



# Vacuum Pump Systems

TURBOLAB

High Vacuum Pump Systems



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# General to High Vacuum Pump Systems TMP

The requirements of production or research engineers concerning the vacuum technology they have to employ are usually widely different. In most cases pumping speed and operating pressure must be accurately matched to suit a particular process. The wide range of vacuum pumps and standard accessories available offers many options.

Sometimes it is just this flexibility which causes difficulties when having to decide between the various configurations of a particular pump system. Based on our experience and by listening to our customers' demands, we have therefore compiled a range of turn-key vacuum systems based on standard components.

Before leaving the factory they are subjected to both functional tests and leak tests. By adding components from our standard range or special accessories they may be easily adapted to meet specific requirements.

## Application and Accessories

Pump systems	TURBOLAB 80	TURBOLAB 250	TURBOLAB 350	TURBOLAB 450
<b>Application</b>				
Microbalances	■	■	■	■
Sputtering	■	■	■	■
Spectroscopy	■	■	■	■
Production of TV and monitor picture tubes	■	■	■	■
Surface refining	■	■	■	■
Evaporation coating systems	■	■	■	■
Beam guidance systems	■	■	■	■
Laboratory pump systems	■	■	■	■
<b>Accessories</b>				
Control unit for turbomolecular pump systems				
Air cooling unit	■	■	■	■
Flange heater	■	■	■	■
Venting valve	■	■	■	■
Power failure venting valve	■	■	■	■
Purge gas and venting valve	■			
Adsorption traps with aluminium oxide insert				
Exhaust filter				
Water cooling unit	■	■	■	■

■ Possible  
 ▲ Included in standard scope of delivery

# Products

## Dry Pump Systems

### Turbomolecular Pump Systems

#### TURBOLAB 90 i, 250 i, 350 i, 450 i



Turbomolecular pump system TURBOLAB 350 i (top left), TURBOLAB 90 i (down left) and TURBOLAB 350 i Cart (right)

This new smart TURBOLAB generation is built on one basic design platform with the opportunity to create two different variants (Tabletop or Cart-System).

Each version can be customized to individual needs regarding add-ons like vacuum measurement devices, a choice of accessories, e.g. valves and heaters.

#### Basic Equipment

##### Turbomolecular pump

TURBOVAC i models from 90 l/s to 450 l/s including frequency converter

##### Backing pump

Dry or oil-sealed, 1 m<sup>3</sup>/h - 30 m<sup>3</sup>/h, 24 V DC/110-230 V

##### Backlight display

Every TURBOLAB comes with the Turbo Pressure Unit TPU for control, configuration and monitoring of the pump system

##### Built-in support for accessories

- Purge
- Vent
- Air or water cooling unit
- Flange heaters
- Two pressure gauges (1000 mbar to 1 x 10<sup>-9</sup> mbar)
- Foreline safety valve

##### Built-in webserver

- Condition monitoring
- Data analysis
- Software updates

- Control, monitor and configure your TURBOLAB system

##### Easily relocate pump

away from the frame and on your chamber

##### Remote control

via the X1 Interface

- Configurable X1 Digital/Analog I/O
- Start/Stop
- Error
- Warning
- Analog Output

##### Advantage to the User

- Enhanced pump performance
- Compact mobile design
- Small foot print
- Easy to relocate pumps out and

away from the frame

- Backlight display (control/monitoring/configuration)
- Monitored data like frequency, temperature, current, pressure are automatically stored to a data log file in the TURBOLAB. Users easily view the log file with the TURBOLAB data viewer software tool which can be downloaded for free from the Leybold website or the last 512 data points can be viewed from the TURBOLAB data viewer in the web server
- Covering more applications with a full range of high vacuum and dry or wet forevacuum pumps to cover more high vacuum applications
- Benchmark turbostation offering dedicated ports for the connection of
  - six different accessories
  - two gauges
- Benchmark functionality, reliability and design
- Prepared for worldwide voltage coverage
- Price-to-performance ratio

## Typical Applications

- Analytical Instruments
- Spectroscopy
- Tube manufacturing
- Beam guidance systems
- Micro balances
- Sputtering and evaporation systems
- Surface physics
- Laboratory pump systems

