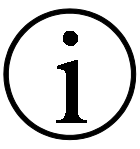
USER MANUAL

BUTT FUSION MACHINE
MODELS
BASIC E & BASIC H

Edition: September 2003
Revision No. 5
Publication: MU-78-03E



NOTE !

At the time of the publication of this *User Manual*, the software version is:
BASIC-E: v 2.03
BASIC-H: v 1.02

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CHAPTER 1: INTRODUCTION

1.1 GENERAL

The range of **BASIC** butt fusion machines consists of the following models:

- **BASIC E** Butt fusion machine for ODS200E/ODS225E/ODS 8"E base frameworks
- **BASIC H** Butt fusion machine for ODS 315 H base framework

Both models are designed to carry out semi-automatic butt fusion joints of PE pipe and fittings.
Both models are designed for the butt fusion system, allowing the joint of polyethylene (PE) pipes and fittings. It can also be used to joint other plastic resins (PP, PB, PVDF,...), in diameters between 63 and 225 mm (**BASIC E**) and between 160 and 315 mm (**BASIC H**).
All you have to do is connect an electric base framework, a heating plate and a trimmer to the unit's electric connectors. The pipes/fittings to be jointed have to be located in the base framework and are fixed by the grips. 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 extremes are jointed applying a controlled strength and time, as selected by the operator. To make a joint, consult the Fusion Parameters Table (butt fusion parameters: time, temperature and strength), according to the diameter and the wall thickness (SDR) of the pipe/fitting to be jointed.

The technical data contained in this manual are purely informative and may be changed at anytime. ACUSTER, S.A. 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 DESIGN SPECIFICATIONS

The butt fusion machines **BASIC** are designed according to the following specifications:

- ISO 12176-1 Equipment for the polyethylene piping system. Part 1: Butt fusion

1.3 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, S.A. assurance quality.

WARNING !
The fusion control box can only be opened by the ACUSTER, S.A. 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.

1.4 MACHINE IDENTIFICATION

1.4.1 **Serial Number Stamping:**

All **BASIC E** and **BASIC H** components: base framework, heating plate, trimmer and hydraulic station (**BASIC H** only) are identified by means of their own identification plate.

Figure 1

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

1.4.2 **"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 98/37/CE, dated 22nd June 1998).

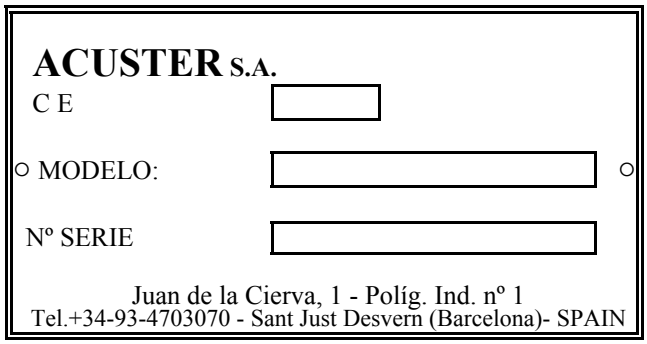


Figure 2

1.5 MEASURES OF PROTECTION AGAINST ACCIDENTS

Please go by the following security 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 electric cables and connections to the base framework, trimmer, heating plate 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, S.A.
- Always plug the control box to a power supply provided with differential and ground connection.
- 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, S.A.
- 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.
  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, S.A.
- The fusion control box can only be opened by the After-Sales Service of ACUSTER, S.A.
- Should the fusion control box not work properly, it will have to be sent immediately to the After-Sales Service of ACUSTER, S.A.

1.6 DECLARATION "CE" OF CONFORMITY

ACUSTER, S.A.
Juan de la Cierva, 1
Polígono Industrial Nº 1
08960 Sant Just Desvern (Spain)

declare under our sole responsibility that the **BASIC E** and **BASIC H** butt fusion machines, to which this declaration relates is in conformity with the following standards:

EN 292-1:1991; EN 292-2:1992; EN 294:1992; EN 563:1994
EN 60335-1:1994; EN 60335-2-45:1996
EN 55014:1993 ;EN 50081-1: 1992; EN 50082-1: 1992
ISO 12176-1

following the provisions of Directives:

98/37/CE
73/23/CEE
89/336/CEE

Sant Just Desvern, 1st October 1998

Ramon García Solé
Technical Department Director

1.7 GUARANTEE

Guarantee declaration:

All the **BASIC E** and **BASIC H** butt 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 established by the European Parliamentary Directive 199/44/CE and the Council on 25th May 1999.

General conditions of Guarantee:

1. ACUSTER S.A. 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, labour and transport at Acuster, S.A.'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, S.A. (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, S.A.'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

The range of **BASIC** butt fusion machines is made up of the following components:

Figure 3a: BASIC E 225 general view

Figure 3b: BASIC H 315 general view

1. A **Fusion Control Box (BASIC E and BASIC H)**, made up of a plastic shell and a stainless steel tubular structure for transport and protection (**BASIC E** only). The front panel is equipped with a display screen and keyboard. The connections to the base framework, trimmer and heating plate are made through the multicontact circular connectors.

2.1 A **base framework, ODS 200E/225E/8"E (BASIC E)**. The framework is made up of a 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 which are easily removable.
The fixed body incorporates the electric motor of the movable body's actuator.

2.2 A **base framework ODS 315 H (BASIC H)**. The base framework is made up of four aluminium fused lower grips and four aluminium fused upper grips, two of which are fixed and two are movable. All four upper grips are easily removable. The fixed outer lower grip is also removable in order to allow fitting mounting (tees, elbows, and so). The moving grips are driven by two double acting hydraulic cylinders. High pressure hoses with quick plugs are supplied for the hydraulic station connection.

Figure 4: Base framework ODS 315 H general view

3. A PTFE lined aluminium **heating plate**, with electronic temperature control by means of an internal sensor (PID). A thermometer for control is also provided.
   Versions of 225 mm and 315 mm.

4. A **trimmer**.
   BASIC E: The standard trimmer is driven by a 24 Vdc electric motor and belt drive. It incorporates two push-buttons for functioning control and a safety switch.
   An optional version of 230 Vac electric motor is also available.
   BASIC H: The trimmer for the base framework **ODS 315 H**, the motor has 230 Vac. It is chain driven and incorporates one push-button for functioning control and a safety switch.

5. A **Hydraulic station (BASIC H)**, 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 !
The hydraulic station is only equipped with the **BASIC H** butt fusion machine.

2.2 ELECTRONIC CONTROL MODULE

2.2.1 General:

The fusion control module consists of an ABS plastic case. On **BASIC E** model the case is installed over a stainless steel tubular frame whereas the **BASIC H** box is attached to the transport hydraulic station trolley.
In its interior, the Control Module features a 230Vac/24Vdc (110Vac/24Vdc, according to model) transformer, as well as the electronics necessary for the butt fusion process. The exterior of the module is made up of a front panel consisting of an LCD display, function buttons, mains, electric connectors for the base framework connection, trimmer and heating plate.

WARNING !
All connectors must be installed for the unit to work properly. Install the connectors correctly with the nuts properly tightened to ensure good contact between the pins.

