

Airtester HP

for compressed air according to EN 12021



Instruction for use



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Notice!

Like any piece of complex equipment, this product will do the job designed to do only if it is used and serviced in accordance with the manufacturer's instructions.

This manual must be carefully read by all individuals who have or will have the responsibility for using or servicing the product. Before choosing and using this product, it is required to assess whether this product is suitable for the application intended. Choice and use are beyond the control of MSA AUER GmbH. Therefore, the liability of MSA AUER GmbH covers only the consistent quality of this product. The above does not alter statements regarding the warranties and conditions of sale and deliveries of MSA AUER GmbH.

MSA AUER Airtester HP

for compressed air according to EN 12021

Instruction for use

1. Use

The compressed air monitoring set "MSA AUER Airtester HP" (HP = high pressure) is used to determine the content of carbon monoxide, carbon dioxide, oil and water vapour in respirable air from compressors and compressed gas cylinders.

According to EN Standard 12021 air for respiratory equipment must meet the following quality requirements:

- CO content max. 15 ppm
- CO₂ content max. 500 ppm
- Free of odor and taste, i.e. practically free of critical mineral oil content (from experience the oil content is less than 0,5 mg/m³)
- Water content in compressed air cylinders:
 - max. 50 mg/m³ at a charging pressure of 200 bar
 - max. 35 mg/m³ at a charging pressure of 300 bar
 - max. 25 mg/m³ of the air from the compressor

The requirements concerning the maximum water vapour content refer to the type of equipment used (200 or 300 bar) and, therefore, apply also to each pressure level of the compressed gas cylinders below the maximum values given above.

All maximum values are based on air not under pressure.

1. Measuring Principle

The pressure in the compressed gas cylinders, resp. in the compressor charging panel is reduced by a pressure reducer. The air to be sampled is withdrawn continually via a regulatory valve. After setting the prescribed flow volume (flow meter), the air flows through a special detector tube for a specific time. The length of stain in the detector tube is an index of the concentration of the measured substance. This can be read directly from the detector tube scale.

3. Design

The case contents all parts required for measuring (see fig. 1):

- The test device, consisting of pressure reducer, pressure gauge, flow meter with adjusting valve and water level, detector tube holder
- Adapter for connection to a compressor charging panel (for charging connection 300 resp. 200 bar)
- Timer
- Tube breaker for breaking detector tube tips
- Detector tubes (package of 10) for measuring CO, CO₂, water vapour and check for oil (sum of vapour and mist).

The standard case contents one package of each of the four types detector tubes. In addition the case has space for storing four additional spare packages.



Fig. 1 MSA AUER Airtester HP

4. Technical Data

| | |
|---------------------|---|
| Operation medium: | air |
| Maximum pressure: | 300 + 30 bar |
| Flow: | Freely adjustable from 0,2 to 3 l/min. The measuring tube of the flowmeter is marked for the setting of the required flow volume (0,3; 1,0 or 2,0 l/min) |
| Weight (with case): | 5 kg |
| Dimensions: | h= 120; w= 320; l= 420 mm |

Measuring ranges of the Detector Tubes:

Carbon monoxide detector tubes

5 to 70 ppm carbon monoxide at a flow rate of 0.3 l/min in a measuring time of 5 minutes. (required sampling volume 1.5 l).

See also specific instructions for use of the MSA AUER detector tubes CO-HP.

Carbon dioxide detector tubes

100 to 2000 ppm carbon dioxide at a flow rate of 0.3 l/min in a measuring time of 5 minutes. (required sampling volume 1.5 l).

See also specific instructions for use of the MSA AUER detector tubes CO-HP.

Oil detector tubes

Check for oil contents (vapour + mist) at a flow rate of 2 l/min in a measuring time of 30 minutes. (required sampling volume 60 l). The oil content is determined whether the discoloration goes beyond the warning mark or not.

See also specific instructions for use of the MSA AUER detector tubes Oil-HP.

Water vapour detector tubes

20 to 160 mg/m³ water vapour at a flow rate of 1 l/min and a measuring time of 5 min. (required sampling volume 5 l) or 5 to 70 mg/m³ water vapour at a flow rate of 1 l/min and a measuring time of 10 min. (required sampling volume 10 l).

