

HL 320.03 *Flat Plate Collector*



Technical Description

HL 320.03 is one of the modules from the HL 320 modular system and allows you to convert solar energy into heat using a modern flat plate collector.

HL 320.03 can be incorporated into the HL 320 modular system in a variety of different ways. The module can be used both for generating heated domestic water and for the combined production of domestic hot water and for heating rooms.

Modules are connected rapidly and easily via hoses and quick-release couplings.

Different combinations for renewable heat sources can be tested and optimised in conjunction with other modules from the HL 320 system.

Carefully structured instructional materials have been created for the intended module combinations with the HL 320.03 module. As part of the documentation for the overall HL 320 system, these materials set out the basic principles and provide a step-by-step guide through the experiments.

Learning Objectives / Experiments

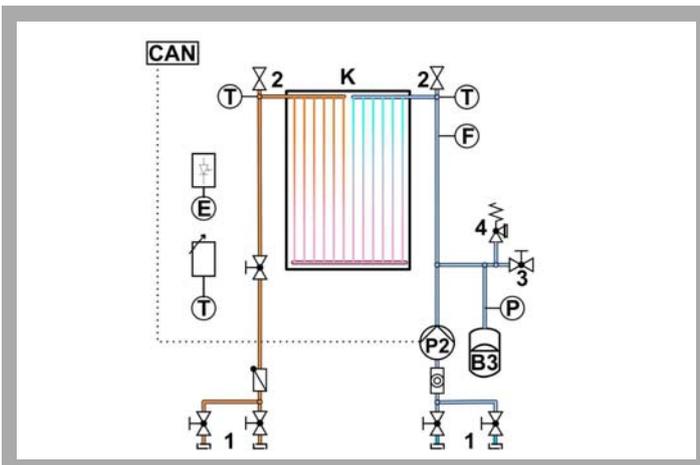
- layout and function of the flat collector
- determining the net power
- how temperature, illuminance and angle of incidence affect the collector efficiency
- integration of a flat collector in a modern heating system
- hydraulic and control engineering operating conditions
- energy balances
- optimisation of operating conditions for different types of use

- * **Pivotable flat plate collector for converting solar energy into heat**
- * **Heat source with connections for the HL 320 module system**
- * **Components for operational and system reliability from real-world modern heating technology**
- * **Suitable for sunlight and artificial light**

HL 320.03 Flat Plate Collector



1 vent valves, 2 lighting sensor, 3 flow sensor, 4 thermometer collector outlet, 5 shut-off valve, 6 connectors for warm water, 7 connectors for cold water, 8 diaphragm expansion vessel, 9 circulation pump, 10 pressure relief valve, 11 pressure sensor, 12 temperature sensor



Components: B3 diaphragm expansion vessel, K flat collector, P2 pump; 1 connections for heat transfer pipes with shut-off valves and quick-release coupling, 2 bleed valves, 3 fill valve, 4 pressure relief valve; E illuminance, F flow rate, T temperature, P pressure

Specification

- [1] trainer for the HL 320 modular system for the investigation of functional and operational behaviour of a flat collector
- [2] solar thermal flat collector with selectively absorbing coating
- [3] adjustable collector tilt angle
- [4] solar circulation station with pump, expansion tank and safety valve
- [5] measurement instruments and controls by HL320.05
- [6] operation with solar radiation or HL 313.01 Artificial Light Source

Technical Data

- Collector
- absorbing surface: 2.5m²
 - rated throughput: 40...150L/h
 - operating pressure: 1...3bar
 - safety valve: 4bar
- Solar circuit station
- solar pump: 3-stage
 - safety valve: 4bar
 - manometer: 0...6bar
 - balancing valve: 1...13L/min

Dimensions and Weight

LxWxH: 1660x800x2300mm
Weight: approx. 220kg

Required for Operation

230V, 50Hz, 1 phase

Scope of Delivery

- 1 trainer
- 1 set of instructional materials

	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

Order Details

065.32003 HL 320.03 Flat Plate Collector

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Available Accessories / HL 320 Modules

Item No. Order Details

065.31301 HL 313.01 Artificial Light Source
065.32001 HL 320.01 Heat Pump
065.32002 HL 320.02 Conventional Heating
065.32004 HL 320.04 Evacuated Tube 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