

# Operating Instructions

## **FRIAMAT® XL**

**FRIAMAT®**



<b>1. Safety</b>	<b>5</b>
1.1 Dangers	5
1.2 Safety hints and tips	5
1.3 Designated equipment use	6
1.4 Sources of danger	7
1.5 Authorised users	7
1.6 Dangers from electric power	8
1.7 Emissions	9
1.8 Safety precautions on site	9
1.9 Signal equipment	10
1.10 Emergencies	10
<b>2. Basic Data</b>	<b>11</b>
2.1 Design/parts	11
2.2 Operating principle	11
2.3 Functions of the fan	12
2.4 Technical Data	12
2.5 Automatic activation of “service interval”	13
2.6 Transport/storage/despatch	13
2.7 Setting up/connecting	14
2.8 Operating	14
<b>3. Basic “Fusion” Procedure</b>	<b>15</b>
3.1 Preparation	15
3.2 Enter barcode	16
3.3 Starting fusion process	17
<b>4. FRIAMAT XL</b>	<b>18</b>
4.1 Description of function buttons	18
4.2 Display Design (basic picture)	19
4.3 Description of display functions	20
4.4 Description of display symbols	21
4.5 Menu “Basic settings”	23
4.5.1 Documentation	23
4.5.2 Time	23
4.5.3 Date	23
4.5.4 Language	23
4.5.5 Protocol language	24
4.5.6 Volume	24

4.6	Menu “Fusion sequence”	24
4.6.1	Commission number	24
4.6.2	Operator pass	25
4.6.3	Info text	26
4.6.4	Comment 1	26
4.6.5	Comment 2	26
4.6.6	Subcontractor	26
4.6.7	Traceability	26
4.6.8	Pipe number	26
4.6.9	Pipe length	26
4.6.10	GPS data	27
4.6.11	Seam number	27
4.6.12	Scraper tool	27
4.7	Menu “Data”	27
4.7.1	Transfer to Memory-Stick (FRIATRACE)	28
4.7.2	Print	28
4.7.3	Transfer to Memory-Stick (PDF-File)	28
4.7.4	Delete	29
4.8	Menu “Info”	29
4.9	Menu “Formatting”	30
4.10	Fusion Options	30
4.10.1	ID-Data	30
4.10.1.1	Commission number	31
4.10.1.2	Operator pass	32
4.10.1.3	Continuous number	32
4.10.1.4	Seam number	32
4.10.1.5	GPS 1 - 3	33
4.10.2	Traceability barcodes/pipe number/pipe length	33
4.10.3	Info text, Comment 1, Comment 2, Subcontractor	34
4.10.4	Emergency input	34
4.10.5	Scraper tool	35
4.11	SUPERVISOR	35
4.11.1	Basic settings	36
4.11.1.1	Documentation	36
4.11.1.2	Time	36
4.11.1.3	Date	36
4.11.1.4	Data protection	36
4.11.1.5	Maintenance date	37
4.11.1.6	Mode	37
4.11.1.7	Language	37
4.11.1.8	Emergency input	37
4.11.1.9	Energy display	37
4.11.1.10	Volume	38

4.11.2	Fusion sequence	38
4.11.2.1	Traceability	38
4.11.2.2	Commission number	38
4.11.2.3	Infotext	38
4.11.2.4	Seam number	38
4.11.2.5	Continuous number	39
4.11.2.6	Operator pass	39
4.11.2.7	Display “Pipe prepared”	39
4.11.3	Factory settings	39
4.11.4	PIN	40
4.11.5	Display (Resistance)	40
<b>5.</b>	<b>Warranty/Maintenance/Taking out of Service</b>	<b>41</b>
5.1	Warranty	41
5.2	Service and maintenance	41
5.3	Taking out of service	41
<b>6.</b>	<b>Operating Faults</b>	<b>42</b>
6.1	Errors when reading in the barcode	42
6.2	Fusion interruption	42
6.3	Error messages/Warning messages/Info	42
<b>7.</b>	<b>Appendix</b>	<b>46</b>
7.1	Recommended accessories (options)	46
7.2	Authorised service points	47
7.3	Operating instructions updates	47

# 1. Safety

## 1.1 Dangers

The FRIAMAT XL fusion unit is state of the art technology and is constructed according to ISO 12176-2 and recognised safety regulations and fitted with appropriate protective equipment. In addition the FRIAMAT XL fusion unit has been submitted to extensive tests in line with the German law for equipment safety. Functionality and safety of the FRIAMAT XL fusion unit is tested before being supplied to the customer. However, incorrect use or abuse of the equipment will lead to dangers with regards to:

- the health of the user,
- your FRIAMAT XL or other material goods by the operator,
- the efficient operation of your FRIAMAT XL.

Everybody involved with operating, servicing and maintaining your FRIAMAT XL must:

- be qualified accordingly, and
- carefully observe these instructions.

**This is about YOUR safety!**

## 1.2 Safety hints and tips

These operating instructions use the following SYMBOLS with WARNING NOTES:



**DANGER!**

**Warns of impending danger!**

Non-compliance with this instruction can result in severe material damage or personal injury.



**WARNING!**

**Warns of a dangerous situation!**

Non-compliance with this instruction can result in moderate material damage or personal injury.



## **IMPORTANT!**

**Indicates user advice and other useful information.**

### **1.3 Designated equipment use**

The FRIAMAT XL fusion unit serve exclusively for the fusion of

- FRIALEN XL joining technology with large HD-PE pressure pipes (SDR 17-33)
- FRIALEN safety fittings with HD-PE pressure pipes (SDR 17-7), and
- FRIAFIT sewage fittings with HD-PE sewage pipes (SDR 17-32).

The FRIAMAT XL fusion unit can also be used to process fittings by other manufacturers as long as these are provided by the manufacturer with a barcode 2/5 interleaved according to ANSI HM 10.8M-1983 and to ISO CD 13950/08.94 and do need a voltage of not less than 12V.

Please also observe the ratings and technical data of the fittings to be fused and your FRIAMAT XL fusion unit during processing (see also section 2.4 "Technical Data").



## **WARNING!**

**Processing of FRIALEN XL conical ring couplers KM-XL  $\geq$  d 1000 with the FRIAMAT XL fusion unit may only be exclusively made using a generator. Mains operation is not permitted!**

The FRIAMAT XL fusion unit is designed for operation in the overvoltage category II.

The designated use also includes observation of:

- all the advice in these operating instructions, as well as
- the guidelines by DVGW Standards, DVS, UVV and local directives.



## **IMPORTANT!**

**Any other use is not in line with designated use!**

FRIATEC AG does not accept liability for damage caused by adverse use:

- modifications and alterations are not permitted for safety reasons.
- the FRIAMAT XL fusion unit may be opened only by electrical specialists.
- when carrying out fusions using FRIAMAT XL fusion units with broken lead seals will result in all claims for warranty and liability being null and void.

