



USER MANUAL

**ELECTROFUSION CONTROL BOX
MODEL BEAT-Tr**

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NOTE !

At the time of the publication of this *User Manual*, the software version is **V. 1.24**. ¶

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 electrofusion units **BEAT-Tr** are designed to carry out polyethylene (PE) pipe/fittings joints through electrofusion fittings with a range of 8 V to 48 V electrofusion voltage.

The **BEAT-Tr** electrofusion unit receives the relevant data of the fitting via the bar code system and also by operator's manual introduction: VOLTAGE and TIME from the fitting manufacturer. Take into account that some fitting manufacturers provide different fusion times according to ambient temperature. Refer to the fitting manufacturer's instructions. The **BEAT-Tr** is provided with traceability, so it allows the data entry such as operator's ID, job order ID, auxiliary data and fitting traceability. The unit stores all this data in its memory for further treatment.

This model can be optionally supplied as **AR** Series (High Performance) with the same original technical specifications, except for having a higher duty cycle. The **AR** series is especially indicated for ongoing electrofusion of large size fittings and for very hot climates.

The technical data contained in this *Manual* are purely informative and may be changed at anytime. ACUSTER BAHISA, S.L.U. 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 electrofusion units **BEAT-Tr** are designed according to the following specifications:

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

The **BEAT-Tr** 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.

1.3 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 quality guarantee.



WARNING !
The electrofusion control box can only be opened by the Grupo Acuster 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 <i>Manual</i> .
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 UNIT IDENTIFICATION

1.4.1 **Serial Number Stamping:**

The electrofusion units **BEAT-Tr** 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 electrofusion unit 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).

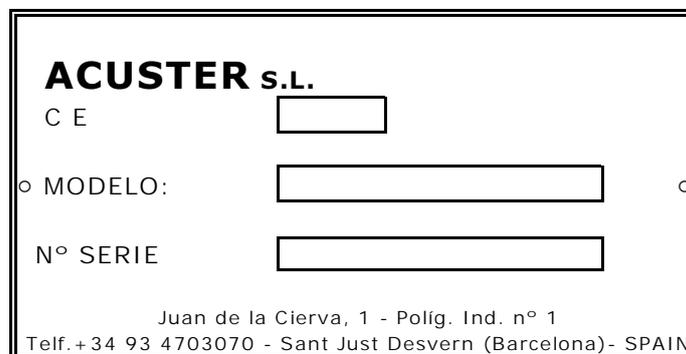


Figure 2

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.
- Protect the electrofusion cables and the cable that goes to the power supply of cutting objects.
- All damaged cables must be replaced immediately by the After-Sales Service of Grupo Acuster.
- 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 Grupo Acuster.
- 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.
- 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 Grupo Acuster.
- The fusion control box can only be opened by the After-Sales Service of Grupo Acuster.
- Should the fusion control box not work properly, it will have to be sent immediately to the After-Sales Service of Grupo Acuster.

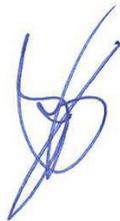
1.6 DECLARATION "CE" OF CONFORMITY

ACUSTER BAHISA, S.L.U.
Juan de la Cierva, 1
Polígono Industrial del Sud-oest
08960 Sant Just Desvern (Spain)

declare under our sole responsibility that the electrofusion unit **BEAT-Tr**, to which this declaration relates is in conformity with the following Directives and also the following relating standards:

Directive	Related Specification	Model
2006/95/CE <i>Low Voltage</i>	EN 60335-1	BEAT-Tr
2004/108/CE <i>Electromagnetic compatibility</i>	EN 61000-6-2; EN 61000-6-3	
	ISO 12176-2	
	ISO 12176-3	
	ISO 12176-4	
	ISO/TR 13950	

Sant Just Desvern, 20th September 2010



Jaume Puig
General Manager

1.7 GUARANTEE

Guarantee Declaration:

All the electrofusion units **BEAT-Tr** electrofusion control boxes 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 careful reading of the following general guarantee conditions.

General conditions of Guarantee:

1. ACUSTER BAHISA, S.L.U. 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 Grupo Acuster's Technical Service.
3. The Guarantee is not valid in the following cases:

When the fault in the product is a result of:
 - 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 Grupo Acuster (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 Grupo Acuster'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: UNIT'S DESCRIPTION

2.1 GENERAL

The electrofusion units **BEAT-Tr** are made up of an ABS plastic case assembled on a steel tubular frame, a master switch, fuse holder, the mains and electrofusion cables as well as serial connector for the non simultaneous connection of optic pen or scanner, a PC and one serial printer.

The front part is formed by a membrane which incorporates tactile push-buttons to enter the data and a back-lit LCD display.

Inside, the unit is formed by a processor board (CPU), transformer, in addition to all of the electronics necessary for the electrofusion process, current and voltage controls.



*Figure 3: **BEAT-Tr** general view*

2.2 FRONT PART

The front part of **BEAT-Tr** electrofusion unit is formed by a silkscreened plastic membrane which incorporates membrane type tactile push-buttons. The display is located on the upper left side.

Where:

- 1** Front cover
- 2** Tubular frame
- 3** Membrane with push-buttons
- 4** Display
- 5** Seal plug
- 6** Adhesive of model: **Tr**

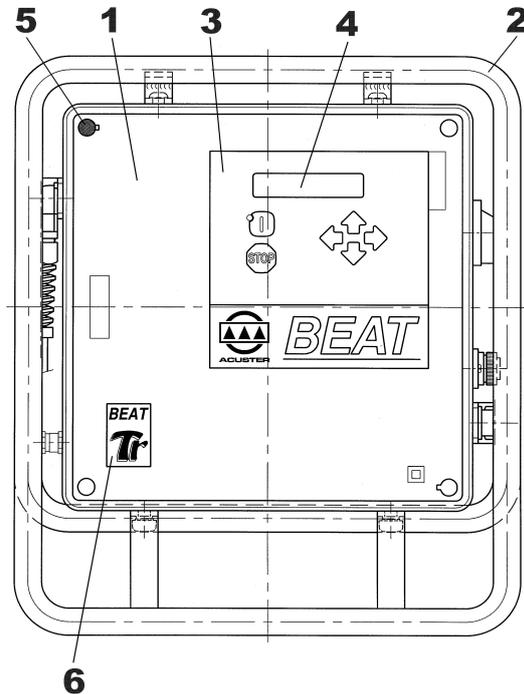


Figure 4

2.3 SIDES

On the right side of the **BEAT-Tr** electrofusion unit (looking at it from the front), the following elements are located:

- 1** Master switch
- 2** Fuse holder
- 3** Power cable

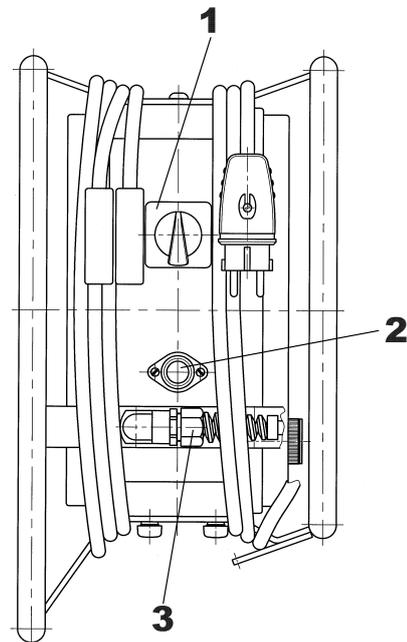


Figure 5

On the left side of the **BEAT-Tr** electrofusion unit (looking at it from the front), the following elements are located:

- 1** Electrofusion cables
- 2** Serial connector
(Optic pen/scanner; PC and printer)
- 3** RT sensor
- 4** Guarantee seals

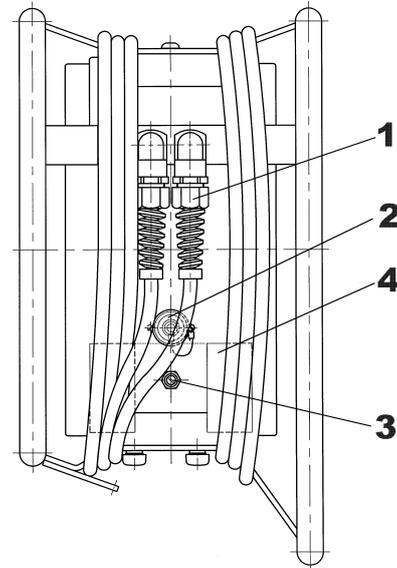


Figure 6

2.4 REAR

The unit's identification plates are located on the rear cover of the **BEAT-Tr** units.

- 1** Technical specifications sticker
- 2** Seal plug
- 3** Document holder bag
- 4** Buzzer
- 5** Service revisions plate
- 6** "CE" plate

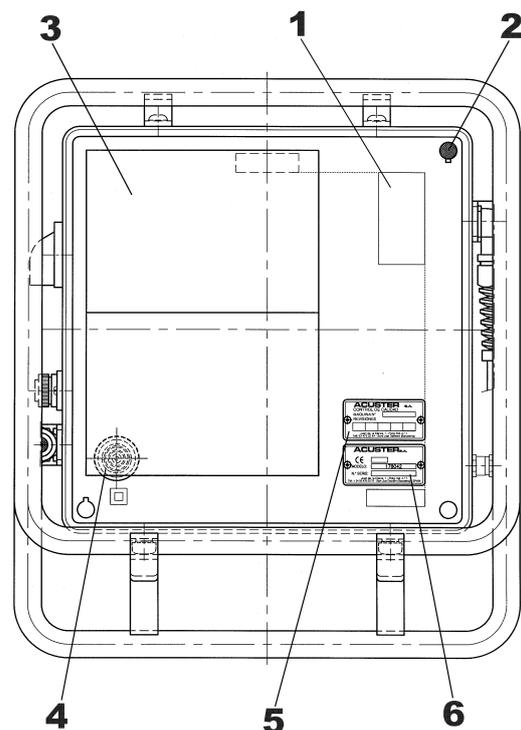


Figure 7

CHAPTER 3: MODE OF USE

3.1 FUSION PROCEDURE FOR ELECTROFUSION FITTINGS

3.1.1 **Introduction:**

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

3.1.2 **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 degreasing towel or with a clean, dry white cloth (which does not shed lint), dampened with isopropanol or recommended PE solvent.

3.1.3 **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 over a pipe from a roll, the placement of an aligner-rounder tool is indispensable. Next install the fitting over 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 are carried out from adverse weather conditions, such as rain, snow or wind. Admissible temperatures range from -5°C to +45°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 previous preparation tasks (scraping, degreasing, etc).

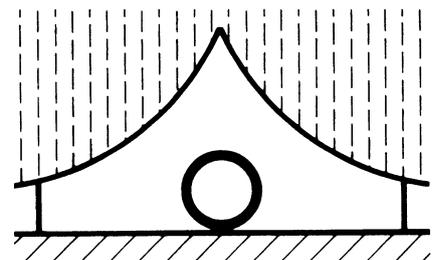


Figure 8

3.1.4 **Unit connection:**

Connect the unit to a 230 V \pm 15%/50-60 Hz mains 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 NOTES !

Connection to a generator: the generator electric connection where the electrofusion unit 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 electrofusion unit is plugged must be fitted with earth connection as well as circuit breaker type D (EN 60898).

Do not unplug the mains by pulling on the cable.

Because the unit allows the use of an optic pen or scanner indistinctly, connect the barcode reader to use before connecting the unit so it will be recognized.

Checking the fitting connection cable terminals before starting up the unit is advised. There are different types of adapters depending on the type of fitting to be used.



Set the master switch in the ON position.

BEAT-TR **No.xxxx**
V v.vv UK **dd/mm/yy**

The display backlight will be enable, an acoustic signal heard and the following information will appear:

BEAT-TR: model
No.xxxx: unit serial number
V v.vv: software version
UK: Letters of the active language
dd/mm/yy: current date

Once the display time has elapsed (3 seconds), the unit will display the following screen.

Possible initial messages:

MEMORY FULL

If the capacity of the memory is already full, the display will show the following message:

MEMORY FULL
FUSION NOT POSSIBLE

Export or/and eraser the fusion records: refer to clause 3.2.2 of this *Manual*.

TECHNICAL MACHINE SERVICE

If the programmed warning date for the Technical Machine Service in the unit has expired, the display will show:

REV. VALID UNTIL
dd/mm/yy

The unit will emit an acoustic signal and a message will appear in the display along with the date of the next check.

If the date **dd/mm/yy** has not expired yet, press START to confirm and proceed to the next screen (regardless of the existing locking set up of the unit).

If the date **dd/mm/yy** has already expired but the unit is set up without locking, by pressing START you will be able to move to the next screen. However, if the unit is set up with locking subsequently the unit will not be able to be used until the TMS has been carried out.

AMBIENT TEMPERATURE OUT OF RANGE

If the ambient temperature is not within -20°C and 50°C [from software version v. 1.21 (previous software versions -15°C and 50° C)] or the temperature sensor is defective, with data entry via bar code the following message will be displayed:

**TEMPERATURE
OUT OF RANGE**

Pressing the key START/VALIDATE automatically switches to manual mode.

NOTE: In the case of faulty probe, send the unit to the Grupo Acuster's After-sale Service.

INTERNAL FAULT

If the software detects that there is a voltage output through the electrofusion cables out of the electrofusion cycle, the display shows the following message:

**SERIOUS TROUBLE
TURN OFF UNIT**

The unit will be blocked and the buzzer will be permanently activated. Switch off immediately the unit.

NOTE: If case to have an electrofusion fitting connected, check if it has suffered damage. Send the unit to the Grupo Acuster's After-sale Service.

LOW BATTERY

In case to detect a battery voltage below the minimum required, the display will indicate:

**SERVICE
FLAT BATTERY**

Send the unit to the Grupo Acuster's After-sale Service for the replacement of the battery.

Pressing the START button, the display shows the date and time to update it (refer to paragraph **DATE/TIME** of section 3.2.4 of this *Manual*). This update will keep for some time if the battery is not replaced, especially with the unit disconnected from the mains.