## Options

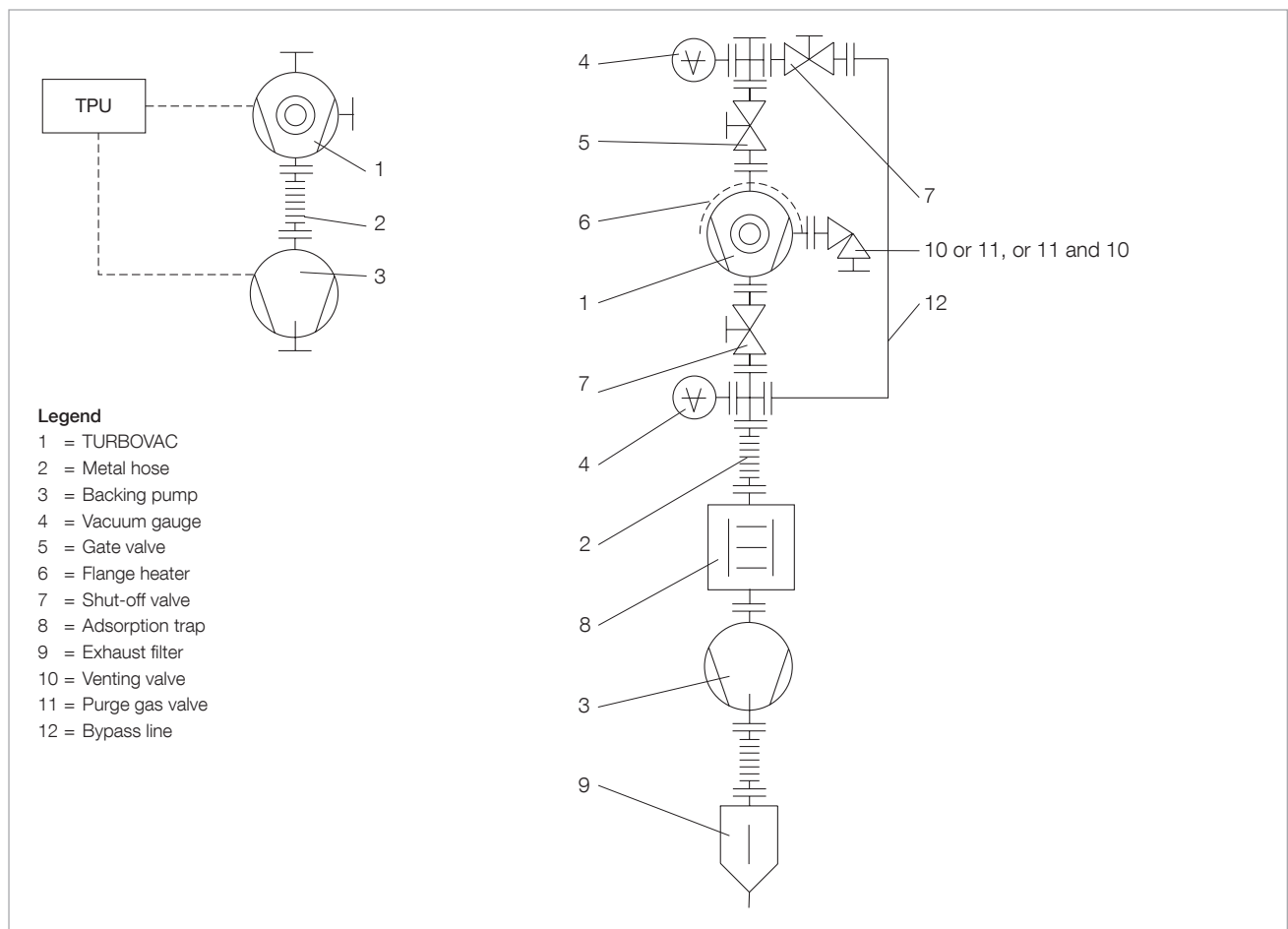
- Alternatively ISO-K or CF connection
- The Cart version comprises a base-plate, mounting column, castors or a benchtop frame with rubber feet
- Relocation kits available to relocate the pumps away from the frame and onto your chamber