Examples of adverse use:

- use as battery charger.
- use as power supply for heaters of any type.

### **1.4 Sources of danger**

- Replace damaged connection and extension cables immediately.
- Do not remove or disable safety devices.
- Rectify known faults immediately.
- Do not leave your FRIAMAT XL fusion unit unattended.
- Keep away from flammable liquids/gases.
- Do not operate in EX environment.

### **1.5 Authorised users**

Only trained personnel may work using your FRIAMAT XL fusion unit. The user is responsible for third parties in the work area. The user must:

- make accessible the operating instructions to the operator and
- ensure that he or she has read and understood them.

## 1.6 Dangers from electric power

- Do not use any damaged connecting cables.
- Check connection cable for any damage.
- All connecting cables may only be replaced by authorised service stations!
- Pull out the plug prior to any maintenance or service tasks.
- Allow any service and repairs to be carried out only at authorised service points.
- Connect the FRIAMAT XL fusion unit only to supply voltage as given on data plate.



### **DANGER!**

#### **Distribution points on the construction site: observe regulation on circuit breakers!**

Outdoors (on construction sites) receptacles must be fitted with earth leakage circuit breakers. When using generators, the DVGW worksheet GW308, the VDE 0100 Part 728 and specific local directives need to be observed. The required generator nominal output depends on the output required by the largest fitting to be used, on connection conditions, ambient conditions and the actual generator type (its control characteristics). As the generators from different model ranges often display very different control characteristics, the suitability of a generator cannot be guaranteed by the specified rated output alone.

When in doubt (e.g. when purchasing brand new) contact an authorised service point or call the FRIATEC service hotline (+49 (0) 621 486 1533).

Only use generators working with frequencies within the 44-66 Hz range.

Start up the generator and leave it running for half a minute. If necessary adjust off-load voltage and limit to voltage indicated by the technical data. Generator (power) fuse maximum 16 A (slow acting).



## **WARNING!**

**Please ensure the correct supply voltage for your FRIAMAT XL fusion unit before starting the fusion. Your FRIAMAT XL fusion unit is operated at three-phase electric power (400 Volts).**

When using an extension cable, please ensure sufficient cross section:

- 2.5 mm<sup>2</sup> to 25 m length (power cable: 5 x 2.5 mm<sup>2</sup> / 16A)

Always roll out cable fully before use! Do not connect any other equipment to the same generator while fusion is taking place! At the end of the fusion process, first disconnect the power cable from the generator and then shut off the generator.



## **DANGER**

**Danger to life! Never open your FRIAMAT XL fusion unit whilst connected to power supply!**

Your FRIAMAT XL fusion unit may be opened only by specialist personnel at an authorised service point!

### **1.7 Emissions**

The (equivalent) continuous sound pressure level of all FRIAMAT XL fusion unit is less than 70 db(A). When working in a quiet environment, the signal when set to “loud” comes across as very loud. For this reason it is possible to adjust the signal (loud/quiet).

### **1.8 Safety precautions on site**



## **WARNING!**

**The weight of your FRIAMAT XL fusion unit is approx. 50 kg. When transporting, please observe the provisions of the labour protection law with regard to hazards caused by lifting and transporting of loads.**



### **WARNING!**

Your FRIAMAT XL fusion unit is splash proof. It may however not be immersed in water.



### **WARNING!**

The FRIAMAT XL fusion unit may only be used outside the construction site trench.

If the FRIAMAT XL fusion unit is also to be used in the trench, a suitable residual current circuit breaker (RCD) is to be interposed in the unit's connection line according to the guidelines of the accident prevention and insurance association (BGI 594 and BGI 534). The required RCD (< 30mA) must be designed for low temperatures (symbol "snowflake"). If the unit is to be used in the trench, the RCD must be checked daily.

## **1.9 Signal equipment**

Your FRIAMAT XL fusion unit confirms certain operating procedures using a signal (1, 2, 3 or 5 signal sounds). The signals signify the following:

- 1 signal: reading in of barcode confirmed.
- 2 signals: fusion process completed.
- 3 signals: supply voltage too low/too high.
- 5 signals: warning: error. Refer to display.

## **1.10 Emergencies**

In an emergency switch off main switch immediately to the "OFF" position and disconnect your FRIAMAT XL from the power supply. FRIAMAT fusion units can be shut off by:

- activation of main switch or
- pulling out the power supply plug.

## **2. Basic Data**

### **2.1 Design/parts**

The electronics of your FRIAMAT XL fusion unit is accommodated in a splashproof housing. At the top, there is the cable deposit for the fusion power and power cable as well as the main switch. The back includes the accessories bag; laterally at the right, there is the cover for the access to the electronic interfaces. The FRIAMAT XL fusion unit is designed for a maximum fusion voltage of 80 Vdc. A safety transformer separates the supply and the fusion voltage.

### **2.2 Operating principle**

Only electrical fusion fittings with a barcode can be fused using the FRIAMAT XL fusion unit: a sticker with a barcode is allocated to each fitting. It contains information for the correct fusion process. Your FRIAMAT XL fusion unit boasts a PC supported command system which:

- controls and adjusts energy supply fully automatically, and
- determines the length of the fusion process, taking into account ambient temperature. The temperature gauge inside the fusion cable continuously measures the ambient temperature.



#### **WARNING!**

**The temperature sensor for determining the ambient temperature is attached to the fusion cable at the barcode scanner cable near the scanner pouch (silver metal sleeve). As the determination of the ambient temperature in the fusion zone is part of a correct fusion process, the temperature sensor must be protected from damage necessarily. In addition you need to make sure that both the temperature sensor as well as the fitting to be welded are exposed to identical ambient temperatures, i.e. processing situations where e.g. the temperature sensor is exposed to bright sunlight and the fitting is in the shade must be avoided.**

## 2.3 Functions of the fan

At the side, there are the ventilation slots and below these the fans. Fundamentally, the fans start up automatically at each fusion (please refer to IMPORTANT note below). This means that the electricians responsible for the output of your FRIAMAT XL fusion unit are active cooled and your unit is now well equipped to meet the demands of the construction site (e.g. a series of fusion processes of different fittings).



