GALVATHERM®

Fluoropolymer Immersion Heaters

User manual

DEAN-10-E

Important

Before installing and using this device, please read the entire manual paying attention to the instructions and safety guidelines contained therein.

Content

1. Identification

1.1. Type of material

Please complete the following information which is engraved on the orange connection pipe.

Reference : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Serial number : _ _ _ _ _ _

Power : _ _ _ kW

Voltage : _ _ _ V ☐ 1~ ☐ 3 ~

1.2. Manufacturer's/distributor's/supplier's address

GALVATEK S.A.S
9 rue de la tour du Mesnil-Renard,
78270 Bonnières-sur-Seine, France
Tel +33 (0)1 30 93 07 57
www.galvatherm.com

1.3. Standards and guidelines

GALVATHERM type P and C immersion heaters fulfil the following requirements.

- **Electromagnetic compatibility directive (CEM) 2014/30/UE**
- **Low voltage electrical equipment 2014/35/EU**
- **EN 60519/1-2**
- **EN 60529, IP64**
- **ROHS directive 2011/65/UE**

2. General recommendations

Carefully read this user manual and follow all instructions, safety guidelines and standards that apply nationally in terms of accident prevention.
This manual is an integral part of the device. It should be handed over to the installation technician and remain available to users for the device's entire lifecycle.

2.1. Warnings

Warnings are identified in the following manner :

Figure 1.

DANGER

- Existence of a hazardous situation. Failure to follow the instructions will lead to death or severe injury

Figure 2.

WARNING

- Existence of a hazardous situation. Failure to follow the instructions may lead to death or severe injury.

Figure 3.

CAUTION

- Presence of a hazardous situation. Failure to follow the instructions may cause light injuries.

Figure 4.

NOTE

- Failure to comply with the instructions may cause material damage to the immersion heater.

2.2. Signs used

√ Preliminary conditions that must be fulfilled.

→ Tasks to perform (one step)..

1. The first step in any operation. Subsequent operations are numbered sequentially.

2.3. Guarantee and repairs

Should an intervention or repairs be warranted under the guarantee, return the cleaned and neutralised immersion heater to the manufacturer or to your distributor, free of charge, and indicate what the defect is.
Please refer to chapter 10 detailing the return procedures and to chapter 11 dealing with the guarantee conditions.

2.4. Normal use

GALVATHERM immersion heaters of type P.. and C.. are for professional use onlyl.

Normal use of the devices :

• GALVATHERM immersion heaters are used to heat aqueous liquids at atmospheric pressure.

The following is also deemed to constitute normal use :

• Do not use the GALVATHERM immersion heater to heat explosive and/or inflammable liquids, gas or solid materials.
• GALVATHERM Immersion heaters are not to be used in explosive areas.
• Follow the instructions provided herein.
• Do not submit the immersion heater to significant mechanical stress.
• Do not use the GALVATHERM immersion heater if it shows visible defects.
• Under no circumstance should you modify the GALVATHERM immersion heater.

In case of abnormal use, random modifications, and failure to comply with the manual, or in case of use by non-qualified personnel, the manufacturer rejects all liability for any ensuing damage. Furthermore, such instances will void the guarantee.

⚠ DANGER	
Explosion and fire hazard	• Do not use the GALVATHERM immersion heater : - in inflammable or explosive products. - in areas with risks of explosion. - to heat up gases or solids. • Ask the manufacturer to provide you with the information you need.

3. Safety instructions

→ A qualified electrician should connect and commission the immersion heater.

The qualified electrician is responsible for the proper connections of the immersion heater

→ Carefully read the entire user manual before commissioning the device and follow the instructions provided.

→ Comply with standards and directives that apply in the country of installation.

→ Follow the CEM directive for the installation.

→ In case of use with hazardous materials (very hot, toxic or presenting a health hazard), follow the safety instructions provided for use with hazardous materials.

→ Ensure permanently safe conditions for the operators, the environment and the liquids used.

→ Ensure that the operators using the immersion heater have been properly trained.

→ Ensure that no one comes in contact with the liquid that is being heated.

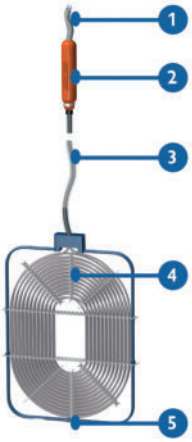
→ Verify that the immersion heater and the liquid are mutually compatible. Should you have a doubt, please contact the manufacturer.

→ Protect the immersion heater against overheating and against functioning without liquid.