See also specific instructions for use of the MSA AUER detector tubes H₂O-HP.

All values above are based on air not under pressure and at room temperature resp, normal pressure.

Total amount of sampling air/sampling time are:
min. 68 l / max. 73 l resp. min. 45 min / max. 50 min

5. Operating Instruction

5.1 Preparing for Measuring

- Clean valve of compressed gas cylinders, resp. charging connections of compressor with brief burst of air.
- Connect test device to compressed gas cylinder, resp. to charging connection of compressor using adapter.
Choose the adapter suitable for the prescript maximum pressure of the compressor charging panel (300 resp. 200 bar). Adjust test device so that flow meter is vertical (use water level on flow meter).

5.2 Measuring on Compressed Air Cylinders

- Slowly open cylinder valve
- Set adjusting valve of test device to flow rate of 2 l/min
- Flush device

When the test device is clean and dry flushing for 2 min. sufficient. If the condition of device is not known, or if during a previous measurement higher values were found than are permissible according to EN 12021, flushing at 2 l/min. must be continued. This must be done until 2 water vapour measurements, made at an interval of approx. 15 min., give identical results within the permissible measuring accuracy range. It then can be assumed that the test device is sufficiently clean for making measurements.

Liquid water (droplets) can only be removed from the test device through long flushings with dry, if necessary warm air.

- Set the air flow required for the measurement (See para. 4 measuring ranges for detector tubes).
- For the exact setting of the air flow, the upper edge of the float must be at the same level as the marking on the measuring tube (see fig. 2).
- Check, and if necessary adjust air flow setting after 2 min.
- Observe arrow on detector tube. The arrow points in the flow direction of the test air, therefore, after inserting the tube, the arrow must

- Break off the detector tube tips at air exit side (see fig. 3)
- Put detector tube into the tube holder, inserting broken-off end tightly into holder side away from test device.
- Break off other end of the detector tube (air entry side) and immediately insert open tube tightly into other end of detector tube holder (close to test device). (see fig. 4).
- Immediately thereafter set timer to the time designated for the type of detector tube and start timer.

Note:

After inserting the detector tube the float in the flowmeter will give a lower reading. Leave the float at the lower setting during measuring (see fig. 5)

- Wait for timer bell to ring and then close the adjusting valve of test device immediately.
- Remove detector tube from holder.
- Take reading from the printed scale on the tube

5.3 Measuring on compressors

- Switch on the compressor
- Wait until 200 resp. 300 bar are reached
- Switch off the compressor
- Slowly open valve on compressor
- Flush test device as scripted in para. 5.2
- Set required air flow as scripted in para. 5.2
- Check air flow after approx. 2 min. and adjust, if necessary.

The water content that is measured in air from a compressor only corresponds to the water content of compressor gas cylinders simultaneously charged, or cylinders charged immediately after measuring, if a pressure retaining valve is built into the compressor at the exit side of the drying cartridges. A prerequisite, however, is that the cylinders to be charged are dry.

The pressure retaining valve assures that the pressure inside the compressor drops only insignificantly from the maximum pressure of 300 resp. 200 bar, when cylinders are being charged. With compressor that have no pressure retaining valve behind the filters, water from the drying cartridge can be released to the sudden decompression when the charging connection is opened. The air has then a higher water content as was measured on the compressor charging panel.

MSA AUER compressors normally have a pressure retaining valve.

5.4 Permissible Test Results:

| | |
|--------------------------|--|
| CO Contents | max. 15 ppm |
| CO ₂ Contents | max. 500 ppm |
| Oil Contents | max. 0,5 mg/m ³ |
| Water contents | max. 50 mg/m ³ (rel. to 200 bar) max. 35 mg/m ³ (rel. to 300 bar) max. 25 mg/m ³ (if sampled from compressor) |

point away from the test device.

