Operating Instructions

FRIAMAT® geo PRINT

FRIAMAT®

FRIATEC

1 Safety

1.1 Dangers

FRIAMAT® fusion units have been designed using state of the art technology and are designed according to recognised safety regulations and fitted with appropriate protective equipment. In addition FRIAMAT® fusion units have been submitted to extensive tests in line with the German law for equipment safety. Functionality and safety of FRIAMAT® fusion units are tested before they are supplied to the customer. However, incorrect use or abuse of the equipment will lead to dangers with regard to:

- the health of the user,
- your FRIAMAT® fusion unit or other material goods of the operator,
- the efficient operation of your FRIAMAT® fusion unit.

Everybody involved with operating, servicing and maintaining your FRIAMAT® fusion unit 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® geo print fusion unit serves exclusively for the fusion of

- component parts from the FRIALEN® Geo product range as well as
- FRIALEN® safety fittings up to d75 with pressure pipes made of HD-PE.

Your FRIAMAT® geo print can also be used to process fittings up to d75 by other manufactures 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 13950/03.2007.

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 <u>other</u> use is <u>not</u> 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.
- FRIAMAT® fusion units may be opened only by electrical specialists.
- When carrying out fusions using FRIAMAT® 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 mains lead and extension cables immediately.
- Do not remove or disable safety devices.
- Rectify known faults immediately.
- Do not leave your FRIAMAT® 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® 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.
- Pull out the plug prior to any maintenance or service tasks!
- Allow any service and repairs to be carried out only at authorised service stations!
- Connect fusion units of the FRIAMAT® range only to supply voltage as given on type plate.

DANGER!

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

Outdoors (on construction sites) receptacles must be fitted with fault-current circuit breakers. When using generators, the DVGW worksheet GW308 and the VDE 0100 Part 728 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 station 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) safety fuse at least 16 A (slow acting).

WARNING!

Check input voltage of your FRIAMAT® fusion unit before starting the fusion process. Your FRIAMAT® fusion unit has been designed for input voltage of 190-250 volt.

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

- 2.5 mm^2 up to 100 m

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® fusion unit whilst connected to power supply! FRIAMAT® fusion units may be opened only by specialist personnel at an authorised service station! The replacement of a damaged mains supply line may only be performed by an authorised service station.

1.7 Emissions

The (equivalent) continuous sound pressure level of all FRIAMAT® fusion units 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!

FRIAMAT® fusion units are splash water proofed. They may however not be immersed in water.

1.9 Signal equipment

FRIAMAT® fusion units confirm 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 case of an emergency switch off main switch immediately to the “OFF” position and disconnect your FRIAMAT® fusion unit 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 settings

2.1 Design/Parts

All electronic parts of your FRIAMAT® fusion unit are kept in a splash water proofed casing. A receptacle for the fusion and mains cable is situated at the back. At the top there is an accessory box; at the right side is the interface box. FRIAMAT® fusion units are designed for a maximum fusion voltage of 48 V. A safety transformer separates supply and fusion voltage.

2.2 Operating principle

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

- controls and adjusts welding stress fully automatically and
- determines the length of the fusion process, taking into account ambient temperature. The temperature sensor 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 reader wand cable near the reader wand 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 at all cost. In addition you need to make sure that both, the temperature sensor as well as the fitting to be fused 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 Technical data*	FRIAMAT® geo print
Input voltage range	AC 190...250 V
Frequency range	45...66Hz
Current consumption	AC 16 A max.
Output	1500 W
Safety fuse	20 A slow acting (inside)
Casing	Type IP 54 Protection grade II
Connecting cable	5 m including Euro plug
Fusion cable	2,5 m
Weight	ca. 15,5 kg
Barcode type	Code 2/5 (interleaved) Code 128
Operating temperature range**	-20 °C to +50 °C
Fusion current monitoring	Short Circuit and Cut-Off
Printer interface	USB
Connecting plug 4.0 mm	yes
Manual emergency programming	yes
Remote operating pass	optional
Operator pass	no
Supervisor pass	no
FRIATRACE	no
Documentation of fusion data	yes
Data output as PDF files	yes
Data output to printer	yes
Data storage in unit	100
Language options	20
Quality control certification	CE-sign
Transport box	yes

*** Technical alterations subject to change without notice.**

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

2.4 Automatic activation of "Service interval"

Starting with the first fusion process which you perform with the FRIAMAT® fusion unit, the stored service interval (see also Chapter 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® fusion unit.