2.2.2 Exterior connections:

The **BASIC E** control module features the following exterior connections:

1 Mains

2 Electrical connector to base framework
3 Electrical connector to heating plate
4 Electrical connector 24 Vdc trimmer
5 Schuko plug socket to 230 Vac trimmer

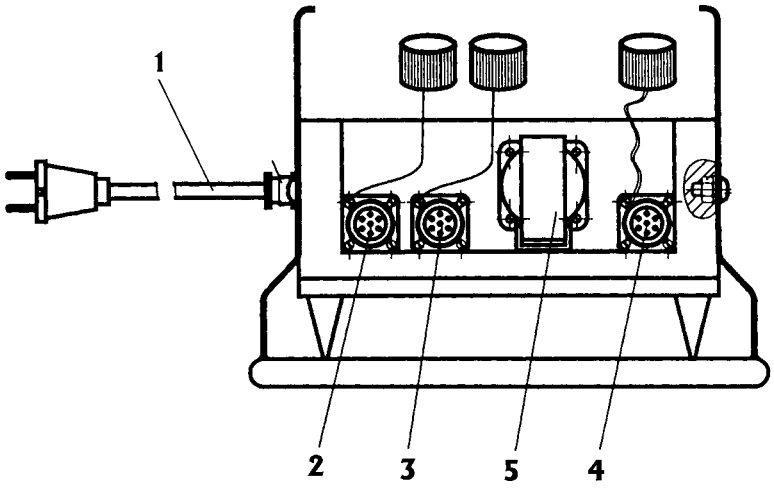


*Figure 5a: **BASIC E** electronic module connections*

The **BASIC H** control module features the following exterior connections:

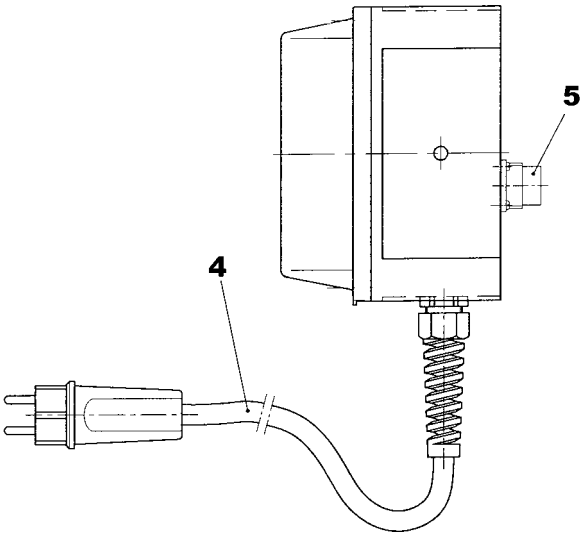


Figure 5b: BASIC H - Side view

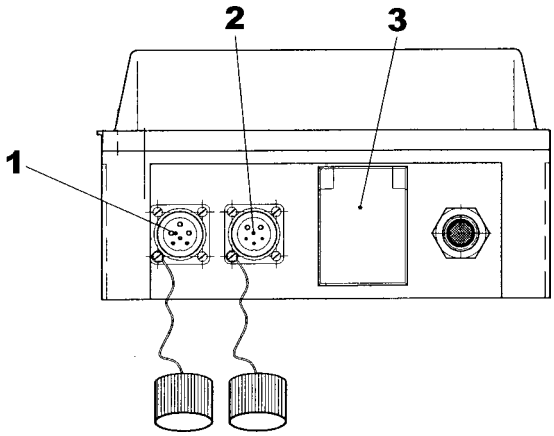


Figure 5c: BASIC H - Underneath view

1 Heating plate base connector
2 230 Vac trimmer base connector
3 230 Vac Schuko plug base
4 Mains with plug
5 Hydraulic station base connector

2.2.3 **Front panel:**

The front panel of the **BASIC** is made up of a plastic silk-screened membrane which incorporates pushbuttons of the membrane variety. The display screen is located on the upper left-hand part of the panel.
It is identical on both models except of the model's name: **BASIC E** or **BASIC H**.

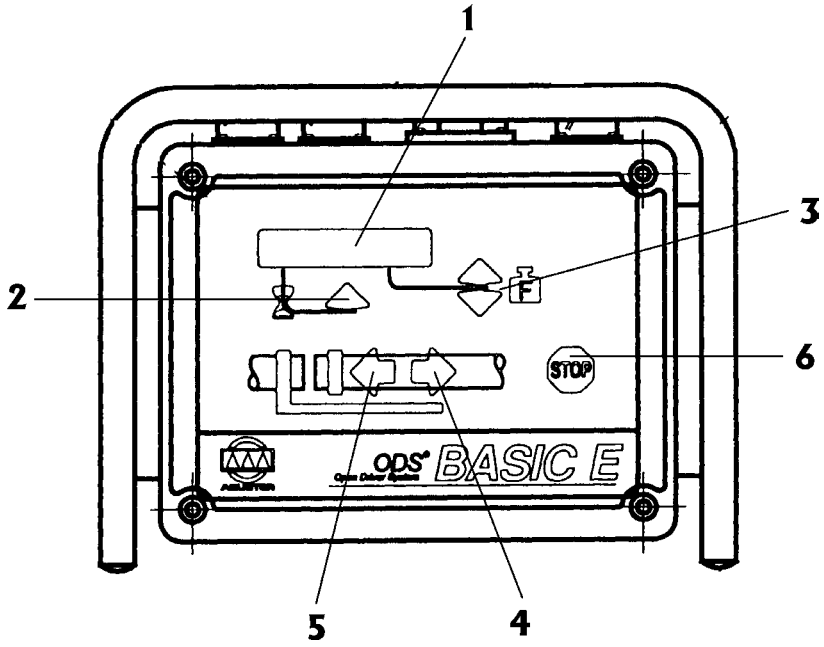


Figure 6: BASIC E front panel

Where:

1 LCD Display (20x2)

2 Button with the following functions:
- 2.1 Timer reset/start/stop
- 2.2 Validation of the heating plate working temperature

3 Buttons for increasing ⇑ and reduction ⇓ of:
- 3.1 Working force of the base framework
- 3.2 Heating plate working temperature

4 Opening button ⇨ for the base framework moving body. This activates the function if held down.

5 Closure button ⇦ for the base framework moving body. It has the following functions:
- 5.1 If held down: it activates the closure function
- 5.2 If briefly pressed, force F=0000 N: closure function to read the drag force
- 5.3 If briefly pressed, force F > 0 N: closure function and maintenance of the selected force; trimming mode activation.

6 STOP button, with the following functions:
- 6.1 It stops mobile body closure operation when acting with selected force
- 6.2 It resets the force indicated on the display (changing to F=0000 N)
- 6.3 It establishes the F reading of the display during measurement of the drag force

2.3.1 BASE FRAMEWORK ODS 200/225/8"

The base framework ODS 200/225/8" 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 200mm, 225mm or 8" diameter pipes and fittings, according to its version; 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.

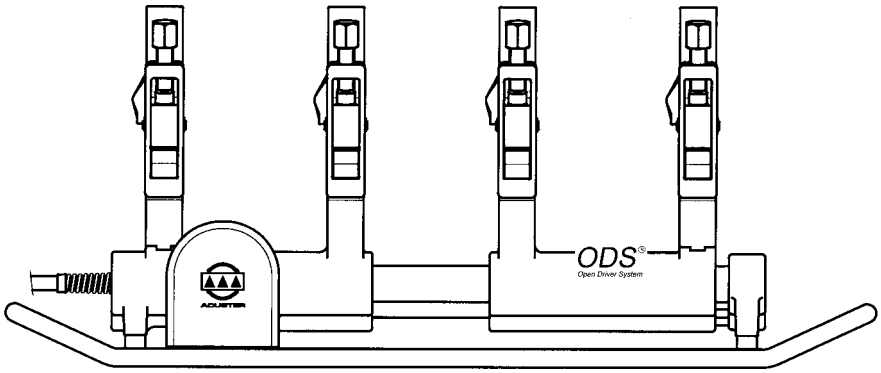


Figure 7: ODS 225 base framework

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 315

The base framework ODS 315 consists of four aluminium fused lower grips and four aluminium fused upper grips, two of which are fixed and two movable. The lower grips are held by supporting plates which are secured by two longitudinal beams.
The four upper grips are easily removable and the fixed outer lower grip is also removable for accommodating various fittings, such as elbows, tees, etc. The movable grips 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.

