



Hydraulic Hand Pump HTP1



Contents

About this operating manual	23
1 Device description	24
1.1 Intended use	25
1.2 Exclusion of liability	25
2 Safety instructions	26
3 Construction and function	27
3.1 Important notes on pressure fluctuations	28
4 Purging hydraulic lines	29
5 Handling	30
5.1 Generating pressure	31
5.2 Pressure measurements	33
5.3 Releasing pressure	34
6 Problems	35
7 Maintenance / cleaning, storage and transportation	36
8 Disposal	37
9 Technical data	38

- The operating manual is aimed at specialists and semi-skilled personnel.
- Before each step, read through the relevant advice carefully and keep to the specified order.
- Thoroughly read and understand the information in the section “Safety instructions”.

If you have any problems or questions, please contact your supplier or contact us directly at:

KELLER AG für Druckmesstechnik

St. Gallerstrasse 119

CH-8404 Winterthur

 +41 52 235 25 25

 info@keller-druck.com

 www.keller-druck.com

1 Device description

The hand pump creates positive pressure for the inspection, adjustment or calibration of all kinds of pressure-measuring devices. The lightweight, compact design makes this handpump ideal for on-site testing.

The hand pump and the pressure hose have Minimes® connections. When the hand pump is used, it needs to be connected to a reference gauge and to the test item.

Reference Gauge

Hand pump

Pressure hose



Scope of delivery

Check the delivered items:

- ➔ Hand pump
- ➔ Pressure hose
- ➔ Operation manual
- ➔ Accessories



Transportation cases, Minimes®-adapter, adapter sets and seal sets are optional accessories.

● Transportation case:

The transportation case provides optimal protection for the hand pump and other accessories with its tight-fitting rigid foam inlay. A document compartment is located in the lid behind the burl foam inlay.

● Minimes® Adapter

● Filling bottle

● Adapter set:

The adapter set comprises 7 adapters for all common pressure connections with or without pins.

● Seal set: The seal set contains flat seals made of plastic and O-rings for all common pressure connections.



Reference gauge

Various reference models from KELLER's product range can be used.

1.1 Intended use

The HTP1 hand pump can only be used for generating pressure in low-volume measuring devices. The device is only designed for use with hydraulic oil or demineralized water, other media will result in damage to the hand pump.

The hand pump may not be attached to external pressure sources.

WARNING! No safety component!

The hand pump of the series HTP1 is not safety component in accordance with Directive 2006-42-EC (Machine Directive).

➔ Never use the HTP1 as a safety component.

The operational safety of the device supplied is only guaranteed by intended use. Do NOT exceed the specified limits (→ paragraph 9: “Technical data”) .

CAUTION! Risk of injury or material damage!

By connecting the HTP1, the measuring device is hydraulically connected to the hand pump. If the pressure relief valve is opened, a compressed medium can flow through the pressure hose into the hand pump's storage container. At sufficiently large volumes, the reservoir may overflow.

➔ Never connect the HTP1 directly to the hydraulic system with large volumes (construction machines, etc.) or an aggressive medium (such as brake fluid).

Before ordering and installation, check that the hand pump is suitable for your applications.

1.2 Exclusion of liability

We accept no liability for any damage or malfunctions resulting from incorrect installation, in-appropriate use of the device or failure to follow the instructions in this operating manual.

2 Safety instructions

Before you install the HTP1, read through this operating manual carefully. If the instructions contained within it are not followed, especially the safety guidelines, this could result in danger for people, the environment, and the device and the system it is connected to.

The HTP1 corresponds with state-of-the-art technology. This concerns the accuracy, the operating mode and the safe operation of the device.

In order to guarantee that the device operates safely, the operator must act competently and be conscious of safety issues.

KELLER provides support for the use of its products either personally or via relevant literature. The customer assumes responsibility for any testing to determine application suitability. KELLER is not responsible for damages due to misuse or application incompatibility.

Qualified personnel

- The personnel who are charged for the installation and operation of the HTP1 must hold a relevant qualification. This can be based on training or relevant experience. The personnel must be aware of this operating manual and have access to it at all times.

