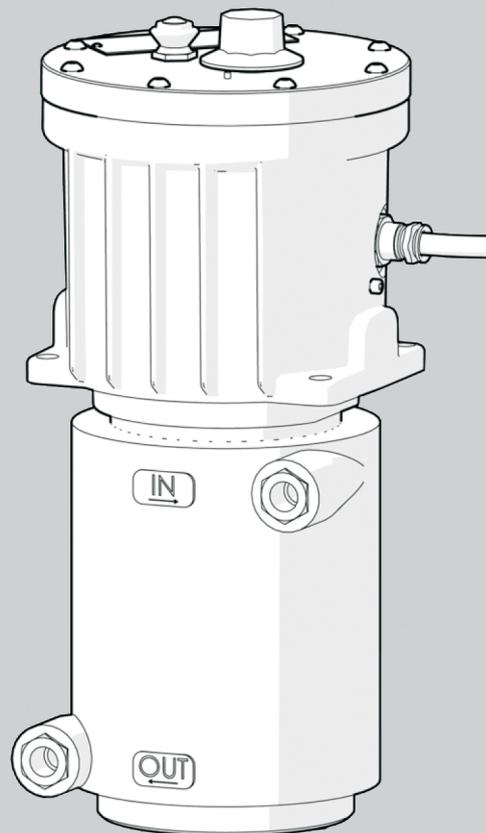


MATERIAL FLUID HEATER



Serial no.



	MFH NW9	MFH NW14
Standard	<ul style="list-style-type: none"> ○ 0663917 ○ 0663907 ○ 0663915 ○ 0663909 ○ 0664671 ○ 0665461 	<ul style="list-style-type: none"> ○ 0663923 ○ 0663908 ○ 0663916 ○ 0663910 ○ 0663965
RFA-Type	<ul style="list-style-type: none"> ○ 0663918 ○ 0663920 	<ul style="list-style-type: none"> ○ 0663919 ○ 0663921
440 V-Type	<ul style="list-style-type: none"> ○ 0663911 ○ 0663913 	<ul style="list-style-type: none"> ○ 0663912 ○ 0663914

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1 Foreword

Dear valued customer,

We are delighted that you have chosen one of our machines.

This operation manual is directed at the operating and maintenance personnel. It contains all information required in order to work with this machine.



The machine owner must ensure that the operating and maintenance personnel always have access to a copy of the operation manual in a language that they understand.

In addition to the operation manual, further information is also essential for the safety operation of the machine. Read and observe the directives and accident prevention regulations valid in your country.

In Germany, these are:

- ZH 1/406 "Guidelines for fluid jets (spray devices)" from the Federation of Institutions for Statutory Accident Insurance and Prevention,
- BGR 500, chap. 2.29 "Processing Coating Materials",
- BGR 500, chap. 2.36 "Working with fluid jets", both from the Professional Association for Gas, District Heating and Water Management.

We recommend enclosing all relevant directives and accident prevention regulations with the operation manual.

Furthermore, always observe the manufacturer's instructions and processing guidelines for coating or conveyance materials.

If questions should arise, we shall be happy to assist you.

We wish you excellent working results with your machine

WIWA Wilhelm Wagner GmbH & Co. KG.

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2 Safety

This machine has been designed and manufactured with consideration to all safety aspects. It reflects current engineering practice and the valid accident prevention regulations. The machine left the factory in faultless condition and guarantees a high level of technical safety. However, improper operation and misuse will pose a risk to:

- the life and limb of the operator or third parties,
- the machine and other property of the owner,
- the efficient function of the machine.

Any method of work that has a negative influence on the safety of the operating personnel and the machine is fundamentally prohibited. All persons involved in the installation, commissioning, operation, care, repair and maintenance of the machine must have read and understood the operation manual beforehand - in particular the "Safety" chapter.

Your safety depends on it!

We recommend that the machine owner have this confirmed in writing.

2.1 Explanation of symbols

Safety notes warn of potential accident risks and describe the measures required for accident prevention. In the operation manual from **WIWA**, safety note is highlighted and labeled as follows:



DANGER

Signals a risk of accidents that are very likely to result in serious injuries and even death, if the safety note is not observed!



WARNING

Signals a risk of accidents that may result in serious injuries and even death, if the safety note is not observed!



CAUTION

Signals a risk of accidents that may result in injuries, if the safety note is not observed!



Signals important information for proper handling of the machine. A failure to observe this may result in damage to the machine or its environment.

Various pictograms are used in the safety notes for accident risks that may result in injury, depending on the hazard source - examples:



General risk of accident



Risk of explosion due to explosive atmosphere



Risk of explosion due to explosive substances



Risk of accident due to electricity or electrostatic charge



Risk of crushing due to lifting movements



Risk of cutting injuries due to rotating machine parts



Risk of burning due to hot surfaces



Risk of freezing due to cold surfaces

The first line of the safety instructions indicates the personal protective equipment that must be worn. This is also highlighted and labelled as follows:



Wear protective clothing

Signals an instruction to wear the prescribed protective clothing, in order to prevent skin injuries due to spray material or gases.



Use eye protection

Signals an instruction to wear protective goggles, in order to prevent eye injuries due to material spray, gases, vapours or dust.



Use ear defenders

Signals an instruction to wear ear defenders, in order to prevent damage to hearing caused by noise.



Use respiratory protection

Signals an instruction to use respiratory protection, in order to prevent damage to the respiratory tract caused by gases, vapours or dust.



Wear protective gloves

Identifies the requirement to wear protective gloves in order to prevent injuries due to aggressive chemicals, fire injuries when processing heated materials, or freezing due to contact with very cold surfaces.



Wear safety shoes

Signals an instruction to wear safety shoes, in order to prevent foot injuries due to falling, toppling or rolling objects, as well as slipping on slippery floors.



Signals references to directives, work instructions and operation manuals that contain very important information and must be observed.

2.2 Safety notes

Always remember that the machine operates in a high pressure process and can cause life-endangering injuries if handled incorrectly!



Always observe and follow all the information in this operation manual and in the operation manual of the machine in which the material fluid heater is installed.

2.2.1 Working pressure



WARNING

Parts that are not designed for the maximum permissible working pressure may rupture and cause serious injuries.

- It is essential to observe the prescribed maximum working pressures for all parts. With varying working pressures, the lowest value always applies as the maximum working pressure for the complete machine.
- Material hoses and hose assemblies must comply with the maximum working pressure including the required safety factor.
- Material hoses must not exhibit leakage, kinks, signs of wear or bulges.
- Hose assemblies must be tight.

2.2.2 Risks due to electricity



WARNING

In atmospheres containing solvents, electrical cables can become brittle or porous. They can injure you due to electric shock.

- Check electrical cables for externally visible damage before each commissioning.
- Never patch electrical cables.
- Have damaged electrical cables replaced immediately by qualified personnel with electrical training.



WARNING

The material fluid heater switches on automatically as soon as it is connected to the power supply.

- Disconnect the voltage supply in case of a power failure.

2.2.3 Risks due to electrostatic charge



WARNING

The high frictions in high pressure systems can result in an electrostatic charge.

Static discharges can result in fire and explosions.

- Ensure that the machine is correctly grounded outside of EX zones!
- Ground the object that is to be coated.
- Always use open containers!
- Never spray solvents or materials containing solvents into narrow-mouthed cans or barrels with a bung opening!
- Set the container down on an grounded surface.
- Use electrically conductive containers.
- Always ensure contact between the spray gun and the container wall.
- Only use electrically conductive material hoses.
All original material hoses from **WIWA** are conductive and designed for our machines.



WARNING

Dirty machines can become electrostatically charged. Fire and explosion can be triggered by severe static discharges.

- Keep the machine clean.
- Always perform the cleaning work outside of EX zones.

