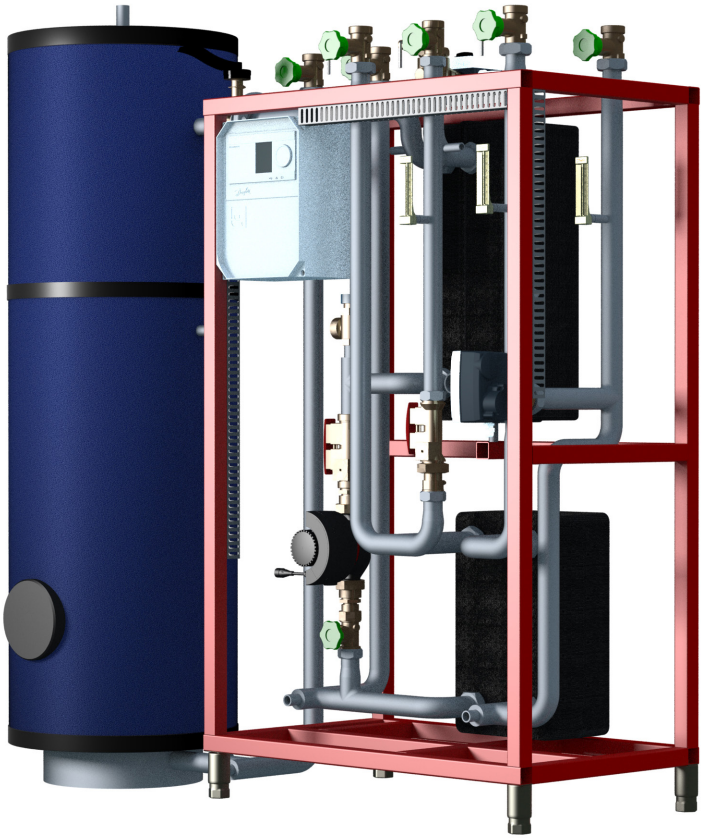
ENGINEERING
TOMORROW

Installation, commissioning and operation manual

Storage Charging Module with integrated legionella prevention **ThermoClean®– DL**



Always keep the instructions for use readily available near the device.

Read the instructions for use before starting any work!

Caution!
Caution! Before putting the device into service, check that it is undamaged and in perfect operating condition.

Original operating instructions

1. General Information

1.1 Information on operating instructions

These operating instructions describe the installation, operation and maintenance of the system. Compliance with all specified safety instructions and operating instructions is a prerequisite for working safely with the system and handling it properly. In addition, the local accident prevention regulations and general safety regulations applicable to the system's area of use must be observed. The operating instructions are part of the product and must be kept accessible to installation, operating, maintenance and cleaning personnel at all times in the immediate vicinity of the system's operating area.

For better presentation of the described situations, the illustrations in this manual are not necessarily to scale and may differ slightly from the actual design of the system. In addition to these operating instructions, the operating instructions for the installed components apply. The information contained therein – in particular safety instructions – must be observed at all times.

1.2 Other applicable documents

Unless otherwise stated, the individual components of the system are modules purchased from other manufacturers. All components used in the system have been subjected to risk assessments by their manufacturers. The conformity of the designs with the applicable European and national regulations has been declared by the manufacturers of the components. The manufacturers' declarations of conformity, as well as the operating, maintenance and repair instructions for the individual system components, are inseparable parts of the system documentation. The instructions for safety, assembly and installation, operation, maintenance, disassembly and disposal of the components contained in the manufacturer's documents must be followed by the system's operating personnel unconditionally.

1.3 Explanation of symbols

Important safety and device-related instructions in this operating manual are marked by warning symbols. The instructions must be followed in order to avoid accidents, personal injury and material damage.

WARNING!
This symbol identifies hazards that may result in adverse health effects, injuries, permanent bodily injury or death.
Be sure to comply with the instructions on work safety and take extra care in these cases.

WARNING!
Electrical hazard. This symbol alerts you to dangerous situations due to electricity. Failure to observe the safety instructions may result in serious injury or death. The work to be carried out may only be carried out by a qualified electrician.

CAUTION!
This symbol indicates instructions, the non-observance of which may result in damage, malfunctions and/or system failure.

NOTE!
This symbol highlights tips and information that must be observed for effective and trouble-free operation of the system.

1.4 Liability and warranty

All information and instructions in this operating manual have been compiled taking into account the applicable regulations, accepted standards of good engineering practice, and our many years of expertise and experience.

In the case of special versions, use of additional order options or due to the latest technical changes, the actual scope of delivery may differ from the explanations and drawings in this document. If you have any questions, please contact the manufacturer.

We reserve the right to make technical changes to the product as part of improving the performance characteristics and product development. Parts such as tools subject to wear in the use of the device and/or normal wear and tear, as well as auxiliary supplies and consumables such as greases, oils or cleaning agents, are not covered by the warranty.

Additionally, the obligations agreed in the delivery contract, the general terms and conditions of business, and the delivery conditions of the manufacturer and applicable statutory regulations at the time of the conclusion of the contract apply.

These operating instructions must be read carefully before starting work on and with the device, particularly before commissioning. The manufacturer accepts no liability for damage or malfunctions resulting from non-compliance with the operating instructions.

1.5 Copyright

The operating instructions are to be treated as confidential. They are intended solely for persons working on and with the system. Transfer of the operating instructions to third parties without the written consent of the manufacturer is not permitted. If necessary, contact the manufacturer.

Reproduction in any form – even in extracts – as well as utilization and/or communication of the content are not permitted without the written approval of the manufacturer. Violations will incur damages. The right to further claims remains reserved.

The content, text, illustrations, images and other representations are protected by copyright and are subject to additional industrial property rights. Any improper use is punishable.

1.6 Spare parts

Only use original spare parts from the manufacturer.

If non-approved spare parts are used, all warranty, service, damage and liability claims against the manufacturer or its agents, dealers and representatives are forfeited.

CAUTION!
Incorrect or faulty replacement parts can lead to damage, malfunctions or total failure of the system.

1.7 Dismantling

For disposal or scrapping, clean and dismantle the device in accordance with applicable health and safety and environmental regulations. See also: -> Hygiene.

Before starting the dismantling:

– Switch off the device and secure it against being switched on again.
– Physically disconnect the all energy and/or power sources from the device and discharge stored residual energy in accordance with regulations.
– Remove operating and auxiliary materials and other processing materials in an environmentally friendly manner.

WARNING!
Risk of injury! Stored residual energy, sharp edges, points and corners on and in the device or on the required tools can cause injuries. All work during dismantling of the device may therefore only be carried out by qualified personnel.


WARNING!
Not drinking water! Domestic water in parts of the system that are not used for a long time may no longer be suitable for drinking. Prevent such use; drain the system parts and dispose of the water.

1.8 Disposal

If no return or disposal agreement has been made, dispose of disassembled parts after proper dismantling as follows:

- Scrap metallic materials.
- Recycle plastic materials.
- Dispose of other components, sorted according to the type of material.
- Dispose of residual media properly. When introducing additives (e.g. glycol, etc.), the applicable regulations must be observed.

Remove used materials such as greases, oils, preservatives and cleaning agents from the device according to type and in an environmentally responsible manner. Use suitable collection and storage containers approved for the respective operating fluids. Label containers with contents, fill level and date and store them protected against misuse until final disposal.

CAUTION!
Electronic waste, electronic components, lubricants and other auxiliary materials are subject to special waste treatment and may only be disposed of by authorized specialist companies!

2. Safety

This section provides an overview of all important safety aspects for optimum protection of the personnel and for the safe and trouble-free operation of the device. In addition, the individual subsections contain specific safety instructions, marked with symbols, to avert immediate dangers.

2.1 General

The device is built in accordance with applicable and accepted rules of good practice at the time of its development and production and is considered safe to operate. However, the device may pose a hazard if it is used by improperly trained personnel or is used improperly or not as intended. Every person who is tasked with working on or with the device must therefore have read and understood the operating instructions before starting work. It is recommended that the operator demonstrably confirms the personnel's knowledge of the operating instructions.

Modifications of any kind, as well as attachments or conversions on the device, are prohibited.

All safety, warning and operating instructions on the device must always be kept in a legible state. Damaged signs or stickers must be replaced immediately.

Specified setting values or ranges must be strictly adhered to.

NOTE!
Conversion and extension measures must always be agreed with the manufacturer.

2.2 Responsibility of the operator

- Always keep the operating instructions in the immediate vicinity of the device and accessible to the installation, operating, maintenance and cleaning personnel at all times.
- Only operate the device in a technically perfect and safe condition.
- Always keep the safety devices freely accessible and check them regularly.

The information on occupational health and safety refers to the regulations of the European Union applicable at the time of the device's manufacture. The operator is obliged to determine the conformity of the stated occupational health and safety measures with the current state of the regulations during the entire period of use of the device and to observe new regulations. Outside of the European Union, the applicable health and safety legislation and local provisions and regulations must be adhered to at the location of the device's use. In addition to the safety instructions in this operating manual, the safety, accident prevention and environmental protection regulations generally applicable to the device's area of use must be observed and complied with.

The operator and the personnel authorized by the operator are responsible for the trouble-free operation of the device as well as for clear definition of the responsibilities for installation, operation, maintenance and cleaning of the device. The information in the operating instructions must be followed fully and unconditionally. The operator must also ensure that:

– In a risk assessment, additional hazards which result from the specific working conditions at the location of the device's use are determined.

– All operating and safety instructions resulting from the risk assessment of the workstations at the device are specified in an operating manual.

In the Federal Republic of Germany e.g., the Industrial Safety Ordinance (BetrSichV, BGBL I 2016) applies.

2.3 Intended use

The operational safety of the device is only assured if it is used as intended in accordance with the instructions in the operating manual. The system serves to provide heat energy from the supply grid of an energy company or other heat generation facility (e.g. boiler) by transferring heat to a customer's in-house system.

Proper use also includes correct compliance with the installation, operating, maintenance and cleaning instructions.

Any other and/or different use of the device is prohibited and is considered improper. Claims of any kind against the manufacturer and/or its authorized representatives due to damage resulting from improper use of the device are excluded. The operator and/or the owner is solely liable for all damage resulting from improper use.

2.4 Possible misuse

The device is used within a system and in some cases may not have its own control or shut-off device. The operator must ensure, by installing suitable safety devices, that the device can be stopped when a dangerous situation or malfunction occurs.

Any use other than the intended use of the system can lead to dangerous situations. For this reason:

- In principle, only use DHW systems in accordance with the instructions in this document, especially in compliance with the limits of use specified in the technical data.
- Refrain from any other or incorrect use of the DHW systems.
- Refrain from refurbishing, refitting or altering the construction or individual pieces of equipment with the aim of changing the application area or the usability of the DHW systems.

Note!
Emergency Stop button, etc.

WARNING!
Danger due to improper use.

2.5 Occupational health and safety

By following the instructions on occupational health and safety, a hazard to persons and/or the system can be prevented.

Failure to comply with these instructions can endanger persons and objects as a result of mechanical effects or failure of the system and the entire workplace.

Non-observance of the safety regulations will result in the loss of any claims for damages.

2.6 Personal protective equipment

When working on and with the device, you must always wear:

Protective clothing
Consisting of closely fitting workwear with low tear resistance, with closely fitting sleeves and no protruding parts. It is mainly used to protect against being caught by moving machine parts. Do not wear rings, necklaces or other jewelry.

Protective gloves
To protect hands from friction, abrasions, punctures or deeper injuries, as well as from contact with hot surfaces.

Safety goggles
To protect the eyes from flying objects and liquid splashes.

Safety shoes
To protect against heavy falling parts and slipping on slippery surfaces.

Protective helmet
For protection against falling and flying parts and materials.