General safety instructions

- In all work, the existing national regulations for accident prevention and safety in the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- Never use the hand pump together with an external pressure source. Do not attach an external pressure generator to the hand pump.
- Do not use brake fluid or other aggressive media.
- Do not remove any attached components (test item, pressure hose, reference gauge) when the hand pump is under pressure:
 - Open the pressure relief valve before removing any of the components.
 - Do not use Teflon tape to seal the pressure connections. Surplus Teflon tape can enter the hand pump and damage it.
 - Only use adapters and seals that are available as accessories.
 - Non-pressurised storage: Only store the hand pump with the pressure relief valve open. This ensures that no pressure can be built up by unintentional pumping movements.
 - Avoid external force of all kinds towards the hand pump and its operating elements.
 - Do not use the hand pump if it is damaged or defective.

Special safety instructions

Warnings that are specifically relevant to individual operating procedures or activities can be found at the beginning of the relevant sections of this operating manual.

3 Construction and function

Connections

- ① Minimess® connection pressure hose
- ② Connector reference gauge

Operating elements

- ③ Fine adjustment valve (hand wheel)
- ④ Pressure relief valve (rotary knob)
- ⑤ Seal reservoir with safety valve
- ⑥ Hand grips

Main components

- ⑦ Upper and lower pump body
- ⑧ Reservoir with suction and relief outlets
- ⑨ Piston rod with internal spring
- ⑩ Pressure hose with Minimess® connection



Function

The reference and the test sample or the pressure device to be tested (hereafter “test sample”) are connected to the hand pump.

Pumping is carried out by repeatedly pushing the hand grips together. An internal spring returns the hand grips to their start position.

The pumping movements are transferred to the pistons in the pump body via the push rods. The hydraulic liquid is then suctioned from the storage container and pressed through valves to the test item.

3 Construction and function

When properly purged, the hand pump will generate positive pressure quickly. The construction of the hand pump means that the same pressure is generated for the test item as for the reference test gauge.

The pressure is set to the necessary value using the fine adjustment valve. With the pressure relief valve, the pressure can be relieved into the reservoir.

For the assessment of the test sample, the pressure displayed on the reference manometer is compared with the measurement value.

3.1 Important notes on pressure fluctuations

It is completely normal that the pressure is not constant from the start. In the event of changes to the pressure in the measurement device, it always lasts a few minutes until the pressure stabilises.

This is influenced by a variety of factors. The most important influence factors are:

- **Improper purging:**
If there is still air in the measurement device, the pressure build-up lasts significantly longer. Moreover, there is a fall-off in pressure over a limited period due to diffusion processes.
- **Mechanical characteristics of the pressure hose:**
Bending or rolling up the pressure hose causes a reduction in the volume and thus leads to an increase in pressure.
At high pressure, the pressure hose extends. Furthermore, enclosed air can be diffused through the pressure hose. In both cases, a drop in pressure results.
- **Temperature influence:**
Temperature changes lead to a change in volume in the measurement device and therefore to changes in pressure. The smaller the volume is, the greater the change in pressure.
- **Settling times of reference and test sample:**
Observe the required waiting times after the reference and test sample have been switched on. More information on this can be found in the corresponding operating manual.

In order for the hand pump to be operated, it is vital that its connections with the reference gauge and the test item are pressure-resistant.

Furthermore, for the best measurement procedure possible, sufficient and correct purging of the measurement device is required. Only then can you reduce the pressure fluctuation (→ paragraph 3.1) to a minimum.

CAUTION! Material damage!

The test sample, the adapter and the seal must be free from impurities to prevent damage to the hand pump or hydraulic lines.

Maximum torque of the pressure connections:

Reference: 15 Nm

Test item: 15 Nm

Carry out the following steps* for the purging air from the hydraulic lines of the hand pump. For this, note also the warnings in section paragraph 5.1 “Generating pressure”.

