MODELS: TWIN-S / DYNAMIC-S

MODELS: TRACK-TWIN-S / TRACK-DYNAMIC-S

USER MANUAL

CNC FUSION MACHINES

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DATOS DEL FABRICANTE, DISTRIBUIDOR Y SAT: ***MANUFACTURER, DISTRIBUTOR AND SERVICE DATA:***	
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NOTE !
At the time of the publication of this *User Manual*, the current software version is **V.6.67**. ‖
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 with polyethylene (PE) pipes/fittings by electrofusion and butt fusion jointing systems.
There are two fusion control box models available: **TWIN-S** and **DYNAMIC-S**.

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

The range of **TWIN-S** 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-S** 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 63 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-S 225 E	63 to 225	**TWIN-S** Control Box Base framework 225 E (electric drive) Trimmer 225 Heating plate 225
TWIN-S 315 G	90 to 315	**TWIN-S** Control Box Base framework 315 G (hydraulic drive) Hydraulic station Trimmer 315 Heating plate 315
DYNAMIC-S 225 E	63 to 225	**DYNAMIC-S** Control Box Base framework 225 E (electric drive) Trimmer 225 Heating plate 225
DYNAMIC-S 315 G	90 to 315	**DYNAMIC-S** Control Box Base framework 315 G (hydraulic drive) Hydraulic station Trimmer 315 Heating plate 315

1.2.2 Track Automatic machines:

MODEL	RANGE OF DIAMETERS
Track-Twin-S T160	50 to 160 mm
Track-Twin-S T250	63 to 250 mm
Track-Twin-S T315	90 to 315 mm
Track-Twin-S T400	160 to 400 mm
Track-Twin-S T500	250 to 500 mm
Track-Dynamic-S T160	50 to 160 mm
Track-Dynamic-S T250	63 to 250 mm
Track-Dynamic-S T315	90 to 315 mm
Track-Dynamic-S T400	160 to 400 mm
Track-Dynamic-S T500	250 to 500 mm

1.3 DESIGN SPECIFICATIONS

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

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

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

Juan de la Cierva, 1 - Políg. Ind. del Sud-oest
Tel.+34-93-4703070 - Sant Just Desvern (Barcelona)

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

Juan de la Cierva, 1 - Políg. Ind. del Sud-oest
Tel.+34-93-4703070 - Sant Just Desvern (Barcelona)- SPAIN

Figure 2

1.6 MEASURES OF PROTECTION AGAINST ACCIDENTS

1.6.1 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.

1.6.2 Safety measures and dangers:

Please go by the following safety measures:

- 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.
- Protect the electrofusion cables, electric connections to the base framework, trimmer, heating plate, hydraulic pack and the cable that goes to the power supply from sharp objects.
- All damaged cables must be replaced immediately by the After-Sales Service of ACUSTER GLOBAL, S.L.
- Always plug the control box to a power supply provided with differential and ground connection.
- For hydraulically operated machines, remember that a sudden hydraulic oil leak can cause serious or even a fatal injury if the pressure is high enough.
- Do not expose the fusion control box to heavy weights. All slight damage caused to the external frame 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.

- 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.
- 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.
- The fusion control box can only be opened 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.

1.7 DECLARATION "CE" OF CONFORMITY

ACUSTER GLOBAL, S.L.
Juan de la Cierva, 1
Polígono Industrial del Sud-oest
08960 Sant Just Desvern (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-ISO12100; EN61310-1-2-3 EN13857; EN13732-1; EN60204-1	TWIN-S DYNAMIC-S
2006/95/CE *Low Voltage Directive*	EN 60335-1; EN 60519-1	TWIN-S DYNAMIC-S
2004/108/CE *EMC Directive*	EN 61000-6-2; EN 61000-6-4	TWIN-S DYNAMIC-S
2002/95/CE RoHS	EN 62321-1	TWIN-S DYNAMIC-S
2002/96/CE WEEE		TWIN-S DYNAMIC-S
	ISO 12176-1	TWIN-S DYNAMIC-S
	ISO 12176-2	TWIN-S
	ISO 12176-3	TWIN-S DYNAMIC-S
	ISO 12176-4	TWIN-S DYNAMIC-S
	ISO/TR 13950	TWIN-S

Sant Just Desvern, 1st April 2014

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-S (plastic casing)

Figure 3b: TWIN-S (steel casing)

Figure 3c: DYNAMIC-S

The fusion control boxes **TWIN-S** and **DYNAMIC-S** 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-S ODS 225 E general view

Figure 4b: DYNAMIC-S 225 E general view

In the **ODS TRACK 315 G** version (*Figure 5a*), the base framework is made up of four aluminium lower clamps and four aluminium upper clamps, two of which are fixed and two are movable. All four upper clamps are connected in pairs and the fixed outer lower clamp is also removable in order to allow fitting mounting (tees, elbows, and so). The moving clamps are driven by two double acting hydraulic cylinders. High pressure hoses with quick plugs are supplied for the hydraulic station connection. The base framework moving clamps have installed an encoder (shift control sensor) for distance control.

Figure 5a: Base framework ODS TRACK 315 G

Figure 5b: Track Automatic

The base frameworks belonging to **Track Automatic** machines (*Figure 5b*), 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.
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).
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 ODS TRACK 315

4. A **trimmer**.

Originally the ODS225 model is driven by a 24 Vdc electric motor and belt drive but the model 2014 is operated by a 230/110 Vac motor and chain drive.

It incorporates two push-buttons for functioning control and a safety switch.

The trimmer for machines **ODS TRACK 315 G** and **ODS 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 ODS 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 Hydraulic station 0-160 bar The hydraulic station of 0-160 bar is used with the Track Automatic 500 only whereas the hydraulic station 0-100 bar is used for the rest of models. Please check *Chapter 6: Technical Characteristics.*

2.2 FUSION CONTROL BOX

2.2.1 **General:**

The Fusion Control Box consists of and ABS plastic cupboard mounted on a stainless steel tubular structure. On the model 2013, the exterior casing is made of steel.

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, RS-232 connector for bar-code scanner, PC and printer, Type A USB connector (model 2013), electric connectors for base framework connection, trimmer, heating plate and hydraulic station (for **TWIN-S / DYNAMIC-S** boxes) and electrofusion cables (for **TWIN-S** 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 via the printer or PC, 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 Push-button STOP
3 Function push-buttons
4 Selection push-buttons
5 Electric connectors:
5a Connection to 24 Vdc trimmer
5b Connection to electric framework
5c Connection to hydraulic framework
5d Connection to 230/110 Vac trimmer*
5e Connection to heating plate*

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

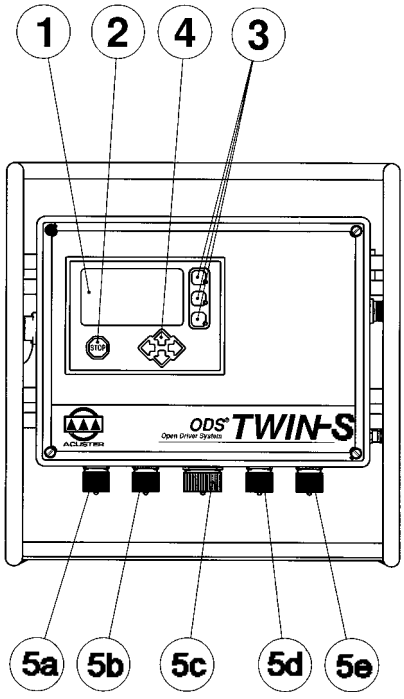


Figure 8a: TWIN-S front side

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 Cable with room temperature sensor
5 Characteristics plate and **CE** Mark plate

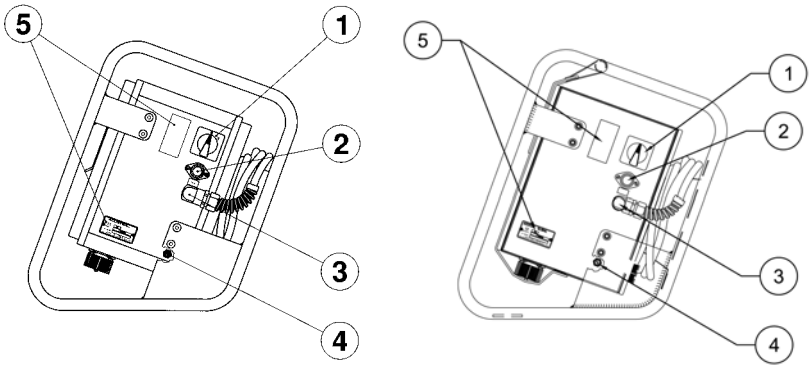


Figure 8b: Plastic casing Metal casing

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-S**) (with φ 4 mm terminals)
2 Serial connector RS-232 Round type for plastic and D-Sub for metal casing (connection to scanner, PC and printer)
3 Connector USB/A Metal casing
4 Accessories' bag Metal casing

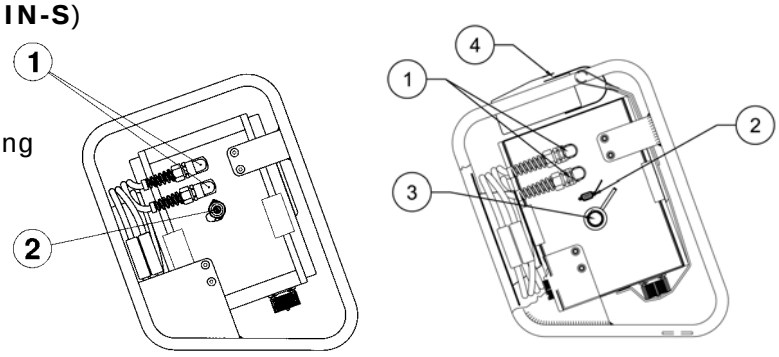


Figure 8c: Plastic casing Metal casing

2.2.5 **Rear side:**

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

1 Cables holder

2 Accessories bag Plastic casing Anchorage for cables holder bracket Metal casing

3 Boozer

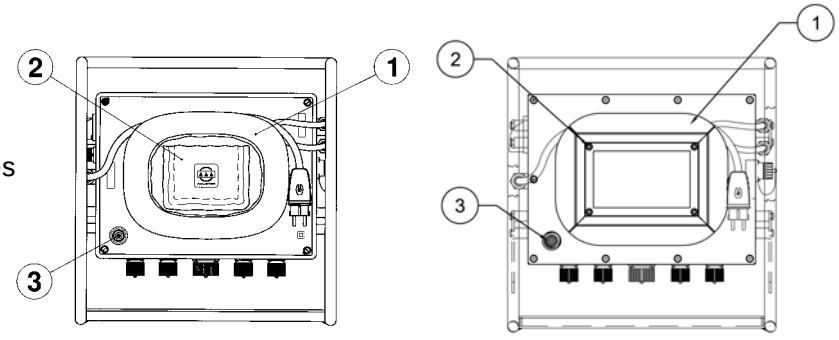


Figure 8d: Plastic casing Metal casing

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.

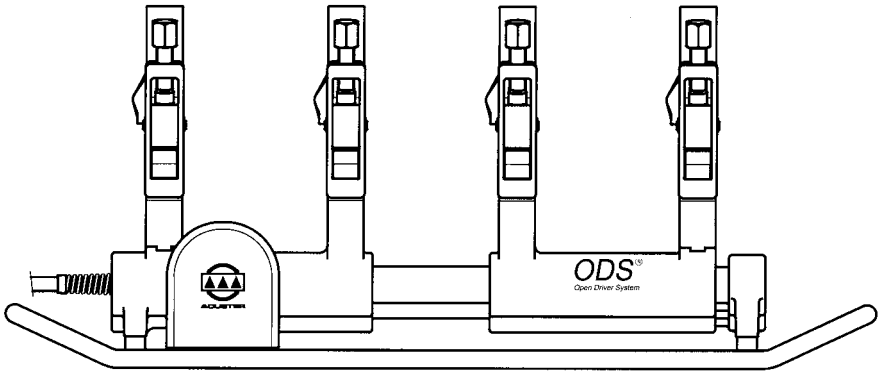


Figure 9: Base framework ODS 225 E

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 **ODS 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).

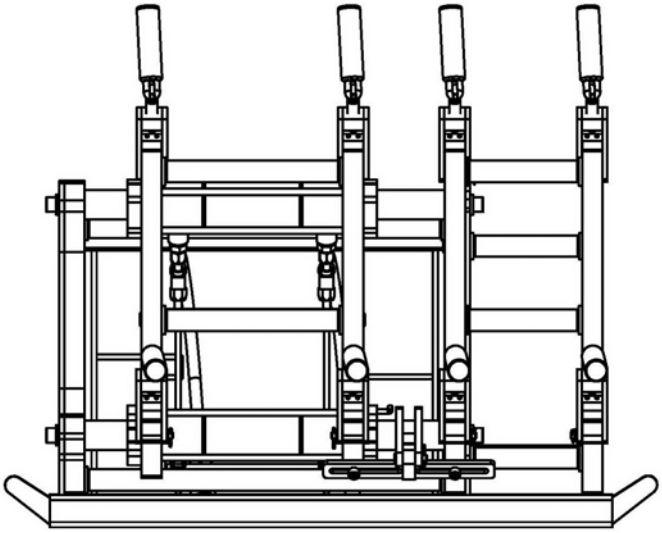


Figure 10: Base framework ODS TRACK 315 G

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** 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** 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.

On the version 24Vdc, the transmission of motion from the electric motor to the trimmer discs is performed by way of a Poly-V belt, whereas on the 230/110V version (model 2014), the transmission is through chain. Both belt and chain can be retightened by means of an eccentric tightener.

The electric motor power is supplied by means of a cable directly connected to the Fusion Control Box. On the 24 Vdc version its power is 465 W and it has an electronically controlled speed. In the event of overcharging the trimmer, there is a torque control which prevents the kinematic chain of the transmission from damaging, limiting the trimmer's electric motor current (it avoids overintensity).

On the 230/110 V version, the motor power is 700 W.

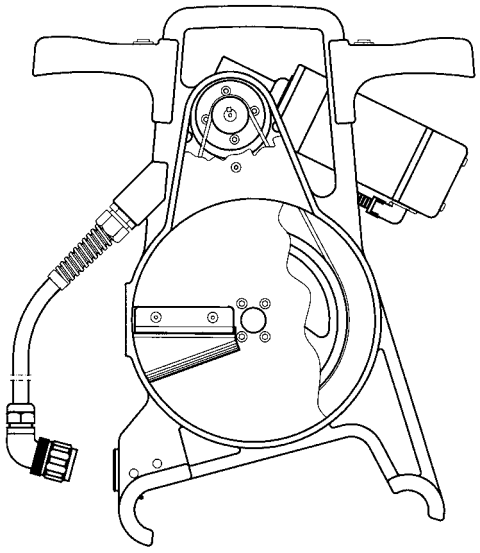


Figure 11a: Trimmer ODS225 24Vdc

Figure 11b: Trimmer ODS225 230/110V

The trimmer version **ODS TRACK** 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.

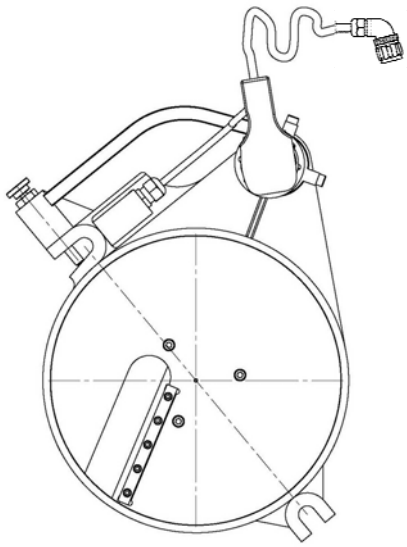


Figure 12: Trimmer ODS TRACK 315 G

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** and then to the Fusion Control Box socket connector.

2.6 HYDRAULIC STATION

The hydraulic station consists of the following:

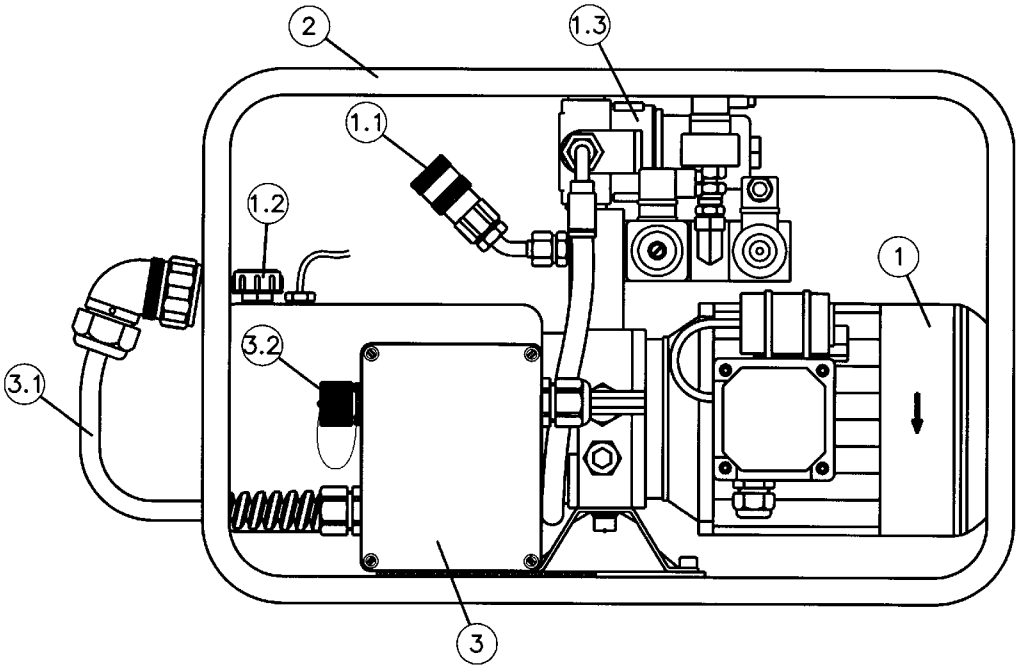


Figure 13: Hydraulic station on tubular frame

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

Replace the hydraulic oil and filter following the maintenance schedule.

NOTE !
Spare oil in one (1) and five (5) litre containers is available. 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), T400 and T500.

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 Vac 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 automatic 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 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. For generator specifications, please refer to CHAPTER 6: TECHNICAL CHARACTERISTICS.

IMPORTANT !
Models ODS225E, T160, T250, T315 & T315G: They could be connected directly to the generator or mains socket plug. **Models T315 (110V), T400 and T500:** They 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.

3.1.2 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.

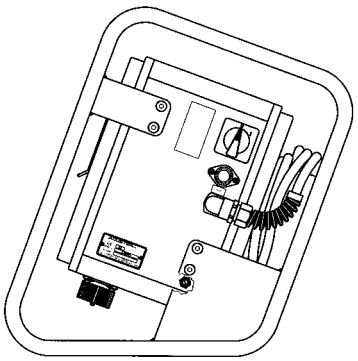


Figure 15a: Vertical position

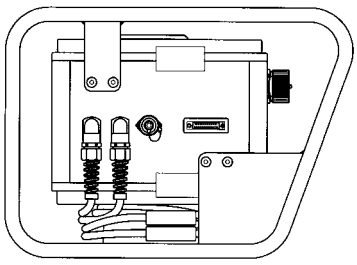
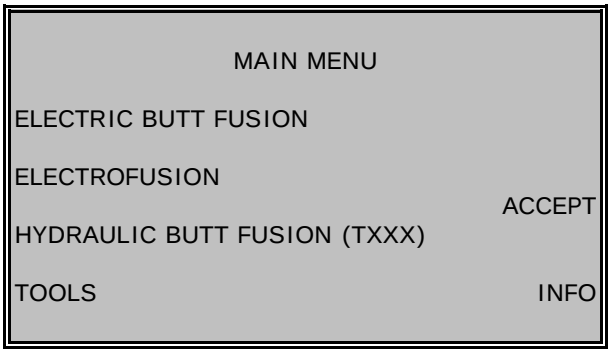


Figure 15b: Horizontal position

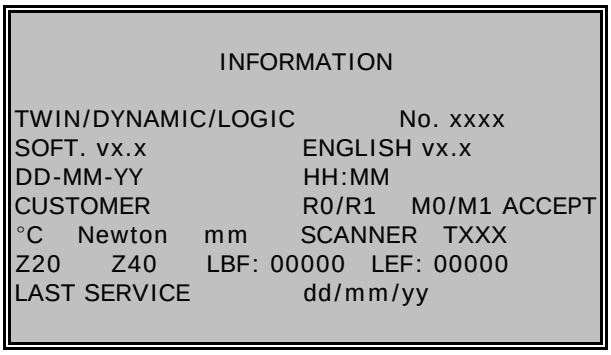
3.1.3 **Start up the unit:**

Set the master switch in the ON position. The display backlight comes on and this message appear on it: MAIN MENU.
The first message in the unit is the MAIN MENU.



