GLOBAL

MODELS: TWIN/DYNAMIC

MODELS: TRACK-TWIN/TRACK-DYNAMIC

USER MANUAL

CNC FUSION MACHINES
MODEL 2015

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STPACUSTER GROUP

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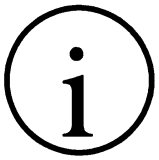

NOTE !
At the time of the publication of this *User Manual*, the current software version is **V.1.27**. ‖
The modifications carried out against the previous revision of this publication are indicated with ‖ on the right margin.

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CHAPTER 1: INTRODUCTION

1.1 GENERAL

The machines **ODS System** and **Track Automatic** are designed for the use of pipes and fittings made of polyethylene (PE) and another plastic resins by electrofusion and butt fusion jointing systems.
There are two fusion control box models available: **TWIN** and **DYNAMIC**.

- Electrofusion > Model of fusion control box: **TWIN**
- Butt fusion > Model of fusion control box: **TWIN & DYNAMIC**

The range of **TWIN** machines allows the making of the combined fusion of pipes/fittings through the jointing systems mentioned above: electrofusion plus butt fusion. The range of **DYNAMIC** machines are designed for butt fusion joints only.

By the electrofusion system, the unit receives the relevant data of the fitting via the bar code system or by operator's manual introduction. It provides, in an automatic and controlled way, the required time for the electrofusion of the diameter and type of fitting connected. Once the operation is finished, it stores in its memory the traceability of the fusion: time, diameter, date, time, make and type of fitting, room temperature, operator No., order No., etc.

The butt fusion jointing models allow the jointing of polyethylene (PE) pipes and fittings, though they can also be used to joint other plastic resins (PP, PB, PVDF,...), for diameters ranging between 50 and 500 mm (depending on the model). All you have to do is to connect a base framework, a heating plate, a trimmer and a hydraulic station (if applies) in the electric connectors to the fusion control box, the pipes/fittings to be jointed have to be put in the base framework and are fixed by the clamps. The sides of both pipes/fittings are faced via the trimmer and subject to heating via the heating plate. Once the heating cycle has been completed, both pipe ends are jointed applying a controlled strength time, programmed in the unit's memory (butt fusion parameters: time, temperature and force/pressure). Prior to the realization of the butt fusion, the diameter and the wall thickness (SDR) of the pipe/fitting to be jointed must be selected, as well as other additional information such as operator No., order No., etc, which may be obligatory or optional for traceability reasons.

The technical data contained in this manual are purely informative and may be changed at anytime. ACUSTER GLOBAL, S.L. declines all responsibility for claims arising from misuse of the data contained herewith and/or errors or omissions detected after publication.
This *Manual* must be considered as part of the unit.

1.2 MODEL RANGE

The **ODS System** and **Track Automatic** machine range available at the time of making this *Manual* are:

1.2.1 ODS machines:

MODEL	RANGE OF DIAMETERS	MACHINE COMPONENTS
TWIN 225 E	63 to 225	**TWIN** Control Box Base framework 225 E (electric drive) Trimmer 225 Heating plate 225
DYNAMIC 225 E	63 to 225	**DYNAMIC** Control Box Base framework 225 E (electric drive) Trimmer 225 Heating plate 225

1.2.2 Track Automatic machines:

MODEL	RANGE OF DIAMETERS (mm)
Track-Twin T160 / **Track-Dynamic T160**	40 (SDR11) to 160
Track-Twin T250 / **Track-Dynamic T250**	63 to 250
Track-Twin T315 / **Track-Dynamic T315**	90 to 315
Track-Twin T315R / **Track-Dynamic T315R**	90 to 315
Track-Twin T400 / **Track-Dynamic T400**	140 (SDR9) to 400
Track-Twin T400R / **Track-Dynamic T400R**	75 to 400
Track-Twin T500 / **Track-Dynamic T500**	200 (SDR9) to 500
Track-Twin T500R / **Track-Dynamic T500R**	200 (SDR9) to 500
Track-Twin T630 / **Track-Dynamic T630**	315 (SDR9) to 630

1.3 DESIGN SPECIFICATIONS

The **TWIN** and **DYNAMIC** machines are designed according to the following specifications:

- ISO 12176-1 Equipment for fusion jointing polyethylene systems. Part 1: Butt fusion (**TWIN/DYNAMIC**).
- ISO 12176-2 Equipment for fusion jointing polyethylene systems. Part 2: Electrofusion (**TWIN)**.
- ISO 12176-3 Equipment for fusion jointing polyethylene systems. Part 3: Operator's badge (**TWIN/DYNAMIC**).
- ISO 12176-4 Equipment for fusion jointing polyethylene systems. Part 4: Traceability coding (**TWIN/DYNAMIC**).
- ISO 13950 Plastic pipes and fittings: automatic recognition of electrofusion systems (**TWIN**).

The **TWIN/DYNAMIC** accepts all the identifications which correspond to the above listed Specifications. On **TWIN** model, all the fittings can be fused by electrofusion if the manufacturer encloses the programmed bar code system in accordance with ISO 13950.

1.4 GENERAL INFORMATION

The development, documentation, production, tests and shipping of the products herewith described have been made:

- Complying with the respective safety rules, and
- In accordance with the requirements of Acuster Global, S.L. assurance quality.

WARNING !
The fusion control box can only be opened by the ACUSTER GLOBAL, S.L. After-sales Service. In the case of the front and back covers opening or coming apart, parts of electrical components which are not covered may be left exposed.
Only qualified personnel are authorised to intervene both for fusion and repairs. These qualified personnel must be familiar with all the safety measures, potential dangers and maintenance rules described in this *Manual*.
The safe use of the products described requires an appropriate means of transport, storage, installation and use, a careful handling and the preestablished periodical maintenance follow-up.

1.5 MACHINE IDENTIFICATION

1.5.1 **Serial Number Stamping:**

All **TWIN/DYNAMIC** components: base framework, heating plate, trimmer and hydraulic station (if applies), are identified by means of their own identification plate.

QUALITY CONTROL

MACHINE No.

MAINTENANCE REVISIONS

MANUFACTURER'S ADDRESS

ACUSTER GLOBAL
CONTROL DE CALIDAD
EQUIPO Nº
REVISIONES
Rambla d'Ègara, 340 4th - 08221 TERRASSA (Barcelona) SPAIN
Tel. +34 93 736 18 80 - e-mail: info@acusterglobal.com

Figure 1

The quality control identification plate includes the fusion control box serial number. The plate includes room for future maintenance date stamping.

1.5.2 **"CE" marking:**

The fusion control box is supplied with the appropriate plate with the "CE" mark, as the European Community norm indicates on the new Machine Security Regulation (Board 2006/42/CE, dated 17th May 2006).

ACUSTER GLOBAL
C E
MODELO:
Nº SERIE
Rambla d'Ègara, 340 4th - 08221 TERRASSA (Barcelona) SPAIN
Tel. +34 93 736 18 80 - e-mail: info@acusterglobal.com

Figure 2

1.6 MEASURES OF PROTECTION AGAINST ACCIDENTS

1.6.1 **Read User Manual:**

Do not operate this equipment until you have read and understand the contents of this *Manual*.
Your safety and the safety of others depends upon care and judgment in the operation of this equipment. Follow all rules and regulations relating to machines with specific jobs in PE piping networks.
In this *Manual* they have not been able to foresee every possible circumstance that might involve a potential hazard. Therefore, notice symbols included here and in the machine, are not necessarily inclusive.
The user must be convinced that the use and mode of use of this equipment is safe for him/her and for others. Also be sure to care and maintenance before and after use.

1.6.2 **Safety alert symbols:**

This *User Manual* employs the following safety alert symbols:

Indicates information, considered important, but not hazard-related.

When appears this hazard alert sign in this manual, carefully read what is says.

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1.6.3 **Operator's and machine safety measures:**

- Always use adequate working clothes.
  For outside work, it is recommended to use rubber gloves and boots with insulating soles (in wet areas, this advice is essential), and other applicable personal protective equipment such as hard hat, safety glasses, etc.
  For indoor fusion jointing work, adequate ventilation of the premises must be provided.
- Keep the fusion control box out of the reach of non authorised personnel, non qualified personnel and children. Protect the control unit from water, rain, snow, etc.
- When transporting the machine, and during loading and unloading operations, the appropriate precautionary measures must be taken to ensure that all machine components are completely secured in the vehicle, and that they are free from impact during transportation.

- Do not expose the fusion control box to heavy weights. All slight damage caused to the external casing or to other elements will have to be replaced immediately by the After-Sales Service of ACUSTER GLOBAL, S.L.
- The fusion control boxes which are not being used must be kept out of the reach of the non authorised personnel. They will have to be kept in rooms of low humidity degrees and of restricted access.
- Before using the fusion control box, its external condition will have to be checked, as well as its working condition. All components must be correctly assembled in order to guarantee the correct functioning of the unit. The damaged components must be repaired or replaced by the After-Sales Service of ACUSTER GLOBAL, S.L.
- Should the fusion control box not work properly, it will have to be sent immediately to the After-Sales Service of ACUSTER GLOBAL, S.L.. It can only be opened by the After-Sales Service of ACUSTER GLOBAL, S.L.

1.6.4 **Electrical safety measures:**

- Always connect the unit to electrical outlets that have differential and earth. It is important to remember that you are working in a wet environment with electrical devices. Proper grounding helps minimize the chances of an electric shock.
- Inspect electrical cords often. Protect the electrofusion cables, electrical connections to the base framework, trimmer, heating plate, hydraulic pack, and mains connection of sharp objects. Damaged cables must be replaced immediately by the After-Sales Service of ACUSTER GLOBAL, S.L.
- Always connect the equipment to the appropriate power source. Refer to label of technical specifications.
- Disconnect the equipment from the power supply before carrying out any maintenance or adjustment.
- Electric motors are not explosion proof. The operation of these components in a hazardous environment without necessary safety precautions can result in explosion and death.

1.6.5 **Machines with hydraulic system:**

- For hydraulic equipment, it is important to remember that a sudden hydraulic oil leak can cause serious injury or even be fatal if the pressure is high enough.
  The fluid escaping under pressure can penetrate the skin and cause serious injury. Keep hands and body away from pipes and hoses pressurized fluid flows. It is recommended to correct the leak. If any fluid is injected into the skin must be removed immediately by a doctor familiar with this type of injury.
  NOTICE: Use safety glasses and keep your face away from the area when an air leak in the hydraulic system occurs to avoid spraying oil into eyes.
- In the base frameworks hydraulic drive, the displacement of the movable clamps is danger of crushing in certain automatic manoeuvres. Keep all parts of the body outside the bars of the hydraulic cylinders.

1.7 DECLARATION "CE" OF CONFORMITY

ACUSTER GLOBAL, S.L.
Rambla d'Ègara, 340 4th
08221 Terrassa (Barcelona)
SPAIN

declare under our sole responsibility that the fusion machines **ODS System** and **Track automatic** are in conformity with the provisions of the following EC Directives based on the specified standards:

Directive	Related standard	Model
2006/42/CE *Machine Safety Directive*	EN-ISO 12100 EN 60204-1	TWIN DYNAMIC
2006/95/CE *Low Voltage Directive*	EN 60204-1 EN 60335-1; EN 60519-1	TWIN DYNAMIC
2004/108/CE *EMC Directive*	EN 61000-6-2 EN 61000-6-3	TWIN DYNAMIC
2002/95/CE RoHS	EN 62321-1	TWIN DYNAMIC
2002/96/CE WEEE		TWIN DYNAMIC
	ISO 12176-1 ISO 12176-3 ISO 12176-4	TWIN DYNAMIC
	ISO 12176-2 ISO/TR 13950	TWIN

Sant Just Desvern, 1st September 2015

Jaume Puig
General Manager

1.8 GUARANTEE

Guarantee declaration:

All the **ODS System** and **Track Automatic** fusion machines are manufactured from high quality material and have been subjected to rigorous tests for resistance and working order as well as passing all the quality control tests required by the applicable normative (see "CE" Declaration of conformity).
Regardless of whether an incident might occur during the period of guarantee, we recommend a careful reading of the following general guarantee conditions.

General conditions of Guarantee:

1. ACUSTER GLOBAL, S.L. guarantees that this product has no manufacturing defect at the time of its purchase and extends this guarantee for the period of TWO years.

2. If the product proves defective during this period, due to the materials or its assembly, it will be repaired free of charge, including the cost of materials and labour at Acuster Global, S.L.'s Technical Service.

3. The Guarantee is not valid in the following cases:

   When the fault in the product is a result of:

   - Usual wear and tear due to usage.
   - Abuse or incorrect use of the unit
   - Not following the instructions specified in this *User Manual* for connecting to a group generator.
   - Repairs carried out without authority from Acuster Global, S.L. (the taking apart or breaking of the unit's seal immediately renders the guarantee invalid).
   - Accidents, natural disasters (including lightning, water action etc) as well as any cause beyond Acuster Global, S.L.'s control.

4. In all claims against this guarantee, information relating to the model, date of purchase, Serial number and any other additional information must at all times be stated.

CHAPTER 2: DESCRIPTION OF THE FUSION MACHINE

2.1 GENERAL

All fusion machines **ODS System** and **Track Automatic** are made up of the following components:

1. A **Fusion Control Box**, containing the Electronic Control Module (microprocessor, display, keyboard, computer and printer connections, etc) and a stainless steel tubular structure for transport and protection.

Figure 3a: TWIN 2015

Figure 3b: DYNAMIC 2015

The fusion control boxes **TWIN** and **DYNAMIC** are also composed of:

2. A **Base Framework**.
   The **ODS 225 E** version (*Figures 4a & 4b*), it is made up of an stainless steel tubular structure for mounting, on 4 silentblocks, two aluminium fused bodies (one fixed and one moveable). The moving body slides along two chrome hardened guiding axles through ball-bearings. Each body mounts two aluminium fused grips, being the exterior one easily removable.
   The fixed body incorporates the electric motor of the moving body's actuator, the loading cell and the encoder (shift control sensor).

Figure 4a: TWIN ODS 225 E general view

Figure 4b: DYNAMIC 225 E general view

The base frameworks belonging to **Track Automatic** machines (*Figure 5a*), consisting of a frame equipped with handles for transportation (for those models whose weight allows this). The frame incorporates four lower aluminium clamps and four detachable upper clamps made of aluminium too (depending on the model).
The securing together of the upper and lower clamps is achieved by use of securing braces equipped with handles which serve as spigots (for large diameter sizes the upper clamps are locked by means of high nuts which require spanner to fix them).

Figure 5a: Base framework TRACK 315

Figure 5b: Lateral view

The movement of the moveable clamps is achieved via two hydraulic cylinders of double effect, connected to flexible high pressure hoses with quick connectors mounted on the ends.
The base framework moving clamps have installed an encoder (shift control sensor) for distance control.

NOTE !
For the care and maintenance of the base framework, consult CHAPTER 5: MAINTENANCE, of this same *User Manual*.

3. A **Heating Plate** (*Figure 6*), consisting on a PTFE lined aluminium plate with electronic temperature control by means of an internal sensor (PID).

NOTE !
For the care and maintenance of the heating plate, consult CHAPTER 5: MAINTENANCE, of this same *User Manual*.



Figure 6a: Heater and Trimmer ODS225E *Figure 6b: Heater TRACK 315*

4. A **trimmer**.
Trimmer model ODS225 is driven by a 230/110V (according to market) electric motor and chain drive (on previous models it was driven by a 24 Vdc motor and belt drive).
It incorporates two push-buttons for functioning control and a safety switch.
The trimmer for machines **TRACK** is activated via an electric motor of 230 or 110 Vac, depending on the market, with chain transmission. It has a safety switch to avoid undesirable actions.


Figure 7a: Trimmer TRACK *Figure 7b: Heating plate and trimmer holder*

NOTE !
For the care and maintenance of the trimmer, consult CHAPTER 5: MAINTENANCE, of this same *User Manual*.

5. A **Hydraulic station**, formed by an electric motor, a hydraulic pump, solenoid valves, quick connectors, as well as the required elements for the hydraulic performance of the base framework.

NOTE !
There are two models of hydraulic station: Hydraulic station 0-100 bar: for models T160;T250;T315;T400 Hydraulic station 0-160 bar: for models T500;T630;T800;T1000; T1200. Please check *Chapter 6: Technical Characteristics.*

2.2 FUSION CONTROL BOX

2.2.1 **General:**

The Fusion Control Box consists of an exterior casing is made of steel mounted on a stainless steel tubular structure.
The Fusion Control Box contains a power board, the processor's board (CPU) and transformer, as well as the electronics required for the fusion process, previous identifications and registers of fusion records for its traceability. It also has an outer front panel with graphic display, function push-buttons, master switch, fuse holder, the mains, type A USB connector for bar-code scanner and memory stick, electric connectors for base framework connection, trimmer, heating plate and hydraulic station (for **TWIN / DYNAMIC** boxes) and electrofusion cables (for **TWIN** boxes only).

WARNING !
All connectors must be installed for the unit to work properly (for butt fusion). Install the connectors correctly with the nuts properly tightened to ensure good contact between the pins.
For the electrofusion, as well as for processing fusion data, it is possible to use the Fusion Control Box Unit with only the mains connected.

2.2.2 **Front part:**

The front part of the fusion control boxes are formed by a silkscreened plastic membrane which incorporates the tactile push-buttons, membrane type. On the upper left side of the front part you can find the display.

Where:

1 Graphic display
2 Keypad with display protection
3 Personalization sticker
4 Electric connectors:
4a Connection to 24 Vdc trimmer
4b Connection to electric framework
4c Connection to hydraulic framework
4d Connection to 230/110 Vac trimmer*
4e Connection to heating plate*

* Direct connection or through the **Switch Box**. Refer to clause 2.7.

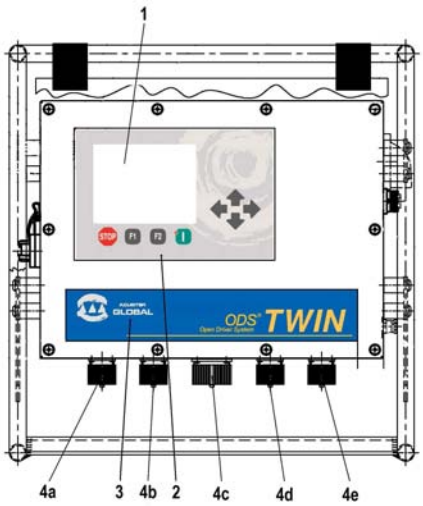


Figure 8a: TWIN front side

2.2.3 **Right side:**

On the right side of the fusion control boxes (looking at it from the front part), the following elements are located:

1 Master switch
2 Fuse holder (with 16A to 230 Vac fuse) *Not used for 110 Vac*
3 Mains cable (with Schuko type plug or according to market requirements)
4 Room temperature sensor
5 Characteristics plate
6 **CE** mark plate

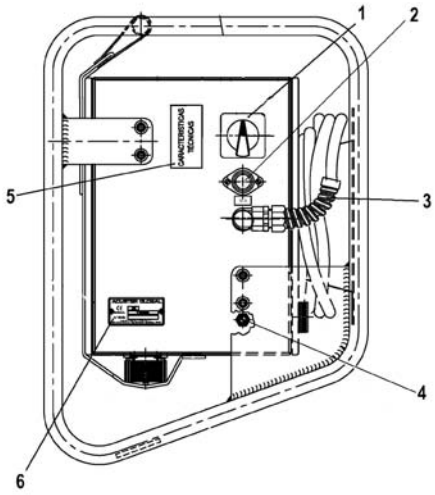


Figure 8b: Right side view

2.2.4 **Left side:**

On the left side of the fusion control boxes (looking at it from the front part), the following elements are located:

1 Electrofusion cables (**TWIN**) (with ϕ 4 mm terminals)
2 Connector USB/A
3 Accessories' bag
4 Protection cover

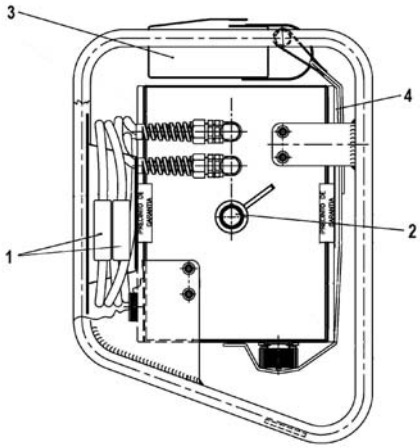


Figure 8c: Left side view

2.2.5 **Rear side:**

On the rear side of the fusion control boxes, the following elements are located:

1 Cables holder

2 Anchorage for cables holder bracket

3 Boozer

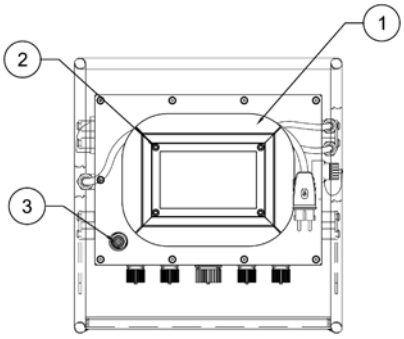


Figure 8d: Rear side view

2.3.1 BASE FRAMEWORK ODS 225 E (ELECTRICALLY DRIVEN)

The base framework **ODS 225 E** consists of a stainless steel tubular structure on to which, through four silentblocks, the two aluminium fused bodies (one fixed and one moveable) are mounted. The moving body slides on two chrome hardened guiding axles on ball bearings. Each body has two aluminium grips, being the exterior one easily removable. The diameter of the four pipe grips is machined to fit up to 225mm diameter pipes and fittings; the clamping of different smaller diameters can be achieved by means of different sets of additional adaptors, which are locked in place using Allen screws. Both outer grips are removable for accommodating various fittings, such as elbows, tees, etc. The linear actuator, the load cell and the encoder are installed on the fixed body.

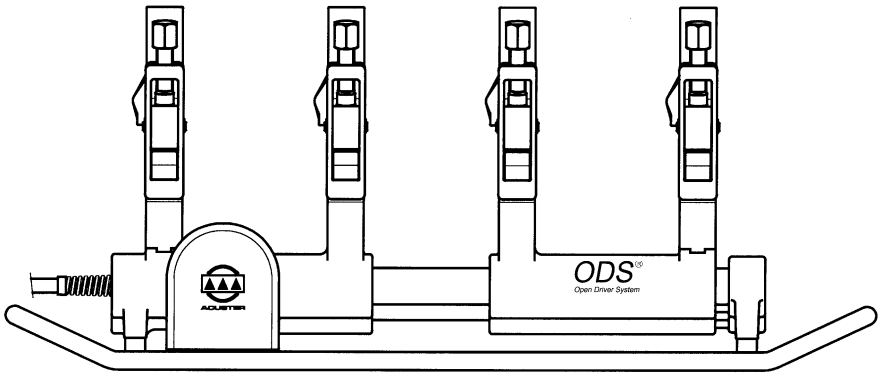


Figure 9: Base framework ODS 225 E

WARNING !
Always connect the base framework electric connector into the corresponding control box connector with the machine switched off. Install the base framework cable connector with the nut properly tightened to ensure good contact between the pins.
For care and maintenance of the base framework, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

2.3.2 BASE FRAMEWORK ODS TRACK (HYDRAULICALLY DRIVEN)

The base framework **TRACK** consists of four aluminium lower clamps and four aluminium upper clamps, two of which are fixed and two movable. The lower clamps are held by supporting plates which are secured by a tubular frame provided by transport handles. The four upper clamps are easily removable and are connected in pairs. The fixed outer lower clamp is also removable for accommodating various fittings, such as elbows, tees, etc. The movable clamps are driven by two double acting hydraulic cylinders. The pressure to the hydraulic cylinders is supplied by a hydraulic station through two high pressure flexible hoses connected by means of male-female flat ends quick plugs.
The clamping of different smaller diameters can be achieved by means of different sets of additional adaptors, which are locked in place using Allen screws.
The clamps displacement is monitored by an encoder (shift control sensor).

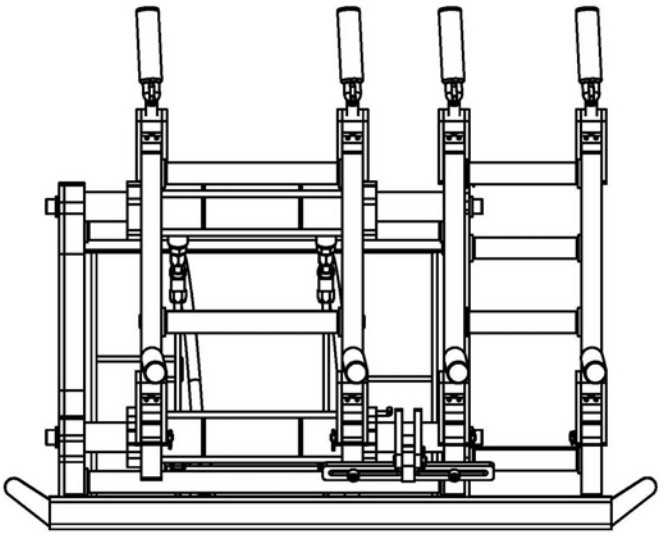


Figure 10: Base framework TRACK 315

Always connect the electric connectors with the machine switched off.
The base framework Track Automatic installation is made by:

1. Connecting the two base framework hydraulic quick couplings into the hydraulic station hydraulic quick couplings (male/female - female/male).
2. Connecting the base framework electric circular connector into the hydraulic station connector.
3. Connecting the hydraulic station electric circular connector into the corresponding control box connector.

WARNING !
Always connect the base framework electric connector into the corresponding control box connector with the machine switched off. Install the base framework cable connector with the nut properly tightened to ensure good contact between the pins.
For care and maintenance of the base framework, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

2.4 HEATING PLATE

The heating plate is made up of an outer PTFE lined aluminium-base alloy body with an electric resistor, supplied by a cable from the Fusion Control Box. the PTFE line is replaceable.
The connection of the heating plate to the Fusion Control Box is done via an electric connector in the following way:

Models ODS225E, T160, T250 and T315:	Directly to the Fusion Control Box socket connector.
Models T315 (110V),T400 and T500:	Into the **Switch Box 230V/110V** and then to the Fusion Control Box socket connector.
Models T630, T800, T1000 and T1200:	Into the **Switch Box 400V** and then to the Fusion Control Box socket connector.

WARNING !
Always connect the heating plate electric connector into the corresponding connector with the machine switched off. Install the heating plate cable connector with the nut properly tightened to ensure good contact between the pins.
For care and maintenance of the heating plate, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

The heating plate temperature is automatically controlled from the Module by means of an internal temperature sensor. The control is PID (proportional, integral, differential). An independent control thermometer may also be provided.