- ➔ Fill the storage container to approximately two-thirds capacity with the required hydraulic fluid.
- ➔ Open the pressure relief valve by turning counter clockwise.
- ➔ Turn the reference manometer with matching seal in the hand pump’s connection (G1/4).
IMPORTANT! Do not tighten the reference yet!
- ➔ Carefully pump until the hydraulic liquid escapes at the connection and the piston system has been ventilated.
- ➔ Only then should you tighten the reference.
- ➔ Pump 5...10 times to prime the hydraulic lines.
- ➔ Turn the pressure relief valve counter clockwise until it is firmly closed.
- ➔ Connect the pressure hose to the hand pump’s Minimesse® connection, and tighten the connection.
- ➔ Tightly screw the Minimesse® adapter on the pressure hose.
- ➔ Select the suitable adapters and seals for the test item’s connection.
- ➔ Screw the adapter for the test sample onto the Minimesse® adapter.
- ➔ Turn the test sample with seal in the adapter.
IMPORTANT! Do not yet tighten the test item!
- ➔ Now pump until the hydraulic liquid escapes at the test sample’s connection. The pressure hose and the test sample connection are now ventilated.

4 Purging hydraulic lines

CAUTION! Demineralized water!

During the quality inspection of the HTP1, a functional test is carried out with demineralised water. The reservoir may therefore contain residues of this liquid.

➔ Check the compatibility with your application and remove the residue using appropriate measures (e.g. rinsing out with the hydraulic liquid).

* The first steps up to "Tightening of the reference" are only required for the first commissioning or during removal of the reference.

5 Handling

Adhere to the following safety instructions when operating the hand pump:

CAUTION! Crushing hazard!

During the pumping procedure ensure that fingers or other body parts are kept away from the area between the hand grips and the piston rod.

CAUTION! Material damage to valve stop!

If put under too much strain the stop and the hand pump will be damaged.

➔ Only continue to tighten the valves (the fine adjustment and pressure relief valves) by hand, once the stop has been reached.

Before creating pressure consider

Before you create pressure with the hand pump you should check for the following requirements:

- The reference gauge is connected to the hand pump.
- The test item is joined to the pressure hose with the correct adapters and seals.
- All pressure connections are correctly in place, so that they resist pressure.
- The hand pump, the pressure hose and the test sample have been properly ventilated (→ paragraph 4).

5.1 Generating pressure

After the purging the hydraulic lines, pressure can be created with the hand pump. With increasing back-pressure in the system, the pumping process becomes increasingly difficult.

WARNING! There is a risk of injury if the maximum pressure is exceeded!

Note the maximum permitted pressures of the individual components in the measurement device. If the limit values are exceeded, it may lead to material damage and injuries.

➔ Do not continue to pump **under any circumstances** if the maximum permitted pressure has been reached or an exceeded measuring range is displayed.

CAUTION! Material damage to test item!

Adhere to the maximum pressure of the test item!

Only create an admission pressure with the hand grips that is lesser than the necessary testing pressure. Following this carefully increase the pressure using the fine adjustment valve.

Notes on operation

Please observe the following notes concerning the operation of the hand pump:

- Ensure that no air is suctioned during the pumping process.
 - To ensure that this does not occur, hold the hand pump at a slight angle so that the suction nozzles are always surrounded by hydraulic liquid.
- Ensure that there is sufficient hydraulic liquid in the reservoir.
 - If necessary, refill the hydraulic liquid. This must also be ensured during depressurisation
- For small hydraulic volumes and well-ventilated systems, a higher pressure is already built up with a few movements of the pump.
 - Ensure that the maximum permitted pressure is not exceeded.
- From approximately 400...500 bar, a lot of strength is required for pumping from the initial position of the handles.
 - Increase the pressure using the fine adjustment valve and note the following tip.

5 Handling

TIP! At high pressures, open the handle only slightly.

The handles can be compressed more easily the further the handles are closed. In this way, you can create high pressures more easily and meter the pressure better.

➔ The higher the pressure is, the less you should open the handles. In the event of high pressures, avoid the initial position of the handles.