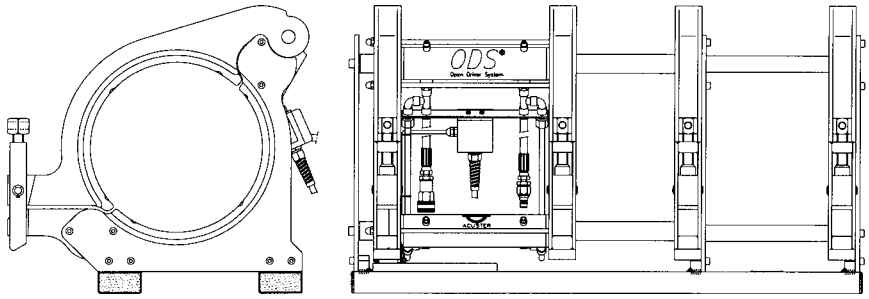


Figure 8: ODS 315 base framework

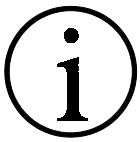
WARNING !
Always connect the electric connectors with the machine switched off. The base framework ODS 315 installation is made by: • Connecting the two base framework hydraulic quick plugs into the hydraulic quick plugs hydraulic station (male/female - female/male). • Be sure that hydraulic station electric circular connector is properly connected into the corresponding control box base connector.
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 occluded electric resistor, supplied by a cable from the Fusion Control Box.
It comes with an outer handle for ease of handling, whose end mounts the electric cable. The connection to the Fusion Control Box is done via an electric connector.
On the ODS 225 version, the PTFE line is replaceable.

WARNING !
Always connect the heating plate electric connector into the corresponding control box connector with the machine switched off. Install the heating element cable connector with the nut properly tightened to ensure good contact between the pins.

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 is also provided.



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

2.5 TRIMMER

The trimmer version **ODS 225** consists of an aluminium fused carter, which covers and protects the two trimming discs. Each disc is also provided with an adjustable cutting blade. The trimming performance is carried out by simultaneously pressing the electric push-buttons located on each hand grip. The operating system also includes a safety switch which prevents the trimmer from operating, in the event of this one not being mounted on its working position on the base framework bars.
The transmission of motion from the electric motor to the trimmer discs is performed by way of a Poly-V belt (version E-00 and upper). The belt can be retightened by means of an eccentric tightener. The electric motor is 24 Vdc and the power is supplied by means of a cable directly connected to the Fusion Control Box. Its power is 465 W at 24 Vdc 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).

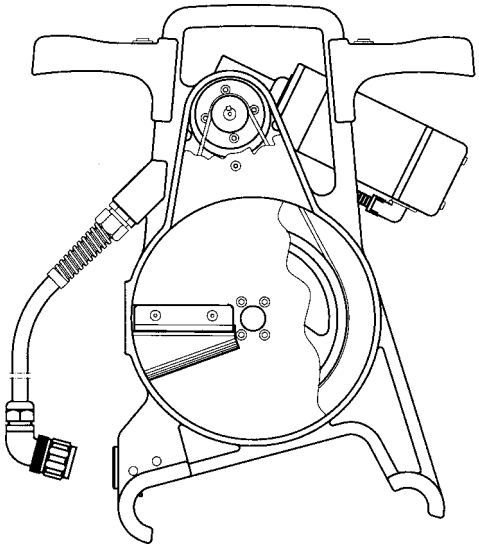


Figure 9: Trimmer ODS 225 E-00

The trimmer version **ODS 315** consists of aluminium fused carter witch covers and protects the two machining discs. Each disc is also provided with an adjustable cutting blade. The movement transmission of the driving motor to the trimmer discs is done via a ring gear, a pinion and a chain. The electric motor used has a power of 720 W at 230 Vac and the power is supplied by means of a cable directly connected to the Fusion Control Box. It is fitted with a safety switch and a push-button for operation.

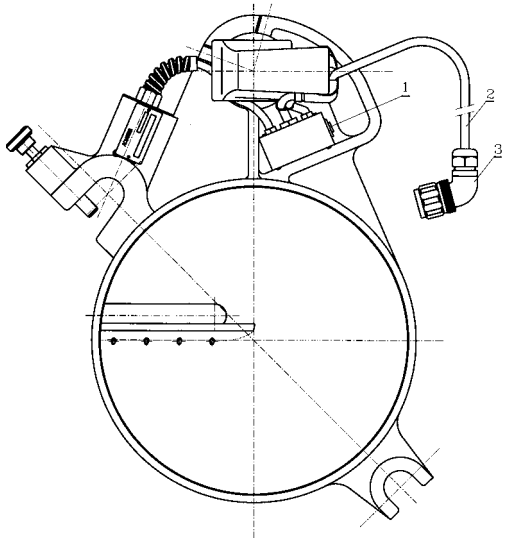


Figure 10: Trimmer ODS 315

WARNING !
Always connect the trimmer electric connector into the corresponding control box connector with the machine switched off. Install the trimmer cable connector with the nut properly tightened to ensure good contact between the pins.

The trimmer cutting blades for both versions are made from hardened, rectified steel. There is a cutter on each side, both of which are adjustable. As stated in CHAPTER 3: MODE OF USE, the swarf produced by the trimming cutters must not be over 0.2 mm thick. If the cut is faulty (either in thickness or in regularity), the cutters should be adjusted.

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

2.6 HYDRAULIC STATION (**BASIC H**)

The hydraulic station consists of the following components:

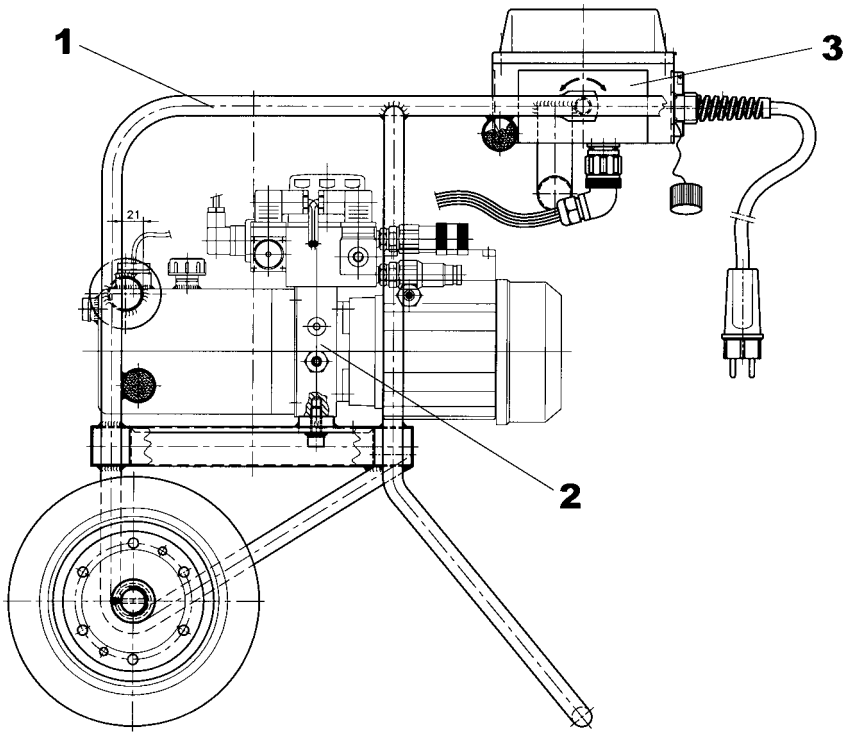


Figure 11: View of BASIC H (hydraulic station on transport trolley)

Where:

1 Transport trolley
2 Hydraulic station
3 **BASIC H** fusion control box

The transport trolley is also used to keep and transport the trimmer and the heating plate.
Replace the hydraulic oil and filter following the maintenance schedule.