From the time the unit is started up, a verification of the input voltage is performed. If the voltage registered by the unit is above or below the tolerance allowed (195 - 265 V for 230Vac nominal voltage or 90-140 V for 110Vac nominal voltage), one of the following messages will appear on the display:

**POWER SUPPLY ERROR
265V 65Hz**

Appears when the input voltage or frequency is over 265Vac (140Vac) / 65 Hz, respectively.

POWER SUPPLY ERROR
195V 45Hz

Appears when the input voltage or frequency is under 195Vac (90Vac) / 45 Hz, respectively.

Check the power supply (group) and correct the defect. It is not necessary to switch the unit off and switch it on again to refresh the input voltage.

3.1.5 Using the Barcode Reader:

If you read the different data (operator's ID, job ID, fittings, pipe, etc) by using optical means (optic pen or scanner, indistinctly), connect the reader device into the corresponding connector and slide it (barcode reader) our put it in front of the barcode data (scanner).



ATTENTION !

The scanner should be correctly setup. In case no data is captured by the device, carry out the following barcode reading.

Software version ≤ v. 1.23

Software version ≥ v. 1.24



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 40°. However, the pen's working angle is bigger: it can be used between 0 and 50°, 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.

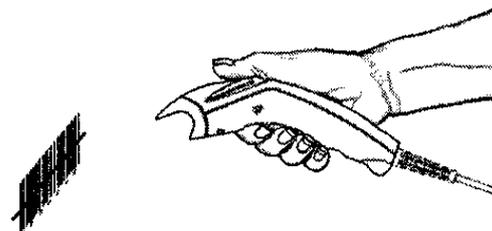
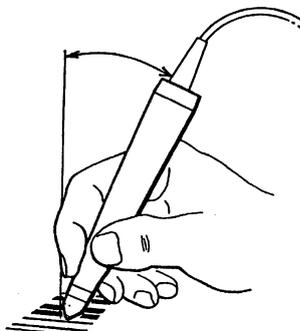


Figure 9a: Example of using the optic pen Figure 9b: Example of using the laser scanner



NOTE !

If none of the configuration menu options are enabled, such as identification of the operator, job, auxiliary data or traceability, go directly to clause 3.1.10 - **Fitting connection**.

3.1.6 Entering the Operator Number: Only If Enabled (SETUP/OPERATOR = 1).

In case the operator's ID entering is enabled, the unit allows both voluntary or compulsory entering according to its established setup.

- *Voluntary operator's setup*: it can be avoided by pressing START/VALIDATE key.
- *Compulsory operator's setup*: it must be unavoidably entered.

In case of pressing START/VALIDATE key to skip it, the following message is displayed:

**OPERATOR:
COMPULSORY**

The message is showed up during 3 seconds.

In case the unit would be setup to carry out the operator's traceability according to ISO 12176-3, it shall be not allowed that the operator's identification would be carried out manually. If done, the following message is displayed:

**OPERATOR:
CONTROL ISO 12176-3**

The message is showed up during 3 seconds.

If once the operator's barcode encoding data is read and processed, some of the coded fields are not accepted, such as the expiry date has expired, the encoded skill does not include the electrofusion jointing or there is an error on the encoding data itself or on the identifier, the following message is displayed:

**OPERATOR:
WRONG DATA**

The message is showed up during 3 seconds.

 *Entering Operator No. by barcode (2x5 interleaved).*

OPERATOR: Start screen.

**OPERATOR:
A 1234/724/SG** Capture by optic pen or scanner.

Shows the decoding of the operator number, country and certifying organization. To delete the reading and move to the start screen, press <STOP>.

If the barcode or reading were incorrect:

**OPERATOR:
WRONG DATA** Error message.

Two acoustic signals are emitted and it returns to the start.

2 *Entering Operator No. without barcode: via the keyboard.*

Click one of the 4 arrows. The display will show the following screen:

OPERATOR: Blinking cursor.

Manually enter using the arrow buttons. 16 alphanumeric characters. Permitted characters: capital letters, 0 to 9 and + . , * / - () <space>.

Press the **➡** and **⬅** arrows to move the cursor to a different field and **⬆** and **⬇** arrows to select the values.

To delete the reading and pass to the start screen press <STOP>.

Press the START/VALIDATE key to pass to the next screen.

3.1.7 Entering the Job Number: Only If Enabled (SETUP/JOB = 1).

In case the job's ID entering is enabled, the unit allows both voluntary or compulsory entering according to its established setup.

- *Voluntary job's setup:* it can be avoided by pressing START/VALIDATE key.
- *Compulsory job's setup:* it must be unavoidably entered.

In case of pressing START/VALIDATE key to skip it, the following message is displayed:



The message is showed up during 3 seconds.

③



Entering job number using the barcode (Code 128 up to 16 characters).



Start screen.



Capture by optic pen or scanner.

To delete the reading and move to the start screen, press <STOP>.

If the barcode or reading were incorrect:



Error message.

Two acoustic signals are emitted and it returns to the start.



Entering job number without barcode: via the keyboard.

Click one of the 4 arrows. The display will show the following screen:



Blinking cursor.

Manually enter using the arrow buttons. 16 alphanumeric characters.

Press the **➡** and **⬅** arrows to move the cursor to a different field and the **⬆** and **⬇** arrows to select the values.

To delete the reading and pass to the start screen press <STOP>.

Press the START/VALIDATE key to pass to the next screen.

3.1.8 **Entering Auxiliary Data: Only If Enabled (SETUP/AUXILIARY DATA = 1).**



Entering Auxiliary data using the barcode (Code 128 up to 16 characters).



Start screen.



Capture by optic pen or scanner.

To delete the reading and move to the start screen, press <STOP>.

If the barcode or reading were incorrect:



Error message.

Two acoustic signals are emitted and it returns to the start.

④



Entering Auxiliary Data without barcode: via the keyboard.

Click one of the 4 arrows. The display will show the following screen:



Blinking cursor.

Manually enter using the arrow buttons. 16 alphanumeric characters.

Press the \blacktriangleright and \blacktriangleleft arrows to move the cursor to a different field and the \blacktriangleup and \blacktriangledown arrows to select the values.

To delete the reading and pass to the start screen press <STOP>.

Press the START/VALIDATE key to pass to the next screen, regardless of whether or not the auxiliary data were entered.

3.1.9 **Traceability: Only If Enabled (SETUP/TRACEABILITY = 1).**

5



Entering Traceability data by barcode (Code 128).

TRACEABILITY:

Start screen.

Y PE100 AGRU
200x100 SDR17.6

Capture by optic pen or scanner.

The decoding is shown when the barcode is entered. The traceability text disappears.

To delete the reading and move to the start screen, press <STOP>.

If the barcode or reading were incorrect:

TRACEABILITY:
WRONG DATA

Error message.

Two acoustic signals are emitted and it returns to the start.

Click the START/VALIDATE key to pass to the following screen.

COMPONENT 1:

Capture by optic pen or scanner.

Now enter the traceability data of Component 1.

