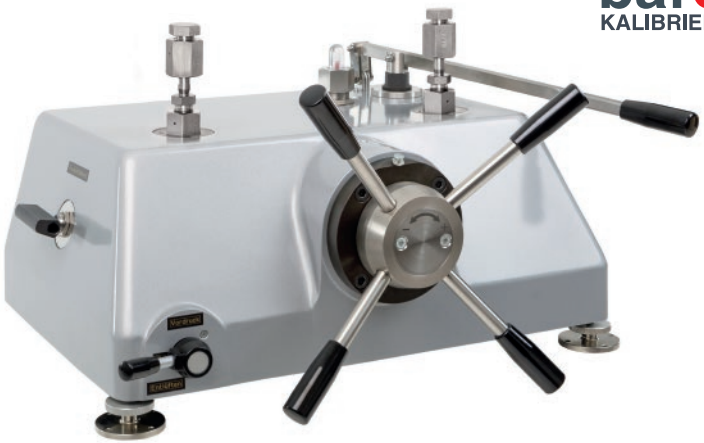

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1. Information on This Operating Instruction

- The manual is aimed at specialists and semi-skilled personnel.
- Please read the instructions carefully before carrying out any operation and keep the specified order.
- Thoroughly read and understand the information in chapter 2 “Safety Instructions”.

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

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1.1 Pictographs Used

In this manual, pictographs are used as hazard warnings.

Particular information, instructions and restrictions designed for the prevention of personal or substantial property damage:

WARNING! Is used to warn you against an imminent danger that may result in personal injury or death.

IMPORTANT! Is used to warn you against a possibly hazardous situation that may result in personal, property or environmental damage.

CAUTION! Is used to draw your attention to important recommendations to be observed. Disregarding them may result in property damage.

The following symbol highlights
actions you have to conduct
or
instructions that have to be strictly observed.

1.2 Exclusion of Liability

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

2. Safety Instructions

Please read this operating instruction thoroughly before operating the comparison pump.
Disregarding the containing warnings, especially the safety instructions, may result in danger for people, the environment, and the device and the system it is connected to.
The comparison pump corresponds with the state of engineering at the time of printing. This concerns 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.

The ARMANO Messtechnik GmbH provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer and application specific tests to ensure that the product is suitable for the intended use. With this verification, all hazards and risks are transferred to our customers. Our warranty expires in case of inappropriate use.

Qualified personnel:
The personnel that is charged for the installation, operation and maintenance of the comparison pump must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this manual and have access to it at all times.

General safety instructions:

- In all work, the existing national regulations for accident prevention and safety at 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.
- Use the comparison pump in its perfect technical condition only. Damaged or defective instruments need to be checked immediately and replaced if necessary.
- Only use appropriate tools for mounting, connecting and dismounting the comparison pump.
- Nameplates or other information on the device shall neither be removed nor obliterated, since otherwise any warranty and manufacturer responsibility expires.

Special safety instructions:
Warnings, which are specifically relevant to individual operating procedures or activities, are to be found at the beginning of the relevant sections of this operating instruction.

3. Device Description

The comparison pump model PS 2500-G is a pressure generator and used for comparative measurements. It is suitable for testing and adjusting pressure measuring devices.

The model is applicable for pressure ranges from 0 to 2500 bar. Acid-free, thin oil is used as medium.

The spindle pump with star handle and the additional hand pump serve to generate the pressure. An external compressed air supply of max. 10 bar is required for the admission pressure.
The test item is compared to a pressure measuring device with higher accuracy (e.g. model overview 2000 Test Gauges, model overview 10000 Calibration Technology).

Comparison pumps in a case are suited for continuous operations, e.g. in test shops. Additionally, the instrument connections are provided with filters to avoid contamination of the pump pipe system (see schematic drawing, page 5).

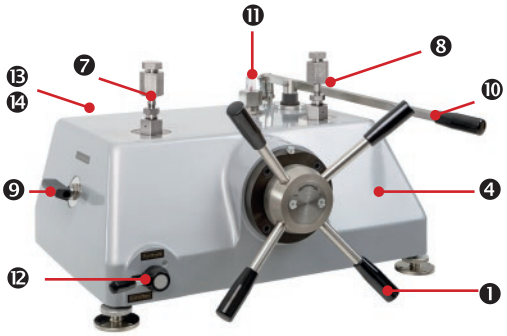
Components:

❶ Spindle pump with cylinder, piston, spindle and star handle
❹ Case
❼ Connection for reference device
❽ Connection for test item
❾ Valve “Pressure compensation / Druckausgleich”
❿ Hand pump
⓫ Reservoir for the medium
⓬ Change-over valve for external admission pressure (functions: “Admission pressure / Vordruck”, “Closed / Zu”, “Vent / Entlüften”)
⓭ “Connection admission pressure / Anschluss Vordruck”
⓮ “Ventilation admission pressure / Entlüftung Vordruck”

Nameplate and label:
The nameplate is placed on the back of the comparison pump. It contains the most important technical data and information.