2.5 TRIMMER

The trimmer version **ODS225** (*Figure 11*) consists of an aluminium fused carter, which covers and protects the two trimming discs. Each disc is also provided with an adjustable cutting blade. The trimming performance is carried out by simultaneously pressing the electric push-buttons located on each hand grip. The operating system also includes a safety switch which prevents the trimmer from operating, in the event of this one not being mounted on its working position on the base framework bars.
The transmission of motion from the electric motor to the trimmer discs is performed by way of a chain which can be retightened by means of an eccentric tightener.
The electric motor has a power of 700 W, a voltage of 230/110V (according market) and is supplied by means of a cable directly connected to the Fusion Control Box.

Figure 11: Trimmer ODS225 230/110V

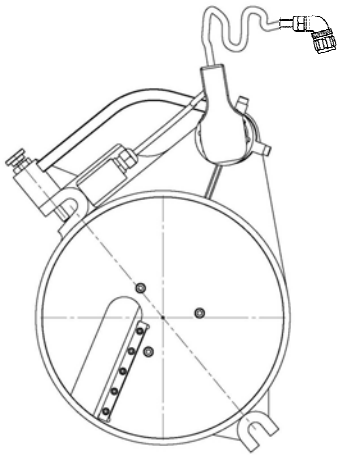


Figure 12: Trimmer ODS TRACK 315 G

The trimmer version **TRACK** (*Figure 12*) consists of aluminium fused carter witch covers and protects the two face discs. Each disc is also provided with one or two adjustable cutting blades. The movement transmission of the driving motor to the trimmer discs is done via a ring gear, a pinion and a chain. The power to the electric motor is supplied by means of a cable directly connected to the Fusion Control Box. It is fitted with a safety switch and a switch for operation.

WARNING !
Always connect the trimmer electric connector into the corresponding connector with the machine switched off. Install the trimmer cable connector with the nut properly tightened to ensure good contact between the pins.
For care and maintenance of the trimmer, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

The trimmer cutting blades are made from hardened, rectified steel. There are one or two blades on each side, which are adjustable. As stated in CHAPTER 3: MODE OF USE, the swarf produced by the trimming blades must not be over 0.3 mm thick. If the cut is faulty (either in thickness or in regularity), the blades should be adjusted.

NOTE !
For blades adjustment, care and maintenance of the trimmer, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

The connection of the trimmer to the Fusion Control Box is done via an electric connector in the following way:

Models ODS225E, T160, T250 and T315:	Directly to the Fusion Control Box socket connector.
Models T315 (110V), T400 and T500:	Into the **Switch Box 230V/110V** and then to the Fusion Control Box socket connector.
Models T630, T800, T1000 and T1200:	Into the **Switch Box 400V** and then to the Fusion Control Box socket connector.

2.6 HYDRAULIC STATION

The hydraulic station consists of the following:

Where:

1 Hydraulic station
- 1.1 Male+Female flat ends quick couplings, according to ISO 7241-1, A Series
- 1.2 Oil refilling plug
- 1.3 Oil filter

2 Tubular frame

3 Control panel
- 3.1 Electric cable with circular connector
- 3.2 Socket circular connector

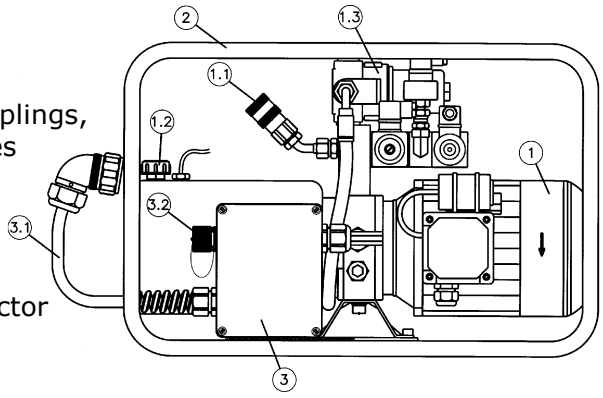


Figure 13: Hydraulic station on tubular frame (on 2017 models is provided with an enclosure)

Replace the hydraulic oil and filter following the maintenance schedule.

NOTE !
For care and maintenance of the hydraulic station, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

2.7 SWITCH BOX

The **Switch Box** must be used to connect the heating plate and trimmer on models T315 (110V) and from T400 and higher.

Figure 14a: Switch Box

Figure 14b: Switch Box on the Fusion box

To avoid that the high consumption of specially the heating plate and trimmer pass through the fusion box, the Switch Box is used on the above mentioned models to provide a direct 230, 110 or 400 Vac (depending on the model) supply to both components.
So, for such models the heating plate and trimmer are fitted with an special connector to be plugged into the corresponding Switch Box socket connector. Then, the Switch Box electric cables have to be plugged in the corresponding Fusion Box circular socket connector to receive the analogical signals. The Fusion control mains must be plugged in the Switch Box socket connector and finally the Switch Box cable mains in the power supply (generator or mains).

CHAPTER 3: MODE OF USE

3.1 UNIT PREPARATION

3.1.1 General:

From the operator's point of view, the unit can be used for:

1. Butt Fusion (models TWIN & DYNAMIC) > **Refer to Section 3.2** (page 25)
2. Electrofusion (TWIN model) > **Refer to Section 3.3** (page 38)
3. Tools: queries, data export, configuration changes, etc. > **Refer to Section 3.4** (page 47)

3.1.2 Positioning of the unit in the work area:

The fusion control box can be located either in the vertical or in the horizontal position as required by the operator.

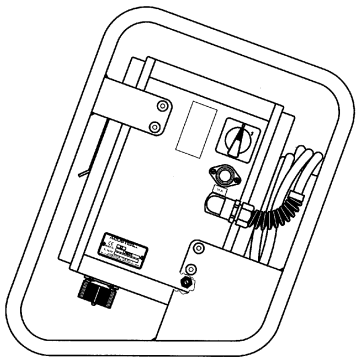


Figure 15a: Vertical position

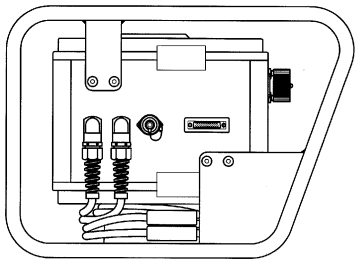


Figure 15b: Horizontal position

3.1.3 Unit connection:

DANGER Connect the fusion control box to a 230 V ± 15% power source (or to 110V, according to market requirement), of alternating current. Both the power supply and the equipment must be located in a non-hazardous location. Otherwise, explosion and death may occur.
For generator specifications, please refer to *CHAPTER 6: TECHNICAL CHARACTERISTICS*.

IMPORTANT !
The fusion box **TWIN/DYNAMIC** could be connected directly to the generator or mains socket plug when using machines models **ODS225E, T160, T250, T315 & T315G**. On machine models **T315 (110V), T400, T500 and T630**, The fusion box must be connected to the Switch Box socket plug.
Connection to a generator: the generator electric connection where the control box mains is plugged must be normalized and fitted with differential and ground pin. Refer to the generator's User Manual. **Connection to the mains:** the building electric installation where the control box mains is plugged must be fitted with earth connection as well as circuit breaker type D (EN 60898).
Do not unplug the mains pulling on the cable.

3.1.4 **Using the Barcode Reader:**

If you read the fitting's data (operator, job, fitting, pipe, etc.) by using optical means, connect the scanner into the corresponding connector and put it in front of the bar-code. When reading, the connected scanner emits a line of a particular length. To capture the barcode data, place the scanner so that the line coincides longitudinally with the barcode. The distance will depend on the size of the barcode to read. Once the scanner has been placed in position, the laser line will stop flashing and remain fixed. When this happens, press any of the three buttons on the top of the scanner (depending on the model).

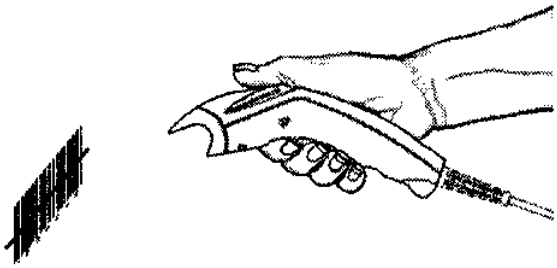


Figure 16 Example of using the laser scanner

3.1.5 **Unit Information:**

Turn on the main switch. The backlight of the display is activated and the MAIN MENU is shown. Press the panel ⬇ key to access to INFO. Press VALIDATE.

Selecting INFO screen:

UNIT INFORMATION
Acuster Global, S.L. - TWIN - Nº nnnn SOFT 1.0/Mxx ENGLISH ºC Newton mm dd/mm/yyyy hh:mm:ss Customer's name **W**0000; **J**000; **T**00; **D**0; **A**0; **K**0; **S**00; **67**0; **C**00; **24V**0; **P**0; **F**0 -20ºC/50ºC **M**0; **B**0; -20ºC/50ºC LBT:nnnnn LEF:nnnnn NSdd/mm/yyyy **W**30**L**0
SYSTEM CORRECT
<<

Where:
Manufacturer name, model and serial number.
Software/Monitor version, active language and units.
Date and time.
Customer's name.
Status of operator, job, traceability, depth, auxiliary data, buzzer, supervisor.
Status on butt fusion phases 6-7, pipe cleaning, trimmer 24V, penalty, anti fraud, room temperature.
Status on manual electrofusion, Bluebox, room temperature.
Counters for butt fusion, electrofusion, next service date, service warning days and unit lock status.
0 = deactivated (OFF)
1 = activated (ON)

Press << to return to the Main Menu.
To change the status of some of the selections displayed, go to TOOLS, Section 3.4 of this *Manual*.

3.2 BUTT FUSION (MODELS TWIN & DYNAMIC)

3.2.1 Introduction:

The assembly jobs and the PE (or other plastic resins) network butt fusion should always be carried out by specifically trained personnel and strictly following the manufacturer's instructions, both for the pipes/fittings as well as the fusion equipment.
The work site where the machine is to be placed must be on a horizontal, scoreless plane.

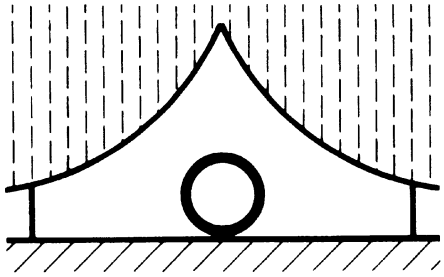


Figure 17

Protect the area where the joints are done against adverse weather conditions, such as rain, snow or wind. When temperatures drop below +5°C or rise above +45°C, appropriate measures will have to be taken in the working area in order to produce a temperature which ensures a satisfactory operation and which avoids any interference with the manual activities.

In order to achieve a uniform temperature in the whole diameter of the pipes, protect the fusion area against sunrays or bad weather. The opposite ends of the pipes and fittings to be butt-fused must be properly sealed and protected in order to minimise an excessively quick cooling process, which could be caused, for example, by the wind.

3.2.2 Machine preparation:

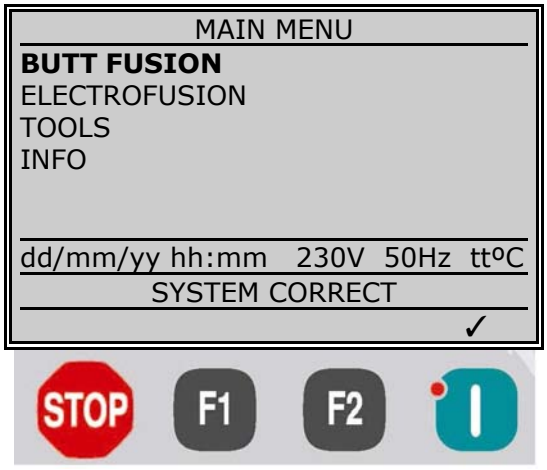
First prepare all machine components: base framework, heating plate, trimmer and hydraulic station (if applies), and connect the electric connectors to the their corresponding control box connector (for further information, please refer to clause 2.2 - *FUSION CONTROL BOX* of this *User Manual*).

MODELS HYDRAULICALLY DRIVEN (all except PDS-225-E)
The butt fusion with a base framework of hydraulic driving requires the use of a hydraulic station. Besides the connexions of the heating plate and trimmer previously described, the base framework installation is made by: 1. Connecting the base framework electric circular connector into the connecting box's hydraulic station socket connector. 2. Connecting the hydraulic station electric circular connector into the corresponding control box socket connector. 3. Connecting the two base framework's hydraulic couplings into the hydraulic station hydraulic couplings (male / female - female / male). NOTE: *In case of one of the two hydraulic couplings gets blocked by the blocked oil, it is recommended to press the key POSITION from the Clamping Position Menu while the hydraulic plug is being connected.*

3.2.3 Startup of the unit (see Section 3.1.3 - Connecting the unit to a power supply):

Turn on the main switch. The backlight of the display is active and appears in this message: MAIN MENU.

Select Butt Fusion:



Where:

dd/mm/yy:	Date
hh:mm:	Time
230V:	Input voltage
50Hz:	Input frequency
ttºC:	Room temperature

For possible initial messages, refer to Section 3.4 TOOLS.

3.2.4 Traceability:

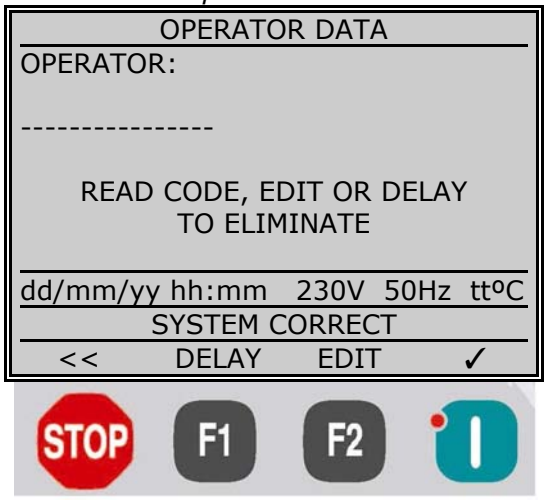
As defined in ISO 12176-4, traceability is the ability to create a trace of the history, purpose or location information, through records.
If required to have implemented some or all of traceability options available on the unit, refer to Section 3.5 - Access to other menus, in which selecting **Setup** / **Options** can be activated traceability necessary functions, which are:

- Identification operator
- Identification of the job order
- Auxiliary data
- Depth
- Traceability

In BUTT FUSION, press the <VALIDATE> key to move to the next screen.

Tr If it is enabled the identification of the operator:

Identification Operator:



Proceed to the introduction of the operator identification.
If not mandatory, you can continue to press <VALIDATE>.

Tr If it is enabled the identification of the job order:

Identification job order:

JOB DATE
JOB:

READ CODE, EDIT OR DELAY TO ELIMINATE
dd/mm/yy hh:mm 230V 50Hz ttºC
SYSTEM CORRECT
<< DELAY EDIT ✓

Proceed to the introduction of the job order identification.
If not mandatory, you can continue to press <VALIDATE>.

Select model and parameters:

BUTT FUSION DATA	
BASE FRAMEWORK	ODS-225-E
ECO	ON/OFF
CYCLE	ISO_v16
MATERIAL	PE
DIAMETER	200
SDR	SDR17
T24V ON/OFF	❄ ON/OFF
dd/mm/yy hh:mm 230V 50Hz ttºC	
SYSTEM CORRECT	
<<	MODIF. ✓

To modify, press **F2**; use the arrow keys to scroll through the options.

Pressing << returns to the main menu.

• BASE FRAMEWORK: select and validate the one which corresponds to the machine connected.

TRIMMER MODEL ODS-225-E !
When using base framework ODS-225-E, currently the trimmer is powered at 230V / 110V (depending on market). Check the correct selection of it: T24V ON means that the trimmer should be connected has a 24 Vdc motor whereas with T24V OFF the trimmer is equipped with a 230V/110V motor (drill). To change settings go to TOOLS / SETUP / BUTT FUSION.

• CYCLE: select and validate the one required to carry out the pipes/fittings joint.

CYCLES WITH COOLING DOWN PHASE !
When the selected cycle has a cooling phase without pressure, its status is showed with ❄ ON / OFF. ON means that, to cancel it when done, the fusion is aborted, while OFF can be cancelled with the result of FUSION CARRIED OUT CORRECTLY. To change settings go to TOOLS / SETUP / BUTT FUSION.

• ECO: For hydraulic stations with ECO adhesive, select ON. For the rest, select OFF.

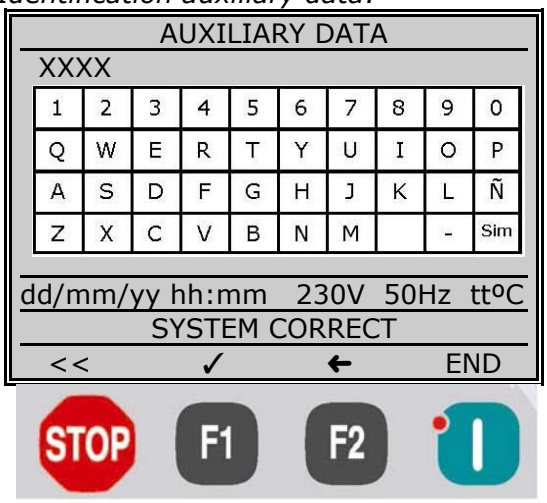
ECO
Introduced from software version v. 1.27. In hydraulic operated base frameworks the hydraulic stations motor stops in the pressure phase in ECO models only (provided that the pressure is maintained within tolerance).

• MATERIAL: select and validate the one which corresponds and according to the chosen cycle.

- DIAMETER: select and validate the one which corresponds to the pipes/fittings used on the joint.
- SDR select and validate the one which corresponds to the pipes/fittings used on the joint.

Tr If it is enabled the identification of the auxiliary data:

Identification auxiliary data:



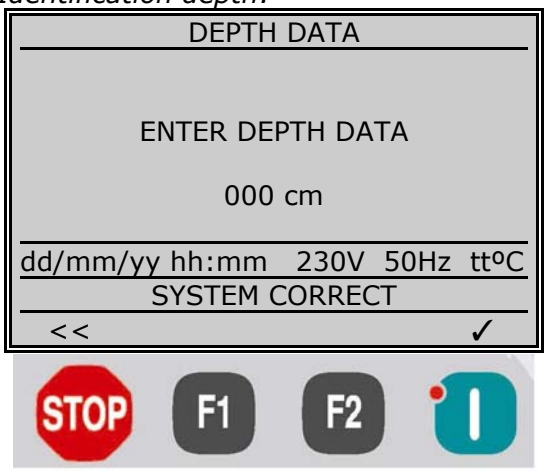
Proceed to the introduction of auxiliary data via the keyboard using the arrows.

Press **Sim** to access to symbols screen.

If not mandatory, you can continue to press <VALIDATE>.

Tr If it is enabled the identification of the depth:

Identification depth:

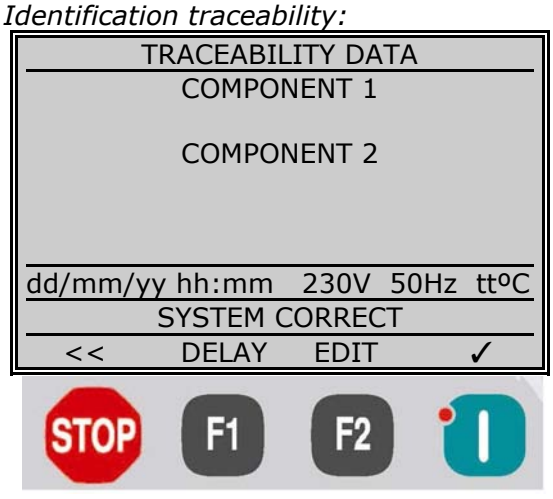


Proceed to the introduction of the trench depth via the keyboard using the arrows.

If not mandatory, you can continue to press <VALIDATE>.

Tr If it is enabled the identification of the traceability:

Identification traceability:



Proceed to the introduction of traceability data through the scanner or alternatively via keyboard using the arrows.

If not mandatory, you can continue to press <VALIDATE>.

3.2.5 **Preparation of the pipes and the machine:**

Once the entry or not of previous traceability identifications, such as operator, job, etc. (if enabled) has been carried out, and after pressing ACCEPT on the screen IDENTIFICATION MENU, the following message will come on:

Preparation of pipes/fittings

PIPES LOCATION
ODS-225-E ISO_V16 PE d.200 SDR17
N. nnnn T. tttºC DRAG: 0N
LOCATE BASE FRAMEWORK. PRESS START TO BEGIN.
dd/mm/yy hh:mm 230V 50Hz ttºC
SYSTEM CORRECT
<< OPEN CLOSE ✓

Press **F1** or **F2** to manual operation (open and close, respectively).
Press the <VALIDATE> key to position the base framework. During this operation the message changes from SYSTEM CORRECT to POSITIONING BASE FRAMEWORK...
Press << to return to the previous menu.

In all base framework movable clamps manual or automatic movements, enters function the buzzer to alert the movement of the machine.

MOUNTING ADVICE !
NEVER carry out the positioning operation with the pipes/fittings mounted on the base framework clamps.

Selecting POSITION, the display will show the following message:

Preparation of pipes/fittings

PIPES LOCATION
ODS-225-E ISO_V16 PE d.200 SDR17
N. nnnn T. tttºC DRAG: 70N
LOCATE PIPES CENTRALLY
dd/mm/yy hh:mm 230V 50Hz ttºC
SYSTEM CORRECT
<< START

Prepare the base framework for mounting the pipes/fittings. In order to do so, adapt the diameter of the pipes / fittings to be jointed via the corresponding adaptors (see list of available adaptors in CHAPTER 6: TECHNICAL CHARACTERISTICS).

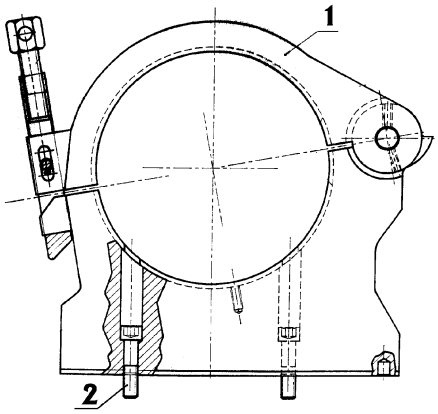
When jointing pipes to fittings or fittings to fittings, prepare the base framework for clamping the fittings. The butt fusion fittings can be, amongst others:

- 90°, 45° or 30° elbows
- 90° bend
- 90° tees (equal or reduced)
- Reducers (concentric or eccentric)
- Flange adaptor
- Caps

BASE FRAMEWORK ODS 225 E

On the base framework **ODS225E**, both outer clamps are removable. To remove them, loosen both clamps bolts (**2**) using a 10 mm Allen key (supplied with the unit tool set).

NOTE !
If an adaptor is already mounted, this should be removed in order to access the clamp bolts.



Where:

1. Clamp assembly
2. Looking bolt, Allen type

Figure 18: Removable outer clamp

BASE FRAMEWORK HYDRAULICALLY ACTUATED (T315G + TRACK RANGE)

On the base framework **T315**, the outer clamp of the fixed body (first clamp on the right hand according to *Figure 19*) is removable to accommodate fittings. To remove it, loose the bolts (**b**) of the lower clamp (**1**) using a 6mm Allen key.

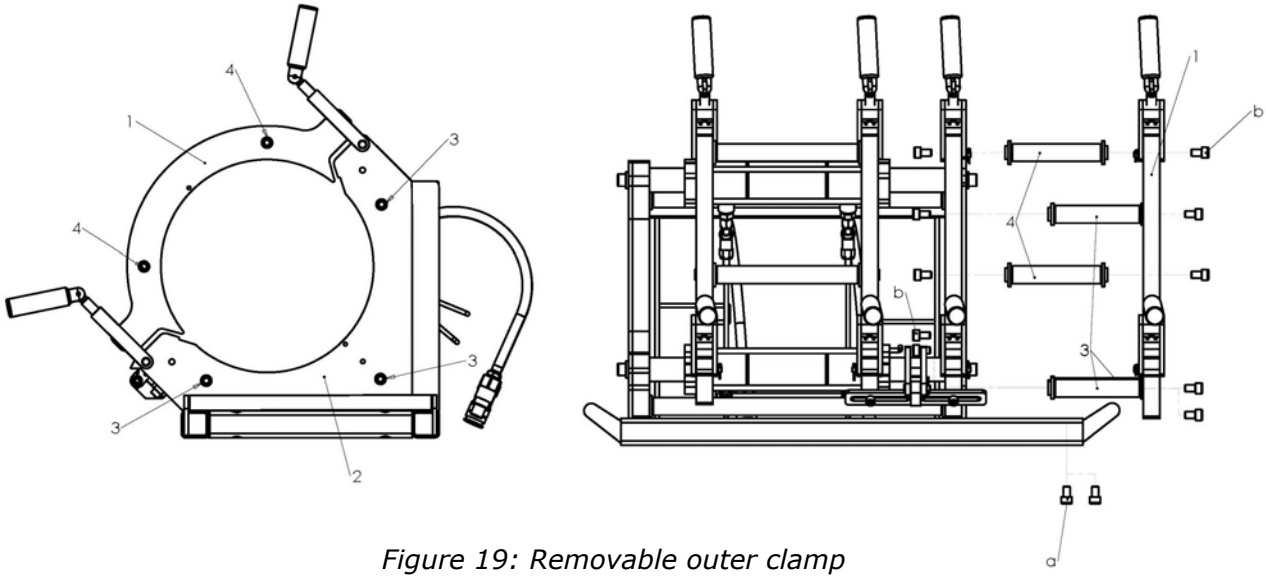


Figure 19: Removable outer clamp

Loosen the bar fixing bolts (**b**) using an 8mm Allen key. Afterwards, dismount the supporting plate (**2**). Once this has been done, dismount the spacer bar (**4**), which is fixed by (**b**) bolts on both ends. Remove the clamp (**1**) and the two spacer bars (**3**) using a 27 mm head-open end wrench.
Revert the above step instructions to assemble.

Now open all the upper clamps and place the pipes/fittings into the machine with both pipe ends touching and with approximately equal distance between the clamps (before mounting, inspect the insides and outsides of the pipes/fittings to be jointed); try and align them (use the supporting rollers).
Tighten the locking bolts (DO NOT overtighten).

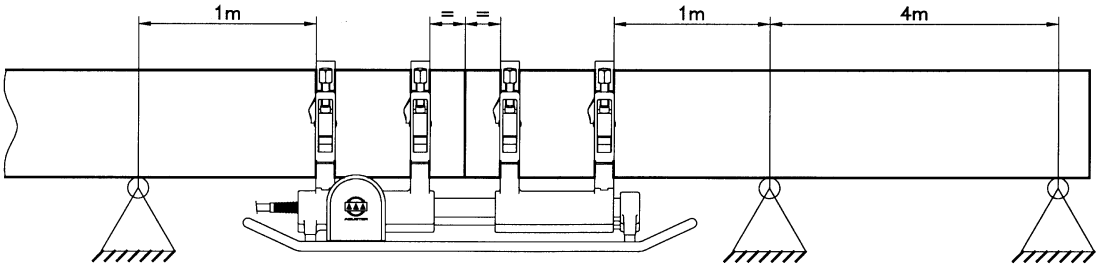


Figure 20

NOTE !
The maximum drag force will be given by the PIPE RECORD (it will never be higher than the fusion force). When champing pipes onto the base framework with precarious drag condition (supporting rollers not used, excessive length, etc) whose manoeuvring force is bigger than the above specified, the moving body will be immobilised. The display will show: "MOTOR OVERCHARGE".

