System comparison of the Löbbe ibcflex-series - ibcflexSM, ibcflex & ibcflexHC

Introduction:

Our system series ibcflexSM, ibcflex & ibcflexHC are cooling and heating systems specially designed for electric heating and cooling of several tank containers. Thereby, ibcflexSM and ibcflex are heating systems only and ibcflexHC is a cooling and optional heating system. This series of systems was designed as external stand-alone systems for multiple tank containers. When used in logistics depots, up to four tank containers can be connected simultaneously with the same supply temperature. Modular in design, the result of each system is an individual and maintenance-friendly design with many expansion options.

Function:

The systems of the ibcflex series temper the tank contents indirectly via the outer wall of the container. For this purpose, the cooling and heating system is connected via a dry coupling to the half-pipes normally used for steam heating. This creates a closed circuit through which the circulating pump conveys a cooling/heating medium. The cooling/heating medium is a food-hygienically safe glycol-water mixture.

ibcflexSM & ibcflex are pure heating systems and therefore only have the heating mode. In heating mode, the electric heater integrated in the system heats the heating medium. The heating of the heat transfer fluid is carried out according to the principle of a continuous flow heater, whereby this is strictly separated in terms of material from the customer product.

ibcflexHC has a cooling system consisting of a refrigeration compressor and a plate heat exchanger as standard. In cooling mode, the heat exchanger extracts heat energy from the glycol-water mixture, which is strictly separated from the customer product. The heating mode works exactly as previously described for ibcflexSM & ibcflex.

The power supply for the system is provided by one/two industry standard 380-440 V CEE plugs.

Cooling and heating is fully automatic. The flow temperature at which the cooling/heating medium flows into the container's pipe circuit can be set with high precision. This means that even very temperature-sensitive products are protected from quality losses due to contact temperatures that are too high or too low. Depending on the number of tank containers connected, only the volume of the cooling/heating medium actually used is ever heated. Even with a full storage tank, the design always remains transportable.

Additional info:

ibcflexSM is the most compact and flexible variant of the ibcflex series. Although it initially only offers the possibility of heating two instead of the usual four tank containers at the same time, it is significantly smaller in size and is mounted on heavy-duty rollers, which enable fast transport over short distances. ibcflexSM generally comes with better basic equipment than ibcflex & ibcflexHC. It generally has the new microflexPLC control system, advanced telematics, control and safety functions and much more.

ibcflex is the standard version of all electric external transportable heating systems. It has all the standard functions and represents the basic equipment of all external transportable heating systems, by some options extended equipment can be retrofitted. Among them is for example the PLC control.

ibcflexHC is the cooling system of the series. Just like ibcflex, ibcflexHC has all the standard functions, except that instead of heating, cooling is the standard function. Unlike the other systems, ibcflexHC can optionally also heat. Just like ibcflex, ibcflexHC has the basic equipment and can be upgraded with some options.

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ibc-heater HEATING-SYSTEM by LÖBBE

ibc-cooling & HEATING-SYSTEM by LÖBBE

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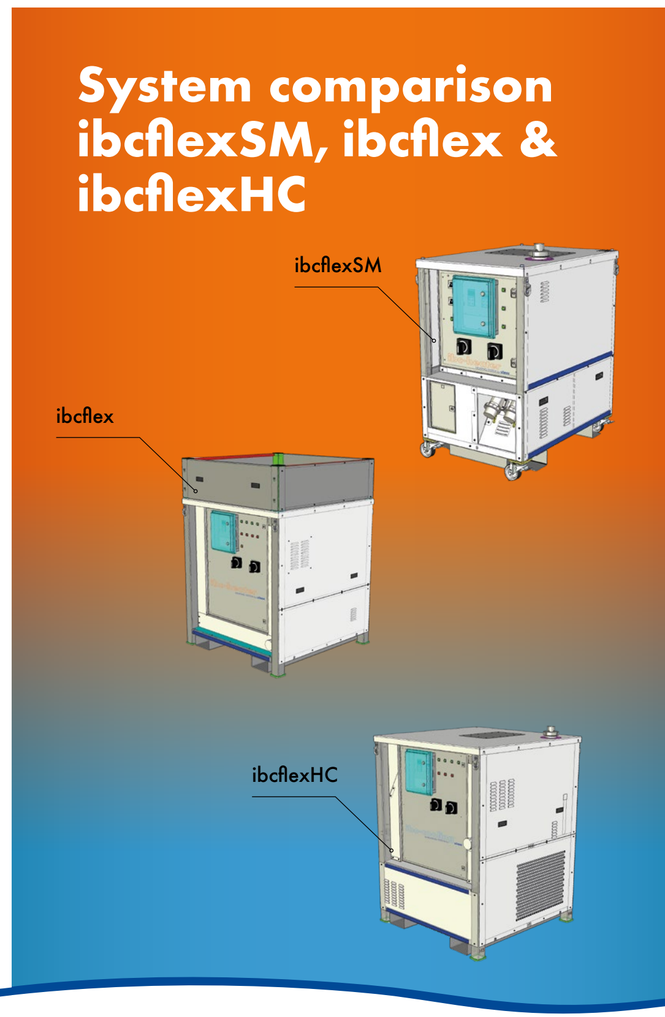