This menu allows us to choose the options ELECTRIC BUTT FUSION, ELECTROFUSION, HYDRAULIC BUTT FUSION and TOOLS. Place the cursor on the word by means of the arrows ⬆ and ⬇, on the panel. Then press the button next to ACCEPT.
The option INFO allows us to access the general information of the machine.

If you press **INFO**, the following information will come on the screen:



Where:
TWIN/DYNAMIC/LOGIC corresponds to the model.
No. xxxx to the serial number.
SOFT.vx.x to the programme's version; the language selected and its version.
DD-MM-YY and **HH:MM** the date and time.
CUSTOMER corresponds to the client's name, owner of the unit.

R0/R1 corresponds to both internal memory and Memory Card (if equipped) overflow on/off; **R0** selection the memory overflow is deactivated (OFF) and on **R1** one is activated (ON).
M0/M1 indicates if the unit has selected (equipped) or not with the Memory Card reader; **M0** displayed means that the Memory Card reader is not equipped and on **M1** it is.
°C Newton mm selected units (it is also possible °F Lb and inches).
SCANNER corresponds to the scanner bar-code reader selected (also optic pen).
TXXX according to the hydraulic base framework selected (T160; T250; T315; T315G; T400; T500).
Z20/Z21 and **Z40/Z41** correspond to the option/obligation of the operator and order identification.
LBF and **LEF** correspond to the last butt fusion done and electrofusion, respectively;
dd/mm/yy is the date of the last service done to the unit.

Press ACCEPT to go back to the Main Menu.
Once in the Main Menu, select ELECTRIC BUTT FUSION, ELECTROFUSION or HYDRAULIC BUTT FUSION according to the model or type of fusion desired, or TOOLS.

3.1.4 Contrast control of the unit's display:

The unit's display screen has an automatic contrast adjustment depending on the temperature and sunbeams effect on it. However, the operator can adjust the contrast making it darker or lighter to his/her taste. In order to do so, press the INFO key from the MAIN MENU (see previous screen).
Pressing the upper button, the contrast of the display increases, whereas pressing the lower button it decreases.
Also, within the electrofusion mode, the contrast can be adjusted by means of the arrows ⬆ and ⬇.
Once the contrast has been selected, the unit will continue to control it automatically according to the temperature. The adjustment carried out by the operator loses its effect when switching off the machine.

3.1.5 Initial programming:

Before selecting the options ELECTRIC BUTT FUSION, ELECTROFUSION and HYDRAULIC BUTT FUSION from the Main Menu, check the need for initial programming such as:

- Change of working language
- Option/Obligation operator/order identification
- Traceability use: Optional and Required
- Change of the butt fusion system and material to use for the pipes/fittings
- Selection of the barcode reader system (barcode reader/scanner)
- Activation or not of the reduced time (cooling down time phase) on butt fusion cycle
- Change of date/time

As an informative option press **INFO** (please refer to previous screen).

NOTE !
To make changes on the unit's initial programming, please refer to point *3.4 - TOOLS* of this CHAPTER.

3.1.6 Using the Barcode Reader:

If you read the fitting's data by using optical means (optic pen or scanner), connect the reader device into the corresponding connector and slide it (barcode reader) or put it in front of the fitting's bar-code (scanner).

NOTE FOR SERIAL SCANNERS (NOT USB SCANNER) !
Check previously through the INFO of the MAIN MENU the existing selection BARCODE READER/SCANNER. To change the selection, please refer to point *3.4: TOOLS* of this CHAPTER.
The serial scanner should be correctly setup. In case no data is captured by the device, carry out the following barcode reading.

Optic pen: The barcode reader pen works with greater efficiency when gently slid along the barcode and when the inclination in relation to the vertical is kept between 10 and 40º. However, the pen's working angle is bigger: it can be used between 0 and 50º, in relation to the vertical.
The displacement speed during the reading is also a factor to be borne in mind (as a general rule, slide the reader neither too slowly nor too fast).

Laser scanner: When reading, the connected scanner emits a red laser line of a particular length. To capture the barcode data, place the scanner so that the laser 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.

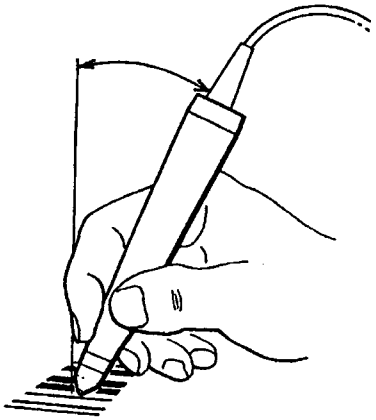


Figure 16a: Example of using the optic pen

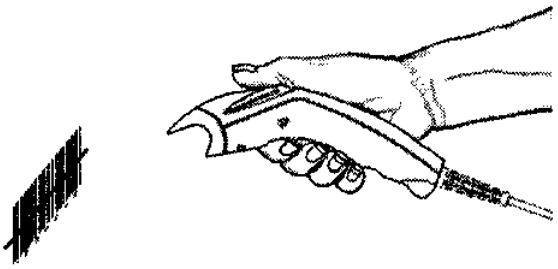


Figure 16b: Example of using the laser scanner

3.2 BUTT FUSION PROCESS FOR PIPES AND FITTINGS (TWIN-S/DYNAMIC-S BOXES)

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.

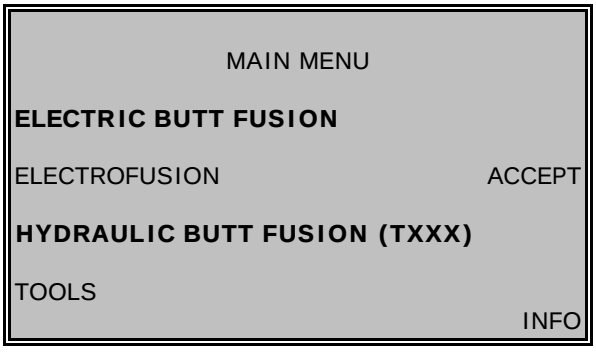
3.2.2 **Unit connection and selection of the butt fusion system from the Main Menu:**

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* and clause 2.7 - *SWITCH BOX* of this *User Manual*).

⚠ DANGER Now connect the fusion control box to a 230 V ±15% power source (or 110 V, according to market requirement), of alternating current. For generator specifications, please refer to *CHAPTER 6: TECHNICAL CHARACTERISTICS.*

IMPORTANT NOTES !
Models ODS225E, T160, T250, T315 & T315G: They could be connected directly to the generator or mains socket plug. **Models T315 (110V), T400 and T500:** They 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.
Because the unit allows the use of an optic pen or scanner indistinctly, connect the barcode reader to use and check the setup. Refer to clause 3.1.6 - **Using the Barcode Reader**.

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 this message appear on it:



In order to start the butt fusion process, select the first or the third option from the MAIN MENU.
Select ELECTRIC or HYDRAULIC BUTT FUSION depending on the base framework connected to the box.
Chose ELECTRIC when using ODS225E machine only and HYDRAULIC for the rest of models.

NOTES !
When using an electrically operated machine (ods225e), check the correct trimmer setup on TOOLS/SETUP/BUTT FUSIONS JOINTS. Refer to point 11, page 77, of this chapter. When using an hydraulically operated machine, check on the screen the base framework model displayed (TXXX) and modify it if not corresponds to the one connected to the unit: T160, T250,... To select different hydraulic base frameworks, please refer to clause 3.4 - TOOLS of this chapter.

Refer to the Chapter 6: Technical characteristics for the hydraulic base framework potentially available at this time.

CAUTION !
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.*

The butt fusion joints must be done by qualified personnel. The work site where the machine is to be placed must be on a horizontal, scoreless plane.

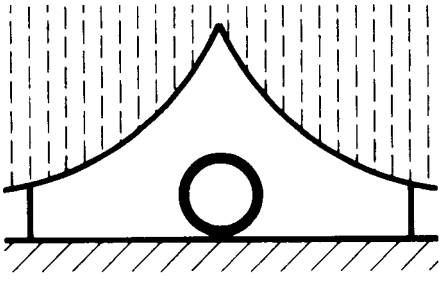


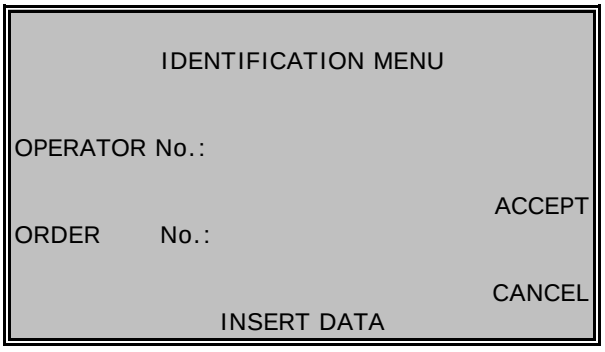
Figure 17

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.

3.2.3 **Operator and job order identification:**

Once the option has been accepted, the following screen will come on the display:



The identification of the operator No. will take place in this phase via a barcode system. The job order No. identification could be done by barcode or keyboard introduction.
Press ACCEPT both if the identification has or has not been made.

If the unit has the obligation to identify the operator No. and/or job order No., then the identification will be perceptive in order to access the programme of the butt fusion.

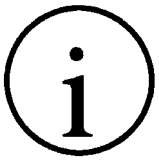
OPERATOR IDENTIFICATION:

Operator identification is performed in accordance with ISO 12176-3. It can be carried out by means of:

- Barcode system

The operator will automatically be identified by inserting the corresponding identification (via barcode system). From this moment the identification will always be associated to the unit fusions made until:

1. A new identification is entered.
2. Entering the same identification a second time (ON/OFF system).
3. Change of date (at zero hours) or switching off the unit the identification will be deleted (according to the unit's setup: OFF on the first case and on the second from the path TOOLS / SETUP / GENERAL / RESET OPERATOR+JOB).
4. The use of the options ON or OFF on OPERATOR ID. (Z20) from the path TOOLS / SETUP / GENERAL.



REMARK !
The operator's identification foresees the automatic change of language according to the barcode entered. Besides, in the **TWIN-S** and **DYNAMIC-S** units, the language can also be selected via the path: TOOLS / SETUP / GENERAL / CHANGE OF LANGUAGE (Please refer to SELECTION OF LANGUAGE of this Chapter).

JOB ORDER IDENTIFICATION:

The job order identification can be done by means of:

- Barcode system
- Manually

The order identification will automatically be carried out by inserting the corresponding identification (via barcode system or manually indistinctively). From this moment the identification will be associated to the unit fusions made until:

1. A new identification is entered.
2. Entering the same identification a second time (ON/OFF system).
3. Change of date (at zero hours) or switching off the unit the identification will be deleted (according to the unit's setup: OFF on the first case and on the second from the path TOOLS / SETUP / GENERAL / RESET OPERATOR+JOB).
4. The use of the options ON or OFF on JOB ORDER ID. (Z40) from the path TOOLS / SETUP / GENERAL.

OPTIONAL/OBLIGATORY IDENTIFICATION:

Obligatory identification:
In order to make compulsory the operator's and/or job order identification, select ON via the path TOOLS / SETUP / GENERAL:

- OPERATOR ID. (**Z20**): *ON*
- JOB ORDER ID. (**Z40**): *ON*

causing that the identification of operator and job order to be compulsory. This option obliges the operator to identify the operator's and/or job order number daily or when the units is switched on (depending on the *OFF* or *ON* setup of option RESET OPERATOR+JOB) in order to access the fusion menus.

Optional identification:

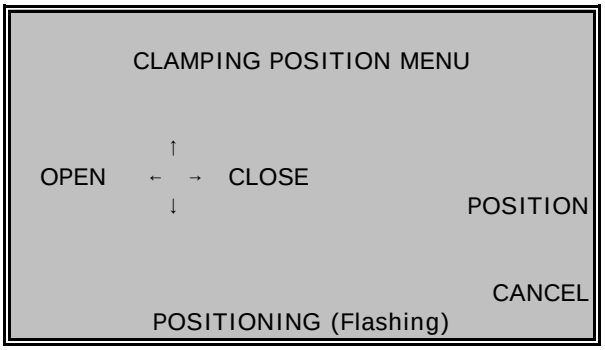
In order to make optional again the operator's and/or job order identification, selecting OFF via the path TOOLS / SETUP / GENERAL:

- OPERATOR ID. (**Z20**): *OFF*
- JOB ORDER ID. (**Z40**): *OFF*

makes the operator and/or job order identification optional (the unit goes back to its previous setting), that is, the fusion unit will be able to carry out fusions with and without the operator and/or job order identification in distinctively (in the latter there will be no traceability of the job in process and his/her operator: this data will not be registered).

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

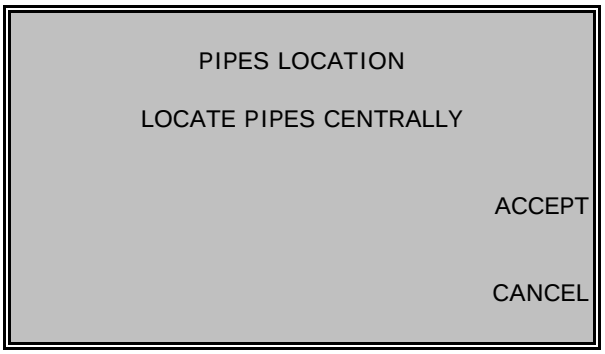
Once the operator/order's identification or non identification has been carried out, and after pressing ACCEPT on the screen IDENTIFICATION MENU, the following message will come on:



By pressing ⬅ and ➡ respectively the manual opening and closing of the moving body's base framework is made. Press the key POSITION to place the moving body in the right position to locate the pipes/fittings on the clamps. During this operation, the flashing message POSITIONING will appear on the lower part of the display.

IMPORTANT FOR **ODS 225 E** BASE FRAMEWORKS !
NEVER carry out the positioning operation with the pipes/fittings mounted on the base framework clamps. This would cause a force miscalculation in later phases.

In all the movements made manually by the machine's moving body (pressing the push-buttons OPEN/CLOSE), the acoustic signal comes into action in order to warn of the movement of the machine.
Pressing CANCEL, it takes you back to the main menu.
Selecting POSITION, the display will show the following message:



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).

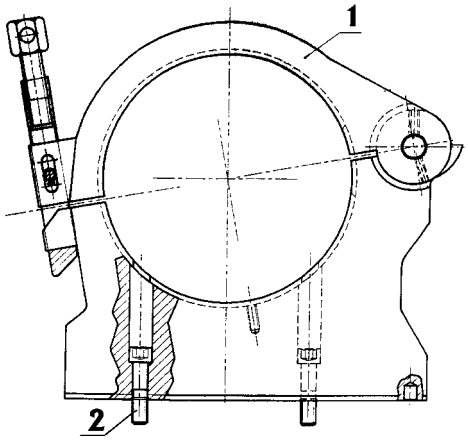
When jointing pipes to fittings or fittings to fittings, prepare the base framework for clamping the fittings. The butt fusion fittings can be, amongst others:

- 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 **ODS 225 E**, 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 **T 315 G**, 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.

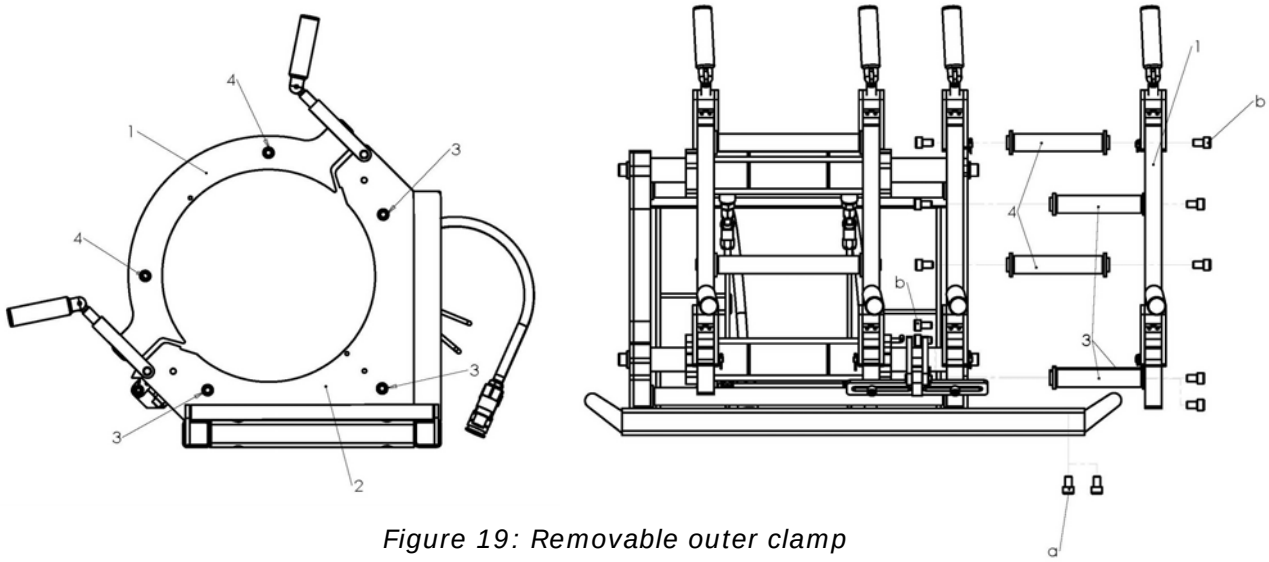


Figure 19: Removable outer clamp

Where:

1. Upper clamp
2. Lower clamp
3. Fixing bolt for lower clamp
4. Connecting bolt for upper clamps

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).

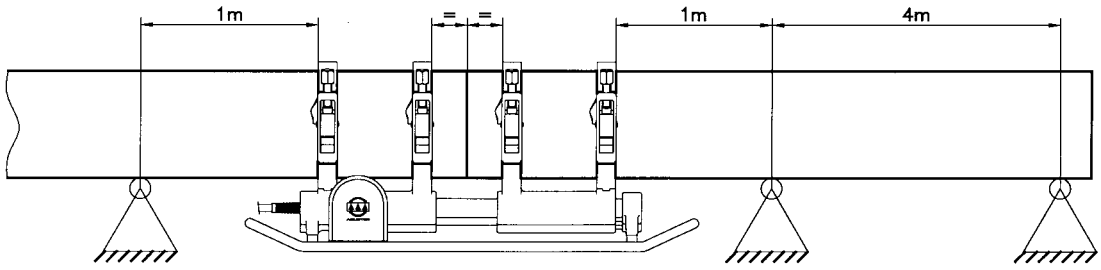


Figure 20

NOTE !

Once the selection of the diameter and SDR of the pipe has been made, the maximum 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".

* For the concept related with PIPE RECORD please refer to “SELECTION OF THE BUTT FUSION SYSTEM” of the point 3.4.3 of this *User Manual*.

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.

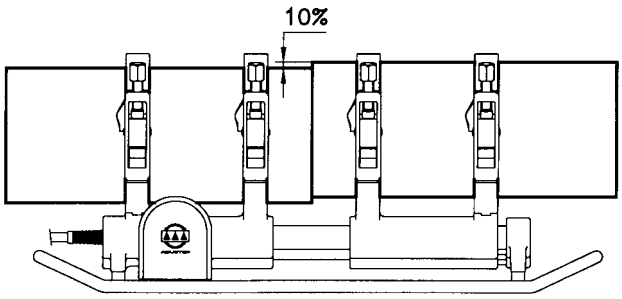
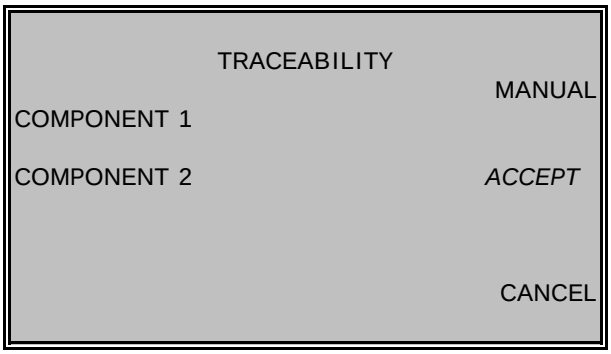


Figure 21

Press CANCEL to go back to previous screen.
Pressing ACCEPT, the moving body will carry out the drag force measurement for trimming and will be placed in the biggest opening position.