NOTE !
Spare oil in one (1) litre containers is available. For care and maintenance of the hydraulic station, please refer to CHAPTER 5: MAINTENANCE, of this *User Manual*.

CHAPTER 3: MODE OF USE

3.1 UNIT PREPARATION

3.1.1 General:

Prepare the machine components (base framework, trimmer and heating plate) and connect the electrical cables to the respective connectors on the fusion control box (for more information, refer to Chapter 2.2 - *FUSION CONTROL BOX* of this *Manual*).
Connect the **BASIC** machine to a 230 V ± 15% power source (or to the corresponding voltage, according to market requirement), of alternating current. For generator group specifications, please refer to *CHAPTER 6: TECHNICAL CHARACTERISTICS.*

IMPORTANT !
The generator group electric connection where the control box mains is plugged must be normalized and fitted with differential and ground pin. Do not unplug the mains by pulling on the cable.

The unit does not have a master switch. Therefore, once it is plugged in, the display backlighting is activated and the following message is shown for a few seconds:

Model: BASIC E

```
BASIC E      T=ttt˚C
    Soft. V.2.02
```

Model: BASIC H

```
BASIC H     T=ttt˚C
    Soft. V.1.02
```

Where:

BASIC E/H: Unit model
T=ttt˚C: Heating plate working temperature, as per most recent programming
Soft. V.X.xx: The software version loaded on the unit

Once the exhibition time has expired for the information, or if STOP is pressed, the display will show the following message:

Model: BASIC E

```
BASIC E     T=ttt˚C *
t=00:00     F=0000N
```

Model: BASIC H

```
BASIC H     T=ttt˚C *
t=00:00     F=0000N
```

Where:

BASIC E/H: Corresponds to the model
T=ttt°C: The working temperature of the heating plate connected
*****: This field of the display corresponds to the on-screen messages, which are:

?	*Heating plate not connected or sensor outside tolerance*
↑	*Heating plate temperature increasing*
✓	*Controlling force/confirm temperature selection*

t=00:00: Time chronometer for the fusion cycle phases. It is activated by the operator
F=0000N: Corresponds to the force value programmed by the operator (selectable in intervals of 25 N).

The **BASIC E** fusion control box can be placed vertically or horizontally, as required by the operator whereas the **BASIC H** fusion control box is attached to the transport trolley, allowing to be positioned at operator's wish.
Butt fusions should only be performed by qualified personnel. The work site where the machine is to be placed must be on a horizontal, slopeless plane.

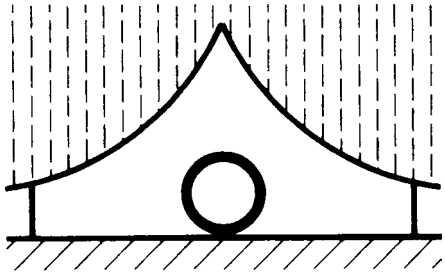


Figure 12

Protect the area where the joints are made from inclement weather conditions, such as rain, snow or wind. When the temperature is below + 5°C or above +45°C, measures must be taken in the working area to provoke a temperature that ensures correct operation, and that avoids interference with manual activity.

In order to achieve a more uniform temperature in the diameter of the pipes, protect the fusion area from sunlight and inclement weather.
The opposite ends of the pipe or fitting facings to be butt jointed should be sealed and properly protected to minimise the effects of an excessively rapid cooling, brought on, for example, by wind action.

3.1.2 **Preliminary checks: temperature selection:**

The fusion control box allows to select the following options:

- **BASIC E/BASIC H**: the control box allows the heating plate working temperature to be programmed depending on the type of plastic resin to joint and/or the applicable regulations. The available programming range oscillates from 180˚C to 240˚C.

- **BASIC H**: Base framework model selection: 315H / 200H (*up to software version v1.01 only*).

To modify the existing programming, keep the ⇦ ⇨ push buttons on the panel pressed down as the unit is plugged in to the mains. The display will show the following information:

- **<u>BASIC E/BASIC H</u>**:

  Setting of heating plate working temperature:

  The temperature indicated on the display corresponds to the most recent programming. To modify it, press the ⇑ or ⇓ F buttons to increase or decrease the value. Once the desired temperature is selected, press the timer key (✓) for validation (if this key is not pressed, the modification of the selection will not take effect).

3.2 BUTT FUSION PROCEDURE FOR PIPES AND FITTINGS

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

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 adapters (see list of available adapters in CHAPTER 6: TECHNICAL CHARACTERISTICS).

NOTE !
It is recommended to check the heating plate working temperature before beginning any work session.

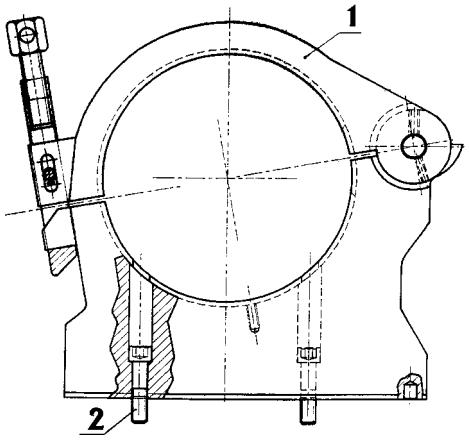
When jointing pipes to fitting or fitting to fitting, prepare the base framework for clamping the fittings. The butt fusion fittings can be, among others:

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

- **BASIC E**:

On the base framework **ODS 200/225/8"**, both outer grips are removable. To remove them, loosen both grip clamping 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 grip clamping bolts.



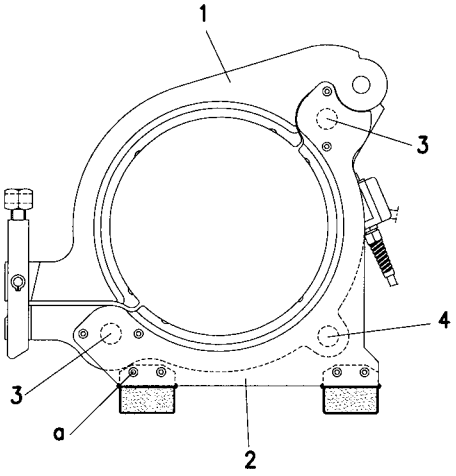
Where:

1. Grip assembly
2. Looking bolt, Allen type

Figure 13: Removable outer grip

- **BASIC H**:

  On the base framework **ODS 315 H**, the outer grip of the fixed body (first grip on the right hand according to *Figure 15*) is removable to accommodate fittings. To remove it, loose the supporting plate (**2**) bolts (**a**) using a 6 mm Allen key (supplied with the unit tool set).