2.2.4 Explosion protection



WARNING

Machines that are not explosion-protected must not be used in operating facilities that fall under the explosion protection ordinance!

Explosion-protected machines can be identified by the corresponding  mark on the type plate and/or the ATEX declaration of conformity provided.

Explosion-protected machines fulfil the requirements of the ATEX Directive for the device group, device category and temperature class cited on the type plate or in the declaration of conformity.

The owner is responsible for designating the zoning in accordance with ATEX Directive, Annex II, No. 2.1-2.3 in accordance with the provisions of the responsible regulatory body. The owner is required to check and ensure that all technical data and labelling comply with the applicable stipulations according to ATEX.

Please note that some parts have their own type plate with separate labelling according to ATEX. In this case, the lowest explosion protection of all labels displayed applies to the entire machine. For applications, whereby a failure of the machine could lead to dangers to personnel, the owner is required to implement appropriate safety measures.

If agitators, heaters or other electrically operated accessories are attached, the explosion protection must be checked. Plugs for heaters, agitators, etc. that do not have explosion protection may only be plugged in outside of areas that fall under the explosion protection ordinance, also if the accessory itself is explosion protected.



WARNING

Heating solvents can lead to an explosion.
Serious personal injuries and property damage may result.

- ▶ Observe the flashpoint and ignition temperature of solvents.
- ▶ Switch all material fluid heaters off when carrying out the following work: Cleaning, pressure testing, decommissioning, maintenance and repair.
- ▶ Always flush and clean the device with solvent only in **cooled off and voltage-free** condition!
Never heat up solvent in the material fluid heater!
- ▶ Never open the device in an explosive atmosphere.
- ▶ Always note the ignition temperature of the materials that are being heated. Set the temperature so that the temperature of the material remains under the ignition temperature specified by the manufacturer.
- ▶ Smoking and handling open flames or possible ignition sources is not permitted in the entire working area!



WARNING

Connections for the material fluid heater that do not have explosion protection may only be used outside of areas that fall under the explosion protection ordinance, even if the material fluid heater itself is explosion protected.

- ▶ Make sure that the connection line is permitted for the respective explosion protection zone according to the operation site.

2.2.5 Risk due to hot surfaces



CAUTION

When using material heaters, the machine surfaces may become hot. A risk of burns exists.

- ▶ When processing heated materials always wear protective gloves with forearm protection.
- ▶ The material hoses may not touch the hot areas of the material fluid heater.

2.2.6 Health risks



CAUTION

Depending on the materials being processed, solvent vapours may arise, which could lead to damage to health and property.

- Make sure the workplace is sufficiently ventilated and aired.
- Always observe the processing instructions of the material manufacturer.



When handling paint, solvents, oils, greases and other chemical substances, observe the safety and proportioning instructions of the manufacturer and the generally applicable regulations.



Only use suitable skin protection, skin cleansing and skincare products for cleansing the skin.

In systems that are closed or under pressure, dangerous chemical reactions may arise, if parts produced from aluminium or galvanised parts come into contact with 1.1.1 - trichloroethane, methylene chloride or other solvents that contain halogenated chlorinated hydrocarbons (CFCs). If you wish to process materials that contain the aforementioned substances, we recommend that you contact the material manufacturer in order to clarify their suitability for use.

A range of machines in rust and acid-resistant designs is available for these types of materials.

2.3 Safety signs

The safety signs attached on the machine, such as for example the warning sign (see Fig. 1) indicate possible hazard points and must be observed.

The symbolism on the safety signs corresponds to the labeling of the safety information described in chap. Chap. 2.1 on page 6.

The safety signs may not be removed from the machine.

Damaged and illegible safety signs must be replaced immediately.

Also read and observe the safety information in the operating manual!



Fig. 1: Warning sign

2.4 Safety features



WARNING

If safety feature is missing or is not fully functional, the operating safety of the machine is not guaranteed!

- Put the machine out of operation immediately if you detect safety feature defects or any other faults on the machine.
- Only put the machine back into operation once the faults have been fully rectified.

The machine is equipped with the following safety features:

- Safety temperature limiter

Check the safety features on the de-pressurised machine:

- Prior to commissioning
- Always prior to starting work,
- After all set-up work,
- After all cleaning, maintenance, and repair work.



Follow the operation manual for the machine in which the material fluid heater is installed to test additional safety features.

2.4.1 Safety temperature limiter

The safety temperature limiter (STL) switches the material fluid heater off if the highest permissible temperature is exceeded and at temperatures below 10°C.

To switch it back on, press the reset button until the control light illuminates.

No.	Description
1	Reset button
2	Control light

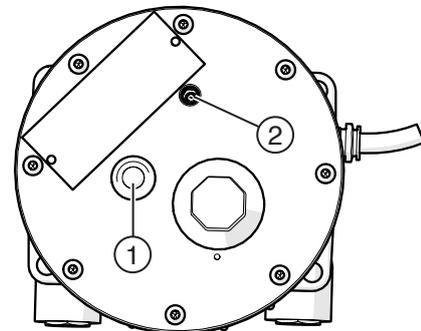


Fig. 2 Resetting the STL

2.5 Operating and maintenance personnel

2.5.1 Obligations of the machine owner

The machine owner:

- is responsible for training the operating and maintenance personnel,
- must instruct the operating and maintenance personnel on correct handling of the machine, and on wearing the correct work clothing and protective equipment,
- must make work aids, such as e.g. lifting gear for transporting the machine or container, available to the operating and maintenance personnel,
- must make the user manual accessible to the operating and maintenance personnel and must ensure that this remains constantly available,

- must ensure that the operating and maintenance personnel have read and understood the user manual.

Only then are they permitted to put the machine into operation.

2.5.2 Personnel qualifications

Differentiation is made between 2 groups of personnel, depending on their qualifications:

- Instructed operators have received verified instruction from the machine owner regarding the tasks entrusted to him and the possible risks if the correct procedure is not followed.
- Trained personnel have received instruction provided by the machine manufacturer and are capable of carrying out maintenance and repair work on the machine, independently recognizing possible dangers and avoiding risks.

2.5.3 Authorized operator

Activity	Qualification
Set-up and operation	Instructed operator
Cleaning	Instructed operator
Maintenance	Trained personnel
Repair	Trained personnel



Young persons under the age of 16 are not permitted to operate this machine.

2.5.4 Personal protective equipment



Wear protective clothing

Always wear the protective clothing stipulated for your working environment (e.g. antistatic protective clothing in potentially explosive areas) and also observe the recommendations in the safety data sheet of the material manufacturer.



Use eye protection

Wear protective goggles, in order to prevent eye injuries due to material spray, gases, vapours or dust.



Use ear defenders

Suitable noise protection equipment must be made available to the operating personnel. The machine owner is responsible for compliance with the accident prevention regulation "Noise" (BGV B3). It is therefore necessary to pay particular attention to the conditions at the installation site – for example noise pollution can increase if the machine is installed in or on hollow bodies.



Use respiratory protection

Although the airless spray process minimizes the paint mist with the right pressure adjustment and correct method of work, we recommend that you wear a respiratory protection mask.

**Wear protective gloves**

Wear anti-static, chemical-resistant protective gloves with lower arm protection in order to prevent injuries due to aggressive chemicals, fire injuries when processing heated materials, or freezing due to contact with very cold surfaces.

**Wear safety shoes**

Wear antistatic safety shoes, in order to prevent foot injuries due to falling, toppling or rolling objects, as well as slipping on slippery floors.

2.6 Guarantee information



Observe our general terms and conditions of business (T&Cs) at www.wiwa.de.

2.6.1 Spare parts

- ▶ When repairing and maintaining the machine, only use original spare parts from **WIWA**.
- ▶ If spare parts are used that have not been produced or supplied by **WIWA**, then the guarantee is voided and all liability shall be excluded.