3.2.5 **Fusion jointing traceability:**

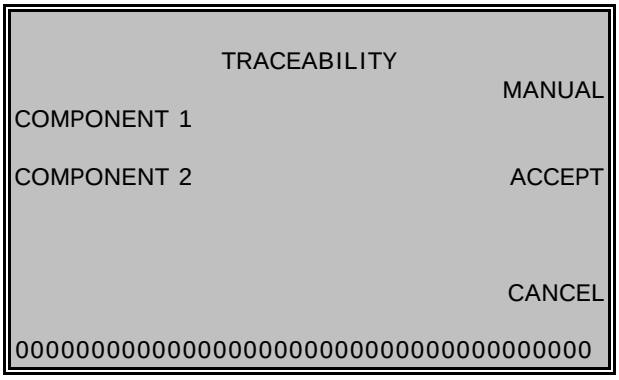
When the TRACEABILITY option on the SETUP/GENERAL menu is enabled (ON), and after having pressed ACCEPT on the pipe location screen, the following screen will appear:



When traceability is enabled (ON), two situations can occur:

a) Optional traceability:
REQUIRED TRACEABILITY *OFF*.
b) Required traceability:
REQUIRED TRACEABILITY *ON*.

The *optional traceability* selection allows the operator to optionally enter the code data of the components (pipes or fittings). If entering component code data, the codes of all the components that make up the fusion jointing must be entered (in the case of butt fusion, two).
ACCEPT will only appear on the screen with the *optional traceability* selection.
Pressing ACCEPT continues with the butt fusion process without traceability.
Pressing CANCEL returns to the previous pipe location screen.
Pressing MANUAL allows manual entry of component codes.



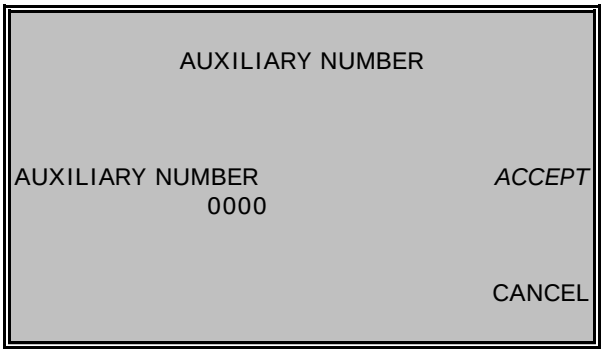
Manual Code Entry:

After pressing MANUAL, ACCEPT will appear on the screen with a code string of 40 zeroes at the bottom. These numbers can be changed individually via the keyboard. Press ⬆ or ⬇ to change values from 0 to 9; press ➡ or ⬅ to move the cursor right or left, respectively.

Enter the component traceability code. If using the manual option, press ACCEPT to validate the code. The code will be recorded on the next line after COMPONENT 1 (ACCEPT will once again disappear from the screen if using the manual option). Repeat the process to enter COMPONENT 2 data.
The coding is in agreement with the criteria set forth in ISO 12176-4. If an incorrect code is entered, the message "INCORRECT READING OR INVALID DATA" will appear at the bottom of the screen.
Press ACCEPT to continue with the fusion jointing process, or CANCEL to return to the previous point.

3.2.6 **Auxiliary number:**

If this option is enabled (ON) on the SETUP/GENERAL menu, and once ACCEPT has been pressed on the previous screen (pipe placement or traceability, according to configuration), the following screen will appear:

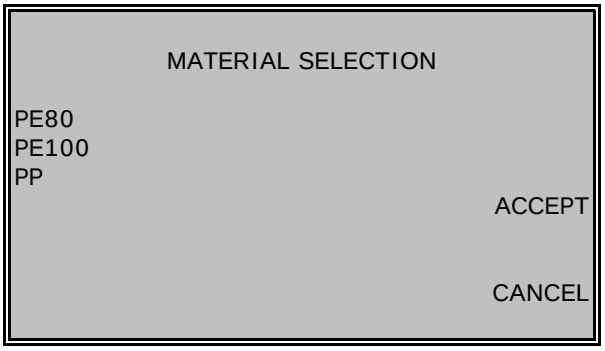


Use the keyboard to enter the Auxiliary number.
The cursor will be placed at the first left digit. Enter the number one digit at a time by pressing ⬆ or ⬇ to change value from 0 to 9; press ➡ or ⬅ to move the cursor right or left, respectively.

Press ACCEPT to continue with the fusion jointing process, or CANCEL to return to the previous point.

3.2.7 **Selection of the material (optional), the pipes / fitting's diameter and thickness:**

NOTICE !
Depending on the unit's setup (MATERIAL SELECTION option *0FF* or *ON*), for each fusion the operator must choose the following: • the pipe or fitting's diameter and SDR or • the pipe or fitting's material, diameter and SDR depending on the job preferences.

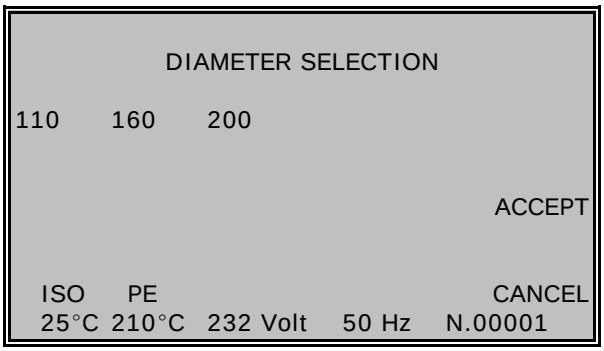


Place the cursor on the material to be selected by means of the push-buttons ➡ and ⬅. Please see NOTICE.

Press ACCEPT to validate command.

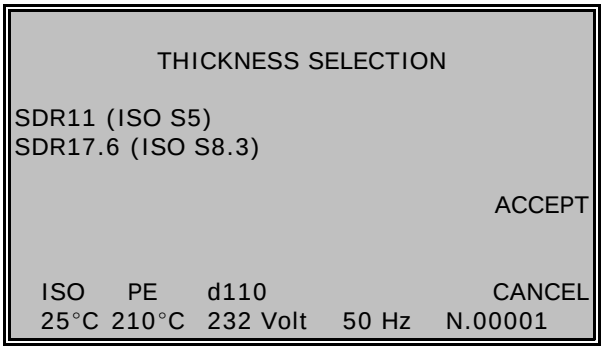
Press CANCEL to return to the previous screen.

Once the material has been selected (only if it is setup as selectable), the following screen will come on:

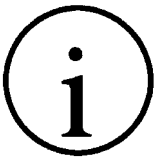


Place the cursor on the diameter to be selected by means of the push-buttons ➡ and ⬅. Please see NOTE.
The information at the bottom of the screen is purely informative.
Press ACCEPT to validate command.
Press CANCEL to go back to the previous screen.

In the example, **ISO** block shown on the lower part of the screen corresponds to the selection previously done via CHANGE OF BLOCK of the SETUP/BUTT FUSION JOINTS menu.
PE corresponds to the material selection done via CHANGE OF PIPE MATERIAL of the SETUP/BUTT FUSION JOINTS menu, or activating the material selection in each fusion via SETUP/BUTT FUSION JOINTS menu, depending on the unit's configuration. Refer to BUTT FUSION SELECTION in Section 3.4.3 of this *Manual*.
Once the diameter has been selected, the following screen will appear:



Place the cursor on the thickness to be selected by means of the push-buttons ⬇ and ⬆.
The information at the bottom of the screen is purely informative.

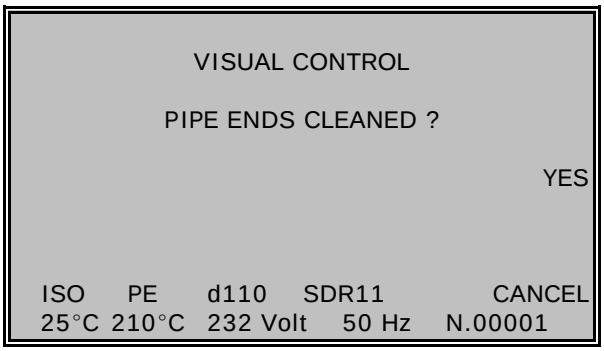


NOTE !

Originally the unit is programmed with PIPE RECORDS* corresponding to diameters ranging from 63 to 500mm, with different SDR, depending on the diameter.
Using the option ON/OFF PIPE RECORDS* of the setup menu, pipe sizes can be activated or deactivated at random. The list given, therefore, is restricted to activated diameters/SDR (ON) and modifiable using the setup.
* For a definition of the concept PIPE RECORD and the modification of pre-determinated diameters/SDR, please refer to "SELECTION OF BUTT FUSION SYSTEM" in Section 3.4.3 of this *Manual*.

Press CANCEL to go back to the previous screen.
Press ACCEPT to validate command.

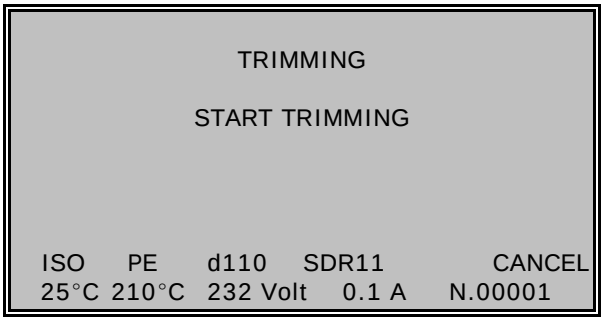
If the pipe cleaning is set as “CLEAN PIPE ENDS TRIM”, the following message will appear on the screen:



Clean the outer and inner surfaces of the ends of the pipes/fittings with an appropriate degreasing liquid.
Pressing YES continues with the trimming phase, and pressing CANCEL returns the user to the previous screen.

3.2.8 **Pipes/fittings trimming:**

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



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 change the frequency by the current (trimmer’s consumption). 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.

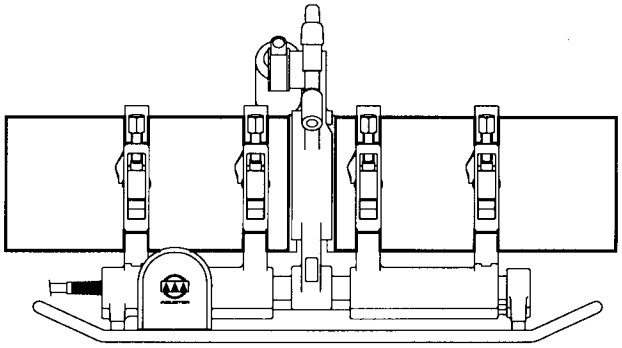


Figure 22

WARNING Press the push-button.

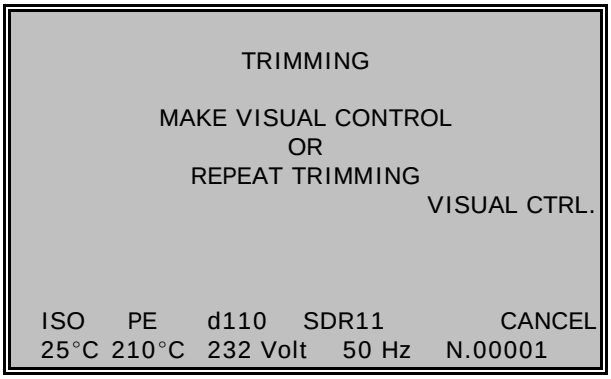
FUSION UNITS AT 110V
On fusion units at 110V, when the trimmer push-button is pressed the heating plate power supply is cut. The feed to the heating plate is automatically activated few seconds after the push-button is released.

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:

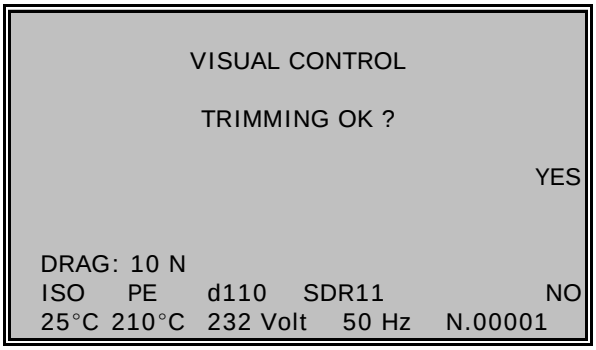


If the trimming is correct, press VISUAL CONTROL to continue with the cycle.

⚠CAUTION Always keep hands clear of the clamps area.

If it is not correct, keep on trimming until the tolerance of the sides of the pipes/fittings is correct.
CANCEL will take us back to the CLAMPING POSITION MENU.

The display will read as follows:



Inspection of the cut obtained.
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.

Visually check the trimming. According to ISO 12176-1, the flatness of the sides of the pipes will have a maximum tolerance from 0.3 to 1mm, depending on the nominal diameter (see following table):

P = 0.3 mm	for φ. ≤ 250 mm
P = 0.5 mm	for φ. 250 to ≤ 400 mm
P = 1 mm	for φ. 400 to ≤ 630 mm

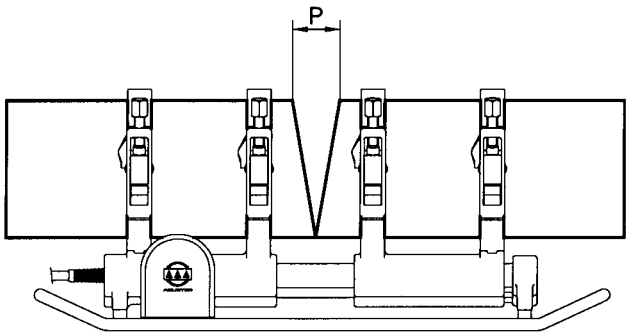
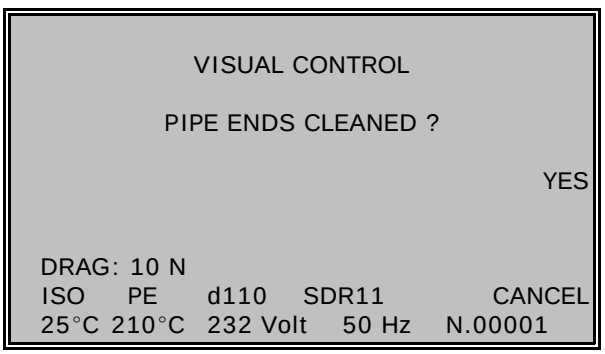


Figure 23

If the tolerance of the specification to be applied did not comply, trim again. By pressing NO, 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 YES to continue with the cycle.
If the pipe cleaning is set as “CLEAN PIPE ENDS FUSION”, the following message will appear on the screen:

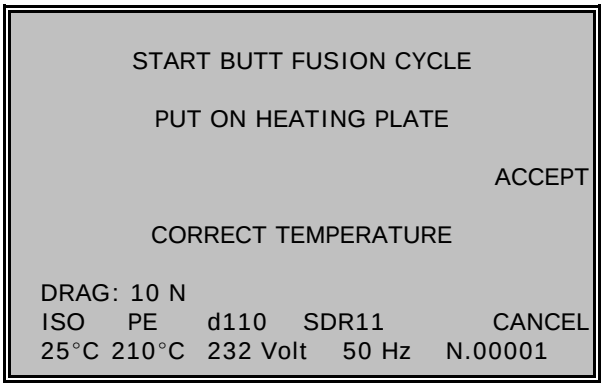


Pressing YES continues with the butt fusion cycle.
Pressing CANCEL interrupts the butt fusion process and returns to the initial screen.

The moving body will open to the end. There is a tolerance of 18-20mm for the trimming. In case of this distance were exceeded, an error message will be displayed ("EXCESSIVE PIPE FACING"). Open the moving body, put the pipes close to each other and reinitiate the cycle from the trimming step.

3.2.9 **Heating plate setting:**

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



If the heating plate is not within the minimum and maximum tolerances established on the PIPE RECORD*, the "INVALID TEMPERATURE. PLEASE WAIT" message will come on. The process will stop until the adequate temperature is attained.
* For the concept related with PIPE RECORD please refer to "SELECTION OF THE BUTT FUSION SYSTEM" of the point 3.4.3 of this *User Manual*.

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.

DANGER

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 ACCEPT from the panel. The moving body closes and applies the programmed force (for the pipe selected + drag).

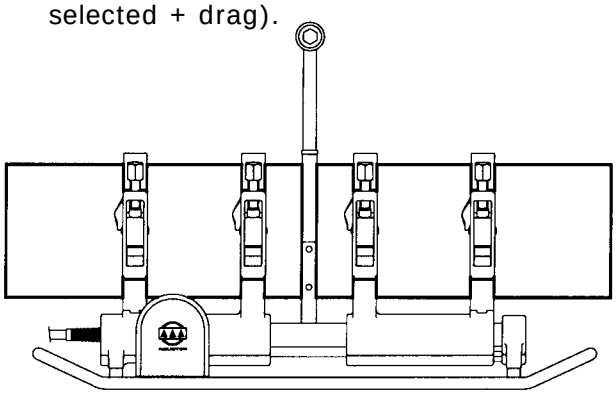
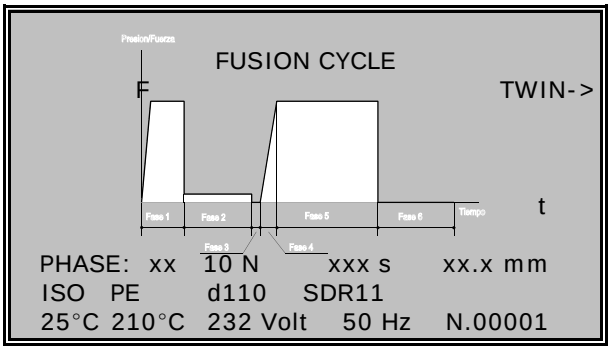


Figure 24

When starting the fusion cycle, the corresponding graphic to the phases of butt fusion will be displayed, and it will show the parameters of FORCE and TIME on the co-ordinate axis.



On the lower part of the screen the corresponding phase number will appear, as well as the duration of each one and the pipe length reduction obtained during the fusion.

Where in the example:

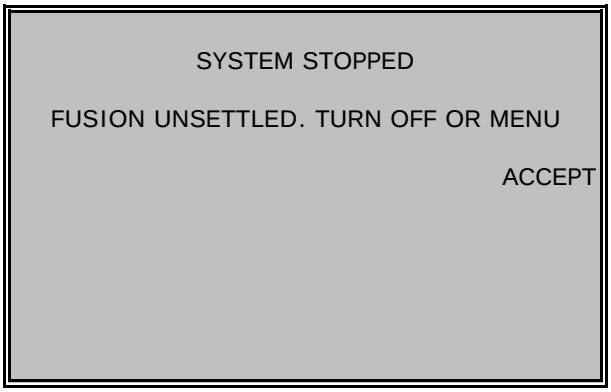
PHASE 1: *Heating*: in this phase, force F1 is exerted for the time T1 needed for forming bead B1.
PHASE 2: *Heat soak*: in this phase force F2 is exerted for time T2.
PHASE 3: *Withdrawal of heater plate*: in this phase the heating plate is withdrawn, with a maximum time T3 from the separation of pipes/fittings to the butt fusion joint of the elements to be fused.
PHASE 4: *Force increase*: this phase represents the required time T4 to obtain force F5.
PHASE 5: *Butt fusion*: in this phase the force F5 is exerted for time T5.
PHASE 6: *Cooling*: in this phase the jointed elements are stationary for time T6 with no force (this phase could be off by selection choice).

In the first phase of the fusion process (HEATING), the fused material at the ends causes a bead to form which reduces the length between the moving body and the fixed one. When the programmed length reduction for the relevant type of pipe is achieved (making of the initial bead), an acoustic signal informs that the next programmed phase HEAT SOAK has been activated. During this phase, the moving body remains applying the programmed force onto the heating plate.
Ten seconds before the end of this phase, the acoustic signal alerts the operator every second to withdraw the heating plate at the same time the moving body opens (programmed according to PIPE RECORD: for the concept related with PIPE RECORD please refer to “SELECTION OF THE BUTT FUSION SYSTEM” of the point 3.4.3 of this *User Manual*).

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: HYDRAULIC BUTT FUSION: “MOTOR OVERCHARGE”. Press the <ACCEPT> key and reinitiate the butt fusion process from the beginning.

3.2.10 **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.
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 is omitted if ON option is selected from the TOOLS/SETUP/BUTT FUSION JOINTS/REDUCED TIME.
Only in the case that the cooling down time is ON, the *SIMULTANEITY* can be done by pressing TWIN on the panel (only for **TWIN-S** Models).