### **IMPORTANT!**

**The function of the fans depends on the internal temperature of the power devices. If a certain temperature is exceeded, the fans are also active beyond the fusion process.**

**Leave the FRIAMAT XL fusion unit switched on after each fusion for the fans to be able to reduce the temperature of the power devices.**

## 2.4 Technical Data

Input voltage range	AC 400V (3P + N + SL)
Frequency range	45 – 66 Hz
Current consumption	AC 16 A max. / 3~
Output	approx. 4600 W
Generator rated output FRIALEN XL large couplers ≥ d 1000	AC 400V minimum AC 10 kW
Unit fuse	20 A slow acting
Casing	protection type IP 54 DIN EN 60529 protection grade I DIN EN 60335-1
Connection cable	4 m with CEE connector (400V / 16A)
Fusion cable	4 m with standard fusion connector ø 4 mm (CONTACT4)

Operating temperature range	-20°C to +50°C**
Storage temperature range	-20°C to +70°C
Fusion current monitoring	Short circuit 110 ADC Open circuit 0,25 x IN
Interfaces	* seriell for Service only * 2 USB- interfaces USB A USB B
Fusion voltage	12 VDC up to max. 80 VDC
Dimensions W x D x H	274 x 593 x 446 mm
Weight	approx. 50 kg

**We reserve the right to make technical alterations.**

**\*\*:** When fusing fittings by other manufacturers it is vital to observe indications regarding operating temperature range!

## 2.5 Automatic activation of “service interval”

Starting with the first fusion process which you perform with the new FRIAMAT XL fusion unit, the stored service interval (see also section 6.2) is automatically set to active (recommendation FRIATEC: 12 months).



### **IMPORTANT!**

**The leading service date is always shown on the display and may deviate from the service label attached to the FRIAMAT XL fusion unit.**

## 2.6 Transport/storage/despatch

Your FRIAMAT XL fusion unit is delivered in an aluminium transport box. Unpacking requires no specific skills, nor does storage in the transport box. The temperature range during storage is -20°C.....+70°C.



**WARNING!**

**Always transport/store inside aluminium transport box.**

## **2.7 Setting up/connecting**

Your FRIAMAT XL fusion unit can be set up and operated out of doors if protected from rain and wet.

- Set up you FRIAMAT XL fusion unit on level ground (as near level as possible).
- Ensure that the used generator is fused with a 16 A maximum (slow acting) fuse.
- Plug unit connection cable into power socket.
- Use extension cable if necessary, ensure sufficient cross section (see also Section 1.6).
- Observe operating instructions of generator if used.



**WARNING!**

**Always unwind all cables completely before use!**

## **2.8 Operating**



**WARNING!**

**Charring! Dirty contacts may char the plug.**

Contact surfaces of fitting and fusion plug must be clean **at all times**:

- thoroughly remove any existing deposits.
- protect plug from contamination, replace if necessary.
- check fusion plug and contact sockets of the fitting for dirt before connecting.

### **3. Basic “Fusion” Procedure**

#### **3.1 Preparation**

The appropriate assembly instructions need to be observed for the correct processing of FRIALEN XL, FRIALEN safety fittings and FRIAFIT sewage system. The same applies for fittings by other manufacturers.



#### **IMPORTANT!**

**Unwind cables completely!**

**This applies to power cables, fusion cables, and extension cables if required. The contact surfaces of the fitting and the fusion plugs must be clean; dirty contacts can cause overheating and charring of the plug. If necessary carefully remove any existing deposits. Always protect plugs from contamination. If there is evidence of a deposit which cannot be completely removed, the fusion plugs must be replaced.**



#### **WARNING!**

**If the FRIAMAT XL fusion unit is used permanently for processing large couplers FRIALEN XL  $\geq d$  1000, the fusion plugs must be replaced at least every 6 months.**

- Prepare fitting and pipes for fusion in accordance with assembly instructions.
- Ensure that the contact pins on the fitting are accessible for connection of fusion plugs.
- Connect to power supply (mains or generator).
- If using a generator, start it first and leave to warm up for 30 seconds.
- Switch on unit by the main switch.
- Connect fusion plug with contact pins of the fitting.



#### **WARNING!**

**It is to be ensured that the fusion plugs are fully plugged in on the fitting's contact plugs.**

### 3.2 Enter barcode



#### **IMPORTANT!**

Take the FRIAMAT XL barcode scanner out of the scanner pouch by opening the pouch, grasping the barcode scanner and taking it out. It is not permitted to read in the barcode of a different type of fitting. On completion of the reading in process the FRIAMAT XL barcode scanner must be returned to its pouch immediately in order to avoid damage and contamination.



#### **IMPORTANT!**

Please also ensure that the fusion plugs of your FRIAMAT XL fusion unit are attached to the contact pins on the fitting across the entire internal contact width.

Once the barcode label has been attached to the fitting, this is the only one to use. If the barcode label of the fitting to be fused is not legible due to damage, a fitting with a legible barcode label built in the same way by the same manufacturer must be used.

The FRIAMAT XL barcode scanner reads the barcodes contact-free. Position the FRIAMAT barcode scanner over the barcode and push the reading button. The barcode is recorded by a red light-band, which should be centred horizontally over the complete barcode. The barcode will not be read if the red light-band is in any other position.

**Correct position!**  
(Position: align at the centre above the bar code)



**Incorrect position;  
reading not possible!**



**Incorrect position;  
reading not possible!**



Optimal reading results can be realised when the FRIAMAT XL barcode scanner is positioned in short distance above the barcode. In case of bad printed or slightly damaged barcodes it can be helpful to position the FRIAMAT XL barcode scanner close to the barcode and then – with pushed reading button – to lift slowly from the barcode. A successful reading of the barcode is signalled by sounding of a verification tone and lighting up of a green signal light in the middle of the barcode.

### 3.3 Starting fusion process



#### **WARNING!**

**If there is a malfunction in the fusion process hot molten PE may be expelled on rare occasions.**

**Therefore:**

**Maintain a safety distance of at least 2 m from the fusion point during fusion! Do not connect any additional equipment during fusion.**

The fusion process can be cancelled at any time by pressing the STOP button. When the fused area has cooled down (and the source of the fault eliminated where necessary) the fusion process can be repeated (depending on the fitting manufacturer, please observe operating instructions by the appropriate fitting manufacturer).

#### **Operating steps:**

1. Display prompts “pipe prepared?”, confirm if yes.
2. Press the START button to start the fusion process. Now follow automatic checks of the ambient temperature and resistance check of the fitting connected. Fusion starts. The display will tell you the duration of the fusion (it will show total time of fusion and count it up in seconds).
3. Display “end of fusion” means that the fusion process has been completed. Displays “t” and “tc:” show reference and actual fusion time and must be identical.
4. Mark fusion parameters on pipe/fitting. This will make sure no second fusion is accidentally carried out.

5. Display „end of fusion“ with “t” and “tc:” is necessarily to confirm by pressing the STOP button. The guide button “OK” can be pushed alternatively. Thus, the fusion process has been completed and the FRIAMAT® fusion unit is ready for the next fusion.

## 4. FRIAMAT XL

### 4.1 Description of function buttons

The FRIAMAT XL fusion unit has 9 function buttons. Please observe the diagram below and the basic description of the buttons.



