

User Manual Labtec PRO



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1. foreword

This operating manual describes the operation of the **Labtec PRO** series of test instruments.

Labtec test devices are professional tools that require comprehensive respiratory protection expertise, e.g. by completing training as a respirator maintenance technician, to ensure proper operation and correct measurement.

A prerequisite for proper operation of the device is that the device is operated and used exclusively in accordance with these operating instructions. Labtec is not liable for personal injury or damage to property or consequential damage of any kind if the device is used in a manner other than that described in this manual. The same applies to the acceptance of any warranty and guarantee claims.

Otherwise, the terms of sale and delivery as well as the warranty and guarantee conditions of Labtec GmbH apply, which are not extended in any way by these instructions.

2. safety instructions

Each Labtec test device requires device-specific instruction by an authorized Labtec employee or training partner.

The device may only be operated by instructed and authorized personnel.

The device may only be serviced and repaired by trained and certified Labtec service technicians. Only original spare parts and accessories must be used.

The device may only be opened by a Labtec service technician or, if expressly requested, under instruction by a Labtec employee.

To ensure proper functioning of the device and thus a correct measurement result, the device must be serviced at least once a year by a trained and certified Labtec service technician and tested and calibrated by him or her using a Labtec calibration device.

The list of current, certified employees, training partners and service technicians is updated daily and is available from Labtec or on the Labtec homepage.

Labtec devices are partly operated with breathing air in the high pressure range of up to 400bar. Operating a device under high pressure requires the greatest care. Before connecting and disconnecting a test item / breathing apparatus, the test bench must always be completely depressurized and air supply lines, especially the main valve, closed.

The device connection must always be checked. Devices must always be connected completely correctly. When connecting to the high pressure device connection, the device thread must be completely screwed to the internal thread of the device connection.

Before switching off the test device electrically, the test bench must first be completely depressurized and vented and then all connected devices and any full face masks must be removed.

Never test dirty demand valves or masks on the test head. There is a risk of dust particles getting into the measuring system, which can impair the function.

When the test stand is started up, the mouth opening and the instrument connections must remain open, otherwise self-calibration will be incorrect and the measurement data will be incorrect.

The test device must be set up horizontally and rest well on all support buffers.

Care must be taken to ensure that the measuring nozzle in the mouth opening in the test head is not clogged. In case of false measuring values in low pressure, the opening can be cleaned with a 0.2 - 0.35 mm needle.

**In case of queries or uncertainties
contact the Labtec customer service!**

3. device description

Labtec PRO are electronic test devices to be operated via a PC for the testing of breathing masks according to DIN EN 136, self-contained breathing apparatus (SCBA) according to DIN EN 137 and chemical protective suits (CPS) according to DIN EN 943-1.

The tests are performed in the low (-50 to 50 mbar), medium (0 to 20 bar) and high pressure measuring range (0 to 300 bar).

For testing other breathing apparatus or chemical protective suits, contact Labtec. Only breathing air according to DIN EN 12021 may be used.

Model differences

Labtec PRO are fully automatic, "high-end" test devices without any restrictions in test operation in the low, medium and high pressure range.

Labtec Pro light are automatic test devices incl. artificial variable lung for static and dynamic testing of respirators during breathing. In contrast to Labtec PRO they do not have the possibility of automatic sealing of demand valves, no microphone for automatic warning signal detection, no pneumatic redundancy and no possibility of SCBA safety valve testing by medium pressure increase.

Compared to Labtec PRO light, **Labtec PRO static** testers do not have an artificial variable lung and are therefore only suitable for static testing of breathing apparatus.

The devices have several expansion options (modules) which are identified by a letter code:

Module R (regulator): External high-pressure regulator 0 to 330 bar mounted on the front for variable adjustment of the high pressure.

Module COM (All-in-One Computer): Freely positionable touchscreen PC, connected to test device via swivel arm mounting, incl. pre-installed LabNet Profi test software.

Connection requirements

A 230-240 V / 50-60 Hz power supply is required to operate the test stand.

The high pressure supply required for operation is provided by a 300 or 200 bar breathing air cylinder or by a central air supply with 300 bar.

As medium pressure connection Euro-coupling and nipple are available as standard. If units with other coupling connections are tested, appropriate intermediate adapters must be used. Please contact the manufacturer of the units for this.