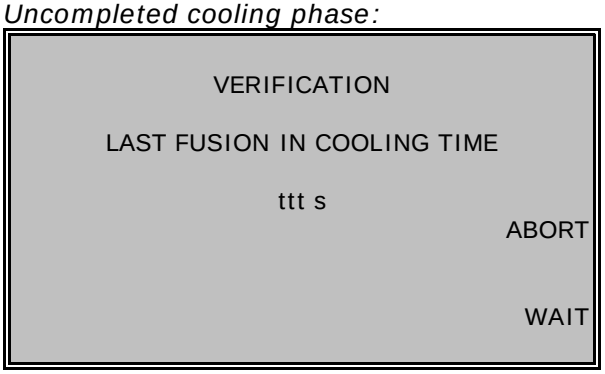


When pressing TWIN on the screen BUTT FUSION CYCLE, the message shown on the side will appear.
Press ACCEPT and proceed to carry out an electrofusion (by switching off, transferring the machine and carrying out the operation or simply by selecting ELECTROFUSION from the main menu in the event of the unit not switched off).

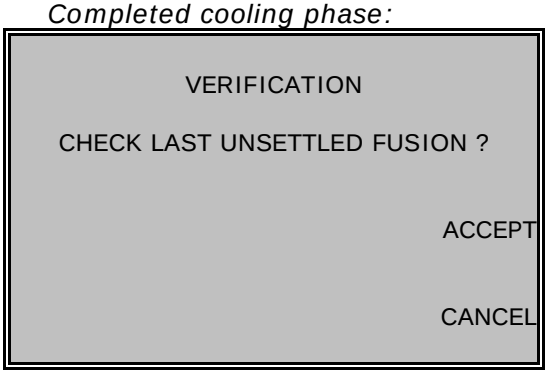
3.2.11 **Simultaneity (TWIN-S only):**

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.
Once the electrofusion and complementary operations have been completed, connect the **TWIN-S** again onto the base framework. Select the main menu HYDRAULIC BUTT FUSION.
Once the operator/order identification step has been completed, the display can show the following screens:

Uncompleted cooling phase:



Completed cooling phase:



In the first option (*uncompleted cooling phase*), the reconnection to the butt fusion menu has been quick and within the time of the cooling phase. Therefore, the message on the display informs that the unit is carrying out the cooling phase as well as the remaining time. Wait until the cycle is finished.

In the second option, the reconnection to the butt fusion programme is carried out once the cooling phase has finished. The message on the display shows the question CHECK LAST UNSETTLED FUSION?. Press ACCEPT and the moving body will carry out the operation of verification in order to ensure that the pipes/fittings are still mounted and fixed on the clamps. Pressing CANCEL the fusion will be stored in the unit's memory as cancelled (OPERATOR'S VOLUNTARY INTERRUPTION).

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.

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.

3.2.12 **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 "CORRECT JOINT" 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 (TWIN-S BOXES)

NOTE !
For units equipped with BlueBox, refer to the *User Guide* GU-78-09.

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.

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).

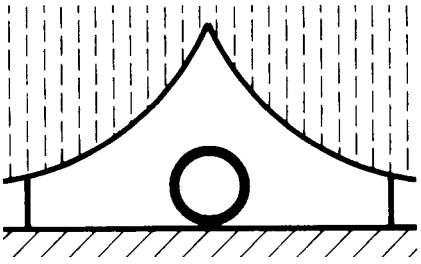


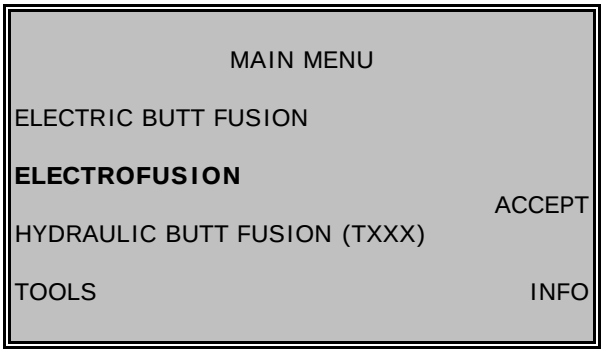
Figure 25

3.3.4 **Unit preparation:**

DANGER Connect the fusion control box to a 230 V ± 15% power source (or to 110V, according to market requirement), of alternating current. For generator specifications, please refer to *CHAPTER 6: TECHNICAL CHARACTERISTICS.*

IMPORTANT NOTES !
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.
Because the unit allows the use of an optic pen or scanner indistinctly, connect the barcode reader to use and check the setup. Refer to clause 3.1.6 - **Using the Barcode Reader**.

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:



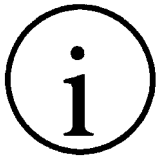
Familiarize yourself with the push-buttons on the panel. The four push-buttons ⬆ ⬇ ➡ ⬅ located below the display are used in general to move the cursor from the messages on screen, whereas the three push-buttons located on the right side are used to carry out functions according to what the display indicates.

The push-button <STOP> is used to interrupt sequences.
Before starting the electrofusion process selecting the ELECTROFUSION option from the main menu, be sure to have selected the correct barcode reader (optic pen or scanner) and setup the manual electrofusion as desired (ON/OFF).

The electrofusion control box allows us the introduction of the fitting data by the following systems:

- Bar-code system
- Manually (via operator)

To active the electrofusion Manual option, please refer to point 3.4.3 - **Unit's setup** of this Chapter (access path: TOOLS/SETUP/ELECTROFUSION/MANUAL).

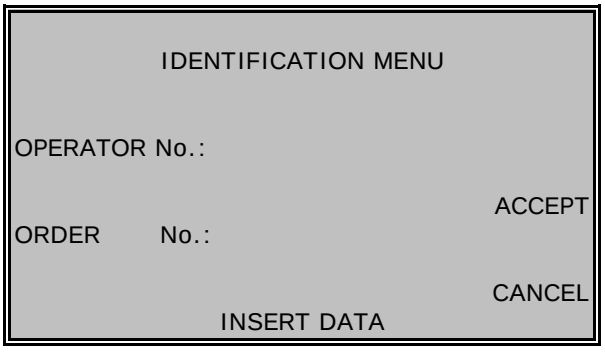


NOTE !
The option INFO allows us to have access to the general information in the machine, as well as to the adjustment of the display's contrast. However, the display contrast can also be adjusted by means or UP and DOWN key arrows once entered in the ELECTROFUSION mode.

Now select the ELECTROFUSION option from the Main Menu and press ACCEPT to start. The joints by electrofusion must be only carried out by qualified personnel.

3.3.5 **Operator and job order identification:**

Once the option has been accepted, the following screen will come on the display:



The identification of the operator No. will take place in this phase via a barcode system. The job order No. identification could be done by barcode or keyboard introduction.
Press ACCEPT both if the identification has or has not been made.

If the unit has the obligation to identify the operator No. and/or job order No., then the identification will be perceptive in order to access the programme of electrofusion.

OPERATOR IDENTIFICATION:

Operator identification is performed in accordance with ISO 12176-3. It can be carried out by means of:

- Barcode system

The operator will automatically be identified by inserting the corresponding identification (via barcode system). From this moment the identification will always be associated to the unit fusions made until:

1. A new identification is entered.
2. Entering the same identification a second time (ON/OFF system).
3. Change of date (at zero hours) or switching off the unit the identification will be deleted (according to the unit's setup: OFF on the first case and ON on the second from the path TOOLS / SETUP / GENERAL / RESET OPERATOR+JOB).
4. The use of the options ON or OFF on OPERATOR ID. (Z2) from the path TOOLS / SETUP / GENERAL.

REMARK !
The operator's identification foresees the automatic change of language according to the card or barcode entered. Besides, in the **TWIN-S** units, the language can also be selected via the path: TOOLS / SETUP / GENERAL / CHANGE OF LANGUAGE (Please refer to SELECTION OF LANGUAGE of this Chapter).

JOB ORDER IDENTIFICATION:

The job order identification can be done by means of:

- Barcode system
- Manually

The order identification will automatically be carried out by inserting the corresponding identification (via barcode system or manually indistinctively). From this moment the identification will be associated to the unit fusions made until:

1. A new identification is entered.
2. Entering the same identification a second time (ON/OFF system).
3. Change of date (at zero hours) or switching off the unit the identification will be deleted (according to the unit's setup: OFF on the first case and ON on the second from the path TOOLS / SETUP / GENERAL / RESET OPERATOR+JOB).
4. The use of the options ON or OFF on JOB ORDER ID. (Z4) from the path TOOLS / SETUP / GENERAL.

OPTIONAL/OBLIGATORY IDENTIFICATION:

Obligatory identification:
In order to make compulsory the operator's and/or job order identification, select ON via the path TOOLS / SETUP / GENERAL:

- OPERATOR ID. (**Z2**): *ON*
- JOB ORDER ID. (**Z4**): *ON*

causing that the identification of operator and job order to be compulsory. This option obliges the operator to identify the operator's and/or job order number daily or when the units is switched on (depending on the *OFF* or *ON* setup of option RESET OPERATOR+JOB) in order to access the fusion menus.

Optional identification:

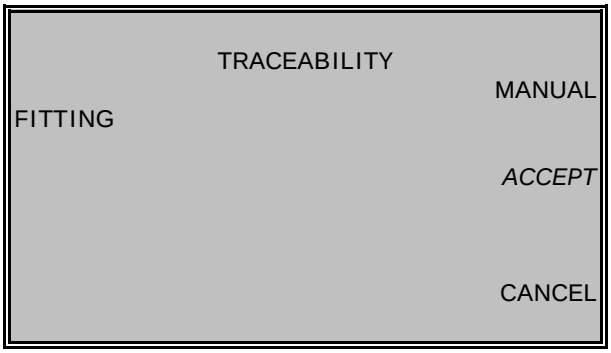
In order to make optional again the operator's and/or job order identification, selecting OFF via the path TOOLS / SETUP / GENERAL:

- OPERATOR ID. (**Z2**): *OFF*
- JOB ORDER ID. (**Z4**): *OFF*

makes the operator and/or job order identification optional (the unit goes back to its previous setting), that is, the fusion unit will be able to carry out fusions with and without the operator and/or job order identification indistinctively (in the latter there will be no traceability of the job in process and his/her operator: this data will not be registered).

3.3.6 **Fusion jointing traceability:**

When the TRACEABILITY option on the SETUP/GENERAL menu is enabled (ON), and after having pressed ACCEPT on the operator and job identification screen, the following screen will appear:



When traceability is enabled (ON), two situations can occur:

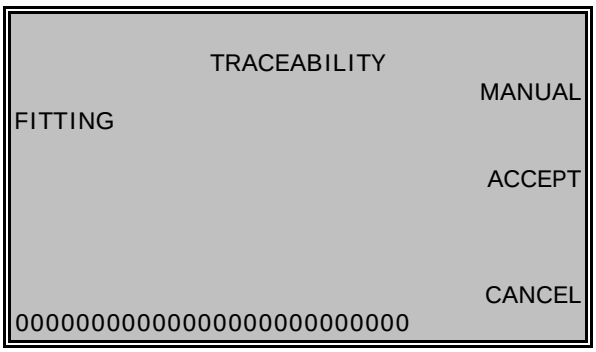
a) Optional traceability:
REQUIRED TRACEABILITY *OFF*.
b) Required traceability:
REQUIRED TRACEABILITY *ON*.

The *optional traceability* selection allows the operator to optionally enter the traceability barcode data of the electrofusion fitting and/or components (the traceability barcode of the components that make up the electrofusion could be entered or not, depending if they are available or not). Once the fitting barcode has been entered, the components to be coded will appear on the screen, ranging from one to two, according to the type of fitting.
ACCEPT will only appear on the screen with the *optional traceability* selection.
Pressing ACCEPT continues with the electrofusion process without traceability.
Pressing CANCEL returns to the previous screen.
Pressing MANUAL allows manual entry of component and fitting codes.

- **Code data entry via bar-code reader:**

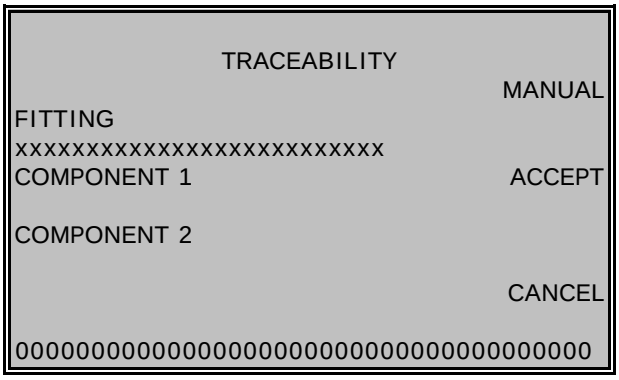
Enter the fitting traceability code.
Once the FITTING code has been entered, the code field names of the components will appear on the screen (ranging from one to two, according to the type of fitting to be electrofused).
Enter the traceability code of the components.
Press CANCEL to return to the very last code.
After completion of the last entry, ACCEPT will once again appear on the screen. Press to continue with the fusion jointing cycle.

- **Manual code data entry:**



After pressing MANUAL, ACCEPT will appear on the screen with a code string of 26 zeroes at the bottom. These numbers can be changed individually via the keyboard. Press ⬆ or ⬇ to change values from 0 to 9; press ➡ or ⬅ to move the cursor right or left, respectively.

After having entered the fitting code, press ACCEPT to validate it. The code will be recorded on the next line after FITTING. Upon entering the first code, the ACCEPT option will disappear from the screen, which will then display the field names of the following codes (COMPONENTS).
Follow the same component code entry as was performed for the fitting.



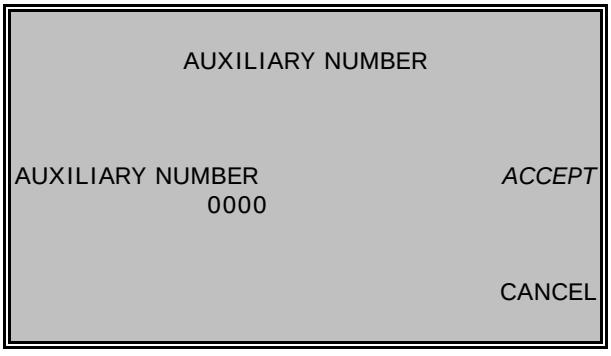
After pressing MANUAL, a code string of 40 zeroes appears at the bottom of the screen. Each number can be changed individually via the keyboard. Press ⬆ or ⬇ to change values from 0 to 9; press ➡ or ⬅ to move the cursor right or left, respectively.

Once having entered the COMPONENT 1 code, press ACCEPT to validate it. The code will be recorded on the next line after COMPONENT 1. The ACCEPT option will disappear from the screen.
Repeat the process until completing the rest of the components.

The coding is in agreement with the criteria set forth in ISO 12176-4. If an incorrect code is entered, the message “INCORRECT READING OR INVALID DATA” will appear at the bottom of the screen.
Press ACCEPT to continue with the electrofusion process, or CANCEL to return to the previous point.

3.3.7 **Auxiliary number:**

When the AUXILIARY NUMBER option on the SETUP/GENERAL menu is enabled (ON), and after having pressed ACCEPT on the previous screen (pipes location or traceability, according to the setting), the following screen will appear:



Use the keyboard to enter the Auxiliary number.
These numbers can be changed individually by pressing ⬆ or ⬇ to change values from 0 to 9; press ➡ or ⬅ to move the cursor right or left, respectively.

Press ACCEPT to continue with the fusion jointing process, or CANCEL to return to the previous point.

3.3.8 **Preparation of the electrofusion:**

Having optionally executed the operator/job identification operation, and that of traceability and auxiliary number (if enabled), the following message will appear:

```
                FITTING DATA

FITTING:
DIAMETER:
INPUT DATA:                          MANUAL
REAL RES:       ------ Ohm


                FUSION DATA ?        CANCEL
  20°C    231 Volt    50 Hz     N.00001
```

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.

NOTE !	
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.	

Enter the fitting's electrofusion data via the bar-code system. In the case to be active the manual option, *MANUAL* would appear beside the central push-button.

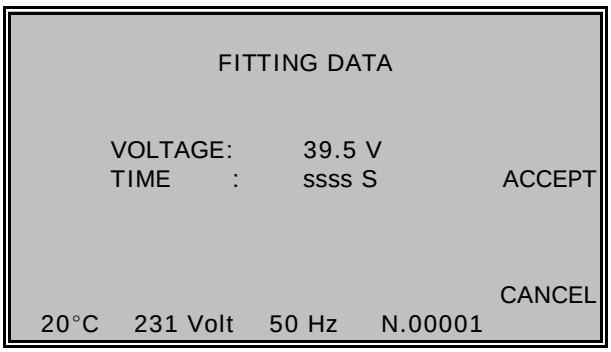
BAR-CODE SYSTEM

If you read the fitting's data by using optical means (optic pen or scanner), connect the reader device into the corresponding connector and slide it (barcode reader) or put it in front of the fitting's bar-code (scanner).

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.

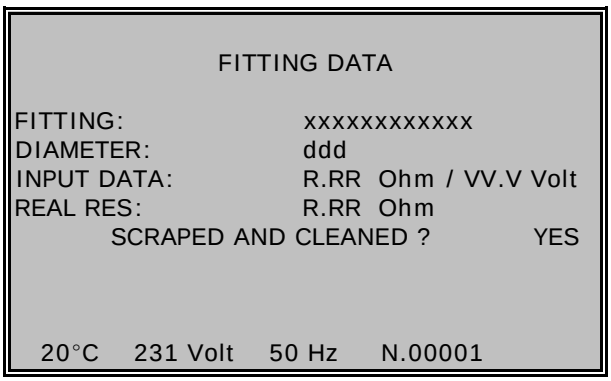
LOADING DATA MANUALLY

If the system of fitting data introducing is manual, once the fitting is connected to the control box cable terminals, press MANUAL push-button of FITTING DATA screen. The following message will be showed on the display:



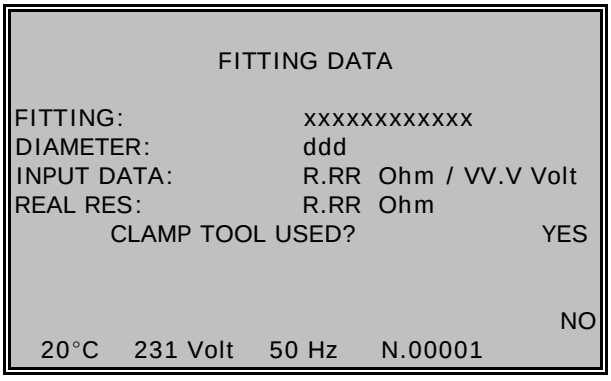
Then the operator should select the fitting voltage value and electrofusion time following the fitting manufacturer information.
The voltage showed on the screen will always be **39.5 V** by default. Press ⬆ arrow to increase the value and ⬇ arrow to reduce it. A change of 0.5 V will be obtained for each pressing.

Pressing ➡ access is gained to TIME. Once in time parameter, press ⬆ and ⬇ arrows in order to increase or decrease the electrofusion time. Press ACCEPT to continue or CANCEL to go back to the previous screen.
Once the fitting data has been introduced (via any of the two possible systems described above), the display will show the following message.



The fitting description, size and coded resistance will be on the screen only in the case of bar-code system has been used.
The REAL RES corresponds to the value of the resistance read on the fitting, whereas the INPUT DATA corresponds to the resistance and voltage values provided by the bar-code.

If the resistance value between the INPUT DATA and the REAL RES. 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.
Press YES to continue. The screen will change to:



Press YES or NOT according the fitting installation used.

Pressing either YES or NOT (the use or not of the clamp tool will be recorded in the fusion records), the following screen will be:

```
                FITTING DATA

FITTING:              xxxxxxxxxxxx
DIAMETER:             ddd
INPUT DATA:           R.RR  Ohm / VV.V Volt
REAL RES:             R.RR  Ohm
                                    START


                                    CANCEL
  20°C    231 Volt    50 Hz     N.00001
```

By pressing CANCEL you will go back to the initial electrofusion (FUSION DATA?).
By pressing START, the unit starts the electrofusion cycle providing the voltage and intensity programmed by the fitting's manufacturer and the fusion time established according to the correction made depending on the room temperature.

⚠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.
The time and the countdown till you get to zero will come on the display in seconds.

NOTICE !
For safety reasons, should you not press the button START during the starting phase of the electrofusion, after 40 seconds the process will be cancelled taking you back to the initial screen FUSION DATA ?.

```
                FITTING DATA

FITTING:              xxxxxxxxxxxx
DIAMETER:             ddd
INPUT DATA:           R.RR  Ohm / VV.V Volt
REAL RES:             R.RR  Ohm

FUSION TIME:  ttt  s
MESSAGE ERROR

  20°C    231 Volt    50 Hz     N.00001
```

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.