Scope of delivery:
The delivery includes – in addition to the comparison pump:

- 1 operating instruction
- 1 l special oil
- 2 connections for G ½ (union nut)
- 2 connections for M 20x1.5 (union nut)
- 4 O-rings as spare parts
- 2 adapters for N 6x1 (admission pressure connection)



3.1 Intended Use

The comparison pump shall only be used for generating pressure in order to carry out comparative measurements for testing and adjusting pressure measuring devices.
Do not use the comparison pump beyond its specification or contrary to the operating instructions.

The operational safety of the device supplied is only guaranteed by intended use. The specified limit values (⇨ chapter 4 “Technical Data”) must not be exceeded. This particularly applies for the adherence to the permissible full scale value and the permissible temperature range.

IMPORTANT! Risk of injury or material damage due to overpressure!
Exceeding the maximum overload values may lead to material failure of the comparison pump. This may also cause serious damage to health.
→ Ensure that the overload values are never exceeded.

Please check if the comparison pump is suitable for your application before ordering and installation.

4. Technical Data

Construction type	case version
Medium	special oil
p_{min} (operating volume ≤ 0.1 litre)	0 bar
p_{max} (operating volume ≤ 0.1 litre)	2500 bar
Required admission pressure	6 bar
Standard connection	2 high pressure connections ⅜" HPF-M 20x1.5, each with 2 adapters for G ½ and M 20x1.5
Connection for external supply	plug connection (Prestolock) for PA hose N 4x1 and an adapter for hose N 6x1
Case	all parts mounted in an aluminum case, grey enamelled, 3 adjustable feet
Case dimensions (L x W x H)	700 x 560 x 310 mm (27.56 x 22.05 x 12.2")
Piston and cylinder	hardened steel
Spindle nut	steel
Weight	approx. 45 kg (99.21 lb)
Temperature range	15 °C to 35 °C (59 °F to 95 °F)

5. Preparation, Functions and Measuring Process

Preparation and functions:
The admission pressure can be connected to the comparison pump either by a PA hose N 4x1 or by adapter for N 6x1 to plug connection (Prestolock).

To protect the comparison pump from contamination, a maintenance unit consisting of pressure regulator and filter (pore size 10 – 20 µm with oil and water separator) is to be placed into the line of the admission pressure to the comparison pump. (The filter is not part of the scope of delivery.)
With the pressure regulator, the pressure needs to be limited to max. 10 bar.

An admission pressure (up to max. 10 bar) is necessary for fast filling of the system and easier operation with the hand pump.

Before commissioning and before mounting the pressure measuring device, close the valves (see schematic drawing, valves ❾ and ⓬, set lever to position "Closed / Zu").
Ensure that there is enough medium in the reservoir ⓫ (see page 6).
Turn the star handle counterclockwise completely to screw out the spindle with the piston.

Turn the star handle slightly clockwise to pump medium into the instrument connections up to the sealing border.

Now, screw the measuring instruments into the connections: The reference device into connection ❼ and the test item into connection ❽.

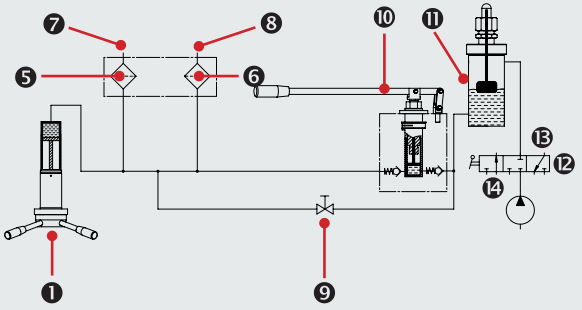
IMPORTANT! Attention must be paid to thorough sealing! Please use an appropriate wrench and the designated wrench flat. During screwing in, the pressure measuring devices should never be held at the case!

Measuring process:
In order to fill the entire measuring system, turn the change-over valve ⓬ to "Admission pressure / Vordruck" and use the external compressed air up to 10 bar. Generate the pressure up to max. 1600 bar via hand pump ❿, for higher pressures via spindle pump.

The precise pressure adjustment is ensued by the spindle pump ❶.

Open valve ❾ to reduce the pressure. To reduce the pressure to 0 bar, additionally turn the change-over valve ⓬ to "Vent / Entlüften".

CAUTION! The total travel of the spindle pump is approximately 16 revolutions. At the lower and the upper end a distinct stop is noticeable. Do not attempt to turn beyond those points forcibly! Otherwise, the spindle pump will be damaged!