**Guide buttons:** Guide buttons are blue, are situated at the very top of the unit (directly below the graphical display) and have a grey background. The guide buttons are not labelled as their functions vary according to input and are displayed in the bottom line of the graphical display (see section 4.2 and 4.3).

**START:** The START button is green. The START button is used to start up the fusion process.

**STOP:** The STOP button is red. The STOP button is used to cancel the fusion process and generally to stop input (without saving data). When terminating input by using the STOP button you will always be taken back to the basic picture of the graphical display (reset function).

**Arrow buttons:** The arrow buttons are blue, with arrows marked on them in black and are situated in the lower half of the unit. Use the arrow buttons (left/right) to move the cursor from left to right and

back in the display when entering alpha numeric symbols (e.g. emergency input, date). The arrow buttons (up/down) are used to select the required symbol (letter, number, special symbol) at the appropriate place.



### **IMPORTANT!**

**In most cases the unit will automatically (via the guide buttons) take you through the individual menus or input processes. If you need to disrupt this automatic process (e.g. because you made a mistake at a previous input step) and/or the guide buttons are used up by other functions, you can use the arrow buttons to move through menus or input processes.**

## **4.2 Display Design (basic picture)**



The display is split into 4 areas:

Display area 1: This part of the screen will continuously display important ambient information (date, time, ambient temperature, voltage and frequency).

Display area 2: This part of the screen will continuously display the functions as symbols, which you have actively selected at this point (e.g. documentation, traceability mode). Refer also to section 4.4 “Description of display symbols”.

Display area 3: This part of the screen (“main window”) will display all entries and information within the individual menus.

Display area 4: The three black text bars are allocated to the blue guide buttons situated below and change their description and function depending on input. The descriptions are largely self explanatory and will guide you safely through your input process (see also section 4.3).

### 4.3 Description of display functions

The function of the black text bars allocated to the blue guide buttons changes in line with input. However, due to the intelligent basic design of the menus, only few terms (or functions) are used:

MENUE	Press this button to take you to the main menu.
SELECT	Press this button to select a submenu.
OK	Press this button to confirm the information displayed in the main window.
SAFE	Press this button to save your input.
CANCEL	Press this button to cancel input without saving data and to be taken back to the previous input step.
FORWARD	Press this button to take you to the next input step.
BACK	Press this button to be taken back to the previous input step.
NEW	This button will allow you to rename text fields (e.g. infotext, commission number, etc.).
CHANGE	This button will allow you to change menu settings and/or text input already in place (e.g. the last 10 commission numbers).

<b>SHIFT</b>	Press this button to take you to “add/remove” when making alterations (see below).
<b>REMOVE</b>	Pressing this button will allow you to remove individual or several alphanumeric symbols from entered text.
<b>ADD</b>	Press this button to add individual or several alphanumeric symbols to text already entered.
<b>DETAILS</b>	Press this button to access the decoded traceability barcode.
<b>ID-DATA</b>	See section 4.10.1.
<b>EMERGENCY INPUT</b>	See section 4.10.4.
<b>INFOTEXT</b>	See section 4.10.3.

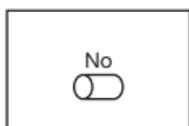
## 4.4 Description of display symbols

### Symbols in display area 2

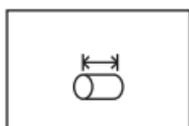
	Documentation switched on (including indication of remaining memory space).
	Seam numbers may be entered.
<p>0... 9999</p>	Current number not sorted by commission number; numbers run consecutively.



Traceability barcodes may be entered.



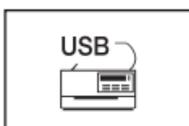
Pipe numbers may be entered.



Pipe lengths may be entered.



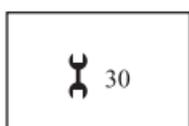
Buzzer not active.



Printer connected.

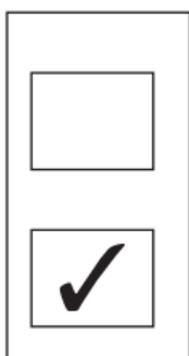


FRIATEC Memory-Stick connected.



Maintenance date exceeded (see also section 4.11.6).

### Symbols in display area 3



Blank box indicates that the appropriate menu point or function has not been activated.

Checked box indicates that the appropriate menu point or function has been activated.

## **4.5 Menu “Basic settings”**

### **4.5.1 Documentation**

Your FRIAMAT XL fusion unit is supplied with the documentation function switched off. The function “Documentation” serves to save fusion parameters. These may be allocated either to an commission number and/or a operator pass. Via the guide button “Menu” you will access the menu “Basic settings” with its submenu “Documentation”. In this menu it is possible to switch documentation on or off.

### **4.5.2 Time**

The guide button “Menu” will take you to the menu “Basic settings” with its submenu “Time”. There you will be able to change the time in this menu.

### **4.5.3 Date**

The guide button “Menu” will take you to the menu “Basic settings” with its submenu “Date”. There you will be able to change the date in this menu.

### **4.5.4 Language**

Press the function key “Menu” to access the menu “Basic Settings”. The menu includes the sub-menu “Language”. By pressing the corresponding function keys, you can select your desired language shown in the display in this menu.



#### **IMPORTANT!**

The menu “Language” is identified by two asterisks (one asterisk to the left of the term “Language” and one asterisk to the right). These asterisks serve to be able to identify the language setting menu in case the language has accidentally been changed.

#### 4.5.5 Protocol language

Press the function key “Menu” to access the menu “Basic Settings”. The menu includes the sub-menu “Protocol language”. By pressing the corresponding function keys, you can select the desired language of the documentation in this menu.



#### **IMPORTANT!**

**The protocol language can be set independent of the language on the display.**

#### 4.5.6 Volume

Use the guide button “Menu” to get to the menu “Basic settings” with its submenu “Volume”. There you can set the volume in this menu to either “loud” or “quiet”.

#### 4.6 Menu “Fusion sequence”



#### **IMPORTANT!**

**The menu “Fusion sequence” is activated (and thus visible to you) when the documentation has been switched on. All submenus are not activated on delivery (factory setting) as a point of principle.**

Press the MENU button to select the main menu. Use the arrow buttons (up/down) to access the submenu “Fusion Process” and select by pressing the START button.

#### 4.6.1 Commission number

The menu “Fusion sequence” is reached via the guide button “MENU”. There you will find the submenu “Commission number”. There you will be able to switch on or off working with commission numbers. On selecting “Commission number” the commission number “#####” will appear in the main screen in the top line next to “→ CODE”.