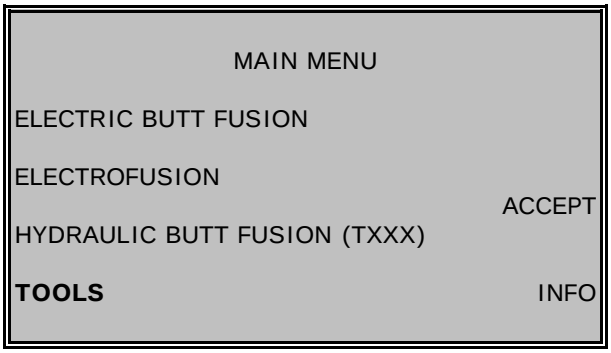
```
                FITTING DATA

FITTING:              xxxxxxxxxxxx
DIAMETER:             ddd
INPUT DATA:           R.RR  Ohm / VV.V Volt
REAL RES:             R.RR  Ohm

COOLING TIME:  tt  min.
CORRECT JOINT
                                    GO
  20°C    231 Volt    50 Hz     N.00001
```

If the electrofusion cycle is completed satisfactorily, the message "CORRECT JOINT" will be displayed, along with the perceptive cooling time provided that it has been given by the fitting's manufacturer.
Press GO to carry out another electrofusion or abandon the menu.

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.

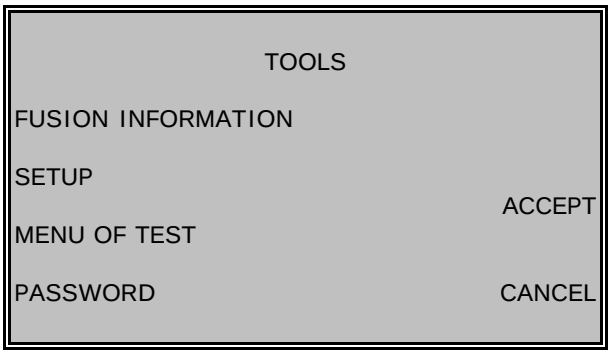
3.4 TOOLS

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



Select TOOLS by placing the cursor on the word by means of the arrows ⬆ and ⬇ on the panel. Then press the button next to ACCEPT.

The following MENU will appear:



Choose the desired option among FUSION INFORMATION, SETUP, MENU OF TEST and PASSWORD by placing the cursor on the word by means of the arrows ⬆ and ⬇ on the panel. Then press the button next to ACCEPT.

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

3.4.1 **Access to restricted options (PASSWORD):**

There are certain options whose access is protected. In order to have access to these options, you need previous identification by means of a **PASSWORD** bar-code. The following LEVELS of access are established:

● OPEN: FREE ACCESS.

There is no need to enter a PASSWORD. It allows access to:

1. The three fusion options (ELECTRIC BUTT FUSION, ELECTROFUSION and HYDRAULIC BUTT FUSION).
2. INFO.
3. The two options in check fusion records.
4. Both send data to PC options.
5. Both printing options.
6. The change of language.
7. Entering a PASSWORD code.
8. Reading system (optic pen/scanner).
9. Hydraulic butt fusion 315H/T160/T250/T315/T315G/T400/T500.
10. Polycontrol.
11. Change of Block, Material, ON/OFF pipe records and Material selection on butt fusion.
12. Choice of TRIMMER 24V ON/OFF.

● AUTHORISED OPERATOR: PASSWORD 1.

Apart from the options OPEN LEVEL, it allows access to:

1. All the options from MENU OF TEST except the option SERVICE.

● OWNER/DISTRIBUTOR: PASSWORD 2.

Apart from the options OPEN LEVEL and AUTHORISED OPERATOR, it allows access to:

1. Both delete fusion records options.
2. Change of date and time.
3. Option/Obligation operator/order's identification.
4. Traceability and traceability requirement.
5. Auxiliary number.
6. Memory overflow.
7. Format Memory Card.
8. Print setup.
9. Clear RAM.
10. Cleaning of the pipe ends before or after trimming.
11. Reduced time.
12. Motor with encoder.
13. To make active or not the MANUAL electrofusion option.
14. Change of setting on operator and/or job order when the identification is compulsory.

● SERVICE: PASSWORD 3.

It is restricted to the technical service centres of ACUSTER GLOBAL, S.L. Apart from the options OPEN LEVEL, AUTHORISED OPERATOR and OWNER, it allows access to:

1. The Service option from the MENU OF TEST.

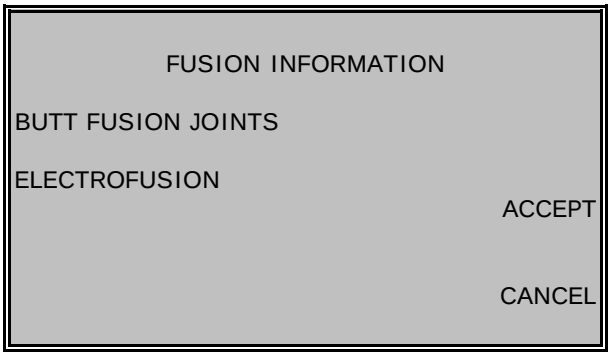
By selecting the option **PASSWORD** from the TOOLS or by requesting directly an option with Password, the following message will appear on display:

Enter the corresponding **PASSWORD** via bar-code (see LEVELS of access mentioned above).
The message "PASSWORD X OK" will be displayed, where X could be 1, 2 or 3 according to the level used.

In the case of introducing an incorrect bar-code with incorrect information or which has been introduced in an unsatisfactory way, the display will show the message “WRONG PASSWORD OR WRONG READ” flashing during 3 seconds. Repeat the password bar-code introduction.
Once the password is accepted, press EXIT to validate command.
From this moment, the restricted options that the introduced password level have opened, will be accessible.
The effect of the access key is lost automatically, either when switching off the machine via the main switch, or going back to the MAIN MENU.

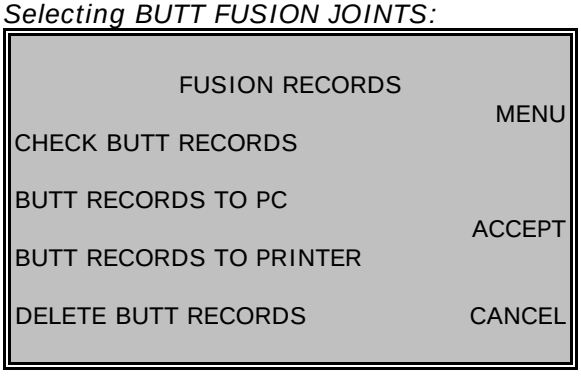
3.4.2 **Fusion information (fusion records):**

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

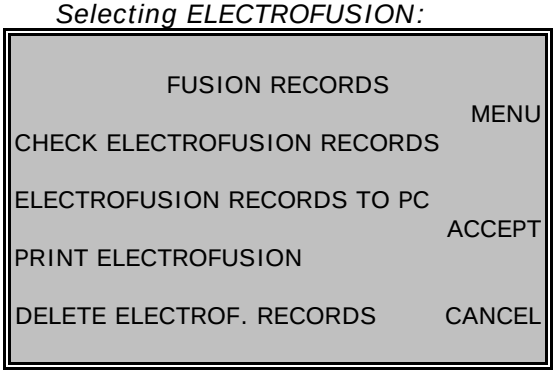


Now select BUTT FUSION JOINTS or ELECTROFUSION depending on what you want to access.
Press ACCEPT to validate command and CANCEL to go back to previous menu.

Selecting BUTT FUSION JOINTS:



Selecting ELECTROFUSION:



The first option on both screens (CHECK BUTT RECORDS and CHECK ELECTROFUSION) are of free access and allows us to see the butt fusion records and the electrofusion records respectively, directly on the screen.
If you press ACCEPT, the record of the last fusion carried out will be displayed. Press ⬆ in order to access the previous records.
Press CANCEL to go back to the previous menu and MENU to go to the main menu.

❶ DIRECT CONSULTATION ON DISPLAY OF THE UNIT:

By selecting the option CHECK BUTT FUSION RECORDS (**TWIN-S/DYNAMIC-S**):

```
          CHECK BUTT RECORDS
No. NNNNN/nnnn      DD/MM/YY        ↑
MATERIAL   ddd      SDRXX   BLOCK
OPERATOR: xxxxxxx
ORDER: xxxxxxxxxxx
START: HH:MM   END: HH:MM
TEMP: xx°C   HEATER: yyy°C        – >
DRAG FORCE:  nN
FUSION FORCE:   nnnN             CANCEL
RED: dd.d mm
MESSAGE OF THE RESULT
```

Where:
No. NNNNN/nnnn corresponds to the last fusion number made/additional number (press ⬆ to access previous fusions).
DD/MM/YY is the date in which fusion has taken place.
MATERIAL/ddd/SDRXX/BLOCK corresponds to the material, diameter and SDR of the pipe/fitting used and name of the Block used in the fusion (ISO, GN,..).

OPERATOR/ORDER corresponds to the operator's number and order's number if this data has been entered (if not, dashes will appear).
START/END refers to the starting and ending time of the fusion respectively.
TEMP/HEATER corresponds to the room temperature and the heating plate's temperature.
DRAG FORCE/FUSION FORCE corresponds to the drag force read and the fusion force programmed.
In **MESSAGE OF THE RESULT** the one corresponding to each case will appear (CORRECT, USER'S INTERRUPTION, etc).

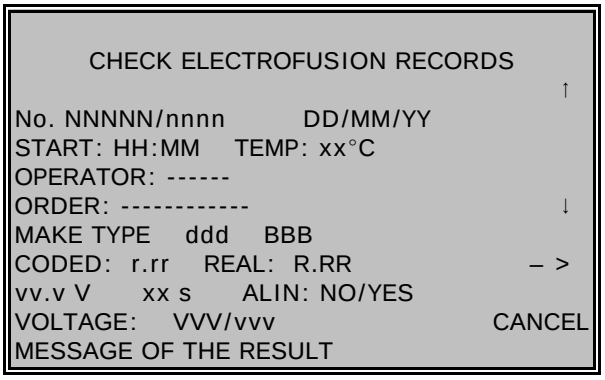
In the event of having butt fusion records with traceability, press – > to access the second screen:

```
          CHECK BUTT RECORDS
No. NNNNN/nnnn      MM/DD/YY        ↑

COMPONENT 1
PIPE A  BB   PE80  ddd   SDR CC      ↓
COMPONENT 2
PIPE A  BB   PE80  ddd   SDR CC     <–

                                  CANCEL
```

Where:
No. NNNNN/nnnn corresponds to the butt fusion number/additional number queried.
COMPONENT 1 and **2** are the codes of the component data returned.
PIPE: where **A** refers to straight or coiled; **BB** corresponds to the pipe manufacturer initials; **PE80**, to the plastic resin; **ddd** to the pipe diameter, and **SDR** to the pipe wall thickness.

Press <– to exit the traceability screen and return to the previous one.
Press ⬆ to access to previous fusion records and ⬇ to access next ones.

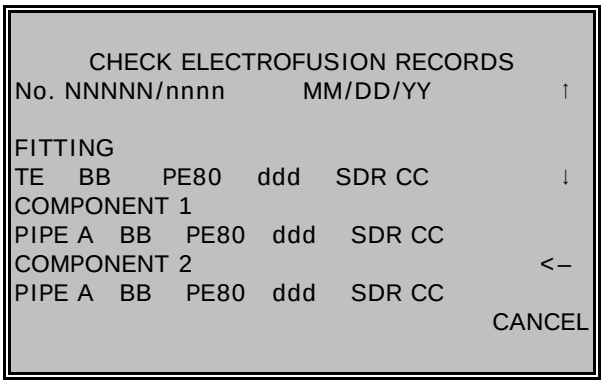
By selecting the option CHECK ELECTROFUSION RECORDS (**TWIN-S**):



Where:
No. NNNNN/nnnn corresponds to the last fusion number made/additional number (press ⬆ to access previous fusions).
DD/MM/YY is the date in which fusion has taken place.
START/TEMP corresponds to the starting time of the electrofusion and the room temperature at the time.

OPERATOR/ORDER corresponds to the operator's number and order's number if this data has been entered (if not, dashes will appear).
MAKE/TYPE/ddd/BBB correspond to the make of the fitting, the type of fitting (coupler, saddle, etc.), its diameter and the batch number (if it has been codified by the fitting's manufacturer).
CODED/REAL refers to the coded resistance codified by the manufacturer and to the real value registered by the fusion unit.
vv.v V/xx s/ALIN corresponds to the fitting's electrofusion voltage, the fusion time whether a clamp tool has been used in the process or not.
In **MESSAGE OF THE RESULT** the one corresponding to the case appears (OK, USER'S INTERRUPTION, etc).

In the event of having electrofusion records with traceability, press – > to access the second screen:



No. NNNNN/nnnn corresponds to the electrofusion No./additional No. queried.
FITTING: Type, manufacturer initials, material, diameter and SDR.
COMPONENT 1 and **2** are the codes of the component data returned.
PIPE: where **A** refers to straight or coiled; **BB** corresponds to the pipe manufacturer initials; **PE80**, to the material; **ddd** to the pipe diameter, and **SDR** to the pipe wall thickness.

Press <– to exit the traceability screen and return to the previous one.
Press ⬆ to access to previous fusion records and ⬇ to access next ones.

❷ EXPORTING FUSION RECORDS:

For exporting fusion records through computer or memory stick, please refer to the **AcusWin** *User Guide*.

❸ RETRIEVAL OF FUSION RECORDS:

For the retrieval of fusion records exported through computer, refer to **AcusWin** *User Guide*.
If the exportation has been done through a memory stick, the exported binary files .dat, can be added to the AcusWin database (AcusWin version 5.4.9 or higher installed on the computer): refer to **AcusWin** *User Guide*. However, if the software AcusWin is not installed on the computer or has a version lower than 5.4.9 (*), the exported binary files .dat can be converted to a csv format files from the web site www.acuster.com/convert.

1. Select the tab: + *Add files (.dat)*
2. Browse and open the file or files where is or are copied.
3. The file or files opened will be shown on the screen. Click *Start*.
   If more than one file has been uploaded, click *Start upload* from the upper toolbar. *Cancel upload* deletes the file or files uploaded.

4. Click on the file: on the example FUS001.dat; the file will be downloaded in a *CSV format file (Comma-Separated Values) that can be open by any spreadsheet software like LibreOffice®, Microsoft Excel®, Google Docs®, etc. or imported from your own database.
5. Select *Delete* to remove the file or files downloaded.
6. Exit the web site.

(*) The upgrade of the software version can be done through the web site www.acusterglobal.com / Downloads / Other Documents / Software Acuswin ODS.

❹ PRINTING FUSION RECORDS:

If you wish to have a hardcopy of the fusions carried out, you can print the records by connecting:

- A serial printer into the serial connector by means the serial transmission cable.

Printer setup (for the first time):

Before using the serial printer on the electrofusion unit, be sure that the printer's *DIP-Switches* are correctly selected. The setup for a printer Citizen, model CT-S280, is the following:

	1	2	3	4	5	6	7	8
ON	x	x				x	x	
OFF			x	x	x			x

The generic setup for an appropriate data print-out on other printer's brands and models is:

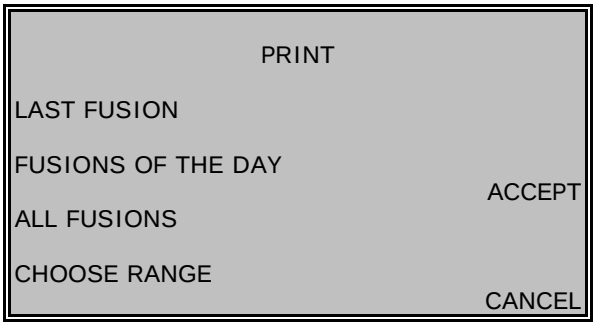
- XON/XOFF
- 8 bits
- Parity: NONE
- 19200 Bauds
- 1 Stop bit

Printing:

Once this connection has been made, start the Unit and the printer (it is not necessary for the Electronic Control Module to have all the elements connected: heating plate, trimmer, base framework).

CAUTION !
Do not connect or disconnect the printer cable connector when the unit is running. The CPU printer communication component could be damaged.

To continue with the available options on the screen FUSION RECORDS, the third option corresponds to BUTT RECORDS TO PRINTER and PRINT ELECTROFUSION (depending on the model and selection made).
Both printing options are of free access and allow us, having been previously connected to a standard parallel printer, to print the fusion records in different ways.
If you press ACCEPT on either of the two printing options, the following screen will be displayed:



Use the arrows ⬇ and ⬆ to select the desired option.
Press ACCEPT and the printer process will start instantly in all options except in CHOOSE RANGE.
CANCEL will take you back to the previous screen.

NOTE !
Should the printer not be connected, have run out of paper or suffered any other eventuality, the message "PRINTER W/O PAPER OR ERROR" will appear on the screen.

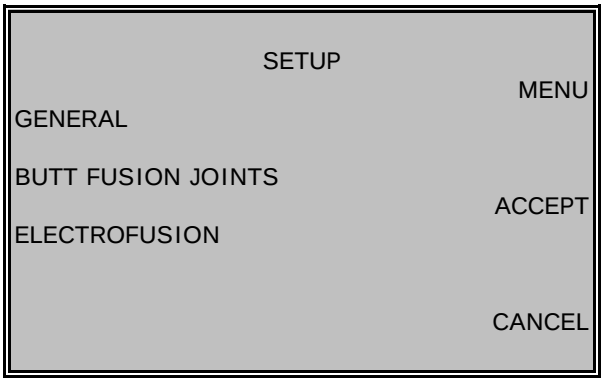
❹ <u>DELETION OF FUSION RECORDS:</u>

The other two DELETE options of both FUSION RECORDS menus (BUTT FUSION and ELECTROFUSION), are used to rub off the storage of the existing records from the unit's internal memory.
The counter keeps track of the numbering.

NOTICE !
The deletion of the fusion records from the unit's memory has a restricted access. Enter PASSWORD 2 access. Refer to point *3.4.1 - Access to restricted options* of this CHAPTER.

3.4.3 **Unit's setup:**

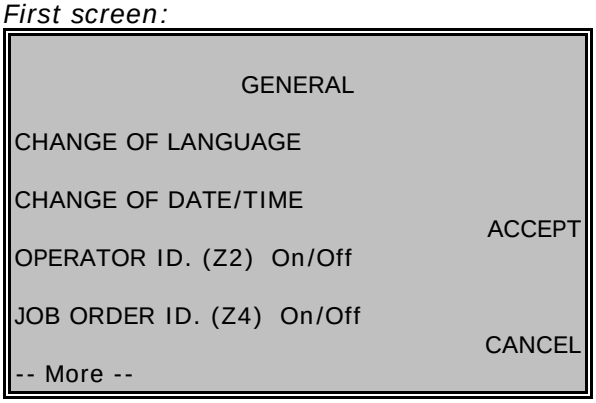
By selecting **SETUP** from the TOOLS menu, you will access the menu:



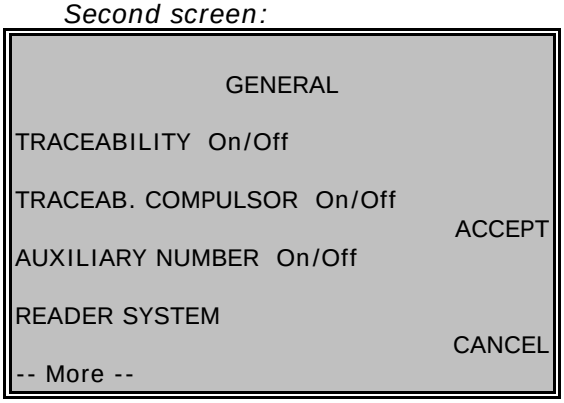
Use the arrows ⬇ and ⬆ to select the desired option.
Press ACCEPT to access to the options of the selected menu.
CANCEL returns the user to the previous screen.

