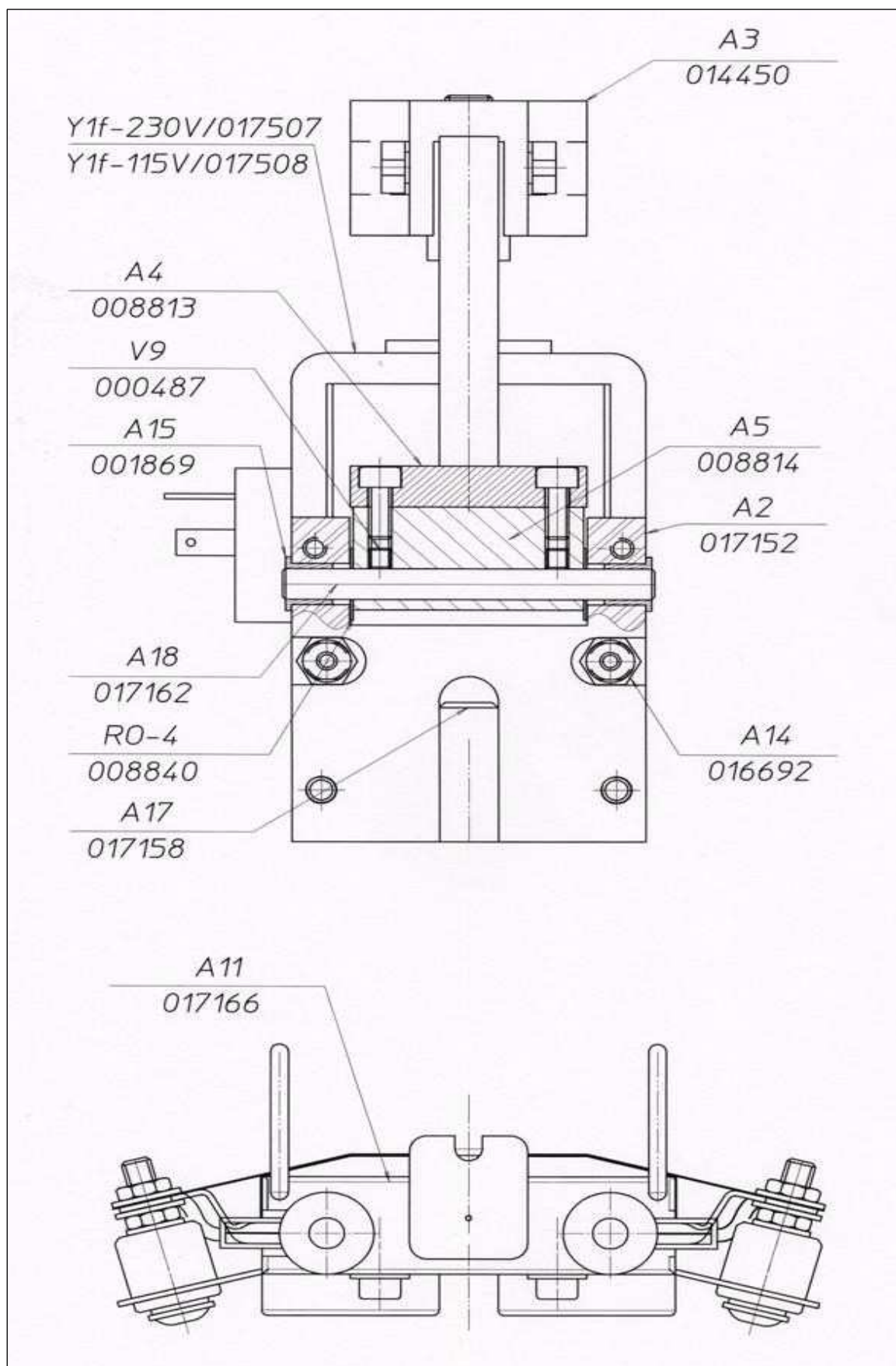
7.4 SYMS parts list – 230V WELDING MACHINE