Scope of delivery and accessories

The scope of delivery of the device includes a high-power-connection cable incl. screw fitting, microphone cable (only PRO), power supply cable and a USB cable.

Adapters for the connection of CPS, regulators and sealing caps for respirators must be ordered separately depending on the connection used (e.g. ESA, PE45, RD40, manufacturer-specific connections).

Labtec offers a wide range of accessories for test devices.

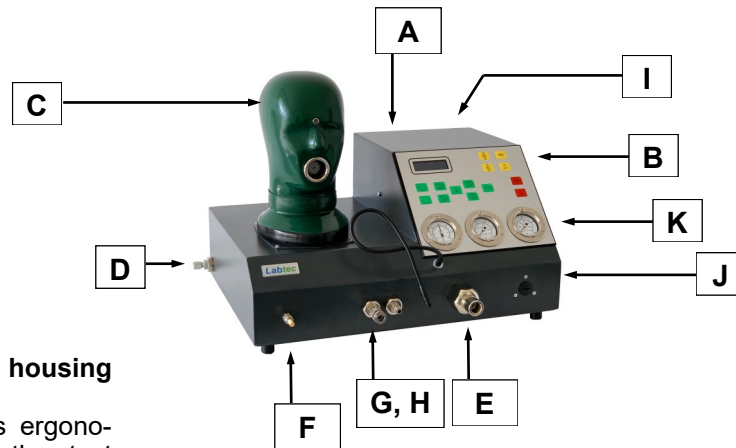
The range includes test adapters for adapting all respiratory protection devices on the market, quick release devices for quick device adaptation as well as holders for holding helmet-mask combinations.

Further information and brochures can be found at www.labtec.de

4. technical data

component	description	unit	value
high-pressure sensor	measuring range	bar	0...400
	precision	%	± 0,5
medium pressure sensor	measuring range	bar	0...+25
	precision	%	± 0,5
low pressure sensor	measuring range	mbar	-50...0...+50
	precision	%	± 0,05
complete device	Max. permissible operating pressure	bar	400
	power supply	V / Hz	230-240 / 50-60
	total power electricity	W	max. 450
	IP rating	IP 54	
	permissible temperature range	°C	-10...+55
	measuring volume	ml	480
	dimensions W X L x H	mm	670 x 510 x 540
	total weight	kg	45 (PRO) 41 (PRO light) 39 (PRO static)

5. component description



Test stand housing (A)

Thanks to its ergonomic design, the test stand can be operated fatigue-free even during continuous operation. Operation in computer mode is via PC keyboard and mouse or manually via the optionally available front panel

Front panel (B)

The front panel contains the control buttons and an OLED display showing measuring values and system information..

Multifunction test head (C)

The test head is a fixed head that can be inflated by an electric pump so that full face masks of any brand can be sealed without problems. A measuring point is installed in the test head which measures the internal pressure in the mask or demand valve.

The Labtec ECO dynamic model has a second measuring point in the forehead area of the head. This can be queried via the software.

Air supply / device connection (D)

The air supply can be provided optionally:

1. Through an existing, fixed 300 bar pipe supply via a 6 mm high-pressure pipe fitting.
2. Through an available 300 bar high pressure hose for connection to a breathing air cylinder or pipe supply.

Device connection (E)

High-pressure device socket for connecting the pressure regulator of the SCBA to be tested.

Vacuum pump

With the built-in vacuum pump, the required air currents are generated and the probe is inflated or deflated. The desired air flow rate can be set in the software from 1 to 10 l/m.

CPS test connection and system vent (F)

Quick coupling for filling CPS. For all other test procedures, the coupling must be connected to the supplied plug-in silencer for system venting.

Medium pressure device connections (G, H)

Quick coupling for connecting the medium pressure line of the demand valve to be tested.

Plug nipple for connecting the medium pressure line of SCBA to be tested.

Power connection (I)

On the left side of the housing there is a C13 power plug coupling for the connection of a cold appliance cable with C14 plug.

USB-Interface (J)

The USB port for data transfer to a PC is located on the left side of the housing.

