

TURBOLAB 80

Turbomolecular pump system with dry
compressing backing pump

Operating Instructions GA501591_002_A2

Material number
501591Vxxx



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1 Description

Described in these Operating Instructions is the equipment and operation of the turbomolecular pump system **TURBOLAB 80**.

1.1 Ordering Information

TURBOLAB 80, DN63ISO-K 501591V1xyz*

TURBOLAB 80, DN63CF 501591V2xyz*

*xyz indicate the precise version of the system together with the possible options.

1.2 Supplied Equipment

TURBOLAB 80

Mains cord 230V/1ph/50Hz

Operating Instructions for the pump system

Operating Instructions for the turbomolecular pump

Inlet screen for the turbomolecular pump

1.2.1 Pump System Components

- Turbomolecular pump SL80
- Frequency converter TURBO.DRIVE 400
- 24 V DC power supply unit
- Diaphragm pump
- Control unit

1.2.2 Accessories

Optional accessories for the pump systems are:

- High vacuum gauge ITR90
- High vacuum gauge PTR90
- Forevacuum gauge TTR91
- Venting valve

1.3 Technical Data

Pumping speed for N ₂	60 l/s
Attainable ultimate pressure range	10 ⁻⁷ mbar *
Run-up time for the turbomolecular pump	1.5 minutes
Pumping speed of the diaphragm pump	0.7 m ³ /h
Ultimate pressure of the diaphragm pump	3 mbar
Mains voltages	100-240V, 1ph, 50-60Hz
Main fuses (at the main switch)	10 A
Dimensions	255 x 355 x 355 mm
Ambient conditions	
Temperature	0 – 35°C
Humidity	5 – 95%, non-condensing
Weight	14.5 kg

* At ambient temperature 20°C.

2 Connections



Never expose any parts of the body to the vacuum.



The turbomolecular pump must be firmly attached using bolts.

If the pump is not affixed adequately, parts from inside the pump may come loose and fly around should the pump seize.

Never operate the pump system without having flanged it to the vacuum chamber first in the course of a benchtop test, for example.



Operate the pump system only off the mains voltage which has been specified on the nameplate.

After a mains power failure in the pump may run up automatically as soon as the mains power returns.

If the pump has been pumping hazardous gases before, then introduce suitable precautions before opening the intake or exhaust connections.

If necessary, wear protection gloves, breathing protection or protective clothing and work under a fume hood.

The turbomolecular pump system is **not** suited for pumping of dusty, aggressive or corrosive media.

The turbomolecular pump system must only be uninstalled when not in operation.

Accelerating forces must be avoided or reduced to such a level that the rotor unit is not excited by vibrations. In critical applications consult our application department first.

The pump must be only opened by persons duly authorised by Leybold.

2.1 Conforming Utilisation

Vacuum pump systems as described in the catalogue are not suited for pumping of:

- oxygen at levels exceeding the concentration present in the atmosphere,
- hazardous gases,
- easily flammable, explosive or toxic gases,
- extremely aggressive or corrosive media
- liquids
- or solid materials.

The operator is responsible for assessing the danger potential of the process media which as to their composition differ from the normal atmosphere.