8 MECHANICAL DIAGRAM

8.1 Mechanical block (017167 / 017186)

8.1.1 Component layout



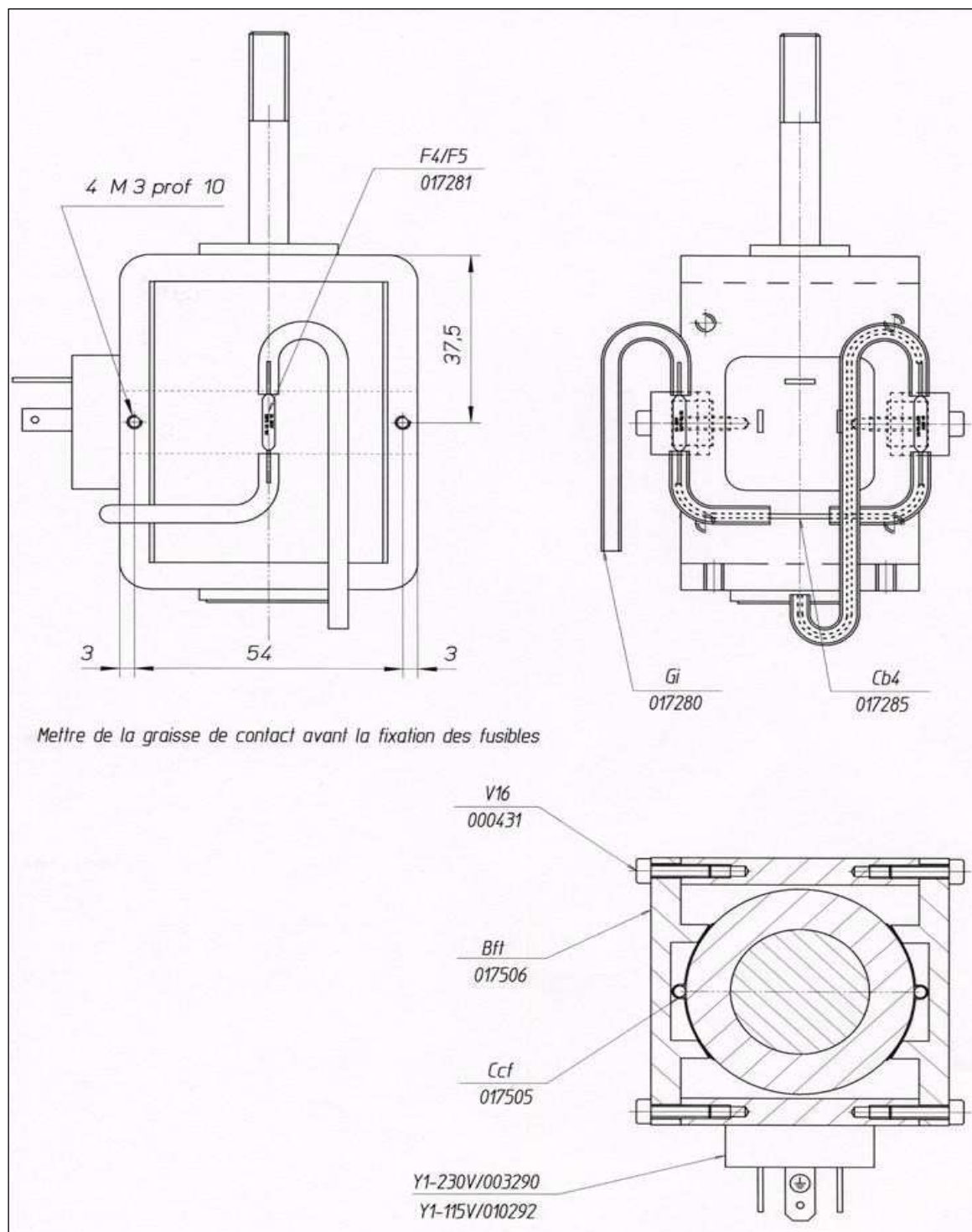


8.1.2 Parts list

Ident.	Qty	Designation	Item ref.	Drawing ref.
A1	1	Electromagnet fixation root face	008809	-UF100003
A2	1	P4 lever support	017152	-UF400002
A3	1	Upper-section fork lever	014450	-UF100031
A4	1	Lower-section lever	008813	-UF100007
A5	1	Lever yoke	008814	-UF100008
A6	1	Middle-section lever	008815	-UF100009
A7	1	Electromagnet guiding plate	017326	-UF400018
A8	1	Welding machine dampening tube	009835	-UF100023
A9	1	ISO Versinic shaper	014197	-UF100701
A10	1	Roller root face	009840	-UF100601
A11	1	Removable electrode unit	017166	-UF400700
A12	1	Lever spring	011506	
A13	2	Spring latched shaft	009323	
A14	2	White 4mm panel bush	016692	
A15	2	Iglidur ring GFM-060810-08	001869	