## The pump system can be upgraded with further components:

- Vacuum gauges: TTR 91 (N), TTR 101 (N), PTR 91 (N). Simultaneous operation of two gauges is possible
- Adsorption trap
- Exhaust filter
- Air cooling unit
- Water cooling unit
- Flange heater
- Venting valve
- Purge gas valve
- Foreline venting valve
- Vacuum safety valve SECUVAC DN 15/25/40 ISO-KF

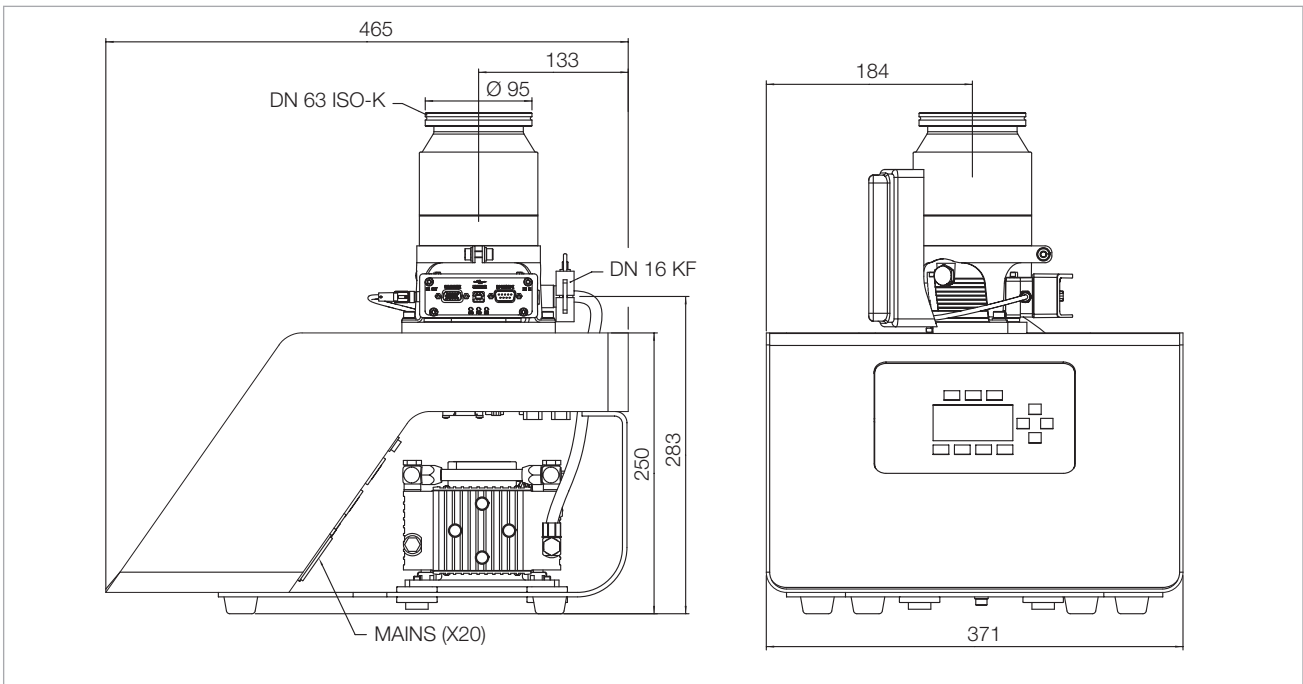
## Scope of delivery

- Transport lock at the high vacuum flange by way of a Plexiglas disc
- Covering caps for the threads of the transport lock
- Exhaust side: centering ring and clamping ring
- Documentation
- The TRIVAC and SOGEVAC are filled with LVO oil