3 Operation

3.1 Electrical Connection

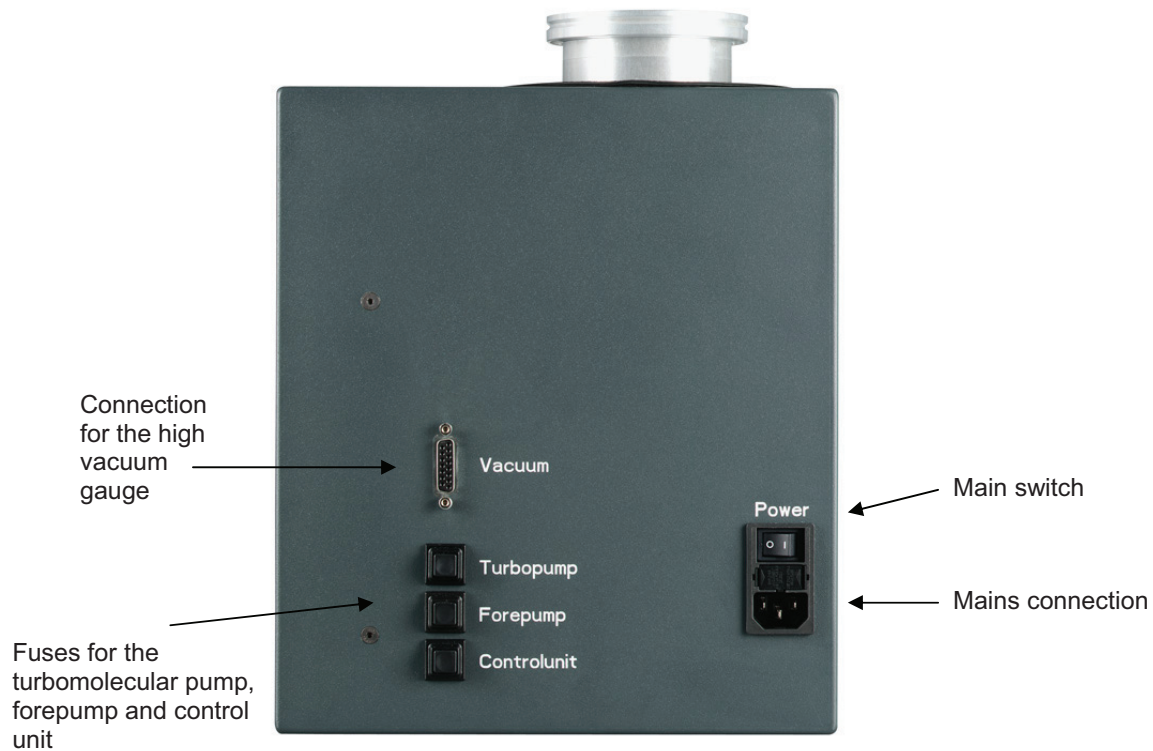


Warning

Risk of suffering injury!

During all connection work deenergise mains power lines (lockout/tag out). The electrical connections must only be prepared by a trained electrician as, for example, in accordance with EN 50110-1.

The mains connection of the pump system can be found on the right at the bottom on the rear of the pump system. There also the main switch can be found. The main fuse is located behind a cover panel on the main switch.



Description


3.2 Switching the System on

The TURBOLAB 80 is switched on through the main switch on the rear of the housing.

After switching on, the display will indicate: Self-Test Passed

After a few seconds the display changes to the welcome screen



By pressing the pushbutton  within 15 seconds, the default settings of the system can be changed, see Chapter 3.3.


3.3 Changing the Default Settings of the System

Welcome screen




← Display/change the default settings


Depending on which high vacuum gauge and which forevacuum gauge has been connected to the TURBOLAB 80 the software must be set up accordingly. This is done through the default settings.

In order to enter the mode of the default settings, the pushbutton  must be pressed within 10 seconds.

Then it is possible to select one after the other the type of high vacuum gauge, the type of forevacuum gauge and the language.

After the 10 seconds have elapsed without operating the pushbutton  the display automatically changes to the operating display mode. In order to redisplay the welcome screen and enter the mode of the default settings, the pump system must be switched off and on again at its main switch.

3.3.1 Selecting the HV Gauge Head

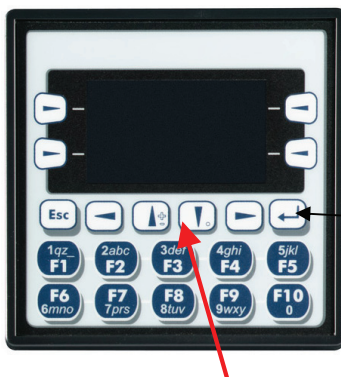
After having pressed the pushbutton  in the welcome screen (see Chapter 3.3) the display will indicate the enabled settings for the high vacuum measurement.

Example:



Depending on how the TURBOLAB 80 has been equipped on delivery, the following will be indicated:

For systems without a gauge head	HV-MESSUNG	OHNE
For systems with an ITR90:	HV-MESSUNG	ITR90
For systems with a PTR90:	HV-MESSUNG	PTR90



ENTER pushbutton

  Pushbuttons for selecting the possible parameters

In order to change the setting, the ENTER pushbutton  must be pressed.

Thereafter the bottom area with the information on the high vacuum gauge (**OHNE** / ITR90 / PTR90) is displayed with a black background.

Through the pushbuttons  and  a different setting can be selected.

Possible settings:

- **OHNE** (no high vacuum gauge)
- ITR90
- PTR90

By pressing the ENTER pushbutton once more the setting is enabled.