2.7 Possible hazards of the device

The device has been subjected to a risk analysis. The design and construction of the device based on this corresponds to currently accepted standards of good practice However, residual risks remain. The device generates a strong jet of liquid when opened, for example by drain or vent valves. The device operates e.g. with a maximum pressure of 10 bar on the domestic water side. All maximum operating parameters can be found on the label.

WARNING! Risk of injury.
Danger from spraying liquids under high pressure. Always wear personal protective equipment when working on the device.

WARNING! Risk of injury.
Sharp-edged housing parts and sharp corners can cause skin abrasions. Wear protective gloves when working on the device.

The device works with voltages up to 230 V and currents up to 16 A.

WARNING! Electrical hazard.
The electrical energy can cause serious injuries. In the event of damage to the insulation or individual components, there is a danger to life.

- Before carrying out any maintenance, cleaning or repair work, switch off the main switch and secure it against being switched on again.
- Disconnect the device from the power supply for all work on the electrical system.
- Do not remove any safety devices or disable them by modifications.

WARNING! Risk of burning.
Hot surfaces can cause severe burn injuries. When working on the device, always wear protective gloves. The device operates at a maximum temperature as indicated on the label.

Components in the device may contain automatic moving parts (motors, gears, etc.). The devices may be heavy.

WARNING! Risk of crushing.
Heavy objects can cause crushing during transport, even with lifting equipment. The device may contain electrically powered moving components (motors, gearboxes) that can cause crushing when touched during operation. When working on the device, always switch off the power and wear protective clothing.

2.8 Emergency stop switch

An emergency stop switch is not integrated in the device. The operator must ensure that emergency stop switches are installed in accordance with the applicable accident prevention regulations, if required by law.

2.9 Operating personnel

The device may only be operated and maintained by authorized, trained and instructed personnel. This personnel must have received specific instruction on the hazards that may occur.

An instructed person is someone who has been instructed and, if necessary, trained on the tasks entrusted to them and the possible hazards arising from improper conduct, and has been instructed on the necessary protective devices and protective measures.

Qualified personnel are those who, on the basis of their professional training, knowledge and experience, as well as knowledge of the relevant provisions, are able to assess the work assigned to them and recognize possible hazards.

If the personnel do not have the necessary knowledge, they must be trained. The responsibilities for operation and maintenance must be clearly defined and adhered to, so that there is no unclear allocation of responsibilities with regard to safety.

The device should only be operated and maintained by persons who can be expected to perform their work reliably. Any operation which affects the safety of persons, the environment or the device is to be avoided. Persons who are under the influence of drugs, alcohol or medication that affects their ability to respond should not perform any work on or with the device.

When selecting personnel, minimum age requirements in the country's youth employment legislation must be observed and, where relevant, applicable professional regulations. The operator must ensure that no unauthorized persons work on or with the device. Unauthorized persons, such as visitors, etc., must not come into contact with the device. They must maintain a reasonable safety distance.

The person using the device must immediately notify the operator of any changes to the device that affect safety.

2.10 Actions in the event of danger or accidents

In case of danger or accidents, the device should be switched off by immediately pressing an emergency stop switch. This can also be done by opening a safety door or protective screen provided with safety switches, which triggers the emergency stop function when opened.

Safety devices with emergency stop function are only to be operated in emergency situations.

Safety devices must not be used for normal shutdown of the device.

Always be prepared for accidents or fires. Keep first aid equipment (first aid kit, eyewash bottle, etc.) and fire extinguishers within easy reach.

Personnel must be familiar with the handling and location of safety, accident reporting, first aid and rescue equipment. This ensures protection against hazards and the best possible assistance in the event of accidents.

2.11 Residual hazards / hazard analysis

Hazard location	Type of hazard	Protection goal	Measure
Shut-off valves and fittings in the substation	Crushing in manual operation	Manual operation of the shut-off valves and fittings must be possible without danger.	Provide sufficient space for ergonomic operation by design.
Piping and components in the substation	Burns from contact	Safe contact when the substation is open	Thermal insulation of pipes and components Information signs at the substation Warnings in the operating instructions
Entire substation	Electric shock	Safe contact at the substation	Adequate contact protection
Entire substation	Spraying liquids and/or steam under high pressure	Controlled pressure reduction in the event of failure	Safety devices according to DIN 4747 Part 1 (hot water) or EN 12828, DIN 1988
Entire substation	Overheating of the substation or rather transfer of heat to the connected in-house system beyond the permissible temperature	Shutting off the heat supply in the event of a fault	Safety devices according to DIN 4747 Part 1 (hot water) or EN 12828

In operation, the residual risk can be limited to the following code value according to the Suva risk assessment method: B5/C4/D3/E2. The residual hazard potential arises from non-observance of the above operating instructions.

The modules have been manufactured according to explicit specifications of the operator, who is responsible for maintaining the specified parameters and for selection and qualification of the operating personnel.

The plant is equipped with the following warning sign on which the most important residual hazards are indicated:

This system may only be operated by trained personnel after careful study of the accompanying documentation. Before commissioning, the system must be filled and fully vented. Exceeding the permissible operating pressure or the maximum permissible operating temperature stated on the CE label, as well as any use other than the intended use, is not allowed.

⚠ **Risk of burns** due to contact with or discharge of hot media (water/steam). Avoid touching the modules. or wear suitable protective clothing.

Risk of crushing when operating the modules.

⚠ **Danger of electric shock:** Before working on the electrical system, it must be disconnected from the power supply.

All flange joints, screw fittings and electrical clamp and screw connections must be checked and, if necessary, tightened **before filling** or commissioning the system. Switch on pumps only when filled (avoid dry running).

Properly install before commissioning (unless fully assembled at the factory):

– Safety valve / drain and vapor lines according to DIN 4751 or DIN 1988
– Strainer in primary supply line / secondary return line
– Equipotential bonding according to VDE 0100 Part 540 (earthing, protective conductor, equipotential bonding)

3.0 Technical Data

3.1 Technical and main system data

The main system data can be found on the label as well as the documents contained in the systems (title page, wiring diagram, data sheet).

3.1.1 CE label

The label is attached to the system. It contains the following information:

– Manufacturer
– Device no.
– Year of manufacture
– Type
– Capacity
– Design parameters
– Max. perm. operating temperature
– Nominal pressure class

SUBSTATION

MANUFACTURER		Danfoss A/S, Nordborgvej 81, 6430 Nordborg, Denmark				
ID NUMBER AND PRODUCTION DATE		1001999999/2018/20				
CODE AND TYPE		004X1618/TC-DL 0200 ECL XB				
PURPOSE OF USE		DOMESTIC HOT WATER				
PED CATEGORY		2014/68/EU Article 4.3				
POWER SUPPLY VOLTAGE		230V AC / 50-60Hz				
		PRIMARY	SECONDARY DHW Charge	SECONDARY DHW Re-cool	SECONDARY	SECONDARY
PN CLASS		16	10	10		
MIN./MAX. OPERATING TEMP.	°C	2/100	2/90	2/90		
MAXIMUM PRESSURE	BAR	16	10	10		
CAPACITY	KW	84	84			
TEMPERATURE PROGRAM	°C		75-50/10(20)-70	10-20/70-60		
HEAT EXCHANGER			XB37H-1 60	XB37L-1 60		
FLOWRATE		m3/h	/	max. 5,0		
PRESSURE DROP/EXCHANGER		BAR	/			

MADE IN POLAND

CE

3.1.2 Legend and designations


Shut-off ball valve or butterfly valve


Check valve

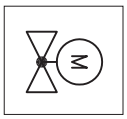

Non-return valve


Safety valve (SFV)

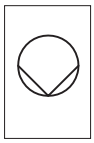

Balancing valve (Taco-Setter)


Air-Vent


Drain



2-way-valve
M1 = component designation in electrical diagram


Circulation pump
(CPU = circulation pump, LPU = loading pump)
P2/V2, P3/V3 = component designation in electrical diagram

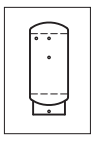
Temperature sensor:
S2, S3, S9... = component designation in electrical diagram

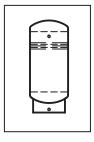

Heat exchanger (HEL / HEC)


Electronic controller (ECD)

3-way-valve
M2 = component designation in electrical diagram


Thermometer

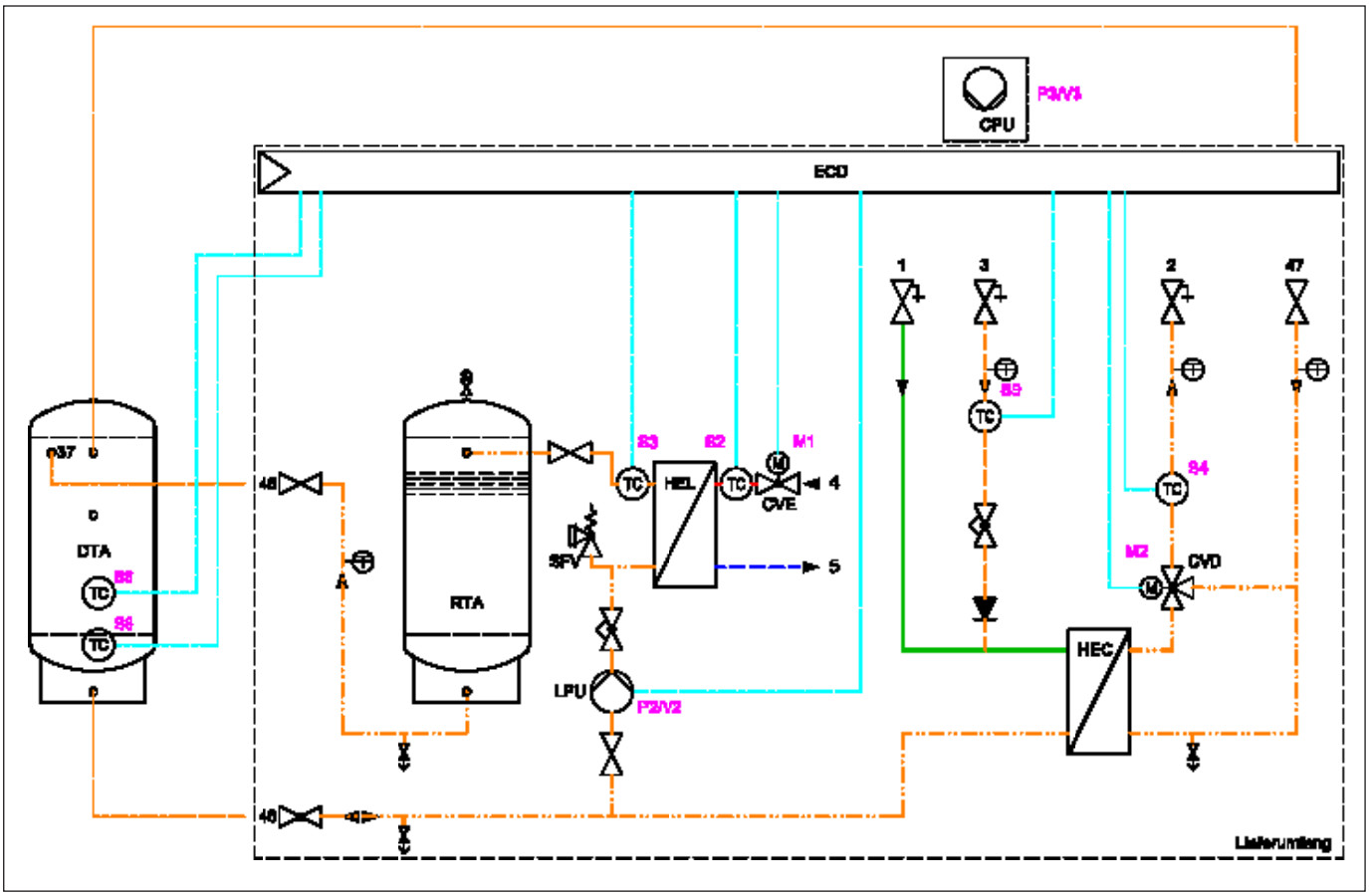

Domestic storage tank (DTA)