PIPE PE100 9052
200 SDR17.6

The Component 1 text disappears.

The decoding is shown when the data are entered.



Entering Traceability data without barcode: via the keyboard.

Click one of the 4 arrows. The display will show the cursor and the 26 digits with zeros. The far right-hand side of the top line of the display shows the digit involved.

TRACEABILITY: **01**
000000000000000000

Blinking cursor.

Press the \rightarrow and \leftarrow arrows to move the cursor to a different field and the \uparrow and \downarrow arrows to select the values.

Once the fitting's traceability data are entered, press START/VALIDATE to show the decoding.

I PE100 AGRU
200 SDR11

The traceability text disappears.

Click the START/VALIDATE key to pass to the following screen.

COMPONENT 1:

Click one of the 4 arrows. The display will show the cursor and the 40 digits with zeros. The far right-hand side of the top line of the display shows the digit involved.

COMPONENT 1: **01**
000000000000000000

Blinking cursor.

Press the \rightarrow and \leftarrow arrows to move the cursor to a different field and the \uparrow and \downarrow arrows to select the values.

To delete the reading and move to the start screen, press <STOP>.

Click the START/VALIDATE key to pass to the following screen, which will correspond to the Component 2 in the case of a *coupler*, *elbow*, *reducer* or *tee* fitting.

COMPONENT 2:

Capture by optic pen or scanner.

Now enter the traceability data of Component 2.

PIPE PE100 9052
110 SDR17.6

The Component 2 text disappears.

The decoding is shown when the data are entered.

To delete the reading and move to the start screen, press <STOP>.

Enter 26 or 40 digits depending on the component.

Click the START/VALIDATE key to show the decoding.

PIPE PE100 9052
200 SDR11

The Component 1 text disappears.

Click the START/VALIDATE key to pass to the following screen, which will correspond to the Component 2 in the case of a *coupler*, *elbow*, *reducer* or *tee* fitting.

COMPONENT 2:

Click one of the 4 arrows. The display will show the cursor and the 40 digits with zeros. The far right-hand side of the top line of the display shows the digit involved.

COMPONENT 2: 01
00000000000000000000

Blinking cursor.

Press the \blacktriangleright and \blacktriangleleft arrows to move the cursor to a different field and the \blacktriangleup and \blacktriangledown arrows to select the values.

Enter 26 or 40 digits depending on the component.

COMPONENT 2: 33
28487650020020387489

Enter data.

Click the START/VALIDATE key to show the decoding.

PIPE PE100 9052
200 SDR11

The Component 2 text disappears.

Press the START/VALIDATE key to pass to the next screen, regardless of whether or not the traceability data were entered.

3.1.10 Fitting connection:

Connect the unit cable connectors in the fitting terminals to be jointed. The contact surfaces of both the fitting's terminals and the cable connectors must always be clean.



NOTE !

We advise you to always use adapters, even though the connection to the fitting may be made directly. Doing so, the cable terminals are protected, do not wear out, burn, etc.



It is recommend refraining from electrofusion if the exterior temperature is below -10°C or above $+45^{\circ}\text{C}$.

3.1.11 Entering electrofusion data in the unit:

- ② When data entry relating to operator, job, auxiliary data and traceability are not enabled or if they are enabled, once validated, the following screen will appear:

Verification of memory capacity:

When 50 or less fusion records remain only to reach the full memory's capacity, the following message will be display:

**ATTENTION MEMORY
POSSIBLE FUSIONS xx**

Where **xx** corresponds to ≤ 50 fusion records.

Press the START/VALIDATE key to pass to the next screen.

**BEAT-TR 23°C
FUSION DATA?**

Where 23°C corresponds to the ambient temperature (informative).



Reading the fitting's barcode using optic pen or scanner.

Read the fitting's barcode with the optic pen or scanner connected to the serial connector.



WARNING !

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

If the barcode or reading were incorrect.

FUSION DATA:
WRONG DATA

Error message.

Two acoustic signals are emitted and it returns to the start.

When the data have been satisfactorily captured, the screen will show the following message:

FUSION DATA: I AG
d20 40,0V 34s

Information captured.

Where it involves a (I) Agru coupler of diameter 20, 40 Volt and 34 seconds (nominal).

Entering joint data without barcode: via the keyboard.

Click one of the 4 arrows. The display will show the following screen:

FUSION DATA: 23°C
VOLTAGE(Volt): 40.0

40.0 Volt
by default.

The electrofusion voltage should be between 8 and 48 V.

Enter voltage. Press the \rightarrow and \leftarrow arrows to move the cursor to a different field and the \uparrow and \downarrow arrows to select the values.

Press START/VALIDATE to pass to the next screen.

FUSION DATA: 23°C
TIME(s): 000

"0000" by default.

Maximum permitted time of 5940 seconds (99 minutes).

Enter the time indicated by the fitting manufacturer, bearing in mind the correction given according to the ambient temperature (according to the manufacturer). Press the \rightarrow and \leftarrow arrows to move the cursor to a different field and the \uparrow and \downarrow arrows to select the values.

Main symbols used (for the full list, please see ISO/TR 13950):

<p>I Monofilar coupler</p> <p>.t. Saddle</p> <p>[Single socket</p>	<p>Y Reducer</p> <p>T Tee</p> <p>C Elbow</p>
--	---

Click the START/VALIDATE key to pass to the following screen.

SCRAPED & CLEANED ?
<YES>

Does not contemplate it being <NO>.

Click the START/VALIDATE key to pass to the following screen.

CLAMP USED ?
<YES>

<YES> by default. Change to <NO> by clicking any of the 4 arrows.

Click the START/VALIDATE key. The following message will appear:

PRESS <START>
TO BEGIN

Click the START/VALIDATE key to hear an acoustic signal and the electrofusion cycle will begin.

3.1.12 Electrofusion process:



The unit has initiated the electrofusion cycle. The time and countdown till you get to zero will come on the display in seconds. The START/VALIDATE led will flash during the whole cycle.

ON PROCESS... I AG
d20 40.0V 34s

Where the data corresponds to an Agru coupler of diameter 20, 40 Volt and 34 seconds.

The input voltage is checked during the start up phase of the electrofusion cycle. During this phase it is considered that the unit – specially for a generator – will stabilize its energy supply. The unit verifies if the input voltage and electrofusion current are within the established range (voltage: 165-265 V for 230Vac nominal voltage and 80-140 V for 110Vac nominal voltage; current >2A <70A). Once overpassed this initial phase, the above mentioned voltage and current values are continuously checked during the whole electrofusion cycle. If electrofusion data were entered using a barcode, the unit should also check that the fitting resistance corresponds to that of the fitting connected and that it is within the tolerances assigned by the manufacturer. This will be done when the unit starts the electrofusion cycle.

If the resistance is not correct, the display will show the following messages, where appropriate:

FAILURE OF FITTING
RESISTENCE TOO HIGH

When the fitting resistance read by the unit is higher than allowed. Corresponds to ERR1.

FAILURE OF FITTING
RESISTENCE TOO LOW

When the fitting resistance read by the unit is lower than allowed. Corresponds to ERR8.