2.6.2 Accessories

- ▶ If you use original **WIWA** accessories, their suitability for use in our machines is guaranteed.
- ▶ If you use third-party accessories, these must be suitable for the machine - in particular with respect to the working pressure, the current connection data, the connection variables, and use in Ex-zones, if applicable. **WIWA** shall not be liable for any damage or injuries arising due to these parts.
- ▶ It is essential to observe the safety provisions applicable to the accessories. You can find these safety provisions in the separate operation manual for the accessories.

2.7 How to respond in an emergency

2.7.1 Shutting down the machine

Shut down the machine immediately in an emergency and disconnect it from the voltage supply.



Relieve the pressure in the spraying device in which the material fluid heater is installed.

2.7.2 Leakage



WARNING

In case of leakage, material may escape under very high pressure and cause serious physical injuries and property damage.

- Bring the machine to an immediate standstill and relieve the pressure.
- Tighten threaded connections and replace defective parts (must be performed by trained personnel).
- Do not seal leakage at connections and on high pressure hoses with the hand or by wrapping.
- Do not patch material hoses!
- Check hoses and threaded connections for leak-tightness when starting the machine up again.

2.7.3 Injuries

If case of injuries caused by processing material or solvents, always have the manufacturer's safety data sheet ready to show the doctor (supplier or manufacturer address, their telephone number, material designation and material number).

3 Device description

Material fluid heaters (MFH) are electrically operated auxiliary devices for material preparation and air heating.

Through the so-called hot spray process, higher layer thicknesses, shorter drying times and super surfaces can be achieved in particular.

Even coating materials, which cannot be processed or are difficult to process due to their consistency, can be sprayed without issues through heating.

A material fluid heater consists of two assemblies:

- ▶ Housing with electrical switching and heating elements.
- ▶ Heat exchanger with one material inlet nozzle and one material outlet nozzle

The liquid materials flow through the heat exchanger and are thereby heated by the electrical heating elements.

The desired temperature can be continuously controlled with the thermostat (max. heating temperature 85°C).

The housing is designed cone-shaped in the lower area.

The heat exchanger has a corresponding contrary cone. If the heat exchanger becomes clogged, it can be dismantled from the main part by means of several jacking screws and be replaced.

An explosion-protected cable gland is installed on the housing for the design with a fixed connection line and is designed according to IP 54.

The technical data for your machine can be found on the machine card enclosed, or on the type plate.

3.1 Intended use

Material fluid heaters can be used in the high pressure range up to a max of 500 bar to heat the material to be processed and for air heating.

The following materials may not be heated:

- ▶ Lacquers and paints,
- ▶ Preserving agents (oils and greases),
- ▶ Release agents,
- ▶ Insulating and flame proofing materials,
- ▶ Tar-epoxy paints, cold bitumen and the like,
- ▶ Polyurethane
- ▶ Water



Intended use also includes:

- ▶ observing the technical documentation and
- ▶ complying with the operating, maintenance and servicing guidelines.

3.2 Overview of types

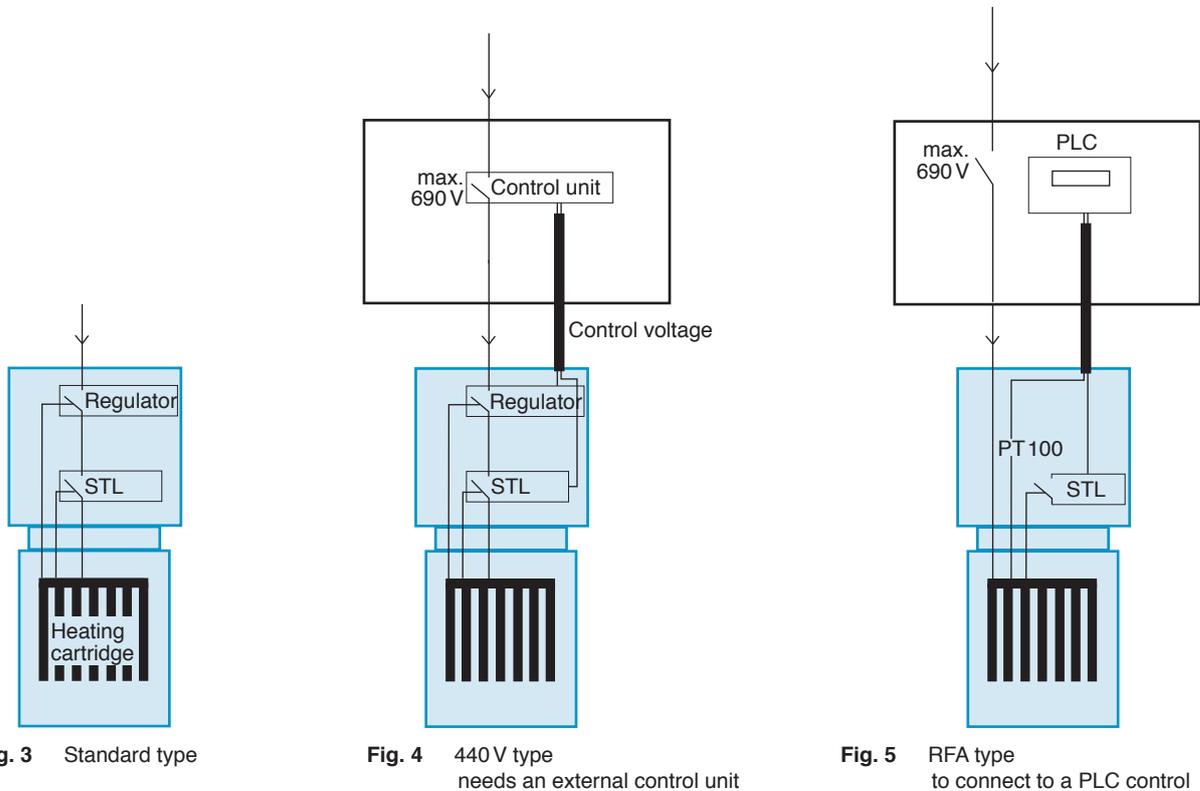


Fig. 3 Standard type

Fig. 4 440 V type needs an external control unit

Fig. 5 RFA type to connect to a PLC control

3.2.1 Standard type

The **NW9 material fluid heaters** are suitable for processing low to medium-viscosity materials in combination with Airless spray systems, Airless 2K systems and Air Combi systems.

The material fluid heaters can also be used simultaneously for air heating by installing an attachment kit:

- as an air preheater for a WIWA compressed air motor to prevent the motor from icing during unfavourable outdoor temperatures with high humidity
- to heat the spray air supply for Air Combi systems. Through the additional heating of the spray air, the quality of the surfaces can be improved and the drying time is shortened.

The **NW14 material fluid heaters** are suitable for processing high-viscosity materials due to the larger material outlet.

Furthermore, these material fluid heaters can be used for compressed air heating or as a preheater for the material supply in 2 component spray systems.

3.2.2 RFA type

The **RFA type** is intended for use with an external controller. To this end, the RFA type does not have its own thermostat and is instead equipped with a PT 100 temperature sensor, which transmits the measurement to the controller.

3.2.3 440V type

The 440V type was especially designed for the higher voltage range. It is mandatory that it has an external control unit with a switching element for 440 V.

3.3 Erroneous use

Any use other than that stipulated in the technical documentation is deemed to be erroneous use and will void the warranty.

Erroneous use applies in particular if

- impermissible materials are processed,
- unauthorised modifications or changes are implemented,
- the safety features are modified, removed or bypassed,
- spare parts are installed that were not manufactured or delivered by WIWA (see chap. 2.6.1),
- accessories are used that are not suitable for the machine (see chap. 2.6.2),
- machines without Ex identification are used in potentially explosive atmospheres.
- the machine is operated outside of the operating limits according to the type plate.