Reaction vessel (tank / RTA)

1 Domestic water (cold)
2 Domestic hot water (hot/network)
3 Circulation (inlet)
4 Heating Supply
5 Heating Return
45 to storage tank top
46 from storage tank bottom
47 from storage tank top

4.0 Function

To meet increased drinking water quality requirements, domestic hot water charging systems can be provided with additional components and functions, e.g. to effectively prevent or kill legionella through thermal disinfection. These systems are used in particular where an increased risk of infection exists or must be prevented. This includes hospitals, nursing homes, hotels, swimming pools or other sports facilities. The ThermoClean® system is ideal for this purpose:



Compared to a conventional domestic hot water charging system, an additional reaction tank (RTA) is integrated in the charging circuit. The water to be heated in the instantaneous water heater (HEL) is not only heated here to the nominal system temperature, but to minimum 70°C. To ensure normal operation, a minimum heating flow temperature of 75°C must be maintained (4). This temperature is controlled via a control device (e.g. electric control valve (CVE)). The heated water flows through the reaction tank (RTA) within a time of not less than 4 minutes. This period of time is maintained by the arrangement of diverse components within the tank, such as perforated plates, etc. This makes it possible to effectively kill legionella. During peak periods, additional drinking water buffer storage tanks must be connected to the system (connections 45, 46 and 47). The volume must be adapted to the demand. To prevent a risk of scalding, the system contains an additional recooler (HCE). Here, the water with a temperature of 70°C is cooled by inflowing cold water (connection 1) to the required system temperature at the connection (2). This must be adjusted according to local or country-specific laws and regulations; from a hygiene aspect, the temperature should not fall below 55°C. Control takes place via the electronic hot water thermostat (ECD) in conjunction with an electric control valve (CVD), which constantly controls the system temperature at the respective sensor. During off-peak periods, cooling takes place via the cooled returning circulation water (connection 3). The circulation temperature or volume can be used to control an on-site circulation pump (CPU) by means of a speed controller integrated in the control device. The returning circulation water volume must not exceed 70% of the system charging volume.

The circulation volume reduces the corresponding charging volume [values see page 48]:

→ max. charging volume flow = circulation volume + effective domestic hot water charging volume flow

The temperature drop in the pipe system must not exceed 5K (see also DVGW worksheet W 551). During off-peak periods, the entire pipe system can be disinfected via a setting or an external request at the controller (ECD). For further information, see Chapter 8.

5.0 Setup and Installation

5.1 Setup and installation / General information

Domestic water heating systems are usually supplied as fully piped and wired units. System connections are given in the data sheet and in this manual. Ensure that the wall or floor has sufficient load bearing capacity for total weight of the system, including water content. Pay close attention to the alignment with the prepared connections, so that they can be joined without stress.

WARNING! Risk of injury.
Improper installation and assembly may result in serious personal injury and/or property damage. Installation and assembly work may therefore only be carried out by trained specialist personnel in compliance with safety regulations.

NOTE!
Do not use pipe wrenches on union joints. Always use matching wrenches.

If parts of the system or components have to be dismantled due to limited space for bringing in (shafts, elevators, small entry openings, etc.), be sure to reinstall or reconnect them after setup.

NOTE!
Do not forcibly separate system parts from network lines and/or frame parts by sawing, cutting, etc.

Only use compliant connecting parts when connecting to the in-house system. Pay special attention to permissible materials in the domestic water sector and comply with all legal requirements. Galvanized pipes and fittings should be avoided at all costs to prevent corrosion. Check the match of the connection type, the pressure level and the dimension. Use approved gaskets and gasket materials.

The following types of gaskets are used by us:

Heating side: KLINGERtop-sil-ML1
Domestic water side: EPDM A-KT 90-00

NOTE!
Check all connections before filling the system and, if necessary, tighten them. After commissioning, repeat this action under hot conditions.

Use the following tightening torques for the above-mentioned gasket type (KLINGERtop-sil-ML1) on the heating side:

Size/torque	20 Nm	30 Nm	40 Nm	50 Nm	60 Nm	70 Nm	80 Nm	90 Nm	100 Nm	110 Nm	120 Nm
G 3/8"	NOK	RISK	OK	OK	OK	OK	RISK	DAM	DAM	DAM	DAM
G 1/2"	NOK	RISK	OK	OK	OK	OK	RISK	DAM	DAM	DAM	DAM
G 3/4"	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM	DAM
G 1"	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM	DAM
G 1 1/4"	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM	DAM
G 1 1/2"	NOK	NOK	RISK	OK	OK	OK	OK	RISK	DAM	DAM	DAM
G 1 3/4"	NOK	NOK	NOK	RISK	OK	OK	OK	OK	RISK	RISK	DAM
G 2"	NOK	NOK	NOK	RISK	OK	OK	OK	OK	RISK	RISK	DAM

Use the following tightening torques for the above-mentioned gasket type (EPDM A-KT 90-00) on the domestic water side:

Size/torque	5 Nm	10 Nm	15 Nm	20 Nm	25 Nm	30 Nm	35 Nm	40 Nm	45 Nm	50 Nm	55 Nm
G 1/2"	NOK	OK	OK	RISK	DAM	DAM	DAM	DAM	DAM	DAM	DAM
G 3/4"	NOK	OK	OK	RISK	DAM	DAM	DAM	DAM	DAM	DAM	DAM
G 1"	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM
G 1 1/4"	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM
G 1 1/2"	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM
G 1 3/4"	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM
G 2"	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM	DAM
G 2 3/8"	NOK	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM
G 2 1/2"	NOK	NOK	NOK	NOK	RISK	OK	OK	OK	RISK	DAM	DAM

NOK	Not sealed (Risk of leakage)
RISK	Risk, not sealed (Risk of leakage)
OK	OK
DAM	Deformation of the gasket

The above-mentioned gasket types should be used for replacement. When using other types or materials, ask the manufacturer or supplier for the optimum tightening torques to ensure proper sealing and avoid damaging the gasket.

Pay particular attention to the suitability of the type of gasket you have selected on the domestic water side. This concerns the maximum possible temperature and the maximum pressure, as well as compatibility with the corresponding media. On the domestic water side, gaskets should always have suitable approval (e.g. KTW or DVGW W270 test, Elastomer Guideline).

6.0 Transport, Packing and Storage

Always observe the following safety rules:

– Transport must be adapted to local conditions.

– Use only approved lifting equipment and gear with sufficient load capacity.

– Only attach lifting gear to suitable lifting points on the device; do not attach to protruding machine parts or parts mounted on lugs. Ensure that slings are firmly attached.

– Ropes and straps must be equipped with safety hooks. Do not use ragged ropes or ropes with chafe marks. Do not place ropes or straps on sharp edges and corners, do not knot and do not twist. Pay attention to the device's center of gravity when attaching lifting gear.

– Never lift, slew or lower loads above persons.

– Always move the device with great care and caution.

WARNING! Risk of death.
When lifting, slewing and lowering, there is a risk of serious personal injury and property damage due to falling parts. Never stand or walk under suspended loads.

– With tanks/buffers, particular attention must be paid to:

- Damage to the thermal insulation during transport must be avoided, and particularly for transport over long distances it must be dismantled.
- Use suitable transport equipment to avoid deformation of connection ports or the tank shell.
- With stainless steel tanks, always avoid direct contact with ferritic materials and damage to the surface.

6.1 Transporting pallets with a forklift

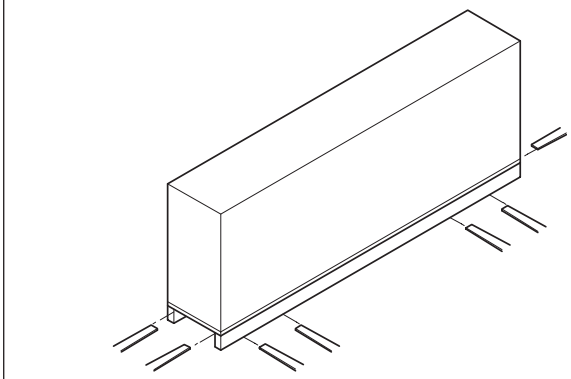
Packages mounted on pallets can be transported with a forklift under the following conditions:

- The forklift must be rated to handle the weight of the transport units.
- The operator must be authorized to operate the forklift truck.

Pick-up:

1. Drive the forklift forks between or under the pallet planks.
2. Drive the forks so far that they protrude on the opposite side.
3. Make sure that the pallet cannot tip over if the center of gravity is off center.
4. Lift the package and start transport.

WARNING! Risk of death.
When lifting, slewing and lowering, there is a risk of serious personal injury and property damage due to falling parts. Never stand or walk under suspended loads.



Transporting with a forklift

6.2 Transport inspection

Upon receipt, immediately check the delivery for completeness and damage in transit. If there is visible transport damage, do not accept delivery or only accept it with reservations. Note the extent of damage on the transport documents or delivery slip of the carrier. Initiate a complaint.

Report hidden defects immediately after detection, as claims for compensation can be honored only within the applicable complaint period.

6.3 Packing

Various forms of packing are used for delivery of the devices. The main packing materials are wood, cardboard and plastics (film, foam), as well as strapping. The packing materials may also include materials that are added to the packages for moisture or frost protection (silica gel bags, antifreeze, etc.).

If no agreement has been made to take back the packing materials, the packing material remains with the customer.

Disposal instruction:
This product should be dismantled and its components sorted, if possible, in various groups before recycling or disposal. Always follow the local disposal regulations.

6.4 Storage

After unloading, the packages must be stored until installation, taking into account the shipping markings. Packaged equipment and accessories must not be unpacked.

The following rules apply to storage:

- Store in a dry place with maximum 60% relative humidity.
- Ensure that the packages are not stored outdoors. In addition, it must be ensured that the floor of the storage room is dry during storage.
- Protect from direct sunlight; storage temperature 15 to 25°C.
- Store dust-free.
- Avoid mechanical shocks and damage.
- For storage longer than about 3 months, the preservation measures must be checked. In case of aggressive weather conditions, the preservation may need to be renewed.

7.0 Installation

WARNING! Risk of injury.
Improper installation and assembly may result in serious personal injury and/or property damage. Installation and assembly work may therefore only be carried out by trained personnel in compliance with safety regulations.

Use only compliant connecting parts when connecting to the in-house system. Check the match of the connection type, the pressure level and the dimension.

Pipe connections are usually:

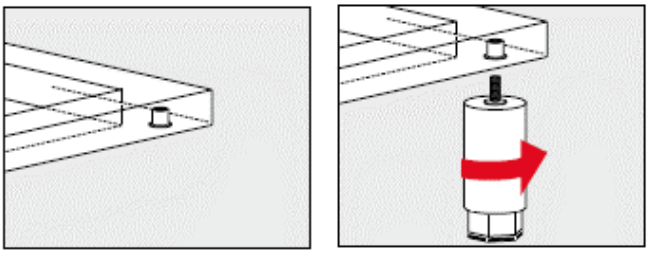
- Heating connections as weld-on fittings
- Flange connections according to DIN/EN standards (pressure levels PN 6 to PN 40)
- Threaded connections according to DIN 2999 with internal or external thread
- Threaded connections according to DIN 2993 / ISO 228 with

7.1 Installation preparation

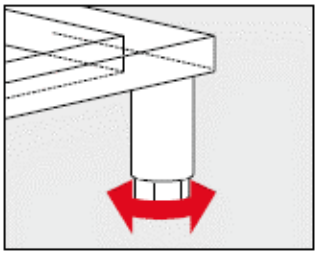
Check all assemblies and individual parts for completeness and perfect condition before starting installation. For installation of the system in the equipment room, please refer to the enclosed installation instructions or Quick Guides.