● GENERAL

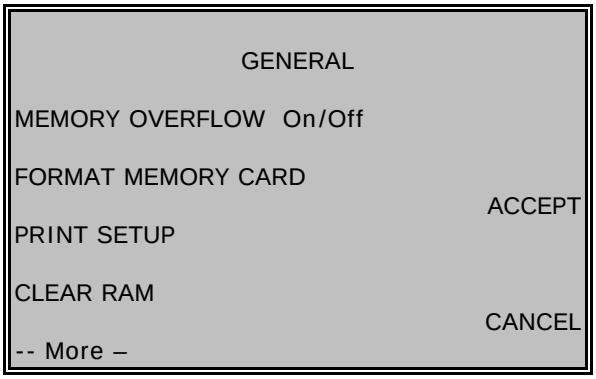
First screen:



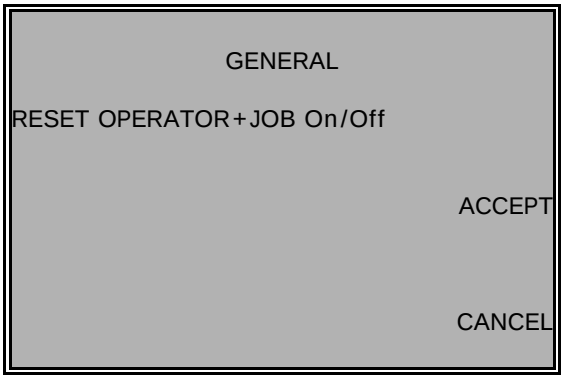
Second screen:



Third screen:

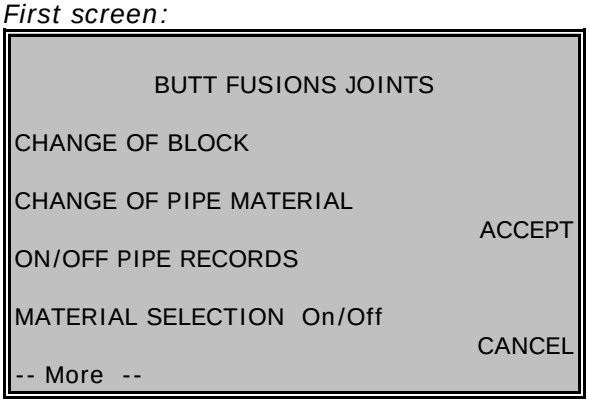


Fourth screen:

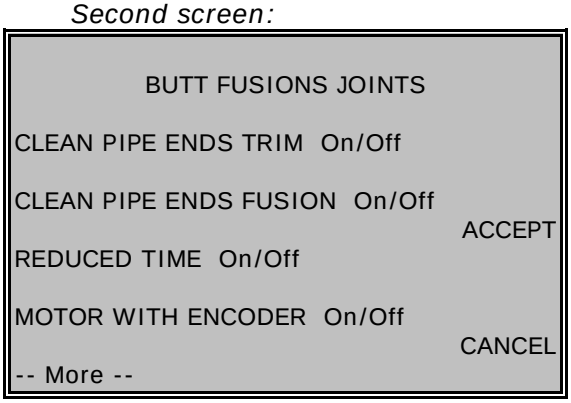


● BUTT FUSION JOINTS

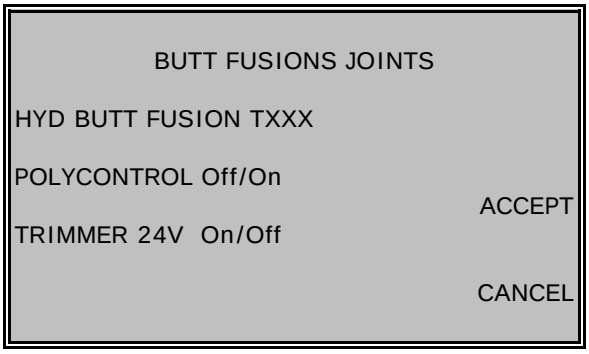
First screen:



Second screen:

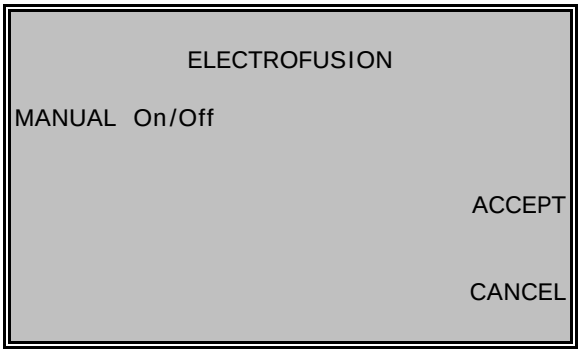


Third screen:



● ELECTROFUSION

First screen:

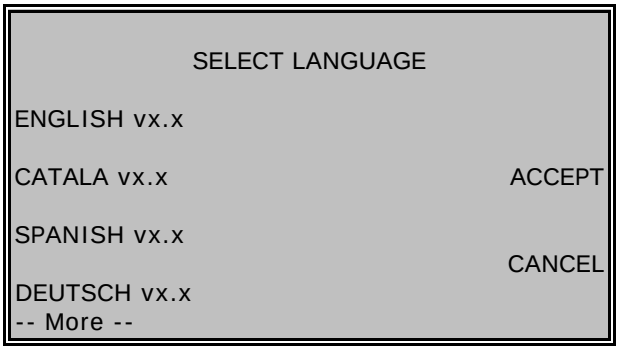


① SELECTION OF THE LANGUAGE

The selection of the language is of free access (PASSWORD is not required).
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 ACCEPT to go back to Main Menu).

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 the first one that has been loaded into the machine.

The first option on the TOOLS/SETUP/GENERAL menu allows us to select the work language among those currently supported (new languages my be introduced based on demand).



Now select the desired language by placing the cursor on the chosen one using the arrows ⬆ and ⬇ on the panel. Then press the button next to ACCEPT to validate command.

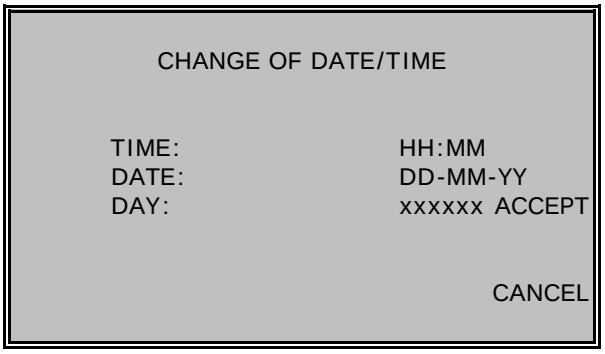
By selecting CANCEL we will go back to the MAIN MENU without changing the language.

② 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 PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.

Select CHANGE DATE/TIME from the SETUP menu by moving the cursor with the arrows ⬆ and ⬇ on the panel. Press ACCEPT to select.
By selecting the option CHANGE DATE/TIME we can update the time, the date and the day of the current week.



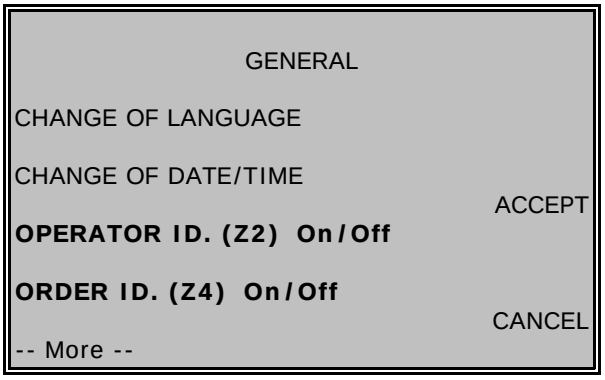
Where HH:MM correspond to hour and minutes, DD:MM:YY correspond to day, month and year, and finally xxxxx correspond to the day of the week.
Press the arrows on the panel to make changes.
Press ACCEPT to validate the change and CANCEL to exit without modifying anything.

INFORMATIVE NOTE !
The date could be also displayed on American system: MM-DD-YY, or the according to ISO: YY-MM-DD. The above selection is only done by Acuster global, S.L. when the initial unit software loading.
From unit's software version v6.25 and AcusWin version v.5.3.0, the date and time will be automatically updated on the unit being taken from the PC's data when exporting fusion records.

③④ OPTIONAL/OBLIGATORY IDENTIFICATION OF THE OPERATOR/JOB

This option in the TOOLS/SETUP/GENERAL menu allows us to establish the option or obligation of the operator/job identification according to the criteria established by the joints traceability.

NOTICE !
This selection has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.
From software version v. 6.67, this option becomes On by default on TWIN units equipped with BLUEBOX.



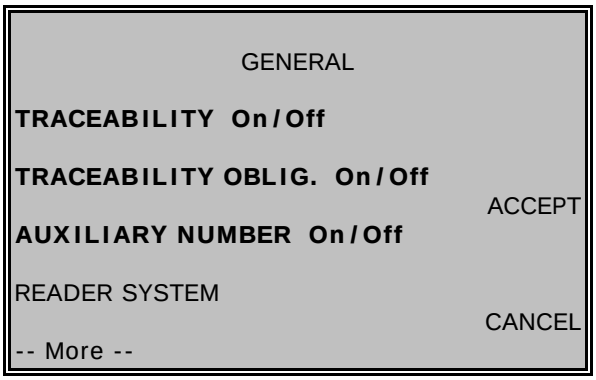
Place the cursor on the desired option, OPERATOR ID (Z2) and/or ORDER ID (Z4). By pressing ACCEPT the ON/OFF selection is changed alternatively.
By selecting OFF, the operator's identification and/or the order's is optional, while pressing ON, the identification of one or both of the options (according to selection), is compulsory: *traceability implantation*.

With the set option "optional" (*OFF*), the information displayed on the screen INFO will be **Z20** for the operator and **Z40** for the job order.
With the set identification option "obligatory" (*ON*), the information displayed on the screen INFO will be **Z21** for the operator and **Z41** for the job order.
Once the desired selection has been made, press CANCEL to exit the option.

⑤⑥⑦ TRACEABILITY IN ACCORDANCE WITH ISO 12176-4 / AUXILIARY NUMBER

The ODS fusion control boxes (beginning with fusion control box software version 6.10 and AcusWin v5.0) allow performing complete fusion jointing traceability.
The following options are available selecting TOOLS/SETUP/GENERAL from the main menu:

NOTICE !
This selection has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.
From software version v. 6.67, this option becomes On by default on TWIN units equipped with BLUEBOX.



Pressing ACCEPT toggles between ON/OFF for the field selected.
When selecting TRACEABILITY *OFF*, the unit operates as if this option were non-existent.
When selecting TRACEABILITY *ON*, the unit allows entering fusion jointing component code data.

Setting AUXILIARY NUMBER to *OFF* causes the unit to operate this feature did not exist.
Setting AUXILIARY NUMBER to *ON* the fusion box allows entering a complementary number linked to the fusion number.

Once having set the traceability option to ON, the following TRACEABILITY OBLIG.. option can now be toggled between ON/OFF.
When selecting TRACEABILITY OBLIG. *OFF*, the unit allows the optional entering of fusion jointing component code data.
When selecting TRACEABILITY OBLIG. *ON*, the unit is configured to require entry of fusion jointing component code data.

Once the desired selection has been made, press CANCEL to exit the option.

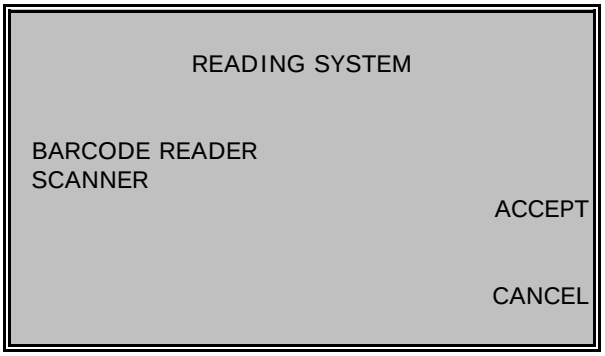
⑧ SELECTION OF THE BAR-CODE READING SYSTEM

The fusion control units allow us to get the recorded data by the bar-code system via:

- Optic pen
- Scanner

In order to do so, you need to previously select one of the devices to be used when reading.

Select READER SYSTEM from the TOOLS/SETUP/GENERAL menu by moving the cursor with the arrows ⬆ and ⬇ on the panel. Press ACCEPT to select.
By selecting this option we can change the reading device of the bar-code system.



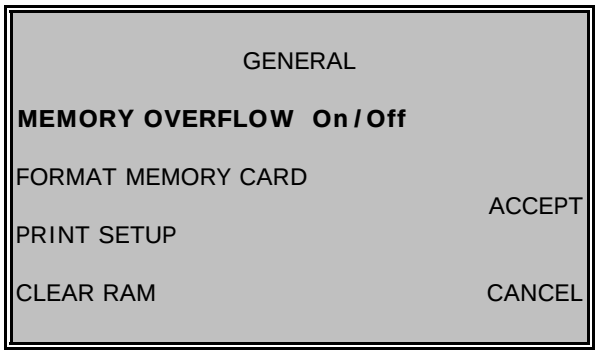
Place the cursor on the desired option by means of the arrows ⬇ and ⬆ on the panel.

Press ACCEPT to validate the change and CANCEL to exit without modifying.

⑨ MEMORY OVERFLOW

This option from the TOOLS/SETUP/GENERAL menu allows us to overwrite or not the existing fusion records on both the internal memory and Memory Card (if equipped).

NOTICE !
This selection has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.



Place the cursor on MEMORY OVERFLOW option.
Press ACCEPT to select the desired option (ON or OFF).
Selecting ON, the unit will continue loading the fusion records even when the memory is full: the first fusion records will be overwritten and lost.

Selecting OFF the unit will be blocked when the memory capacity was full.
Once the desired option is selected, press CANCEL to exit this menu.

⑩ FORMAT MEMORY CARD

Please refer to the **AcusWin** *User Guide*.

⑪ PRINTING UNIT'S SETUP

By selecting **PRINT SETUP** from the TOOLS/SETUP/GENERAL menu and pressing ACCEPT (having been connected to a printer), the setup with which the unit has come out of the factory will be printed.

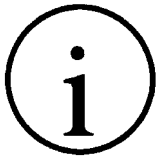
NOTICE !
Do not connect or disconnect the printer cable connector when the unit is running. The CPU printer communication component could be damaged.
The selection of setup printing has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.

The printed data of the above mentioned setup using a serial printer correspond to:

- All INFO screen data (model, Serial No., software and language version, date and time, client's name, memory overflow on/off, Memory Card option, measuring units, bar-code reader, hydraulic base framework selection, operator's and job order information, butt fusion and electrofusion counters status and date of last revision).
- All On/Off options from the Setup Menu.
- All On/Off options from the Service Menu as well as the calibration values.
- Setup of the maximum and minimum temperature range for electrofusion.
- Loaded blocks for butt fusion (if the print-out is made using a parallel printer, if the Centronics connector is fitted on the fusion box, additionally the pipe material, the maximum and minimum temperature range setup and all the butt fusion parameters of all the loaded blocks in the unit are printed).

⑫ CLEAR RAM

This option must be always done after a new unit "**Send software**" telecharge.



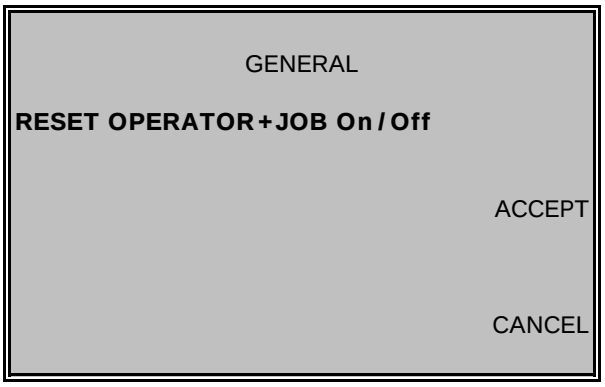
NOTICE !
The selection of CLEAR RAM has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.

Press ACCEPT to clear Ram. If this selection in not performed, the data stored on the Ram will not be updated because the new programme loaded through a PC has been directed to the unit safety memory. By pressing CLEAR RAM from the SETUP menu the existing data in the Ram is replaced by the new one loaded on the safety memory.
The fusion records are kept stored in memory.

(13) SETTING OF IDENTIFICATION OF OPERATOR & JOB ORDER WHEN OBLIGATORY

This option in the TOOLS/SETUP/GENERAL menu allows us to establish the delete setting of operator and/or job order identification when they are obligatory (OPERATOR ID. (Z2) and/or JOB ORDER ID. (Z4) selected ON) according to the criteria established by the company.

NOTICE !
This selection has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.



Place the cursor on the RESET OPERATOR+JOB option. By pressing ACCEPT the ON/OFF selection is changed alternatively.
By selecting OFF, the operator's and/or job order's identification is kept till the change of date, while pressing ON, the identification of one or both of the options (according to selection), is kept till the unit is switched off.

Once the desired selection has been made, press CANCEL to exit the option.

❶❷❸ SELECTION OF THE BUTT FUSION SYSTEM (**TWIN-S / DYNAMIC-S** BOXES)

The fusion control units have the possibility of butt fusing different plastic resins (PE80, PE100, PP, etc), as well as programming the unit so that it can carry out fusion cycles according to different norms or specifications, such as ISO, DVS, Sedigás, Electrabel, WIS (Water Industry Specification), Transco (BG), etc.
As a preliminary condition, in order to choose the desired butt fusion system, this must be loaded into the unit's memory. If not, ask the manufacturer.
The selection BLOCK, MATERIAL and ON-OFF PIPE RECORDS is of free access (PASSWORD is not required).
To choose the fusion system, select the option **BLOCK** from the TOOLS/SETUP/BUTT FUSION JOINTS menu.

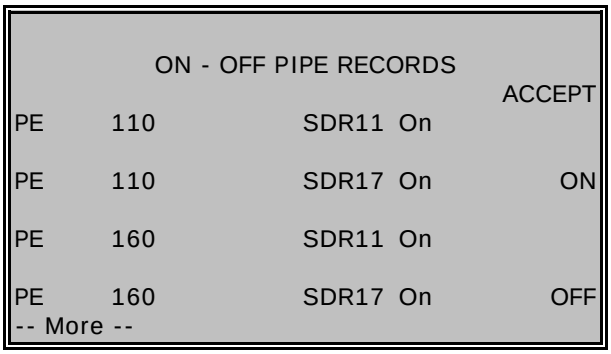
● CHANGE OF BLOCK:

By selecting CHANGE OF BLOCK, the screen shows the different options loaded into the unit, which correspond to recognised butt fusion systems: ISO, Electrabel ,etc. Each BLOCK has a series of PIPE RECORDS.
Each PIPE RECORD corresponds to material, diameter and pipe wall thickness, and it has the fusion and verification parameters.
When selecting a specific BLOCK, the automatic selection of a material is activated by default (e.g. PE80).

● CHANGE OF PIPE MATERIAL:

If on the PIPE RECORDS comprised in the Block there is a different material from the one selected by default, e.g. PE100, select the option CHANGE OF PIPE MATERIAL from the Setup Menu in order to change the selection of material by default.

● ON - OFF PIPE RECORDS:

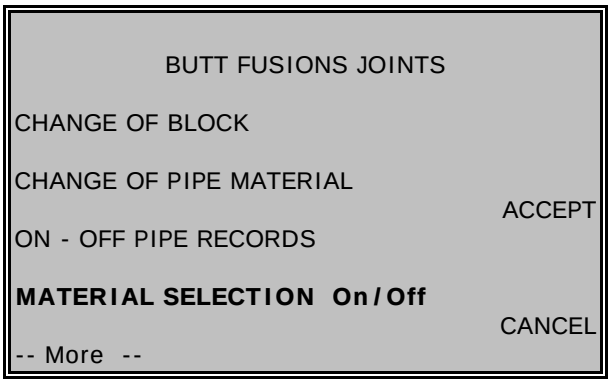


Having selected the BLOCK, it is possible to restrict the diameters and SDRs through the option ON - OFF PIPE RECORDS from the Setup Menu. All you have to do is move the cursor with the arrows ⬇ and ⬆, pressing OFF or ON as desired. The selected OFF will not appear available when choosing the pipe to be jointed.

Press ACCEPT to go to previous screen.

❹ MATERIAL SELECTION (**TWIN-S/DYNAMIC-S** BOXES)

The last option of this screen is used to configure the unit in such a way that it allows the operator (ON selection) to choose the material in each butt fusion (in addition to diameter and SDR). When set to OFF, the material is chosen via the CHANGE PIPE MATERIAL option on this same menu (standard option).
The selection MATERIAL SELECTION is of free access (PASSWORD is not required).

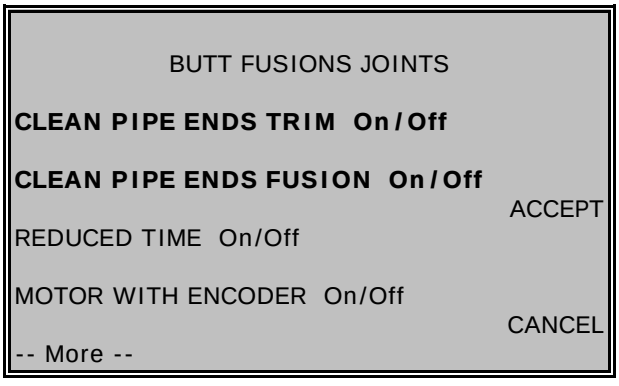


Pressing ACCEPT toggles between ON/OFF for the field selected.
Once the desired selection has been made, press CANCEL to exit the option.

❺❻ PIPE ENDS CLEANING (**TWIN-S/DYNAMIC-S** BOXES):

These two options allows us to settle the display of the message "PIPE ENDS CLEANED ?" before of after trimming, according to applicable specification.
Select TOOLS/SETUP/BUTT FUSION JOINTS.