2.5 Transport/Storage/Despatch

Your FRIAMAT® 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.

2.6 Setting up/Connecting

Your FRIAMAT® fusion unit can be set up and operated outdoors if protected from rain and wet.

- Set up your FRIAMAT® fusion unit on level ground (preferably horizontal).
- Ensure that generator is fused with a 16 A minimum (slow acting) fuse.
- Plug unit connection cable into power socket.
- Use extension cable if necessary, ensure sufficient cross section (see also Section 2.3 "Technical data").
- Observe operating instructions of generator if used.

WARNING!

Always roll out all cables before use!

2.7 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 relevant assembly instructions for the proper processing of component parts of the FRIALEN® Geo product range and the FRIALEN® safety fittings up to d75 are to be observed. The same applies for fittings by other manufacturers.

IMPORTANT!

Roll out cables completely!

This applies to power cable, fusion cable, and extension cable 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.

- 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.

3.2 Enter barcode

WARNING!

Take reader wand out of reader wand pouch by opening the pouch, grasping the reader wand at its end/anti-kink sleeve (black) 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 reader wand must be returned to its pouch immediately in order to avoid damage and contamination of the reader wand tip.

IMPORTANT!

The fusion plugs of your FRIAMAT® fusion unit must be connected with the contact plugs of the fitting as a resistance check is carried out immediately after reading in the barcode. An error message will appear if there is "non contact". Please also ensure that the fusion plugs of your FRIAMAT® 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.

Hold the reader wand slightly slanted and slightly inclined (like a pencil) and place it on the fitting in front of the barcode. Now move the reader wand quickly across the whole label and a little way beyond. The reading can be done from right to left or the other way around. If this has been done correctly,

the unit will confirm the reading with a signal. If reading in is not successful straight away, try again, if necessary at a different angle or speed.

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 1 m from the fusion area 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 (see also the visual description on the next page):

1. Display shows “PIPE PREPARED?”, confirm if correct.
2. Press the START button to start the fusion process. Now an automatic check of the ambient temperature and resistance check of the connected fitting follow. 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 till the fusion ends).
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. Thus, the fusion process has been completed and the FRIAMAT® fusion unit is ready for the next fusion.

4. Settings

4.1 Description of the function buttons

The FRIAMAT® geo print fusion unit has 7 function buttons.

MENUE: The MENUE button is grey. It calls up the main menu with its submenus “Basic settings”, “Info” and “Emergency input”. In addition pressing the MENUE button will clarify an error following an error message.
START: The START button is green. It starts up the fusion process, selects submenus or individual menus and saves settings. In addition this button is used to confirm error messages/warning messages/hints in the display.
STOP: The STOP button is red. It cancels the fusion process, is used to close submenus or individual menus and stops the entering process (without saving data).
Arrow buttons: The arrow buttons are blue. The arrow buttons (up/down) are used to “browse” through sub or individual menus. The arrow buttons (left/right) are used to move the curser from left to right and back when entering alphanumeric symbols (e.g. emergency input, date). Use the arrow buttons (up/down) to select the required symbol (letter, number, special symbol) at the appropriate place.

4.2 Menu “Basic settings”

Pressing the MENUE button will take you to the main menu. Once there use the arrow buttons to take you to the submenu “Basic settings” and select this by pressing the START button. The submenu “Basic settings” has the following individual menus:

- Documentation
- Time
- Date
- Language
- Volume

Use the arrow buttons to take you to the required individual menu and select this using the START button. Within the individual menus you can make the desired changes using arrow buttons and save these by pressing the START button or exit using the STOP button without saving the changes.

IMPORTANT!

The language setting menu displays two asterisks right and left in the top line. These serve to identify the language setting menu if the language has been accidentally changed.

4.3 Menu “Data”

IMPORTANT!

The menu “Data” is activated (and thus made visible to you) only once documentation is switched on and an initial set of data has been saved.

4.3.1 Menu “Transfer”

The guide button “MENUE” will take you to the menu “Data” with its submenu “Transfer”. Your FRIAMAT® geo print will recognise automatically whether a FRIATEC Memory-Stick or a printer is connected. Transfer data by pressing the START button.

When transferring the data to the FRIATEC Memory-Stick, these are written as PDF files into a sub-directory which has the following name: F+device number (e.g. FR 07 67 123): F0767123

The filenames 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

Afterwards the pdf files can be printed out directly at the PC/Laptop with Acrobat Reader© for example.

IMPORTANT!