After the assembling, check the pipe/fittings alignment. The maximum alignment tolerance allowed according to ISO 12176-1 is 10% of the pipe's wall thickness.

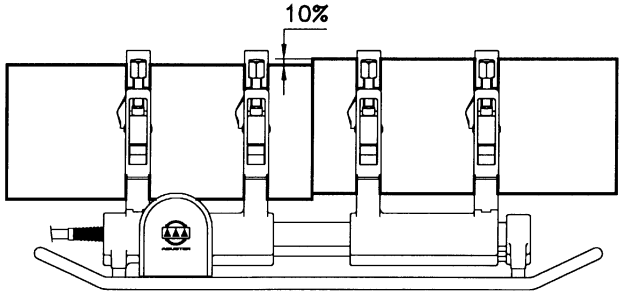


Figure 21

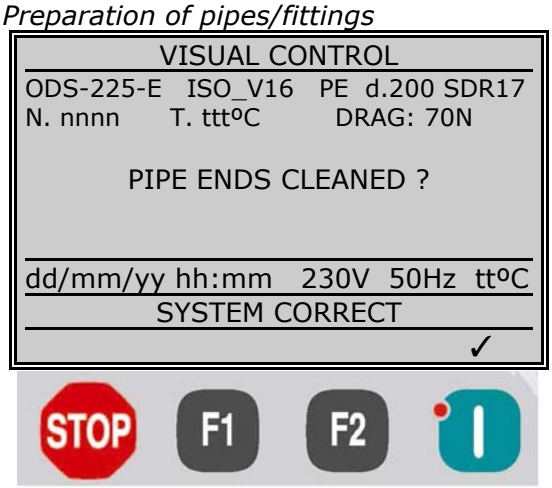
Preparation of pipes/fittings

PIPES LOCATION
ODS-225-E ISO_V16 PE d.200 SDR17
N. nnnn T. tttºC DRAG: 70N
LOCATING BASE FRAMEWORK FOR TRIMMING
dd/mm/yy hh:mm 230V 50Hz ttºC
LOCATING BASE FRAMEWORK...
<< START

Pressing <VALIDATE> the mobile body held a reading of drag and it is placed in the position of maximum opening.
Press << to return to the previous screen.

If the pipe cleaning is set as "INITIAL PIPE CLEANING", the following message will appear on the screen:

Preparation of pipes/fittings



Clean the outer and inner surfaces of the ends of the pipes/fittings with an appropriate degreasing liquid.
Pressing <VALIDATE> continues with the trimming phase.

3.2.6 **Pipes/fittings trimming:**

If you accept the previous selection, the following message will appear on the display:

Preparation of pipes/fittings
Trimming

NOTE: For electrically operated machines (**ODS225E**), be sure that the trimmer is properly setup:
24 Vdc motor: ON
230/110V motor: OFF
During this phase the display will show the field TRIMMER (that is for information purposes just for 24Vdc trimmer).

Place the trimmer between the two pipes/fittings to be jointed, resting it on the base framework guides against the facing of the pipe on the fixed body, and with the handle of the electric cable on the clamps bolts side.

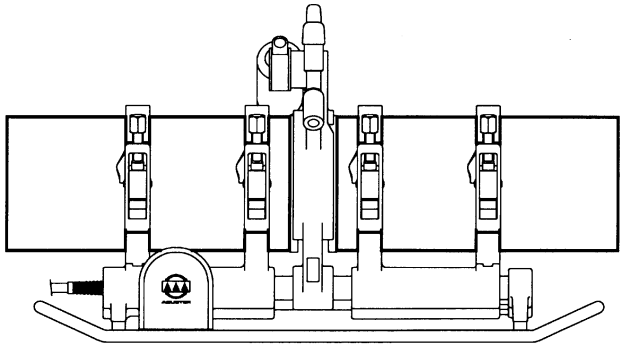


Figure 22

WARNING Keep Pressed the push-button.

TRIMMING (230/110V FUSION UNITS)
When the trimmer push-button is pressed the heating plate power supply is cut. The feed to the heating plate is automatically activated few seconds after the push-button is released.

WARNING !
Handle the trimmer with caution. These is risk of being cut by the blades.
If for any reason the operator releases either of the trimmer push-buttons (however short a time), the cycle will be interrupted. Repeat the process by releasing and pressing both trimmer push-buttons simultaneously.
The trimmer is equipped with a position sensor that prevents it from starting up if is not placed on the guiding axles.

With the trimmer's push-button pressed, the moving body starts a closing cycle (in which the required drag force is read). Then the trimmer starts up, and the moving body automatically approaches it. The force exerted on the trimmer will depend on the one established on the corresponding pipe SDR and diameter selected plus the drag force of the pipes/fittings.
Trim both ends till the shavings come off continuously from both sides. Then, release the push-buttons. The moving body will automatically open and stop the trimmer.
The shaving thickness must be 0.3 mm at the most.

NOTE !
If the cutting is not correct, check and adjust the cutters according to the procedure described in CHAPTER 5: MAINTENANCE, of this *User Manual*.

Once this operation has been made, the display will show:

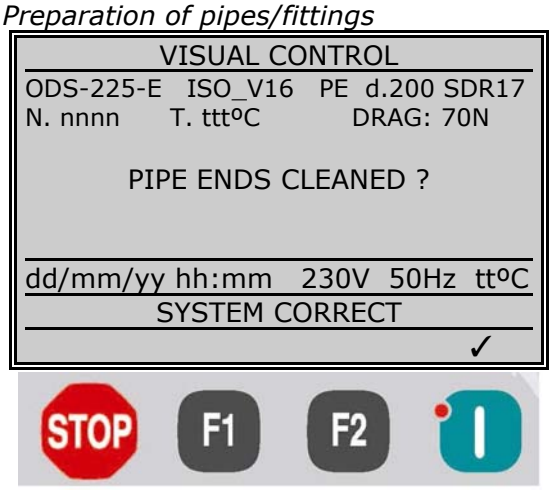
Trimming

If the trimming is correct, press <VALIDATE> to continue with the cycle.
If it is not correct, keep on trimming until the tolerance of the sides of the pipes/fittings is correct.
If trimming is excessively, the system automatically detects and the message EXCESSIVE TRIMMING is displayed.
Press << to return to PIPES LOCATION menu.

CAUTION keep hands clear of the area.

If the pipe cleaning is set as "FINAL PIPE CLEANING", the following message will appear on the screen:

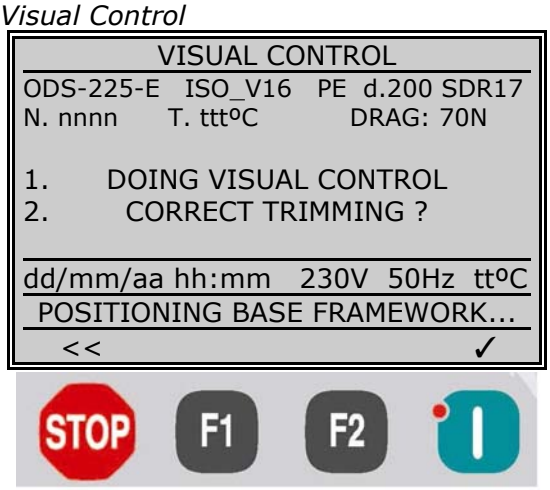
Preparation of pipes/fittings



Clean the outer and inner surfaces of the ends of the pipes/fittings with an appropriate degreasing liquid.
Pressing <VALIDATE> continues with the trimming phase.

The display will read as follows:

Visual Control



1. DOING VISUAL CONTROL.
With this operation the drag force is measured and displayed when it is fully closed. The position of the moving body is then saved in the memory in order to calculate the distance reduction of the fusion.

2. IS VISUAL CONTROL CORRECT ?
Inspection of the cut obtained.

Visually check the trimming. According to ISO 12176-1, the flatness of the sides of the pipes will have a maximum tolerance from 0.25 to 0.95mm, depending on the nominal diameter (see following table):

P = 0.25 mm for $d_n \leq 315$ mm
P = 0.5 mm for d_n 315 < to ≤ 630 mm
P = 0.65 mm for d_n 630 < to ≤ 800 mm
P = 0.80 mm for d_n 800 < to ≤ 1000 mm
P = 0.95 mm for d_n 1000 < to ≤ 1200 mm

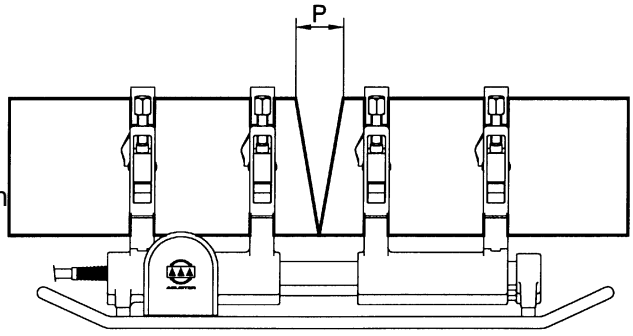
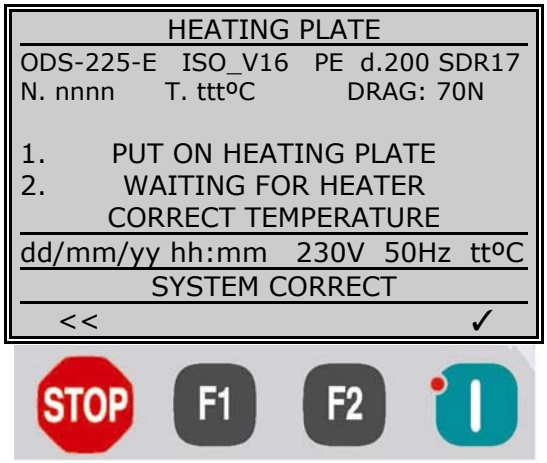


Figure 23

If the tolerance of the specification to be applied did not comply, trim again. By pressing <<, the moving body is placed in the biggest opening position and the display goes back to the TRIMMING menu.
When the visual check is satisfactory, press <VALIDATE> to continue with the cycle.

3.2.7 **Heating plate setting:**

Once the trimming and visual check phase has been completed, the display will show the following indication:
Visual control



1. PUT ON HEATING PLATE.
If the heating plate is not within the minimum and maximum tolerances established (T. tttºC), the message number 2 will come on.

2. WAITING FOR HEATER CORRECT TEMPERATURE.
The process will stop until the adequate temperature is attained.

The heating plate temperature control is automatically carried out via the electronic control unit. However, the heating plate is fitted with an independent thermometer for additional information. It has a green indicator led which is on or off; when it is on indicates that the heating plate is receiving power.
When the heater reaches suitable working temperature, the display will show the message CORRECT TEMPERATURE.

WARNING !
Hot surfaces ! Do not touch ! The use of protection gloves is recommended.

Place the heating plate on the base framework guides between the pipes/fittings (approximately midway); the electric cable should be on the clamp bolts side. Pres <VALIDATE> from the panel. The moving body closes and applies the programmed force (for the pipe selected + drag).

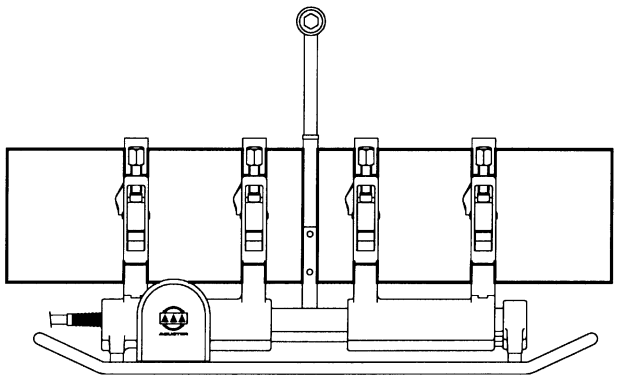


Figure 24

When starting the fusion cycle, two bars of progress will be displayed: one for the phase which is carried out at the moment and a second for the total cycle.

Fusion Cycle

REDUCTION: It will be showed this field which pipes end length reduction is being produced in the fusion is displayed.
FORCE/TIME: they indicate the force and time applied on the phase which is being carried out.
PHASE: progress bar; it indicates the current phase number vs total.
CYCLE: total cycle progress bar. TWIN is showed on phase 6. Refer to clause 3.2.8 - Simultaneity.

CAUTION !
Should the heating plate not be withdrawn within this time, the moving body will close normally following the butt fusion cycle. The display will show the following message: "MOTOR OVERCHARGE". Press << key and reinitiate the butt fusion process from the beginning.

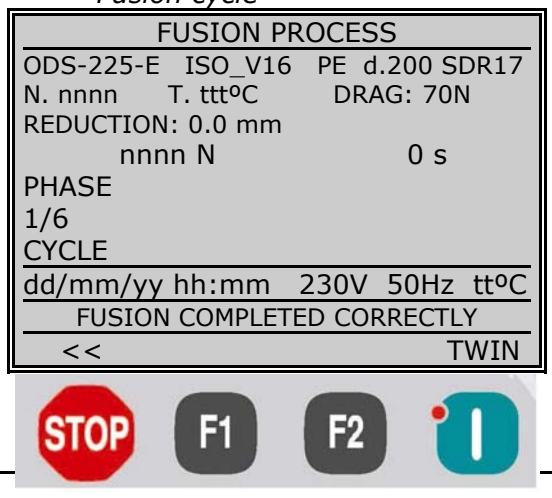
3.2.8 **Fusion and cooling down cycle:**

After the opening time has expired, the moving body closes to start the programmed cycle BUTT FUSION TIME, with force (fusion force + drag force).
The countdown time will be shown on the display, along with the force exerted on the cycle and the joint length reduction.

NOTE !
For ECO hydraulic stations (having selected ECO ON), after 120 seconds of the start of the phase, the hydraulic station motor will stop and will not start if the pressure is kept within tolerance.

This step is followed by the cycle COOLING TIME (without force). During this phase, the moving body remains blocked and the clamps holding the pipe/fittings must not be loosened until the cooling time is over. This phase can be cancelled at any time without penalty provided that the cooling phase is set to OFF (see page 27, selection of the butt fusion cycle). As indicated above, there will be the word appeared **TWIN**; *SIMULTANEITY* can be executed by pressing TWIN on the panel (for models TWIN only).
Where in the example:

Fusion cycle

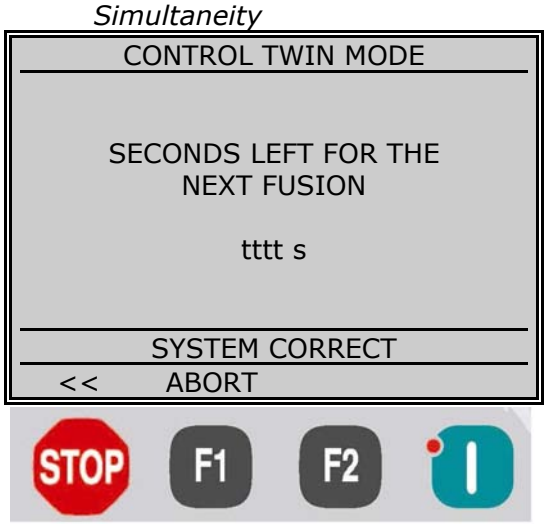


CAUTION !
Should the pipes/fittings be loosened from the clamps before time, the electronic control unit would detect it causing the following message to be displayed: "PIPE FREE BEFORE COOLING".
This will be stored in the unit's memory.

3.2.9 **Simultaneity (TWIN only):**

The simultaneity allows you to carry out an electrofusion with the same unit, thus making the most of the time of usage of the machine. Press << and proceed to carry out an electrofusion (by switching off, transferring the machine and carrying out the operation or simply by selecting ELECTROFUSION from the main menu in the event of the unit not switched off).
Once the electrofusion and complementary operations have been completed, connect the **TWIN** again onto the base framework (if disconnected). Select the main menu BUTT FUSION.

Simultaneity



Pressing TWIN on FUSION PROCESS screen, the message showed on the left side screen will be displayed.
Upon the expiration of the cooling time, ABORT passes to VALIDATE. Press **F1** to store the fusion record in memory. (Pressing **F1** when it is in ABORT the fusion record will be stored in the memory unit as cancelled (VOLUNTARY INTERRUPTION BY THE OPERATOR).

If the *SIMULTANEITY* is not used, the fusion cycle will carry on. When the countdown of the programmed cooling time is finished, the moving body will carry out the operation of verification to ensure that the pipes/fittings are still mounted and fixed on the clamps.

3.2.10 **End of butt fusion joint:**

If the full sequence herewith described has been carried out correctly in all its phases, and the pipe length reduction lies between the programmed maximum and minimum, the message "FUSION COMPLETED CORRECTLY" is displayed. If not, the message with the reason for the failure will appear.
The <STOP> key can be pressed any time during the fusion process in order to stop the process. The unit will be then ready to go back to the beginning of the trimming process.

3.3 ELECTROFUSION PROCEDURE FOR FITTINGS (MODEL TWIN)

3.3.1 Introduction:

The assembly jobs and the PE/PP network electrofusion should always be carried out by specifically trained personnel and strictly following the manufacturer's instructions, both for the fittings as well as the fusion equipment. In the gas sector in Spain, to give an example, this training is given by specialised centres adhering to technical specifications edited by Sedigás and which are available in pdf format at www.sedigas.es (PE welder's certification).

3.3.2 Scraping pipe surfaces:

First clean the surface to be scraped with a clean lint-free dry cloth. The length to be cleaned will depend on the size of the fitting to be used, adding a minimum additional margin of 50 mm on each end.
Scrape the area of the pipe or pipes where the fitting to be joined will be installed. The length of the scraping should be greater than that of the fitting.

IMPORTANT !
The scraping of the pipe should generate swarfs. This ensures the elimination of the pipe's most exterior oxidation, which would otherwise lead to a dissatisfactory electrofusion joint.

Next clean the scraped area with a de-greasing towel or with a clean, dry white cloth (which does not shed lint), dampened with isopropanol or recommended PE solvent.

3.3.3 Fitting installation:

For joints of *tapping saddles* and *branch saddles*, place a rounder on each side of the scraped area if the fusion is performed over a bar pipe. If the joint is performed on a pipe from a roll, the placement of an aligner-rounder tool is indispensable. Next install the fitting on the pipe.
If the fitting to be jointed is a *coupler*, *reducer* or *elbow*, remove it from its wrapping, and without touching its interior, install it on the scraped and cleaned pipe. Now assemble the aligner and the other specially-prepared pipe or fitting.
Electrofusion joints should only be carried out by qualified staff.
Protect the area where electrofusions area carried out from adverse weather conditions, such as rain, snow or wind. Admissible temperatures range from -10°C to +40°C. In order to achieve a uniform temperature in the whole diameter of the pipes, protect the fusion area against sunrays or bad weather.
The quality of the joint depends substantially on the care taken in the preliminary preparation tasks (scraping, de-greasing, etc).

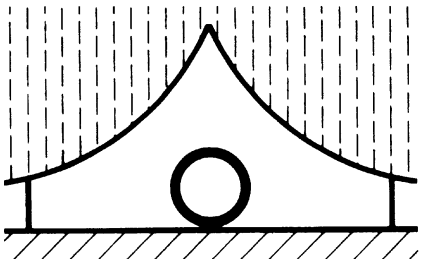
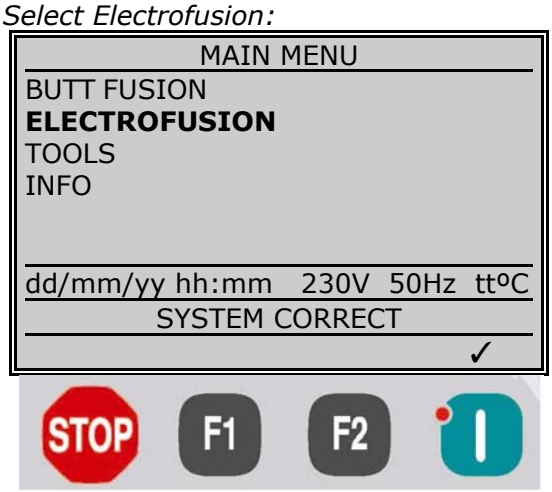


Figure 25

3.3.4 Startup of the unit (see Section 3.1.3 - Connecting the unit to a power supply):

The fusion control box can be located either in the vertical or in the horizontal position as required by the operator.
Set the master switch in the ON position. The display backlight comes on and the following message is displayed:

Select Electrofusion:



Where:

dd/mm/yy:	Date
hh:mm:	Time
230V:	Input voltage
50Hz:	Input frequency
ttºC:	Room temperature

For possible initial messages, refer to Section 3.4 TOOLS.

3.2.5 Traceability:

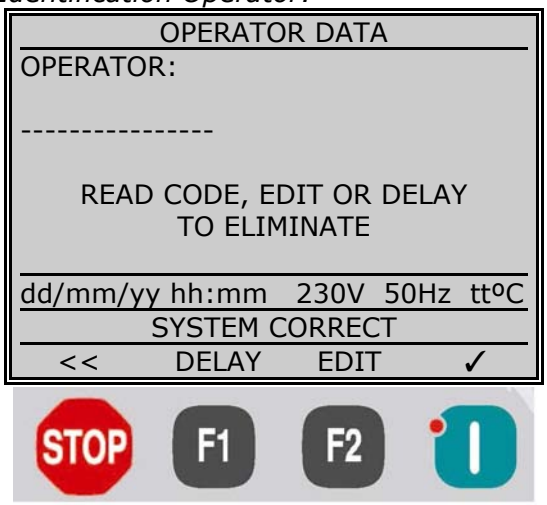
As defined in ISO 12176-4, traceability is the ability to create a trace of the history, purpose or location information, through records.
If required to have implemented some or all of traceability options available on the unit, refer to Section 3.5 - Access to other menus, in which selecting **Setup** / **Options** can be activated traceability necessary functions, which are:

- Identification operator
- Identification of the job order
- Auxiliary data
- Depth
- Traceability

In ELECTROFUSION, press the <VALIDATE> key to move to the next screen.

Tr If it is enabled the identification of the operator:

Identification Operator:

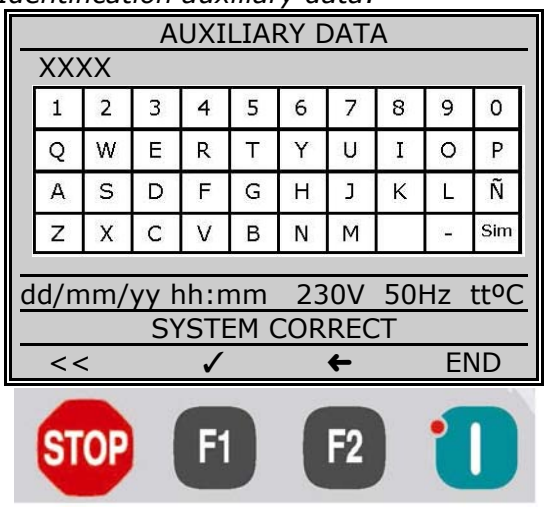


Proceed to the introduction of the operator identification.
If not mandatory, you can continue to press <VALIDATE>.

Tr If it is enabled the identification of the job order:
Identification job order:

Proceed to the introduction of the job order identification.
If not mandatory, you can continue to press <VALIDATE>.

Tr If it is enabled the identification of the auxiliary data:
Identification auxiliary data:

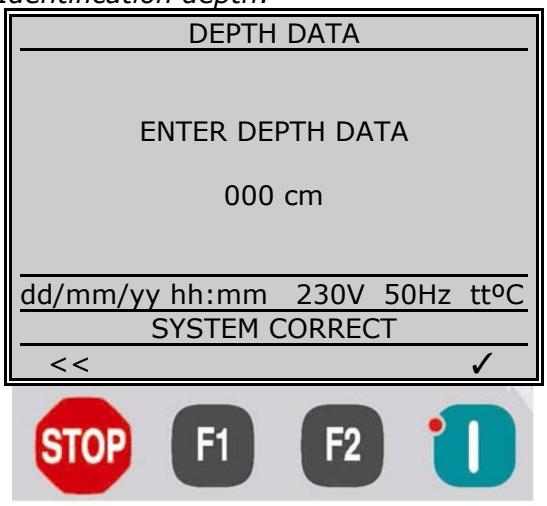


Proceed to the introduction of auxiliary data via the keyboard using the arrows.

Press **Sim** to access to symbols screen.

If not mandatory, you can continue to press <VALIDATE>.

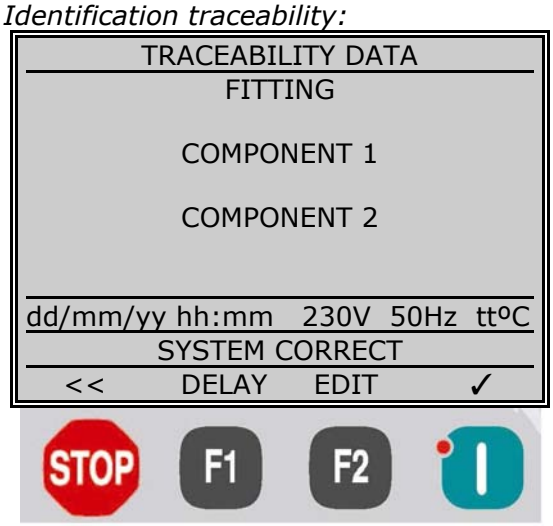
Tr If it is enabled the identification of the depth:
Identification depth:



Proceed to the introduction of the trench depth via the keyboard using the arrows.

If not mandatory, you can continue to press <VALIDATE>.

Tr If it is enabled the identification of the traceability:
Identification traceability:



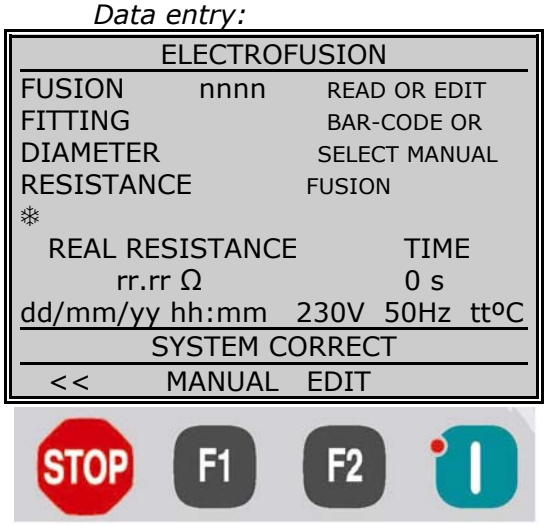
Proceed to the introduction of traceability data of the electrofusion fitting through the scanner or alternatively via keyboard using the arrows.