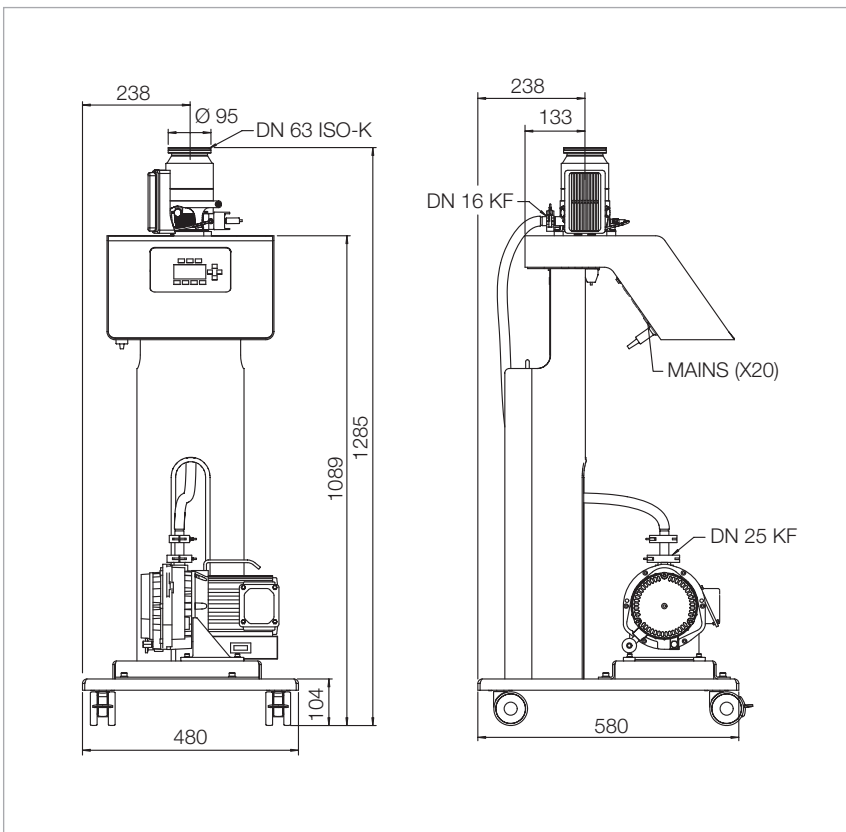


Schematic diagram of the turbomolecular pump systems TURBOLAB (left basic version, right equipment with accessories (TPU not shown))