Setting up the system:

Screw the height-adjustable, enclosed feet into the threads beneath the frame:



Align the system horizontally by adjusting the height of the feet, e.g. using a spirit level. You can compensate for any unevenness of the installation area by up to 50 mm:



For more uneven surfaces, it is first necessary to create a level surface on site, e.g. a boiler platform or similar.

external thread

7.2 Primary connection, heating medium (e.g. district heating)

The primary connection is carried out by qualified personnel in coordination with the local or district heating supply company, provided that the system is connected to such a supply network.

The primary supply and return lines must be connected to the designated ports or shut-off valves of the system. Commissioning of the primary side is normally carried out by the competent local or district heating utility for district heating connections.

The system is delivered without a primary-side strainer or filter. A suitable strainer or filter must be installed ahead of the system to protect the components of the system from dirt entry. Failure to do so may result in loss of warranty.

Before commissioning, remove all particles in the piping of the system and the strainer (by flushing).

7.3 Secondary connection, domestic water

The secondary side is connected by the installation company to the designated shut-off valves of the system.

Also on the domestic water side, an approved water filter must be installed ahead of the system in accordance with regulations.

Before putting the system into service, flush the complete system and remove all dirt, including cleaning the reversible flow filter. These measures are also essential for maintaining the warranty.

7.4 Electrical connection

Only a qualified electrician authorized by the responsible electricity supply company may carry out the electrical installation of the substation in compliance with all applicable regulations and provisions. The system is completely wired and tested in the factory.

Before you start with the electrical connection, please note the following:

- Read the relevant passages in the Warnings section.
- The substation must be connected to a 230 V AC supply. The AC line connection must be carried out in accordance with official regulations.
- The system must be fully wired and connected to an external main switch so that it can be switched off for maintenance, cleaning or repair work.

7.4.1 Electrical connection of electronic controller

Connection of the field devices and sensors is described in the separate document "Installation Guide, ECL Comfort 310, P318".

The wiring diagram of the complete device can be found in the appendix as well as in the additionally enclosed documents.

7.5 Installation of the system

Installation and connection of the device may only be carried out by authorized and qualified personnel. When installing, comply with all local standards and regulations.

When installing, make sure that the system remains freely accessible for installation and maintenance work.

Before installing the system, all piping and connections must be cleared of contamination.

All fittings and connections must be tightened as they may have been loosened during transport.

The safety valve discharge line must be installed in accordance with applicable local regulations. For installation of the system in the equipment room, please refer to the enclosed installation instructions or Quick Guides.

8.0 Commissioning

The following measures must always be carried out for:

- Initial commissioning of the device (see commissioning report)
- Recommissioning after complex maintenance on the device
- Recommissioning after relocation of the device
- Recommissioning after troubleshooting of the device
- Recommissioning after shutdown or longer downtime
- Check water quality

Installation and commissioning of the device are carried out as agreed by employees of the manufacturer, partner companies authorized by the manufacturer. or the installation company. Unauthorized initial commissioning is not permitted.

NOTE!
Observe the necessary measures to maintain domestic water quality.

In any case, availability of the completed commissioning report (see attached documents) is a prerequisite for maintaining the system's warranty.

Before commissioning, check whether all safety regulations and provisions have been observed. Fill the house system with domestic water. To avoid damage, make sure that the pressure during filling does not exceed the maximum permissible operating pressure.

Before commissioning, the secondary side must be sufficiently flushed by the installation company. Check all connections for leaks and tightness. Fill the system to the required static pressure.

8.1 Requirements for commissioning

The following conditions must be fulfilled for commissioning of the domestic water system:

- Commissioning may require approval by the district heating utility
- All bolted joints and fastenings must be firmly tightened
- The system must be properly connected to the piping
- All impurities and installation residues must be removed from the piping
- The electrical and control system connections must be properly implemented. The supply voltage must be present at the main switch or circuit breaker
- The heating medium must be present at the primary shut-off valves with the required parameters
- The in-house installation and the device must be filled and vented (pumps must always be vented)

8.2 Secondary commissioning, domestic water network

Before commissioning, check whether all safety regulations and provisions have been observed.

The operating data on the system's label must correspond to the operating data of the local or district heating utility or the heating supply system and the in-house system (domestic water side).

Fill the domestic water network with domestic water. To avoid damage, make sure that the pressure during filling does not exceed the maximum permissible operating pressure. Vent the system completely at the highest points.

Before commissioning, the secondary side must be sufficiently flushed by the installation company.

Check all connections for absence of leaks and tightness.

8.3 Primary commissioning

All work on the primary side of the system may only be carried out by suitably trained and instructed specialist personnel in consultation with the local or district heating utility.

Slowly fill the system through the shut-off valve in the primary supply line. To do this, slowly open the shut-off valve in the primary return line.

When operating with an electronic controller, the control valve (if present) must be manually set to the open position.

Set the flow /differential pressure regulator or pressure regulator (if present) to maximum flow or differential pressure.

Set the existing pressure regulators to the design value.

Check all connections for tightness and absence of leaks; retighten to the required torque if necessary.

Flush the primary side sufficiently, close the shut-off valves. Clean the strainer and set the electronic heating controller, if present, to nominal operation in accordance with the manufacturer's operating instructions provided.

8.4 Controller

The Danfoss electronic controller is preset at the factory.

Connect the controller to the power supply. Confirm the language selection, set the date and time, and the controller is ready for operation.

The preset parameters can be changed according to the operating instructions of the controller manufacturer included with the substation.

8.5 Malfunction or taking out of service

The heating pump and other components, such as control valves, sensors or thermostats, are connected to the AC line voltage. Immediately turn off the main switch or disconnect the power plug. Close shut-off valves. For troubleshooting, consult a specialist company.

– Disconnect AC line voltage
– Close shut-off valves on the primary and secondary side
– Consult a specialist company for troubleshooting

The system must be vented for emptying. Negative pressure can lead to damage to system components or the tank if present.

WARNING!
Risk of burns. If there are leaks on the primary side, hot water or steam can escape. Risk of burns.

WARNING!
Electrical hazard.
Leaking water can cause a potentially lethal voltage to be present on the entire system. Before starting work, disconnect the system from voltage and secure it against being switched on again!

8.6 Recommissioning after a fault

After a fault, recommissioning occurs with the specialist company.

8.7 Danfoss controller default settings

8.7.1 Basic settings

Part	Designation Abbreviation	Parameter:	Parameter-Number	Range	Default	TD-DL
Main-/Startsetting		Application	Main setting (Start) >Type P318. xxxx			**318.2**
			Hydraulic type/Control type (must not be set)			*a*
		Code-Number				004X1618 … 23 004X1634 … 37
Charging Pump	P2 / V2	DHW P post-run (P2)	11041	0 … 180 min	1 min	1 min
Circulation Pump	P3 / V3	Cont. T control	11054	OFF / ON	OFF	**ON**
		Circ. P priority	13055	AUTO / IDLE / STOP	AUTO	AUTO
Heating/Supply	S2	Pump start diff. (Supply primary) *)	11371	0 … 40 K	4 K	**3 K**
Charging Temperature	S3	Max. charge T (DHW charging) *) **)	11152	10 … 110 °C	80 °C	80 °C
Charging Temperature	S3	Temp. min. (Supply primary) *)	11177	10 … 120 °C	10 °C	
Charging Temperature	S3	Temp. max. (Supply primary) *)	11178	10 … 120 °C	90 °C	
Charging Temperature	S3	DHW Temp. / Out/Supply sec. HEX *)	> Circuit 1 (left bar) > Time program/Day active > Setpoint S3	10 … 150 °C	60 °C	**70 °C**
DHW Network temperature	S4	DHW / Out Net (TC) *)	> Circuit 1 (left bar) > Time program/Day active > Setpoint S4	10 … 150 °C	60 °C	60 °C
Heating/ Return Limitation	S5	Limit (Return primary)	11030	10 … 110 °C	40 °C	**65 °C**
Tank top ON	S6	Start difference *)	11195	-50 … +30 K	-5 K	**+5 K**
Tank top OFF	S8	Stop difference *)	11194	-50 … -1 K	-3 K	**-1 K**
Circulation Temperature	S9	Max. return T (Normal-/Comfort) *)	13370	5 … 90 °C	55 °C	55 °C
	S9	Max. return T (Disinfektion) *)	12125	OFF/10 … 110 °C	OFF	**65 °C**

*) Sensor must be connected

**) Note: Setting cannot be lower as value S3 + S2!

not relevant

70 °C fat visible values are different from default and have to be changed!

8.7.2 Pump and valve settings

Component					Charging pump [P2]		Circulation Pump [P3]		Actuator valve [M1]	Actuator valve [M2]
Type	Capacity	Control	System		**Parameter max./min.**		**Parameter max./min.**		**Parameter 11186**	**Parameter 14186**
	[kW]	Type	Application	Code	**12165 [%]**	**12167 [%]**	13165 [%]	**13167 [%]**	s full	s full
TC-DL	84	2-Way-Valve w./o. Safety Function	318.2a	004X1618	**55**	**15**	100	20 *	**75,0**	**70,0**
	147			004X1619	**55**	**15**			**150,0**	
	210			004X1620	**55**	**15**			**150,0**	
	315			004X1621	**75**	20			**150,0**	
	420			004X1622	**86**	20			**150,0**	
	546			004X1623	**94**	20			**72,0**	

70 °C fat visible values are different from default and have to be changed!

20 * for PWM-controlled pumps value has to been 15

9.0 Operation

The system is operated in automatic mode. During operation, no operating personnel are required in the area of the system or in its immediate vicinity.

9.1 Switching on

For switching on, please observe the requirements in section 8, "Commissioning".

The system can be switched on at the main switch of the electronic controller and then operates automatically. In the case of controllers without their own main switch, this must be installed by the customer.

9.2 Switching off

Switching off takes place at the main switch of the electronic controller. In the case of controllers without their own main switch, this must be installed by the customer.

9.3 Recommissioning

For recommissioning after extended downtimes, the provisions of DIN 1988 Part 8 and VDI 6023 apply in Germany. Other corresponding local or country-specific requirements, if any, must be observed. Particularly after a thermal disinfection, there is a risk of scalding.

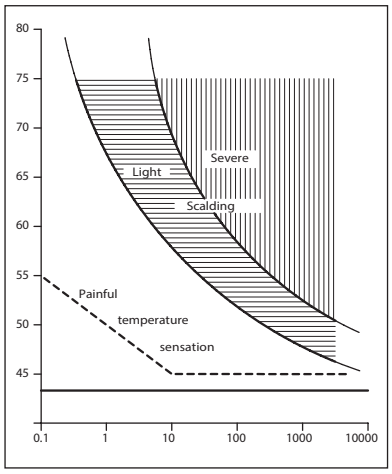
WARNING!
Risk of scalding. When handling hot water, observe the applicable safety regulations. Caution when handling hot operating materials: Risk of burns.

9.4 Hygiene and thermal disinfection

If necessary, thermal disinfection must be carried out according to local or country-specific regulations, statues or other specifications. The procedure described below is therefore just one possible suggestion. If the system is to be operated temporarily in "Thermal disinfection" mode, observe the following instructions:

1. Make sure that hot water is not drawn at the tapping points. Operating materials can reach high temperatures.
2. Open shut-off valves on the heating water side.
3. Switch on all pumps.
4. Set the setpoint for valves to 70°C (for disinfection).
5. Heat the stored water on the domestic water side (if present) and the hot water supply, including the circulation line, to 70°C (duration approximately 2-3 hours).
6. Run each tap for about 3 minutes with 70-degree water. This will disinfect the pipes.
7. After disinfection, set the regular setpoints again (recommended 60°C, i.e. set to automatic mode).