If not mandatory, you can continue to press <VALIDATE>.

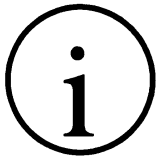
3.3.6 **Preparation of the electrofusion:**

Having optionally executed the operator, job, auxiliary data, depth and traceability identification operation (if enabled), the following message will appear:

Data entry:



Connect the unit electrofusion cable terminals into the fitting's connectors to be jointed. The contact surfaces of both the fitting's connectors and cables terminal must always be clean. The fitting resistance value will be display on rr.rr Ω field.
Enter the fitting's electrofusion data via the bar-code system via the connected scanner. See NOTE.



RECOMMENDATION !	
We advise you to always use electrofusion adaptors, even though the connection to the fitting may be possible directly. Doing so, the cable terminals are protected, they do not wear out, burn, etc.	

NOTE:
The first option is the automatic way: read the fitting barcode through the scanner. Alternatively, electrofusion data can be entered manually (press **F1** if the manual option is ON) or editing (press **F2**) and entering the fitting numbers of the barcode in case of not having an scanner or the barcode is illegible.

BAR-CODE SYSTEM

By this system the entry of electrofusion parameters is carried out by the fitting's barcode, via the connected scanner or editing and manually entering the fitting barcode numbers.

WARNING !
Make sure you always read the bar-code corresponding to the fitting to be electrofused. Should you not record the fitting's data, this could cause into errors in the electrofusion process that would have repercussions in the quality and reliability of the joint.

① VIA SCANNER:

Data entry:

ELECTROFUSION		
FUSION	nnnn	
FITTING	xxxxxxxxx	mm
DIAMETER	ddd mm	
RESISTANCE	rr.rr Ω	VOLTAGE vv.v V
❄	ttt min	
REAL RESISTANCE		TIME
rr.rr Ω		tttt s
dd/mm/yy hh:mm	230V 50Hz	ttºC
SYSTEM CORRECT		
<<		GO

FUSION: sequential number.
FITTING: type of fitting (coupler, elbow, etc.).
BRAND: mm field corresponds to the initials of the fitting manufacturer.
DIAMETER: it corresponds to the diameter of the fitting.
RESISTANCE: the nominal coil resistance of the fitting according to the manufacturer.
VOLTAGE: electrofusion voltage indicated by the manufacturer of the fitting.
❄: fitting's cooling time.

REAL RESISTANCE: is the value of the coil resistence of the fitting read by the unit.
TIME: it corresponds to the fusion time indicated by the fitting's manufacturer.

COOLING TIME ❄
The cooling time will be displayed only if the fitting manufacturer has loaded this information on the bar-code. This indicates the minimum waiting time that is required before pulling apart the gripping tools used (aligner, clamping tool, etc). For further information on the minimum waiting time for the drilling and pressure test, please refer to the assembly instructions of the fitting's manufacturer respectively.

If the resistance value between the fields RESISTANCE and the REAL RESISTANCE lie within the pre-established tolerances by the fitting manufacturer, the electrofusion cycle will be able to proceed. If not, the message "RESISTANCE TOO LOW" or "RESISTANCE TOO HIGH" will be displayed. Check connections, fitting or unit calibration.

Enquiries about scraping and aligning tool:

ELECTROFUSION		
FUSION	nnnn	
FITTING	xxxxxxxxx	mm
DIAMETER	ddd mm	
RESISTANCE	rr.rr Ω	VOLTAGE vv.v V
❄	ttt min	
REAL RESISTANCE		TIME
rr.rr Ω		tttt s
dd/mm/yy hh:mm	230V 50Hz	ttºC
SCRAPED AND CLEANED ?		
YES		

ELECTROFUSION		
FUSION	nnnn	
FITTING	xxxxxxxxx	mm
DIAMETER	ddd mm	
RESISTANCE	rr.rr Ω	VOLTAGE vv.v V
❄	ttt min	
REAL RESISTANCE		TIME
rr.rr Ω		tttt s
dd/mm/yy hh:mm	230V 50Hz	ttºC
ALIGNING TOOL USED ?		
YES	NO	

Pressing GO, the display shows the message of SCRAPING AND CLEAN ?. Press **F1** to continue. The next screen asks if you used aligner. Press **F1** if used or **F2** if not.

Start of the fusion cycle:

ELECTROFUSION		
FUSION	nnnn	
FITTING	xxxxxxxxx	mm
DIAMETER	ddd mm	
RESISTANCE	rr.rr Ω	VOLTAGE vv.v V
❄	ttt min	
REAL RESISTANCE		TIME
	rr.rr Ω	tttt s
dd/mm/yy hh:mm	230V	50Hz ttºC
SYSTEM CORRECT		
<<		START

By pressing START, the unit verify again the connected resistance (RESISTANCE CHECK ...) and starts the electrofusion cycle powering the voltage programmed by the fitting manufacturer as well as fusion time established according to the correction made as per as the ambient temperature.
The time shown in the display, perform a decreasingly count to zero. At any time you can interrupt the cycle by pressing STOP.

Making the fusion cycle:

ELECTROFUSION		
FUSION	nnnn	
FITTING	xxxxxxxxx	mm
DIAMETER	ddd mm	
RESISTANCE	rr.rr Ω	VOLTAGE vv.v V
❄	ttt min	
REAL RESISTANCE		TIME
	rr.rr Ω	tttt s
dd/mm/yy hh:mm	230V	50Hz ttºC
DOING FUSION...		
<<		

WARNING

If there is a malfunction in the electrofusion process, hot molten PE/PP can be expelled in rare cases. Therefore, keep at a safe distance from the fusion point during the electrofusion cycle and do not connect any other electric equipment during the process.

Finalization of the fusion cycle:

ELECTROFUSION		
FUSION	nnnn	
FITTING	xxxxxxxxx	mm
DIAMETER	ddd mm	
RESISTANCE	rr.rr Ω	VOLTAGE vv.v V
❄	ttt min	
REAL RESISTANCE		TIME
	rr.rr Ω	tttt s
dd/mm/yy hh:mm	230V	50Hz ttºC
ELECTROFUSION COMPLETED CORRECTLY		
		✓

If the electrofusion cycle is completed satisfactorily (time 0 s), the message "ELECTROFUSION COMPLETED CORRECTLY" will be displayed.
If during the fitting's fusion cycle there is an eventuality such as: disconnection of a fitting's terminal, increase or decrease of voltage over the allowed limits by the machine, an electric failure, etc., the electrofusion process will stop and the corresponding message will be displayed.

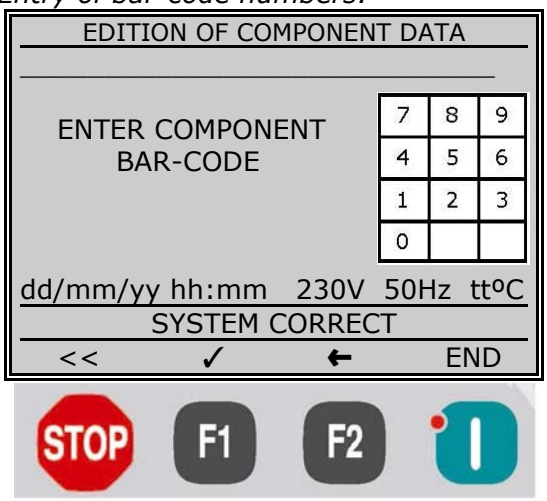
WARNING !
In order to guarantee a good electrofusion, it is recommendable not to reuse a fitting in which the fusion cycle has been interrupted.

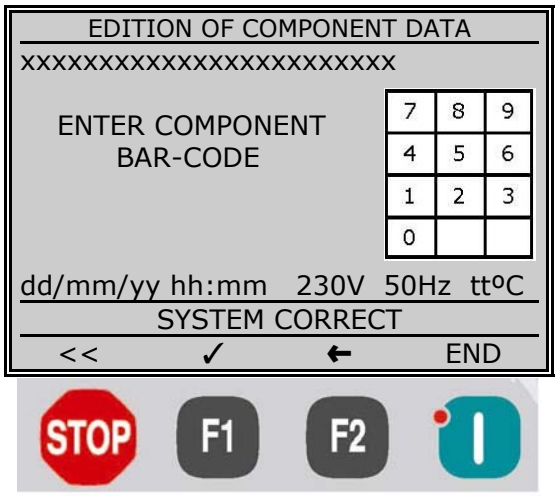
Press <VALIDATE> to carry out another electrofusion or exit the menu.

② EDITING BARCODE

If you do not have scanner or not being able to carry out the capture of bar-codes and traceability of the fitting data is required, press **F2** to edit and enter the bar-code numbers.

Entry of bar-code numbers:

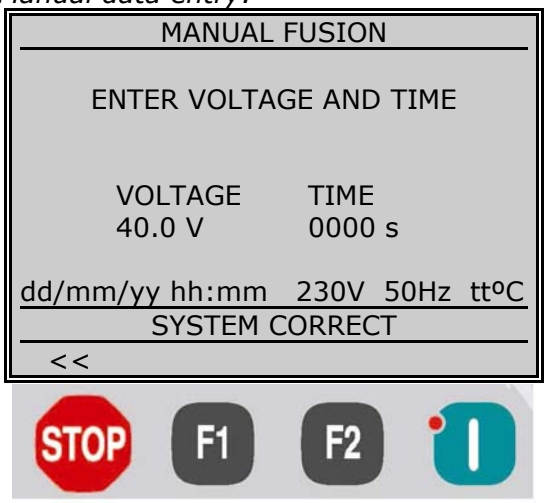




Enter the bar-code numbers moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the code, press **END** to move to the next screen.
From this point, follow the same procedure as described in capturing the barcode by scanner. Go to ① VIA SCANNER.

③ MANUAL SYSTEM (if enabled)

If the chosen option for data entry is the manual one, once the fitting connection is done, pressing **F1** on the ELECTROFUSION screen, the display shows the following screen:
Manual data entry:

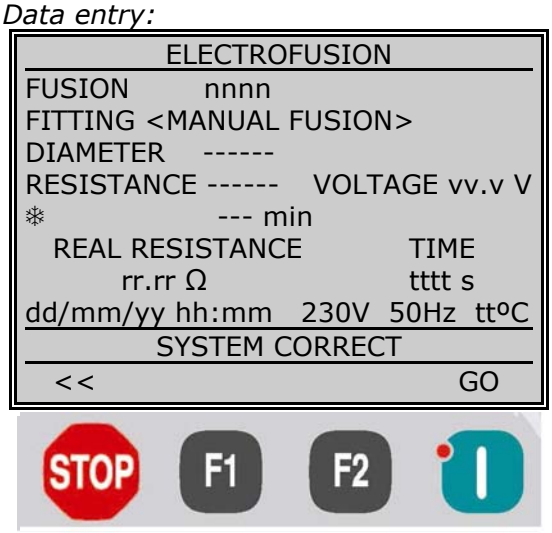


The operator must select the electrofusion voltage and time following the manufacturer's instructions for the connected fitting. The voltage displayed will always be 40.0 V by default. To change it, press ⬆ to increase the voltage and ⬇ to reduce it. Each pulse represents a change of 0.5V. Press ➡ to move to TIME. Press ➡ and ⬅ arrow keys to move the cursor in the field and arrows ⬆ and ⬇ to select the time value. See NOTE.

Once entered the time, the sign ✓ will appear to confirm.

NOTE:
According to room temperature, the electrofusion time may vary; consult the fitting manufacturer.

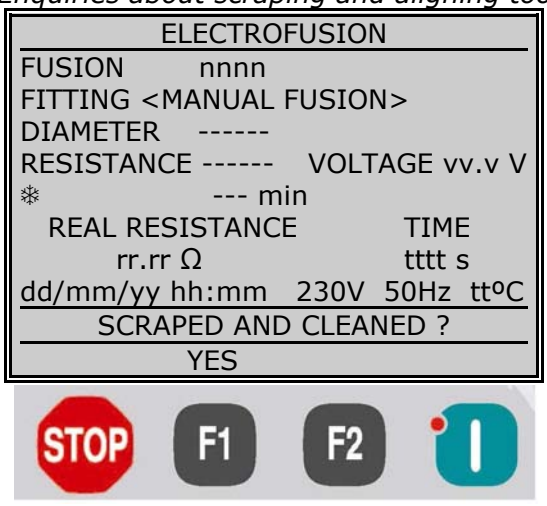
Data entry:

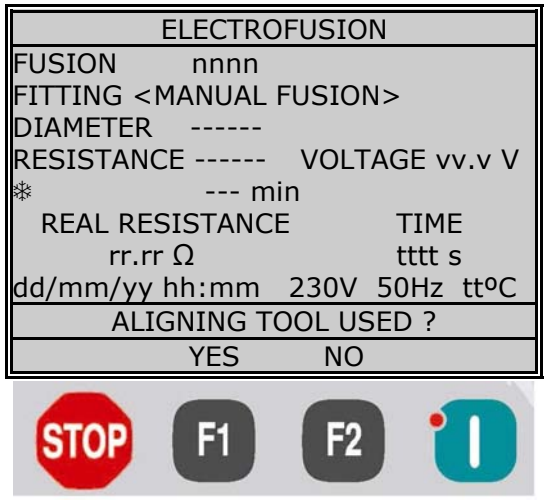


FUSION: sequential number.
FITTING: no data for being manual fusion.
BRAND: no data for being manual fusion.
DIAMETER: no data for being manual fusion.
RESISTANCE: no data for being manual fusion.
VOLTAGE: electrofusion voltage manually entered.
❄: no data for being manual fusion.
REAL RESISTANCE: is the value of the fitting resistance read by the unit.
TIME: corresponds to the time manually entered.

Pressing GO, the display shows the message of SCRAPING AND CLEAN ?. Press **F1** to continue. The next screen asks if you used aligner. Press **F1** if used or **F2** if not.

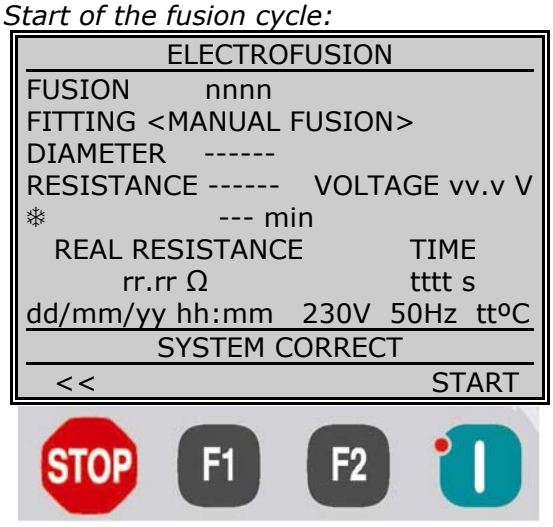
Enquiries about scraping and aligning tool:



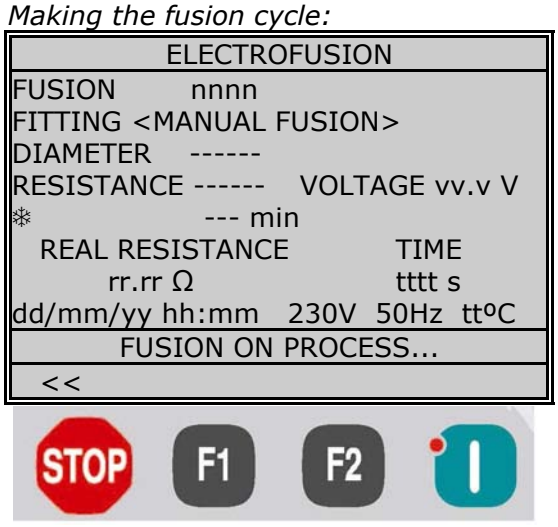


By pressing START, the unit starts the electrofusion cycle powering the voltage and time entered by the operator.
The time shown in the display, perform a decreasingly count to zero. At any time you can interrupt the cycle by pressing STOP.

Start of the fusion cycle:



Making the fusion cycle:



WARNING If there is a malfunction in the electrofusion process, hot molten PE/PP can be expelled in rare cases. Therefore, keep at a safe distance from the fusion point during the electrofusion cycle and do not connect any other electric equipment during the process.

Finalization of the fusion cycle:

ELECTROFUSION
FUSION nnnn
FITTING <MANUAL FUSION>
DIAMETER ------
RESISTANCE ------ VOLTAGE vv.v V
❄ --- min
REAL RESISTANCE TIME
rr.rr Ω tttt s
dd/mm/yy hh:mm 230V 50Hz ttºC
ELECTROFUSION COMPLETED CORRECTLY
✓

If the electrofusion cycle is completed satisfactorily (time 0 s), the message "ELECTROFUSION COMPLETED CORRECTLY" will be displayed.
If during the fitting's fusion cycle there is an eventuality such as: disconnection of a fitting's terminal, increase or decrease of voltage over the allowed limits by the machine, an electric failure, etc., the electrofusion process will stop and the corresponding message will be displayed.

WARNING !
In order to guarantee a good electrofusion, it is recommendable not to reuse a fitting in which the fusion cycle has been interrupted.

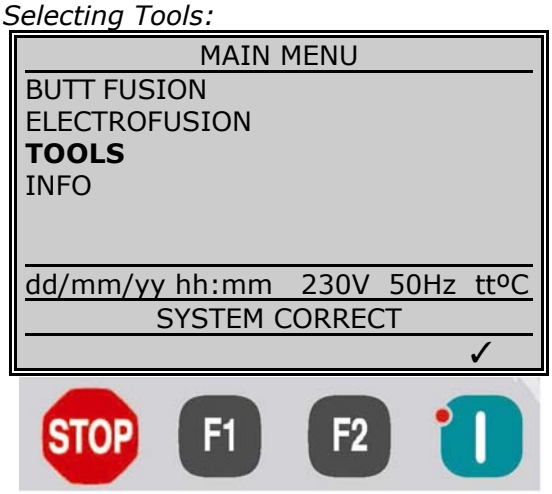
Press <VALIDATE> to carry out another electrofusion or exit the menu.

3.4 TOOLS (MODELS TWIN & DYNAMIC)

3.4.1 Tools Menu:

By selecting **TOOLS** from the MAIN MENU, you can access the functions of consulting, setup, adjustment, etc.

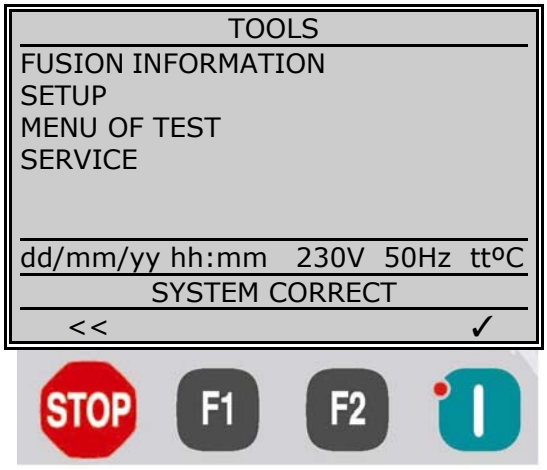
Selecting Tools:



Select TOOLS by placing the cursor on the word by means of the arrows ⬆ and ⬇ on the panel. Then press the button <VALIDATE>.

The following MENU will appear:

Menu of Tools:



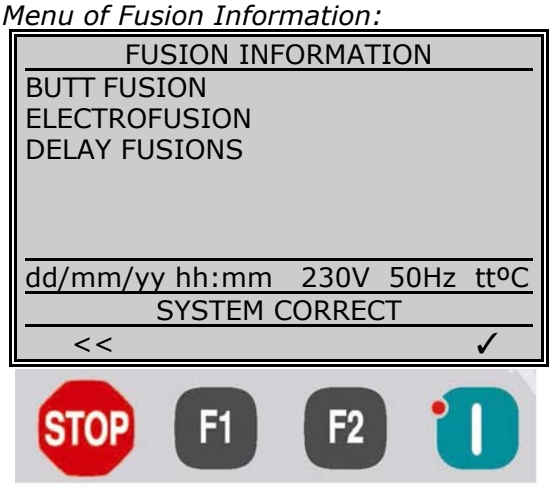
Choose the desired option among FUSION INFORMATION, SETUP, MENU OF TEST and SERVICE by placing the cursor on the word by means of the arrows ⬆ and ⬇ on the panel. Then press the button <VALIDATE>.

By selecting <<, you go back to the MAIN MENU.

3.4.2 **Fusion information (fusion records):**

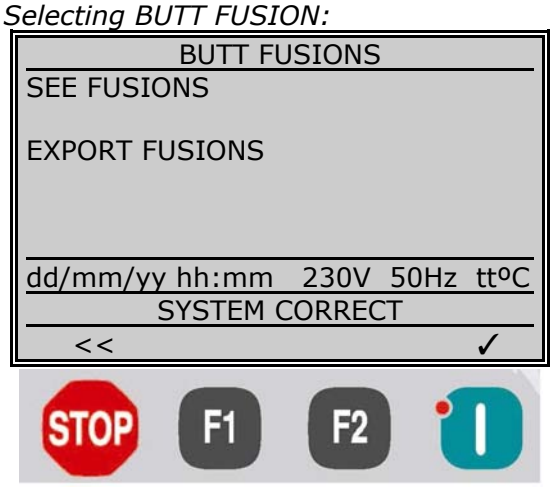
By selecting the first option **FUSION INFORMATION** from the TOOLS menu you can access the following menu:

Menu of Fusion Information:

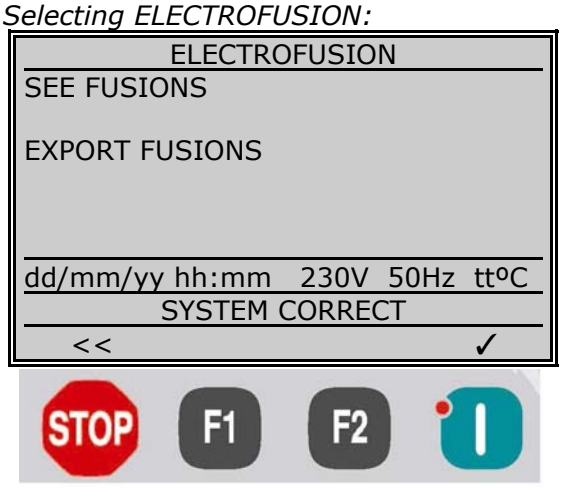


Now select BUTT FUSION, ELECTROFUSION or DELAY FUSIONS depending on what you want to access placing the cursor on the word through ⬆ and ⬇ panel arrows. Press <VALIDATE> to validate command and << to go back to previous menu.

Selecting BUTT FUSION:



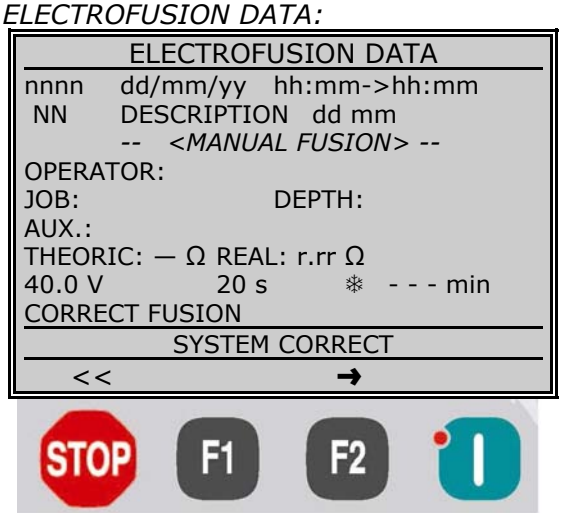
Selecting ELECTROFUSION:



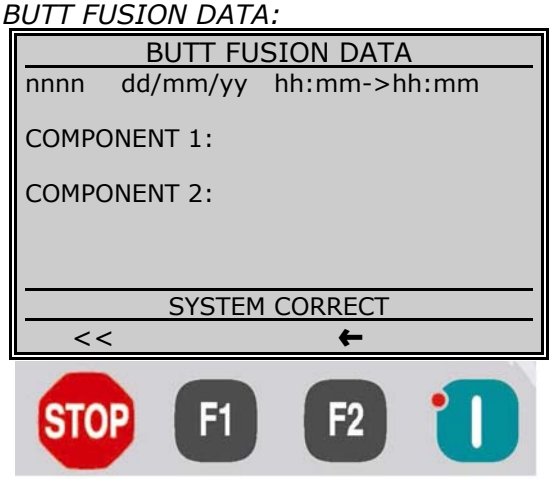
❶ SEE FUSION RECORDS: The first option SEE FUSIONS of both screens allow us to check directly on screen the butt fusion and electrofusion protocols, respectively. Pressing VALIDATE, the last fusion records protocol is displayed. Press **F2** to enter to the second screen of the protocol.

BUTT FUSION DATA:

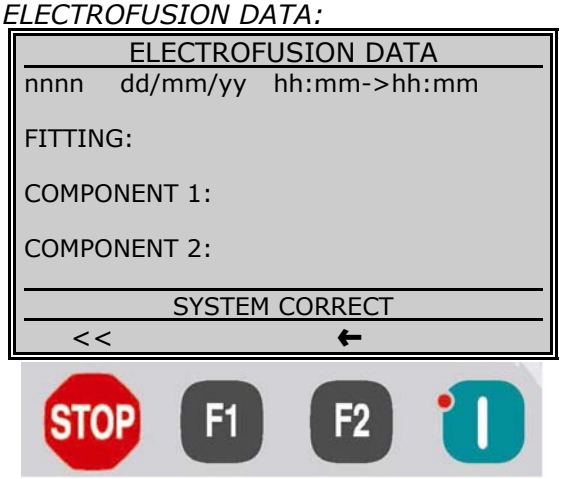
ELECTROFUSION DATA:



BUTT FUSION DATA:



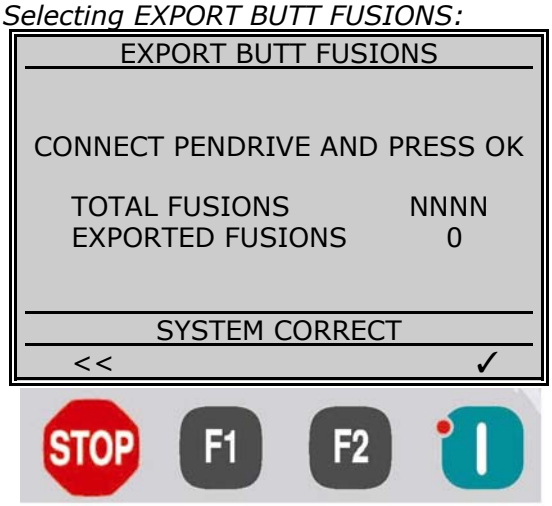
ELECTROFUSION DATA:



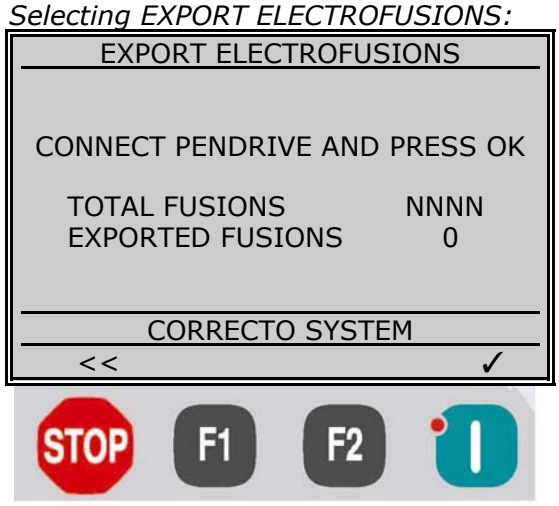
Press **F2** to return to watch the first screen of the protocol.
Press the ⬇ arrow to access to the previous fusion records and arrow ⬆ for subsequent ones. Press << to return to the previous menu.