Check the fitting, connections, etc., and restart the cycle.

When the fusion cycle has ended satisfactorily, the display will show the following message:

BEAT-TR No.0019
CORRECT FUSION

The upper message is displayed alternately.

COOLING TIME 10'
CORRECT FUSION

The top line of the display alternately shows the messages listed above. Where **No. 0019** corresponds to the internal numbering of the unit's electrofusions and **10'** corresponds to the cooling time indicated in the fitting bar code. The fusion process can be stopped at any time by pressing the STOP key. The cycle will then stop and the display will show the following message:

<STOP> PRESSED
xxxxs

Where xxxxs is the remaining cycle time at the moment of stopping. Corresponds to ERR7.

If other incidents occur during the fitting electrofusion process, the process will stop and the corresponding message will be shown on the display. For further information, see CHAPTER 4: TROUBLESHOOTING.

3.1.13 Cooling time:

④

Once the electrofusion cycle is completed satisfactorily, leave a minimum cooling time as provided by the fitting's manufacturer before proceeding to disassemble the equipment. Repeat the procedure described for a new electrofusion process.

3.2 ACCESS TO OTHER MENUS

3.2.1 **Available options:**

You can access other menus by starting up the unit at the main power supply, clicking the START/VALIDATE key.

There are a total of 5 menu options: DATA/INFO/SETUP/LAST REVISION/SERVICE, accessed by sequentially clicking the ↓ key. The first screen is:

>FUSION RECORDS
INFO

Use the ↑ and ↓ keys to move to the selected option and validate with the START key.

Click on ↓ to see:

FUSION RECORDS
>INFO

Use the ↑ and ↓ keys to move to the selected option and validate with the START key.

And click ↓ again to see:

INFO
>SETUP

Use the ↑ and ↓ keys to move to the selected option and validate with the START key.

And click ↓ again to see:

SETUP
>LAST REVISION

Use the ↑ and ↓ keys to move to the selected option and validate with the START key.

And click ↓ again to see:

LAST REVISION
>SERVICE

Use the ↑ and ↓ keys to move to the selected option and validate with the START key.

And click ↓ again to see the first option.

SERVICE
>FUSION RECORDS

Use the ↑ and ↓ keys to move to the selected option and validate with the START key.

3.2.2 **FUSION RECORDS option:**

With the cursor marking FUSION RECORDS, click the START/VALIDATE key.

>SEE FUSION RECORDS
EXPORT

Click the START key to validate.
Click the ↓ key to pass to the following option.

• **SEE FUSION RECORDS:**

Validate the SEE FUSION RECORDS option to show the latest fusion stored in the memory.

```
00016 dd/mm/yy hh:mm
I AG d20      OK
```

Click the ↓ key to see the previous fusion.

Top line: fusion no.; date; start time.

Bottom line: fitting type (I = coupler in the example); brand (AG); diameter; result (OK=correct; ERRn=incorrect > for the errors list, see CHAPTER 4: TROUBLESHOOTING). In the case of electrofusion with manual data entry, the display will show the following information:

```
00016 dd/mm/yy hh:mm
40.0V 0020s  ERR2
```

Click the ↓ key to see the previous fusion.

Top line: fusion No.; date; start time.

Bottom line: electrofusion voltage; cycle time (completed if fusion OK or remaining if it shows an error); result (OK=correct; ERRn=incorrect > for the errors list, see CHAPTER 4: TROUBLESHOOTING).

Click <STOP> to exit this option.

• **EXPORT:**

Validate the EXPORT option to transfer the fusion data to a computer.

```
>EXPORT
PRINT
```

Click the START key to validate.

Click the ↓ key to pass to the following option.

The unit must have been previously connected to a computer using the ODS transmission cable. No specific PC software is required. It is done using Windows Hyper Terminal.

Connection configuration (for the first time):

1. Open Windows Hyper Terminal (usually in Programs / Accessories / Communications).
2. Accept any possible previous screens until you reach **Connection Description:**

Name:	e.g., BEAT
Icon:	Choose one of the icons shown.
OK	
3. **Connect to** screen

Connect using:	Select COM1 or COM2 as appropriate.
OK	

4. **COM1/COM2 Properties** screen
Port configuration:
Bits per second: Select 38400
Data bits: Select 8
Parity: Select None
Stop bits: Select 1
Flow control: Select None
OK
5. Connection created. When exit it is asked **Do You Wish To Save?** YES.

Exporting to a PC:

1. Run the connection created in Hyper Terminal.
2. With the BEAT-Tr unit on the >EXPORT screen, click the START/VALIDATE key.

EXPORTING RECORDS...
00%

The display will show the percentage of the data exported.

3. Select **Transfer** and **Receive file...** in the Hyper Terminal menu:
Move the received file to the following folder:
C:\..... the one you want.
Use reception protocol: Select Xmodem.
Receive
 4. **Name of the received file** will appear
File name: The name you want. We recommend using *.txt or *.csv extensions.
OK
 5. The file will be transferred. The BEAT-Tr display will show the progress %.
- Click <STOP> to exit this option. Disconnect the ODS transmission cable.

Dealing with exported fusion records:

Once the fusion records have been exported, these can be consulted by the following ways:

① Using the text file:

The exported fusion records to a PC can be consulted directly in the text file created during the export process. Once the text file has been opened, the stored fusion records data will appear in a row with fields separated by a semicolon.

Description of the list of fields:

Fusion No.;
Unit No.;
Unit manufacturer;
Unit last revision (service);
Type of fitting;
Fitting manufacturer;
Fitting diameter;
Fitting nominal resistance;
Fitting nominal voltage;
Nominal fusion time;
Operator No.;
Job No.;
Auxiliary data;
Scraped and cleaned;
Clamp used;
Ambient temperature;
Date;
Start fusion time;
Real fusion time;
Result;
Fitting traceability;
Traceability component 1;
Traceability component 2;
Fusion conde (type);
Control (internal).

② *Using Microsoft Excel:*



NOTE !

If the entries contain data of the traceability acc. to ISO 12176-4 and these need to be decoded, go straight to clause ③.

The exported data can easily be transferred to Microsoft Excel where they can be dealt with and organised as one wishes. To do this, follow the set of instructions below:

1. Open Microsoft Excel.
2. On the menu choose: **File/Open**
3. In the dialogue box which appears, change the **Files of Type:** to:
Text Files (*.prn; *.txt; *.csv)
4. Choose the corresponding directory and choose the exported filer from BEAT-Tr. Click **Open**

5. In the **Text Import Wizard - Step 1 of 3** which will appear, do the following:
Field **Delimited**: mark it
Option **Start import at row**: 1
and in **File origin**: **Windows (ANSI)**.
Click **Next >** and the next step will appear.
6. In el **Text Import Wizard - Step 2 of 3** which will appear, do the following:
Delimiters: mark **Semicolon** (the remainder of the options should be unmarked)
Text qualifier: "
Click **Next >** and the next step will appear.
7. In the **Text Import Wizard - step 3 of 3** which will appear, select the last column (very wide and empty) and do the following:
In the box **Column data format**, click the option **Do not import column (skip)**.
Click **Finish**.
8. The exported data will then appear on screen in columns. The order of the columns is the same as that specified for the text file (see previous page).
9. Delete last row <END OF TRANSMISSION>.
10. Once we have the data ready in Excel, we will be able to use the following options:
Data / Order... , **Data / Filter / Autofilter** or others...

