









Product group:	Electrically operated glycol/water heating system for integration on tank containers
Product details:	In addition to the possibility of heating a product, cflex also offers a cooling function
Housing formfactor:	The container must be slightly adapted to the design of the system <sup>1</sup>
Installation of operator panel:	Control panel installation at different locations under certain conditions
Cooling-/Heating power:	Up to 8,1 kW <sup>2</sup> cooling and 12 kW heating power (at 440 V)
System safety:	Stage II (optional Stage III)
Mains connection:	32 A CEE - 380 to 440 VAC (50/60 Hz)
Ambient temperatures:	-20 °C – +40 °C
Min./Max. preflow temperatures:	From -15 °C to +85 °C
Control unit:	Regulator, PLC or microflexPLC controlled
aflex extention <sup>5</sup> :	Yes
Control schematic:	Operated by a control panel and the regulators. Optional: intuitive visualization, almost all functions are operated using a robust touch display
Range of functions::	Simple or, with PLC advanced Functions (TRM, SFM, PCM, SCM, ECO) <sup>3</sup>
Telematics interface:	With data interface (RS485/Modbus, other common protocols with PLC)
Telematics scalable:	Simple telematics functions, with PLC option extended telematics functions, in addition to the simple telematics functions also detailed, historized fault messages incl. remote maintenance <sup>4</sup>
Installation orientation:	Upright installation position
Clip-In Generator expandable <sup>6</sup> :	No, however, the system can be operated via a clip-on power generator
Maintenance:	The heating rod and other wearing parts are easy to reach and replace (partly by Tri-Clamp connections)
Housing:	All housings are made of stainless steel and are additionally powder-coated for corrosion protection

<sup>1</sup>It must be specified during the production of the container that a Löbbe hybrid or cflex system will be installed. Large container manufacturers such as CIMC, NT-Tank, Singamas, van Hool, or Welfit Oddy already work with us. <sup>2</sup>At condenser temperature 45 °C, evaporating temperature -10 °C and suction gas temperature at 20 °C (according to EN12900). <sup>3</sup>See list of abbreviations/special functions. <sup>4</sup>Remote maintenance access to the heating system is only possible with our self-developed telematics (working title teleflex). <sup>5</sup>aflex is an agitator extension for many of our heating systems and for our cooling /heating system cflex. The heating system is extended in the control accordingly and can control one or more agitator drives. The drives can additionally be equipped with frequency converters to control the rotation of the agitators. <sup>6</sup>The clip-in generator is a small power generator system which can operate electrically low-power heating systems, such as dflex and at the same time represent a runtime extension. Since a diesel-powered heating system can run longer on its diesel filling, than on its battery charge, the clip-in generator can be used to provide an equalization.

**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.