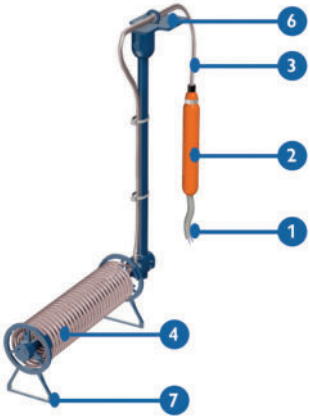
→ Record modifications and changes in this manual.

4. Description of the product

4.1. Composition



GALVATHERM *Flat*
Example of type A assembly



GALVATHERM *Cylindrical*
Example of type P assembly

1 - Electric connection cable
2 - Connection pipe
3 - Fluoropolymer-coated non heating cable(1). Maximum and minimum immersion depths are indicated with black marks.
4 - Heating segment with fluoropolymer-coated cable (1)
5 - Structure (material and type defined according to the application)
6 - For GALVATHERM cylindrical type P or R : mount made of PVDF or PP
7 - Installation example :
PVDF or PP feet for GALVATHERM cylindrical, type P

(1) - Depending on Whether FEP or PFA version

4.2. Models and accessories

Different types of assemblies are available for both flat and cylindrical GALVATHERM models. Furthermore, various accessories are available for the immersion heaters, to help during the installation, to improve service and to enhance maintenance ease.
Refer to the relevant documents, which may be obtained from the manufacturer or distributor.

4.3. Features of materials used

Abbreviation	Name	Maximum temperature of use
FEP	Fluorinated ethylene propylene	+ 80°C
PFA	Perfluoroalkoxy	+ 95°C
PP	Polypropylene	+ 60°C
PVDF	Polyvinylidene fluoride	+ 95°C
PVC	Polyvinyl chloride	+ 50°C

4.4. Technical features

- **Connection pipe**

Material	PVC
Type of protection	Protection against dust and water spray IP64 (EN 60529)
Exposure temperature	- 10°C to + 50°C

- **Electric connection cable**

Standard length	1m
Material	PVC (HO5 VV-F) or neoprene insulation (HO7RN-F) depending on power and voltage

- **Grounding** Continuous copper shielding
- **Thermal load** Standard heating cable: 0.5W/cm2 or 1W/cm^2 (see section 1.1 Identification)
- **Maximum temperature of the liquid** For aqueous solutions, up to 80°C (FEP coating) or 95°C (with PFA coating)
- **Nominal power** See on the connection pipe. Min: 0.5kW max: 15kW
- **Nominal voltage** See on the connection pipe. Min: 110V max: 460V
- **Type of current** 1~ or 3 ~
- **Storage temperature** -10°C to +50°C

5. Marking

The connection pipe bears an indication all the important features of the immersion heater :

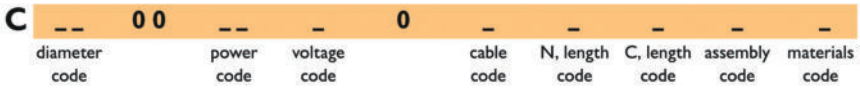
- Nominal power
- Nominal voltage
- Type of current
- Reference

The reference indicates the model and specifies whether the model is compliant (materials, size) with the process it will be used for.

The following illustrations show the underlying code of the reference :

GALVATHERM *Flat :*

GALVATHERM *Cylindrical :*



The code tables included in the documentation enable to identify the model. These are available upon request or by downloading them from our Internet site.

6. Installation

→ Please refer to the appended assembly instructions.

7. Electrical connection

Type of voltage	Number of phases	Connection diagram	Colour of connection wires
AC current	Single phase	L | N | PE	brown | blue | green/yellow
AC current	Three phase	L1 | L2 | L3 |PE	brown | grey | black | green/yellow

The immersion heater must be electrically connected by a qualified professional electrician.

NOTE	
Risk of damage to the immersion heater	• Verify that the supply voltage and the immersion heater correspond.

7.1. Connecting the device

Verify the following items prior to connecting the device :

√ The connection cable of the immersion heater is in good working order.

√ The connection cable is suited to the installation environment.

√ All necessary electric protections, as per national standards, are installed upstream.

√ The main power supply is disconnected.

→ Connect the immersion heater's cable according to the connection diagram given in the above table.

8. Commissioning

√ Check that the heating part is entirely immersed and that the level of the liquid is between the minimal and maximal immersion depths.

√ Ensure that the immersion heater is correctly installed and firmly attached.

√ Check that the heating area is free of any obstruction that would hinder the natural heat radiation (such as deposits, object ...).

√ Make sure that nobody is in contact with the liquid.

→ Power up the immersion heater.