3.3.2 Selecting the Forevacuum Gauge Head

By pressing the pushbutton  the display will indicate the enabled settings for the forevacuum measurement.

Example:



Depending on how the TURBOLAB 80 has been equipped on delivery, the following will be indicated:

For systems without a gauge head:	VV-MESSUNG	OHNE
For systems with a TTR91:	VV-MESSUNG	TTR91

In order to change the setting, the ENTER pushbutton  must be pressed.

Thereafter the bottom area with the information on the forevacuum gauge (OHNE / TTR91) is displayed with a black background.


Through the pushbuttons  and  a different setting can be selected.

Possible settings:

- OHNE (no forevacuum gauge head)
- TTR91

By pressing the ENTER pushbutton once more the setting is enabled.

3.3.3 Selecting the Language

When pressing the pushbutton  once more the display will indicate the currently enabled language.

Example:



Upon delivery of the TURBOLAB 80 the language has been set to German.

In order to change the setting, the ENTER pushbutton  must be pressed.

Thereafter the bottom area with the information on the language (Deutsch / Italiano / Francaise / English) is displayed with a black background.


Through the pushbuttons  and  a different setting can be selected.

Description

Possible settings:

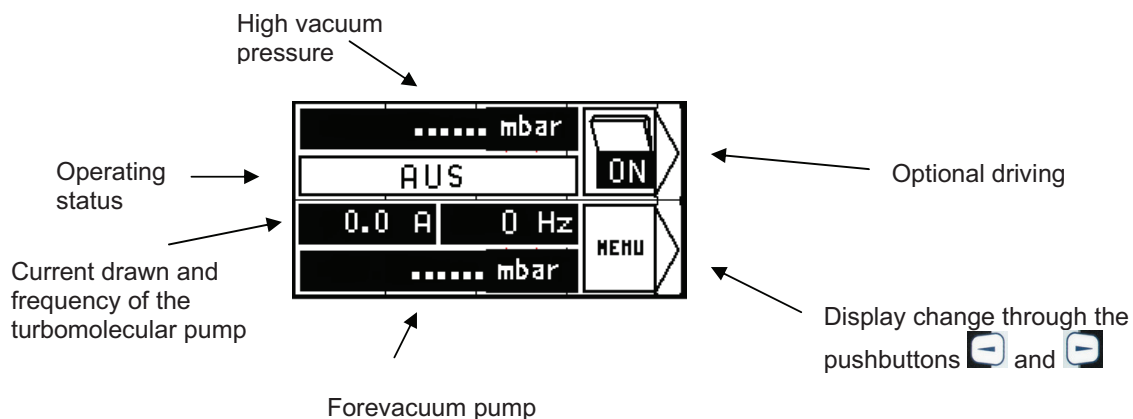
- Deutsch
- Italiano
- Francaise
- English

By pressing the ENTER pushbutton once more the setting is enabled.


After pressing the pushbutton  once more, the welcome screen will be displayed again which after approximately 10 seconds automatically changes to the operating mode display.

3.4 Commissioning the System

After the display has switched over to the operating mode display the following is indicated.




If no high vacuum or forevacuum gauge has been selected, then nothing will be displayed in the corresponding field.



Through the pushbutton  next to "ON" the pump system can be started. The display will then change to "OFF" and the operating status will indicate "VV EIN".

As soon as the factory default cut-in pressure of 20 mbar has been attained, the turbomolecular pump will start automatically and the operating display will change to "TMP HOCHLAUF".

After run-up has completed, the operating status "HV ERREICHT" will be displayed.

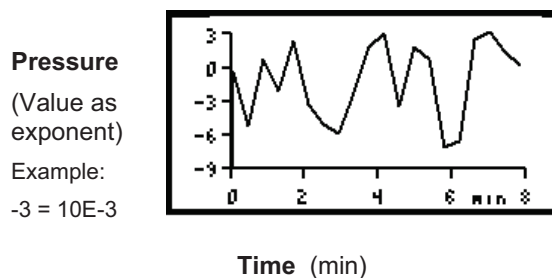
3.4.1 Changing the Display Settings

During operation of the TURBOLAB 80 different display settings can be set up through the pushbutton .

The following displays are available which may be selected by pressing the pushbutton  once more and alternatively backwards through the pushbutton .

3.4.2 Pressure History

The pressure history may be displayed by way of the pumpdown curve over the last eight minutes



The pressure unit will be the unit which has been set up.