Gauges - pneumatic redundancy (K)

There is a pneumatic redundancy in the **Labtec PRO** model only. The analog pressure gauges are used for the optical validity check of the measurement results. The sensors are connected in parallel to the installed digital sensors.

Artificial Lung

Labtec PRO and PRO light devices contain an artificial lung, which is continuously adjustable in stroke and breathing frequency. The desired respiration can be infinitely adjusted in the software in the stroke from 5 to 40 strokes/min and in the volume from 0.5 to 3.5 litres.

6. operating elements



LCD multi function display

Digital display of status of operation

Display for low pressure (LP)

Display for medium pressure (MP)

Display for high pressure (HP)



Push button for test head inflation

Pressing causes the test head to be inflated out of the test head



Push button for test head deflation

Pressing causes the air to be aspirated out of the test head



Push button to generate positive pressure

Forcing pump +5 l/min is set in motion by pressing this button



Push button to generate negative pressure

Forcing pump -5 l/min is set in motion by pressing this button



Push button for low pressure relief

Pressing causes the air to be aspirated out of the test equipment



Switch button for 10 l/m exhalation

Forcing pump +10 l/min is set in motion by pressing this button. LED shows function. Pressing button again switches it off.



Switch button for 10 l/m inhalation

Forcing pump -10 l/min is set in motion by pressing this button. LED shows function. Pressing button again switches it off.



Switch button for CPS inflation

Pressing causes the CPS to be inflated.



Switch button for CPS deflation

Pressing causes the CPS to be deflated.



Push button for medium pressure relief

Pressing causes the air to be aspirated out of the test equipment



Switch button for the main valve

When pressed, the high pressure main valve is opened which raises the high pressure. Pressing button again switches it off.



Push button for high pressure relief

Pressing causes the air to be aspirated out of the test equipment



Push button for Medium pressure increase (Only Labtec PRO)

When pressing the medium pressure is increased until the safety valve on the device opens.



Switch button for Artificial Lung (main valve has to be open, Only Labtec PRO + PRO light)

When pressed, the artificial lung is switched on and ventilated through the mouth opening of the test head. Pressing button again switches it off.

7. commissioning

When setting up the unit, make sure that it is horizontal and rests well on all support buffers.

Establish high-pressure connection

Connect the high-pressure line to the air supply connection of the test device.

Establish power supply

Connect the power supply to a 230 V / 50-60 Hz power source using the supplied power cable. Switch on the unit at the switch.

Establish connection to the PC

Install the **LabNet Profi** test software according to the installation instructions. Establish the connection between PC and test bench via USB cable.

> See separate installation and operating instructions LabNet Profi

Device connection (breathing mask)

The test head must be completely vented. The breathing connection of the mask is closed with a suitable sealing cap. Alternatively, connect the mask to a suitable demand valve and then make a device connection (SCBA).

The mask is put on the test head. The inner mask should rest correctly on the nose of the probe.

Then tighten the fasteners of the head mask starting from the bottom. The test head can now be inflated until a tight fit of the mask is ensured. If necessary, readjust the mask.

Device connection (SCBA)

The regulator of the compressed air breathing apparatus is screwed directly to the high pressure device connection. When connecting, make sure that the compressed air breathing apparatus is screwed completely into the internal thread of the device connection.

For tests in the medium pressure range, disconnect the medium pressure line of the SCBA at the Euro coupling and connect it to the plug nipple of the medium pressure device connection and the line of the demand valve to the EURO quick coupling of the medium pressure device connection.

If the SCBA to be tested does not have a Euro coupling, a suitable adapter must be used. Please contact the compressed air breathing apparatus manufacturer.

The demand valve is inserted into the mouth opening of the test head using a suitable adapter.

8. care and maintenance

The test instrument should be protected from external harmful influences such as water, moisture in the form of steam and dust.

The test head should be cleaned and maintained regularly. This can significantly increase the service life of the search unit.

The test head should always be covered with the enclosed protective hood after the instrument has been used.

> See separate test head care instructions

The test device must be serviced at least annually by a certified Labtec service technician.

The test device is recalibrated and deviations in the previous test cycle can be excluded. The maintenance is carried out with a special calibration device.

The maintenance is confirmed by a calibration certificate issued directly by Labtec. The maintenance may only be carried out by authorized and trained service technicians.