A16	1	Plastimont body shaper switch M4	016688	
A17	1	Support bracket	017158	-UF400008
A18	1	Lever articulation axis	017162	-UF400012
Y1f-115V	1	Electromagnet equip 115V with thermal cutoff	017508	-UF410805
Y1f-230V	1	Electromagnet equip 230V with thermal cutoff	017507	-UF400805
V9	2	Stainless steel STHC screw M4x4	000487	
V10	3	Stainless steel CHC screw M4x20	000441	
V11	2	Stainless steel TBE screw M4x10	009138	
V12	2	Stainless steel CHC screw M5x20	000447	
V14	1	TH screw M4x12	015297	
V15	8	Stainless steel CHC screw M4x10	000438	
R0-4	2	Teflon washer 14x6	008840	
E5	1	Hm M8 bolt	004631	

8.2 Electromagnet equip with thermal cutoff (017507 / 017508)

8.2.1 Component layout



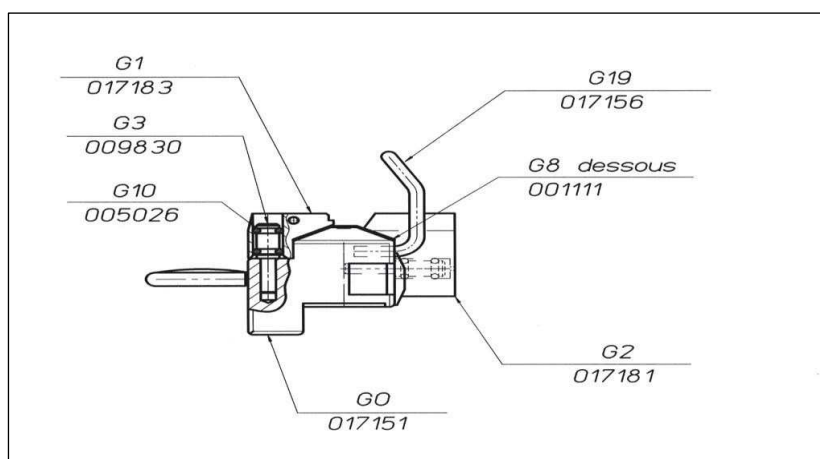
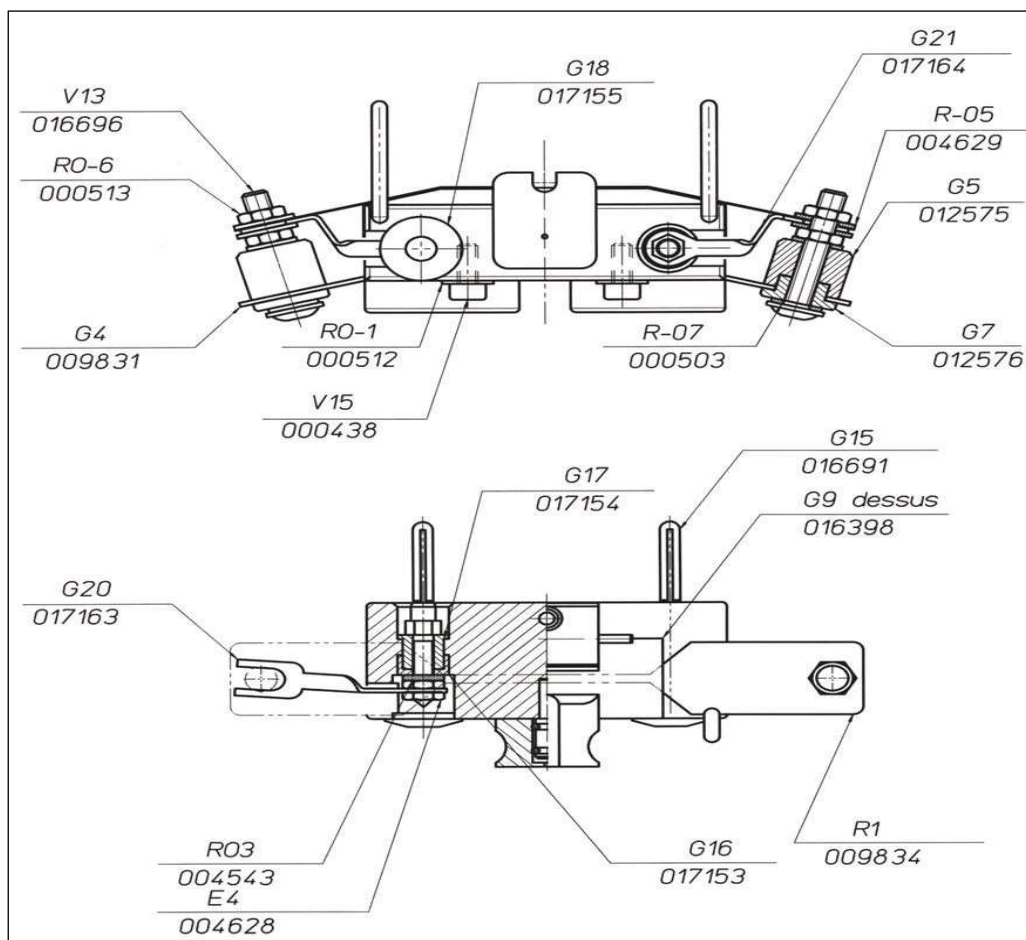
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8.2.2 Parts list

