

User Manual LabModul 400



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1. foreword

This operating manual describes the operation of **LabModul 400** 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

LabModul 400 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) and medium pressure measuring range (0 to 20 bar).

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

Module T Control panel with LCD display and membrane keyboard for manual operation of the device.

Module COM Freely positionable touchscreen PC, connected to test device via swivel arm mounting, incl. pre-installed LabNet Profi test software

The device is also available as model MT. The model **LabModul 400 MT** has no interface to the LabNet Profi operating software but is designed for purely manual operation without PC support. The LabModul 400 MT has the standard operating panel of option T. The interface can be retrofitted at the factory.

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-pressure-connection cable incl. screw fitting, 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).

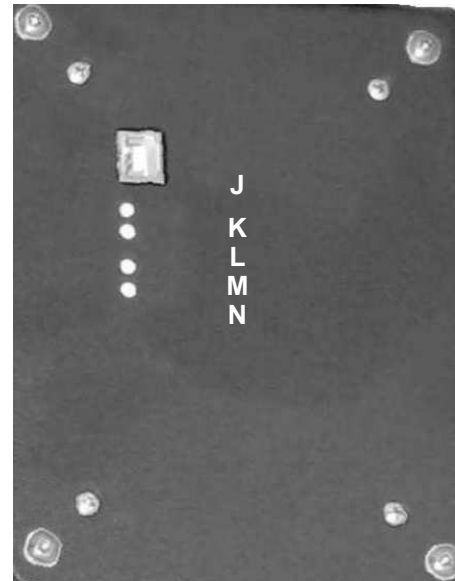
Labtec offers a wide range of accessories for test devices.

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

4. technical data

Medium pressure connection:	EURO coupling and nipple 0...20 bar
high pressure connection:	Tube screw connector 6 mm S for central 300 bar air supply and alternatively 300 and 200 bar cylinder hose.
High pressure sensor:	Measuring range 0...400 bar precision ± 0,5 %
Medium pressure sensor:	Measuring range 0...25 bar precision ± 0,5 %
Low pressure sensor:	Measuring range -50.0.+50 mbar precision ± 0,05 %
Dead space	approx. 480 ml -w. o. Adapter
Power Transformer	Input: 230 V AC Output: 24 V DC
Dimensions	~ B 460 x H 490 x D 500 mm
Weight:	approx. 26 kg

5. operating elements



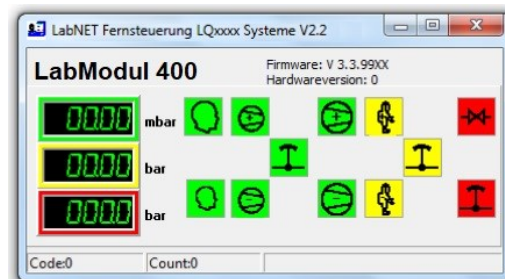
- A test stand housing
- B Control panel (Option T)
- C Test head / breathing connection
- D High pressure connection (T-piece)
- E Device connection 300 bar
- F CPS Filling connection and device venting
- G Medium pressure regulator connection (coupling)
- H Medium pressure device connection (plug nipple)
- I Power supply 230 V AC with switch

- J USB interface
- K LED USB signals reception
- L LED USB signals transmission
- M LED + 24 V present
- N LED + 5 V present



- 1 LCD Display Low Pressure Display
- 2 LCD Display Medium Pressure Display
- 3 LCD display high pressure display
- 4 Inflate test head, sensing valve
- 5 Empty test head, tactile valve
- 6 Generate overpressure 5 l/min, sensing valve
- 7 Generate vacuum 5 l/min, push button valve
- 8 Relieve low pressure, sensing valve
- 9 Exhalation 10 l/min, switching valve
- 10 Inhalation 10 l/min, switching valve
- 11 Fill CPS, switching valve
- 12 Empty CPS, switching valve
- 13 Relieve medium pressure, tactile valve
- 14 High pressure main valve, switching valve
- 15 Relieve high pressure, sensing valve

or operating terminal via the test software



6. 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) (Option T)

The front panel contains the control buttons and a multi-function LCD display showing print and system information.

The following abbreviation is used:
LP = low pressure (-50...+50 mbar)
MP = medium pressure (0...25 bar)
HP = high pressure (0-400 bar)

Multifunction probe (C)

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

Air supply / device connection (D)

The air supply can be attached in 2 ways.