Before any thermal disinfection, always check whether all system components, including the house installation, are suitable for the desired disinfection temperature.



Effects of Domestic Water Temperatures on Skin Surfaces. Source: Dr. J.P. Bull, Industrial Injuries and Burns Unit, Medical Research Council

The following reference values of the hazard potential must be observed:

Up to 38°C	Safe temperature for bathing
39 – 45°C	Pain sensation after 10 seconds or longer
46 – 48°C	Pain sensation 2 – 6 s
49 – 54°C	Potential scalding
55 – 59°C	Risk of scalding, briefly
60°C and above	Scalding hazard, immediate
70°C and above	Extreme danger

Source:
Dr. Gabriele Elsäßer, Landesgesundheitsamt Brandenburg
Dr. J.P. Bull, Birmingham Accident Hospital

10.0 Maintenance

10.1 Safety instructions

The annex contains an overview of the most important technical regulations. For instructions on maintenance of the system, see in particular DIN 1988, EN 806, VDI 2895 and VDI 6023. It is recommended to engage a local installation company for regular maintenance. Section 10.2 summarizes the most important measures for specific components and modules. Attached you will also find the appropriate maintenance and operating instructions for individual components, which must be observed.

WARNING!
Work on the device must always be carried out by qualified and suitably trained personnel. Always wear the following personal protective equipment when using the device:
– Closely fitting clothing (no wide sleeves, rings, etc.)
– Safety glasses to protect the eyes from flying parts and liquids
– Safety shoes for protection against heavy falling parts and slipping on slippery surfaces

WARNING!
Electrical hazard. Work on electrical equipment may only be carried out by electricians in compliance with safety regulations.
Before starting work, switch off the electrical supply and secure it against being switched on again.

Maintenance schedule (recommendations)

Interval	Maintenance tasks	Remarks
Every 2 months	Inspection of all connections	If necessary, retighten and/or replace gaskets
	Check all parameters for setpoint/actual values or correctness	If exceeded: restore parameters to intended values
	Cleaning reversible flow filters	See also DIN 1988 / EN 806
	General visual inspection of all components for damages	Functional check where there is visible damage and replacement where necessary
Additionally every 6 months	Functional test of the safety valve	See also DIN 1988 / EN 806
	Functional test of electrical and electronic components, switches, etc.	Manual switch on/off or opening and closing of actuators
	Cleaning of filters or strainers	See also DIN 1988 / EN 806
	Test of electrical safety devices	Temperature monitor and/or limiter
Additionally every 12 months	Functional check of all components for function and operability	e.g. opening and closing shut-off valves
	Check the external condition	Discoloration (corrosion), thermal insulation
	Check heat exchanger	If soiled, where necessary cleaning/descaling (see section 10.2)
	Cleaning the tanks/storage tanks	See also section 10.2
	Check the meters	including calibration period
	Check the display devices	pressure gauges, thermometers
	Check expansion vessels	Prepressure, load pressure, tightness of membrane

10.2 Maintenance tasks

The following are essential tasks that should be performed during maintenance. Additional information is included in the manufacturer's instructions included in the appendix.

The compilation does not claim to be complete. It is important in every case to observe the legal and relevant technical regulations as well as the requirements of local conditions and regulations (for example TCR/"Technical requirements for connecting to network", regulations of the utility company, etc.)

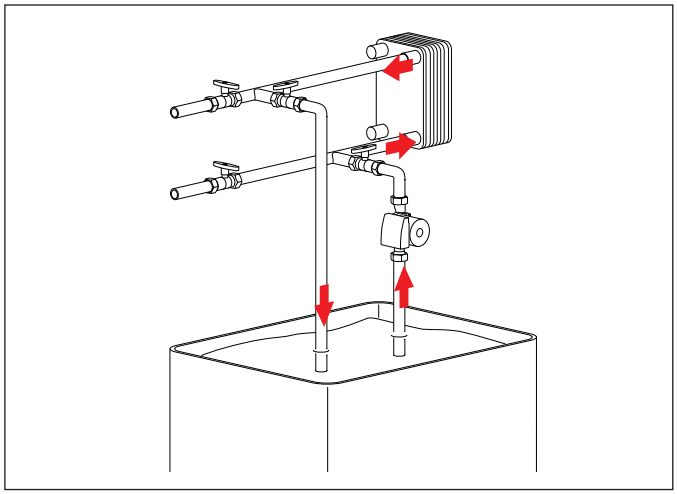
Valves:

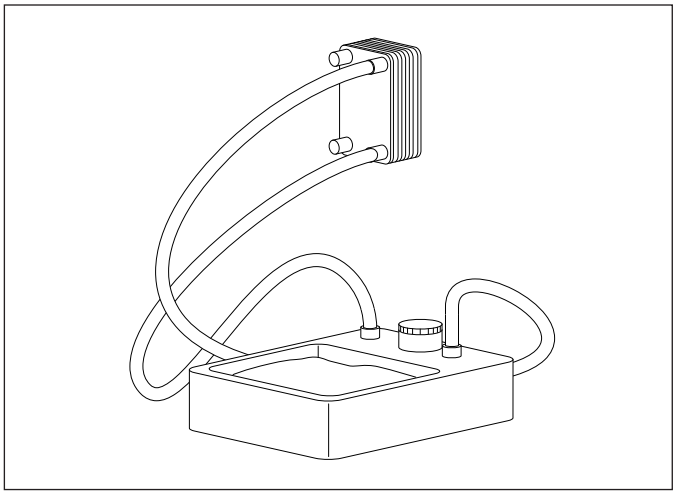
In general, the valves used are maintenance-free. As part of maintenance work, functionality should be checked with regard to ease of movement of hand wheels or levers by opening and closing.

This prevents the accumulation of dirt and limescale deposits on balls, plates and valve seats.

Heat exchanger:

Heat exchangers in particular are subject to calcification in case of prolonged operation due to the relatively high temperatures on the plates or tubes. As part of the aforementioned maintenance tasks, these devices should be cleaned in case of performance degradation. Brazed plate heat exchangers can be flushed. With relatively thick deposits, weak inhibited acid solutions (e.g. 5% formic, acetic or phosphoric acid) can be used for this. The drawings show this arrangement:





Flushing and cleaning brazed plate heat exchangers

Tank:

Please refer to separate enclosed documents for details.

Pipes:

The pipes used are made of high-grade stainless steel. If soiled, these can be treated the same way as tanks. For this you will find instructions in the operating instructions for stainless steel storage tanks.

10.3 Actions after maintenance tasks

After the maintenance tasks and before switching on the device:

- Check that all previously loosened bolted joints are tight.
- Check that all previously removed guards, covers and tank lids are properly reinstalled.
- Make sure that all tools, materials and other equipment have been removed from the work area.
- Clean the work area and remove any leaked substances such as liquids, processing material or similar.
- Make sure that all safety devices and the system are working properly again.

11.0 Faults

Faults in electrical equipment and in components of mechanical, pneumatic and hydraulic systems may only be rectified by suitably trained specialists in these areas. If faults cannot be remedied with the measures described below, inform the manufacturer or a service partner authorized by the manufacturer.

11.1 Malfunctions

Fault	Possible cause	Remedy	Remark
Domestic water temperature too low **Domestic water hygiene endangered.**	No power supply	– Turn on the main switch – Check the supply line – Check circuit breaker or fuse and contactor	
	No water supply – No cold water pressure – Primary differential pressure too low – Not enough hot water	Operating conditions – Pressure – Flow rate – Establish/secure differential pressure	Heat or media provider
	Wrong controller setting(s)	Correct settings	Operating instructions for controller
	Closed shut-off valve(s)	Open valves	
	Defective sensor	Replace sensor	
	Defective charge pump (LPU) or charge pump not switched on	Switch on/replace	
	Defective heating (supply) pump (HPU) or heating pump not switched on	Switch on/replace	
	Defective control valve	Clean/free up, exchange if necessary	
	Defective actuator or thermostat	Replace actuator/thermostat	
	System dimensioned incorrectly	– Check dimensioning – Expand/enlarge system	Contact our specialist advisers
	System is overdrawn	– Check dimensioning – Expand/enlarge system	Contact our specialist advisers
Domestic water temperature too high **Risk of scalding.**	– No power supply – Electric actuator disconnected	– Take the system out of service – Restore power supply – If necessary, operate in manual emergency mode	
	Wrong controller setting(s)	Correct settings	Operating instructions for controller
	Defective sensor	Replace sensor	
	Defective control valve	Clean/free up or replace valve	Valve stuck
	Defective actuator or thermostat	Replace actuator/thermostat	Actuator in position “OPEN” or thermostat/capillary tube defective
Domestic water temperature fluctuates or not constant **Risk of scalding.**	Wrong controller setting(s)	Correct settings – Controller gain setting – Reset time – Valve operating time / pump parameters	Operating instructions for controller
	Fluctuating heating water supply – Fluctuating primary differential pressure – Fluctuating heating water flow	Operating conditions – Pressure – Flow rate – Establish/secure differential pressure	Heat or media provider
Leakage of media **Risk of scalding.**	Leaky connections (flange/ screw connections)	Switch off the system – Check operating parameters for correctness (see label) – Check connections, retighten if necessary or replace gaskets	
	Leakage of weld seams	Switch off the system	Contact customer service
	Leakage of valves or fittings (housing/screw connections)	– Check valves for the correct fitting or installation – Retighten packing glands or replace parts	Operating instructions Contact manufacturer or customer service if necessary
	– Leakage of bolted heat exchangers – Soiling/calcification – Pressure surges	– Retighten bolts – Open and clean – Replace gaskets	Operating instructions Contact manufacturer or customer service
	– Leakage of brazed or welded heat exchangers – Soiling/calcification – Pressure surges	Change device	Operating instructions Contact manufacturer or customer service

11.2 What to do when faults occur

The following generally applies:

1. In case of faults that pose an immediate danger to persons, property and/or operational safety, stop the system immediately with the emergency stop button.
2. In case of faults which do not pose such risks, switch off the system via the system controller, disconnect power to the device, and secure it against reconnection.
3. Immediately inform the responsible person on site about the problem.
4. Have authorized specialist personnel determine the nature and extent of the fault, determine the cause, and have the fault rectified.

WARNING!
Improper troubleshooting can result in serious personal injury and/or property damage. It may therefore only be carried out by trained and authorized specialist personnel.

12.0 Spare parts

Only use original spare parts from the manufacturer.

If non-approved spare parts are used, all warranty, service, damage and liability claims against the manufacturer or its agents, dealers and representatives are forfeited.

