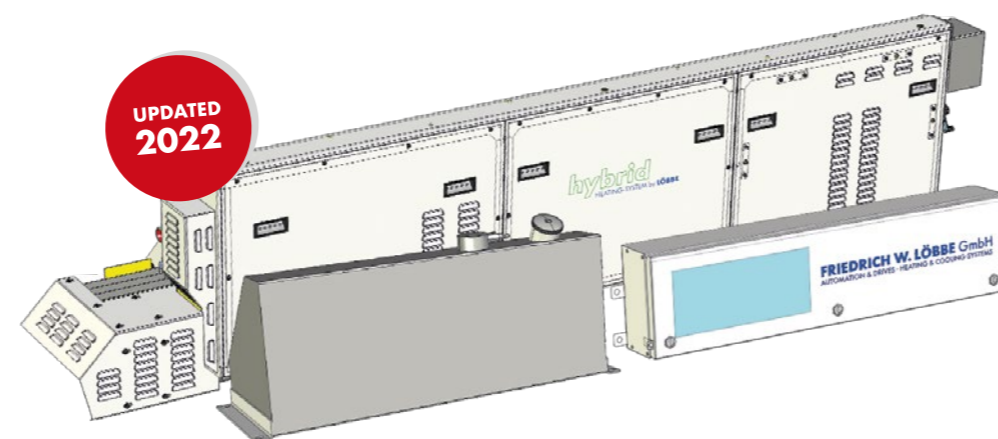


## Löbbe autarkic series: hybrid 1.4 (2.0)



**hybrid**  
HEATING-SYSTEM by LÖBBE

Product group:	Autarkic, diesel and electric glycol/water heating systems for integration in tank containers - diesel heating systems which are operated by their own battery system - independent of mains voltage!
Product details:	High power system, compact design
Housing formfactor:	The systems are adapted to the contours of the tank container in their narrow design
Installation of operator panel:	Installation possible at different locations on the tank container.
Heating power:	Up to 15 kW diesel heating power and 12 kW electric heating power
Scalable heating powe:	Double Boost Mode (DBM) - diesel and electric heater can heat together for a certain period = 27 kW heating power
System safety:	Stage III
Battery charging options:	Batteries can be charged using mains voltage or truck on-board voltage
Runtime examples:	Up to 58 h with 35 l fuel tank and 230 Ah battery/173 h with 120 l and 690 Ah bat.
Battery capacities:	230 Ah up to 460 Ah (LiFePo Battery)
Fuel storage:	35 or 120 l fuel tank (as of 460 Ah always 120 l)
Mains connection:	32 A CEE connection - 380 to 440 VAC (50/60 Hz)
Ambient temperatures:	-20 °C bis +40 °C <sup>2</sup>
Max. preflow temperatures:	Up to 90 °C in diesel operation/95 °C in electric operation
Control unit:	microflexPLC controlled
Control schematic:	The system has an intuitive visualization, almost all functions are operated using a touch display.
Range of functions:	Advanced control/and safety functions (TRM, SFM, PCM, DBM, ECO) <sup>4</sup>
Telematics interface:	With data interface for all common protocols (e.g., RS485/Modbus, CAN-Bus, Ethernet)
Telematics scalable:	Extended telematics functions, in addition to the simple telematics functions also detailed, historized fault messages incl. remote maintenance <sup>5</sup>
Installation orientation:	Upright installation position
Clip-in generator expandable <sup>6</sup> :	Integration of an economical clip-in generator possible
Maintenance:	Heating rod, diesel burner 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>The minimum ambient operating temperature depends on the diesel fuel used. To ensure safe operation at a minimum temperature of -20 °C, it may be necessary to use winter diesel to operate the burner and the generator. <sup>3</sup>It is possible to increase the temperature to 80 °C for a period of two hours (boost mode). After this time, this function is blocked until the system is restarted. <sup>4</sup>See list of abbreviations/special functions. <sup>5</sup>Remote maintenance access to the heating system is only possible with our self-developed telematics (working title teleflex). <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:

	<b>Cooling</b>		<b>Diesel burner</b>
	<b>Cooling heating</b>		<b>High power</b>
	<b>Heating</b>		<b>Battery</b>
	<b>Glykol</b> (up to 95 °C optional up to 110 °C)		<b>Generator</b>
	<b>Thermaloil</b> (up to 230 °C)		

#### 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.