1. Through an existing, fixed 300 bar pipe supply line via a 6 mm high-pressure pipe fitting (heavy series). The high-pressure coupling at the T-piece is removed and the other connection is closed with the blind plug and union nut.

2. Via a high-pressure quick coupling in conjunction with a separately available 200 or 300 bar cylinder high-pressure line. The high-pressure connection cable is adapted to the cylinder valve of the breathing air cylinder with the cylinder connection on the one hand. At the other end of the line there is a self-closing nipple for the high-pressure coupling on the test bench.

Caution: Never connect or disconnect the line under pressure!

Device connection (E)

High-pressure device socket for connecting the pressure regulator of the compressed air respirator to be tested.

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 nipple/silencer for system venting.

Medium pressure device connections (G, H)

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

Plug nipple for connecting the medium pressure line of the compressed air regulator to be tested.

Interface (J)

The USB interface for data transfer to a PC is located on the left side of the housing. (is without function for the manual device Lab-Modul 400 MT)

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 2...12 l/min.

Processor

The built-in microprocessor takes over the control and signal conversion.

7. description of the operating elements

- LCD multi function display**
Digital display of status of operation
- 1 **Display for low pressure (LP)**
 - 2 **Display for medium pressure (MP)**
 - 3 **Display for high pressure (HP)**
 - 4 **Push button for test head inflation**
Pressing causes the test head to be inflated out of the test head
 - 5 **Push button for test head aspiration**
Pressing causes the air to be aspirated out of the test head
 - 6 **Push button to generate positive pressure**
Forcing pump +5 l/min is set in motion by pressing this button
 - 7 **Push button to generate negative pressure**
Forcing pump -5 l/min is set in motion by pressing this button
 - 8 **Push button for low pressure decompressing**
Pressing causes the air to be aspirated out of the test equipment
 - 9 **Switch button for forcing pump**
Forcing pump +10 l/min is set in motion by pressing this button. LED shows function. Pressing button again switches it off.
 - 10 **Switch button for forcing pump**
Forcing pump -10 l/min is set in motion by pressing this button. LED shows function. Pressing button again switches it off.
 - 11 **Switch button for medium pressure / CPS inflated**
Pressing causes the CPS to be inflated out of the CPS
 - 12 **Switch button for medium pressure / CPS aspirated**
Pressing causes the air to be aspirated out of the test head
 - 13 **Push button for medium pressure decompressing**
Pressing causes the air to be aspirated out of the test equipment
 - 14 **Switch button for high pressure (main valve)**
LED shows function.
 - 15 **Push button for high pressure decompressing**
Pressing causes the air to be aspirated out of the test equipment

8. 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 (not with MT)

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.

9. 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.

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

A 1 testing full-face masks

Leakage and opening pressure


















- 1.1 Leakage test with open A-valve at --# mbar (standard test, should always be carried out)
- 1.2 Leakage test with sealed A-valve at +# mbar (performed to locate any leak detected by test 1.1)
- 1.3 Opening pressure of the outlet valve

Test step	Operation	Comments	Controls
1.1.1	Wet the outlet valve rubber slice. Breathing connection of mask close with the dust cap.	Flutter valve must be thoroughly moist	
1.1.2	Mount mask on test head, pull straps tight, inflate test head (4).	A few seconds is usually long enough	
1.1.3	Adjust negative pressure to exactly - # mbar (7) use stop watch.	By means of pressure relief valve (8)	
1.1.4	Pressure increase after # min at the LCD (LP) read off and compare with the nominal value		
1.1.5	Deflate test head (5), remove mask		
1.2.1	Wet the outlet valve rubber slice. Breathing connection of mask close with the dust cap.	Test only possible with tight-set A-valve. Use mark specific adaptors.	
1.2.2	Mount mask on test head, pull straps tight, inflate test head (4).	A few seconds is usually long enough.	
1.2.3	Adjust positive pressure to exactly + # mbar (6) use stop watch.	By means of pressure relief valve (8)	
1.2.4	Pressure increase after # min at the LCD (LP) read off and compare with the nominal value.		
1.2.5	Deflate test head (5), remove mask.		
1.3.1	Mount mask on test head, pull straps tight, inflate test head (4).	A few seconds is usually long enough.	
1.3.2	Pump +10 l/min switch on (9).		
1.3.3	Opening pressure at the LCD (LP) read off and compare with the nominal value		
1.3.4	Pump +10 l/min switch off (9).		
1.3.5	Deflate test head (5), remove mask.		