→ Control the liquid's temperature change using the appropriate method.

A rising temperature indicates that the immersion heater works.

• Insufficient liquid, the presence of deposits on the heating part or insufficient spacing may lead to poor heat radiation.
This may in turn lead to damages to the immersion heater or to parts of the environment that are sensitive to heat.

⚠ WARNING	
Fire hazard	• Ensure that the minimal level of liquid is present. • Ensure that the heat can be properly dispersed.

- Damaged wires or an incorrect connection may electrify the liquid that is used.
- Should liquid seep into the connection pipe, a ground leakage current may be created.

 **WARNING**	
 **Electric shock hazard**	• Ensure that the cables and the electric connection are in good working order. • The connection cable must be chemically, thermally and mechanically resistant to the ambient conditions. • The connection cable is not suitable for transport or installation of the devices. • Respect a bending radius of > 10 x the outside diameter of the cable during installation, transport and storage. • Use a residual current circuit breaker with a threshold of 30mA, EN 61008-1/2-1. Protect a maximum of 12 devices or maximum 40 kW with a single RCCB.

9. Maintenance and servicing

GALVATHERM immersion heaters are made of materials that are oxidation-resistant and therefore require a minimum of maintenance.

To achieve the highest levels of performance, they should be regularly inspected and their proper working order should be frequently verified. During such inspections, follow these procedures :

1. Shut down the immersion heater.

2. Wait at least 15 minutes for the immersion heater to cool down before removing it.

⚠ CAUTION	
Burn hazard	• Do not touch the heating part of the immersion heater before it has entirely cooled down.

3. Remove the immersion heater.

• When handling the immersion heater, ensure that no liquid seeps from it.

⚠ WARNING	
Injury hazard	• Wear all necessary safety and protection equipments. • Refer to the safety sheet provided by the equipment's manufacturer.

4. Clean and neutralise the immersion heater.

• In order to ensure the highest level of safety during maintenance, the immersion heater must be chemically neutralized with adequate means and then abundantly rinsed with water.

5. Remove deposits or coats

• Some chemical solutions may cause deposits or a coat to form on the immersion heater. This phenomenon must be prevented as it reduces the transfer of heat and leads to early failure of the immersion heater.
• The level and time necessary for deposits or coats to form depend on the working conditions.
The user must therefore base the frequency of maintenance on observations and experience.
• No information about the cleaning methods and maintenance cycles can be given because of the specific nature of each application.

NOTE	
Risk of damage to the immersion heater	• The immersion heater can only be cleaned by chemical means • Contact the product's supplier to determine a suitable cleaning method.

6. Check the general state of the immersion heater

• Ensure that the cable that runs through the heating and non-heating sections of the immersion heater is in good condition and not damaged.
• Should the cable show any visible signs of damage (such as swelling, holes, etc.) do not power up the immersion heater.
Contact the manufacturer and refer to section 10 concerning transport procedures.
• Check the state of the electric connection cable. It's an integral part of the GALVATHERM immersion heater. In case of a defect, the entire device is to be returned to the distributor or manufacturer according to the procedures given in section 10.

10. Transport - Storage - Disposal

⚠ CAUTION	
Risk of injury	• Contact with hazardous substance residues may cause burns. • Clean the immersion heater using an appropriate method in case of coating or deposits. • In this event, neutralise the hazardous substance deposits.

10.1. Transport and storage

During transport, ensure that the packaging provides the immersion heater with proper protection against any damage.
The device should be stored as per ambient conditions, as given in the section about technical features.

10.2. Returning the device

Follow these instructions when returning the device :

- Clean and neutralise the immersion heater.
- Include a description of the use (heated product, concentration, temperature,...).
- Describe the fault.
- Indicate the period of use of the device.
- Provide your address and contact information.

The returned device will not be inspected in case of failure to follow these instructions.

10.3. Disposing of the immersion heater

Dispose of the device and its residues as per local environmental regulations.

11. Guarantee

GALVATHERM immersion heaters are guaranteed against all manufacturing defects for a 12-month period starting on the product's delivery date or for a maximum 15-month period if the device is commissioned at a later date.

The guarantee is applicable in case of normal use of the immersion heater and the manufacturer reserves the right to inspect the product.

The manufacturer rejects all liability in case of failure to :

- follow the instructions provided herein, or in case of
- improper use of the immersion heater, accidental damages,
- technical modifications of the immersion heater that could damage the immersion heater and affect the user's safety,
- abnormal wear of the parts (for example the electric cable).

Please keep these instructions for the entire lifecycle of the product.

Notes

updated 22-11-17
Subject to change, non-contractual pictures