## 4.6.2 Operator pass



### **IMPORTANT!**

The menu “Operator pass” is activated (and thus visible to you) only once an operator pass has been read in – with the documentation switched on. You can order operator passes from FRIATEC. Once an operator pass has been read in, all fusion processes carried out will be saved under the code of this operator pass. By reading in a different operator pass your FRIAMAT XL fusion unit will be switched over accordingly.



### **IMPORTANT!**

Once you have read in the operator pass you will automatically be taken to submenu “ID Data” (see also Section 4.10.1). By moving the blue arrow buttons (up/down) you will be given an overview of the settings that have been selected on your FRIAMAT XL fusion unit. Press the STOP button to exit this submenu.



### **IMPORTANT!**

By means of the operator pass your FRIAMAT XL fusion unit can be blocked to prevent it from unauthorised use. After repeated reading in of the current operator pass the question will be posed “BLOCK UNIT?”. Then you can confirm this or cancel the action. Your FRIAMAT XL fusion unit will be blocked automatically when the code of an operator pass is on file and there has been a change of date, i.e. your FRIAMAT XL fusion unit is blocked the next day. In both cases (manual or automatic blocking) the following message appears in the display “OPERATOR → CODE”. By reading in an operator pass your FRIAMAT XL fusion unit is once again cleared for use.

### **4.6.3 Info text**

Press the MENU button and then submenu “Fusion process” to access “Info text”. Activating/switching on this menu will allow you to include additional text information to a fusion process.

### **4.6.4 Comment 1**

Press the MENU button and then submenu “Basic setting” to access “Comment 1”. Activating/switching on this menu will allow you to include additional text information to a fusion process.

### **4.6.5 Comment 2**

Press the MENU button and then submenu “Fusion process” to access “Comment 2”. Activating/switching on this menu will allow you to include additional text information to a fusion process.

### **4.6.6 Subcontractor**

Press the MENU button and then submenu “Fusion process” to access “Subcontractor”. Activating/switching on this menu will allow you to include additional text information to a fusion process.

### **4.6.7 Traceability**

The guide button “Menu” will take you to the menu “Fusion sequence”. The submenu “Traceability” can be found there. There you will be able to release in this menu your FRIAMAT XL fusion unit for reading in, processing and saving of traceability barcodes. In addition submenus “Pipe number” and “Pipe length” are activated when this menu is accessed.

### **4.6.8 Pipe number**

Press the MENU button and then submenu “Fusion process” to access “Pipe number”. Activating/switching on this menu will allow you to allocate an individual pipe number to the pipes to be fused.

### **4.6.9 Pipe length**

Press the MENU button and then submenu “Fusion process” to access “Pipe length”. Activating/switching on this menu will allow you to add the length of the pipes to be fused.

#### **4.6.10 GPS data**

Press the MENU button and then submenu “Fusion Process” to access “GPS data”. Activating/switching on this menu will allow you to enter coordinates/position of your fusion fitting. To determine the GPS data you will need an appropriate device.

#### **4.6.11 Seam number**

The menu “Fusion sequence” is reached via the guide button “MENU”, where you will find the submenu “Seam number”. There you will be able to switch on or off seam numbers entry.

#### **4.6.12 Scraper tool**

Press the MENU key and then submenu “Fusion process” to access “Scraper tool”. Activating/switching on this menu will allow you to enter data (e.g. unit number) of the scraper tool used for the preparation of the fusion. For this facility the scraper tool must have an appropriate barcode.

### **4.7 Menu “Data”**

Press the function key “Menu” to access the menu “Data”. This menu includes the sub-menus “Transfer”, “Print”, “PDF” and “Cancel”. The various options to read out and transfer stored data from your FRIAMAT XL fusion unit are described in the following section.



#### **IMPORTANT!**

**The menu “data” is activated (and thus made visible to you) only once documentation is switched on and the first fusion data is saved.**

#### **4.7.1 Transfer to Memory-Stick (FRIATRACE)**

Press the function key “Menu” to access the menu “Data”. This menu includes the sub-menu “Transfer”. You will make this selection if you inserted your memory stick (see also section 8.1) into the USB interface at your FRIAMAT XL fusion unit and want to transfer your data. The sub-menu “Transfer” offers the selection options “ALL” (output of the complete protocol memory content), “SELECTED” (output of selected job numbers) and “CANCEL” (exit the menu without any action).



#### **IMPORTANT!**

**FRIATEC does not assume any liability if commercially available USB flash drives are used. Use your FRIATEC memory stick.**

#### **4.7.2 Print**

Press the function key “Menu” to access the menu “Data”. The menu includes the sub-menu “Print”. You will make this selection if you connected your printer to the USB interface and want to print your data on paper. The sub-menu “Print” offers the selection options “ALL” (output of the complete protocol memory content), “SELECTED” (output of selected job numbers) and “CANCEL” (exit the menu without any action).

#### **4.7.3 Transfer to Memory-Stick (PDF-File)**

Press the function key “Menu” to access the menu “Data”. The menu includes the sub-menu “PDF”. “PDF” is selected for outputting the data as pdf file on the FRIATEC Memory-Stick. The sub-menu “PDF” offers the selection options “ALL” (output of the complete protocol memory content), “SELECTED” (output of selected job numbers) and “CANCEL” (exit the menu without any action).

The pdf files are written into a sub-directory on the FRIATEC Memory-Stick which has the following name: F+device number (e.g. FR 07 67 123): F0767123

The file names are generated based on the present date and a two-digit ascending number starting from 0, e.g. 2nd hardcopy (02) on 4 September 2007 (070904): 07090402.PDF

PDF files can be directly printed at the PC/laptop with the corresponding software (e.g. Acrobat Reader®).

#### 4.7.4 Delete

Press the function key “Menu” to access the menu “Data”. The menu includes the sub-menu “Delete”. The sub-menu “Cancel” offers the selection options “ALL” (output of the complete protocol memory content), “SELECTED” (output of selected job numbers) and “CANCEL” (exit the menu without any action).

By pressing the corresponding function keys, you can delete your stored data in this menu. The option “All” requires you to confirm the query “Are you sure?” by pressing the function key “OK” if you really want to delete the entire memory content.



#### **IMPORTANT!**

**If you have deleted data, these will be irrevocably lost. Based on the automatic back-up function of the device, authorised FRIATEC service personnel might be able to restore deleted data. Please contact your local service station (see section 8.2).**

#### 4.8 Menu “Info”

The guide button “Menu” will take you to the menu “Info”. Here you will find important information about your FRIAMAT XL fusion unit: device number, software version and next maintenance date. Make sure you have this information with you when you approach an authorised FRIATEC service point with questions or problems.

## 4.9 Menu “Formatting”

Basically the FRIATEC Memory-Stick can be used for the transfer of data. The FRIATEC Memory-Stick can be purchased from FRIATEC.