A 2 testing demand valves

2 Demand valve

- 2.1 Leakage: Pressure rise after # min at --# mbar negative pressure / overpressure
- 2.2 Tightness of the dosing valve: Pressure change with pending medium pressure to # min. at # mbar
- 2.3 Opening pressure / activating pressure on # l/min exhausting
- 2.4 Static pressure / overpressure of demand valves

Test step	Operation	Comments	Controls
2.1.1	Couple demand valve to test head	Use mark specific adaptors..	
2.1.2	Seal the medium-pressure hose of the demand valve with a cap or connect it to the medium pressure connection (G) on the device.		G
2.1.3	Test vacuum with push button (7) to setpoint. Set - # mbar. Turn on the stopwatch.	If necessary, relieve with button (8) and approach to setpoint.	 
and/or	Test overpressure with push button (6) to setpoint. Set + # mbar. Turn on the stopwatch.	If necessary, relieve with button (8) and approach to setpoint.	 
2.1.4	Read off the pressure change on the LCD display (LP) after a specified time # min and compare with the setpoint.		
	<i>All further tests require high pressure!</i> Connect the demand valve to the test device in conjunction with a SCBA.	The regulator of the SCBA must be connected to device connection (E) and medium pressure hose to device connection (H).	E, H
2.2.1	High pressure main valve (14) open.	high pressure flows into the device	
2.2.2	High pressure main valve (14) close.	Tester / DUT are under pressure .	
2.2.3	Relieve low pressure with button (8) and set to setpoint.	Demand valve must be closed, close if necessary.	
2.2.4	Read off the pressure change on the LCD display (LP) after a specified time # min and compare with the setpoint.		
2.3.1	High pressure main valve (14) open and leave open.	high pressure flows into the device and is in the device.	
2.3.2	Switch on pump with switch (9) and flow of -10 l / min. produce.	until the regulator opens.	
2.3.3	Read the opening / closing pressure of the regulator on the LCD display (LP).		
2.3.4	Switch off pump with switch (10).		
2.4.1	With High pressure main valve (14) open, read the static overpressure of the open LA on the LCD display (LP) and compare with the setpoint.	Testing only for positive pressure regulators	 
2.4.2	High and medium pressure relieve with buttons (13) and (15).	at the end of the test or continue with further tests.	 









A 3 testing breathing apparatus

3 Pressure gauge (Manometer comparison measurement)

3.1 pressure comparison at # bar (p.e. 300, 200 ...bar)

4 Acoustic warning device

4.1 Pressure

Test step	Operation	Comments	Controls
3.1.1	Connect the SCBA-regulator to the device connecting piece (E)	For 200 bar devices, use the optional 300/200 bar adapter and feed 200 bar from the breathing air bottle on the input side.	E
3.1.2	Connect the medium-pressure device connection coupling with the plug nipple (H) and the demand valve with the coupling (G). Insert the demand valve in the test head.		H, G
3.1.3	Open HP main valve with switch (14).	high pressure flows into the device	
3.1.4	Close HP main valve with switch (14).	Tester / DUT are under pressure .	
3.1.5	Lower high pressure with probe (15) and (13) to test pressure (300 bar) until the PA manometer shows the setpoint.	Read off the SCBA manometer	
3.1.6	Read high pressure on LCD display (HP) and compare with unit pressure.		
3.1.7	Test step 3.1.5 and 3.1.6 with further, pressure gauge specified by the manufacturer Repeat test values.		
4.1.1	Open HP main valve with switch (14).	high pressure flows into the device	
4.1.2	Close HP main valve with switch (14).	Tester / DUT are under pressure .	
4.1.3	Lower High pressure fast with switch (15) or slow with switch (13), until the acoustic signal (warning whistle) becomes audible.		
4.1.4	Read the set pressure on the LCD display (HP) and compare with the setpoint.		






