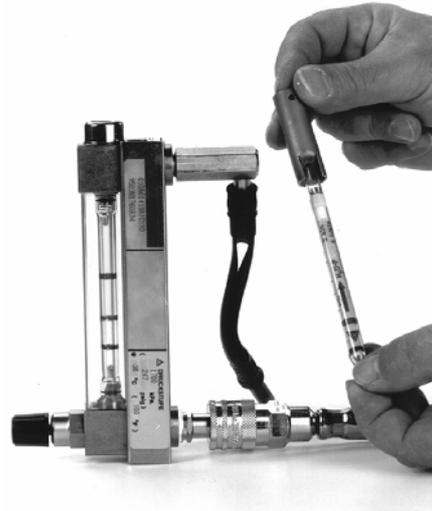


Fig. 3: Breaking off detector tube tips

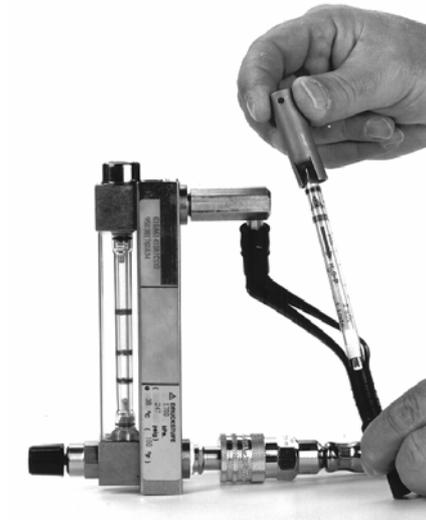


Fig. 4: Inserting detector tube into detector tube holder

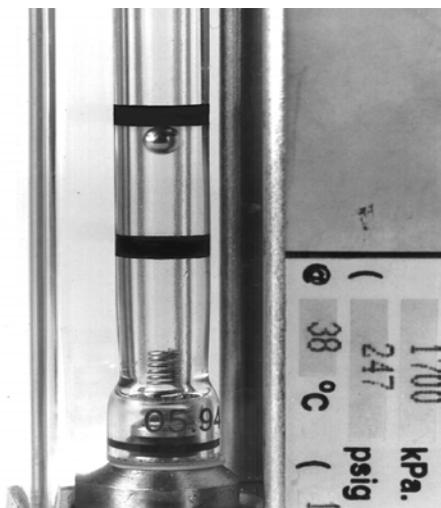


Fig. 2: Setting flow rate on flowmeter



Fig. 5 :Flowmeter during Measuring

6. Maintainance

6.1 General

In view of the significance of the accuracy of measuring results, the test device must be treated with care. Dirt must be avoided at all time, especially at the highpressure connection.

Flushing and cleanless control of the test device must be made as described in para. 5.2. After measuring is completed, the test device shall be stored in the case. The high pressure connection should be closed with a protective cap.

Functual checks should be made at regular intervals and if erroneous measurements are suspected.

6.2 Disorders

If the hand wheel of the test device cannot be loosened while it is connected to a compressed gas cylinder or compressor, check if connection is under pressure. In this case close the cylinder valve or compressor valve and release air from test device.

Leaks at the connection to the cylinder resp. compressor could be due to a defect gasket. In this case replace the gasket.

If the high pressure gauge or the detector tube holder are defective, they must be replaced.

In case of other disorders the device should be returned for repair to MSA AUER or any authorized service station.

7. Part Numbers

MSA AUER Airtester HP D3188701
(Compressed air monitoring set)

Complete with case containing:
Test device consisting of pressure reducer, high pressure gauge, flow meter with adjusting valve and water level, detector tube holder.

Adapter for 200 and 300 bar one each for connecting to compressor charging panel

Timer

device for breaking off detector tube tips

detector tubes for measuring carbon monoxide, carbondioxide, water vapour, oil - one package each.

Accessories and Spare Parts

| | |
|-------------------------------------|----------|
| Detector tubes CO-HP* | D5085847 |
| Detector tubes CO ₂ -HP* | D5085848 |
| Detector tubes H ₂ O-HP* | D5085849 |
| Detector tubes Oil-HP* | 10040887 |
| Detector tubes Oil- HP synth.* | D5085850 |
| Test device | D4074937 |
| Gaskets for connector to cylinder | D4080948 |
| Gaskets-lifter | D4060989 |
| Detector tube holder | D4074058 |
| High pressure gauge | D4080073 |
| Timer | D5185020 |
| Tube tip breaking device | D5085012 |
| Case | D5185911 |
| Case insert | D5185931 |

* = Package of 10 pieces

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