If you have not used the FRIATEC Memory-Stick on the FRIAMAT XL fusion unit and the correct format has therefore not been set, or you decide to go for a standard USB flash drive, please note that it must be formatted to FAT 12 or FAT 16. A USB flash drive formatted to FAT 32 or a partitioned USB flash drive (Master Boot Record) will produce the error message “ERROR 91” on your FRIAMAT XL fusion unit.

Formatting to FAT 12 or FAT 16 can be done in submenu “Formatting”. Press the MENU button to access the main menu. Use the arrow buttons (up/down) to access submenu “Formatting” and select by pressing the START button. On selecting menu point “MEMORY-STICK” you will be asked “ARE YOU SURE?” before formatting starts.



### **IMPORTANT!**

**Please note that all data is deleted from the FRIATEC Memory-Stick during formatting!**



### **IMPORTANT!**

**FRIATEC AG accepts no liability for the use of standard USB flash drives. Please use the FRIATEC Memory-Stick.**

## 4.10 Fusion Options

### 4.10.1 ID-Data



### **IMPORTANT!**

**The “ID-data” option is activated and visible to you only once documentation has been switched on.**

Once documentation has been switched on, the function “ID-data” appears in the guide button bar on the basic picture (see also section 4.2). This includes data which you can allocate to your imminent fusion process: commission number, operator pass, continuous number and seam number. The following sections describe this additional information.



### **IMPORTANT!**

**Entering commission numbers and seam numbers is possible only when documentation and function “Commission number” (see section 4.6.1) and/or “Seam number” (see section 4.6.11) are switched on.**

#### **4.10.1.1 Commission number**

Press the MENU button to access submenu “ID-data”. Press the START button to bring up “Commission Number” in the top line of the display. On entering an commission number for the first time the following appears “#####”. The first digit flashes. By moving the arrow buttons you will be able to enter your commission number. Use the START button to save this number and the STOP button to exit the submenu.

If you have already entered one or several commission numbers, you will be able to choose in “ID-data” in submenu “Commission number” between “CHANGE” (changing of last entered commission number), “NEW” (entering a new commission number), and “SELECTION” (selecting an commission number from the last 20 commission numbers entered) by pressing the START button and using the arrow buttons (up/down). Data entry, saving and exiting this submenu takes place as described above.

#### **4.10.1.2 Operator pass**

By pressing guide button “ID-data” the main window will indicate whether and which operator is on file (if no operator pass has been activated, there will be no indication in this window). The operator can not be changed manually – i.e. via the buttons. This means that you will require an operator pass to put a new operator on file (see section 4.6.2).

#### **4.10.1.3 Continuous number**

By pressing guide button “ID-data” the continuous number of the fusions carried out by you will be indicated. This number is allocated automatically by the unit and can not be changed. Normally the continuous number is allocated to the appropriate activated commission number; the SUPERVISOR (see section 4.11) has the option of setting different allocations (see section 4.11.2.5).

#### **4.10.1.4 Seam number**

By pressing guide button “ID-data” the main window (display area 3, see also section 4.2) will allow you to allocate a number chosen by you (“seam number”) to your fusion process. If the commission number input has been activated at the same time, you will need to move from commission number (on black) to the seam number (now on black) by activating the arrow buttons down. By activating the appropriate guide buttons you will now be able to enter a seam number (“CHANGE”). Select alphanumeric symbols using the arrow buttons. Confirm your entry by pressing the guide button “SAVE”. As this main window also allows you to enter data regarding information on commission number, operator pass and continuous number (when activated) you will have to leave the main window – once you have made all required changes – by pressing the guide button “OK”.

#### 4.10.1.5 GPS 1 - 3

Use the MENU button to access submenu „ID-data“. Press the START button and use the arrow buttons (up/down) to access the screen where you are able to enter the coordinates of the fusion processes carried out by you (GPS 1, GPS 2 and GPS 3). Symbols are chosen by using the arrow buttons. Use the START button to save this number and the STOP button to exit the submenu. You will need an appropriate device for calculating the GPS data.

#### 4.10.2 Traceability barcodes/pipe number/pipe length



#### **IMPORTANT!**

**It is possible to enter traceability data only when documentation and “traceability” function and/or “pipe number and/or “pipe length” are switched on (see section 4.6.7).**

Traceability barcodes entry option is activated by reading in the fusion barcode of the fitting to be fused. A command to enter the traceability barcode of the fitting will appear in the main window. Once you have entered this (made visible by a tick in a box), the display in the main window will “jump” to the command for entering the traceability barcode of component 1. When you have activated entry of pipe number and/or pipe length, this will also be indicated here and can be entered accordingly. Once entered, the display in the main window will change to the command for entering traceability barcode of component 2. Enter pipe number and/or pipe length the same way as described above. The following display will remind you by asking “pipe prepared?” to make absolutely sure that the pipe has been scraped. By pressing “FORWARD” (i.e. the pipe has been prepared appropriately) you will reach the starting mode. Start the fusion process by pressing the START button.



### **IMPORTANT!**

Entering traceability data is fully automatic, i.e. the display will show the next step on each entry until you reach the starting point of the fusion process. If you need or want to interrupt this automatic process (e.g. because you want to check your input once more), move around using guide buttons “FORWARD” and “BACK” between individual displays “fitting” / “component 1” / “component 2” / “pipe prepared” / “start”. The arrow buttons allow you to move within individual windows.

#### **4.10.3 Info text, Comment 1, Comment 2, Subcontractor**

Depending on your selections, the following will appear as part of the data programming prior to fusion “INFO TEXT”, “COMMENT 1”, “COMMENT 2” and/or “SUBCONTRACTOR”. By pressing the MENU button and using the arrow buttons (symbol selection) you will be able to add any additional text. The lines will be blank initially, i.e. no additional text is displayed (e.g. the text last entered). Use the START button to save your entry and press it again to continue preparing for your fusion.



### **IMPORTANT!**

**The additional text must be entered for each fusion process, as no text will appear in the report otherwise. If the START button is activated immediately after reading in the fitting barcode, no additional text is added to the fusion.**

#### **4.10.4 Emergency input**

During the entering process of data in preparation of the fusion process one of the guide buttons comes up with the term “EMERGENCY INPUT”. Press this to enter the individual window where you will be able to enter the digits from each barcode. The word “code” appears and the digits from the most recently manually entered barcode (if this is being done for the first time, no digits will appear).

The digits to be entered must be taken from the barcode of the fitting to be fused. Select “NEW” to delete the most recently entered barcode. You will now be able to enter the new digits. Use “CHANGE” to select the last barcode entered. Once entry (using arrow buttons) or selection have been completed, press the appropriate guide button, either “SAVE” or “CANCEL”.