A 3 testing breathing apparatus

5 pressure reducer

- 5.1 Medium pressure, static at # bar pre-pressure
- 5.2 Medium pressure leakage after # min
- 5.3 Medium pressure, dynamic at 10 l / min suction (optional, not required by manufacturers)

6 Total Unit

- 6.1 High pressure leak test

Test step	Operation	Comments	Controls
5.1.1	Open HP main valve with switch (14).	high pressure flows into the device	
5.1.2	Close HP main valve with switch (14).	Tester / DUT are under pressure .	
5.1.3	High pressure with button (15) and (13) on lower preset # bar form.		 
5.1.4	Read the medium pressure on the LCD display (MP) and compare with setpoint.		
5.2.1	Open HP main valve with switch (14).	high pressure flows into the device	
5.2.2	Close HP main valve with switch (14).	Tester / DUT are under pressure .	
5.2.3	High pressure with button (15) and (13) on lower preset # bar form.		 
5.2.4	Read medium pressure on LCD (MP) display, start stopwatch.		
5.2.5	After a specified time of # min, read the medium pressure again and compare with the previously measured value.	Compare difference value with allowable deviation.	
5.3.1	Open HP main valve with switch (14) and leave open.	high pressure flows into the device and is in the device.	
5.3.2	Switch on pump with switch (10) and flow of -10 l / min. produce.	Regulator must be connected.	
5.3.3	Read medium pressure on the LCD (MP) display.		
5.3.4	Close HP main valve with switch (14).	Tester / DUT are under pressure .	
6.1.1	Open HP main valve with switch (14).	high pressure flows into the device	
6.1.2	Close HP main valve with switch (14).	Tester / DUT are under pressure .	
6.1.3	Read high pressure on LCD display (HP), start stopwatch.		
6.1.4	After a specified time of # min, read the high pressure again and compare with the previously measured value.	Compare difference value with allowable deviation.	
6.1.5	Relieve high pressure and medium pressure with the buttons (13) and (15).	at the end of the test or continue with further tests.	 

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















7 Tightness

7.1 Tightness of the suit

8 A-Valve

8.1 - Tightness test of suit valves No. 1 to 4 after # min. at - # mbar

8.4 (Repeat test according to the number of valves)

Test step	Operation	Comments	Controls
7.1.1	Close the device connection (E) with a plug or connect a SCBA regulator.	Device connection (E) must be closed in case of tightness test.	E
7.1.2	Connect a tightening valve with test adapter, seal all other tightening valves with plugs.	CPS test adapter CGA 200 and manufacturer-specific adapter	
7.1.3	Engage filling hose of the test adapter with plug nipple in filling connection (F).	CPS test adapter CGA 200	F
7.1.4	Insert measuring hose of the test adapter into the mouth opening of the test head (C).	CPS test adapter CGA 200	C
7.1.5	Open HP main valve with switch (14).	high pressure flows into the device .	
7.1.6	Press the switch (11) to inflate CPS	CPS is filled to > # mbar.	
7.1.7	Press the switch (11) again to stop filling the suit.	when the required internal pressure is reached.	
7.1.8	Lower pressure with switch (12) to the required internal pressure, if necessary with button (13) close and turn on the stopwatch.	Setting the required settling time	 
7.1.9	When the time has expired, lower with the switch (12), if necessary with the button (13) to the required test pressure and switch on the stopwatch		 
7.1.10	After a specified time of # min read off the low pressure on the LCD display (LP) and compare with the previously set test pressure.	Compare difference value with allowable deviation.	
7.1.11	Close HP main valve with switch (14).		
7.1.12	Relieve the pressure on the test system, remove the test adapter	Open suit.	 
8.1.1 - 8.4.1	Insert measuring hose of the test adapter into the mouth opening of the test head (C).	CPS test adapter CGA 200	C
8.1.2 - 8.4.2	Connect suit valves 1 to 4 one after the other with valve test adapter from the inside	brand-specific adapter, depending on the number of the suit existing valves.	
8.1.3 - 8.4.3	Test vacuum with button (7) to setpoint. Set - # mbar. Turn on the stopwatch.	If necessary, relieve with button (8) and approach to setpoint.	 
8.1.5 - 8.4.5	After a specified time of # min. Read pressure change on the LCD display (LP) and compare with setpoint.		

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:	Labtest / LabModul
Geräte Nr. / instrument no. / Instrument numéro:	240 / 400 / 800 / 1000 / 1200 / 1600

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 nomes 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
01.01.2017

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