Hand pump operation

➔ ① Switch on reference gauge and test item (if necessary).

➔ ② Close pressure relief valve:
– Turn the knob of the valve in a clockwise direction until the stop is reached.

➔ ③ Create pressure:
– Push the hand grips together:
The pressure is built up.
– Repeat the pumping movements until the necessary testing pressure has roughly been reached.

➔ ④ Adjust the testing pressure.
The necessary testing pressure is precisely adjusted with the fine adjustment valve:
– Turn the hand wheel in a clockwise direction to increase the pressure.
– Turn the hand wheel of the valve counter clockwise to reduce the pressure.
– Set the necessary testing pressure by turning the wheel as needed.

➔ ② Releasing pressure:

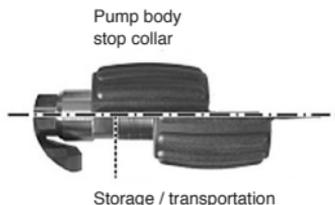
Turn the pressure relief valve knob 1–2 rotations counter clockwise and wait until there is no longer any positive pressure.



Increasing pressure with the fine adjustment valve

Alternatively, you can increase the pressure with the fine adjustment valve.

- ➔ Turn the hand wheel in a clockwise direction in the direction of the “pump body stop collar”. Depending on the pressure of the test item and the setting of the hand wheel, pressure can be achieved quite easily.



Fine adjustment valve

When it is not under pressure the fine adjustment valve moves very freely. The wide hand wheel of the fine adjustment valve can be moved into the needed position very easily using with the palm of the hand.

5.2 Pressure measurements

For adjustments, calibrations or an inspection of accuracy, it is vital that the test item and the reference have the same pressure.

The pressure needed for the test points is built up and adjusted with the hand pump (→ paragraph 5.1).

Wait for pressure stabilization!

After changes in the pressure, it takes a few minutes for the pressure in the measurement device to stabilize (→ paragraph 3.1).

- ➔ Wait approximately 3...5 min before you begin taking measurements.

The necessary procedures for measuring pressure are configured by the operator.

Carrying out the pressure measurements:

- Carry out the necessary tests and measurements.
- Document your results.

5 Handling

5.3 Releasing pressure

Once the pressure measurements have been completed, the positive pressure in the hand pump, the test item and in the pressure hose need to be brought into balance.

CAUTION! Risk of injury through excessive pressure!

Do not remove any connected components (test item, pressure hose, reference gauge) if the hand pump is under pressure.

➔ Open the pressure relief valve before removing any of the components.

➔ ② Releasing pressure:

Turn the pressure relief valve knob 2–3 rotations counter clockwise direction and wait until there is no longer any positive pressure.

➔ Remove the test item with adapters and seals from the pressure hose.

➔ Put the hand pump away along with any accessories which have been used.
(→ paragraph 7: “Maintenance / cleaning, storage and transportation”)



IMPORTANT! Do not release the pressure without supervision!

When relieving the pressure, hydraulic fluid flows from the measurement device into the reservoir. Pressure equalization in the reservoir occurs through the safety valve in the seal.

In the event of large-volume measurement devices or if hydraulic liquid has been refilled during pressure generation, the reservoir may fill up and overflow through the safety valve.

➔ Carefully drain the pressure and note the fill level in the reservoir.

CAUTION! Material damage!

The hand pump cannot be repaired by the operator! In the case of a defect, the appliance must be sent back to the manufacturer for repair.

➔ Never open up the hand pump and / or carry out any repairs yourself.

The table below describes steps that can be taken in the event of a malfunction.