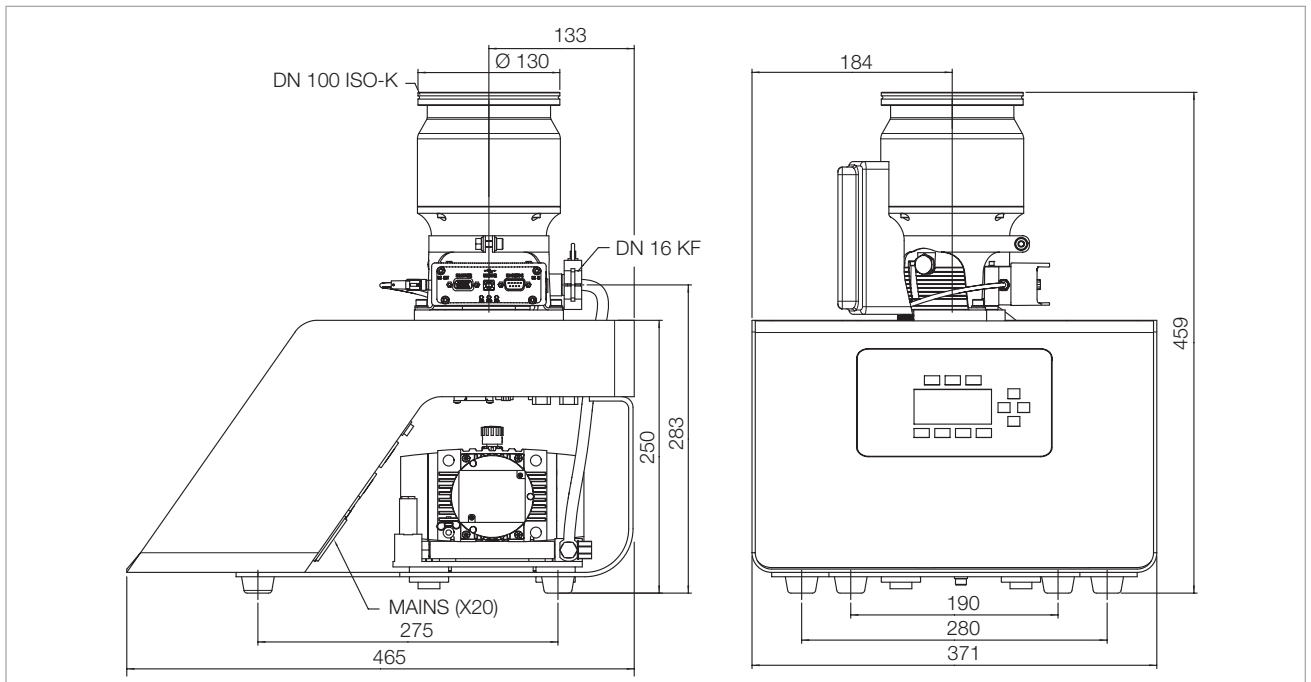




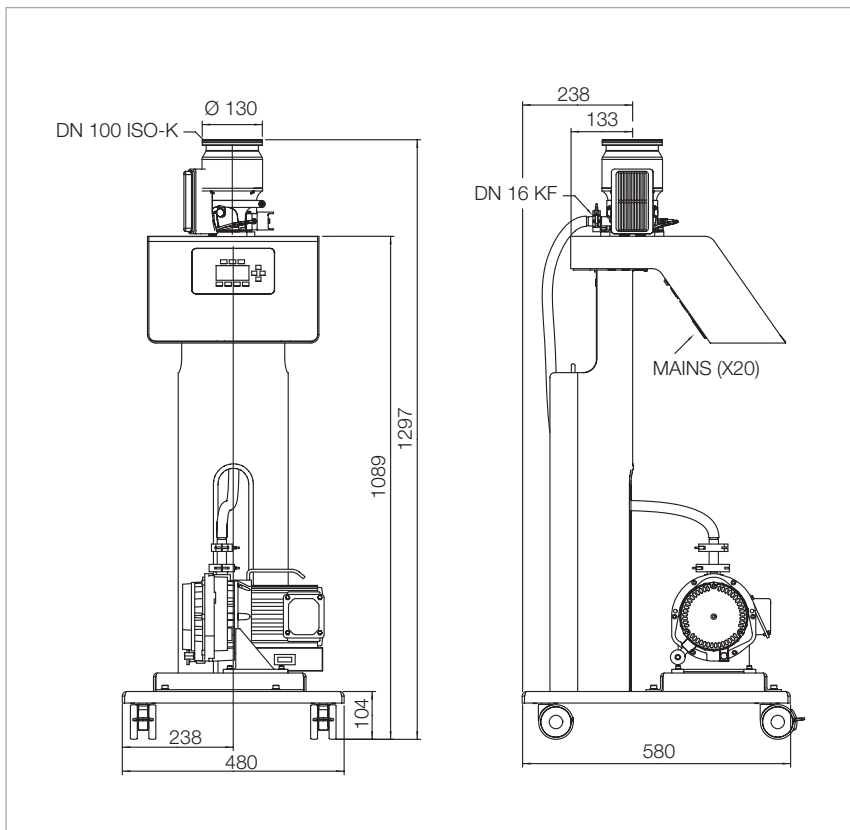
Dimensional drawing TURBOLAB 90 i, dimensions in mm