3.4 Device design

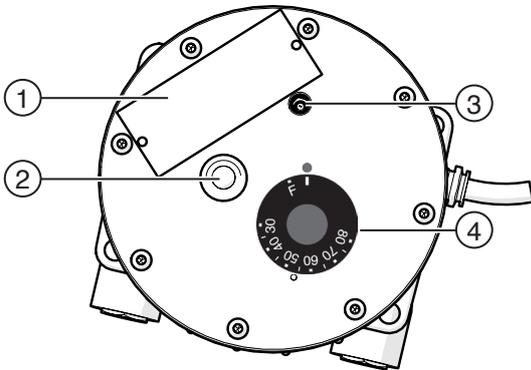


Fig. 7 View from the top

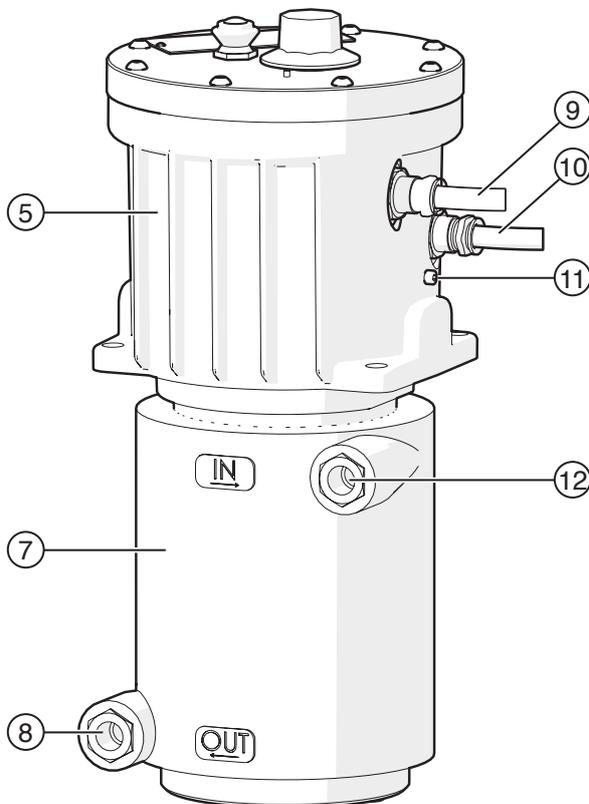


Fig. 6 View from the side

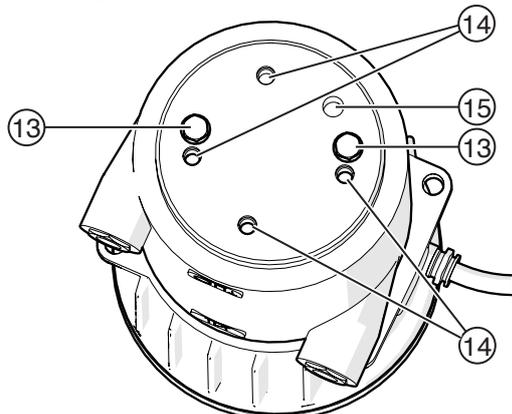


Fig. 8 View from below

No.	Description
1	Type plate
2	Reset button / reset (omitted for RFA type)
3	Control light (omitted for RFA type) illuminates during the heat-up phase. The control light goes out when the set temperature is reached and switches back on when heating up is started again.
4	Thermostat (omitted for RFA type) with temperature scale from 30 to 85°C I = OFF F = Anti-freeze function
5	Top with electrical switching and heating elements
6	Air connection (G 1/4") (only for air heating)
7	Bottom / heat exchanger
8	Connection for material hose - OUT
9	24 V control voltage (only for RFA and 440 V type)
10	Power connection (explosion protected cable gland)
11	Grounding screw
12	Connection for material hose - IN
13	Fastening screws for heat exchanger (M 8) tightening torque: 1x 20 Nm + 1x 13 Nm
14	Seal openings when using for air heating. Screws (M 10) are included in the "Air heating" attachment kit.
15	Air connection (G 1/4") (only for air heating)

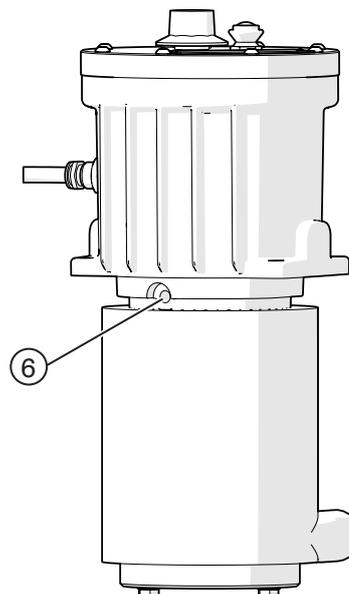


Fig. 9 View turned to the side

3.5 Application areas

3.5.1 Material heating in the Airless or Air Combi spray process

By attaching a material fluid heater, higher layer thicknesses, shorter drying times and better surfaces are achieved.

Furthermore, materials, which cannot be processed or are difficult to process when cold, can be sprayed without issues through heating.

Appropriate attachment kits are available for all WIWA Airless and Air Combi devices.

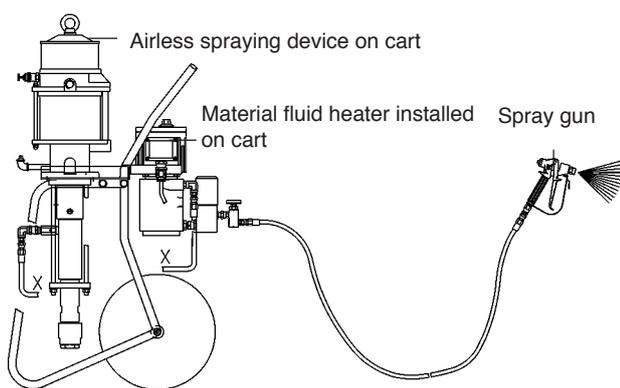


Fig. 10 Installed on the frame

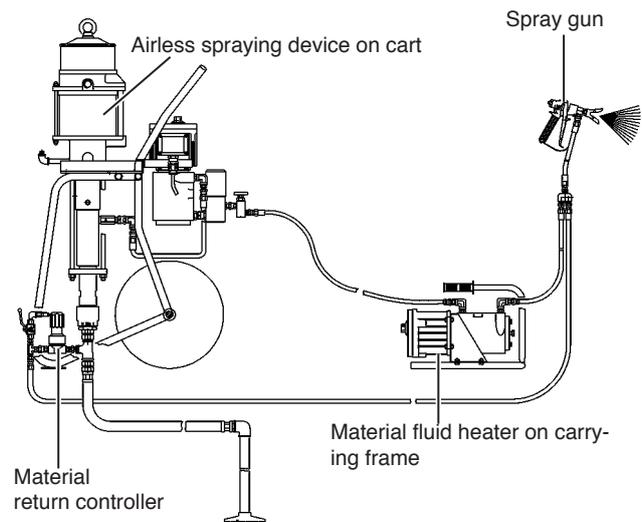


Fig. 11 Installed portably on carrying frame

Alternatively, or additionally, material fluid heaters can be used on a portable carrying frame if high temperatures are needed on the spray gun or in the spray nozzle. This design with an additional heater is also especially suitable for longer hose lines to compensate for temperature losses due to the great distance.

The following kit is required:

Carrying frame for material fluid heater, order no. 0632538 and a material fluid heater.