The FRIATEC Memory-Stick must be connected before accessing the sub-menu “Transfer”.

IMPORTANT!

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

4.3.2 Menu “Delete”

The submenu “Data” will take you to “Delete”. In this menu you can delete saved data by pressing the appropriate buttons.

IMPORTANT!

Once you have deleted data, it has been lost irrevocably. The unit has an automatic back up function which may allow authorised FRIATEC service personnel to retrieve deleted data. Please contact your local service station (see section 7.2).

4.4 Menu “Info”

Press the MENUE button to access the main menu. Use arrow buttons (up/down) to access submenu “Info” and select by pressing the START button. The submenu “Info” contains the following individual menus:

- Time/Date
- Voltage/Frequency
- Temperature (ambient temperature)
- Unit number
- Software version
- Date of next service

Use the arrow buttons to take you to the required individual menu and select this using the START button. Within the individual menus you can take a look at the desired information and leave the particular menu by pressing the STOP button.

4.5 Menu “Emergency input”

Press the MENUE button to access the main menu. Use arrow buttons to access submenu “Emergency input” and select by pressing the START button.

Now “Code:” is displayed and 24 numbers with the first one flashing (when accessing this for the first time all the digits will be set to “0”, afterwards the most recently manually entered barcode is displayed). Enter the numbers displayed on the barcode of the fitting to be fused. Once the numbers have been entered using the arrow buttons, you must confirm this by pressing the START button; if you press the STOP button the process will be stopped (without saving data).

4.6 Menu “Formatting”

Press the MENUE button to access the main menu. Use arrow buttons to access submenu “Formatting” and select by pressing the START button.

With the help of this menu it is possible to format the FRIATEC Memory-Stick or a standard USB flash drive. Please note that it must be formatted to FAT 12 or FAT 16. An USB flash drive formatted to FAT 32 or a partitioned USB flash drive (Master Boot Record) will produce an error message on your FRIAMAT® fusion unit.

Formatting to FAT 12 or FAT 16 can be done in submenu “Formatting”. 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 USB flash drive during formatting!

IMPORTANT!

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

5 Warranty/Maintanance/ Taking out of service

5.1 Warranty

The warranty period for FRIAMAT® fusion units is 24 months.

5.2 Maintenance

According to DVS 2208 part 1 and BGV A3 “Electrical Plants and Devices” a maintenance of moveable electrical devices should be carried out once a year (see list of authorised service points in section 7.2). Please include all connecting adapters for service checks.

WHAT?	WHEN?	WHO?
Cleaning the reader wand 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!

FRIAMAT® fusion units contain different components which make specialist disposal necessary. Your FRIAMAT® 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 reader wand is damaged, fusion can still be carried out using the Emergency Input Mode.

6.2 Overheating

It is possible for your FRIAMAT® fusion unit to overheat if used for extreme lengths of time. In order to avoid damage to the unit, a temperature monitor has been installed which causes your FRIAMAT® fusion unit to calculate before fusion whether the temperature increase to be expected during fusion is permitted. If the calculated temperature is not in the permitted range, the display will show the message “Let the unit cool down”.
As the power consumption of different electrofusion fittings will vary, there may be the option of fusing a different fitting.

6.3 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).

6.4 Error messages/ Warning messages/Info

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

IMPORTANT!

In the event that your FRIAMAT® 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:

No	Text in Display	Significance/ Causes	Remedy
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.
10	Cancel of fusion	Fusion interrupted by pressing the STOP button.	–

Error messages:

No	Text in Display	Significance/ Causes	Remedy
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® fusion unit	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:

Text in Display	Instruction/Remedy
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).

Warning messages/Info:

Text in Display	Instruction/Remedy
Faulty/incorrect barcode	Use new barcode of fitting built in the same way or correct using manually entered code.
Let the unit cool down	Protective funcion 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 full	Print out report.
Maintenance date exceeded	Contact authorised service point. Arrange for unit to be serviced.

7 Appendix

7.1 Recommended accessories

- FRIATEC Memory-Stick (USB) to transfer fusion data from fusion unit to PC/Laptop (option)
- Remote control pass (option)

7.2 Authorised service points

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

7.3 Updates of these operating instructions

These technical data are regularly checked for their up-to-dateness. The date of the last revision is stated on the document. Please visit www.friatools.com on the Internet and go to the product area “FRIATOOLS® Equipment Technology”. Then click on the sub-menu “Downloads” on the navigation bar. Here, you can download our operating instructions as pdf files. We will also mail them to you on request.

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