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AUTOMATION & DRIVES · HEATING & COOLING-SYSTEMS

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ibcflexSM 2.0

ibc-heater HEATING-SYSTEM by LÖBBE

ibcflex 1.4

ibc-heater HEATING-SYSTEM by LÖBBE

ibcflexHC 1.1

ibc-cooling & HEATING-SYSTEM by LÖBBE

	ibcflexSM 2.0	ibcflex 1.4	ibcflexHC 1.1
Product group:	Glycol/water heating systems for external connection to the steam pipes of tank containers		Glycol/water cooling- and heating system for external connection to the steam pipes of tank containers
Product details:	+ The weatherproof systems are designed for temperature control of tank containers in warehouses or depots		
Housing formfactor:	+ Space-saving, robust cuboid housing. Optionally with storage space for hoses and accessories		
Installation of operator panel:	The control panel attached to the control cabinet at the front of the device, all functions and status messages can be viewed and operated from there		
Heating power:	Up to 38 kW (at 440 V)	+ Up to 57 kW (at 440 V)	+ Up to 38 kW heating- and 3,5 kW cooling-power (at 440 V)
System safety:	Stage II	Stage II or with PLC, microflexPLC Stage III	
Mains connection:	1x or 2x 32 A CEE - 380 to 440 VAC (50/60 Hz)	2x or 3x 32 A CEE - 380 to 440 VAC (50/60 Hz)	1x or 2x 32 A CEE - 380 to 440 VAC (50/60 Hz)
Ambient temperatures:	-20 °C to +40 °C		
Max. preflow temperatures:	Up to 95 °C		+ From -10 °C to 55 °C regulator version or 85 °C PLC version
Max. container connections:			
Air compressor option:	Yes (the compressor option offers the possibility to return the heating/cooling medium to the storage tank of the ibcflex without an external device)		
Control unit:	+ microflexPLC controlled	Regulator or PLC controlled	
Control schematic:	+ The system has an intuitive visualization, almost all functions are operated using a touch display	The system is operated by a control panel and the regulators. Optional intuitive visualization, almost all functions are operated using a robust touch display	
Scope of functions:	+ Advanced functions (TRM, SFM, PCM, SCM, ECO)[4]	Simple or with PLC advanced functions (TRM, SFM, PCM, SCM, ECO)[1]	
Telematics interface:	+ With data interface (all common protocols)	With data interface (RS485/Modbus, other common protocols with PLC)	
Telematics scalable:	+ Extended telematics functions, in addition to the simple telematics functions also detailed, historized fault messages incl. remote maintenance[4]	Simple telematics: simple telematics functions telematics functions PLC/microflexPLC (optional): simple telematics functions and additionally also detailed, historicised fault messages incl. remote maintenance (2)	
Installation positions:	ibcflex is set up on a straight surface; steep inclines and soft ground should be avoided		
Maintenance:	+ The heating rod and other wearing parts are easy to reach and replace (partly by Tri-Clamp connections)		
Housing:	+ The housing consists of a galvanized steel frame, powder-coated aluminum and a stainless-steel control cabinet. It is therefore hardly vulnerable to corrosion		

[1]see list of abbreviations/special functions. [2]Remote maintenance access to the heating system is only possible with our self-developed telematics (working title teleflex).

Pictograms & abbreviations list:

- **Cooling**
- **Cooling heating**
- **Heating**
- **Glykol** (up to 95 °C optional up to 110 °C)
- **Thermaloil** (up to 230 °C)
- **Diesel burner**
- **High power**
- **Battery**
- **Generator**

TRM: Temperature Rise Monitoring
The controller monitors the rate of temperature rise. If this rises too quickly, the heat is not transported away correctly and there is a high probability of a flow fault; the system then switches off the heating process and outputs an error message.

SFM: Software Flow Monitoring
The temperature of the heating medium is monitored at two points in the system. If the differential temperature remains stable within a set range, the flow of the heating medium is in order. If the differential temperature drops, there is a flow fault, and a warning message is issued.

PCM: Power Contactor Monitoring
The mechanical main and circuit contactors in the system are switched at fixed intervals (once a day), the auxiliary contacts are monitored, and it is determined whether the contactor is still working reliably. In this way, any „sticking" of the contactor can be determined. If one of the two contactors no longer switches correctly, the system is disabled for heating processes and an error message is displayed.

DBM: Double Boost Mode
This mode is currently only available for the hybrid and dflexHP systems. When connected to the mains voltage, the system can also switch on the diesel burner in addition to the electric heating element. This is only possible for a certain period and is then blocked until the system is restarted.

SCM: Single Channel Monitoring (ibcflex only)
The single channel monitoring measures the temperature at each back flow connection of the ibcflex, thus the most accurate temperature control of the product is possible. This monitoring can also be carried out directly in the product, either cable-bound or by radio sensors.

ECO: Eco Mode
The eco mode is an automatic operating mode to make the heating process as energy-efficient as possible. In a system with a minimum of two heating elements, both are controlled in such a way that the heating phase is as short as possible, and the holding phase is as economical as possible.

STB: Safety Temperature Limiter
The safety temperature limiter is a standard component installed in every heating system, from Stage I to Stage III. It is the most important and, in case of a temperature rise monitoring (TRM) in the system, also the last instance for emergency shutdown of the heating process. The sensor of the STB is located directly on the heating rod and switches off the heating rod at a fixed defined overtemperature (e.g., 105 °C).

Stage I-III: Safety Level (I – lowest / III – highest level)
The individual safety levels are shown in a table, currently only levels II and III are used. Level I is only used in old or transitional systems.