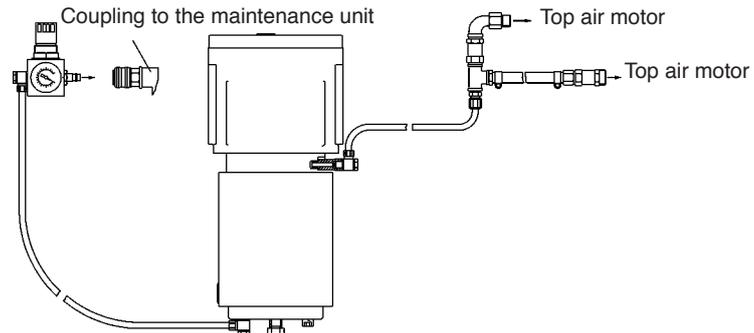
3.5.2 Air heating (de-icing system) for the air motor

In order to prevent the air motor from icing during unfavourable ambient temperatures with high humidity, the material fluid heater can simultaneously be used to heat compressed air (de-icing system). A part is taken from the main air and is led via a hose into the material fluid heater and is then routed into the air motor. The preheated air flows through the aeration and ventilation channels and thus prevents icing of the air motor.

The air heating for material heater kit, order no. 0632629, is required.



Higher air flow can reduce the heat output for the material heating.



3.5.3 Spray air heating for Air Combi hot spray devices

For an optimal spray pattern, a better flow of the paint and shorter drying times. So that the preheated material is not cooled off by cold spray air, the material fluid heater can also be simultaneously used as a spray air heater.

A part of the air is branched off from the main air supply and is led through a hose into the material fluid heater and is then led via an air hose to the spray gun warmed up.

In order to prevent heat losses, the air and material hose should be used as an insulated hose pair.

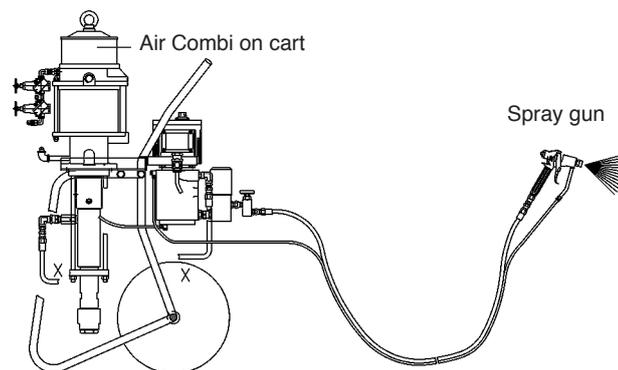


Fig. 12 MFH for spray air heating



Higher air flow can reduce the heat output for the material heating.

3.6 Optional expansions and accessories

The following list contains just some of the most common accessories and expansions.

You can find the detailed accessory catalogue at www.wiwa.de. For further information and order numbers, you can also contact an approved **WIWA** dealer or **WIWA** customer service.

3.6.1 Temperature display

The temperature display (Fig. 13) is used to read the temperature at the material outlet of the material fluid heater.

Different installation accessories are required depending on the nominal size of the material fluid heater.



Fig. 13 MFH with high pressure filter and temperature display

3.6.2 Material return controller

A material return controller is used everywhere where materials are to circulate, so e.g. during the hot spray process to keep the material at a uniform temperature or when materials are filled to prevent deposits.

The material return controller opens when the spray gun is closed through the existing pressure in the spray or return line.



Note that the material return controller has a lower max. working pressure than the material fluid heater.



Observe the information in the operation manual of your spraying device: e.g. WIWA Airless devices in chap. 3.6.5 on page 32.

No.	Description
1	Pressure adjustment
2	Material outlet (covered) G 3/8"
3	Connection for pressure gauge (optional)
4	Material inlet G 3/8"

Specifications for the material return controller:	
Max. working pressure:	400 bar (5800 psi)
Adjustable pressure range:	50 - 400 bar
Temperature range:	4.5 - 100 °C
Max. delivery volume:	13.3l/min. (3.5 gal./min.)



Fig. 14: Material return controller

When using a material return controller, a spray gun with two material hoses must be used. The material hoses are installed at the material outlet of the material fluid heater and at the material inlet of the material return controller (see Fig. 14). Different installation accessories are required depending on the nominal size of the material fluid heater.

The material return controller is installed in the flow direction of the material between the fluid pump and the suction hose. Observe the markings on the housing!

The material return controller can be equipped with a pressure relief valve depending on the pump type (see Fig. 15).

The desired circulation speed is set using the pressure adjustment (see Fig. 14, no. 1).

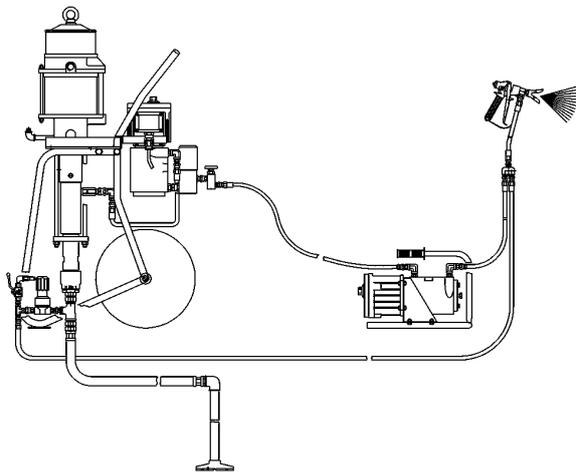


Fig. 15 Material return controller with pressure relief valve

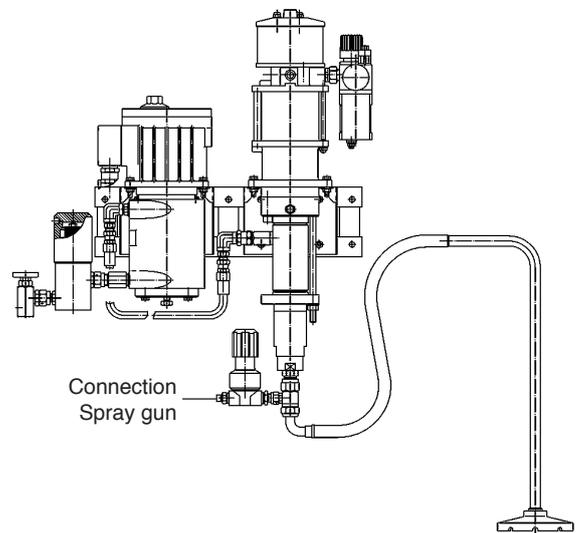


Fig. 16 Material return controller without pressure relief valve

4 Transport, installation and assembly

The machine left the factory in faultless condition, packaged correctly for transport.



Check the machine at the time of receipt for any transport damage and for completeness.

4.1 Transport

When transporting the machine, observe the following information:

- ▶ Disconnect the entire energy supply to the machine - even for short transport distances.
- ▶ Empty the machine prior to transport - residual liquids may still leak out of the machine during transport.

4.2 Installation site

- ▶ Always observe the processing instructions of the material manufacturer. Pay particular attention to the information on ignition temperatures.
- ▶ Observe the explosion protection zones at your place of work.
- ▶ Before connecting the device to the power supply, check the electrical supply system for possible malfunctions.
- ▶ The owner of the system must protect the entire system with suitable lightning protection measures.
- ▶ Keep the working area clean, in particular all walking and standing areas. Remove spilled paint or solvent immediately.
- ▶ Make sure that no moisture (e.g. through rain, cleaning with high pressure cleaner, etc.) can penetrate into the material fluid heater. The material fluid heater may never be immersed in a container with liquid (e.g. solvent).
- ▶ Make sure the workplace is sufficiently ventilated and aired. Always observe the processing instructions of the material manufacturer.
- ▶ Observe and follow all the information in the operation manual of the spraying device used and the manuals of the accessories used.

4.3 Assembly



WARNING

During installation work ignition sources may arise (e.g. due to mechanical sparks, electrostatic discharge, etc.).

