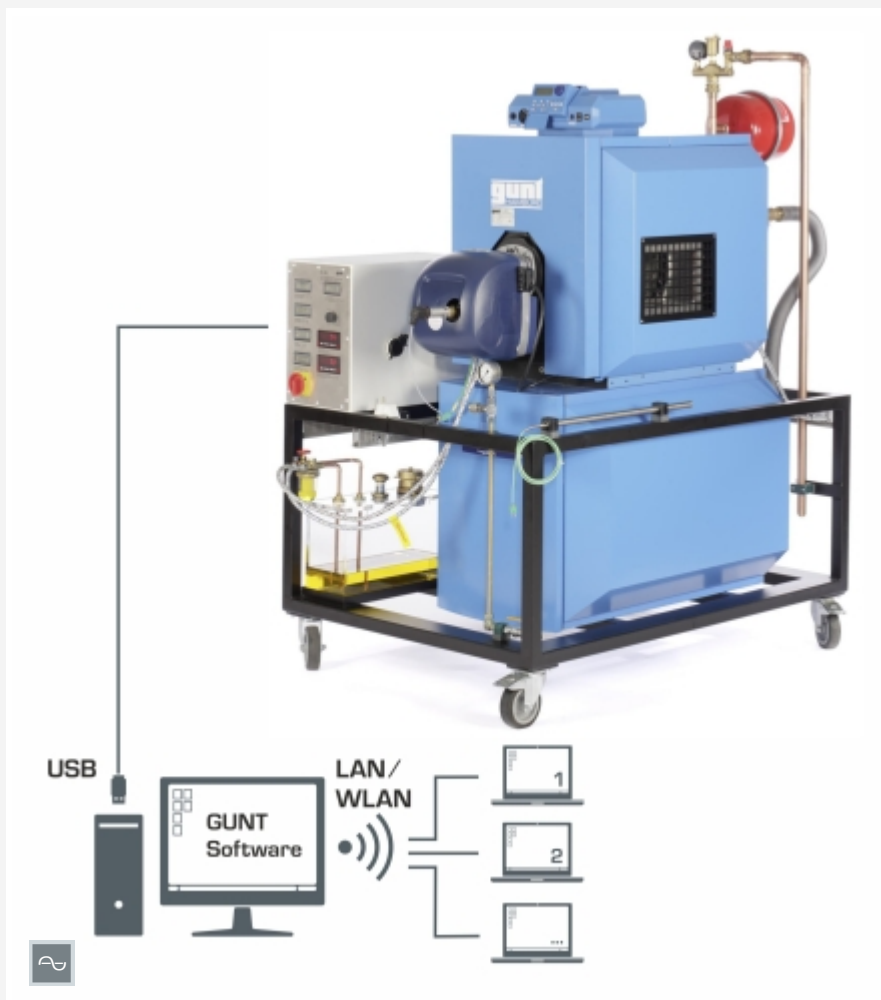


# HL 352

## 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
- network capability: observe, acquire, analyse experiments via customer's own network

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.

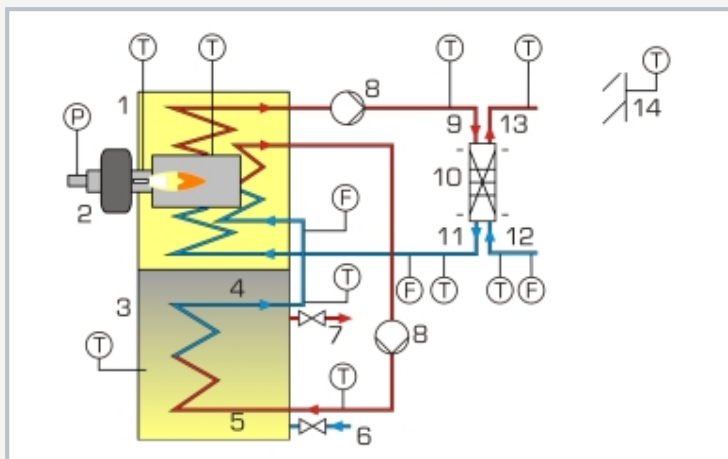
An integrated heating circuit with plate heat exchanger simulates a heater circuit. The measured values are transmitted directly to a PC via USB where they can be analysed using the software included.

# HL 352

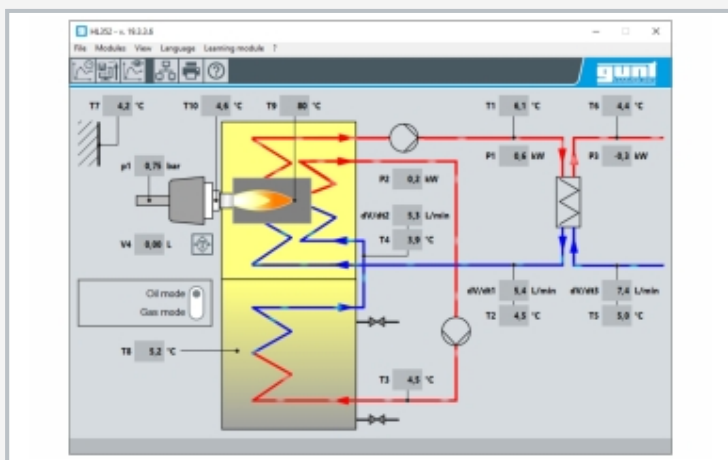
## Test stand for oil, natural gas and propane gas burners



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, 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 return, 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] network capability: observe, acquire, analyse experiments at any number of workstations with GUNT software via the customer's own LAN/WLAN network
- [9] GUNT software via USB under Windows 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: 3...60L/min (water)
  - flow rate: 0...40L/min (oil)

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 + USB cable
- 1 set of instructional material

## HL 352

### Test stand for oil, natural gas and propane gas burners

#### Required accessories

HL 352.01            Oil burner  
or  
HL 352.02            Natural gas burner  
or  
HL 352.03            Propane gas burner

#### Optional accessories

for Remote Learning  
GU 100            Web Access Box  
with  
HL 352W            Web Access Software

#### Other accessories

HL 860            Exhaust gas analyser