❷ EXPORT FUSION RECORDS:

Selecting EXPORT BUTT FUSIONS:

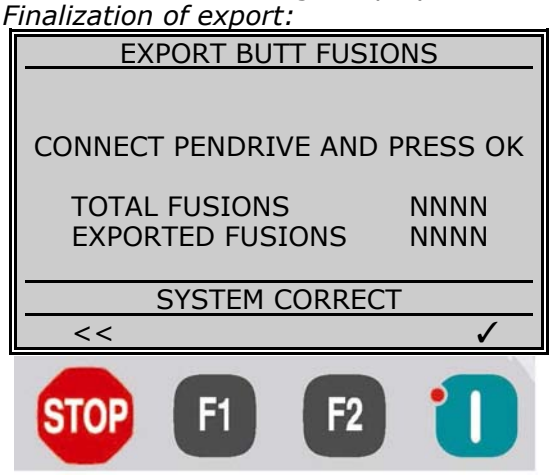


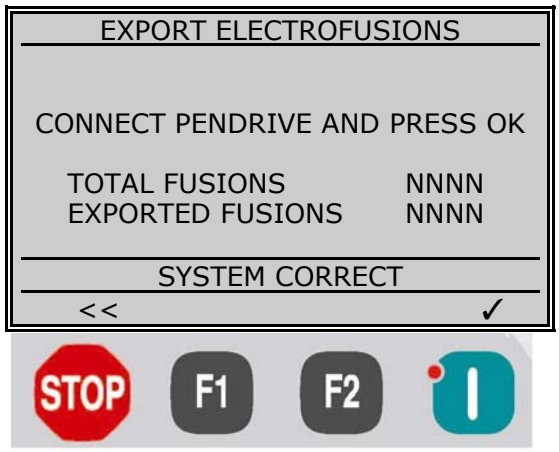
Selecting EXPORT ELECTROFUSIONS:



Connect a memory stick (FAT or FAT32) in the connector USB/A (located on the left side of the unit).
Press <VALIDATE> to start the export. At the end the number of fusion records exported match the total number of fusions. In case of failure or that memory stick is not connected, the message displayed is "FAILURE IN THE PROCESS".

Finalization of export:





The file format exported to the memory stick is xxxxe.csv and xxxxt.csv where xxxx corresponds to the serial number of the unit and letter **e** means electrofusion and letter **t** butt fusion, respectively.

ATTENTION !
For the same fusion box, the same file name for all exports is generated; therefore, the latter replaces the former with the same name.
From software version v. 1.11, fusion records can be exported in .dat files (see point 11 GENERAL - ENCRYPT FUSION RECORDS).

Press << to return to the previous menu.

RETRIEVAL OF FUSION RECORDS NOT ENCRYPTED (.csv):
The exported file is in file format * CSV (Comma-Separated Values), in plain ASCII text; UTF's or other types of conversions are not applied. The file can be opened in any spreadsheet such as LibreOffice®, Microsoft Excel, Google Docs®, etc. or imported into your own database. The column headings are:

BUTT FUSION

A	Struct_Version
B	Unit_Type
C	Unit_Manufact
D	Unit_Model
E	Unit_Serial
F	Unit_Firmware
G	Unit_Last_Service
H	Operator
I	Job
J	Contractor
K	Location
L	GPS
M	Depth
N	Fusion_Type
O	Fusion_Number
P	Auxiliary_Data
Q	Date
R	Start_Time
S	End_Time
T	Temperature
U	Climate_DVS
V	Cycle
W	Material
X	Diameter
Y	SDR
Z	Heater_Temp
AA	Drag_Force
AB	Initial_Force
AC	Heat_Force
AD	Fusion_Force
AE	Reduction
AF	Result_Code
AG	Result_Description

AH	C1_Manufacturer
AI	C1_Fitting
AJ	C1_Diameter
AH	C1_Batch_Number

ELECTROFUSION

A	Struct_Version
B	Unit_Type
C	Unit_Manufact
D	Unit_Model
E	Unit_Serial
F	Unit_Firmware
G	Unit_Last_Service
H	Operator
I	Job
J	Contractor
K	Location
L	GPS
M	Depth
N	Fusion_Type
O	Fusion_Number
P	Auxiliary_Data
Q	Date
R	Start_Time
S	End_Time
T	Temperature
U	Climate_DVS
V	Input_Type
W	Manufacturer
X	Fitting_Code
Y	Fitting_Name
Z	Diameter
AA	Nom_Resistance
AB	Nominal_Voltage
AC	Nominal_Time
AD	Scraper_Used
AE	Clamp_Used
AF	Voltage
AG	Actual_Time
AH	Actual_Resistance
AI	Result_Code
AJ	Result_Description

AH	TR_Manufacturer

BUTT FUSION

AL	C1_Prod_Site
AM	C1_SDR
AN	C1_Compound
AO	C1_Material_Type
AP	C1_PE_Designation
AQ	C1_MFR
AR	C1_Add_Info1
AS	C1_Add_Info2
----------	----------
AT	C2_Manufacturer
AU	C2_Fitting
AV	C2_Diameter
AW	C2_Batch_Number
AX	C2_Prod_Site
AY	C2_SDR
AZ	C2_Compound
BA	C2_Material_Type
BB	C2_PE_Designation
BC	C2_MFR
BD	C2_Add_Info1
BE	C2_Add_Info2

ELECTROFUSION

AL	TR_Fitting
AM	TR_Diameter
AN	TR_Batch_Number
AO	TR_Prod_Site
AP	TR_SDR
AQ	TR_Compound
AR	TR_Material_Type
AS	TR_PE_Designation
AT	TR_MFR
----------	----------
AU	C1_Manufacturer
AV	C1_Fitting
AW	C1_Diameter
AX	C1_Batch_Number
AY	C1_Prod_Site
AZ	C1_SDR
BA	C1_Compound
BB	C1_Material_Type
BC	C1_PE_Designation
BD	C1_MFR
BE	C1_Add_Info1
----------	----------
BF	C1_Add_Info2
BG	C2_Manufacturer
BH	C2_Fitting
BI	C2_Diameter
BJ	C2_Batch_Number
BK	C2_Prod_Site
BL	C2_SDR
BM	C2_Compound
BN	C2_Material_Type
BO	C2_PE_Designation
BP	C2_MFR
BQ	C2_Add_Info1
BR	C2_Add_Info2

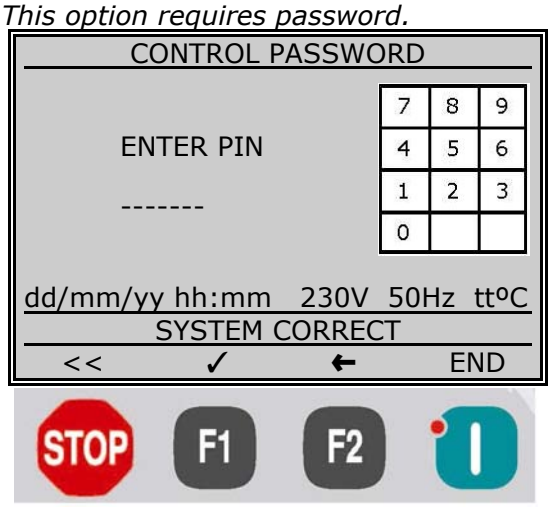
RETRIEVAL OF FUSION RECORDS ENCRYPTED (.dat):

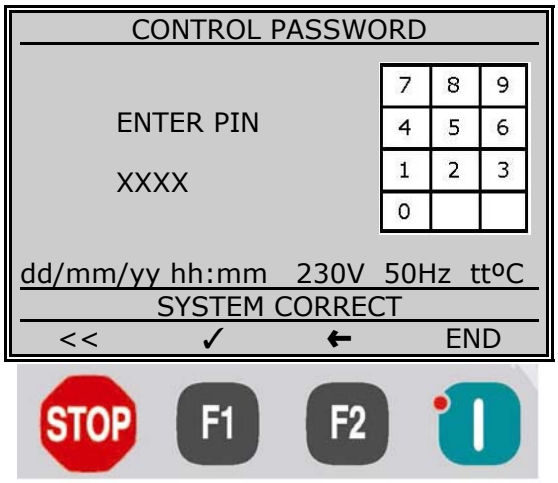
To convert the exported .dat files to PDF it is used the special software FRAPP which must be installed on the PC.

❸ DELETION OF FUSION RECORDS:

The third option of FUSION INFORMATION menu corresponds to DELAY FUSIONS. It is used to rub off the storage of the existing records from the unit's internal memory (electrofusion + butt fusion).

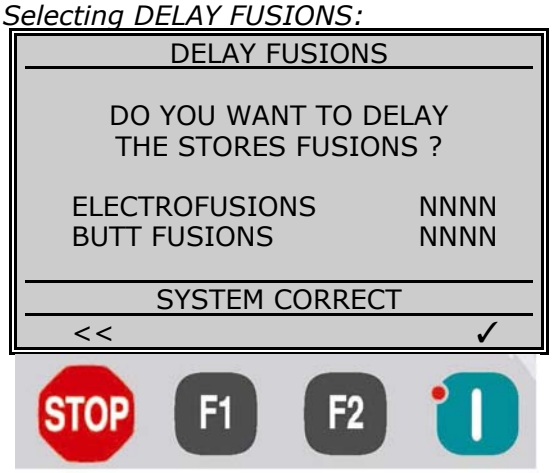
This option requires password.

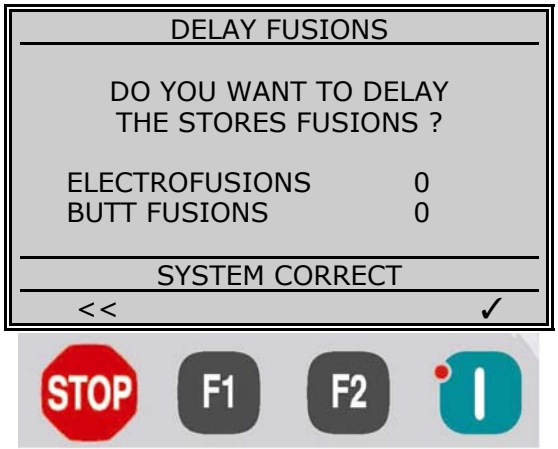




Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Selecting DELAY FUSIONS:

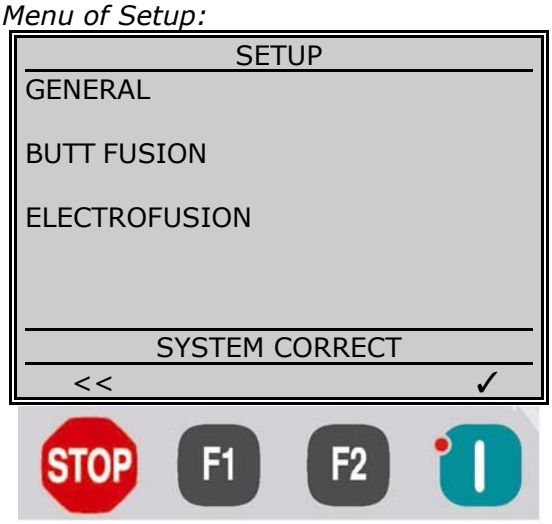




Once you entered the password, press <VALIDATE> to delete the fusion records from the memory. The counter will indicate 0.
Press << to exit and return to FUSION DATA.

3.4.3 **Unit's setup:**

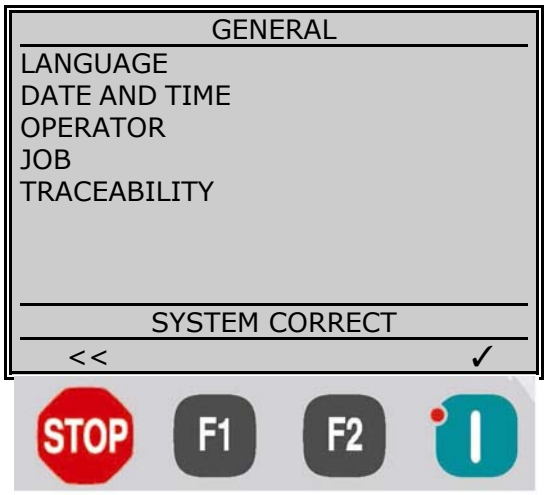
By selecting **SETUP** from the TOOLS menu, you will access the menu:
Menu of Setup:



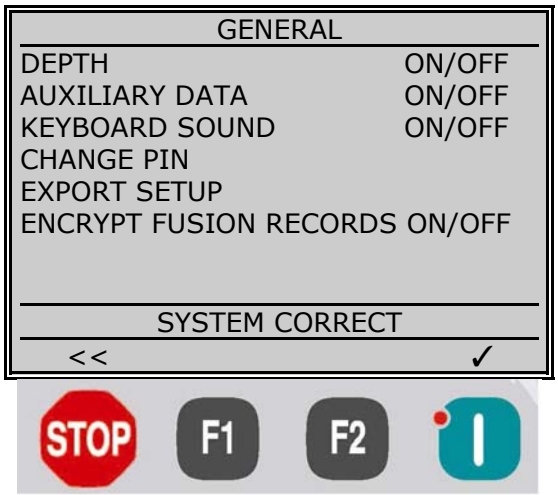
Use the arrows 🡻 and 🡹 to select the desired option.
Press <VALIDATE> to access to the options of the selected menu.
Pressing << returns the user to the previous screen.

• GENERAL

First screen:

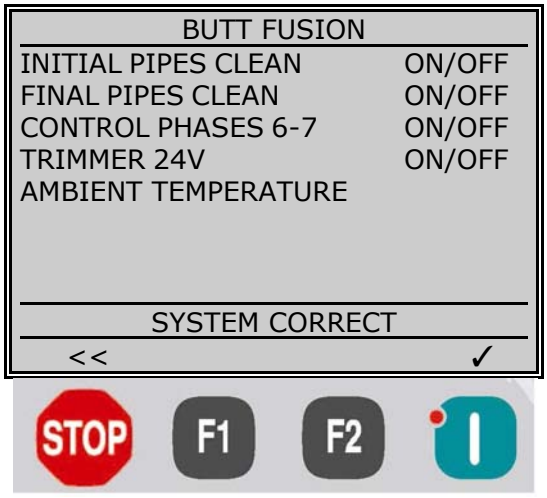


Second and third screen:

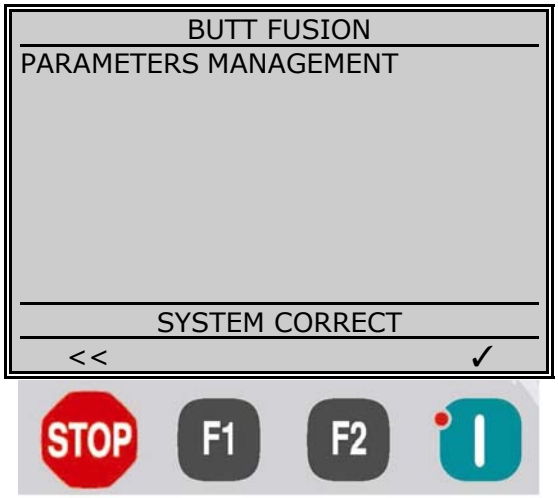


• BUTT FUSION

First screen:

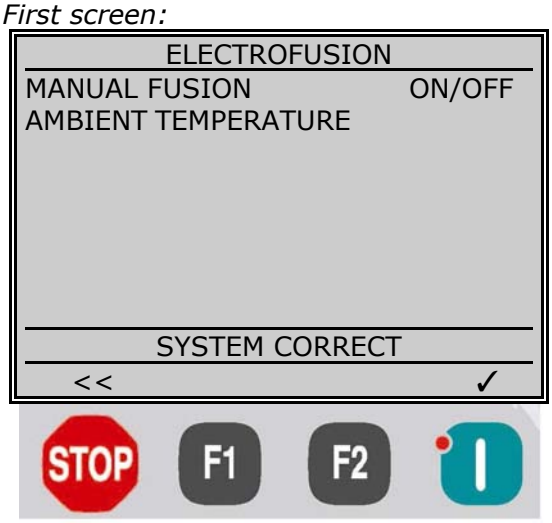


Second screen:



• ELECTROFUSION

First screen:



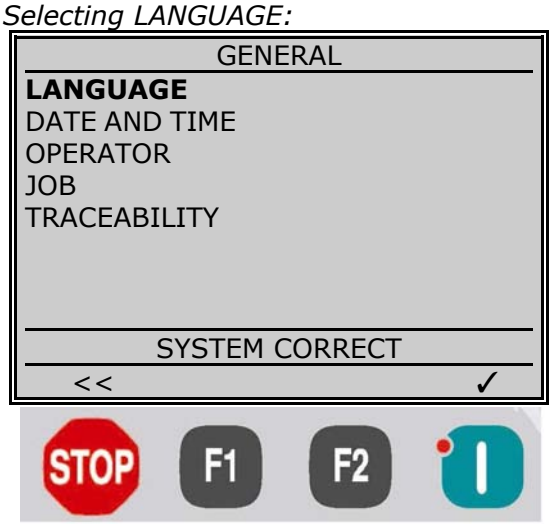
① GENERAL - SELECTION OF THE LANGUAGE

The selection of the language is of free access (PASSWORD is not required).

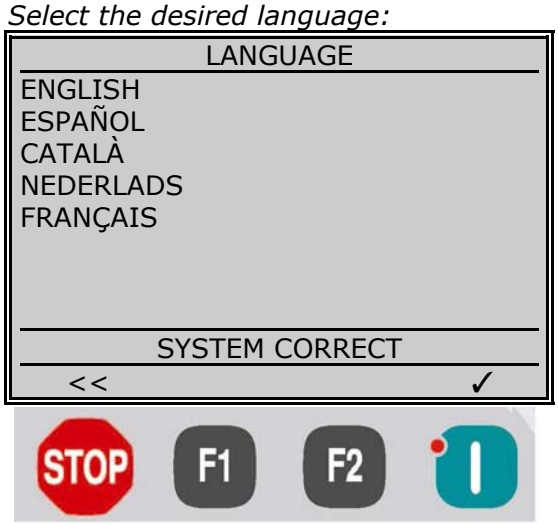
REMARK !
If the operator is identified (via bar-code system), the language is selected automatically. Should the language configurated on the bar-code not be available in the unit, the unit will continue to be setup in the working language which had been selected at the time.
Should there be a fault or temporary deprogramming of the unit, the adopted language by default would be English.

If the messages of the display appear in a non desired language, please proceed to the change of language by selecting TOOLS from the Main Menu. Press <VALIDATE> to go back to Main Menu.

Selecting LANGUAGE:



Select the desired language:



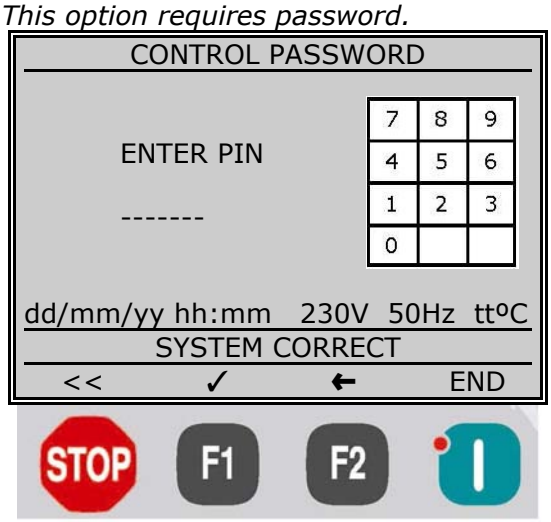
Now select the desired language by placing the cursor on the chosen one using the arrows ⬆ and ⬇ on the panel. Then press <VALIDATE> to validate command.
By selecting << we will go back to the MAIN MENU.

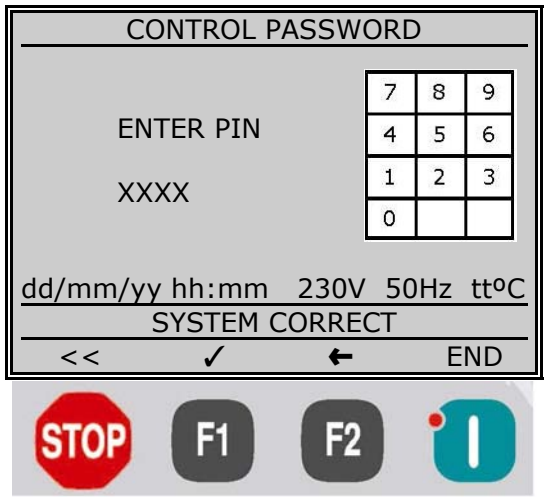
② GENERAL - DATE/TIME UPDATING

If the date, time or day do not correspond to the present one, proceed to the change by selecting TOOLS/SETUP/GENERAL from the Main Menu.

NOTICE !
The change of DATE/TIME has a restricted access. Enter CONTROL PASSWORD.

This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Change the date and/or time:

Where DD:MM:YY correspond to day, month and year and HH:MM:SS correspond to hour, minutes and seconds.
Press the arrows on the panel to make changes.
Then press <VALIDATE> to validate the change and << to exit without modifying anything.

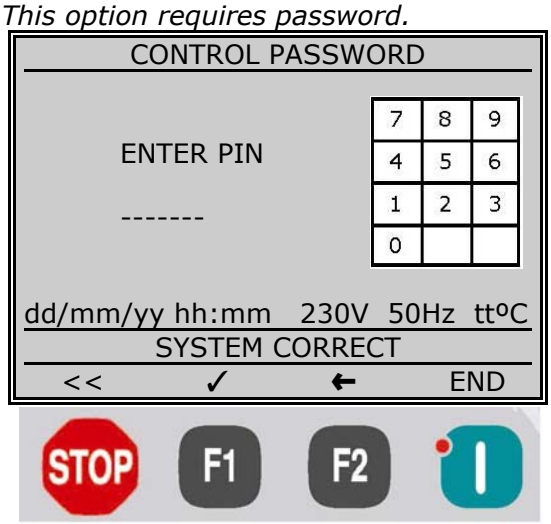
INFORMATIVE NOTE !
The date could be also displayed on American system: MM-DD-YY, or according to ISO: YY-MM-DD (all screens except THE DATE AND TIME one that is displayed in European format). The above selection is only done by Acuster global, S.L. when the initial unit software loading.

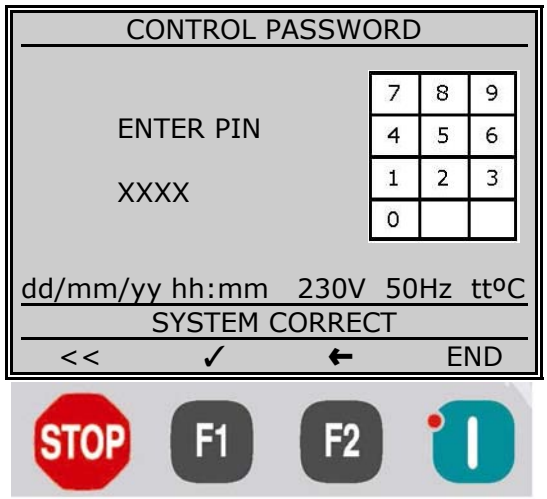
③ GENERAL - IDENTIFICATION OF THE OPERATOR

This option in the TOOLS/SETUP/GENERAL menu allows us to establish the different setup options of the operator identification according to the criteria established by the joints traceability.

NOTICE !
The selection has a restricted access. Enter CONTROL PASSWORD.
This option becomes ON by default on TWIN units equipped with BLUEBOX.

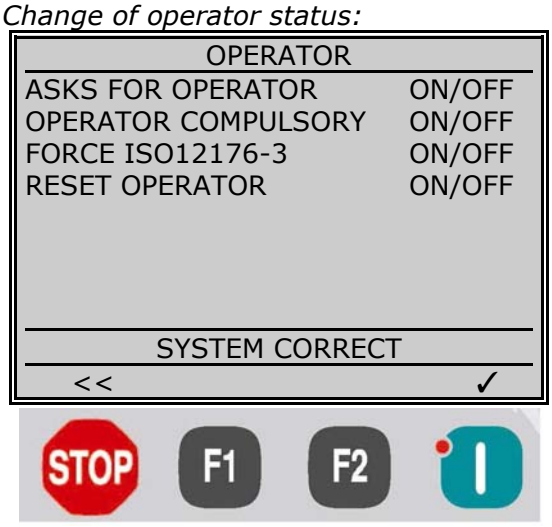
This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Change of operator status:



ON corresponds to identification enabled while OFF to deactivated.
FORCE ISO12176-3: ON involves entering the identification of the operator under the criteria set by the ISO standard for expiration date and fusion skills, language, etc.
RESET OPERATOR: ON data erasure is performed whenever the unit is turned off while (OFF) with the date change.

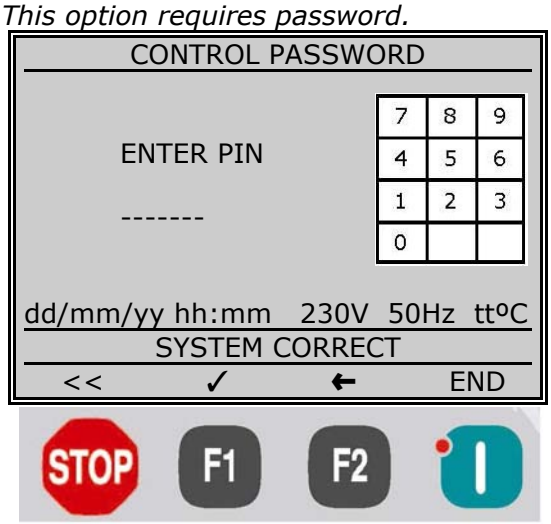
Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

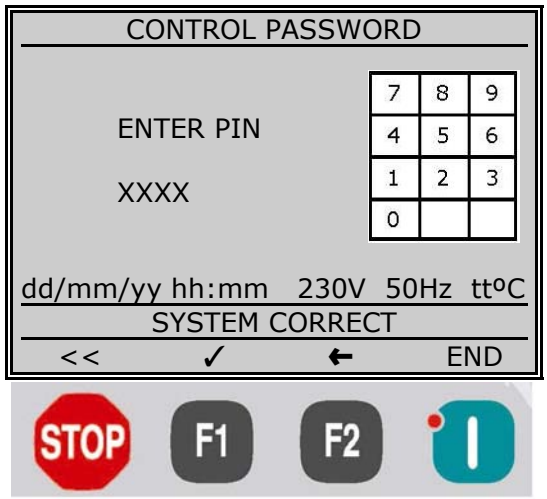
④ GENERAL - IDENTIFICATION OF THE JOB

This option in the TOOLS/SETUP/GENERAL menu allows us to establish the different setup options of the job identification according to the criteria established by the joints traceability.