3.4.3 Operating Hours

Forevacuum pump operating hours



High vacuum pump operating hours



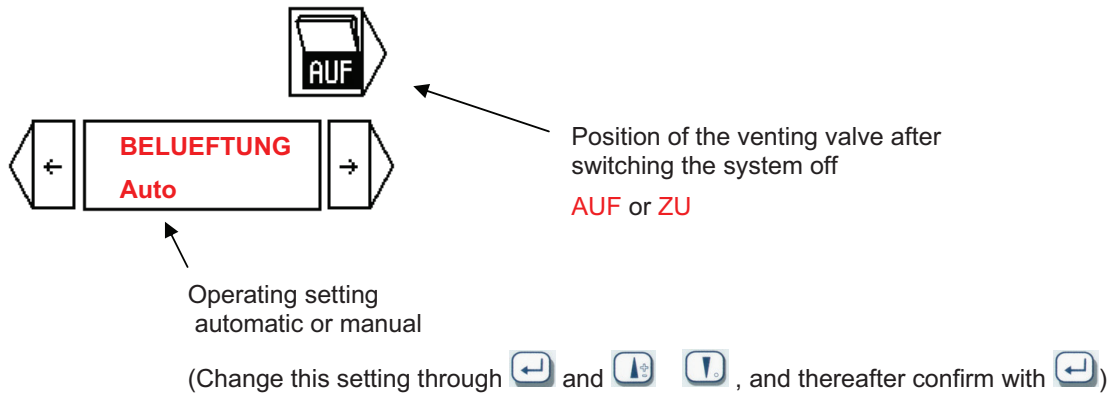
Generally the number of operating hours for the high vacuum pump will be higher than those for the forevacuum pump, since the high vacuum pump has been subjected to an endurance test in the factory over several hours. This time is recorded by the turbomolecular pump. The displayed value is composed of the number of operating hours during the test run in the factory plus the number of operating hours of the pump system.

The number of operating hours for the forevacuum pump will only indicate the number of operating hours for the pump system.

Description

3.4.4 Venting Valve

The venting valve can be set up to fulfil different functions.




Operating setting	Position	Function
Auto	OPEN or CLOSED	60 seconds after the turbomolecular pump has been switched off and decelerated, the venting valve opens for two minutes. Thereafter it closes automatically.
Manual	CLOSED	The pump system is not vented.
Manual	OPEN	60 seconds after the turbomolecular pump has been switched off, venting is effected. Thereafter the venting valve remains open. When the pump system starts, the venting valve closes.

3.4.5 Pressure Units


Different pressure units can be set up



Through the pushbuttons  and   the pressure unit can be changed, thereafter confirm through .

Possible pressure units:

- mbar
- Pa
- Torr

By pressing the pushbutton  the operating display is displayed once more.

3.5 Shutting the System Down

To shut down the system,  is selected with the pushbutton  next to it.

The display will indicate the message “**TMP BREMST**”.

After the turbomolecular pump has arrived at standstill, the display will change to “**AUS**”.

3.6 Operating Information

With connected gauge heads, only automatic operation is possible.

Without gauge heads, only manual operation is possible.

To read out the parameters on a PC please contact Oerlikon Leybold Vacuum, Cologne.

Description

4 Spare Parts

Fuses 10 A	P/N	500 007 955
Controller with Software	P/N	6504920

5 Options

Venting valve kit	P/N	6504899
Adapter for PTR gauge head	P/N	6504112

EC - Declaration of Conformity

The manufacturer: Oerlikon Leybold Vacuum GmbH
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herewith declares that the following product:

Product designation: Turbomolecular pump system
Type designation: TURBOLAB 80 Full Featured
Part number: 501591Vxxxx

complies with all pertinent regulations of the Directive on Machinery (2006/42/EC).
Furthermore the machinery complies with all regulations of the Directive Electrical Equipment (2006/95/EC) and Electromagnetic Compatibility (2004/108/EC).

The following harmonised standards have been applied:

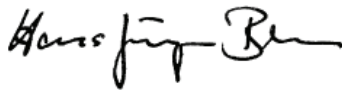
EN 1012-2,	1996	Compressors and vacuum pumps - Safety requirements - Part 2: Vacuum pumps
EN 60204-1,	2006	Safety of machinery - Electrical equipment of machines – Part 1: General requirements
EN 61010-1	2002	Safety of electrical measure, control and laboratory equipment
EN 61000-6-4,	2007	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
EN 61000-6-2	2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

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