- ▶ Carry out all assembly work outside of potentially explosive areas.

4.3.1 Connecting the devices

The material fluid heater is equipped with a permanent connection line with an open end. An additional cable is added for the 440 V and RFA devices for the connection to the external control unit.

Connect the devices as follows:



WARNING

If untrained personnel carry out assembly work, they endanger themselves and others, as well as risking the operational safety of the machine.

- Electrical parts may only be installed by specialist personnel with an electrical qualification.



WARNING

- Observe the explosion protection zones at your place of work.
- In potentially explosive areas, the connection must be designed explosion-protected! Cables and cable entries must be appropriately approved and be temperature-resistant.
- Entries that are not used must be sealed.
- Cables and cable entries and the cables used must have at least a maximum operating temperature of +80°C. Alternative, equivalent approved cable entries may be used.

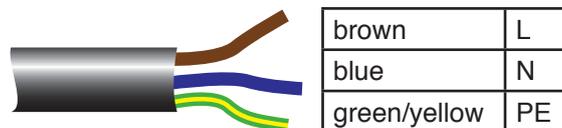


Fig. 17 for 230 V standard devices

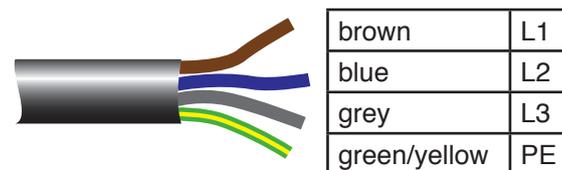


Fig. 18 for 400V standard devices

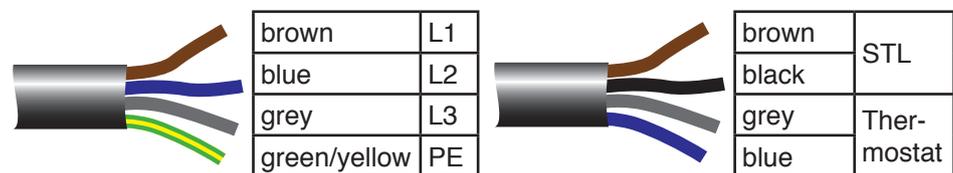


Fig. 19 for 440V devices

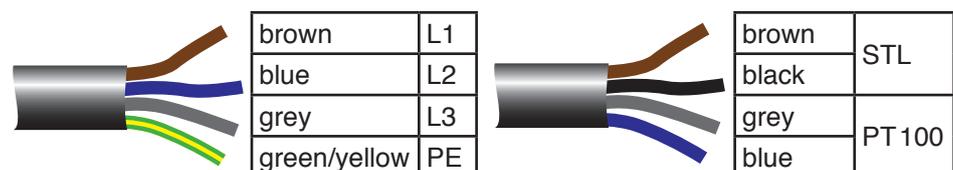


Fig. 20 for RFA devices

4.3.2 Installing the material fluid heater on a holder

The material fluid heater can be installed in different ways depending on the intended purpose (see chap. 3.5 Application areas on page 20):

- on a holder directly on the frame of the spraying device or the coating unit,
- separately on a wall holder
- on a portable carrying frame

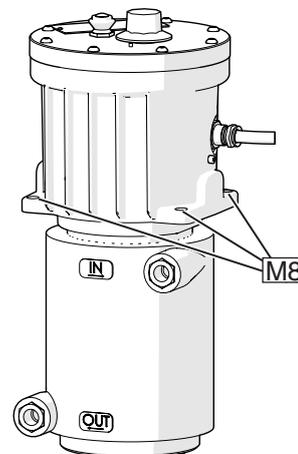


Fig. 21 Holes for fastening the MFH to a holder (1 additional hole covered)

4.3.3 Installing / disassembling top to / from bottom

The top and bottom of the material fluid heater can be twisted together in 90° steps, depending on how the assembly situation on-site requires it.

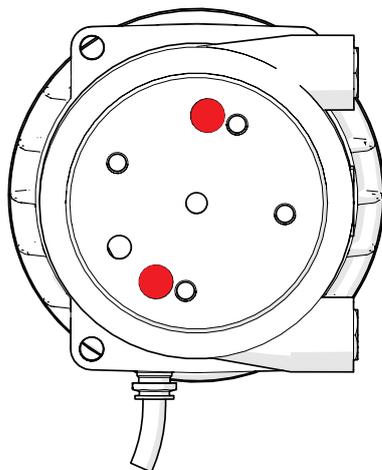


Fig. 22 When installing the top and the bottom, always use the two holes that are located at the points marked here.

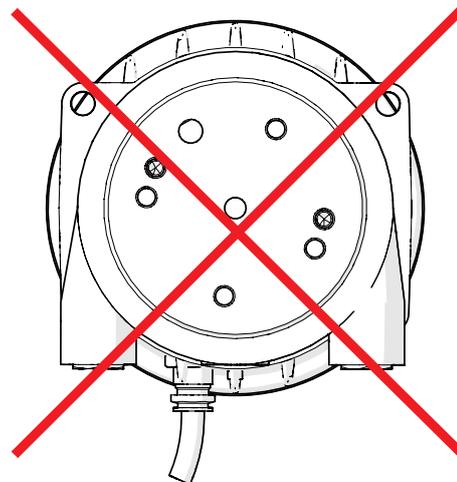


Fig. 23 Do not install like this!

Orientate yourself with the position of the material inlets and outlets to the position of the cable gland when installing the top to the bottom.

Assembly when both the cable gland and the material inlets and outlets point to the same side is not possible (see Fig. 23).

Disassembly:

WARNING

Despite relieving the pressure, residual pressures can still be present due to material congestion or clumping which can suddenly escape during disassembly work and cause serious injuries.

- You must be particularly careful during disassembly work!
- When disassembling material hoses, cover the screw connection with a cloth in order to catch possible material sprays.

1. Disconnect device from power supply.
2. Release both screws on the bottom of the device in order to lift the top from the bottom.

4.3.4 Installing the air heating

If the material fluid heater is used for air heating for an air motor, proceed as follows:



A corresponding conversion kit is required for the air heating. Please contact a **WIWA** dealer or **WIWA** customer service.



Use the spare parts list for the conversion kit as an aid for the installation.

1. Install elbow union (item 0463175) as air inlet in one of the holes on the bottom of the device.
2. Screw pneumatic screw connection (item 0632803) into the air outlet by means of the socket nipple (item 0632912).
3. Establish a pneumatic connection between the air motor of the spraying device and the material fluid heater.

4.4 Grounding the device

0474487A separate grounding of the material fluid heater is required if the device is not connected to the grounded spraying device through a conductive connection (order no. for ground cable: 0474487).



A separate grounding of the MFH is absolutely necessary in areas with potentially explosive atmosphere!

The object to be coated must also always be grounded!

1. Connect the ground cable to the grounding screw provided for this.

The grounding screw is located right next to the power cord connection (see Fig. 24) and is labelled with ⊕.

2. Attach the terminal of the ground cable to an electrically conductive object.

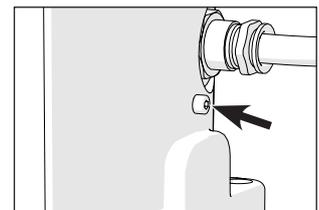


Fig. 24 Grounding screw

4.5 Attaching the material hoses

1. Remove yellow protective caps from the IN and OUT nozzles of the heat exchanger.
2. Seal the connections well with medium thread lock.
3. Install material hoses by means of double nipples to the material fluid heater (tightening torque 80 Nm).