Ident.	Qty	Designation	Item ref.	Drawing ref.
Cb4	0.25ml	Red single-wire cable 0.81 mm ²	017285	
Y1-115V	1	Electromagnet – FM 5 - 205VCC / 308W Stroke 15mm	010292	
Y1-230V	1	Electromagnet – FM 25 - 205VCC / 75W Stroke 15mm	003290	
F4	1	Thermal cutoff 2A-250V 102°C	017281	
F5	1	Thermal cutoff 2A-250V 102°C	017281	
Gi	0.3ml	HT insulating sheath 3 ϕ	017280	
Ccf	2	Fine conductor sheet of metal for Thermal cutoff	017505	-UF400020
Bft	2	Thermal cutoff clamp	017506	-UF400021
V16	4	Stainless steel CHC screw M3x12	000431	

8.3 Electrode assembly (017166)

8.3.1 Component layout

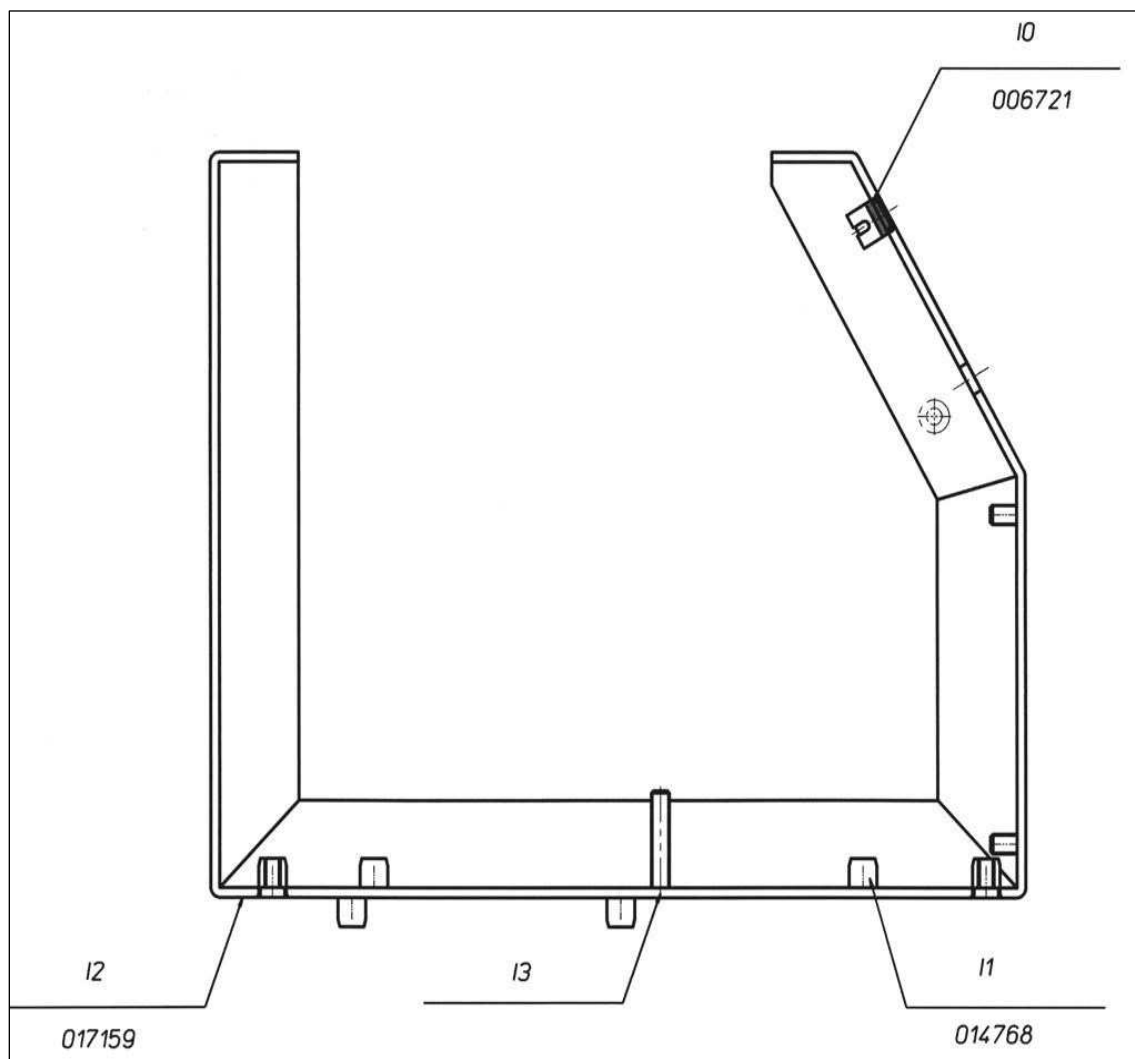


8.3.2 Parts list

Ident.	Qty	Designation	Item ref.	Drawing ref.
G0	1	P4 Welding band support	017151	-UF400001
G1	1	Full straw stopper	017183	-UF400601
G2	1	0.5ml and 1ml straw guide	017181	-UF400016
G3	2	Straw stopper guide	009830	-UF100016
G4	2	Feather key tightener	009831	-UF100019
G5	2	Female welding insulator	012575	-UF100028
G7	2	Male welding insulator	012576	-UF100029
G8	1	Adhesive Teflon, thickness 0.2 mm Width 25mm	001111	
G9	1	Welding band sup Teflon	016398	-UF100035
G10	4	Festo regulating weld	005026	
G15	2	Non-insulated 4mm panel plug	016691	
G16	2	Socket insulator 4 ϕ 1	017153	-UF400003
G17	2	Socket insulator 4 ϕ 2	017154	-UF400004
G18	2	Welding support terminal cover	017155	-UF400005
G19	2	Dismantling hook	017156	-UF400006
G20	1	Schunt left welding band	017163	-UF400013
G21	1	Schunt right welding band	017164	-UF400014
R0-1	2	Stainless steel MU washer Decol 4	000512	
R0-3	2	Galvanized AZ star washer bichro. D4	004543	
R0-5	4	Stainless steel washer Decol HM5	004629	
R0-6	6	Stainless steel MU washer Decol 5	000513	
R0-7	4	Galvanized AZ star washer bichro. D5	000503	
R1	1	Welding band	009834	-UF100022
V15	2	Stainless steel CHC screw M4x10	000438	
V13	2	Stainless steel TBE screw M5x30	016696	
E4	4	Bolt Decol Hm4	004628	