Problem	Possible cause	Remedy
Pressure cannot be built up.	Defective / incorrect seal.	Check seal (size / material / wear)
	Seal incorrectly positioned	Check positioning of seal.
	Pressure relief valve open	Close pressure relief valve.
No further increase of pressure is possible	Air was sucked in during pressure generation.	Open pressure relief valve so that the air can be rinsed out of the piston system. Ensure the correct position of the hand pump during pressure generation.
Pressure fades (unstable)	Leakage in the test item	Check connections
		Check positioning of seals
Pumping stroke stiff	High counter pressure in the test item	Increase the pressure with the hand wheel of the fine adjustment valve

7 Maintenance / cleaning, storage and transportation

Maintenance

No maintenance is required for the hand pump and it cannot be repaired by the operator either. In the case of a defect the appliance must be sent back to the manufacturer for repair.

- ➔ Check the seals and O-rings for fractures and wear before use.
- ➔ Replace defective or worn seals and O-rings.

Cleaning

Clean the hand pump with a dry or slightly damp lint-free cloth.

Do not use sharp objects or aggressive cleaning agents to clean the pump. Avoid contact with aggressive media.

Storage and transportation

For storage and transportation we recommend our transportation case, which is available as an optional accessory.

The tight-fitting rigid foam inlay offers optimum protection for the hand pump with pressure hose and accessories.

Reference gauge

The common reference models fit into the gaps in the transportation case and do not need to be removed.

Before storage, we recommend that you consider the following points:

- Clean the hand pump and the accessories.
- Turn the fine adjustment valve in a clockwise direction until the thread is no longer visible (→ illustration).
- Open the pressure relief valve.



IMPORTANT! Do not store under pressure!

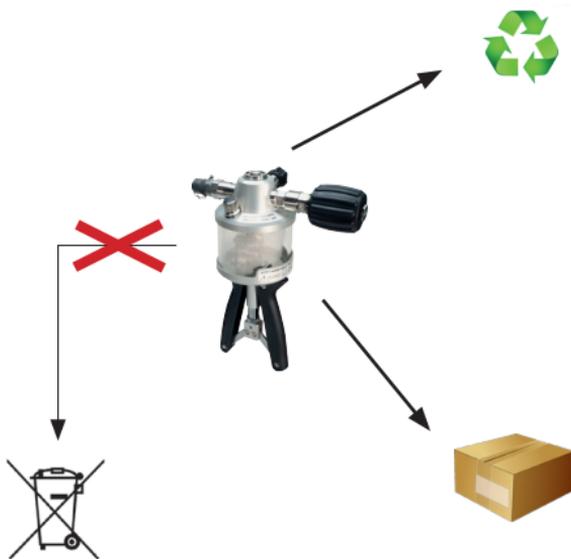
Only store the hand pump with the pressure relief valve open. This ensures that no pressure can be built up by unintentional pumping movements.

The hand pump consists of various different materials. It should not be disposed of with household waste.

➔ Take the hand pump to your local recycling plant

or

➔ send the hand pump back to your supplier or to KELLER.



9 Technical data

Type	HTP1
Pump with hose	
Pressure range:	
– Positive pressure	700 bar
Medium	Hydraulic oil Demineralized water (optional)
Connection:	
– Reference	G1/4
– Pressure hose	Minimesse® 1620
– Test item	Pressure hose (1 m) with Minimesse® 1620 or with Minimesse® adapter 1620 to G1/4
Dimensions	~ 265 x 225 x 125 mm
Weight	~ 2,1 kg

Accessories	
Minimesse® adapter	Minimesse® 1620 to G1/4
Adapter set	G1/8", G3/8", G1/2", 1/8" NPT, 3/8" NPT, 1/4" NPT, 1/2" NPT
Seal set	Flat seals made of plastic and O-rings
Transportation case	
Lid	Burl foam with document compartment
Main compartment	Tight-fitting rigid foam inlay for pump and accessories
– Dimensions	~ 450 x 370 x 140 mm
– Weight with pump and accessories	~ 4,35 kg
– Pressure hose	Replacement pressure hose with seals
Consumables	Hydraulic oil Demineralized water (optional)



Illustration (example):
Complete set

KELLER AG für Druckmesstechnik
St. Gallerstrasse 119 • CH-8404 Winterthur
☎ +41 52 235 25 25 • ✉ info@keller-druck.com
🏠 www.keller-druck.com



+ KELLER