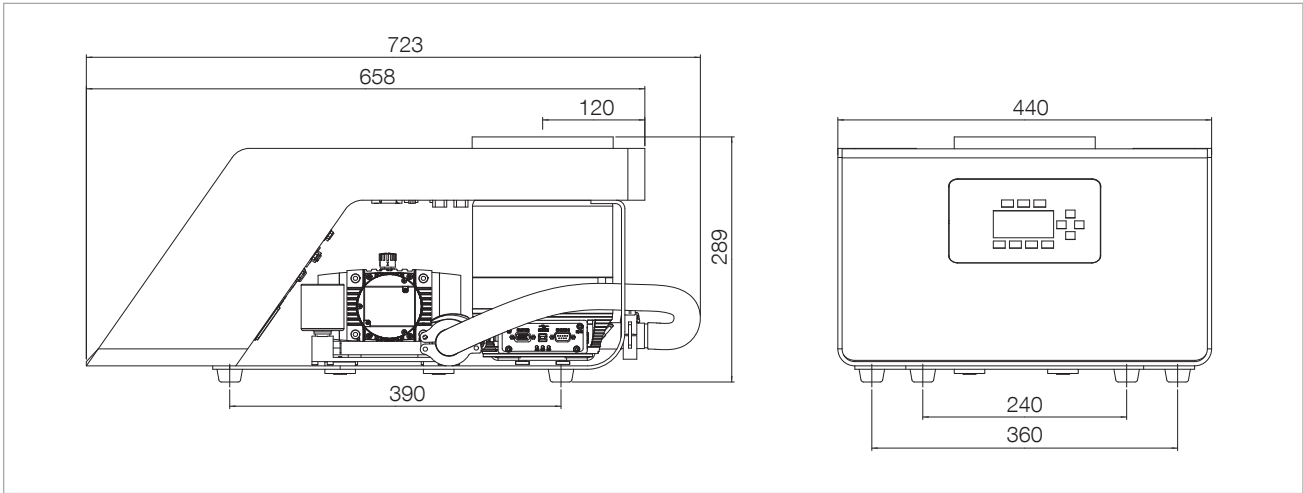
Dimensional drawing TURBOLAB 90 i Cart, dimensions in mm



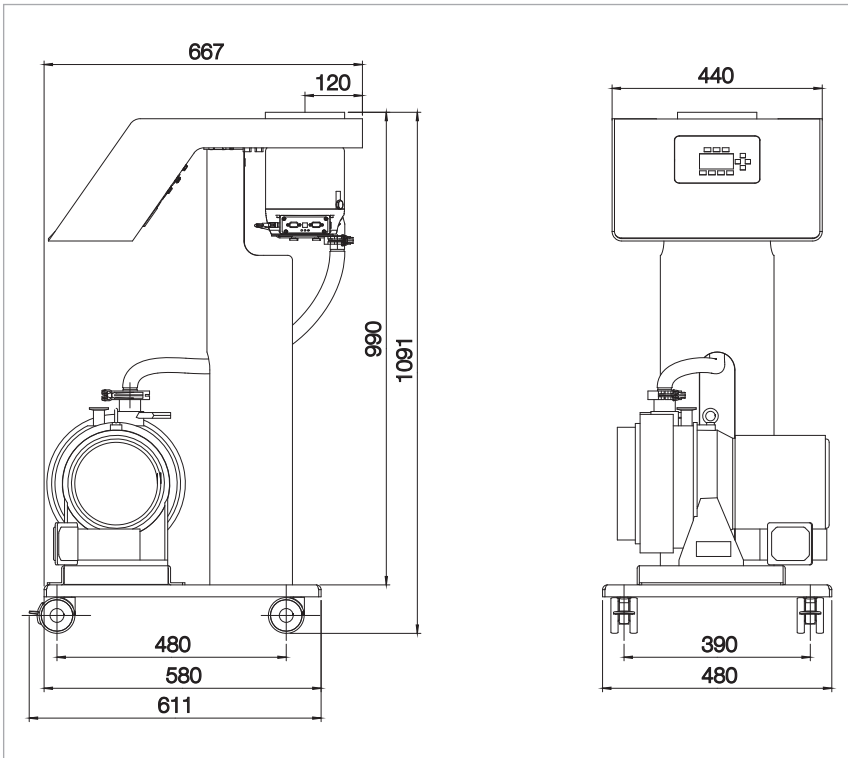
Dimensional drawing TURBOLAB 250 i, dimensions in mm