No.	Designation
1	Material inlet (IN)
2	Material outlet (OUT)

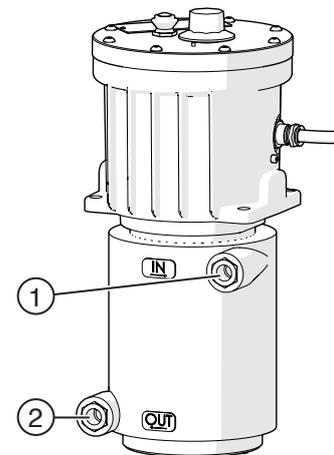


Fig. 25 Material connections

5 Operation

Prerequisites:

- The machine must be correctly installed and fully assembled.
- Only put the machine into operation if you are equipped with the prescribed personal protective equipment. Details on this can be found in Chap. 2.5.4 Personal protective equipment on page 13



Observe the safety data sheet of the respective material manufacturer when heating spraying materials.

5.1 Putting the machine into operation

- Check if all safety features are present and fully functional
- Check if all parts and accessories for the spraying device used correspond to the maximum permissible working pressure of the material fluid heater.



The maximum working pressure of the material fluid heater must be the same or higher than the maximum working pressure of the spraying device and the accessories used.

With varying working pressures, the lowest value always applies as the maximum permissible working pressure for the entire spraying system.

- Flush the material fluid heater in cold, switched off condition together with the spraying device on which it is constructed in order to flush out the factory test substance (during initial commissioning) or residues of previous spraying material.
In order to prevent a risk of explosion due to heating of the solvent, the cleaning fluid may not be pumped longer than a maximum of 5 minutes. The amount of the cleaning fluid must be tailored to the size of the spraying device. At least 8 to 25 litres of cleaning fluid is required depending on the size of the spraying device.
- During commissioning (flushing), check that all machine parts are leak-tight and tighten the connections if necessary.
- Make sure that the machine and the object to be coated are correctly grounded (see. Chap. 4.4 Grounding the device on page 27).

5.2 Switching on the device and setting the temperature



Observe the operation manual for the spraying device or the device with which the material fluid heater is being used.



Note that for devices without circulation, material that is still cold is in the hoses. Spray the material back into the material drum until warm material escapes.



Note that the pot life of the material may potentially be significantly shortened through the heating, particularly for 2 component materials.

Using the thermostat, the device is switched on and the temperature to which the material (or air) to be processed is to be heated up to is set.

No.	Description
1	Reset button (reset)
2	Control light illuminates during the heat-up phase. The control light goes out when the set temperature is reached and switches back on when heating up is started again.
3	Thermostat with temperature scale from 30 to 85°C I = OFF F = Anti-freeze function

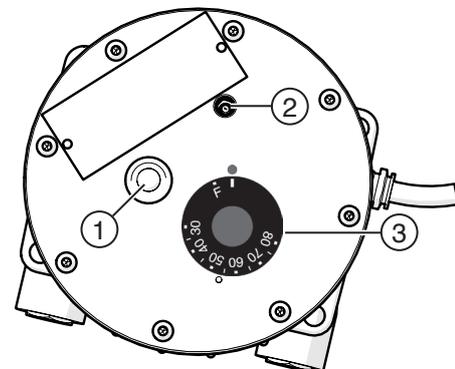


Fig. 26 Thermostat, control light and reset button

When the outdoor temperature is below 10°C, press the reset button and hold it until the control light illuminates.

If the highest permissible temperature is exceeded, a temperature limiter switches the material fluid heater off.

To switch it back on, press the reset button until the control light illuminates again.

5.3 Flushing

Flushing is necessary

- during the initial commissioning so that the spraying material is not influenced by the test substance with which the machine was tested in the factory for faultless function.
- during a change of the material.
- if the machine is to be deactivated for a longer period.



WARNING

Heating solvents can lead to an explosion. Serious personal injuries and property damage may result.

- Always flush and clean the device with a suitable cleaning fluid only in **cooled off and voltage-free** condition!



Use the cleaning fluid pertaining to the new material and recommended by the material manufacturer.



Observe and follow all work steps that are described in the operation manual of your spraying device for a change of material and/or commissioning.

5.4 Decommissioning

1. Switch off the device
 - Switch off the device 10 min. before the end of work.
 - Turn the thermostat to position "I" (see Fig. 27 Thermostat on "OFF").
 - Use the residual heat until the end of work. The cooling time also shortens until the flushing.

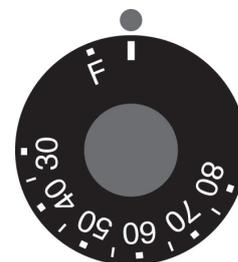


Fig. 27 Thermostat on "OFF"

2. Flush the device
Prevent damage to the device and the entire system by thoroughly flushing the device after each decommissioning.

Observe and follow the information in the operation manual for the spraying device and in Chap. 5.3 Flushing on page 30

5.5 Storage

Store the machine in a place where it is protected against dirt, moisture, frost, and heat.

5.6 Disposal



It is necessary to collect residues of spraying material, cleaning fluids, oil, greases and other chemical substances according to the legal regulations for recycling or disposal. The official local waste water protection laws apply.

At the end of the machine's use it must be put out of use, disassembled and disposed of according to the legal regulations.

- Thoroughly clean the machine of material residues.
- Disassemble the machine and separate the materials - metals must be taken to a scrap metal depot, plastic parts can be disposed of with household waste.

6 Testing and maintenance



WARNING

If untrained personnel carry out maintenance and repair work, they endanger themselves and others, as well as risking the operational safety of the machine.

- Maintenance and repair work on electrical parts must be carried out by specialist personnel with an electrical qualification - all other maintenance and repair work must be carried out by **WIWA** customer service or specially trained personnel.

Prior to maintenance and repair work:

1. Shut off the compressed air supply for the entire spraying system.
2. Disconnect the power supply.
3. Completely relieve the pressure in the spraying system.



Observe and follow the operation manual for the spraying device and accessories used for this.

The device must be regularly checked by expert personnel according to DIN EN 60079-17 when using it in potentially explosive areas.

For devices that are not used in potentially explosive areas, the following should be regularly checked:

- the function of all safety features,
- the faultless function of the machine and
- that the cables are free of damages.

In the case of machines that have been put out of use, the test can be delayed until the next time commissioning takes place.

The results of the tests must be recorded in writing and stored until the next test. The test certificate or a copy of this must be available at the machine's place of use.

7 Malfunctions and their elimination

Fault	Possible cause	Elimination
Material in the material fluid heater is not heated	➤ No voltage present	➤ A: Check power supply ➤ B: Check mains connection and power cable and replace if necessary The faults (point A and B) may only be eliminated by personnel with an electrical qualification.
	➤ Material fluid heater switched off by temperature limiter	➤ C: Press the reset button (see Fig. 26) until the control light illuminates again.
Material does not reach the desired temperature	➤ The heating cartridges are defective	➤ Call customer service
	➤ Temperature limiter is defective	➤ Call customer service
	➤ Temperature is set incorrectly	➤ Reset temperature on the thermostat
	➤ Flow volume is too high	➤ Decrease flow volume (smaller nozzle hole) ➤ Install a second material fluid heater in the spraying system
Leakage at double nipples or material hoses	➤ Double nipples and/or material hoses are not securely installed or are damaged	➤ Tighten or replace double nipples and/or material hoses
No material flow	➤ The heat exchanger is clogged.	 ➤ As long as the spray material is not yet completely hardened, the heat exchanger can possibly still be cleaned by flushing with a higher pressure (max. 450 bar). ➤ However, due to the risk of explosion, the material fluid heater may only be flushed with solvent in cold condition. ➤ Flush heat exchanger thoroughly, replace if necessary. ➤ If the material is hardened (particularly with two component materials), the heat exchanger must be replaced. ➤ Replace the heat exchanger only in cold condition and voltage-free condition. ➤ For removal, release the 2 fastening screws and screw the jacking screw in further until the heat exchanger can be removed from the housing. ➤ Before the installation, the cone-shaped inner side of the heat exchanger must be completely brushed with copper paste, WIWA order no.0000233.