#### **4.10.5 Scraper tool**

As part of the process of entering data to start the fusion the request “SCRAPER TOOL: → CODE” – if selected by you (see Section 4.6.12) – appears after the prompt “PIPE PREPARED?”. If the scraper tool which you used for the scraping of the pipe has the appropriate barcode you will now be able to enter this – this data will then be allocated to your fusion in the report.

### **4.11 SUPERVISOR**

The so-called SUPERVISOR has a supervisor pass which allows him or her to carry out specific settings on the FRIAMAT XL fusion unit, which due to their effect on the unit’s properties and functions should be done by one specific person only. The SUPERVISOR needs to be familiar with the functions of the unit and have fully understood the contents and effects of the sections below.

The SUPERVISOR is able to configure the FRIAMAT XL fusion unit in exactly the way he would like the procedure to run on the construction site. This means the unit can be set up to function quite simply according to requirements (e.g. fusion without documentation) or very complex indeed (including documentation, traceability, seam number, pipe number, pipe length, etc. ).

The main difference between this and the setting options available to the user on the construction site (see section 4.5 to 4.10) is that the SUPERVISOR has the option not only to carry out his settings, but to block them to further changes, i.e. the user on the construction site will not be able to change the given settings and procedures.



## **IMPORTANT!**

The settings/menus blocked by the SUPERVISOR will not be shown to the user on the construction site (e.g. where documentation is switched on and blocked at the same time to the user, the menu “Documentation” disappears from the menu bar).

The SUPERVISOR accesses the SUPERVISOR menu by reading in the barcode on the SUPERVISOR pass (this pass is purchased with the FRIAMAT XL fusion unit). A PIN code will be requested. The PIN code has been factory set to “0000” – however, it is possible for the SUPERVISOR to set his own PIN code combination, see also section 4.11.4).

### **4.11.1 Basic settings**

#### **4.11.1.1 Documentation**

Select “Basic settings” to access submenu “Documentation”. By activating the appropriate guide buttons you will be able to switch documentation on or off and block your settings from changes by users.

#### **4.11.1.2 Time**

Select “Basic settings” to access submenu “Time”. By activating the appropriate guide buttons you will be able to make the setting in in such a way that the time can not be changed by the user.

#### **4.11.1.3 Date**

Select “Basic settings” to access submenu “Date”. By activating the appropriate guide buttons you will be able to make the settings in such a way that the date can not be changed by the user.

#### **4.11.1.4 Data protection**

Select “Basic settings” to access submenu “Data protection”. By activating the appropriate guide buttons you will be able to limit the delete function by blocking deletion through the user (data can not be deleted) or by allowing the user to delete data after print-out or transfer of data from the unit.

#### **4.11.1.5 Maintenance date**

Select “Basic settings” to access submenu “Maintenance date”. By activating the appropriate guide buttons you will be able either to deactivate the warning “Maintenance date exceeded” (not recommended, see section 5.2) or to set the unit in such a way that it will stop carrying out fusions once the maintenance date has passed. This setting will also allow you, once the maintenance is overdue, to make the “blocking” of the unit a little less rigid by setting a period of between 0 and 99 days after “blocking” during which the unit will continue to work after the date of the maintenance has passed. This setting is shown to the user in the display once the maintenance date has passed (as the symbol of a screwdriver and the number of days left for the unit to work).

#### **4.11.1.6 Mode**

Select “Basic settings” to access submenu “Mode”. By activating the appropriate guide buttons you are able to set international date and time formats as well as temperature units.

#### **4.11.1.7 Language**

Select “Basic settings” to access submenu “Language”. There you will be able to set the required language, i.e. users will not be able to change the language.

#### **4.11.1.8 Emergency input**

Select “Basic settings” to access submenu “Emergency Input”. There you will be able to block the option of entering barcode numbers manually (not recommended, as work will have to cancel if there is e.g. a damaged fusion barcode).

#### **4.11.1.9 Energy display**

Select “Basic settings” to access submenu “Energy display”. There the amount of energy used is shown to you (or not) after fusion is completed.

#### **4.11.1.10 Volume**

Select “Basic settings” to access submenu “Volume”. There you will be able to set the volume of the signal (on/off; loud/quiet) and block this setting from any changes by the user.

#### **4.11.2 Fusion sequence**

##### **4.11.2.1 Traceability**

Select “Fusion sequence” to access submenu “Traceability”. There you will be able to switch on or off the option to enter traceability barcodes, pipe number and pipe length, and to block the selected setting from any changes by the user.

##### **4.11.2.2 Commission number**

Select “Fusion sequence” to access submenu “Commission number”. There you will be able to switch on or off the option of working with commission numbers. In addition you are able to indicate (if you have opted for “On”) the need for entering the commission number each time the unit is switched on or before each fusion process. You are also able to block your setting from any changes by the user.

##### **4.11.2.3 Infotext**

Select “Fusion sequence” to access submenu “Infotext”. There you will be able to switch on or off the option of entering up to four different text entries (“infotext”, “comment 1”, “comment 2”, “operator”) and to block the selected setting from any changes by the user.

##### **4.11.2.4 Seam number**

Select “Fusion sequence” to access submenu “Seam number”. There you will be able to switch on or off the option of entering seam numbers and to block the selected setting from any changes by the user.

#### **4.11.2.5 Continuous number**

Select “Fusion sequence” to access submenu “Continuous number”. There you will be able either to allocate the continuous number (always given out by the unit) to commission numbers (counting takes place within the commission number, starting with “1”) or to set to continuous, i.e. not relating to the commission numbers.

#### **4.11.2.6 Operator pass**

Select “Fusion sequence” to access submenu “Operator pass”. There you will be able to switch on or off the option of working with the operator pass. In addition you are able to deactivate the factory setting (if you have opted for “On”), that the operator pass must be read in once more when the date changes (i.e. in the activated mode your unit will be initially blocked the next day, until an operator pass has been read in). In addition you are able to indicate that the operator pass must be read in every time the unit is switched on and/or before each fusion. You will also be able to block your selected setting from any changes by the user.

#### **4.11.2.7 Display “Pipe prepared”**

Select “Fusion sequence” to access submenu “Display pipe prepared”. There you are able to switch on or off the warning message which comes up before fusion is started (switching off not recommended).

### **4.11.3 Factory settings**

In the “Factory settings” menu you will be able to reset all settings made by you and/or the user; i.e. FRIAMAT XL fusion unit will return to being configured the same way it was delivered by the manufacturer FRIATEC.



#### **WARNING!**

**If you press “O.K.”, all your settings and text entries will be lost.**

#### 4.11.4 PIN

The menu “PIN” allows you to change the number combination “0000” for accessing the SUPERVISOR menu as supplied by the factory. We recommend to keep the number combination secret and not to make the SUPERVISOR pass accessible to anybody. This is the only way to make sure that the configuration set by you will not be changed.