③ Using Microsoft Access:

If the fusion records contain traceability data of ISO 12176-4 and the respective bar codes need to be decoded, these can easily be transferred to Access (Microsoft Access 2000 or higher). To do this, follow the instructions below:

1. Open the data base file BEAT_06.mdb *provided by Acuster*.
2. On the menu choose the option: **File/Get external data/Import**
3. In the dialogue box which appears, change the **Files of Type**: to:
Text files (*.txt, *.csv, *.tab, *.asc)
4. Choose the corresponding directory and select the text file exported from BEAT-Tr.
Click **Import**
5. In the **Text Import Wizard** which will appear, press **Advanced...**
Click **Specs...** and a box will open with a list with the **beat** specification selected.
Click **Open**.
Click **Accept** and that window will be closed.
6. Check that the **Delimited** option is marked and click **Next >**

7. In the next window, check that the **Semicolon** is selected and click **Next >**
8. In the following window, select the option **In and existing table:** and select the **Electrofusion** table. Click **Next >**
9. On the next screen, check that the slot **Import to table:** indicates **Electrofusion**. Check that the two lower options are unmarked and click **Finish**.
10. The message **Microsoft Access was unable to annex all the data to the table** and you will be asked **Do you want to continue with this?** Click **Yes**
11. Another message containing information will open. Click **Accept**.
12. The table **<name_file>_ImportErrors** will have been created which can be deleted. This is because the last line of the exported text file by BEAT-Tr contains a line **<END OF TRANSMISSION>**.
If we have previously deleted this entire line in the text file, (the contents of the file should end with the semicolon of the last line of data) the message indicated in step 10 will not appear nor will a table of import errors be created.
13. To manage the data of the data file, open the **Electrofusion** Table in which the electrofusion data appears and whose columns are ordered in the same way as that specified for the text file (see previous page).
14. When accessing Queries we will find one created with the name **DATA with ISO12176-4**, in which the same fields are listed as in the previous Table option but in which the fields of the fitting and component's traceability (if they should exist) have been decoded with their description shown.
15. When accessing Reports, you will be able to make the reports you wish or otherwise use the provided ready made report **Report with ISO12176-4 data**.

• PRINT:

Validate the following PRINT option menu to print the fusion data to a serial printer.



Connect the unit to a serial printer using the ODS 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:

Validate this option to print the options: LAST FUSION / TODAY'S RECORDS / ALL FUSIONS / SELECT DATE RANGE.

Use the **↑** and **↓** keys to move to the selected option and the **START** key to validate. Click the **START/VALIDATE** key to print the fusion data.

If you select the last option of **SELECT DATE RANGE**, the display will show the following screen:

DD/MM/YY
dd/mm/yy

DD/MM/YY corresponds to the earliest fusion record (the first by default) and dd/mm/yy to the latest.

Press the **→** and **←** arrows to move the cursor to a different field and the **↑** and **↓** arrows to modify the values. Once past the second line, it is not possible to return to the first. You will have to click **<STOP>** to restart the range selection. Click the **START/VALIDATE** key to print.

Select any of the four options for the display to show the following message while the printing is under way.

PRINTING RECORDS...

When data delivery to printer has terminated, the display returns to the option selected at the start.

Click **<STOP>** key to exit this option.

• ERASING RECORDS:

Validate the following and last option of the **ERASER RECORDS** menu to delete the fusion data recorded in the unit's memory.



WARNING !

This option might have restricted access. If enabled, the following screen will appear initially:

OPERATOR:

Enter the supervisor PIN number.

Once the supervisor code has been introduced and the **START/VALIDATE** button pressed, the following screen will appear which is the one that is automatically shown if the restriction is not enabled:

PRINT
>ERASER RECORDS

Validate this option to request delete confirmation.

ARE YOU SURE ?
<NO>

<NO> by default. Use the **➡** or **⬅** keys to change to <YES>. Click START to validate.

Click <STOP> key to exit this option.

3.2.3 **INFO option:**

To validate the following INFO menu option,

FUSION RECORDS
>INFO

Use the **⬆** and **⬇** keys to move to the selected option and validate with the START key.

V v.vv UK 1100
LAST SERV: dd/mm/yy

The display screen shows the following information:

V v.vv is the software version and UK are the letters of the active language.

1111 indicates that the four setup options are enabled (ON).

0000 indicates that the four setup options are disabled (OFF).

These setup options correspond to (from left to right): Operator identification; Job identification; Auxiliary data; Traceability.

dd/mm/yy corresponds to the date of the latest revision made in the unit.

Click <STOP> to exit this option.

3.2.4 **SETUP option:**

Validate the option of the SETUP menu:

INFO
>SETUP

Use the **⬆** and **⬇** keys to move to the selected option and validate with the START key.

This enables access to the following options: LANGUAGE / DATE/TIME / OPERATOR / JOB / AUXILIARY DATA / TRACEABILITY.

Use the **⬆** and **⬇** keys to move to the selected option and validate with the START key.

• **LANGUAGE:**

LANGUAGE
UK

The display shows the letters of the active language.

Click the **➡** and **⬅** keys to see the other languages loaded in the unit. If you cannot find the language you want, consult with your distributor.

Click the START/VALIDATE key to accept the option. Click <STOP> to exit this option without changing the language.

• **DATE/TIME:**

The following option enables you to update the unit's date and time.



WARNING !

This option might have restricted access. If enabled, the following screen will appear initially:

OPERATOR:

Enter the supervisor PIN number.

Once the supervisor code has been introduced and the START/VALIDATE button pressed, the following screen will appear which is the one that is automatically shown if the restriction is not enabled:

dd/mm/yy
hh:mm

dd/mm/yy corresponds to the date and hh:mm to the time.

Click the **➡** and **⬅** keys to move the field and **⬆** and **⬇** keys to modify values. Once past the second line, it is not possible to return to the first. You will have to click **<STOP>** to restart the change of date/time. Click the START/VALIDATE key to accept the option once you have gone over the 5 fields. Click **<STOP>** to exit this option without making a modification.

• **OPERATOR:**

To modify the existing configuration of the option OPERATOR, proceed as follows:



WARNING !

This option might have restricted access. If enabled, the following screen will appear initially:

OPERATOR:

Enter the supervisor PIN number.

Once the supervisor code has been introduced and the START/VALIDATE button pressed, the following screen will appear which is the one that is automatically shown if the restriction is not enabled:

>SHOW
COMPULSORY

Pressing START/VALIDATE key the current configuration is showed.

SHOW
<YES>/<NO>

<YES> corresponds to operator's identification enabled whereas **<NO>** to disenabled.

Use the **➡** or **⬅** keys to shift from **<YES>** to **<NO>** or vice versa. Click the START / VALIDATE key to accept the selection made. Click **<STOP>** to exit this option without making a modification.