Where:

1. Set of outer grips
2. Grip supporting plate
3. Grip intermediate bar
4. Grip intermediate bar
a. Supporting plate fixing bolt
b. Intermediate bar fixing bolt

Figure 14: Removable outer grip

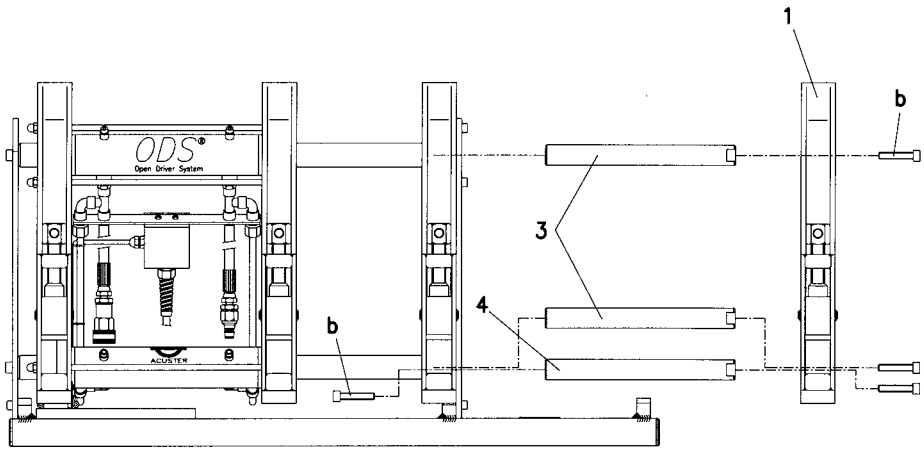


Figure 15: Base framework 315 - Frontal view

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

3.2.2 **Assembly of pipes/fittings:**

Place the moving body in the fully open position by holding down the ⇒ push button on the panel. Open all the upper grips and place the pipes/fittings into the machine, equally distributing the distance and leaving space for the trimmer (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).

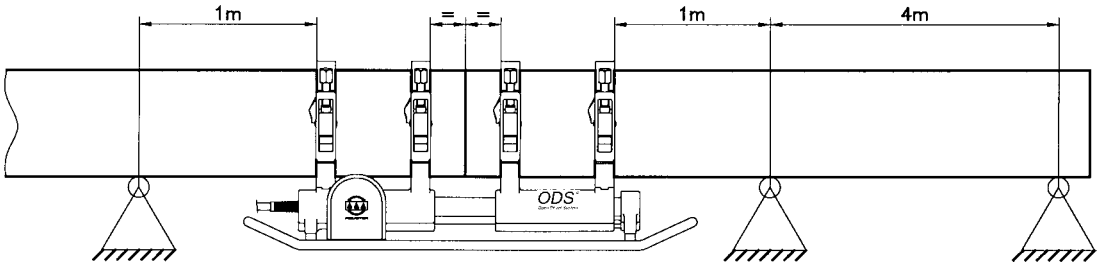


Figure 16: Recommended layout

After assembly, place the facings of the tubes/fittings together by pressing the ⇦ push button on the panel. Check the alignment. The maximum alignment tolerance allowed according to ISO 12176-1 is 10% of the pipe's thickness.

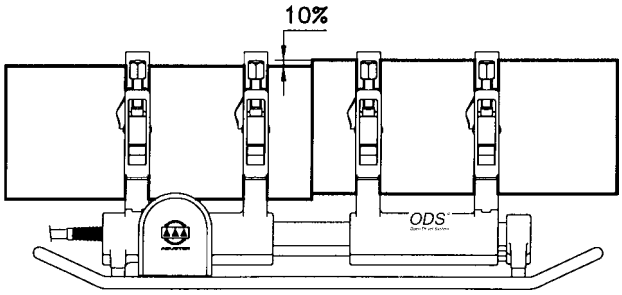


Figure 17

3.2.3 Pipes/fittings trimming:

Measuring the drag force:

Place the moving body in the fully open position by holding down the ⇒ button on the panel. *Briefly press* the⇐ key on the panel (make certain that the force selected on the display is F=0000 N). Using this procedure, the DRAG FORCE necessary to move the pipe/fitting of the base framework's moving body is measured (the force message will go from **F=0000 N** to **F=---- N** when the moving body moves). Stop the movement by pressing STOP.

ATTENTION !
BASIC E: In case the moving body reaches the travel end or the drag force is greater than 3000 N, the display will show: **F=9999 N**. **BASIC H**: Warning ! The drag force value could be affected by the hydraulic station oil temperature.

Retain the force shown on the display, which should be added to the trimming force.

Trimming phase:

NOTICE !
The trimming operation is fully automatic from software version **v 1.9** on **BASIC E** fusion boxes.

Clean the outer surface of the pipes/fittings ends with the adequate degreasing liquid.
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 grip clamping bolts side.

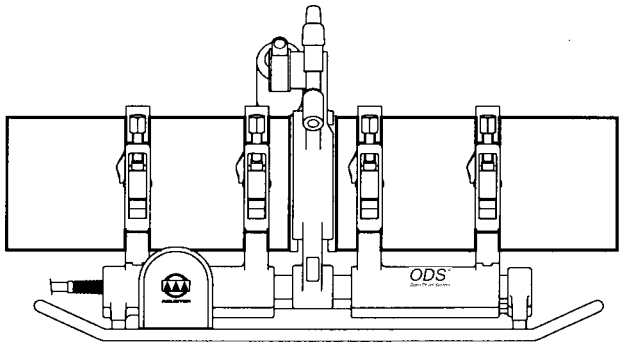
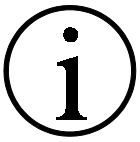


Figure 18

Select the force to be applied with the **F** keys (we recommend 200-250 N + drag force - *drag of 300 N on the example*).
Start the trimming operation by making a *briefly press* onto ⇐ key on the panel. The sign ✓will be displayed and the moving body will began to close.

BASIC	T=210˚C
t=00:00	F=0550N ✓

Immediately press the trimmer push buttons (**ODS 24 Vdc** version) or the individual push button (**ODS 315** version).
Once the pipe/fitting end of the moving body has approached to the trimmer, it will slightly open the trimmer will start up and the moving body will close with the programmed force (increase or decrease the force according to the trimming operation).
Trim both ends until the shavings come off continuously from both sides.
The shaving thickness must be 0.2 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*.

The trimming operation can be interrupted or reinitiated as many times as necessary. Just switch off and on the push-buttons.
Once the trimming is completed, withdraw the trimmer from the base framework guiding axles.

3.2.4 **Visual control:**

Put the trimmed pipes close to each other to perform the VISUAL CONTROL.
Measure the *drag force* again during the visual control phase.
Briefly press the ⇐ key on the panel (make certain that the force selected on the display is F=0000 N). Using this procedure, the DRAG FORCE necessary to move the pipe/fitting of the base framework's moving body is measured (the force message will go from **F=0000 N** to **F=---- N** when the moving body moves). Stop the movement by pressing STOP.

ATTENTION !
BASIC E: In case the moving body reaches the travel end or the drag force is greater than 3000 N, the display will show: **F=9999 N**. **BASIC H**: Warning ! The drag force value could be affected by the hydraulic station oil temperature.

Retain the force shown on the display, which should be added to the working forces in successive phases.
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 1 mm, 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

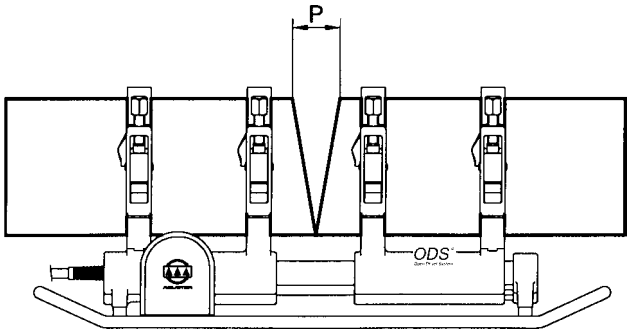


Figure 19

If the tolerance of the specification to be applied does not comply, trim again.
When the visual check is satisfactory, place the moving body in the fully open position using the panel push button.

3.2.5 **Heating plate setting:**

Once the trimming and visual check phase has been completed, select the heating force on the display, corresponding to the diameter and SDR of the pipes/fittings to be jointed (refer to the Fusion Parameter Table for the **BASIC E** or **BASIC H**).
Select the **F** force using the panel push buttons.