NOTICE !
The selection has a restricted access. Enter CONTROL PASSWORD.
This option becomes ON by default on TWIN units equipped with BLUEBOX.

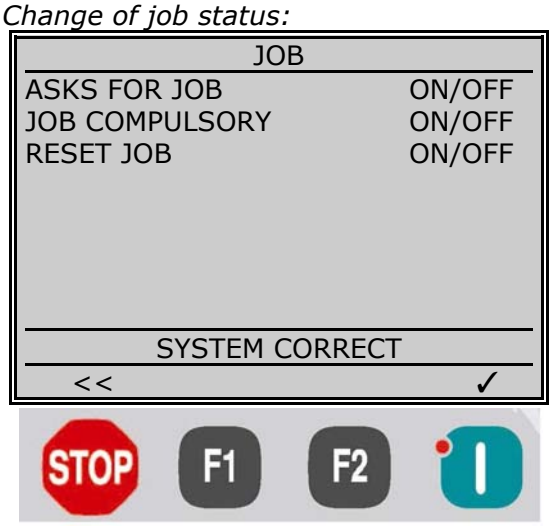
This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Change of job status:



ON corresponds to identification enabled while OFF to deactivated.
RESET JOB: ON data erasure is performed whenever the unit is turned off while (OFF) with the date change.

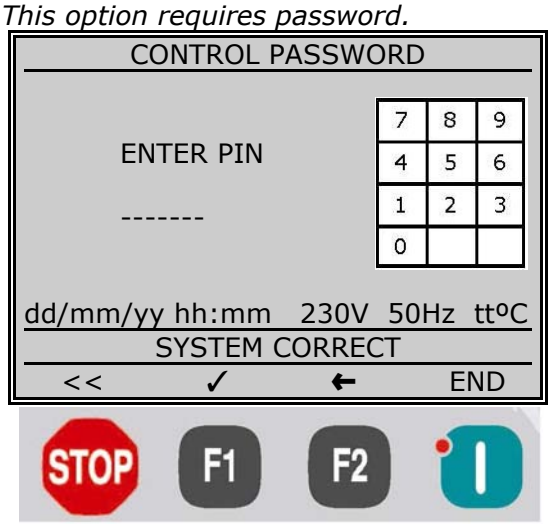
Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

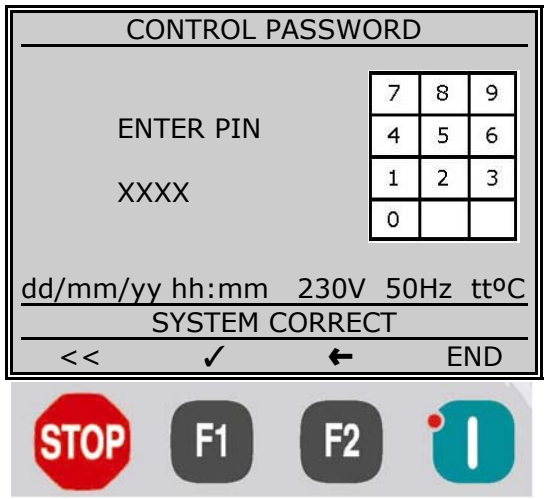
⑤ GENERAL - TRACEABILITY ACC. TO ISO 12176-4

This option in the TOOLS/SETUP/GENERAL menu allows us to establish the different setup options of the traceability identification according to the criteria established by the joints traceability.

NOTICE !
The selection has a restricted access. Enter CONTROL PASSWORD.
This option becomes ON by default on TWIN units equipped with BLUEBOX.

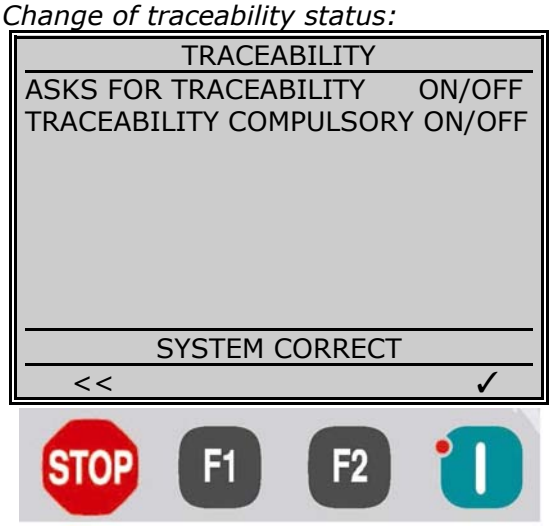
This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Change of traceability status:



ON corresponds to identification enabled while OFF to deactivated.
TRACEABILITY COMPULSORY: ON involves entering traceability of components codes to be joined obligatorily (total or partial).

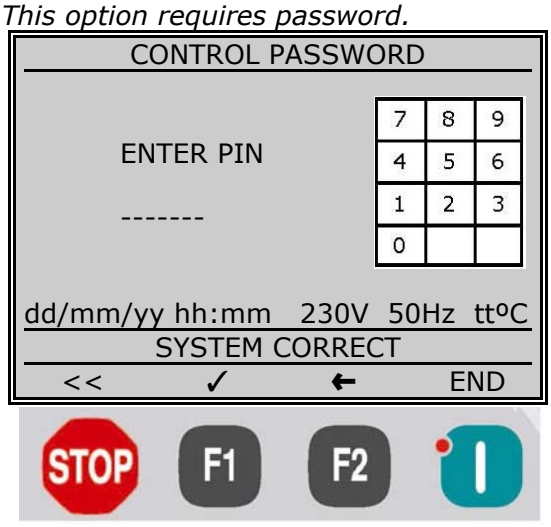
Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

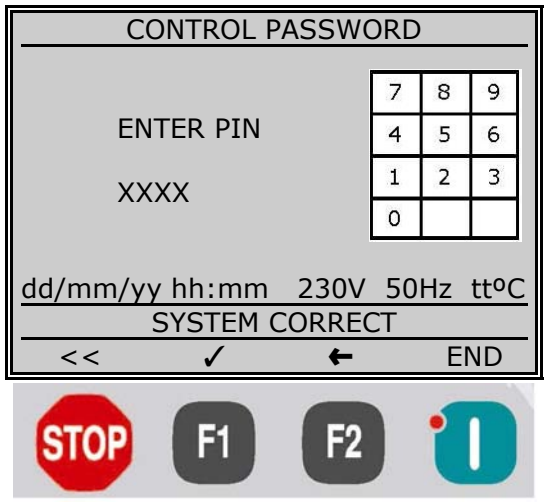
⑥⑦ GENERAL - DEPTH + AUXILIARY DATA

These two options in the TOOLS/SETUP/GENERAL menu allows us to establish the different setup options of the depth and/or auxiliary data identification according to the criteria established by the joints traceability.

NOTICE !
These selections have a restricted access. Enter CONTROL PASSWORD.

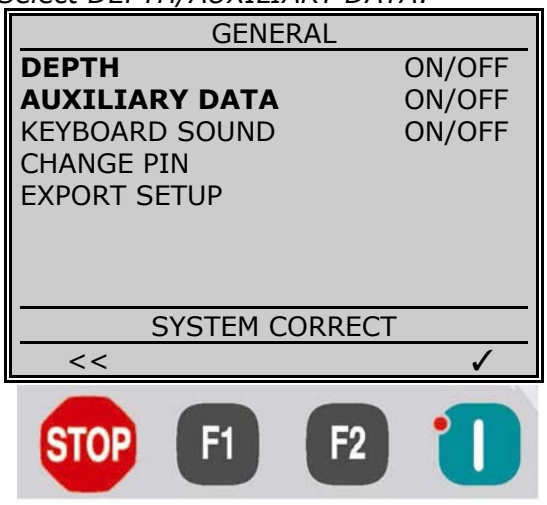
This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Select DEPTH/AUXILIARY DATA:

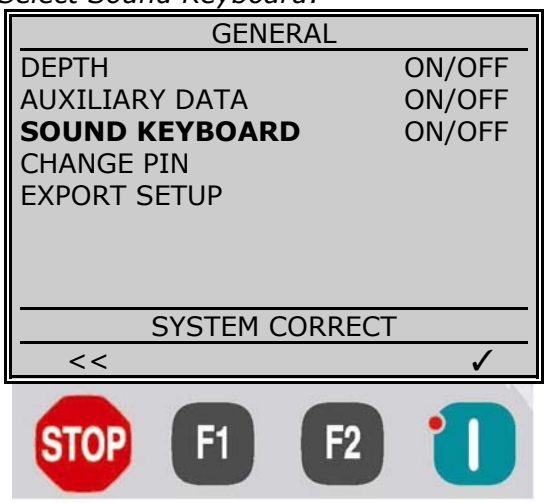


ON corresponds to identification enabled while OFF to deactivated.

Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

⑧ GENERAL - SOUND KEYBOARD

The selection of the sound keyboard is of free access (PASSWORD is not required).
Select Sound Keyboard:



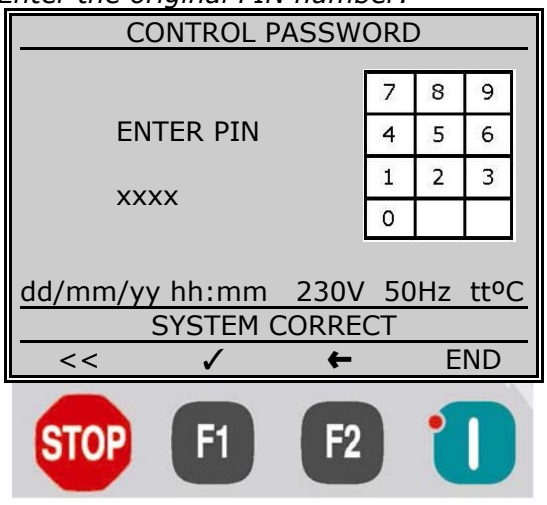
ON corresponds to the buzzer is on and is audible in all the keystrokes and manoeuvres of the machine, while OFF is disabled.
NOTE: it is recommended having it ON in normal working conditions.

Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

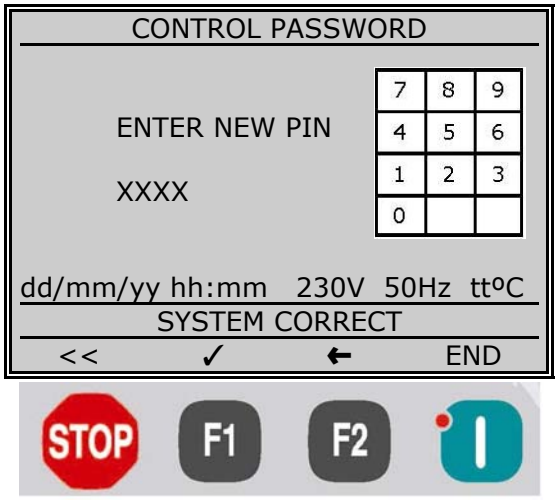
⑨ GENERAL - PIN CHANGE

Use this option to change the original factory PIN. Select CHANGE PIN:

Enter the original PIN number:



Enter the new PIN number:



Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

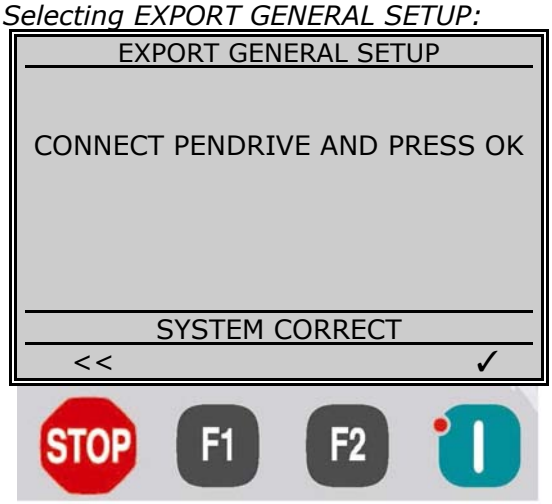
PIN NUMBER
In case you have forgotten the PIN number, send the file odssetup.bin to Acuster Global. Refer to the following clause 10: General - Exporting the unit setup.

⑩ GENERAL - EXPORTING THE UNIT SETUP

This option from TOOLS/SETUP/GENERAL menu allows export of a binary file with the configuration data (odssetup.bin).

FILE odssetup.bin
This file is for internal use by Acuster Global and which specifications such as model, serial number, PIN password, customer name, etc. are defined.

Selecting EXPORT GENERAL SETUP:



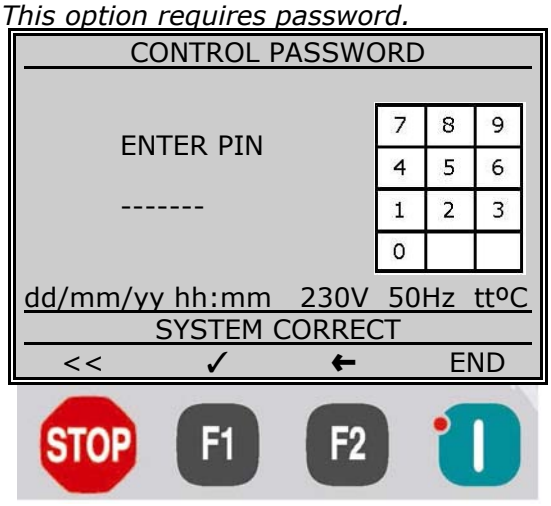
Connect a memory stick (FAT or FAT32) in the connector USB/A (located on the left side of the unit).
Press <VALIDATE> to start the export. At the end of exportation the message "OPERATION COMPLETED CORRECTLY" will be displayed. In case of failure or that memory stick is not connected, the message displayed is "FAILURE IN THE PROCESS".
Press << to return to the main menu.

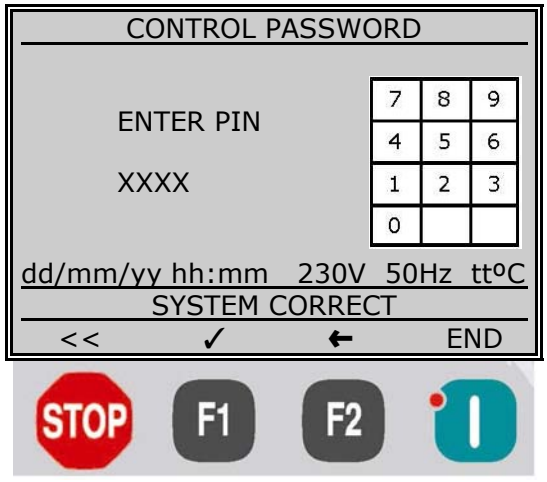
⑪ GENERAL - ENCRYPT FUSION RECORDS

This option in the TOOLS/SETUP/GENERAL menu allows us to enable the encryption of fusion records.

NOTICE !
This selection has a restricted access. Enter CONTROL PASSWORD.

This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Select ENCRYPT FUSION RECORDS:

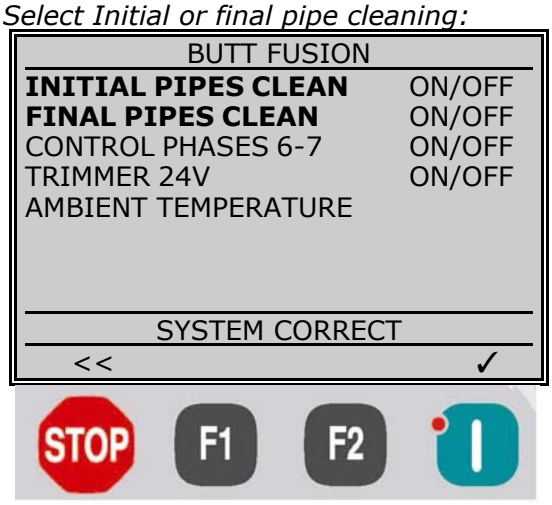
If (ON) is activated, .dat files are generated instead of .csv files (OFF).
NOTE: .dat files need to be treated with special software to convert them to pdf format.

Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

❶❷ BUTT FUSION - PIPE ENDS CLEANING

These two selections are of free access (PASSWORD is not required).

Select Initial or final pipe cleaning:



Selecting ON the message to clean the pipe ends ("PIPE ENDS CLEANED ?" according to the applicable specification) will be displayed at the start, end, or both of the trimming phase.
Selecting OFF the message is not displayed.
Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.

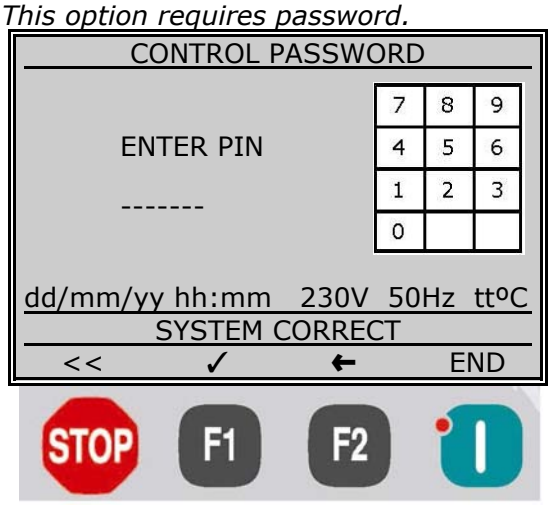
Press << to return to the main menu.

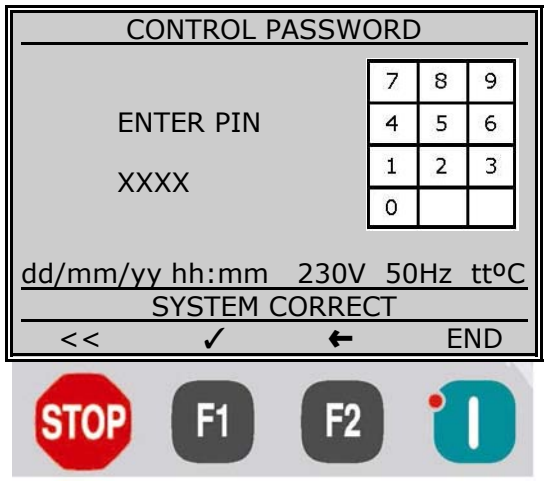
❸ BUTT FUSION - CONTROL PHASES 6-7

This option from TOOLS/SETUP/BUTT FUSION menu allows to stop at wish the cooling phase (without pressure) of the butt fusion cycle (according to the butt fusion used -if it has cooling phase- or regulations to be applied on the joint).

NOTICE !
The selection of CONTROL PHASES 6-7 has a restricted access. Enter CONTROL PASSWORD.

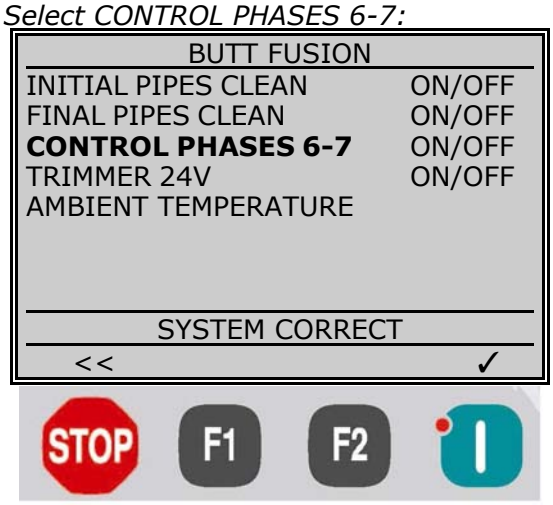
This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Select CONTROL PHASES 6-7:



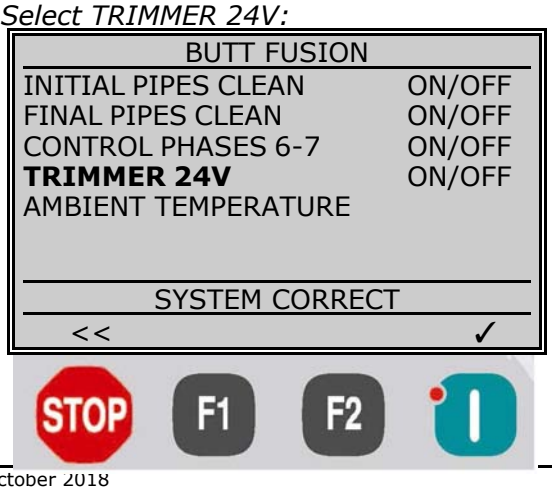
Selecting ON, should be respected the cooling time without pressure; pressing STOP at this phase, recording of the fusion remain as interrupted by the operator.
While selecting OFF, the phase of cooling can be interrupted at will without leaving the penalized message.

Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed. Press << to return to the main menu.

❹ BUTT FUSION - TRIMMER 24V

This selection is of free access (PASSWORD is not required).

Select TRIMMER 24V:



INTRODUCTION: Currently the trimmer ODS225E is powered with a 230/110V motor (depending on market); however, there is a very important park of trimmers powered by a 24Vdc motor.
This menu is for selecting which corresponds to the machine in use (ODS225E model only).
Select ON for 24Vdc motor and OFF for 230/110V ones.

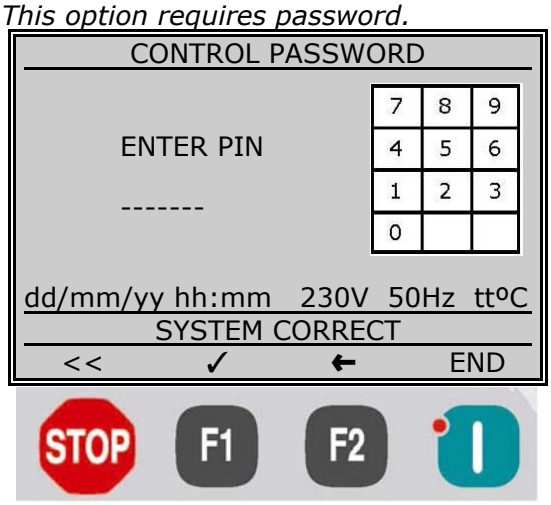
Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

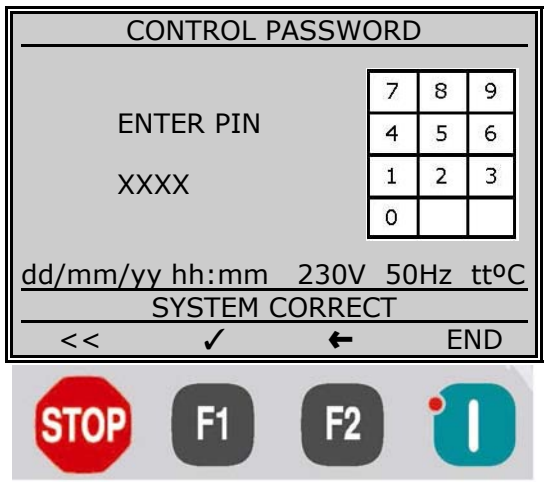
❺ BUTT FUSION - AMBIENT TEMPERATURE

This option from TOOLS/SETUP/BUTT FUSION menu can set the range of ambient temperature that is required.

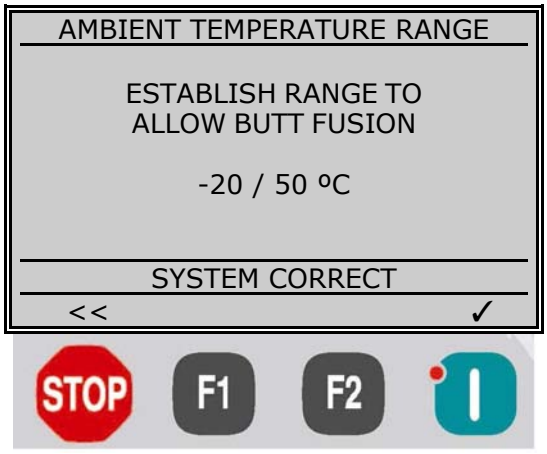
NOTICE !
The selection of AMBIENT TEMPERATURE has a restricted access. Enter CONTROL PASSWORD.

This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

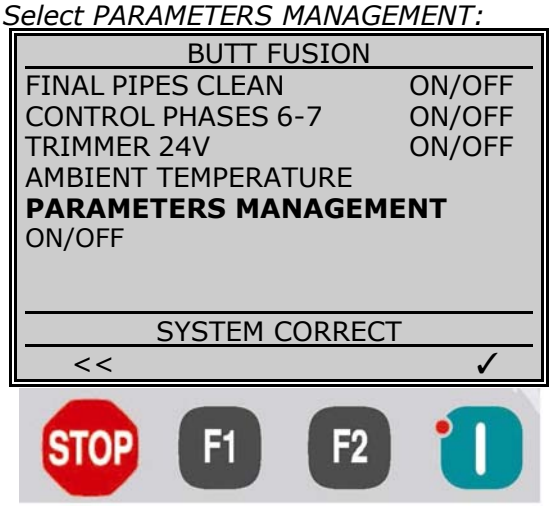


The ambient temperature set by default is -20º C and 50º C (-4º F and 122º F). To change it, press ⬆ to increase the temperature and ⬇ to reduce it. Pressing ➡ the cursor moves to the next field.
Press <VALIDATE> to exit the menu wit the change or pressing << to exit without change.

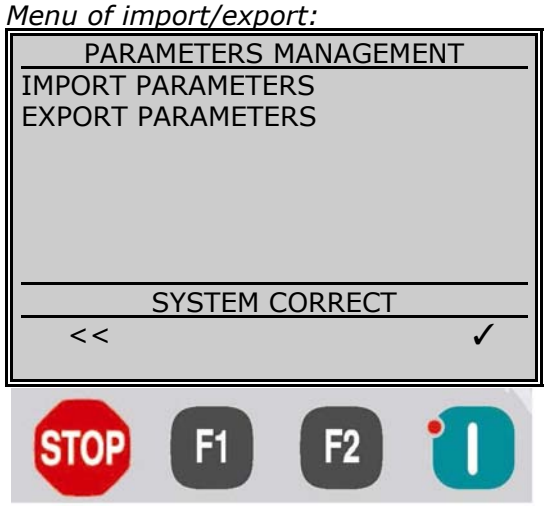
❻ BUTT FUSION - PARAMETERS MANAGEMENT

This option from TOOLS/SETUP/BUTT FUSION menu can import or export the fusion parameters: fusion records and base frameworks.