The next option allows to establish the obligation or not in carrying out the identification.

SHOW
>COMPULSORY

Pressing START/VALIDATE key the current configuration is showed.

COMPULSORY
<YES>/<NO>

<YES> enables the obligation and automatically makes that the SHOW option shifts to <YES>.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

The next option allows to establish the operator's identification following ISO 12176-3 criteria in the fields of expiration date and skills (that the operator's would be allowed to carry out electrofusion joints).



NOTE !

The fact to enable this option (by selecting <YES>), automatically disenable the data manual input.

COMPULSORY
>CONTROL ISO 12176-3

Pressing START/VALIDATE key the current configuration is showed.

CONTROL ISO 12176-3
<YES>/<NO>

<YES> corresponds to the identification according to ISO 12176-3 whereas selecting <NO> there is no observance.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

Finally, the latest option RESET allows to establish the way to delete the operator's identification entered.

CONTROL ISO 12176-3
>RESET

Pressing START/VALIDATE key the current configuration is showed.

RESET
<YES>/<NO>

<YES> the operator's ID is deleted every time the unit is switched off. <NO> with the change of date only.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

• **JOB:**

To modify the existing configuration of the option JOB, proceed as follows:



WARNING !

This option might have restricted access. If enabled, the following screen will appear initially:

OPERATOR:

Enter the supervisor PIN number.

Once the supervisor code has been introduced and the START/VALIDATE button pressed, the following screen will appear which is the one that is automatically shown if the restriction is not enabled:

**>SHOW
COMPULSORY**

Pressing START/VALIDATE key the current configuration is showed.

**SHOW
<YES>/<NO>**

<YES> corresponds to the job identification enabled whereas <NO> to disenabled.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

The next option allows to establish the obligation or not in carrying out the identification.

**SHOW
>COMPULSORY**

Pressing START/VALIDATE key the current configuration is showed.

**COMPULSORY
<YES>/<NO>**

<YES> enables the obligation and automatically makes that the SHOW option shifts to <YES>.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

Finally, the latest option RESET allows to establish the way to delete the job's identification entered.

**COMPULSORY
>RESET**

Pressing START/VALIDATE key the current configuration is showed.

**RESET
<YES>/<NO>**

<YES> the job's ID is deleted every time the unit is switched off. <NO> with the change of date only.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

• **AUXILIARY DATA:**

To modify the existing configuration of the option AUXILIARY DATA, proceed as follows:



WARNING !
This option might have restricted access. If enabled, the following screen will appear initially:

OPERATOR:

Enter the supervisor PIN number.

Once the supervisor code has been introduced and the START/VALIDATE button pressed, the following screen will appear which is the one that is automatically shown if the restriction is not enabled:

AUXILIARY DATA
<YES>/<NO>

<YES> corresponds to the auxiliary data identification enabled whereas <NO> to disabled.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

• **TRACEABILITY:**

To modify the existing configuration of the option TRACEABILITY, proceed as follows:



WARNING !
This option might have restricted access. If enabled, the following screen will appear initially:

OPERATOR:

Enter the supervisor PIN number.

Once the supervisor code has been introduced and the START/VALIDATE button pressed, the following screen will appear which is the one that is automatically shown if the restriction is not enabled:

TRACEABILITY
<YES>/<NO>

<YES> corresponds to the traceability identification enabled whereas <NO> to disabled.

Use the **➡** or **⬅** keys to shift from <YES> to <NO> or vice versa. Click the START / VALIDATE key to accept the selection made. Click <STOP> to exit this option without making a modification.

Click <STOP> to exit this option. Turn the unit off and turn back on again at the mains to access the work menu.

3.2.5 **LAST REVISION option:**

Validating the fourth menu option of LAST REVISION:

```
SETUP
>LAST REVISION
```

Use the **↑** and **↓** keys to move to the selected option and validate with the START key.

```
dd/mm/yy    dd/mm/yy
dd/mm/yy    ON/OFF
```

The display will show the following information:

It allows to check the date of the last revision (service), the warning date, the date of expiration of the next service and the unit blocking status (OFF or ON) in this order. Click <STOP> to exit this option.

3.2.6 **SERVICE option:**

Finally, validate the last menu option of SERVICE:

```
LAST REVISION
>SERVICE
```

Use the **↑** and **↓** keys to move to the selected option and validate with the START key.

The last option of the **Setup** is for exclusive use of the Grupo Acuster's after-sales service centres and an access password is required. To exit from this access to other menus, stop the unit through the general switch.

CHAPTER 4: TROUBLESHOOTING

4.1 GENERAL

All maintenance and repair work of the **BEAT-Tr** electrofusion units is to be carried out by qualified personnel. Full guarantees are obtained by shipping the unit to the Grupo Acuster's After-Sales Service, both for the yearly revision and for repairing any fault that may have occurred in the unit.

4.2 DISPLAY ERROR MESSAGES

4.2.1 **Input voltage/frequency:**

The input voltage/frequency is valued differently according to the process being done at the time.

1. *Verification before fusion process:*

If the input voltage/frequency is outside the established tolerances (min. 195Vac (90Vac for 110Vac nominal voltage) / max. 265Vac (140Vac for 110Vac nominal voltage) and min. 45Hz / max. 65Hz, respectively), the screen will show:

POWER SUPPLY ERROR
194V 44Hz

The values the display shows are refreshed and correspond to the real input of the unit.

POWER SUPPLY ERROR
266V 66Hz

The values the display shows are refreshed and correspond to the real input of the unit.

2. *Verification during electrofusion:*

During the fusion cycle the minimum input voltage may be below 195 Vac (90Vac for 110Vac nominal voltage) without the process being interrupted, but always so long as the required output current is supplied. Otherwise, the display will show the following **ERR2** message:

POWER SUPPLY ERROR
xxxxs 160V 42Hz

Where xxxxs corresponds to the remaining cycle time at the moment of stopping.

In the example, 160V is the minimum voltage detected by the unit. This error message also is enabled when the maximum input voltage detected by the unit is higher than 265 Vac (140Vac for 110Vac nominal voltage). Check the power supply (group), connections, state of fitting, etc. It is not necessary to restart the unit to refresh the input voltage.

4.2.2 **Fitting resistance outside margins:**

ERR1 Once the electrofusion process has begun and where data is captured exclusively by barcodes, if the fitting resistance is higher than the tolerances established by the fitting's manufacturer, the display will show:

**FAILURE OF FITTING
RESISTENCE TOO HIGH**

If this message persists, send the unit the After-Sales Service to check the calibration of the resistance measure.

ERR8 Once the electrofusion process has begun and where data is captured exclusively by barcodes, if the fitting resistance is lower than the tolerances established by the fitting's manufacturer, the display will show:

**FAILURE OF FITTING
RESISTENCE TOO LOW**

If this message persists and after checking the that fitting and barcode resistance are correct, send the unit the After-Sales Service to check the calibration of the resistance measure.

4.2.3 **Interruption by operator:**

ERR7 If the operator presses the <STOP> key once the electrofusion process has begun, the display will show:

**<STOP> PUSHED
xxxxs**

Where xxxxs corresponds to the remaining cycle time at the moment of stopping.