In order to ensure a cost-effective and timely maintenance, it is possible to conclude a maintenance contract with Labtec.

Labtec
Gesellschaft für Labortechnik mbH

**Konformitätserklärung
Certificate of Conformity
Attestation de Conformité**



Bezeichnung der Maschine: Type of machine: Description de la machine:	Prüfgerät Test Equipment Instrument de vérification
Modell / Model / Modèle: Typ / Type / Type:	Labtec PRO
Geräte Nr. / instrument no. / Instrument numéro:	PRO / PRO light / PRO static

Hiermit wird bestätigt, dass das Gerät den Anforderungen der **Maschinenrichtlinie 2016/42/EG**, sowie der **EMV - Richtlinie 2014/30/EU** einschließlich allen bis heute veröffentlichten Änderungen bzw. Nachträgen entspricht. Das Gerät entspricht folgenden Normen bzw. Richtlinien:

We do hereby certify that the above mentioned product meets the requirements set forth in **EEC-Guideline 2016/42/EG** and **EMC 2014/30/EU** including all changes and addendums to date thereto. The above mentioned product meets the following standards and guidelines:

Nous Vous Confirmons que l'appareil cité ci-dessus correspond aux exigences des directives **2016/42/EG** ainsi qu' à la directive **CEM 2014/30/EU** ci-inclus toutes les modifications ainsi que tous les suppléments publiés jusqu'à ce jour. L'appareil mentionné correspond aux normes cités ci-après :


DIN EN 60950-1, Ausgabe / dates / en date du **2014-08**
DIN EN 135 Ausgabe / dates / en date du **1999**
DIN EN 136 Ausgabe / dates / en date du **1998**
DIN EN 137 Ausgabe / dates / en date du **2006**
DIN EN 837 Ausgabe / dates / en date du **1997**

Datum / date
01.01.2022

Diese Konformitätsbescheinigung wurde automatisch erstellt und ist ohne Unterschrift gültig.
This calibration certificate was produced automatically and is valid without signature.

A 1 Testing of full face breathing masks

- 1. Complete device (full face mask)**
- 1.1 Leak test with open exhalation valve at - # mbar
- 1.2 Tightness test with closed exhalation valve at + # mbar
- 1.3 Opening pressure of the exhalation valve

Step	Activity	Comment	operating elements
1.1.1	Close breathing connection to mask with sealing plug.	If necessary, moisten the exhalation valve of the mask.	
1.1.2	Place the mask on the test head and tighten the mask strap. Fill test head with head inflation button	The inflation time varies from mask type to mask type.	
1.1.3	Set test vacuum with negative pressure button to setpoint value - # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	 
1.1.4	Read the pressure difference after # min. on the display (LP) and compare with setpoint.		
1.1.5	Deflate the test head with button for test head deflation. Remove mask from test head.		
1.2.1	Seal the exhalation valve of the mask with the adapter. Close breathing connection to mask with sealing plug.	Test only possible with tightly fitted exhalation valve. Use the manufacturer's specific adapters.	
1.2.2	Place the mask on the test head and tighten the mask strap. Fill test head with head inflation button	The inflation time varies from mask type to mask type.	
1.2.3	Set test vacuum with negative pressure button to setpoint value - # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	 
1.2.4	Read the pressure difference after # min. on the display (LP) and compare with setpoint.		
1.2.5	Deflate the test head with button for test head deflation. Remove mask from test head.		
1.3.1	Close breathing connection to mask with sealing plug.		
1.3.2	Place the mask on the test head and tighten the mask strap. Fill test head with head inflation button	The inflation time varies from mask type to mask type.	
1.3.3	Switch on vacuum pump with switch 10l/min Exhalation to produce constant flow.		
1.3.4	Read the opening pressure on the display (LP) and compare it with the setpoint.		
1.3.5	Switch off the pump by pressing the 10l/min Exhalation switch again.		
1.3.6	Deflate the test head with button for test head deflation. Remove mask from test head.		