Select PARAMETERS MANAGEMENT:



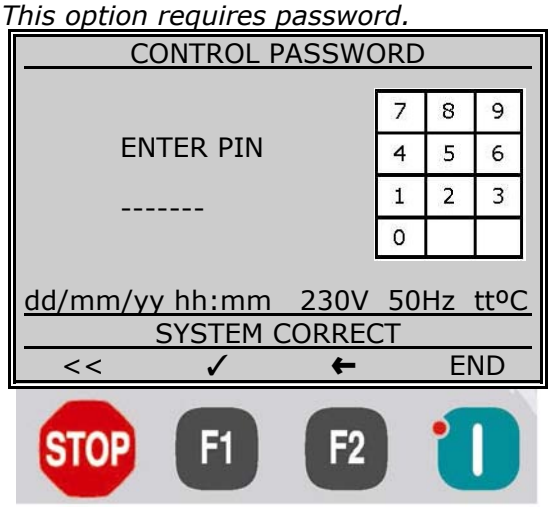
Menu of import/export:

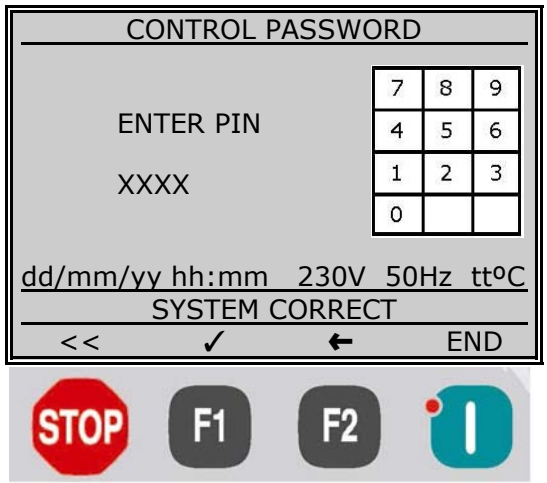


• IMPORT PARAMETERS:

NOTICE !
The selection has a restricted access. Enter CONTROL PASSWORD.

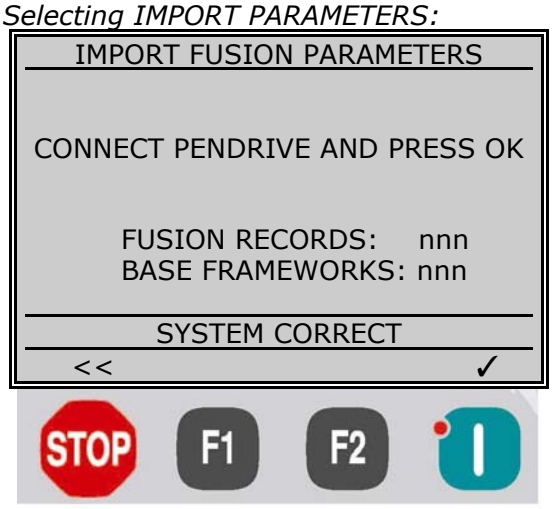
This option requires password.

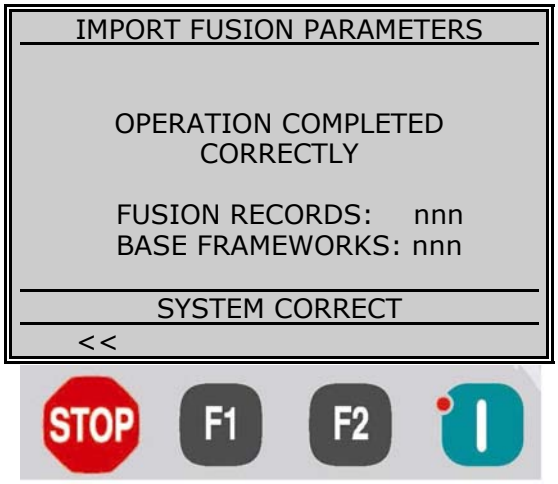




Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Selecting IMPORT PARAMETERS:

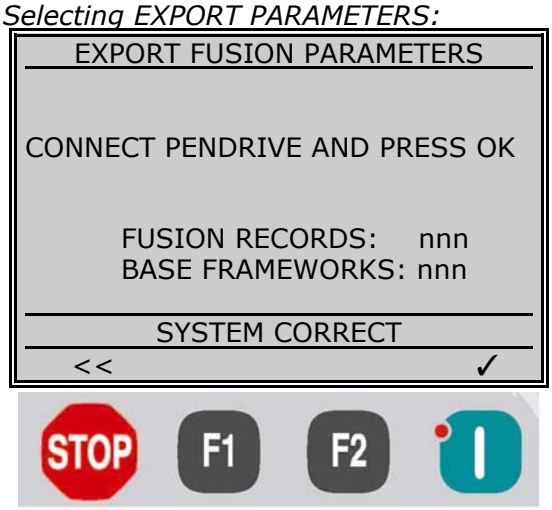


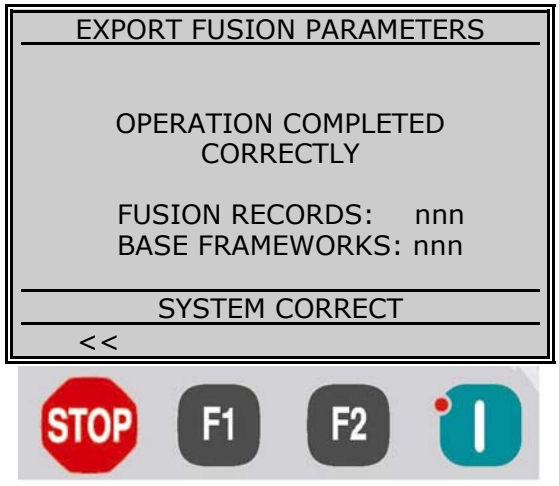


Connect a memory stick (FAT or FAT32) in the connector USB/A (located on the left side of the unit).
Press <VALIDATE> to start the export. At the end of exportation the message "OPERATION COMPLETED CORRECTLY" will be displayed. In case of failure or that memory stick is not connected, the message displayed is "FAILURE IN THE PROCESS".
Press << to return to the main menu.

• EXPORT PARAMETERS:

Selecting EXPORT PARAMETERS:





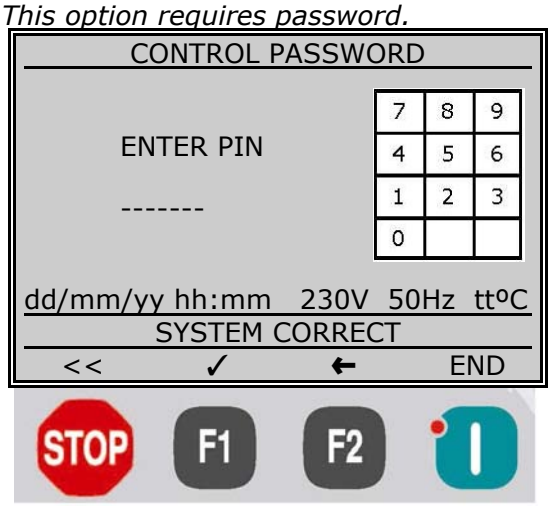
Connect a memory stick (FAT or FAT32) in the connector USB/A (located on the left side of the unit).
Press <VALIDATE> to start the export. At the end of exportation the message "OPERATION COMPLETED CORRECTLY" will be displayed. In case of failure or that memory stick is not connected, the message displayed is "FAILURE IN THE PROCESS".
Press << to return to the main menu.

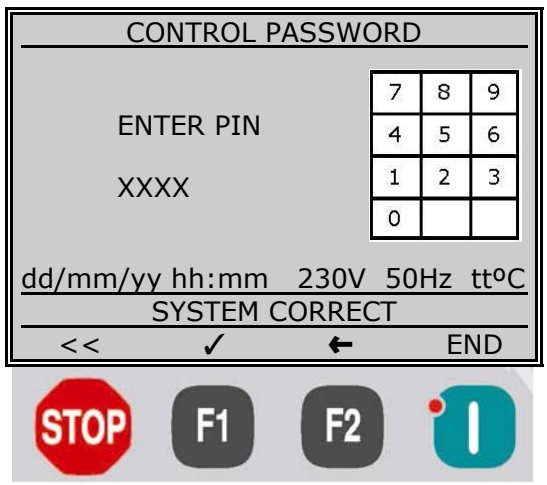
❶ ELECTROFUSION - MANUAL FUSION (**TWIN**)

This option from TOOLS/SETUP/ELECTROFUSION menu enables (ON) or not (OFF) the possibility to carry out electrofusions with manual input.

NOTICE !
The selection has a restricted access. Enter CONTROL PASSWORD.

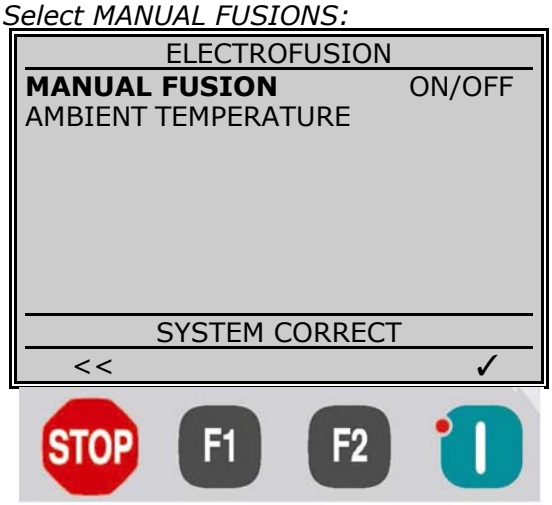
This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.

Select MANUAL FUSIONS:



Selecting ON allows to carry out electrofusions with manual data input while selecting OFF, no.

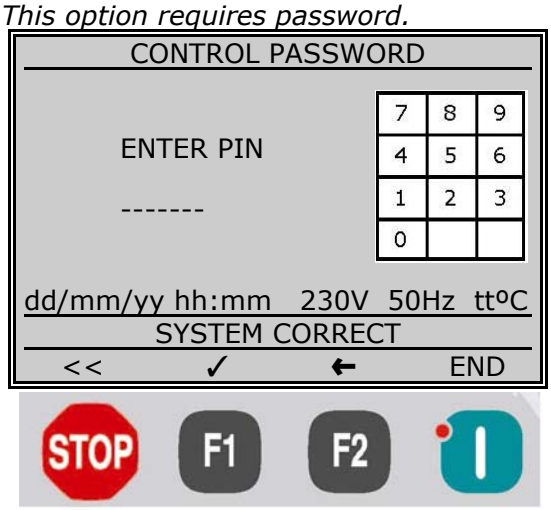
Press <VALIDATE> to switch from OFF to ON or vice versa in each of the options, as needed.
Press << to return to the main menu.

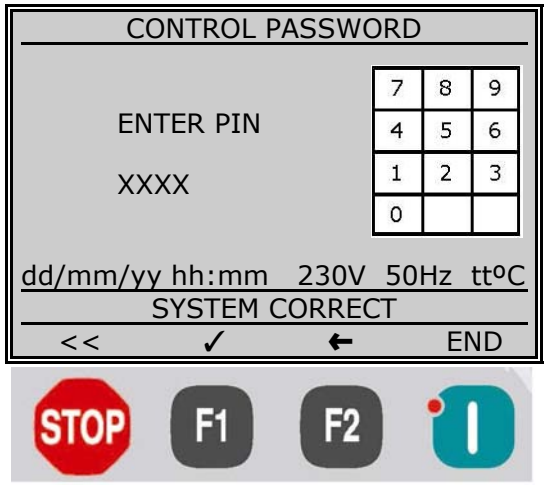
❷ ELECTROFUSION - AMBIENT TEMPERATURE

This option from TOOLS/SETUP/ELECTROFUSION menu can set the range of ambient temperature that is required.

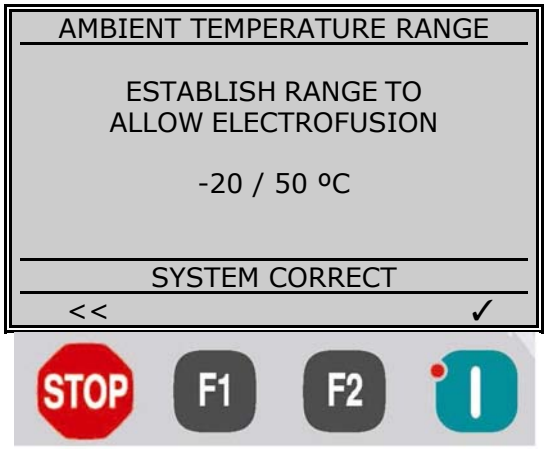
NOTICE !
The selection of AMBIENT TEMPERATURE has a restricted access. Enter CONTROL PASSWORD.

This option requires password.





Enter the PIN number moving in the number table with the arrows; press **F1** to validate each number. Press **F2** to delete and move to the previous digit. After completing the password, press **END** to move to the next screen.



The ambient temperature set by default is -20º C and 50º C (-4º F and 122º F). To change it, press ⬆ to increase the temperature and ⬇ to reduce it. Pressing ➡ the cursor moves to the next field.
Press <VALIDATE> to exit the menu wit the change or pressing << to exit without change.

CHAPTER 4: TROUBLESHOOTING

4.1 GENERAL

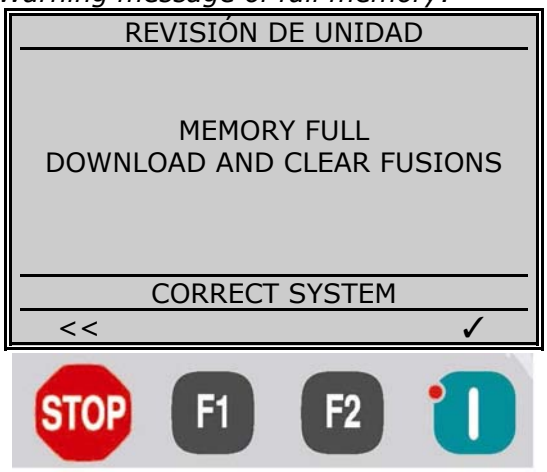
All maintenance and repair work of the fusion machine is to be carried out by qualified personnel. Full guarantees are obtained by shipping the unit to the ACUSTER GLOBAL, S.L. After-Sales Service, both for the yearly revision and for repairing any fault that may have occurred in the unit.
However, and as a guide, we enclose the checks that the operator could make to the unit through the MENU OF TEST.

4.2 POSSIBLE INITIAL MESSAGES

4.2.1 **Memory full:**

When the memory to storage of the fusion records is full, the display will indicate:

Warning message of full memory:



The total capacity of fusion records is about 5000.
From 4950 records, the unit will alert the operator (both butt and electrofusion). Arriving at full capacity, the unit will be locked until exported and / or delete existing records in memory. See Section 3.4.2 of this *Manual*.

4.2.2 **Service revision:**

If the unit scheduled warning service date is being exceeded, the display will indicate:

Warning message service date:

If the date **dd/mm/yy** has not yet passed the service date or having expired, the unit is set without lock, press the VALIDATE button and move to the next screen work. However, if the date **dd/mm/yy** has expired but the unit is configured to lock the box, it can not be used until has not made the annual service.

4.2.3 **Ambient Temperature out of range:**

The ambient temperature is configurable (as required by the company), separately for butt fusion and electrofusion.
The operating limits of the unit are -20ºC and 50ºC (-4ºF and 122ºF). In the case shown in the display "TEMPERATURE OUT OF RANGE", verify the configuration of the temperature or if the room temperature sensor is defective.
NOTE: In the case of faulty probe, send the unit to the after-sales service of STPAcuster Group.

4.2.4 **Error detection on date/time:**

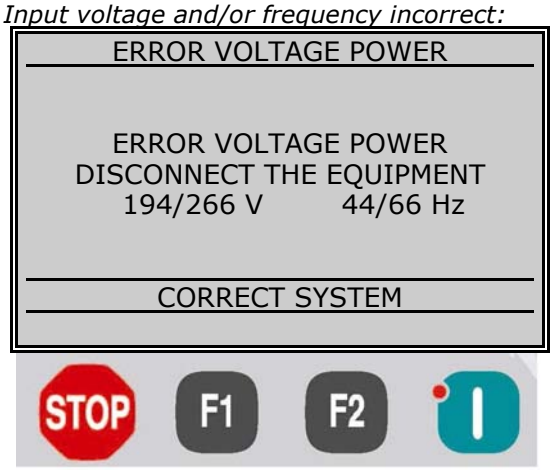
In case the internal battery voltage has decreased or been disconnected by poor contact, etc., when turning on the unit appears on the display "CLOCK EDIT" screen. Refer to Section 3.4.3 - **Configuration unit** of this Manual.
Enter the correct values. Repeated the message, it is advisable to send the unit to the after-sales service of STPAcuster Group for replacement of the battery.

4.2.5 **Voltage/frequency input:**

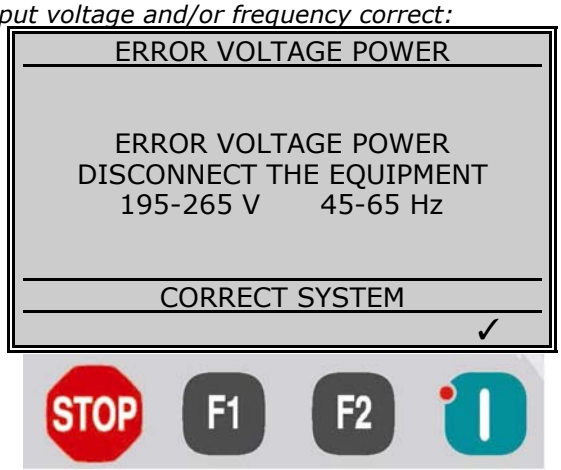
The voltage/frequency input are valued differently depending on the process being performed at that time.

1. Verification before fusing (TWIN & DYNAMIC):
   If the voltage/frequency input is out of the established tolerances:
   For nominal 230V: min 195Vac / 265Vac max and min 45Hz / 65Hz max
   For nominal 110V: 90Vac min / max and min 140Vac 45Hz / 65Hz max
   the following informational message appears on the display:

Input voltage and/or frequency incorrect:



Input voltage and/or frequency correct:



The values showed on the display are refreshed and correspond to the actual input of the unit.

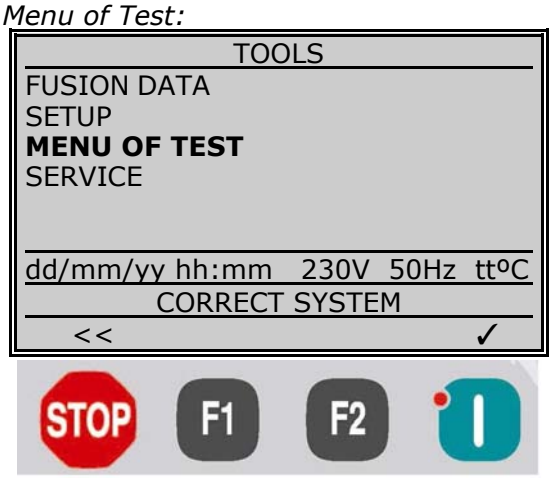
2. Verification for electrofusion (TWIN):
   During the fusion cycle minimum the input voltage may drop to 165 V without thereby interrupting the process, but as long as the required output voltage is supplied. Otherwise on the display appears the message "ERROR VOLTAGE".

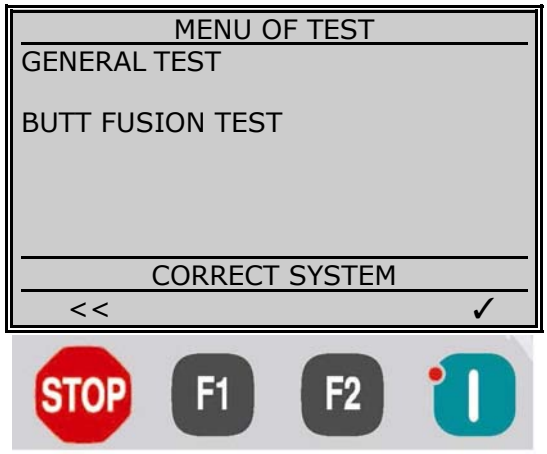
In either case, check the power source (generator), connection, fitting condition, etc. No need to restart the unit to refresh the input voltage.

4.3 CHECKING OF THE UNIT: MENU OF TEST

To be able to check the performance of the different components of the unit, select **MENU OF TEST** from the TOOLS menu.

Menu of Test:

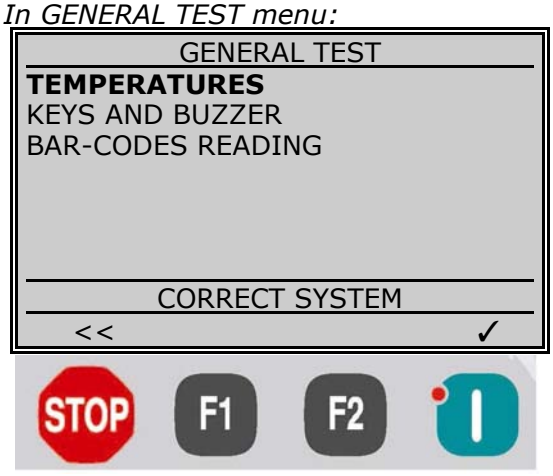




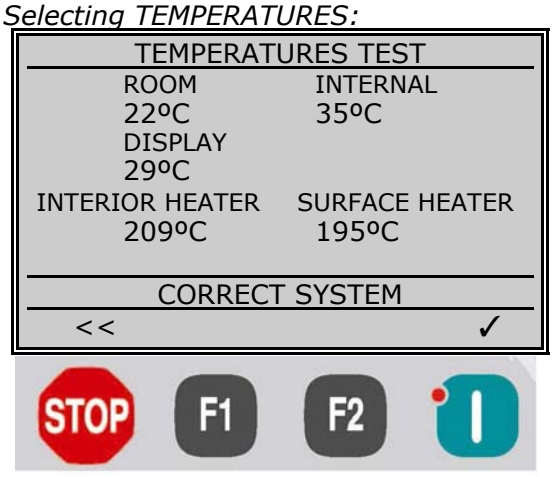
4.3.1 **General test:**

Selecting GENERAL TEST from the MENU OF TEST, you access the following options:

In GENERAL TEST menu:

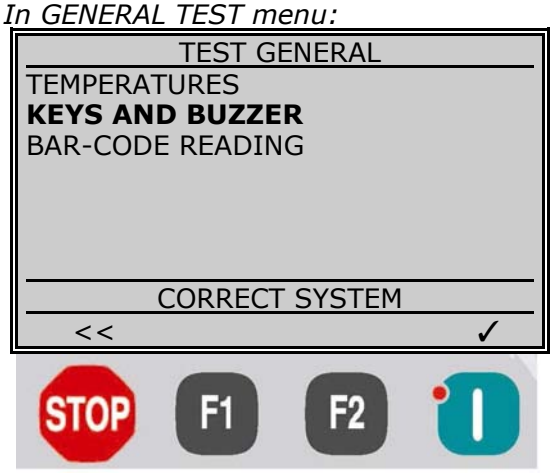


Selecting TEMPERATURES:

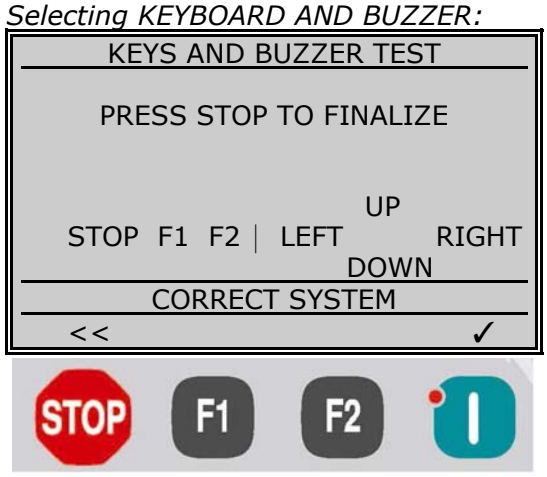


The TEMPERATURE TEST option is informative and shows the different temperatures to be considered for the unit and for the operator.

In GENERAL TEST menu:

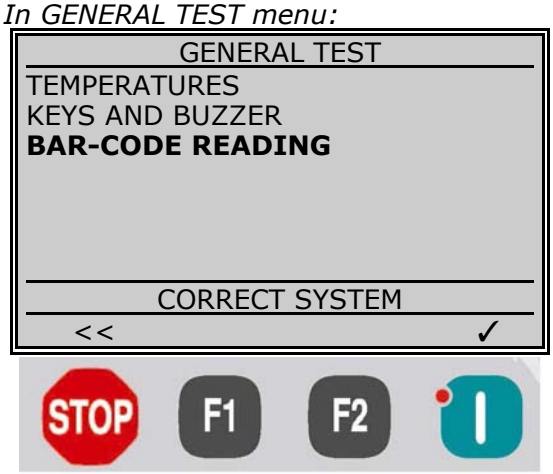


Selecting KEYBOARD AND BUZZER:

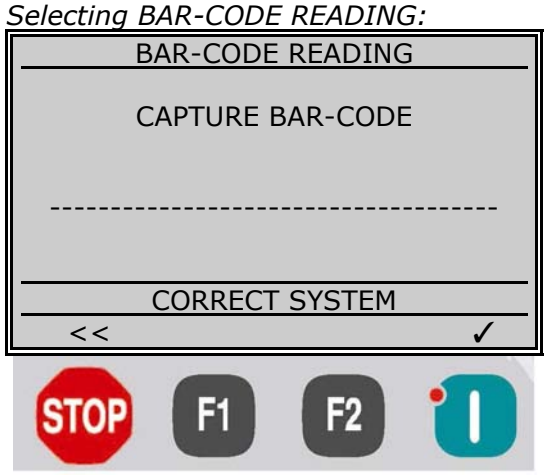


This option allows you to check the performance of all the buttons (arrows, keys STOP, F1, F2, VALIDATE) and the buzzer. Each press the key pressed together with the acoustic signal is displayed.
Press << to return to the previous menu.

In GENERAL TEST menu:



Selecting BAR-CODE READING:

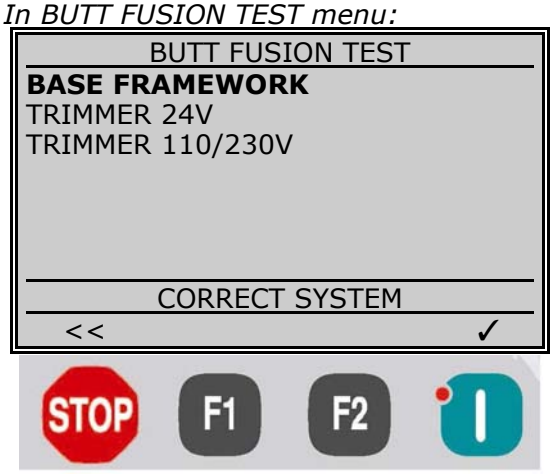


This informative option shows on the screen the information contained in the bar code. Capture the bar-code via scanner. In the display the corresponding information appears.
Press << to return to the previous menu.