❶ Spindle pump with cylinder, piston, spindle and star handle
❺ Filter
❻ Filter
❼ Connection for reference device
❽ Connection for test item
❾ Valve "Pressure compensation / Druckausgleich"
❿ Hand pump
⓫ Reservoir for the medium
⓬ Change-over valve for external admission pressure (functions: "Admission pressure / Vordruck", "Closed / Zu", "Vent / Entlüften")
⓭ "Connection admission pressure / Anschluss Vordruck"
⓮ "Ventilation admission pressure / Entlüftung Vordruck"

Fig. schematic drawing

IMPORTANT! Never open any pressure-bearing connection as long as there is any pressure left in the system!
In particular, do not screw out the test item. Please vent the entire system always completely until no pressure is left in the system!

When actuating the change-over valve ⓬, please make sure that it notably snaps into place at the lever position right above the tags.

Refilling the medium reservoir:
The reservoir is supplied filled and thus ready for operation.
If the red float pin is no longer visible in the window of the oil column, oil must be refilled. Please use only the oil included in the delivery or the re-ordered oil, which is available upon request.

For refilling, turn the change-over valve ⓬ to "Vent / Entlüften". Open valve ❾, then turn the change-over valve ⓬ to "Closed / Zu". Remove the union nut and the cap from the oil reservoir, fill in oil up to the lower rim of the reservoir while pressing down the float pin. Then screw union nut and cap back on the reservoir.

6. Maintenance / Cleaning, Storage and Transport

CAUTION! Material damage and loss of warranty!
Any modifications or interventions in the device, made by the customer, might damage important parts or components. Such intervention leads to the loss of any warranty and manufacturer's responsibility!
→ Never modify the device or perform any repairs yourself.

Maintenance:
The maintenance is limited to lubrication with instrument grease after approximately 50 hours of operation (grease fitting on the top of the spindle pump).

The instrument cannot be repaired by the operator.
In case of faults, which cannot be eliminated without interference in the device, please return the instrument to the manufacturer for repair. Any arising repairs may only be executed by the manufacturer.

Cleaning:
- Clean the comparison pump with a dry or slightly dampened lint-free cloth.
- Do not use any sharp objects or aggressive agents for cleaning.

Storage and transport:
- Use the original packaging or comparable packaging for transport.
- Avoid impacts or strong vibrations.
- Protect the device against moisture.

7. Dismounting and Disposal

Before dismounting:
The test item must be unpressurised before dismounting! For this purpose, the valves should be opened.

Disposal:

NO DOMESTIC WASTE!
The comparison pump comprises various materials. It shall not be disposed of together with domestic waste.

→ Bring the comparison pump to your local recycling plant

or

→ send the comparison pump back to your supplier or to the ARMANO Messtechnik GmbH.

8. CE Conformity

CE

The CE marking of the instruments certifies the conformity with prevailing EU directives for placing products on the market within the European Union. The following directive applies:

2014/68/EU (PED)

The corresponding declaration of conformity is enclosed or available upon request.

9. Declaration of Conformity

EU-Konformitätserklärung

EU Declaration of Conformity

Für die nachfolgend bezeichneten Erzeugnisse

VERGLEICHS-PRÜFPUMPEN
Typ PS 2500-G gemäß Datenblatt 10157

und

KOLBEN-MANOMETER
Typ PD 2500 gemäß Datenblatt 10317

wird hiermit bestätigt, dass sie den Schutzanforderungen der folgenden Richtlinie entsprechen:

2014/68/EU (DGRL)

Modul A, druckhaltendes Ausrüstungsteil

Diese Erklärung gilt für alle Exemplare, die nach den entsprechenden Fertigungszeichnungen, die Bestandteil der technischen Dokumentation sind, hergestellt werden.

Die CE-Kennzeichnung erfolgt mittels Aufkleber auf dem Gehäuse.

We hereby declare for the following named goods

COMPARISON PUMPS
Model PS 2500-G according to data sheet 10157

and

DEAD WEIGHT TESTERS
Model PD 2500 according to data sheet 10317

that they meet the protective requirements of the directive:

2014/68/EU (PED)

Module A, pressure equipment parts

This declaration applies to any specimen manufactured according to the manufacturing drawings, which are part of the technical documentation.

The CE-marking is made via sticker on the case.

Diese Erklärung wird verantwortlich für den Hersteller:
This declaration is issued under the sole responsibility of the manufacturer:

ARMANO Messtechnik GmbH
abgegeben durch / *by*
Grünhain-Beierfeld, 2021-04-14

Bernd Vetter
Geschäftsführender Gesellschafter / *Managing Director*

ARMANO Messtechnik GmbH

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