When ordering spare parts, please indicate:

– Device type
– ID/production number
– Part number / item number (see parts list / wiring diagram)
– Quantity
– Designation
– Desired shipping method (post, freight, sea, air, express)
– Shipping address
– If necessary, a sketch or photo with comments

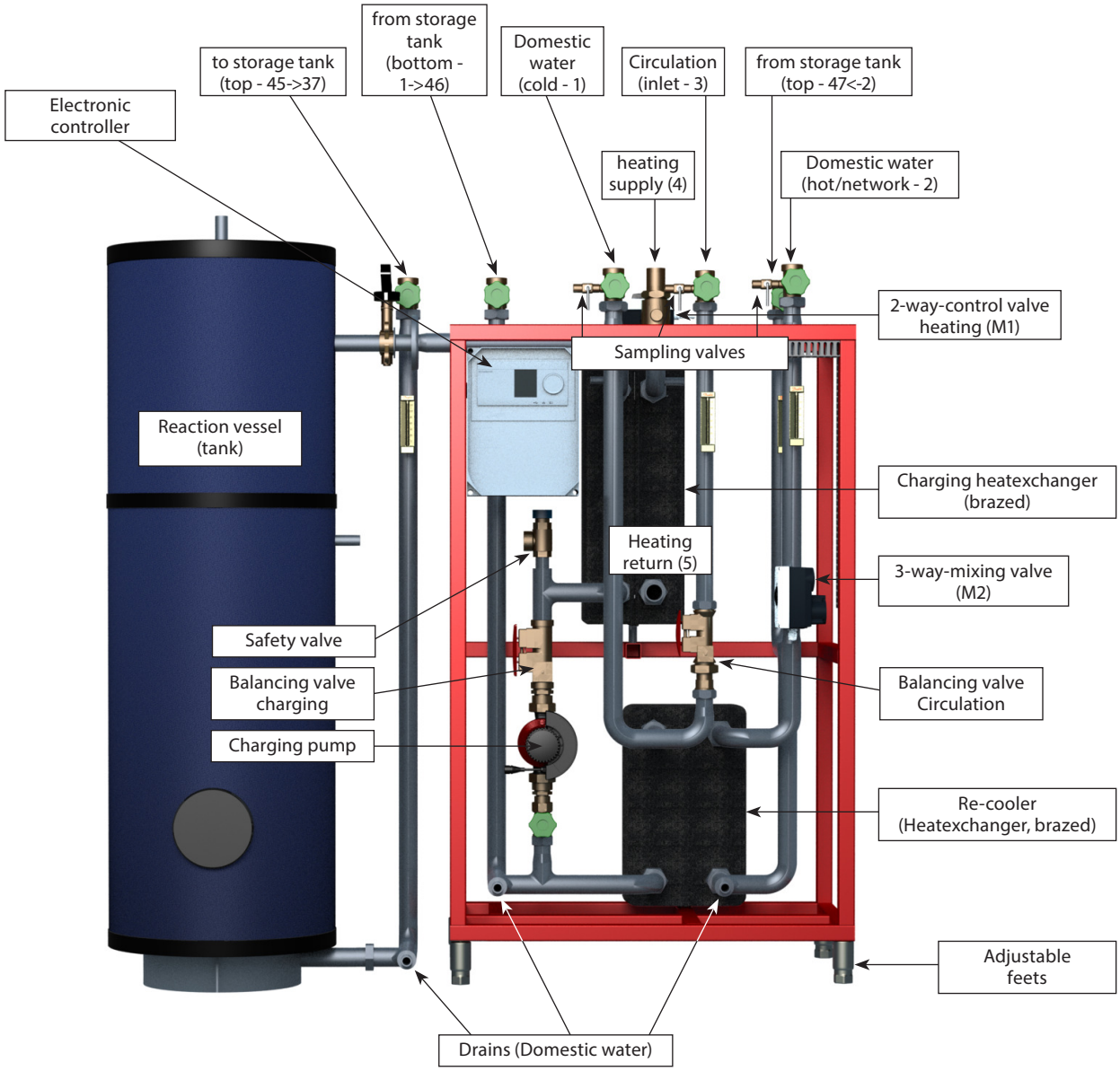
Spare parts orders without above-mentioned information cannot be processed. If you do not specify the shipping method, shipping is at the discretion of the supplier. Inform the manufacturer comprehensively about parts usage so that an equivalent replacement can be offered.

CAUTION!
Incorrect or faulty replacement parts and components from third-party manufacturers can lead to severe damage, malfunction or total failure of the device.

INDEX

Annex

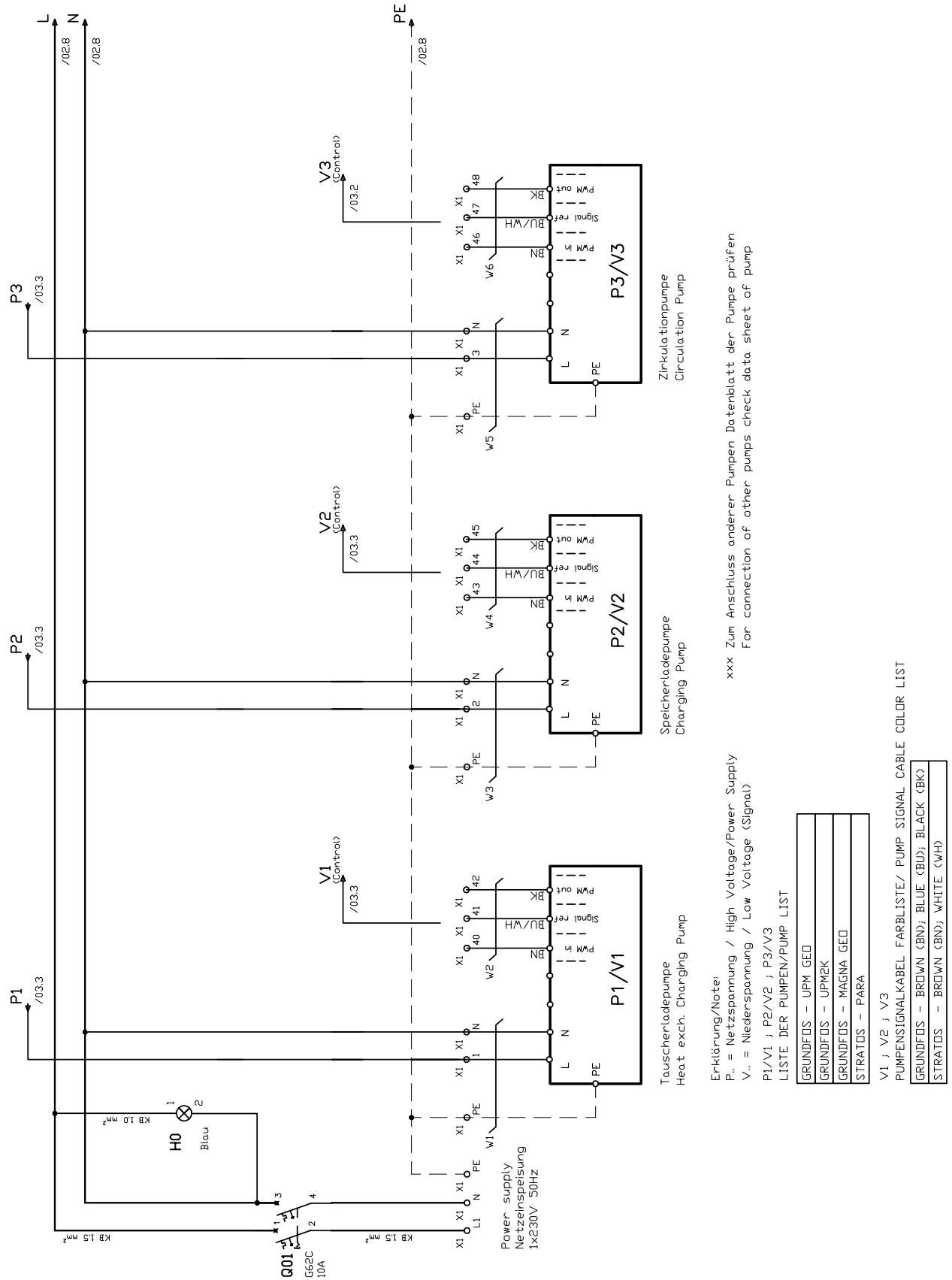
Layout / Part locations ThermoClean® - DL