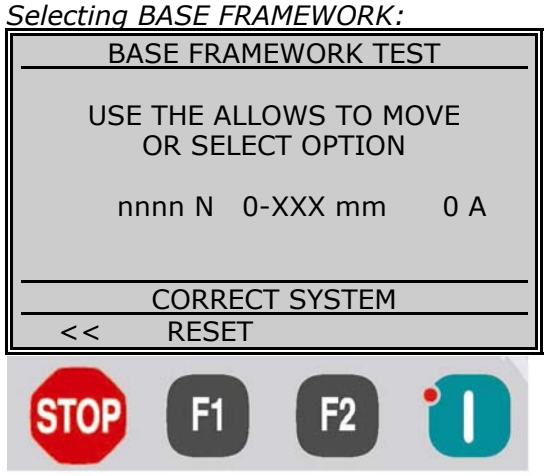
4.3.2 **Butt fusion test:**

Selecting BUTT FUSION TEST from the MENU OF TEST, you access the following options:

In BUTT FUSION TEST menu:



Selecting BASE FRAMEWORK:

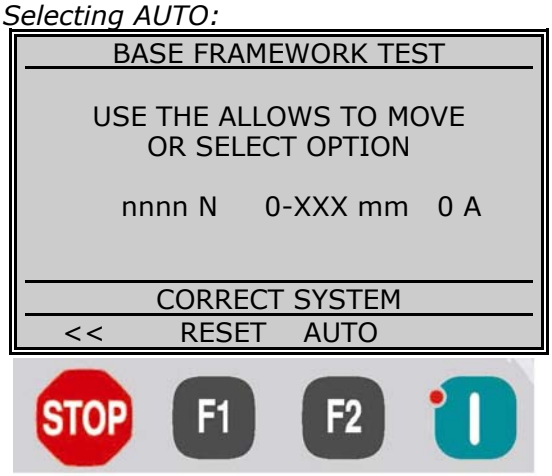


This option allows you to check the performance of the encoder, check the force (pressure) reading and the motor consumption (for base frameworks ODS225E only) on the connected base frameworks.

CHECKING THE ENCODER:
Pressing **F1** to select RESET, the movable body made a full stroke of opening and closing, indicating the value of the on-screen stroke: 0 mm to XXX mm (depending on the model) in open and closed. If these values are not correct, the encoder makes no correct readings.
At this point you can manually open or close the movable body pressing ➡ and ⬅ arrows. The encoder position is displayed. closing, in which can be seen reading the encoder.

Press **F2** to select **AUTO**, the moving body carry out uninterrupted cycles of opening and closing, in which can be seen the encoder's reading.
Press << to stop and return to the previous menu.

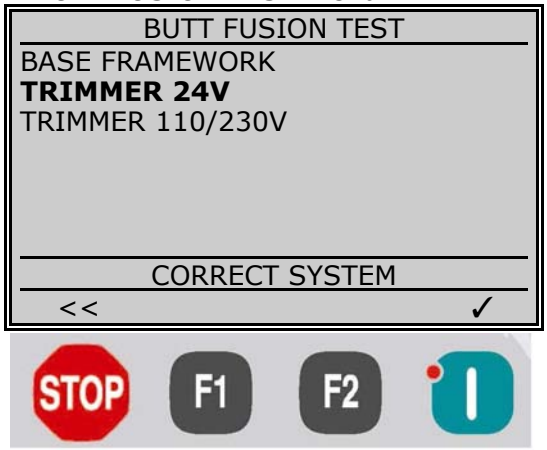
Selecting AUTO:



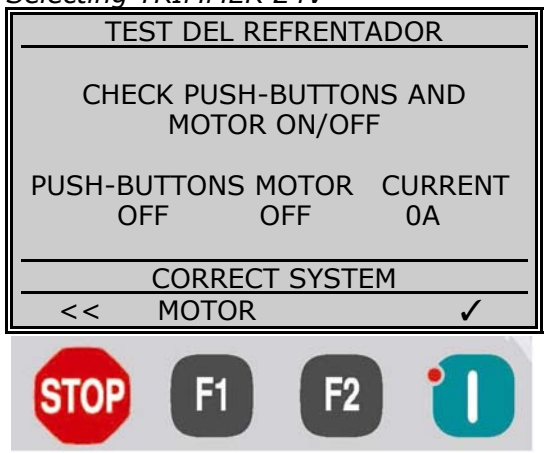
Press << again to exit.

Selecting TRIMMER 24V from the MENU OF TEST:

In BUTT FUSION TEST menu:

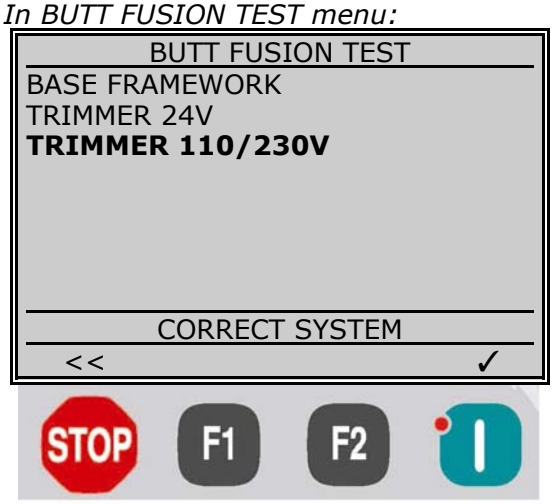


Selecting TRIMMER 24V

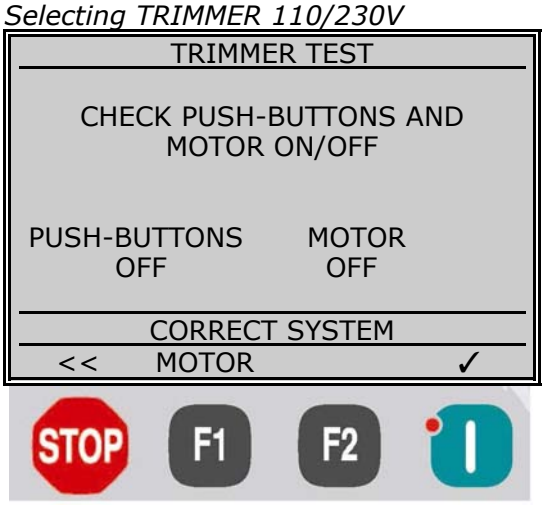


This option allows you to check the functioning of the trimmer ODS225E of 24Vdc.
Locate the trimmer on the base framework bars, in trimming position. Press the two buttons on the trimmer. If the circuit is correct, the PUSH-BUTTON OFF switch to ON at the time of press (the trimmer is not launched).
Press **F1** now. Pressing the buttons on the trimmer will start to turn, passing MOTOR OFF to ON and indicating current consumption.
In unload conditions, the trimmer consumption should be placed on the 4 or 5 A, approximately. As protection, limiting trimmer work load is 25 A maximum. If that value is exceeded in working condition, the trimmer stops appearing on the display: TRIMMER OVER CONSUMPTION.
Press << to return to the previous menu.

In BUTT FUSION TEST menu:



Selecting TRIMMER 110/230V



This option allows to check the operation of all trimmer powered at 230/110V.
Locate the trimmer on the base framework bars, in trimming position. Press the button on the trimmer. If the circuit is correct, the PUSH-BUTTON OFF switch to ON at the time of press (the trimmer is not launched).
Press **F1** now. Pressing the button on the trimmer will start to turn, passing MOTOR OFF to ON.
Press << to return to the previous menu.

CHAPTER 5: MAINTENANCE

5.1 GENERAL

5.1.1 Introduction:

The **ODS + Track Automatic** fusion machines have been designed and manufactured for a long life without the need for costly repairs and adjustments. All that is required is careful handling when loading/unloading and during transport, and in general to keep the unit clean by following the recommended preventive maintenance. The costs are very low and are soon written off given that the machine will be fully functional at all times.
This section includes a list of general upkeep and maintenance routine operations. Should any problem arise please refer to CHAPTER 4: TROUBLESHOOTING in this *User Manual*. However, no action should be taken by unqualified personnel beyond these troubleshooting measures in order not to run the risk of seriously damaging the unit, in particular the electronic control module.

WARNING!
All cleaning and maintenance operations, and base framework, heating plate, trimmer and hydraulic station adjustments must be performed with the components disconnected from the unit.

5.1.2 Storage:

If the unit is not to be used for a long period of time, keep all the components in their respective boxes protected from dust, moisture, extremes of temperatures, direct sunlight, and so on. The complete unit could be stored either on the warehouse floor or in pallet racks.

5.1.3 Cleaning:

Clean the fusion control box regularly using only a damp cloth.

NOTICE !
Do not clean the fusion control box with water under pressure, by immersion in water o with compressed air.

Should the unit be very dirty, clean it with a bit of alcohol (do not use solvents or cleaning products containing trichloroethylene).

5.1.4 Checks:

We recommend shipping the fusion machine to the ACUSTER GLOBAL, S.L. After-Sales Service for a yearly service.

5.2 FUSION CONTROL MODULE MAINTENANCE

5.2.1 General:

Apart from the general external cleaning procedure there is no specific instruction regarding the electronic unit. Any adjustments should be carried out either by the ACUSTER GLOBAL, S.L. After-Sales Service.

5.2.2 Internal battery:

The clock/calendar battery can be replaced (only by Grupo STPAcuster Service) when used up (it has an autonomy of between 2 and 2.5 years without using it, and between 4 and 5 years depending on use.

CAUTION !
The internal battery must be removed from the unit before the machine is pulled apart. To do this, the front cover needs to be removed from its battery holder. Deposit the removed battery in recycling containers of used batteries.

5.2.3 Updating program version:

Updating the software version of the **ODS** units it is made in principle for the Acuster Global Service Centres. However, the customer may upgrade the version of software using the following procedure:

Checking the software version on INFO screen:

UNIT INFORMATION
Acuster Global, S.L. - TWIN - Nº nnnn **SOFT 1.0/M28** ENGLISH ºC Newton mm dd/mm/yyyy hh:mm:ss Customer's name W0000; J000; T00; D0; A0; K0; S00; 670; C00; 24V0; P0; F0 -20ºC/50ºC M0; B0; -20ºC/50ºC LBT:nnnnn LEF:nnnnn NSdd/mm/yyyy W30L0
CORRECT SYSTEM
<<

Software updating screen:

FIRMWARE UPDATE
UPDATING UNIT'S FIRMWARE. PLEASE WAIT...
CORRECT SYSTEM
<<

EXISTING FUSION RECORDS ON INTERNAL MEMORY
A version number change does not mean erasing the fusion records. The deletion would occur only in the event of a change of record structures, extending the machine configuration, etc..
SOFT WARE FILES
The constant evolution of the units may require certain changes that force an update of the monitor (sac143.bin).

WITH MEMORY STICK USB/A:

1. Connect a memory stick into the USB/A connector. The stick:
   - It must contain the sac142.bin file (also *sac143.bin* if required) for the version you want to load, which must be in the root directory of the same file.
   - It must be FAT or FAT32 format and single partition.
2. Press ⬆ key panel and simultaneously put the unit on via the main switch. The downloading process starts automatically, the display of "Firmware Update" appearing. If the sac143.bin file has been also copied, once the download of sac142.bin is completed and the file is detected, the message "update monitor" is showed. You must wait for the process to finish.

3. Once the downloading, the unit automatically initiates the launch showing the initial screen. Verify the software version loaded through the INFO screen.
4. Turn off the unit and remove the stick.

5.3 BASE FRAMEWORK MAINTENANCE (**TWIN/DYNAMIC**)

5.3.1 **Linear actuator (ODS 225 E):**

Check for correct functioning of the kinematic transmission chain. Any possible resistance may cause problems with the displacement which could affect the unit's performance and sensitivity.
Check via the MENU OF TEST (please refer to CHAPTER 4: TROUBLESHOOTING of this *User Manual*).

5.3.2 **Hydraulic cylinders, pressure hoses and quick connectors:**

Check periodically that the hydraulic cylinders do not exude oil and that the drain screws and their joint washer is firmly in place.
Check that the hydraulic hoses do not have any cuts or incisions that might cause an oil leak and that the quick connectors are clean and protected from dust and dirt (maintain the oil circuit free from impurities).

5.3.3 **Clamp adaptors:**

These additional parts have to be checked for cleanliness and correct seating before mounting. Do not overtighten the Allen screws.

5.3.4 **General cleaning and greasing:**

Keep the base framework clean and in good working order. Clean after use. Lubricate the guiding axles and cylinder stem with an oil cloth.

5.4 HEATING PLATE MAINTENANCE (**TWIN/DYNAMIC**)

Clean from time to time to prevent PE particles (or other plastic resins) from adhering to the plate faces and forming an insulating coat which may affect the caloric performance. For cleaning purposes only use white paper or a clean and dry fluff-free 100% cotton cloth (NEVER use Tangit, isopropyl alcohol, trichloroethylene, above all if the heating plate is hot).
You can check the performance of the heating resistors with the help of the TEST MENU (please refer to CHAPTER 4: TROUBLESHOOTING of this *User Manual*).
The display will show the temperature of the plate's probe (INTERIOR HEATER) and the surface temperature (SURFACE HEATER). The heating plate's temperature should be approximately 210°C at 23°C RT.

5.5 TRIMMER MAINTENANCE (**TWIN/DYNAMIC**)

5.5.1 **Trimmer face discs:**

Verify the correct cutting of the blades. The shearing of shavings must be uniform and with a recommended thickness of between 0.2 and 0.3 mm on both sides. If the cut is not correct (both in terms of the thickness and evenness of the shavings), proceed to adjust the blade(s). To do this, dismantle the blade and supplement with gauges if necessary. If the edge of the blade shows signs of wear or is nicked, reverse the blade to the other side of the cut (double-edged blades).

5.5.2 **Adjustment of cutters:**

To adjust the cutters, proceed as follows:

1. Release the cutter (**1**) using the screws (**2**).
2. Once the cutter has been removed, add or remove the necessary adjustment shims (**3**).
3. Place the cutter back on position. Tight up replacing the screws (**2**).
4. Check the positioning with a ruler or a calliper the height **h**. Carry out the trimming operation.
5. If the shavings thickness were still incorrect, repeat the operation.

Where:

1 Cutter
2 Fixing screw
3 Adjusting shim (0.1 mm thickness)

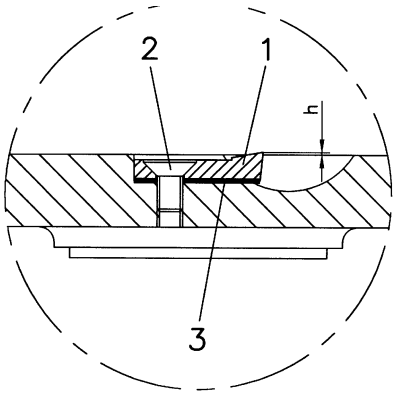


Figure 26a: Adjustment of cutters 225E

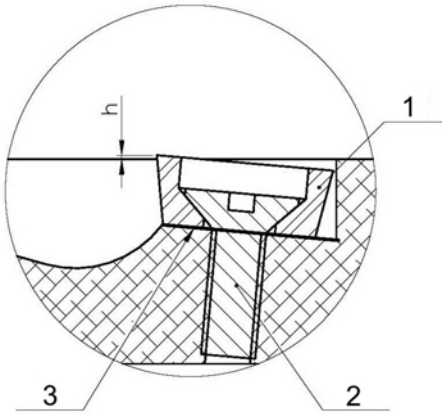


Figure 26b: Adjustment of cutters Track range

One must also bear in mind that the adjustment of the blades may vary according to the diameter of the pipes/fittings to be trimmed, needing to be adjusted to adapt to the specific dimension of the pipe size used.

5.5.3 **Electric motor:**

For the trimmer to function the switches of the machine must be activated, putting it on by means of the blockage button of the switch. For this, it is necessary that the trimmer be positioned in the area of work, seeing that the safety switch which it is equipped impedes an inappropriate usage. Check that the switches are working.
To check the function of the trimmer electric motor, please refer to TRIMMER of the TEST MENU (CHAPTER 4: TROUBLESHOOTING, of this *User Manual*).

5.5.4 **Driving chain:**

The drive chain is replaceable in case of breakage. Refer to the spare parts catalogue. In all cases the chain tension can be adjusted via a cam mechanism.

5.6 HYDRAULIC STATION MAINTENANCE

Check the oil level with the stick. Check weekly.
Should the level be too low, refill with HM 46 oil, according to the ISO 6743/4-HM specifications. For very cold climates, oil Rando WM32 (ISO 6743/V HV) can be used.
The scheduled maintenance for oil and filters is as follows:

FILTERS + OIL: Replace after every 2000 working hours or once a year.

CHAPTER 6: TECHNICAL CHARACTERISTICS

6.1 FUSION CONTROL BOX

MODEL	TWIN	DYNAMIC
Classification acc. to ISO 12176-2	$P_2$4UES$_1$VKADX	
Input voltage	180Vac to 264Vac. Nominal voltage: 230 Vac 90 Vac to 140 Vac. Nominal voltage: 110 Vac 45 Hz to 65 Hz. Nominal frequency: 50 Hz	
Output power	3500 W (maximum)	
Generator output performance	See clause 6.8 - Generator specifications (electronic regulation preferably)	
Input fuse (external)	16 A at 230 Vac / non-applicable for 110Vac	
Protection fuse (internal)	20 A at 230 Vac / 32 A at 110 Vac	
Degree of protection (CEI 60529) Mechanical strength (CEI 62262)	IP54, Class I IK10 (20 Joules)	
Operating temperatures	-20ºC to 50ºC (-4ºF to 122ºF): can be modified separately for electrofusion and butt fusion via setup menu	
Temperature control	NTC (interior and exterior)	
Acoustic signal	Piezoelectric boozer	
Display	Graphic LCD of 320x240 points in resolution	
Keyboard	8 touch-sensitive membrane push-buttons	
Connection to scanner and memory stick	USB/A	
Internal memory capacity	~ 5000 total fusion records	
Power cable	3x2.5 mm^2 for 230Vac (Schuko + French type plug) 4 m long 3x4 mm^2 for 110Vac (IEC 60309 type plug) 4 m long	
Electrofusion voltage	8 to 48 V galvanically separated	
Electrofusion time	Up to 5940 seconds (99 minutes)	
Enter fusion data	Automatic acc. To ISO/TR 13950 Manual according to setup	
Duty factor	20 to 100% (according to fitting's size) Electronic temperature control	
Electrofusion cable	1x16 mm^2 4 m long (female terminals of diameter 4 mm)	
Included accessories	Front protection Accessories bag Scanner Transport case	
	Set of 4 and 4.7 mm electrofusion adapters	
Dimensions	Height: 460 mm; Width: 450 mm; Length: 470 mm	
Net weight	36.5 kg	22.5 kg

6.2 BASE FRAMEWORK

MODEL ODS	ODS 225 E
Size range (mm)	63-225
Included pipe adapters	225x200
Set of pipe adapters available (not included with the machine)	63, 75, 90, 110, 125, 140, 160 and 180
Operation	Linear actuator at 24 Vdc
Maximum force/pressure	4000 N
Net weight w/o adapters (kg)	50
Included tools	One 3 mm Allen key One 5 mm Allen key One 6 mm Allen key One 10 mm Allen key One ½" ratchet wrench One 26 mm socket wrench
Exterior dimensions (cm)	L=96xW=39xH=40

MODEL TRACK AUTOMATIC	TRACK 160	TRACK 250	TRACK 315	TRACK 315R	TRACK 400	TRACK 400R	TRACK 500	TRACK 500R	TRACK 630
Range of sizes	40-160	63-250	90-315	90-315	140-400	75-400	200-500	200-500	315-630
Exterior dimensions (cm)	79x39x41	79x44x47	79x55x54	82x59x55	120x65x65	95x67x66	121x66x70	116x70x73	170x115x105
Weight without pipe adapters (kg)	32.5	41	44.5	66	87.5	87	107	200	300
Pipe adapters: 75x40	Optional								
75x50	✓								
110x63	✓	Optional							
110x75	✓	✓							
110x90	✓	✓	✓	✓					
160x110	✓	✓	✓	✓					
160x125	✓	✓	✓	✓					
160x140	✓	✓	✓	✓	Optional	Optional			
250x160		✓	✓	✓	✓	✓			
250x180		✓	✓	✓	✓	✓			
250x200		✓	✓	✓	✓	✓	Optional	Optional	
250x225		✓	✓	✓	✓	✓	Optional	Optional	
Steel 315x90				✓					
Steel 315x110				✓					
Steel 315x115				✓					
Steel 315x140				✓					
Steel 315x160				✓		✓			
Steel 315x180				✓		✓			
Steel 315x200				✓		✓			
Steel 315x225				✓		✓			
315x250			✓	✓	✓	✓	✓	✓	
315x280			✓	✓	✓	✓	✓	✓	
400x315					✓	✓	✓	✓	Optional
400x355					✓	✓	✓	✓	✓
500x400							✓	✓	✓
500x450							✓	✓	✓
630x500									✓
630x560									✓
Transport case dimensions (cm)	54x36x12	64x35x17	64x35x17	67x36x21	80x48x24	80x48x24	76x43x35	76x43x35	110x70x43
Weight of adapters (with case)(kg)	13.7	30.7	40.1	107.7	61.1	86.8	81.8	81.8	200.3

6.3 HEATING PLATE

MODEL ODS	ODS 225 E
Voltage (Vac)	230/110 (Monophasic)
Power (W)	2000(230V)/1800(110V)
Surface temperature	Up to 250°C according to the pipe material used
Temperature regulation	PID type with Triac
Independent temperature control	Analogical thermometer
Coating	Replaceable PTFE sheet
Exterior dimensions (cm)	38x5x54.5
Net weight (kg)	625

MODEL TRACK AUTOMATIC	TRACK 315	TRACK 160	TRACK 250	TRACK 315	TRACK 315R	TRACK 400	TRACK 400R	TRACK 500	TRACK 500R	TRACK 630
Voltage Vac (110&230 mono-phase; 400 tri-phase)	110	230								400
Power (W)	1800	1000	1900	2100	2100	3100	3100	3800	3800	6800
Surface temperature	Up to 250˚C according to the pipe material used									
Temperature regulation	PID type with Triac									
Coating	PTFE									
Exterior dimensions (cm)	47x11x70	28x6.5x50	36x12x58	47x11x70	44.5x12x57	52x12x75	52x12x64	64x8x110	84x62x81	82x10x110
Weight (kg)	9.6	3.35	5.5	7.2	10	12	14	17.5	18	30

6.4 TRIMMER

MODEL ODS	ODS225 230/110V
Voltage	230/110 Vac (Monophasic)
Power (W)	700
Operation	2 Push-buttons 1 Safety switch
Cutters	1 adjustable blade
Transmission	Chain with eccentric tensor
Exterior dimensions (cm)	54x43x14
Net weight (kg)	1325

MODEL TRACK AUTOMATIC	TRACK 315	TRACK 160	TRACK 250	TRACK 315	TRACK 315R	TRACK 400	TRACK 400R	TRACK 500	TRACK 500R	TRACK 630
Voltage Vac (110&230 mono-phase; 400 tri-phase)	110	230								400
Power (W) *with gearbox	720	1200	1200	1200	1200	1300*	1300*	750*	750*	1100*
Cutting blades	Double edge, adjustable									
Exterior dimensions (cm)	46x47x55	36x26x45	41x36x42	46x47x55	48x28.5x53	62x16x90	79x16x78	62X23X98	96x73x22	92x25x120
Weight (kg)	20.8	8.3	15.3	21.8	22	35.5	37	58	58	102

6.5 HEATING PLATE AND TRIMMER HOLDER

MODEL ODS	ODS 225 E
Exterior dimensions (cm)	29x27x56
Net wight (kg)	3

6.6 HYDRAULIC STATION

MODEL ODS + TRACK AUTOMATIC	T160/T250/T315/T315R/T400/T400R	T500/T500R/T630
Voltage (Vac mono-phase)	230 or 110	
Power (W)	735,5	
Maximum working pressure (bar)	100	160
Oil tank capacity (l)	25	
Aspiration filter (microns)	250	
Oil type	HM-46 as ISO 6743/4-HM	
Exterior dimensions (cm)	73x35.5x49	
Net weight (kg)	47	

6.7 COMPLETE MACHINE

MODEL	ODS 225E	TRACK 315(110V)	TRACK 160	TRACK 250	TRACK 315	TRACK 315R	TRACK 400	TRACK 400R	TRACK 500	TRACK 500R	TRACK 630
Voltage Vac (110&230 mono-phase; 400 tri-phase)	230/110	110	230								400
Total power (Kw)	2.8	3.26	2.94	3.84	4.04	4.04	5.14	5.14	5.29	5.29	8.64
Nett weight w/o adapters (kg)*	72.5	117.5	95.4	115.3	128.5	153.5	195	200	252	349	519.5
Nett weight with adapters (kg)*	80	136	109.1	146	168.5	261.2	256.1	268.8	333.8	430.8	719.8

* without Fusion Box

6.8 GENERATOR SPECIFICATIONS

MODEL	ODS 225E	TRACK 315	TRACK 160	TRACK 250	TRACK 315	TRACK 315R	TRACK 400	TRACK 400R	TRACK 500	TRACK 500R	TRACK 630
Voltage Vac (110&230 mono-phase; 400 tri-phase)	230	110	230								400
Advisable minimum power (VA)	4500	4500	3500	4500	5000	5000	6000	6000	7500	7500	11000

6.9 PALLET TYPE PACKING FOR FUSION CONTROL BOX

6.9.1 **Pallet type packing for fusion control box:**

FUSION CONTROL BOX	TWIN-S	DYNAMIC-S
Exterior dimensions (cm)	49.5x38.5x49.5	
Gross approximate weight (kg)	47	32
Contents	Fusion control box User Manual Scanner Electrofusion adapters 4 and 4.7 mm (TWIN only)	

6.9.2 **Pallet type packing for base framework:**

BASE FRAMEWORK	ODS 225E
Exterior dimensions (cm)	99.5x41.5x60
Gross approximate weight (kg)	68 (w/o pipe adapters)
Contents	Base framework Set of tools

6.9.3 **Pallet type packing for heating plate. trimmer and hydraulic station:**

HEATING PLATE TRIMMER HYDRAULIC STATION	ODS 225E
Exterior dimensions (cm)	61.5x44.5x30.5
Gross approximate weight (kg)	39
Contents	Heating plate & trimmer holder Heating plate Trimmer

REMARKS