

HL 320.02

Conventional heating



HL 320.02 heater installed in the bivalent storage tank of HL 320.05

Learning objectives/experiments

- complementary heating and/or domestic water heating by conventional additional heater
- bivalence point and heating load
- control strategies for complementary heating
- energy balances in conventionally supported solar thermal and heat pump systems

Description

- **complementary heater for the HL 320 modular system**
- **heater with electricity meter**
- **easy installation in HL 320.05 storage tank**

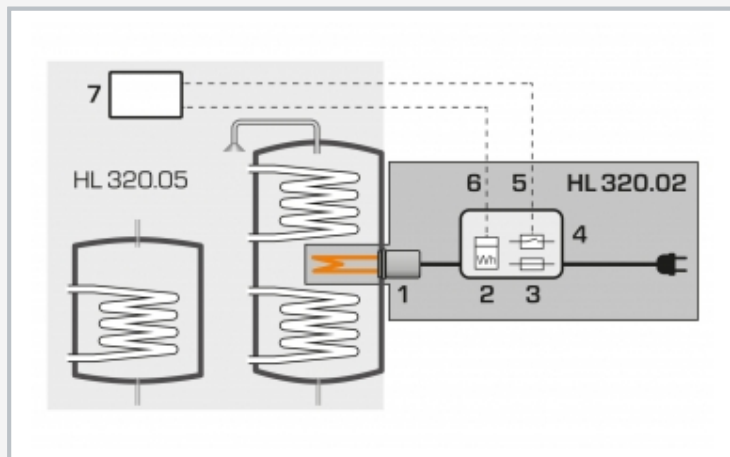
In heating systems using different renewable heat sources, it may be economically feasible to cover the peak demand by means of a conventional heater. In order to be able to investigate this aspect in the HL 320 modular system, the HL 320.02 module provides an additional heater that can easily be integrated into different system configurations.

The practicality of operating this heater in laboratory experiments is kept simple by using an electrically operated heater. The heater is inserted into the storage tank of the HL 320.05 storage module and can be controlled by the storage module's controller. An integrated meter records the amount of electricity consumed. The data from this meter can be sent to the controller of the HL 320.05 storage module via a suitable data cable, by means of the data logger.

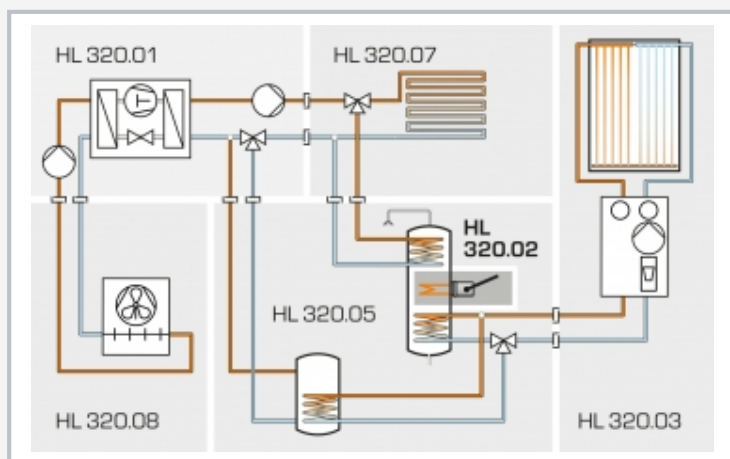
Carefully structured instructional materials have been created for the recommended modular combinations with the HL 320.02 module. As part of the documentation for the HL 320 modular system, these materials set out the basic principles and provide a step-by-step guide through the experiments.

HL 320.02

Conventional heating



1 heater, 2 energy meter, 3 fuse, 4 control cabinet 5 connection between contactor and controller output, 6 connection between energy meter and controller input, 7 controller attached to module HL 320.05



Inclusion of HL 320.02 in one possible configuration of the HL 320 modular system

	1	2	3	4	5
HL 320.01			X	X	X
HL 320.02		X			X
HL 320.03	X	X		X	X
HL 320.04	(X)	(X)		(X)	(X)
HL 320.05	X	X		X	X
HL 320.07		X	X	X	X
HL 320.08			X	X	X

Recommended combinations of the HL 320 modular system

Specification

- [1] electrical heater for the HL 320 modular system
- [2] control by means of the HL 320.05 module's controller
- [3] control cabinet with power contactor, miniature circuit breaker and energy meter
- [4] recording the amount of energy consumed by SO connection to the HL 320.05 module's controller

Technical data

Heater

- electric output: 3kW
- thermostat: 30...110°C

Electricity meter

- voltage: 230VAC, 50Hz
- max. current: 32A
- SO output: 1000Imp./kWh

230V, 50Hz, 1 phase
 230V, 60Hz, 1 phase
 Dxh: 115x370mm (heater)
 Weight: approx. 2kg
 LxWxH: 300x250x200mm (switch box)
 Weight: approx. 1,5kg

Scope of delivery

- 1 heater
- 1 switch box
- 1 manual

HL 320.02

Conventional heating

Required accessories

Combination 2

065.32003	HL 320.03	Flat plate collector
065.32005	HL 320.05	Central storage module with controller
065.32007	HL 320.07	Underfloor heating / geothermal energy absorber

Combination 5

065.32001	HL 320.01	Heat pump
065.32003	HL 320.03	Flat plate collector
065.32005	HL 320.05	Central storage module with controller
065.32007	HL 320.07	Underfloor heating / geothermal energy absorber
065.32008	HL 320.08	Fan heater / air heat exchanger

Optional accessories

Combination 2, 5

065.32004	HL 320.04	Evacuated tube collector
-----------	-----------	--------------------------