Wiring diagram

power supply and pump connections

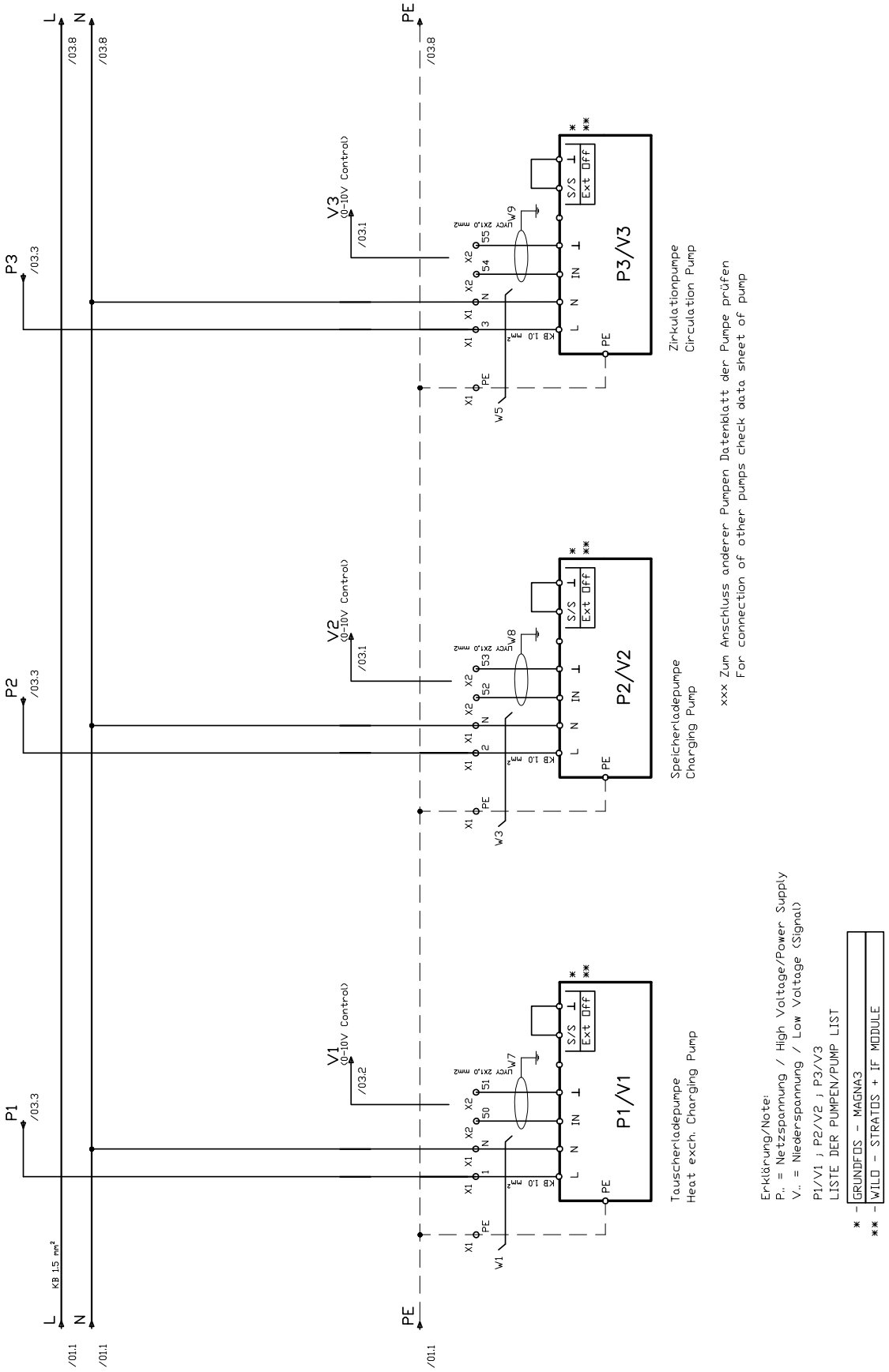
Variant: ThermoClean® – DL



Wiring diagram

power supply and pump connections

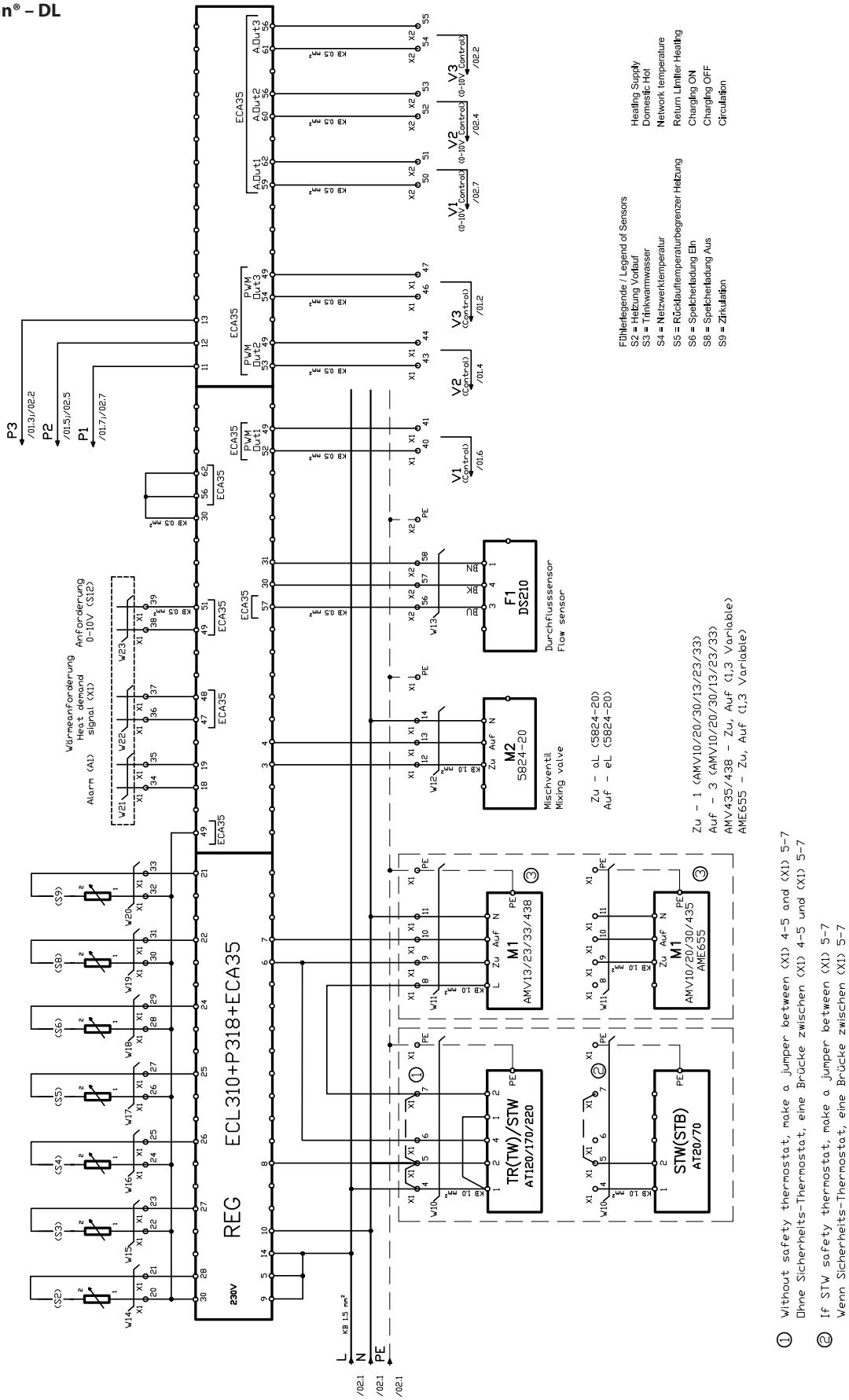
Variant: ThermoClean® – DL



Wiring diagram

Controller drive and sensor terminal assignments

Variant: ThermoClean® – DL



① Without safety thermostat, make a jumper between (X1) 4-5 and (X1) 5-7
Ohne Sicherheits-Thermostat, eine Brücke zwischen (X1) 4-5 und (X1) 5-7

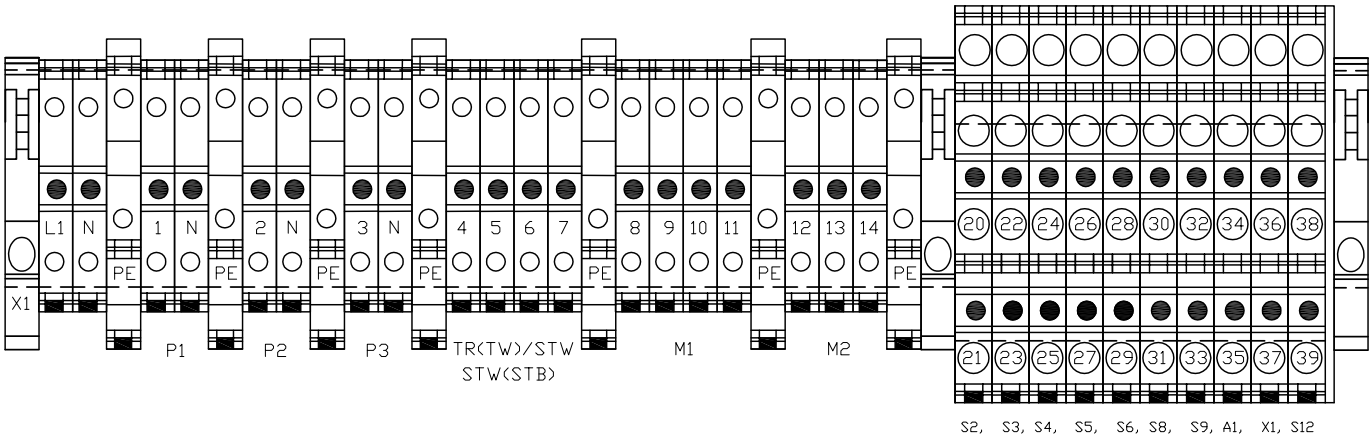
② If STW safety thermostat, make a jumper between (X1) 5-7
Wenn Sicherheits-Thermostat, eine Brücke zwischen (X1) 5-7

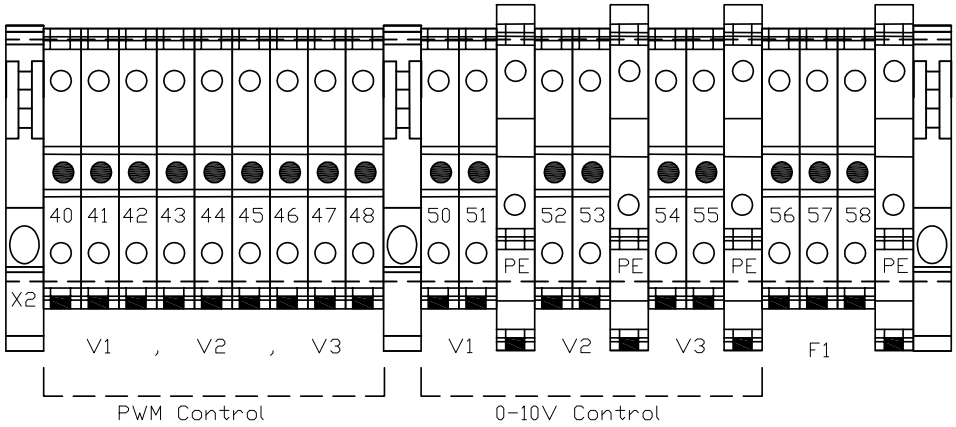
③ AMV10, AMV13, AMV435, AME655 - without a protective conductor
AMV10, AMV13, AMV435, AME655 - ohne Schutzleiter

Wiring diagram

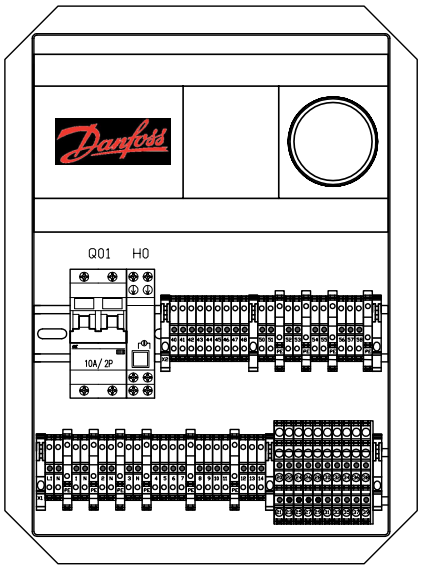
Terminal plan X1

Variant: ThermoClean® - DL

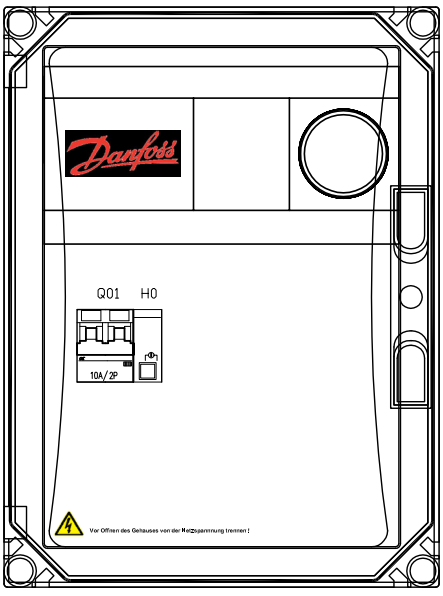




Innenansicht
Interior view



Aussenansicht
Outside view



Legende:
Q01 - Sicherung
H0 - LED (Betrieb)
X1,X2 - Klemmen

Legend:
Q01 - Current breaker
H0 - LED (operation)
X1,X2 - Clamp

Danfoss A/S
DK-6430 Nordborg
Denmark
CVR nr.: 20 16 57 15

Telephone: +45 7488 2222
Fax:+45 7449 0949

EU DECLARATION OF CONFORMITY

Danfoss A/S

Danfoss Heating Segment

Declares under our sole responsibility that the

Product(s) Heavy Duty Stations for Domestic Hot Water

Type(s)

TD-FLS COMBI	ThermoDual® FLS Combi Instantaneous Domestic Hot Water Heater
TD-FLS	ThermoDual® FLS Instantaneous Domestic Hot Water Heater
TD-CM	ThermoDual® CM Storage Charging System, Brazed
TD-CMG	ThermoDual® CM Storage Charging System, Gasketed
TD-CIRC	ThermoDual® CM Circulation System, Brazed
TD-S LM-S TD-GS	ThermoDual® TD-S, LM-S, TD-GS Storage Charging System with tank, Brazed + Gasketed
MH	Multiheat 2-Step-Storage Charging System, Brazed
TC-C	ThermoClean® Combi Antilegionella System, Brazed
TC-DL	ThermoClean® DL Antilegionella System, Brazed

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

MD – Machinery Directive (2006/42/EC)
EN ISO 12100:2011 Safety of Machinery – General principles for design – Risk assessment and risk reduction
EN 60204-1:2016, Safety of machinery – Electrical equipment of machines – Part 1: General requirements
EN 60730-1:2016, Automatic electrical controls for household and similar use – Part 1: General requirements
EN 60730-2-9:2011, Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls.

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EMC – Electromagnetic Compatibility Directive (2014/30/EU)
EN 61000-6-1:2007, Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments
EN 61000-6-2:2005, Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-3:2007, Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments
EN 61000-6-4:2007, Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments

Products marked as PED Category I, II, III covered by this declaration, are also in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

PED – Pressure Equipment Directive (2014/68/EU)
EN 13480-1:2012, Metallic industrial piping – Part 1: General
EN 13480-4:2012, Metallic industrial piping – Part 4: Fabrication and installation
EN 13480-5:2012, Metallic industrial piping – Part 5: Inspection and testing

Products marked as PED Category I covered by this declaration, have been evaluated by Conformity Assessment Procedure according to Module A: Internal control of inspection.