A 2 Testing of demand valves




















2. Complete device (Demand Valve)

- 2.1 Tightness: Pressure increase after # min at - # mbar negative pressure / + # mbar positive pressure
 2.2 Tightness: Pressure change when medium pressure is applied after # min at # mbar

Step	Activity	Comment	operating elements
2.1.1	Insert the test adapter into the mouth opening of the test head and connect it to the demand valve.	Select suitable adapter according to function and connection type	
2.1.2	Seal the medium pressure hose of the demand valve with a sealing cap or connect it to the medium pressure connection on the device.		
2.1.3	Set test negative pressure with button to generate negative pressure to setpoint + # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	 
opt.	Set test overpressure with button to generate positive pressure to setpoint + # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	 
2.1.4	After a preset time # min, read the pressure change on the display (LP) and compare with the setpoint.		
2.1.5	Completely vent the test device.		
All further tests require high pressure! Check correct device connection! The Labtec test bench + connected test device parts must be completely vented before connecting or removing test devices.			
	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
2.2.1	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
2.2.2	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
2.2.3	Set test negative pressure with button to generate negative pressure to setpoint + # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	 
opt.	Set test overpressure with button to generate positive pressure to setpoint + # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	 
2.2.4	After a preset time # min, read the pressure change on the display (LP) and compare with the setpoint.		
2.2.5	Completely vent the test device.		 















A 2 Testing of demand valves

2. Complete device (Demand Valve)
2.3 Opening pressure / cut-in pressure at # l/min suction
2.4 Static overpressure
2.5 Inhalation resistance at 40 x 2.5 l/min breathing (Only PRO + PRO light)

Step	Activity	Comment	operating elements
2.3.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
2.3.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit and is present in the unit.	
2.3.3	Switch on vacuum pump with switch 10l/min Inhalation to produce constant flow.	until the regulator opens and the maximum negative pressure point is reached	
2.3.4	Read the opening / closing pressure of the demand valve on the display (LP).		
2.3.5	Switch off the pump by pressing the 10l/min Inhalation switch again.		
2.3.6	Close high pressure main valve with main valve switch.		
2.2.7	Completely vent the test device.		 
2.4.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
2.4.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit and is present in the unit.	
2.4.3	Read the static overpressure of the opened demand valve on the display (LP) and compare it with the setpoint.	Test only for positive pressure lung valves	
2.4.4	Close high pressure main valve with main valve switch.		
2.4.5	Completely vent the test device.		 
2.5.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
2.5.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit and is present in the unit.	
2.5.3	Start breathing with switch for artificial lung		
2.5.4	Read the low pressure on the display (LP).	Read the minimum low pressure during the inhalation	
2.5.5	Stop breathing with switch for artificial lung		
2.5.6	Close high pressure main valve with main valve switch.		
2.5.7	Completely vent the test device.		 

A 3 Testing of SCBA


3	Pressure indicator (pressure gauge comparison measurement)
3.1	Pressure comparison at # bar (e.g. 300, 200 ...bar)
4	Acoustic warning device
4.1	Response pressure

Step	Activity	Comment	operating elements
3.1.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
3.1.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
3.1.3	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
3.1.4	Vent high pressure with button for high pressure relief (fast) or medium pressure relief (slower) to test pressure until PA pressure gauge shows the set point.	Read off the SCBA manometer	 
3.1.5	Read the high pressure on the display (HP) and compare it with instrument pressure.		
opt.	Repeat test steps 3.1.4 and 3.1.5 with other test values required by manufacturer		
3.1.6	Completely vent the test device.		 
4.1.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
4.1.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
4.1.3	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
4.1.4	Vent high pressure with button for high pressure relief (fast) or medium pressure relief (slower) until an acoustic signal (warning whistle) becomes audible.		 
4.1.5	Read the response pressure on the display (HP) and compare with setpoint.		
4.1.6	Completely vent the test device.		 

A 3 Testing of SCBA

5 Pressure Regulator (base unit)

- 5.1 Static Medium pressure at # bar inlet pressure
- 5.2 Medium pressure increase after # min

Step	Activity	Comment	operating elements
5.1.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
5.1.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
5.1.3	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
5.1.4	Vent high pressure with button for high pressure relief (fast) or medium pressure relief (slower) to to setpoint + # bar inlet pressure		 
5.1.5	Read the medium pressure on the display (MP) and compare with setpoint.		
5.1.6	Completely vent the test device		 
5.3.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
5.2.1	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
5.2.2	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
5.2.3	Vent high pressure with button for high pressure relief (fast) or medium pressure relief (slower) to to setpoint + # bar inlet pressure		 
5.2.4	Read the medium pressure on the display (MP), start the stopwatch.		
5.2.5	After a preset time of # min, read the medium pressure again and compare it with the previously measured value.	Compare difference value with permissible deviation.	
5.2.6	Completely vent the test device.		 




