8.4 Box frame with inserts (017178)

8.4.1 Component layout

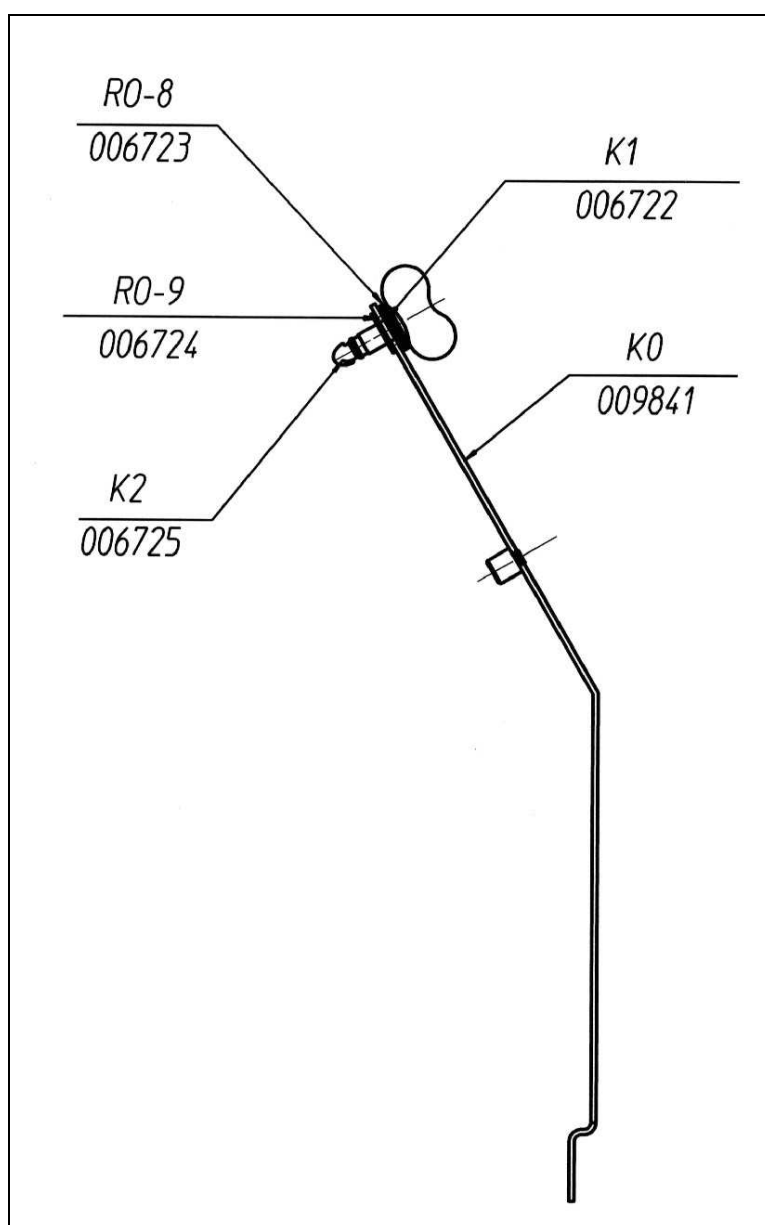


8.4.2 Parts list

Ident.	Qty	Designation	Item ref.	Drawing ref.
I0	1	Receptacle ref 81-35-308-55	006721	
I1	12	M4 insert with cylindrical reduced head	014768	
I2	1	Welding machine box frame	017159	-UF400009
I3	1	Threaded insert M4x25		

8.5 ¼ turn flap (009844)