Products marked with PED Category II, III covered by this declaration, have been evaluated by

Notified Body – 0041
Bureau Veritas UK, Parklands, Wilmslow Road
Didsbury, Manchester,
M20 2RE – United Kingdom

According to Module H1: Full quality assurance plus design examination.

The following certificate has been issued:
CE-0041-PED-H1-DAN-001-15-DNK-rev-A

Products are marked with CE **0041**

Date	Issued by	Date	Approved by
23.06.2017	Signature Name: Firan Mihai Lucian Title: R&D Manager	23.06.2017	Signature Name: Marcin Rewucki Title: Quality Director

Danfoss only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation

ID No: VJLZE25B

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Danfoss A/S
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Denmark
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Telephone: +45 7488 2222
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EU Konformitätserklärung

Danfoss A/S

Danfoss Heating Segment

erklärt in alleiniger Verantwortung, dass das (die)

Produkt(e) Trinkwassererwärmungssystem(e)

Typ(e)

TD-FLS COMBI	ThermoDual® FLS Combi Durchflußwassererwärmer
TD-FLS	ThermoDual® FLS Durchflußwassererwärmer
TD-CM	ThermoDual® CM Speicherlademodul, gelötet
TD-CMG	ThermoDual® CM Speicherladesystem, geschraubt
TD-CIRC	ThermoDual® CIR Zirkulationsmodul, gelötet
TD-S, LM-S, TD-GS	ThermoDual® TD-S, LM-S, TD-GS Speicherladesystem incl. Speicher, Gelötete + Gedichtete Wärmeübertrager-Ausführung
MH	Multiheat 2-Schritt-Speicherlademodul, gelötet
TC-C	ThermoClean® Combi Antilegionellen System, gelötet
TC-DL	ThermoClean® DL Antilegionellen System, gelötet

Voraussetzung ist, dass die Produkte bestimmungsgemäß entsprechend der Betriebsanleitung eingesetzt werden und keine Veränderungen an den Produkten durch Dritte vorgenommen wurden.

MD - Maschinenrichtlinie (2006/42/EG)
EN ISO 12100: 2011 Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung
EN 60204-1: 2016 Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen
EN 60730-1: 2016 Automatische elektrische Regel- und Steuergeräte - Teil 1: Allgemeine Anforderungen
EN 60730-2-9: 2011 Automatische elektrische Regel- und Steuergeräte für den Hausgebrauch und ähnliche Anwendungen - Teil 2-9: Besondere Anforderungen an temperaturabhängige Steuerungen

ID No: VJLZE25B

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EMV - Elektromagnetische Verträglichkeit (2014/30/EU)
EN 61000-6-1: 2007 Elektromagnetische Verträglichkeit (EMV) - Teil 6-1: Fachgrundnormen - Störfestigkeit für Wohnbereich , Geschäfts- und Gewerbebereich
EN 61000-6-2: 2005 Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche
EN 61000-6-3: 2007 Elektromagnetische Verträglichkeit (EMV) - Teil 6-3: Fachgrundnormen - Störaussendung für Wohn-, Geschäfts- und Gewerbebereich
EN 61000-6-4: 2007 Elektromagnetische Verträglichkeit (EMV) - Teil 6-4: Fachgrundnormen - Störaussendung für Industriebereich

Produkte, die als PED-Kategorie I, II, III gekennzeichnet sind und unter diese Erklärung fallen, stimmen auch mit den folgenden Direktiven, Standards oder anderen normativen Standards überein, sofern die Produkte gemäß unseren Anweisungen verwendet werden.

PED - Druckgeräterichtlinie (2014/68/EU)
EN 13480-1:2012 Metallische industrielle Rohrleitungen - Teil 1: Allgemeines
EN 13480-4:2012 Metallische industrielle Rohrleitungen - Teil 4: Fertigung und Verlegung
EN 13480-5:2012 Metallische industrielle Rohrleitungen - Teil 5: Prüfung

Produkte, die als PED-Kategorie I gekennzeichnet sind und unter diese Erklärung fallen, wurden nach dem Konformitätsbewertungsverfahren gemäß Modul A: „Interne Fertigungskontrolle“ geprüft und bewertet.

Produkte, die als PED-Kategorie II, III gekennzeichnet sind und unter diese Erklärung fallen, wurden nach dem Konformitätsbewertungsverfahren gemäß Modul H1: „Vollständige Qualitätssicherung plus Designprüfung“ geprüft und bewertet. Die Prüfung erfolgte durch:

Benannte Stelle - 0041
Bureau Veritas UK, Parklands, Wilmslow Road
Didsbury, Manchester,
M20 2RE – United Kingdom

Ausgestelltes Zertifikat:
CE-0041-PED-H1-DAN-001-15-DNK-rev-A

Produkte sind gekennzeichnet mit CE **0041**

Date	Issued by	Date	Approved by
23.06.2017	Signature Name: Firan Mihai Lucian Title: R&D Manager	23.06.2017	Signature Name: Marcin Rewucki Title: Quality Director

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ID No: VJLZE25B

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MANUFACTURER'S DECLARATION

Danfoss A/S

Danfoss Heating Segment

Declares under our sole responsibility that the

Product(s) Heavy Duty Stations for Domestic Hot Water

Type(s)

TD-FLS COMBI	ThermoDual® FLS Combi Instantaneous Domestic Hot Water Heater
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MH	Multiheat 2-Step-Storage Charging System, Brazed
TC-C	ThermoClean® Combi Antilegionella System, Brazed
TC-DL	ThermoClean® DL Antilegionella System, Brazed

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption
EN 806-1:2000 Specification for installations inside buildings conveying water for human consumption – Part 1: General

EN 806-2:2005 Specification for installations inside buildings conveying water for human consumption – Part 2: Design

EN 806-3:2006 Specification for installations inside buildings conveying water for human consumption – Part 3: Pipe sizing – Simplified method

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National norms and legislations Germany and Austria:
DIN 4747-1:2009 Heating plants for district heating - Part 1: Safety requirements for domestic substations, stations and domestic systems to be connected to hot-water district heating networks, Corrigendum to DIN 4747-1:2003-11

DIN 4753-3:2011 Water heaters, water heating installations and storage water heaters for drinking water - Part 3: Corrosion protection on the water side by enamelling and cathodic protection - Requirements and testing

DIN 1988-600:2010 Codes of practice for drinking water installations - Part 600: Drinking water installations in connection with firefighting and fire protection installations;

DVGW code of practice, DWGW working sheet W551

AGFW Guide FW527

DIN EN 12828:2014 Heating systems in buildings - Design for water-based heating systems; German version EN 12828:2012+A1:2014

Ö-Norm B 5019 Hygienic aspects of the planning, construction, operation, surveillance and rehabilitation of central heating installations for drinking water.

Date	Issued by	Date	Approved by
23.06.2017	Signature Name: Firan Mihai Lucian Title: R&D Manager	23.06.2017	Signature Name: Marcin Rewucki Title: Quality Director

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Telephone: +45 7488 2222
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Herstellererklärung

Danfoss A/S

Danfoss Heating Segment

erklärt in alleiniger Verantwortung, dass das(die)

Produkt(e) Trinkwassererwärmungssystem(e)

Typ(e)

TD-FLS COMBI	ThermoDual® FLS Combi Durchflußwassererwärmer
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TD-CMG	ThermoDual® CM Speicherladesystem, geschraubt
TD-CIRC	ThermoDual® CIR Zirkulationsmodul, gelötet
TD-S, LM-S, TD-GS	ThermoDual® TD-S, LM-S, TD-GS Speicherladesystem incl. Speicher, Gelötete + Gedichtete Wärmeübertrager-Ausführung
MH	Multiheat 2-Schritt-Speicherlademodul, gelötet
TC-C	ThermoClean® Combi Antilegionellen System, gelötet
TC-DL	ThermoClean® DL Antilegionellen System, gelötet

Voraussetzung ist, dass die Produkte bestimmungsgemäß entsprechend der Betriebsanleitung eingesetzt werden und keine Veränderungen an den Produkten durch Dritte vorgenommen wurden.

Richtlinie 98/83/EG des Rates vom 3. November 1998 über die Qualität von Wasser für den menschlichen Gebrauch
EN 806-1:2000 Technische Regeln für Trinkwasser-Installationen - Teil 1: Allgemeines

EN 806-2:2005 Technische Regeln für Trinkwasser-Installationen - Teil 2: Planung

EN 806-3:2006 Technische Regeln für Trinkwasser-Installationen - Teil 3: Berechnung der Rohrinnendurchmesser - Vereinfachtes Verfahren

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Nationale Normen und Vorschriften in Deutschland und Österreich:
DIN 4747-1:2009-09 Fernwärmeanlagen - Teil 1: Sicherheitstechnische Ausrüstung von Unterstationen, Hausstationen und Hausanlagen zum Anschluss an Heizwasser-Fernwärmenetze, Berichtigung zu DIN 4747-1:2003-11

DIN 4753-3:2011-11 Trinkwassererwärmer, Trinkwassererwärmungsanlagen und Speicher-Trinkwassererwärmer - Teil 3: Wasserseitiger Korrosionsschutz durch Emaillierung und kathodischer Korrosionsschutz - Anforderungen und Prüfung

DIN 1988-600:2010-12 Technische Regeln für Trinkwasser-Installationen - Teil 600: Trinkwasser-Installationen in Verbindung mit Feuerlösch- und Brandschutzanlagen;

Technische Regel des DVGW, DWGW Arbeitsblatt W551

AGFW Richtlinie FW527

DIN EN 12828:2014-07 Heizungsanlagen in Gebäuden - Planung von Warmwasser-Heizungsanlagen; Deutsche Fassung EN 12828:2012+A1:2014

Ö-Norm B 5019 Hygienerelevante Planung, Ausführung, Betrieb, Überwachung und Sanierung von zentralen Trinkwasser-Erwärmungsanlagen

Date	Issued by	Date	Approved by
23.06.2017	Signature Name: Firan Mihai Lucian Title: R&D Manager	23.06.2017	Signature Name: Marcin Rewucki Title: Quality Director

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Field device configuration and hydraulic parameters

(pumps / control valves / heat exchanger)

System and control application					Heatexchanger		Pump, domestic side		Valve / Actuator heating side			Valve / Actuator domestic side			Circulation pump			
Type	Capacity	Control	System		load/charge	re-cool	Charging pump [P2]	Nominal flow	Valve	k_{vs}	Actuator [M1]	Valve	k_{vs}	Acyuator [M1]	Circulation pump [P3]	Flow	internal
	[kW]	Type	Applica-tion	Code	Type	Type	Type	[m³/h]	Type	[m³/h]	Type	Type	[m³/h]	Type	Type	MAX [m³/h]	Pressure drop
TC-DL	84	2-Way-Valve w./o. Safety Function	318.2a	004X1618	XB37H-1 60	XB37L-1 60	STRATOS PARA Z 25/1-12	2,40	VM2	8,00	AMV 20	3226 M/DVGW	16,00	5824-20	on site (by customer)	1,80	19
	147			004X1619	XB59M-1 60	XB 52M-1 40	STRATOS PARA Z 25/1-12	4,20		16,00			16,00			3,15	22
	210			004X1620	XB59M-1 70	XB 52M-1 50	STRATOS PARA Z 25/1-12	6,00		25,00			25,00			4,50	20
	315			004X1621	XB59M-1 100	XB 52M-1 60	MG3 40-80FN	9,00	VB2	40,00			40,00			6,75	22
	420			004X1622	XB59M-1 120	XB 52M-1 80	MG3 40-80FN	12,00		40,00			40,00			9,00	26
	546			004X1623	XB59M-1 140	XB 52M-1 100	MG3 40-100FN	15,60	VFG2	50,00	AME 655		40,00			11,70	33

Danfoss A/S
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