8 Technical data

The following applies for all material fluid heaters:

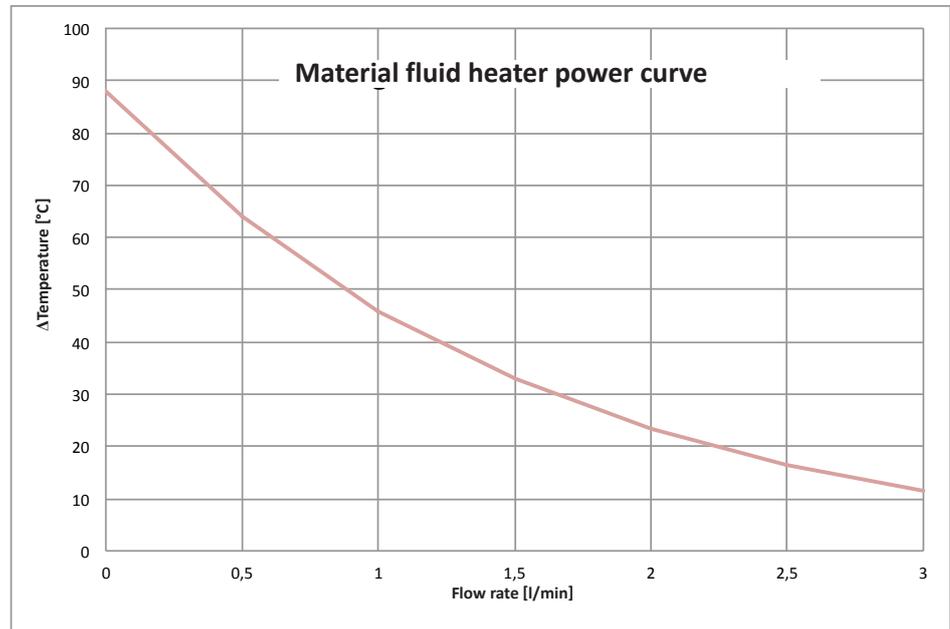
Max. temperature*	85°C
*at 1.8 kW, 1l of water can be heated in 1 minute about 25°C. *at 2.0 kW, 1l of water can be heated in 1 minute about 28°C. *at 3.5 kW, 1l of water can be heated in 1 minute about 50°C.	
Max. working pressure	500 bar
Temperature class	T4 (130°C)
Dimensions (LxWxH)	405 x 220 x 180 mm
Weight	17.6 kg

The following specific technical data results according to the item number on the type plate:

	Types			Connecting thread IN/OUT	Max. nominal voltage [V]	Phases	Max. rated current [A]	Output [W]
	Standard	RFA	440 V					
NW 9	0663917	–	–	3/8" NPSM (I)	115	1	16	1800
	0663907	0663918	–	3/8" NPSM (I)	230	1	16	3500
	0663915	–	–	3/8" NPSM (I)	230	3	10	3800
	0663909	0663920	–	3/8" NPSM (I)	400	3	6	3800
	–	–	0663911	3/8" NPSM (I)	440	1	8	3500
	–	–	0663913	3/8" NPSM (I)	440	3	5	3500
	0664671	–	–	3/8" NPSM (I)	230	1	9	2000
	0665461	–	–	3/8" NPSM (I)	400	3	3	1900

	Types			Connecting thread IN/OUT	Max. nominal voltage [V]	Phases	Max. rated current [A]	Output [W]
	Standard	RFA	440 V					
NW 14	0663923	–	–	G 3/4" (I)	115	1	16	1800
	0663908	0663919	–	G 3/4" (I)	230	1	16	3500
	0663916	–	–	G 3/4" (I)	230	3	10	3800
	0663910	0663921	–	G 3/4" (I)	400	3	6	3800
	–	–	0663912	G 3/4" (I)	440	1	8	3500
	–	–	0663914	G 3/4" (I)	440	3	5	3500
	0663965	–	–	G 3/4" (I)	400	3	6	3800

8.1 Power curve



8.2 Type plate

No.	Description
1	Name and Address of the manufacturer
2	Device designation
3	Serial-no. - year of manufacture
4	Power data: <ul style="list-style-type: none"> ▶ U = voltage ▶ 1 or 3 phases ▶ f = frequency in hertz ▶ I = amperage in ampere ▶ P = power in watt
5	Max. pressure in bar / psi
6	ATEX marking
7	Inner diameter
8	CE sign
9	QR Code

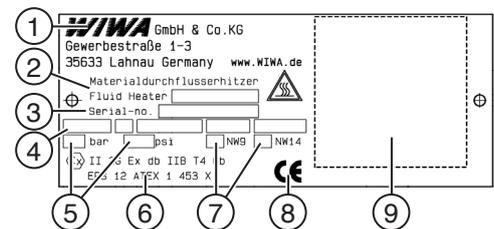


Fig. 28 Type plate



(1) EU - Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres – Directive 2014/34/EU
- (3) EU - Type Examination Certificate Number
EPS 12 ATEX 1 453 X **Revision 2**
- (4) Equipment: Fluid heaters type WIWA 1000 ...3780
- (5) Manufacturer: WIWA Wilhelm Wagner GmbH & Co.KG
- (6) Address: Gewerbestrasse 1-3
35633 Lahnau
Germany
- (7) This equipment and any acceptable variation thereto are specified in the annex to this certificate and the documentation therein referred to.
- (8) Bureau Veritas Consumer Products Services Germany GmbH, notified body No. 2004 in accordance with Article 21 given in the Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014, certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II of the Directive. The examination and test results are recorded in the confidential documentation under the reference number 12TH0308.
- (9) Compliance with the essential health and safety requirements has been assured by compliance with:
EN 60079-0:2012 **EN 60079-1:2014**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the annex to this certificate.
- (11) This EU - Type Examination Certificate relates only to the design and examination of the specified equipment in accordance with Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture of this equipment and its placing on the market. Those requirements are not covered by this certificate.
- (12) The marking of the equipment shall include the following:

 II 2G Ex db IIB T4 Gb



Certification department of explosion protection

Nuremberg, 2016-04-21



Page 1 of 2

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Annex

(13)

(14) EU - Type Examination Certificate EPS 12 ATEX 1 453 X

Revision 2

 (15) Description of equipment:

The Fluid heaters type WIWA 1000 W to 3780 W are used for heating of liquid fluids which are not sprayable at normal temperature. The main part (flameproof enclosure) includes all electrical switching and heating elements. External to the main part a heat exchanger is fitted. The maximum surface temperature of 130°C is limited by a safety temperature switch.

Electrical data:

115 V 16 A 1800W 50/60 Hz

230 V 16 A 3500W 50/60 Hz

400 V 9 A 3500 W 50/60 Hz

400 V 10 A 3780 W 50/60 Hz

Voltages up to 400-690V can be also used. Therefore the switching operation is performed with an external certified control box.

 (16) Reference number: 12TH0308

 (17) Special conditions for safe use:

Connection to external circuits shall be established by suitable temperature resistant wiring and cable glands. Loose leads connected inside hazardous location shall be protected by suitable type of protection. All unused openings shall be closed by certified blind plugs.

A repair of flameproof joints is only allowed according to manufacturer's requirements. A repair according to the values of table 1 and 2 of EN 60079-1 is not allowed.

The used cable gland and the cable must have a minimum operating temperature of +80°C. Alternative cable glands and cables can be used.

 (18) Essential health and safety requirements:

Met by compliance with standards.

Certification department of explosion protection

Nuremberg, 2016-04-21



D. Zitzmann

Page 2 of 2

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because it works

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