Place the heating plate on the base framework guides between the pipes/fittings (approximately midway); the electric cable should be on the grip clamping bolts side.

CAUTION !
Hot surfaces!

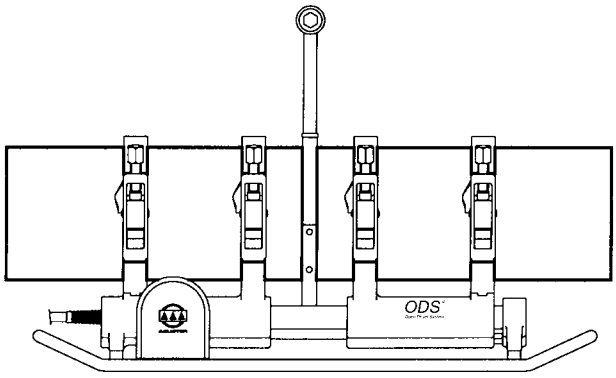


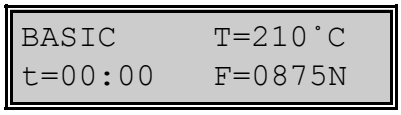
Figure 20

Place the movable body pipe/fitting end close to the heating plate by pressing the ⇦ push button on the panel. Now *briefly press* the ⇦ panel push button. The sign ✓will be displayed and the moving body will close and will continue applying the force selected on the display (for example: 575N fusion force + 300N drag force).

BASIC	T=210˚C
t=00:00	F=0875N ✓

The display also shows the temperature of the heating plate. In the example, the heating plate is selected at a 210 ˚C working temperature. If the↑ indication appears to the right of ˚C, it means that the plate has still not reached the working temperature and the fusion control box will continue to supply the plate with energy until it reaches the temperature programmed. If a question mark (?) appears to the right of ˚C, it means that the heating plate is not connected or that the plate temperature sensor is outside the tolerance (faulty).
The heating plate is fitted with an independent control thermometer for additional information.

The HEATING phase is begun, wherein the fused material at the ends causes a bead to form which progressively reduces the length. When the programmed length reduction for the relevant type of pipe is achieved (making of the initial bead indicated on the Table, depending on the diameter and SDR of the pipes/fittings to be jointed), *briefly press* the ⇨ panel key. The sign ✓will be gone from the display and t the movable body will keep still.

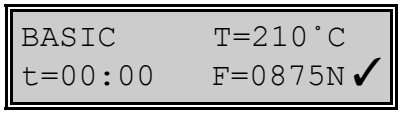


Next press the time key to begin the phase timing.

Once the heat soak time has expired, open the moving body *keeping the ⇨ panel key pressed down* to withdraw the heating plate from the base framework.

3.2.6 Fusion and cooling down cycle:

Press the panel ⇦ key in order to bring together both pipe ends. Immediately *briefly press* the panel ⇦ key to validate the selected force. The moving body will close maintaining the force selected.



Press the time push button *twice* (the first is to reset the counter and the second to initiate the timing of the FUSION phase).
Once the fusion time indicated on the display (according to the Table, diameter and SDR of the pipes to be jointed) has expired, *press* the **STOP** push button on the panel.

Once the butt fusion cycle is complete, *press* the time key *twice* (the first is to reset the counter and the second to initiate the timing of the pressureless COOLING phase). During this phase, the moving body remains blocked and the clamps holding the pipe/fittings must not be loosened until the cooling time indicated in the Table is over.

3.2.7 **Functional operations outline (summary):**

PHASE	SEQUENCE	SEQUENCE DESCRIPTION
Selection check Configuration	Press and hold ⇦⇨ Plug in unit Press ⇑ or ⇓ to change Press timer ⧗to confirm Press STOP to return to menu	When plugging in the unit, check heating plate programmed temperature. To change the existing selection, follow the described sequence.
Placement of pipes / fittings into the base framework	OPEN: Press and hold ⇨ CLOSE: Press and hold ⇦	Manual procedures.
Drag force measurement	F=0000 N (pressing STOP) Press and hold ⇨ to open Briefly press ⇦ F=----N Press STOP to halt Pipes / fittings cleaning	Force selected on the panel must be 0 N. Press STOP in the event of any other value appearing. Place the moving body in the open position. Briefly press the closure push-button and press STOP before contact between pipes. Drag measurement display.
Trimming	Place trimmer into position Select force by pressing ⇑ Briefly press ⇦ Actuate the trimmer push-buttons Visual control of the cut Remove the trimmer	Once the trimmer is placed into position, select the drag force + 200-250 N (recommended). The moving body is set into motion when ⇦ is pressed. Start trimmer immediately, by actuating its push-buttons. Repeat the trimming as many times as necessary and/or increase force in accordance with the cut obtained.
Visual control	F=0000 N (pressing STOP) Briefly press ⇦ F=----N STOP to halt CLOSE: Press and hold ⇦	While carrying out the visual control, take the opportunity to perform a new measurement of the drag force. Once drag force has been performed, finish manually moving the pipes / fittings toward each other by pressing close button.
1: Heating	Select force by pressing ⇑ Place plate into position Move toward by pressing ⇦ Briefly press ⇦ Bead visual control	Select *Heating* force from the Table, in accordance with diameter and SDR. Add drag force obtained. Manually move the pipes / fittings toward the heating plate before briefly pressing ⇦.
2: Heat soak	Briefly press ⇨ Start the timer ⧗	Interrupt Phase 1 once the initial bead indicated in the Table has been achieved. Activate the timer.
3: Heating plate removal	OPEN: Press and hold ⇨ Heating plate removal	Manually open to a degree sufficient to remove the heating plate.
4: Force increase	Bring together by pressing ⇦ Briefly press ⇦	Manually bring the pipe ends together by pressing ⇦. Briefly press ⇦ to validate the selected force.

PHASE	SEQUENCE	SEQUENCE DESCRIPTION
5: Fusion	Stop and restart timer ⧗	Actuate the timer twice (once to stop it, then start it again).
6: Cooling-off	Press STOP Stop and restart timer ⧗	Once the Fusion time specified in the Table for the respective diameter and SDR has been reached, stop the process. Actuate the timer twice (once to stop it, then start it again).
Removal	Stop timer ⧗ OPEN: Press and hold ⇨ CLOSE: Press and hold ⇦	Once the *cooling-off* (forceless cooling) time specified in the Table has elapsed, check the bead width and proceed to removal of pipes / fittings from base framework.

CHAPTER 4: TROUBLESHOOTING

4.1 GENERAL

All maintenance and repair work of the butt fusion machine is to be carried out by qualified personnel. Full guarantees are obtained by shipping the unit to the ACUSTER, S.A. After-Sales Service, both for the yearly revision and for repairing any fault that may have occurred in the unit.

4.2 UNIT CHECKS

The simplicity of the unit's design makes costly inspections unnecessary. To inform the operator of any potential malfunctions or faults, there is a set of symbols that appear on the display when necessary.
Following is a short list of possible faults:

4.2.1 The ODS 24 Vdc trimmer does not work (BASIC E):

1. Press the base framework's operation push buttons (open or close). This is to verify that the 24 Vdc outlet (which powers both the base framework's actuator and the trimmer) is operative.
2. Check trimmer operation. Connect the trimmer to the fusion control box and select the trimming mode.

   Trimming:

   Select the force to be applied with the **F** keys. Start the trimming operation by making a *briefly press* onto ⇦ key on the panel. The sign ✓will be displayed and the moving body will began to close.
   With the trimmer located onto the base framework guiding bars, immediately press the trimmer push buttons.
   Once the pipe/fitting end of the moving body has approached to the trimmer, it will slightly open the trimmer will start up and the moving body will close with the programmed force.
   This operation is to verify the correctness of the 24 Vdc output voltage (that feeds the linear actuator motor and trimmer motor as well).