A 3 Testing of SCBA

5 Pressure Regulator (base unit)

- 5.3 Dynamic Medium pressure at 40 x 2.5 l/min breathing (Only PRO + PRO light)
- 5.4 Opening pressure of the pressure regulator safety valve (Only PRO)

6 Complete Device

- 6.1 High pressure tightness test

Step	Activity	Comment	operating elements
5.3.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
5.3.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit and is present in the unit.	
5.3.3	Start breathing with switch for artificial lung		
5.3.4	Read the medium pressure on the display (MP).	Read the minimum medium pressure during the inhalation process	
5.3.5	Stop breathing with switch for artificial lung		
5.3.6	Close high pressure main valve with main valve switch.		
5.3.7	Completely vent the test device.		 
5.4.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
5.4.2	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
5.4.3	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
5.4.4	Increase medium pressure with specific button until the pressure regulator safety valve opens.	Only carry out testing if prescribed by the manufacturer, otherwise the device may be damaged.	
5.4.5	Read the medium pressure on the display (MP).		
5.4.6	Completely vent the test device.		 
6.1.1	Connect demand valve in combination with a SCBA base unit to the test device.	Check correct device connection!	
6.1.1	Open high pressure main valve with main valve switch.	High pressure flows into the unit.	
6.1.2	Close high pressure main valve with main valve switch.	Test instrument/test specimen are under pressure.	
6.1.3	Read high pressure on the display (HP), start stop watch.		
6.1.4	After a preset time of # min, read the high pressure again and compare it with the previously measured value.	Compare difference value with permissible deviation.	
6.1.5	Completely vent the test device.		 











A 4 Testing of gas-tight chemical protective suits (CPS)

7 Tightness

7.1 Tightness of the suit

8 Valves

8.1 Tightness of the suit valves after # min. at - # mbar
(repeat the test depending on the number of valves)

Step	Activity	Comment	operating elements
7.1.1	Close the high-pressure device connection with a plug.	Device connection must be closed during tightness test.	
7.1.2	Connect one tightening valve with test adapter, seal all other tightening valves with plugs.	CPS test adapter CGA 200 and brand-specific adapters	
7.1.3	Couple the filling hose of the test adapter with plug nipple of CPS test connector.	CPS test adapter CGA 200	
7.1.4	Insert the measuring hose of the test adapter into the mouth of the test head.	CPS test adapter CGA 200	
7.1.5	Open high pressure main valve with main valve switch.	High pressure flows into the unit and is present in the unit.	
7.1.6	Fill CPS by pressing the CPS inflation switch	CPS is filled to +# mbar	
7.1.7	Durch erneutes Drücken des Schalters CSA füllen das Befüllen des Anzugs stoppen.	when the required tightening internal pressure is reached.	
7.1.8	Press the CPS inflation switch again to stop filling the suit.	Setting the required settling time.	
7.1.9	When time has elapsed, set the required test pressure with the CPS inflation or CPS deflation switches and start the stopwatch.		
7.1.10	After a preset time of # min, read the low pressure on the display (LP) and compare with the previously set test pressure.	Compare difference value with permissible deviation.	
7.1.11	Close high pressure main valve with main valve switch.		
7.1.12	Completely vent the test device.	Open the suit	
8.1.1	Insert the measuring hose of the test adapter into the mouth of the test head.	CPS test adapter CGA 200	
8.1.2	Connect tightening valve with valve test adapter from inside	manufacturer-dependent adapter, depending on the number of existing valves.	
8.1.3	Set test vacuum with negative pressure button to setpoint value - # mbar. Switch on stop watch.	Adjust the test pressure with the low pressure relief button if necessary.	
8.1.4	After a preset time of # min. pressure change read off the display (LP) and compare with set-point.		
8.1.5	Completely vent the test device.		