NOTICE !
Access to selecting this option is restricted. Enter access PASSWORD 2. Refer to point *3.4.1 - Restricted options access* in this same section.



Pressing ACCEPT toggles between ON/OFF for the field selected.
Once the desired selection has been made, press CANCEL to exit the option.

Selection options:

1. Cleaning of pipe ends before trimming: CLEAN PIPE ENDS TRIM *On*
CLEAN PIPE ENDS FUSION *Off*

2. Cleaning of pipe ends after trimming:
CLEAN PIPE ENDS TRIM *Off*
CLEAN PIPE ENDS FUSION *On*

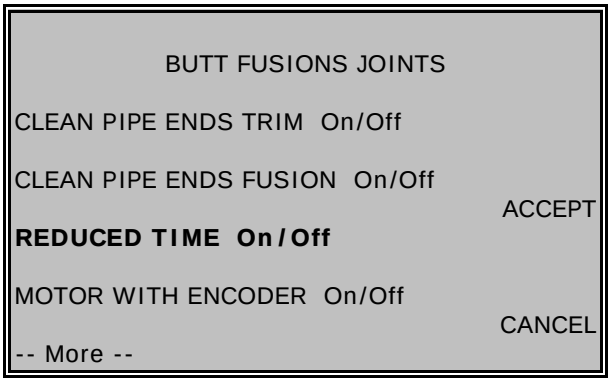
3. Cleaning of pipe ends before and after trimming:
CLEAN PIPE ENDS TRIM *On*
CLEAN PIPE ENDS FUSION *On*

4. No cleaning of pipe ends:
CLEAN PIPE ENDS TRIM *Off*
CLEAN PIPE ENDS FUSION *Off*

❼ REDUCED TIME ON BUTT FUSION CYCLE (**TWIN-S/DYNAMIC-S** BOXES)

This option from the TOOLS/SETUP/BUTT FUSION JOINTS menu allows us to cancel or not the cooling down time (phase number six) of the butt fusion cycle.

NOTICE !
This selection has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.



Pressing ACCEPT the ON/OFF selection is changed alternatively.
By selecting OFF the fusion cycle is fully performed, including phase 6 of cooling time planned on the pipe fusion record. By selecting ON, this phase is interrupted, and the cycle finishes with phase 5 of the fusion.

Once the desired selection has been made, press CANCEL to exit the option.

❽ SELECTING THE LINEAR ACTUATOR (**TWIN-S/DYNAMIC-S** BOXES)

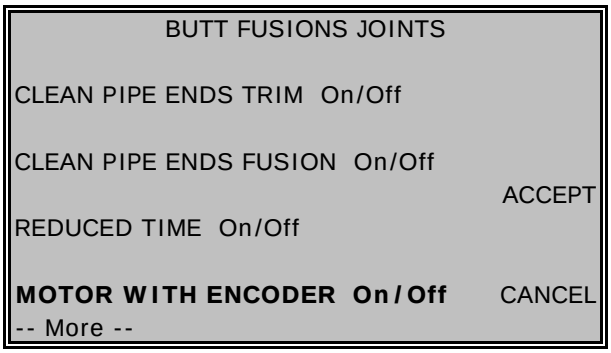
This option from the TOOLS/SETUP/BUTT FUSION JOINTS menu allows us to select the type of *electric base framework* to be used.

NOTICE !
This selection has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.

The base frameworks electrically driven commercialized are:

- ODS 200 E with linear actuator and separated encoder
- ODS 200/225 E with linear actuator with integrated encoder

From the ELECTRIC BUTT FUSION the recognition of the two different type of base frameworks is automatically done; once accepting "locate pipes centrally" from the electric butt fusion cycle, the moving body will carry on an extra travel in order to recognise and automatically select the current electric framework used.



Pressing ACCEPT the ON/OFF selection is changed alternatively.

Select OFF if the electric base framework used is without encoder and ON when the linear actuator is with integrated encoder.

Once the desired option is selected, press CANCEL to exit this menu.

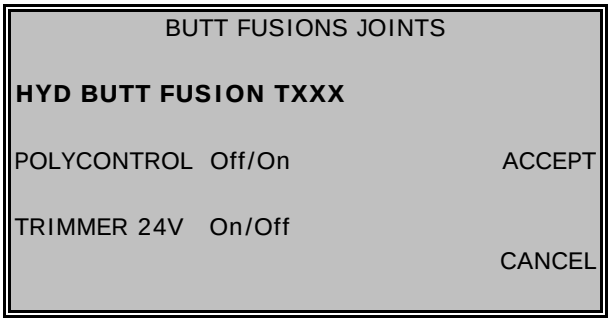
❾ SELECTING THE HYDRAULIC BASE FRAMEWORK (**TWIN-S/DYNAMIC-S**)

This option from the TOOLS/SETUP/BUTT FUSION JOINTS menu allows us to select the type of *hydraulic base framework* to be used.

The base frameworks hydraulically driven available are:

- ODS 315 H
- TRACK 160
- TRACK 250
- TRACK 315
- ODS TRACK 315 G
- TRACK 400
- TRACK 500

In order to make proper butt fusion joints by selecting the HYDRAULIC BUTT FUSION option, you need to previously select the correct the hydraulic base framework currently used.



Pressing ACCEPT the selection is changed alternatively.

Once the desired option is selected, press CANCEL to exit this menu.

❿ POLYCONTROL OFF/ON

This option from the TOOLS/SETUP/BUTT FUSION JOINTS menu allows us to select the model of the fusion control box to be used.

TWIN-S/DYNAMIC-S:	position OFF
POLYCONTROL/SMARTBOX:	position ON

⓫ TRIMMER 24V ON/OFF

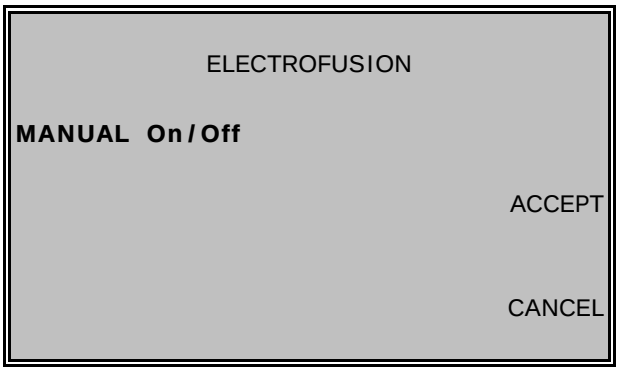
This option from the TOOLS/SETUP/BUTT FUSION JOINTS menu allows us to select the trimmer model for ODS225 machines:

Trimmer ODS225 with 24Vdc motor:	setup ON
Trimmer ODS225 with 230/110V motor:	setup OFF

❶ MANUAL ON/OFF (**TWIN-S** BOXES)

By selecting this option from the TOOLS/SETUP/ELECTROFUSION menu allows us to activate (ON) or deactivate (OFF) the manual fitting programming on ELECTROFUSION.

NOTICE !
The selection of MANUAL has a restricted access. Enter PASSWORD 2 access. Please refer to point *3.4.1 - Access to restricted options* of this CHAPTER.



Pressing ACCEPT the ON/OFF selection is changed alternatively.

Once the desired option is selected, press CANCEL to exit this menu.

CHAPTER 4: TROUBLESHOOTING

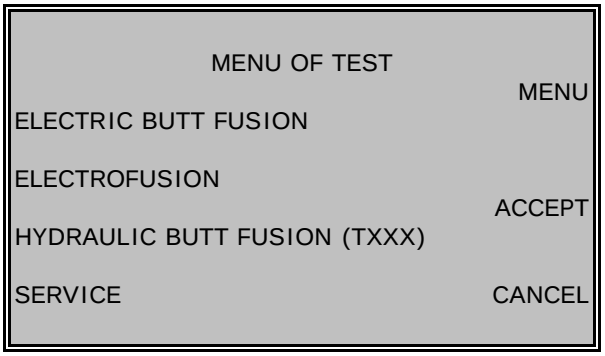
4.1 GENERAL

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 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.

NOTICE !
The selection of MENU OF TEST has a restricted access. Enter PASSWORD 1 access. Please refer to point *3.4.1. Access to restricted options* of this *User Manual*.



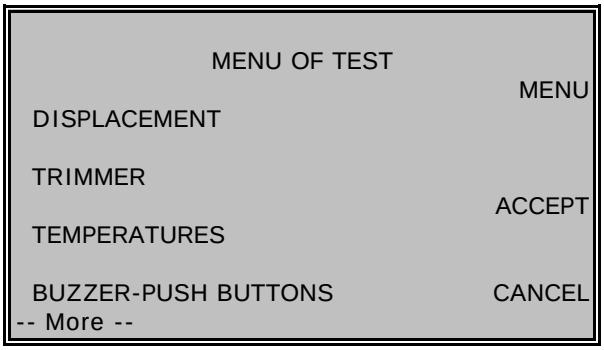
Each one of these options allows us to carry out a test of the unit.
Select the desired option according to unit model from the first three by moving the cursor with the arrows ⬇ and ⬆ on the panel and press ACCEPT.
By selecting CANCEL we go back to previous Menu.
By selecting MENU we go back to the MAIN MENU.

The selection **SERVICE** is restricted to the ACUSTER GLOBAL, S.L. After-Sales Service.

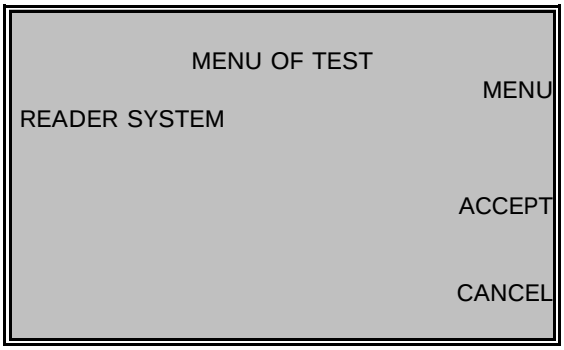
4.2.1 **Electric butt fusion (TWIN-S/DYNAMIC-S BOXES):**

Select **ELECTRIC BUTT FUSION** from the MENU OF TEST. The following options will appear on the screen:

First screen:



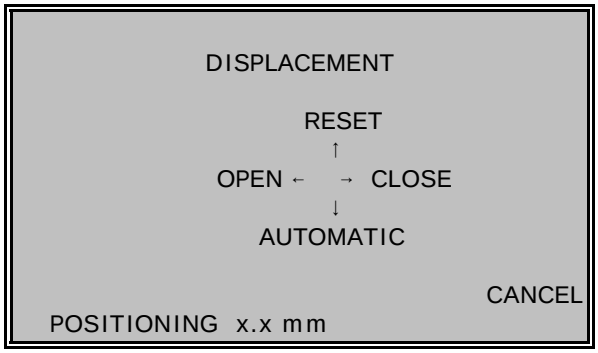
Second screen:



Select the desired option by moving the cursor with the arrows ⬇ and ⬆ on the panel. Press ACCEPT.
By pressing CANCEL we go back to the previous menu.
By selecting MENU we go to the MAIN MENU.

① <u>DISPLACEMENT VERIFICATION:</u>

If you select the first option, DISPLACEMENT, the following screen will appear:



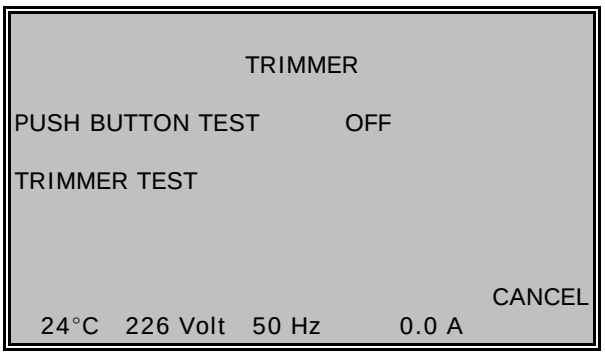
By pressing the push-buttons ⬅ and ➡, the moving body will open and close manually. The lower part of the display will show the displacement.
By pressing ⬆, the moving body will be located on the fully close position while the position counter is reset. This option is used to check displacement controls.

By pressing ⬇, the moving body will start uninterrupted cycles of opening and closing, in which the encoder reader can be seen.
Press CANCEL to exit this option and go back to the menu of test of ELECTRIC BUTT FUSION.

② VERIFICATION OF TRIMMER:

Selecting the second option TRIMMER from the menu ELECTRIC BUTT FUSION:

WARNING !
On ODS225E machines with 230/110 V trimmer, refer to **4.2.3 Hydraulic butt fusion**: VERIFICATION OF TRIMMER.

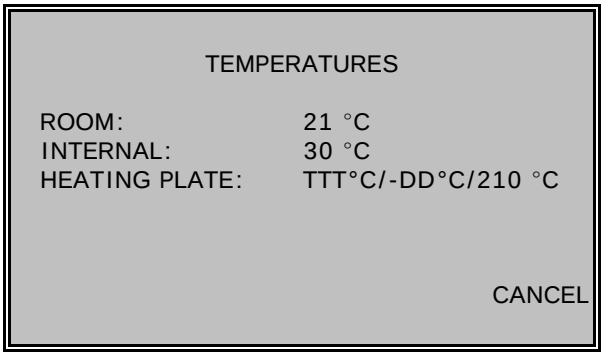


First select PUSH-BUTTON TEST. Press both push-buttons on the trimmer. If the circuit is correct, the OFF on the screen changes to ON when pressing (the trimmer will not start).
If you now select TRIMMER TEST, when pressing the push-buttons on the trimmer it will start, the consumption being shown on the screen.

With no-load operating conditions, the consumption of the trimmer must be placed on the 4 or 5 A approximately. As a protection, the working limitation on load of the trimmer is 25 A at the most. If in working conditions this value is exceeded, the trimmer will stop and the message: EXCESSIVE CONSUMPTION OF THE TRIMMER will appear on screen.
Press CANCEL to exit this option and go back to the menu of test of ELECTRIC BUTT FUSION.

③ VERIFICATION OF TEMPERATURES:

Selecting TEMPERATURES from the Menu ELECTRIC BUTT FUSION:

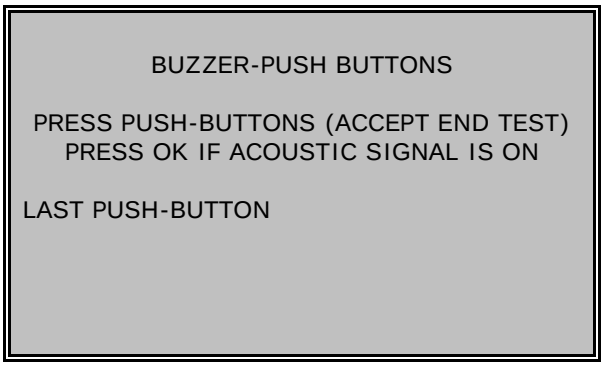


This informative option shows us the different temperatures to be borne in mind by the unit and the operator.
The room temperature is read by the external temperature sensor of the unit.
The internal temperature is the recorded temperature inside the unit.

Finally, the temperature on the heating plate is the one registered by the temperature sensor of the heating plate and is displayed on three fields: INTERNAL TEMPERATURE (TTT°C) / APPLIED DIFFERENTIAL (-DD°C) / SURFACE TEMPERATURE (210°C).
Press CANCEL to exit this option and go back to the menu of test of ELECTRIC BUTT FUSION.

④ VERIFICATION OF THE ACOUSTIC SIGNAL AND PUSH-BUTTONS:

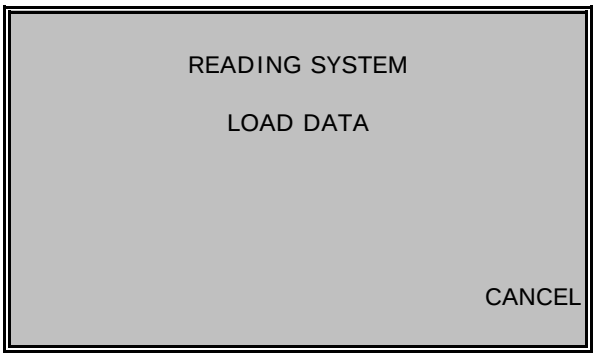
By selecting BUZZER-PUSH BUTTONS from the Menu ELECTRIC BUTT FUSION:



This option allows us to verify the functioning of all push-buttons (arrows, STOP and the three side push-button), as well as the buzzer. With each pressing, the pressed push-buttons appears on screen, along with the acoustic signal. Press the central push-button on the side to exit this option and go back to menu of test of ELECTRIC BUTT FUSION.

⑤ READING SYSTEM:

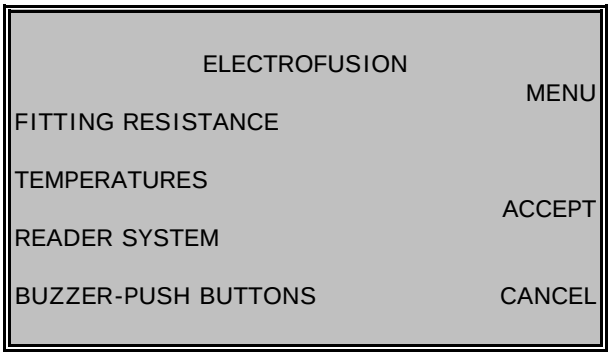
By selecting the option READING SYSTEM:



This informative option shows us on screen the data contained on the bar-code system.
Once the bar-code is read, the corresponding data will be showed on screen.
Press CANCEL to go back to previous screen.

4.2.2 **Electrofusion (TWIN-S BOXES):**

Select **ELECTROFUSION** from the MENU OF TEST. The following options will appear on screen:



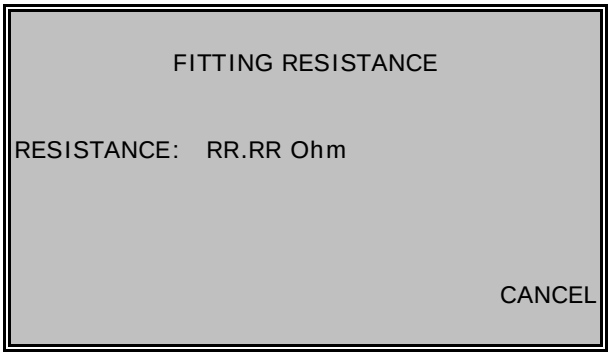
Select the desired option by moving the cursor with the arrows ⬇ and ⬆ on the panel. Press ACCEPT.

By pressing CANCEL we go back to the previous menu.

By selecting MENU we go to the MAIN MENU.

① CHECKING OF THE READING OF THE FITTING'S RESISTANCE:

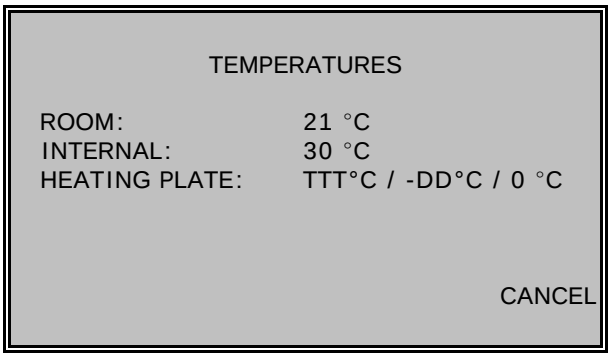
By selecting the first option FITTING RESISTANCE:



This option shows us the reading of the fitting's resistance **RR.RR** or master resistance connected to the unit's electrofusion cables.
For the reading adjustment, please refer to the option SERVICE (option only available for the ACUSTER GLOBAL, S.L. After-Sales Service).
Press CANCEL to go back to previous screen.

② VERIFICATION OF THE TEMPERATURES:

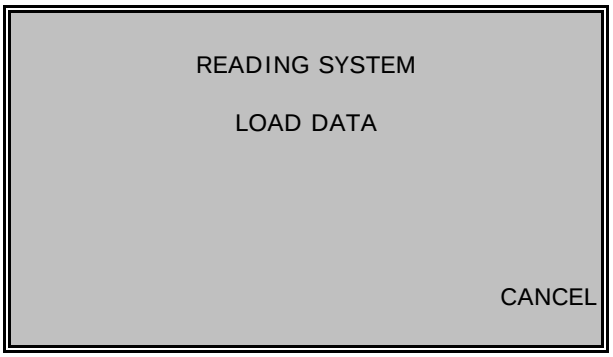
By selecting the second option TEMPERATURES:



This informative option shows us the different temperatures to be borne in mind by the unit and operator.
The room temperature is read by the external temperature sensor of the unit.
The internal temperature is the reading of the recorded temperature inside the unit.
Press CANCEL to go back to previous screen.