3. Possible fault in one of the trimmer's push buttons.
4. Possible fault in the electronic component which controls the trimmer's operation through the push buttons.

4.2.2 The base framework does not work (BASIC E):

If there is no movement of the base framework's moving body, a verification by the following procedure is recommended:

1. First check the base framework's electrical connections to the fusion control box.
2. Press the chronometer button or the **F** push buttons to verify that the internal cable connecting the keyboard to the electronic plate is operating correctly.
3. Potential faulty on the 24 Vdc output voltage.
4. Linear actuator motor faulty.

4.2.3 The ODS 225 V230 trimmer does not work:

1. Check the bit controls.
2. Check the Schuko plug output by connecting another element which operates at 230Vac.

4.2.4 The ODS 315 trimmer does not work (BASIC H):

1. Check trimmer operation. Connect the trimmer to the fusion control box and select the trimming mode.

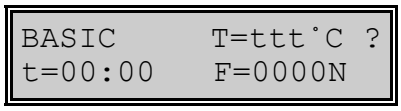
   Trimming:

   Select the force to be applied with the **F** keys. Start the trimming operation by making a *briefly press* onto ⇦ key on the panel. The sign ✓will be displayed and the moving body will began to close.
   With the trimmer located onto the base framework guiding bars, immediately press the trimmer push buttons.
   Once the pipe/fitting end of the moving body has approached to the trimmer, it will slightly open the trimmer will start up and the moving body will close with the programmed force.

2. Possible fault in the trimmer's push button.
3. Possible fault in the electronic component which controls the trimmer's operation through the push buttons.

4.2.5 The heating plate does not heat up or does not maintain working temperature:

1. First check the heating plate's electrical connections to the fusion control box.
2. Check the plate temperature on the display. Also check plate temperature on the display if the question mark appears.



The question mark (?) Indicates that the heating plate is not connected or that the plate's internal sensor is outside tolerance (faulty).

3. The temperature on the display does not match the working temperature to be used by the operator. Check the machine's programmed temperature (remember that the plate's working temperature can be programmed from 180˚C to 240˚C, according to the type of plastic resin to be jointed and/or applicable regulations).
With the unit disconnected, keep the ⇦ ⇨ keys simultaneously pressed down. Next, the following information will appear on the display:

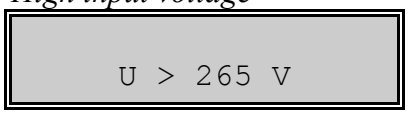
The temperature shown on the display corresponds to the unit's last programming. To modify it, press the force ⇑ or ⇓ F push buttons to increase or reduce the value. Once the desired temperature is selected, press the chronometer button (✓) to confirm (if this push-button is not pressed, the modified selection will not take effect).

4.2.6 **Mains voltage outside tolerance:**

If any of the following messages appear on the unit's display:

Low input voltage

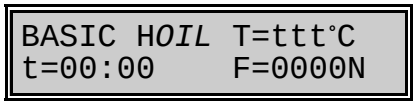
High input voltage



The message displayed on the left hand screen indicates that the supply voltage to the control box is lower than the allowed margin (this function was introduced since the v1.6 software version on **BASIC E**).
The message displayed on the right hand screen indicates that the supply voltage to the control box is higher than the allowed margin (this function is active within the first seconds the box is plugged to the mains). In case the message is displayed on the screen, switch the box off, verify the supply and switch on again.

4.2.7 Low oil level (BASIC H):

In case the hydraulic oil level is below the minimum allowed, the following informative message will be displayed on the screen:



The message **OIL** is blinking on the screen, indicating that the oil level is below the minimum correct working level (that message is just informative and no interruption of the machine is done).
Refill the necessary oil quantity. If the message is still displayed, the oil level sensor could be faulty.

CHAPTER 5: MAINTENANCE

5.1 GENERAL

5.1.1 Introduction:

The **BASIC** fusion units 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.

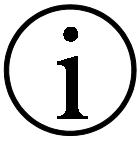
WARNING!
All cleaning and maintenance operations, and base framework, heating plate, trimmer and hydraulic station (**BASIC H** only) adjustments must be performed with the components disconnected from the unit.

5.1.2 Storage:

If the unit is not to be used for a long period of time, keep it in its box protected from dust, moisture, extreme temperatures, direct sunlight, and so on. The complete unit can be stored on the warehouse floor or in pallet racks.

5.1.3 **Cleaning:**

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



NOTICE !
Do not clean the fusion control box with water under pressure, by immersion in water o with compressed air. Do not rub excessively the plastic shell, 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 S.A. After-Sales Service for a yearly service.

5.2 BASE FRAMEWORK MAINTENANCE

5.2.1 **Linear actuator (BASIC 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.
Perform the verification by operating the panel's opening and closing push buttons. Also perform a test for the drag force. This value should not surpass 100N.

5.2.2 **Clamp adaptors:**

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

5.2.3 **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

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, as well as the power supplied. The heating plate's temperature should be approximately 210°C at 23°C RT.

5.4 TRIMMER MAINTENANCE

5.4.1 **Trimmer faceplates:**

Check for cutting performance. The shavings must be uniform, and never above 0.2 mm thick on both sides. If the cut is faulty (either in thickness or regularity) the cutters must be adjusted. First check the cutting height (h) by means of a calliper or gauge.

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.

Flat Cutter (versions ODS 225 and ODS 315 E-00 - from Serial No. 50)

Where:

1 Cutter
2 Fixing screw M5 (3mm Allen key)
3 Adjusting shim (0.1 mm thickness)

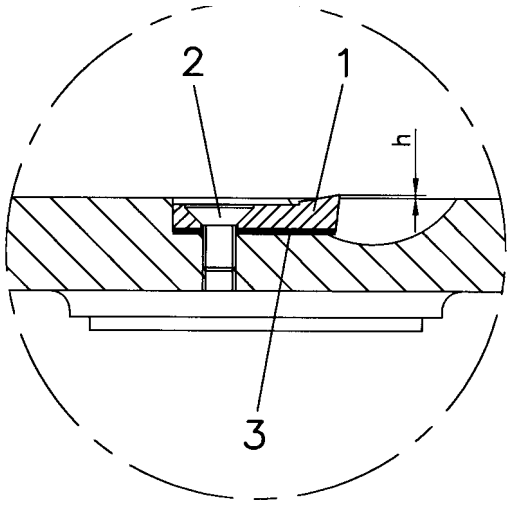


Figure 21: Cutter adjustment

Bear in mind that the cutter adjustment can vary according to the diameter of the pipe/fitting to be faced, having to be regulated in order to adapt to the job's specification.

5.4.3 **Driving electric motor:**

To check the function of the trimmer electric motor, please refer to TRIMMER of the TEST MENU (CHAPTER 4: TROUBLESHOOTING, of this *User Manual*).
The ODS 225 trimmer version is driven by a 24 Vdc electric motor while the ODS 315 one is driven by a drilling machine of 230 Vac voltage.

5.4.4 **Driving belt:**

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

ODS 225 E-00:	Part # Poly-V J9
ODS 315:	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, S.A. After-Sales Service.

5.5.2 **Updating program version:**

The updating of the **BASIC E** and **BASIC H** units software must be performed exclusively by the ACUSTER, S.A. After-Sales Service.

5.6 HYDRAULIC STATION MAINTENANCE

Check the oil level with the stick (there is an external viewer too). Check weekly.
Should the level be too low, refill with HV 46 oil, according to the ISO 6743/4-HV specifications.
The scheduled maintenance for oil and filter is as follows:

FILTER: Replace after every 500 working hours
OIL: Replace after every 2000 working hours

or once a year (filter + oil).