8.5.1 Component layout



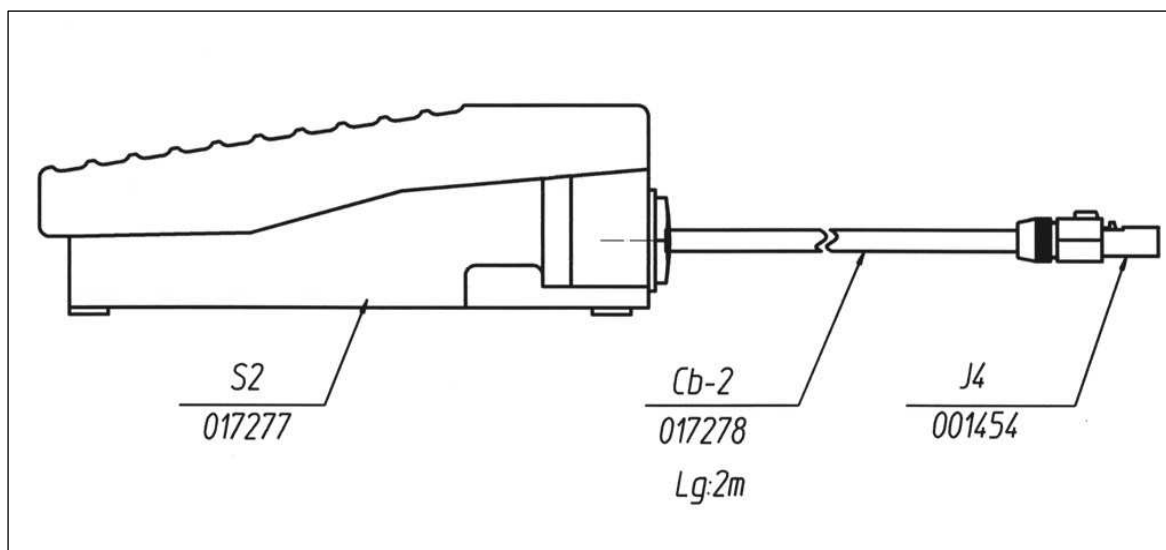
8.5.2 Nomenclature

8.5.3 Parts list

Repère	Quantité	Désignation	Réf. Article	Réf. plan
K0	1	Complete inspection flap	009841	-UF100602
K1	1	Ejector spring	006722	
R0-8	1	Support washer	006723	
R0-9	1	Retaining washer	006724	
K2	1	¼ turn cotter pin	006725	

8.6 Control pedal (017171)

8.6.1 Component layout



8.6.2 Parts list

Ident.	Qty	Designation	Item ref.	Drawing ref.
S2	1	O+C pedal switch	017277	
J4	1	3-pin male connector D01p306MST	001454	
Cb-2	1	Cable 2x 0.75 grey, length 2 m	017278	

9 IMPORTANT INFORMATION

9.1 Ordering

When you order spare parts, refer to chapter 3 and 4 of this manual. Note the reference: Ref Foss or Ref Plan on the parts list.

9.2 New Equipment Guarantee Conditions

In force from the date indicated on the Guarantee certificate.

Cryo Bio System guarantees the equipment sold against all operating vices resulting from a fault in the materials, manufacturing or design for a period of one year.

Free parts and labour during this period.

The operating faults must appear within a period of twelve months starting from delivery for a use well defined in the order.

The guarantee is excluded in the following cases:

- if the operating fault results from an intervention on the equipment carried out without permission;
- if the operating fault results from a use not complying with the technical specifications and the user manual of the seller;
- if the faulty operation results from force major.


In virtue of the above guarantee, Cryo Bio System undertakes to repair or replace any parts which might become unusable in the course of the guarantee period for reasons which might be attributed to it.

The application of this guarantee, i.e. repairs or replacements of all or part of the equipment supplied, may not prolong the guarantee period.

If the repair is carried out on the spot, the travel and accommodation expenses are to be paid by Cryo Bio System.

Any dispute arising out of the interpretation and/or execution of these guarantee conditions shall be subject exclusively to French law. The courts of L'AIGLE shall have sole jurisdiction, even in the event of an appeal under the guarantee and in the event of plurality of defendants.

9.3 Contact

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