③ READING SYSTEM:

By selecting the third option READING SYSTEM:

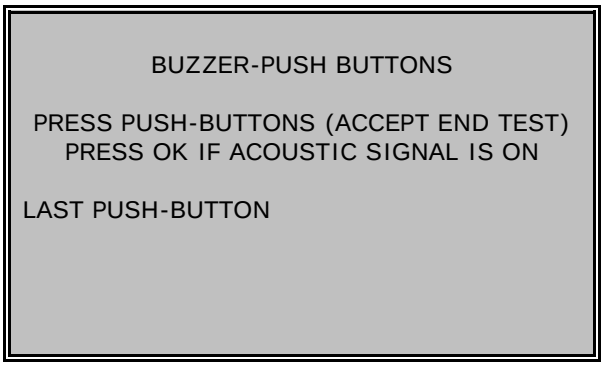


This informative option shows us on screen the data contained on the bar-code system.
Once the bar-code is read, the corresponding data will be showed on screen. Press CANCEL to go back to previous screen.

This option is particularly useful when it is required to know the coded number from a bar code system, specially when the fitting manufacturer does not provide that relevant information along the bar code sticker.

④ VERIFICATION OF THE ACOUSTIC SIGNAL AND PUSH-BUTTONS:

Finally, by selecting BUZZER-PUSH BUTTONS from the Menu ELECTRIC BUTT FUSION:

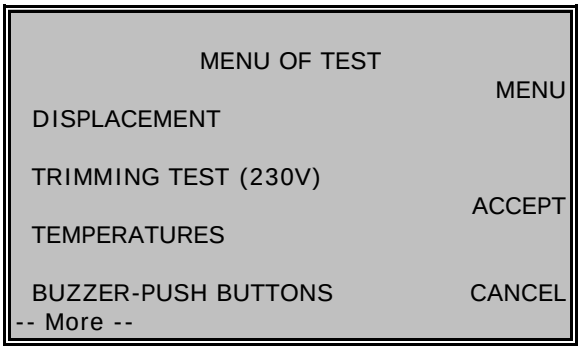


This option allows us to verify the functioning of all push-buttons (arrows, STOP and the three side push-button), as well as the buzzer. With each pressing, the pressed push-buttons appears on screen, along with the acoustic signal. Press the central push-button on the side to exit this option and go back to menu of test of ELECTROFUSION.

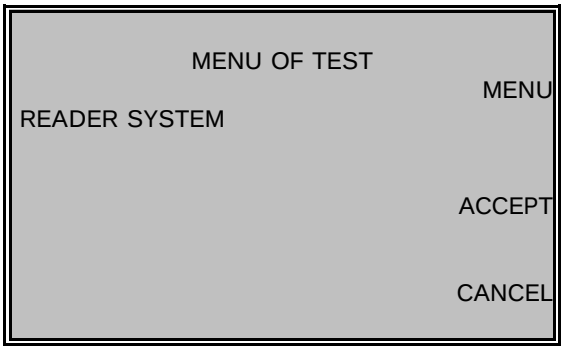
4.2.3 **Hydraulic butt fusion (TWIN-S/DYNAMIC-S BOXES):**

Select **HYDRAULIC BUTT FUSION** from the MENU OF TEST. The following options will appear on screen:

First screen:



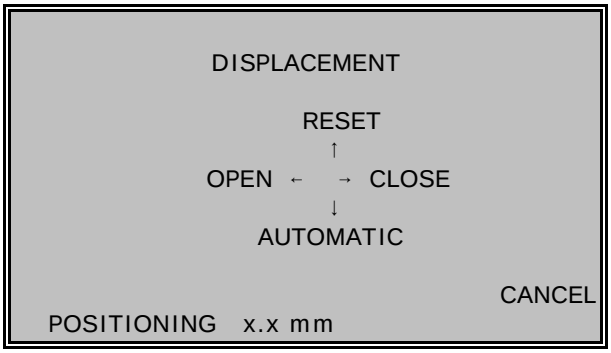
Second screen:



Select the desired option by moving the cursor with the arrows ⬇ and ⬆ on the panel. Press ACCEPT.
By pressing CANCEL we go back to the previous menu.
By selecting MENU we go to the MAIN MENU.

① <u>VERIFICATION OF THE DISPLACEMENT:</u>

By selecting the first option, DISPLACEMENT, the following screen will appear:

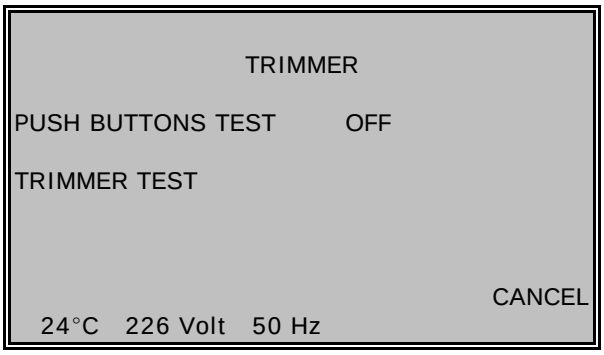


By pressing the push-buttons ⬅ and ➡, the moving body will open and close manually. The lower part of the display will show the displacement.
By pressing ⬆ we reset the counter.
By pressing ⬇, the moving body will start uninterrupted opening and closing cycles, in which the encoder reader can be seen.

Press CANCEL to exit this option and go back to the menu of test of HYDRAULIC BUTT FUSION.

② VERIFICATION OF THE TRIMMER:

By selecting the second option TRIMMER from the Menu HYDRAULIC BUTT FUSION Menu:

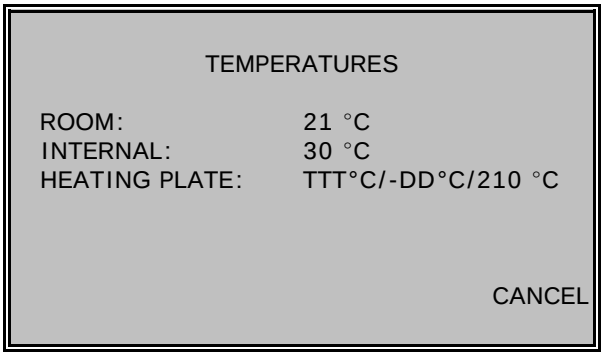


First select PUSH BUTTONS TEST. Press both push-buttons on the trimmer. If the circuit is correct, the OFF on the screen will change into ON at the time of pressing (the trimmer will not start).
If we select the TRIMMER TEST now, the trimmer will start when pressing the push-button.

Press CANCEL to exit this option and go back to the menu of test of HYDRAULIC BUTT FUSION.

③ VERIFICATION OF THE TEMPERATURES:

By selecting TEMPERATURES from the HYDRAULIC BUTT FUSION Menu:

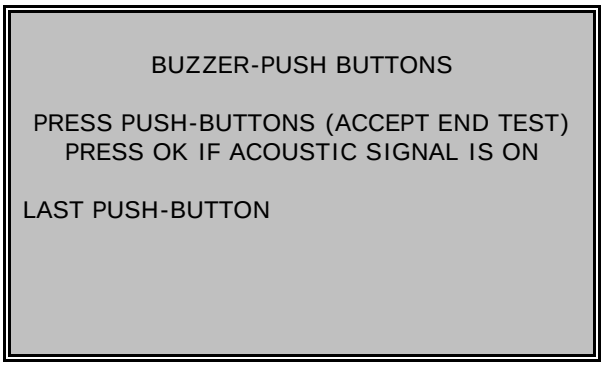


This informative option shows us the different temperatures to be borne in mind by the unit and operator.
The room temperature is read by the external temperature sensor of the unit.

Finally, the temperature on the heating plate is the one registered by the temperature sensor of the heating plate and is displayed on three fields: INTERNAL TEMPERATURE (TTT°C) / APPLIED DIFFERENTIAL (-DD°C) / SURFACE TEMPERATURE (210°C).
Press CANCEL to exit this option and go back to the menu of test of HYDRAULIC BUTT FUSION.

④ VERIFICATION OF THE ACOUSTIC SIGNAL AND PUSH-BUTTONS:

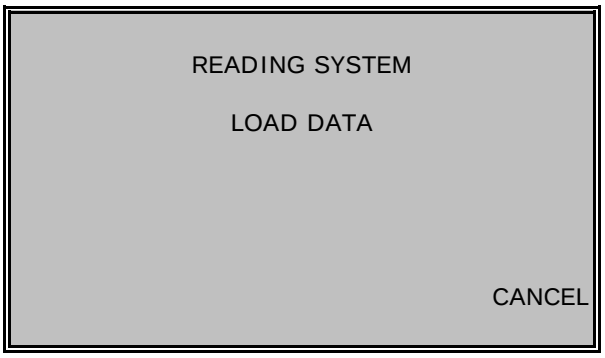
By selecting BUZZER-PUSH BUTTONS from the Menu HYDRAULIC BUTT FUSION:



This option allows us to verify the functioning of all push-buttons (arrows, STOP and the three side push-button), as well as the buzzer. With each pressing, the pressed push-buttons appears on screen, along with the acoustic signal. Press the central push-button on the side to exit this option and go back to menu of test of HYDRAULIC BUTT FUSION.

⑤ READING SYSTEM:

By selecting the option READING SYSTEM:



This informative option shows us on screen the data contained on the bar-code system.
Once the bar-code is read, the corresponding data will be showed on screen. Press CANCEL to go back to previous screen.

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.
The autonomy of the internal battery lasts for between two years and two years and a half. Should the storage time exceed this period, control that the battery does not run out. It is advisable to connect the fusion control box to the network and start it in order to check the internal battery functioning (for example verify the time and date via the INFO).

NOTICE !
If the battery uses up its charge, all the stored data in RAM memory will be lost (fusion records, machine's identification, date, time, etc).

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. Do not rub excessively the plastic shell (if applicable), for it could charge itself with static electricity.

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 butt fusion unit to the ACUSTER GLOBAL, S.L. After-Sales Service for a yearly service.

5.2 BASE FRAMEWORK MAINTENANCE (**TWIN-S/DYNAMIC-S BOXES**)

5.2.1 **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*).

5.2.2 **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).

5.2.3 **Clamp adaptors:**

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

5.2.4 **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.

5.3 HEATING PLATE MAINTENANCE (**TWIN-S/DYNAMIC-S BOXES**)

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 / the differential temperature / as well as the surface temperature. The heating plate's temperature should be approximately 210°C at 23°C RT.

5.4 TRIMMER MAINTENANCE (**TWIN-S / DYNAMIC-S**)

5.4.1 **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).

5.4.2 **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.

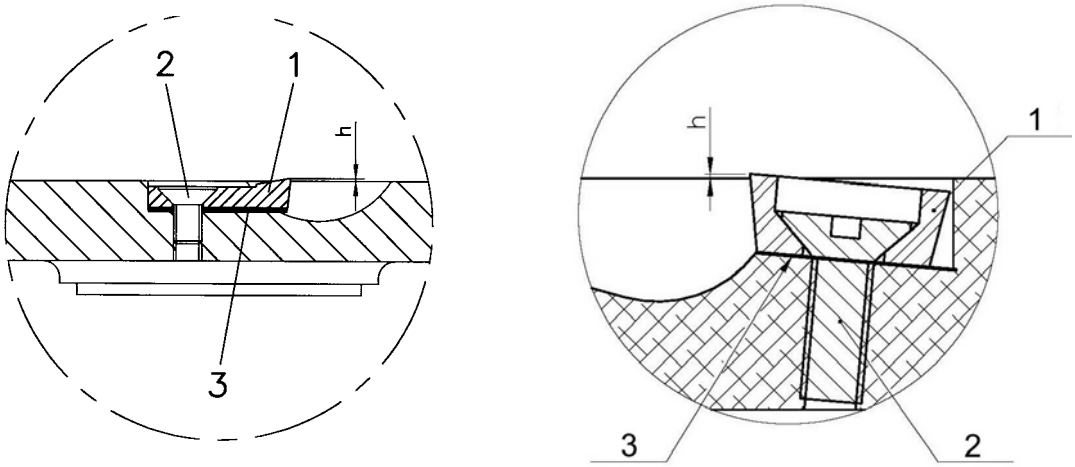


Figure 26a: Adjustment of cutters 225E Figure 26b: Adjustment of cutters Track range

Where:

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

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.

5.4.3 **Electric motor (drilling machine or 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.

The ODS225 24V trimmer version is driven by a 24 Vdc electric motor while the ODS225 model 2014 and the rest belonging to the Track range are driven by a motor propeller of 230/110 Vac voltage (according to market).

To check the function of the trimmer electric motor, please refer to TRIMMER of the TEST MENU (CHAPTER 4: TROUBLESHOOTING, of this *User Manual*).

5.4.4 **Driving belt/chain:**

The transmission belt can be replaced if it should break. The spare part reference is:

ODS 225E:	Part # Poly-V J9 / chain (model 2014)
Track range:	Part # chain with tightener

5.5 FUSION CONTROL MODULE MAINTENANCE

5.5.1 **General:**

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

5.5.2 **Internal battery:**

The clock/calendar battery can be replaced (only by Grupo Acuster 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 - see point 5.1.2 of this Chapter).

CAUTION !
The internal battery must be removed from the unit before the machine is pulled apart. To do this, the front cover needs removing and the battery pins installed in the CPU board cut out or unsoldered, which is in turn mounted on the inside of the frontal cover itself. Deposit the removed battery in recycling containers of used batteries.

5.5.3 **Updating program version:**

Please refer to the *User Guide* **AcusWin**.

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.
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-S	DYNAMIC-S
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)	Plastic casing: IP54, Class II IK9 (10 Joules)	Metal casing: IP54, Class I IK10 (20 Joules)
Operating temperatures	-10° to 50° C (can be modified on request)	
Temperature control	NTC (interior and exterior)	
Acoustic signal	Piezoelectric boozer	
Display	Graphic LCD of 240x128 points in resolution; 16 lines	
Keyboard	8 touch-sensitive membrane push-buttons	
Connection to a PC and printer	special RS-232 serial	
Optic pen/scanner	Non-intelligent infrared Laser scanner optional	
Connection to optic pen, scanner, PC, printer	Serial connector RS-232	
Internal memory capacity	~ 1000 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 Password 1 and Password 2 cards ODS transmission cable (for plastic casing only) AcusWin CD-Rom (for plastic casing only) Transport case	
	Set of 4 and 4.7 mm electrofusion adapters	
Optional accessories	Null modem cable DB9(F)-DB9(F) for PC and printer connection Serial printer	
Dimensions	Height: 460 mm; Width: 450 mm; Length: 470 mm	
Net weight (plastic casing/steel casing)	34/36.5 kg	20/22.5 kg

6.2 BASE FRAMEWORK

MODEL ODS	ODS 225 E	ODS TRACK 315 G
Size range (mm)	63-225	90-315
Included pipe adapters	225x200	
Set of pipe adapters available (not included with the machine)	63, 75, 90, 110, 125, 140, 160 and 180	90, 110, 125, 140, 160, 180, 200, 225, 250 and 280
Operation	Linear actuator at 24 Vdc	2 double acting hydraulic cylinders
Maximum force/pressure	4000 N	100 bar
Net weight w/o adapters (kg)	50	69
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	L=80xW=56xH=52

MODEL TRACK AUTOMATIC	TRACK 160	TRACK 250	TRACK 315	TRACK 400	TRACK 500
Range of sizes	50-160	75-250	90-315	160-400	250-500
Exterior dimensions (cm)	79x39x41	79x44x47	79x55x54	120x65x65	121x66x70
Weight without pipe adapters (kg)	32.5	41	44.5	87.5	107
Set of basic pipe adapters	90, 110, 125	110, 125, 160, 180, 200	200, 225, 250	250, 280, 315, 355	355, 400, 450
Transport case dimensions (cm)	54x36x12	64x35x17	64x35x17	81x46x24	76x44x36
Weight of pipe adapters (with case)(kg)	10	24	18.5	35	68

6.3 HEATING PLATE

MODEL ODS	ODS 225 E	ODS TRACK 315 G
Voltage (Vac)	230/110 (Monophasic)	
Power (W)	2000(230V)/1800(110V)	2100(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	70x12x48
Net weight (kg)	6.25	9

MODEL TRACK AUTOMATIC	TRACK 315 (110V)	TRACK 160	TRACK 250	TRACK 315	TRACK 400	TRACK 500
Voltage (Vac mono-phasic)	110	230				
Power (W)	1800	1000	1900	2100	3100	3800
Surface temperature	Up to 250°C according to the pipe material used					
Temperature regulation	PID type with Triac					
Coating	PTFE line					
Exterior dimensions (cm)	47x11x70	27x6.5x50	36x12x58	47x11x70	52x12x75	64x8x110
Weight (kg)	9.6	3.35	5.5	7.2	12	17.5

6.4 TRIMMER

MODEL ODS	ODS225 24V	ODS225 (214)	ODS TRACK 315 G
Voltage	24 Vdc	230/110 Vac (Monophasic)	
Power (W)	465	700	1010
Operation	2 Push-buttons 1 Safety switch		1 push-button 1 Safety switch
Cutters	1 adjustable blade		1 Double-edge adjustable blade
Transmission	Poly V belt with eccentric tensor	Chain with eccentric tensor	Chain with tensor
Exterior dimensions (cm)	54x43x14		50x60x47
Net weight (kg)	13.25		22

MODEL TRACK AUTOMATIC	TRACK 315 (110V)	TRACK 160	TRACK 250	TRACK 315	TRACK 400	TRACK 500
Voltage (Vac mono-phasic)	110	230				
Power (W)	720	500	1010	1010	1010	1100
Cutting blades	Double edge, adjustable					
Exterior dimensions (cm)	46x47x55	36x26x45	41x36x42	46x47x55	62x16x90	62x23x98
Weight (kg)	20.8	8.3	15.3	21.8	35.5	58

6.5 HEATING PLATE AND TRIMMER HOLDER

MODEL ODS	ODS 225 E	ODS TRACK 315 G
Exterior dimensions (cm)	29x27x56	42x41x37
Net wight (kg)	3	13

MODEL TRACK AUTOMATIC	TRACK 160	TRACK 250	TRACK 315	TRACK 400	TRACK 500
Exterior dimensions (cm)	32x25.5x34	36x33x34	40x37x42	50x42x50	60x60x70
Weight (kg)	4.22	6.5	8	13	22.5

6.6 HYDRAULIC STATION

MODEL ODS + TRACK AUTOMATIC	T160/T250/T315/T315G/T400	T500
Voltage (Vac mono-phasic)	230 or 110	
Power (W)	750	
Maximum working pressure (bar)	100	160
Oil tank capacity (l)	5	
Aspiration filter (microns)	250	
Oil type	HM-46 as ISO 6743/4-HM	
Exterior dimensions (cm)	60x32x40	
Net weight (kg)	34.5	

6.7 COMPLETE MACHINE

MODEL	ODS 225E	TRACK 315 (110V)	TRACK 160	TRACK 250	TRACK 315	TRACK 315G	TRACK 400	TRACK 500
Voltage (Vac mono-phasic)	230	110	230					
Total power (kW)	2.5-2.7	3.27	2.25	3.66	3.86	3.86	4.86	5.65
Nett weight w/o pipe adapters (kg)*	72.5	117.5	83	103	116	147.5	182.5	239.5
Nett weight w. pipe adapters (kg)*	80	136	93	127	134.5	166	217.5	307.5

* without Fusion box

6.8 GENERATOR SPECIFICATIONS

MODEL	ODS225E T315G	TRACK 315 (110V)	TRACK 160	TRACK 250	TRACK 315	TRACK 400	TRACK 500
Voltage (Vac mono-phasic)	230	110	230				
Advisable minimum power (VA)	4500	4500	3000	4500	5000	6000	7500

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)	44/47*	30/32*
Contents	Fusion control box User Manual Password 1 and Password 2 cards AcusWin CD-Rom** ODS transmission cable** Scanner*** Electrofusion adapters 4 and 4.7 mm (TWIN-S only)	

* Steel casing
** For plastic casing models only
*** Serial scanner for plastic casing models and USB scanner for metal casing models

6.9.2 Pallet type packing for base framework:

BASE FRAMEWORK	ODS 225E	ODS TRACK 315G
Exterior dimensions (cm)	99.5x41.5x60	100x60x60
Gross approximate weight (kg)	68 (w/o pipe adapters)	86 (w/o pipe adapters)
Contents	Base framework Set of tools	Base framework

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

HEATING PLATE TRIMMER HYDRAULIC STATION	ODS 225E	ODS TRACK 315G
Exterior dimensions (cm)	61.5x44.5x30.5	120x60x60
Gross approximate weight (kg)	39	95.5
Contents	Heating plate & trimmer holder Heating plate Trimmer	Heating plate & trimmer holder Heating plate Trimmer Hydraulic station

REMARKS