REMARK !
Spare oil in 1 litre containers is available.

CHAPTER 6: TECHNICAL CHARACTERISTICS

6.1 FUSION CONTROL BOX MODULE

6.1.1 General specifications:

Power supply	:	195 Vac to 265 Vac. Nominal voltage: 230 Vac 95 Vac to 140 Vac. Nominal voltage: 110 Vac
Mains frequency	:	45 Hz to 65 Hz. Nominal frequency: 50 Hz
Power consumption	:	3500 W maximum
Generator output	:	4.5 kVA monophase, recommended Electronic regulation, preferable
Protection class	:	IP54
Working temperature	:	At user's discretion.
Display	:	LCD (2 lines x 20 characters, backlit)
Keyboard	:	6 tactile feeling membrane push buttons
Power cable	:	3x2.5 mm^2 cable
Electric connection	:	3 multicontact circular connectors Base framework (BASIC E): 20x13 Heating plate: 20x6 24 Vdc trimmer (BASIC E): 20x3 230 Vac trimmer (BASIC H): 20x6 230 Vac trimmer (BASIC E): Schuko socket

6.1.2 Generator group specifications:

Frequency	:	50 Hz
Output power	:	4.5 kVA (minimum)
Voltage	:	230 Vac/110 Vac
Intensity	:	16 A (minimum) for 230 Vac; 20 A (min) for 110 Vac
Voltage regulation	:	Preferably electronic

6.2.1 BASE FRAMEWORK 200/225/8" E

Diameter range	:	From 63 to 200 mm/225 mm/8", depending on model
Fixing grips	:	26 mm socket wrench
Clamp adapters	:	For ϕ 63, 75, 90, 110, 125, 140, 160, 180, 200mm; 6", 5", 4", 3", 2-½", 2" (not included in the unit); fixing screw: 6mm Allen
Drive	:	Lineal actuator at 24 Vdc
Maximum working force	:	4000 N
Displacement speed	:	20 mm/s maximum
Electric connection	:	14x1 mm^2 cable

6.2.2 BASE FRAMEWORK 315 H (hydraulic drive)

Diameter range	:	From 90 to 315 mm
Fixing grips	:	30 mm socket wrench
Clamp adaptors	:	For 90, 110, 125, 140, 160, 180, 200, 225, 250 and 280 mm pipe diameter (not included in the unit); fixing screw: 5 mm Allen
Drive	:	Two double action hydraulic cylinders
Maximum working force	:	100 bar
Displacement speed	:	20 mm/s maximum
Hydraulic connection	:	3/8" flat ended quick plugs, according to ISO 7241-1, A Series

6.3.1 TRIMMER (Driving electric motor 24 Vdc)

Power supply	:	24 Vdc nominal
Electric motor power	:	465 W nominal
Drive	:	Via 2 push buttons; safety switch
Rotation speed	:	≈ 112 rpm
Cutters regulation	:	Fixing screws: 3 mm Allen Adjusting shims
Transmission belt	:	Poly-V
Electrical connection	:	3x2.5 mm^2 cable

6.3.2 TRIMMER (230 V driver)

Mains power supply	:	230 Vac nominal
Electric motor voltage	:	720 W nominal
Drive	:	via 1 push-button (plus safety switch)
Rotation speed	:	≈ 60 rpm
Cutters regulation	:	Fixing screws: 3 mm Allen Adjusting shims
Transmission	:	Chain with tightener
Electric connection	:	Electric cable 3x2.5 mm^2

6.4 HEATING PLATE

Surface temperature	:	From 180 to 240°C to be programmed according to material to be jointed
Temperature regulation	:	PID type with Triac
Independent temperature control	:	Analogical thermometer
Plate coating	:	PTFE replaceable cloth
Power supply	:	230 Vac nominal; 110 Vac nominal;
Plate power	:	2000 W (ODS 225 Version at 230 Vdc) 1800 W (ODS 225 Version at 110 Vdc) 2300 W (ODS 315 version)
Electrical connection	:	10x1 mm^2 cable

6.5 HYDRAULIC STATION

Mains power supply	:	230 Vac/110 Vac nominal
Maximum working pressure	:	100 bar
Safety valve gage	:	110 bar
Oil tank capacity	:	2 litres/5 litres (according to model)
Oil filter	:	25 microns/10 microns (according to model)
Type of oil	:	HV-46, according to ISO 6743/4-HV
Cylinder connections	:	3/8" flat-ended quick plugs, according to ISO 7241-1, A Series

6.6 SIZE AND WEIGHT

6.6.1 **Weights of various parts:**

		BASIC E	BASIC H
Control box	:	8 Kg	8 kg
Base framework (without adapters)	:	50 Kg (225 version) 53 Kg (200 version)	100 Kg (315 version)
Heating plate	:	6¼ Kg (225 version)	10 Kg (315 version)
Trimmer	:	13¼ Kg (225 version)	21½ Kg (315 version)
Plate and trimmer support	:	3 Kg (225 version)	---
Transport trolley + hydraulic station	:	---	35 Kg/63 Kg (acc model)
Total nett weight	:	80½ Kg (225 version) 83½ Kg (200 version)	174¼ Kg/192½ Kg (acc model)

6.6.2 **Dimensions of various parts:**

			200/225/8" VERSION	315 VERSION
Base framework	:	length	960 mm	960 mm
		width	390 mm	550 mm
		height	400 mm	540 mm
Heating plate	:	width	380 mm	470 mm
		depth	50 mm	70 mm
		height	545 mm	620 mm
Trimmer	:	width	430 mm	500 mm
		depth	140 mm	370 mm
		height	580 mm	530 mm
Fusion Control Box	:	width	450 mm	
		depth	470 mm	
		height	460 mm	
Electric cables length	:	Mains connection cable		= 4 m
		Base framework connection cable		= 4 m
		Trimmer connection cable		= 4 m
		Heating plate connection cable		= 4 m

6.6.3 **Packing weight and dimensions:**

6.6.3.1 Packing for **BASIC E** fusion control box:

Contents:
- Fusion Control Box
- User Manual (Publication No. MU-78-03E)
- Butt fusion parameters chart (Publication Nos. ANX-097/ANX-098/ANX-099)

Exterior dimensions: 410 x 330 x 320 mm

Gross approximate weight: 9 kg

6.6.3.2 Pallet type packing for base framework (ODS 200/225/8" E):

Contents:
- Base framework
- Tool set: 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: 1000 x 410 x 600 mm

Gross approximate weight: ODS 225 E: 68 kg
(*without clamp adaptors*) ODS 200 E: 71 kg

6.6.3.3 Pallet type packing for heating plate + trimmer (ODS 200/225/8" E):

Contents:
- Heating plate
- Trimmer
- Trimmer and heating plate holder

Exterior dimensions: 620 x 440 x 600 mm

Gross approximate weight: 39 kg

6.6.3.4 Pallet type packing for base framework (ODS 315 H):

Contents: - Base framework
- Tool set: 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 30 mm socket wrench

Exterior dimensions: 1200 x 590 x 680 mm
Base framework gross weight (*without clamp adaptors*): 127 kg
Base framework transport's trolley gross weight (*optional*): 26 kg (without cage)

6.6.3.5 Pallet type packing for hydraulic station, heating plate and trimmer (BASIC H):

Contents: - Transport trolley with hydraulic station and BASIC H control box
- User Manual (Publication No. MU-78-03E)
- Butt fusion parameters chart (Publication Nos. ANX-097/ANX-098/ANX-099)
- Heating plate 315
- Trimmer 315

Exterior dimensions: 750 x 570 x 980 mm

Gross approximate weight: 93 kg/111 Kg (according to model)

RESERVED FOR NOTES