4.2.4 **Output current:**

ERR3 If the electrofusion current is excessive, the display will show:

**CURRENT TOO HIGH
xxxxs**

Where xxxxs corresponds to the remaining cycle time at the moment of stopping.

This message appears in the following cases:

1. When the connected fitting has a very low resistance, outside the margins.
2. Crossed fitting resistance.

ERR4 If the electrofusion current is very low, the display will show:

CURRENT TOO LOW xxxxs

Where xxxxs corresponds to the remaining cycle time at the moment of stopping.

This message appears in the following cases:

1. Fitting not connected.
2. Disconnection of the electrofusion terminals.
3. Cut in the filament of the fitting resistance.
4. If the electrofusion current is lower than 2 A.

4.2.5 Electrofusion output voltage:

ERR5 If there is a deviation of $\pm 0,5$ V in the output voltage during the electrofusion of the fitting, the cycle will stop and the display will show:

VOLTAGE FAILURE
xxxxs

Where xxxxs corresponds to the remaining cycle time at the moment of stopping.

This message may also appear due to poor fitting application (fitting voltage outside range).

4.2.6 Protection against internal temperature:

If the electrofusion unit is submitted to intensive, prolonged operation, especially with large-diameter fittings with high fusion times, for which the internal temperature may exceed the maximum allowed, the following procedure is established:

1. If after an electrofusion cycle the transformer temperature is higher than 60°C, the transformer and electronics are protected by an internal temperature sensor which blocks the unit. If this safety device is activated, the electrofusion under way will not be interrupted. The display will show the following message:

TRAFO TEMPERATURE
TOO HIGH **WAIT**

This message will remain on the screen until the internal temperature falls to 55°C.

2. If during an electrofusion process the transformer temperature reaches 90°C, the cycle will stop and the unit will remain blocked until the internal temperature falls to 55°C. The display will show the following **ERR6** message:

TEMPERATURE TOO HIGH
xxxxs

Where xxxxs corresponds to the remaining cycle time at the moment of stopping.

CHAPTER 5: MAINTENANCE

5.1 GENERAL

5.1.1 **Introduction:**

The electrofusion units **BEAT-Tr** have been designed and manufactured for a long life service 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 unit 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 point 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.

5.1.2 **Storage:**

If the unit is not to be used for a long period of time, keep it in its original packing and protected from dust, moisture, extremes of temperatures, direct sunlight, and so on. The electrofusion control box could be stored either on the warehouse floor or in pallet racks.

5.1.3 **Cleaning:**

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



NOTICE !

Do not clean the electrofusion control box with water under pressure, by immersion in water or 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 electrofusion control unit to the Grupo Acuster's After-Sales Service for a yearly service.

5.2 CONTROL UNIT

5.2.1 **Electronic Control Unit:**

Besides the exterior cleaning of the casing, there is no specific maintenance for the electronic control unit. Tune-ups and adjustments should be performed by qualified personnel, or by the Grupo Acuster's After-Sales Service.

5.2.2 **Updating the Programme Version:**

The updating of the **BEAT-Tr** electrofusion unit software must be performed exclusively by the Grupo Acuster's After-Sales Service.

CHAPTER 6: TECHNICAL CHARACTERISTICS

6.1 ELECTROFUSION CONTROL UNIT

6.1.1 **General specifications:**

Classification acc to ISO 12176-2	P ₂ 4US,VKADX					
Configuration options	Language	Date/Time	Operator	Job	Auxiliary data	Traceability
Activate/deactivate		ON/OFF	ON/OFF	ON/OFF	ON/OFF	ON/OFF
Enter data by barcode			acc. to ISO 12176-3	acc. to ISO 12176-4		acc. to ISO 12176-4
Enter data manually	Multilingual Select	Manual Enter	16 alphanumeric characters maximum			26 or 40 digits as component
Input voltage	195 Vac to 265 Vac. Nominal voltage: 230 Vac 90 Vac to 140 Vac. Nominal voltage: 110 Vac					
Input frequency	45 Hz to 65 Hz. Nominal frequency: 50 Hz					
Electrofusion voltage	8 to 48 Vac galvanically separated					
Power consumption	3500 W maximum					
Generator output performance	4.5 kVA unipolar operation; electronic regulation					
Protection fuse	Exterior of 20 A at 230 Vac / 32 A at 110 Vac					
Protection type	Doble isolation IP54 / Series AR: Doble isolation IP43					
Duty factor	20 to 100% (depending on the fitting); Series AR: 40 to 100% Electronic temperature monitoring of the unit					
Working temperature	<i>Manual</i>	Informative, with established limits (recommended acc. to ISO 12176-2 from -10 to 40°C)				
	<i>Barcode</i>	-20 to 50°C				
Display	LCD, 2 lines x 20 characters backlight					
Acoustic warning	piezoelectric buzzer					
Enter fusion data	Automatic		Manual			
	Barcode acc. to ISO/TR 13950		Voltage: Multivoltage Time: Up to 5,940 seconds (99 minutes)			
Internal memory capacity	~ 1000 fusions					
Front, keys and chassis	Green/grey silkscreen plastic membrane with tactile push buttons and tubular frame of 20° of inclination					
Other features	Soft start and message display in case of initial voltage failure					
Power cable	3x2.5 mm ² (Schuko + French type plug) 4 m long 3x4 mm ² (3-pin, 110V, 32A plug acc. to EN 60309-2) 4 m long					
Electrofusion cables	1x16 mm ² , 4 m long (female terminals of diameter 4 mm)					
Optic pen/scanner	Non-intelligent infrared Laser scanner optional					
Connection of optic pen, scanner, PC and serial printer	Combined TTL / RS-232 special					
Accessories	Document holder with optic pen or scanner and set of 4 and 4.7 mm electrofusion adaptors					
Options	ODS transmission cable (for PC and printer connection) Serial printer					
Weight and dimensions	Height: 425 mm; Width: 370 mm; Length: 230 mm Nett weight: 23 kg					

6.1.2 **Generator specifications:**

Frequency	:	50/60 Hz
Output power	:	4.5 kVA (minimum)
Voltage	:	230 Vac / 110 Vac
Intensity	:	16 A (min) for 230 Vac / 20 A (min) for 110 Vac
Voltage regulation	:	Preferably electronic

6.2 SIZE AND WEIGHT

6.2.1 **Weights and dimensions:**

Nett weight	:	23 Kg (including cables and accessories)
Dimensions	:	Height 425 mm Width 370 mm Length 230 mm
Package exterior dimensions	:	440 x 430 x 240 mm
Gross approximate weight	:	30 Kg

6.2.2 **Accessories:**

List of accessories included in the unit:

<u>QTY</u>	<u>DESCRIPTION</u>
1	Document holder
1	User Guide BEAT-Tr
1	Optic pen or scanner, depending on the model option
2	ö 4 mm terminal adaptors
2	ö 4.7 mm terminal adaptors

List of optional items not included in the unit:

<u>QTY</u>	<u>DESCRIPTION</u>
1	ODS transmission cable
1	High speed thermal serial printer

