

HL 352

Test stand for oil, natural gas and propane gas burners



The illustration shows the trainer together with the HL 352.01 oil burner accessory

Learning objectives/experiments

- design and operating behaviour of a heating boiler
- comparison of burners (3 different burners available as accessories)
- changes in settings during operation with observation of the effects on the flame pattern
- temperature measurements in different areas of the combustion chamber
- oil pressure measurements on the burner with observation of the effect on the flame pattern
- thermal balance
- calculation of the thermal output of a heating boiler
- function of a plate heat exchanger

Description

- investigation of gas and oil burners
- viewing window for observing the flame pattern

Gas and oil burners can be used to generate heat for central hot water heating systems. Burners convert the chemically stored energy of the fuels into thermal energy. There are different types of burners that differ mainly in their design. Oil burners are distinguished as yellow flame or atomizing burners and blue flame burners. Gas burners can be built in the form of gas fan burners, which are optimised for different gases depending on the heating medium.

The HL 352 test stand can be used to study gas and oil burners and compare their thermal balance. The test stand consists of a heating boiler, a heating control unit and a domestic water heater.

The accessories HL 352.01 oil burner, HL 352.02 natural gas burner and HL 352.03 propane gas burner are available. The flue gas can be analysed with the HL 860 Exhaust gas analyser. The test stand is supplied with a fuel oil tank.

A viewing window is installed in the boiler body, which allows the flame to be observed and the settings on the burner to be immediately assessed.

The test stand is equipped with the prescribed safety devices. A heatable domestic water tank serves as a second heat consumer.

In addition to oil pressure and flow rate, all relevant temperatures, water flow rates and the combustion chamber temperature are measured. A thermal balance can be created from the measurement data and the energy efficiency can be determined.

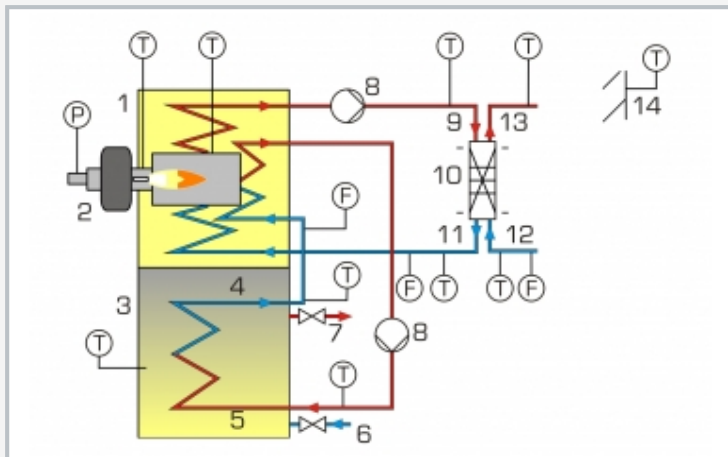
An integrated heating circuit with plate heat exchanger simulates a heater circuit. The measured values are transmitted directly to a PC via USB where they can be analysed using the software included.

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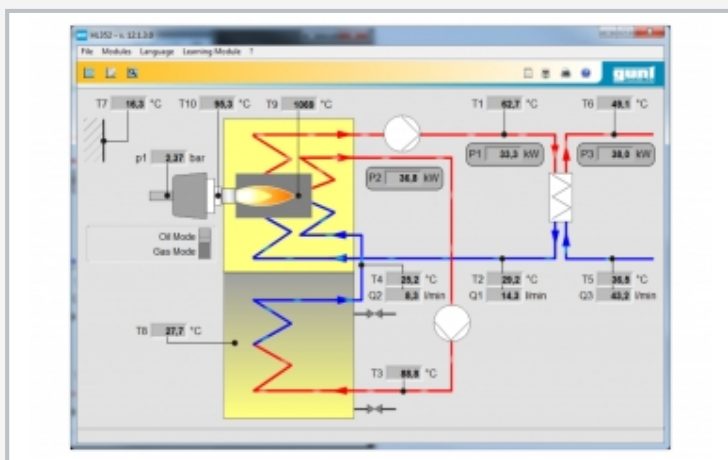
Test stand for oil, natural gas and propane gas burners



1 heating control unit, 2 heating boiler, 3 HL 352.01 Oil burner [not included], 4 switch cabinet with digital displays and control panel, 5 gas pressure manometer, 6 two-strand oil filter, 7 fuel oil tank with fittings, 8 gas connection, 9 viewing window in the heating control-ler, 10 expansion tank, 11 boiler safety group



Process schematic: 1 heating boiler, 2 burner, 3 domestic water heater, 4 domestic water heater return, 5 domestic water heater feed, 6 cold water connection, 7 hot water drain, 8 circulation pump, 9 heating circuit feed, 10 plate heat exchanger, 11 heating circuit re- turn, 12 cooling water connection, 13 cooling water drain, 14 external temperature sensor



Software screenshot

Specification

- [1] comparison of burners
- [2] oil burner, natural gas burner and propane gas burner available as accessories
- [3] function of a heating boiler
- [4] boiler body with 1 viewing window made of special glass
- [5] domestic water heater with circulation pump
- [6] transparent heating oil tank with filling and venting valve
- [7] digital displays for oil pressure sensor, temperature and flow rate sensor
- [8] GUNT software for data acquisition via USB under Windows 7, 8.1, 10

Technical data

Boiler

- nominal power output: 18kW
- control unit with temperature limiter

Circulation pump

- max. power consumption: 70W
- max. flow rate: 45L/min
- max. head: 4m

Plate heat exchanger: 10 plates

Boiler safety group according to DIN 4751

- 3bar
- 50kW

Domestic water heater: 160L

Heating oil tank, transparent: 15L

Measuring ranges

- oil pressure: 0...16bar
- gas pressure (nozzle): 0...10mbar
- temperature: 1x 0...1.500°C / 9x 0...100°C
- flow rate (water): 3...60L/min
- flow rate (oil): 0...40L/min

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 1000x1440x1920mm

Weight: approx. 377kg

Required for operation

water connection, drain, ventilation, exhaust gas routing, PC with Windows

Scope of delivery

- 1 trainer without burner
- 1 GUNT software CD + USB cable
- 1 set of instructional material

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Optional accessories

065.35201	HL 352.01	Oil burner
065.35202	HL 352.02	Natural gas burner
065.35203	HL 352.03	Propane gas burner
065.86000	HL 860	Exhaust gas analyser