#### **WARNING!**

**Keep the number combination selected by you secret and note it down in a place inaccessible by others (in case you should forget the combination). If you have lost or forgotten your PIN, please contact our service hotline +49 (0) 621 486 1533.**

#### 4.11.5 Display (Resistance)

In the menu “display” you can specify whether the resistance actually measured at the fitting before starting the fusion is to be indicated on the display. The indication must then be acknowledged before any fusion process by pressing the START key.

## 5. Warranty/Maintenance/ Taking out of Service

### 5.1 Warranty

The warranty period for the FRIAMAT XL fusion unit is 24 months.

### 5.2 Service and maintenance

According to DVS 2208 Part 1 or BGV A3 “Electrical Plants and Devices” a maintenance of movable electrical devices is to be performed at least once a year (see list of the authorised service points in section 7.2). Please observe any deviating, country-specific regulations. Please include all connecting adapters for service checks.

WHAT?	WHEN?	WHO?
cleaning the barcode reader and checking for damage	daily	user
checking function	weekly	user
cleaning contacts	weekly	user
factory service	annually	authorised service points (see section 7.2)

### 5.3 Taking out of service



#### **IMPORTANT!**

The FRIAMAT XL fusion unit contain different components which make specialist disposal necessary. You FRIAMAT XL fusion unit can be disposed of in the factory or at one of the authorised service points.

## **6. Operating Faults**

### **6.1 Errors when reading in the barcode**

If reading in is not confirmed by an acoustic signal the reader wand should be checked for dirt or damage. If the barcode scanner is damaged, fusion can still be carried out using the Emergency Input Mode (see Section 4.10.4).

### **6.2 Fusion interruption**

If the fusion is interrupted, because e.g. the power supply was disrupted during a fusion process, the fusion can be repeated once the source of the fault has been removed and the fitting has cooled off completely (depending on manufacturer, please observe operating instructions by the appropriate fitting manufacturer).

### **6.3 Error messages/Warning messages/Info**

If irregularities occur during the fusion process, your FRIAMAT XL fusion unit will display the appropriate error messages.



#### **IMPORTANT!**

**In the event that your FRIAMAT XL fusion unit displays an error message or warning message not described below and this cannot be clarified or rectified based on the description in the display, please contact our service hotline +49 (0) 621 486 1533.**

**Error messages:**

<b>No</b>	<b>Text in Display</b>	<b>Significance/ Causes</b>	<b>Remedy</b>
02	Temperature outside range	Ambient temperature outside permitted range.	Set up tent if necessary.
03	Resistance outside tolerance	Electrical resistance of fitting outside tolerance.	Check contact for firm seating/dirt. Maybe clean contacts, if necessary replace fitting.
04	Fitting winding short circuit	Short circuit in the wire winding of fitting.	Replace fitting, send in for checks.
05	Fitting winding open circuit	Current flow interrupted.	Check connection of fusion plug on fitting. If okay replace the fitting and send in for checks.
06	Voltage outside tolerance	Non permitted deviation of fusion voltage.	Contact authorised service point.
08	Mains voltage outside range	Power voltage outside permitted range during fusion.	Extension cable too long or cross section too small. Check voltage and connections of generator.
09	Frequency outside range	Frequency outside permitted range during fusion.	Check frequency of generator voltage.

**Further Error messages:**

<b>No</b>	<b>Text in Display</b>	<b>Significance/ Causes</b>	<b>Remedy</b>
10	Cancel of fusion	Fusion interrupted by pressing the STOP button.	–
13	Mains failure	Supply voltage interrupted (e.g. power cut during fusion) or too low.	Check connections.
15	Mains rating exceeded	Power consumption of fitting exceeds rating of the FRIAMAT XL.	Please contact FRIATEC service hotline: +49 (0) 621 486 1533
23	Generator failure	Generator maybe not suited for fusion work.	Please contact FRIATEC service hotline: +49 (0) 621 486 1533
xy*	System error		Please contact FRIATEC service hotline: +49 (0) 621 486 1533

\*: error messages with numbers not displayed in above table.

## **Warning Messages/Info:**

<b>Text in Display</b>	<b>Instruction / Remedy</b>
Attention: Second fusion process	If a fusion is to be fused twice, the contact plugs on the fusion unit of the fitting must be pulled out after the first fusion, and the fitting must be allowed to cool (see processing instructions by fitting manufacturers).
Read in fusion code first please	Appears when the traceability barcode of a fitting was accidentally read in first.
Read in valid traceability barcode please	If e.g. the fusion barcode of the fitting was accidentally read in.
Read in valid operator pass please	Appears when the operator pass needs to be read in e.g.when unit is blocked) and/or a different (wrong) barcode is read in.
Read in valid commission number please	Appears when the commission number needs to be read in (e.g. when the unit is set to reading in before each fusion) and/or a faulty takes place or a different (wrong) barcode is read in.
Printer not ready	Check if printer is connected properly.
Faulty/incorrect barcode	Use new barcode of fitting built in the same way or correct using manually entered code.
Unit blocked	When maintenance is overdue (see section 4.11.1.6).

### **Further Warning messages/Info:**

<b>Text in Display</b>	<b>Instruction / Remedy</b>
Let the unit cool down	Protective function designed to prevent overheating of unit. Switch unit off and leave to cool until warning no longer appears when switching it on again.
Cancel of fusion	Fusion interrupted by pressing STOP button.
End of fusion	Fusion completed.
Voltage ...V; Frequency... Hz	Adjust generator and quit using STOP button.
Memory empty	Printing out not possible if memory is empty.
Memory full	Print out report.
Maintenance date exceeded	Contact authorised service point. Arrange for unit to be serviced.

## **7. Appendix**

### **7.1 Recommended accessories (options)**

- FRIATEC Memory-Stick to save and transfer fusion data and to output the data as pdf file
- SUPERVISOR pass for individual adjusting of menu functions
- FRIATRACE IV for the electronic processing of fusion data
- Operator pass
- Remote control pass

## **7.2 Authorised service points**

FRIATEC AG  
Technical Plastics Division  
FRIATOOLS-Technical equipment  
Steinzeugstraße 50  
68229 Mannheim, Germany  
Tel.: +49 621 486-2336  
Fax: +49 621 486-1837

Please contact our service hotline +49 (0) 621 486 1533 for details of service points world wide.

## **7.3 Operating instructions updates**

These technical statements are regularly revised to be up-to-date. The date of the last revision is stated on the document.

For an updated version of the operating instructions, please visit our website [www.friatools.com](http://www.friatools.com) on the Internet. You will find the “Download” page on the navigation bar. This page contains our updated operating instructions as pdf documents. We will also mail them to you on request.

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