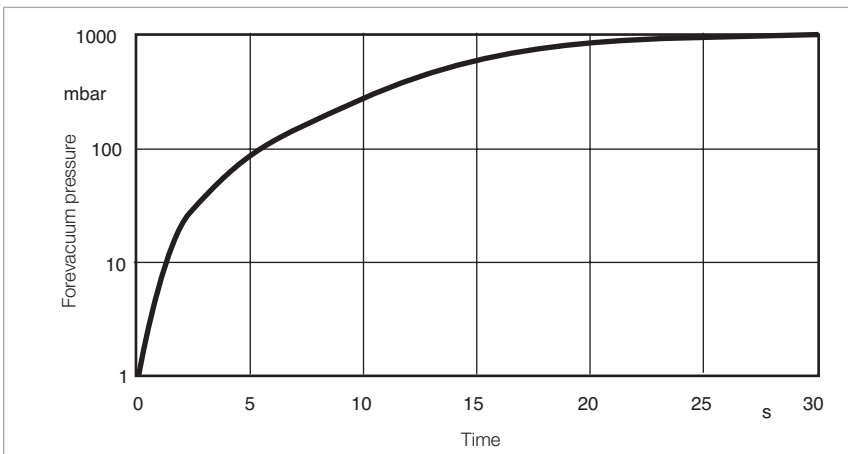
Dimensional drawing TURBOLAB 250 i Cart, dimensions in mm



Dimensional drawing TURBOLAB 350 i / 450 i, dimensions in mm



Dimensional drawing TURBOLAB 350 i / 450 i Cart, dimensions in mm



Maximum rise in pressure

## Technical Data Pump system

## TURBOLAB

		<b>90 i</b>		<b>250 i</b>		<b>350 i</b>		<b>450 i</b>	
Inlet flange	DN	63 ISO-K	63 CF	100 ISO-K	100 CF	100 ISO-K	100 CF	160 ISO-K	160 CF
Forevacuum connection	DN	16 ISO-KF		16 ISO-KF		25 ISO-KF		25 ISO-KF	
Pumping speed	l/s	90		225		290		430	
Ultimate pressure	mbar	< 8 x 10 <sup>-8</sup>	< 5 x 10 <sup>-10</sup>	< 8 x 10 <sup>-8</sup>	< 5 x 10 <sup>-10</sup>	< 8 x 10 <sup>-8</sup>	< 5 x 10 <sup>-10</sup>	< 8 x 10 <sup>-8</sup>	< 5 x 10 <sup>-10</sup>
Mains Supply 50/60 Hz	V AC	110 ± 10% / 230 ± 10%							
Power consumption, max.	VA	1760 / 3680							
Weight (ISO-KF / CF)	kg								
Table top unit		20		35		35		35	
Cart		100		110		110		110	
Number of accessories, max.		6		6		6		6	
Number of gauges, max.		2		2		2		2	
CBM		Internal condition monitoring							
Software		Internal webserver (no software to install)							

## Technical Data Backing pumps

Diaphragm vacuum pump	DIVAC			<b>3.0</b>			
Pumping speed	m <sup>3</sup> /h			3.0			
Exhaust connection	DN			Silencer			
Noise level	dB(A)			54			
Scroll vacuum pump	SCROLLVAC	<b>SC 5 D</b>		<b>SC 15 D</b>		<b>SC 30 D</b>	
Pumping speed	m <sup>3</sup> /h	5.4		15.0		30.0	
Exhaust connection	DN	16 ISO-KF		16 ISO-KF		25 ISO-KF	
Noise level	dB(A)	52		58		62	
Rotary vane vacuum pump	TRIVAC	<b>D 4 B</b>		<b>D 8 B</b>			
Pumping speed	m <sup>3</sup> /h	4.8		9.7			
Exhaust connection	DN	16 ISO-KF		16 ISO-KF			
Noise level	dB(A)	52		52			
Rotary vane vacuum pump	SOGEVAC			<b>SV 16 D</b>			
Pumping speed	m <sup>3</sup> /h			16.0			
Exhaust connection	DN			1/2"			
Noise level	dB(A)			59			

## Ordering Information

## TURBOLAB 90 i

	Part. No.	Part. No.
Pump system with TURBOVAC 90 i	230 V, 50/60 Hz	110 V, 50/60 Hz
Table top unit with DIVAC 3.0 DN 63 ISO-K DN 63 CF	<b>501592V00001000</b> <b>501592V01001000</b>	
Cart with SCROLLVAC SC 5 D DN 63 ISO-K DN 63 CF	<b>501592V00020000</b> <b>501592V01020000</b>	<b>501592V00030000</b> <b>501592V01030000</b>
Cart with SCROLLVAC SC 15 D DN 63 ISO-K DN 63 CF	<b>501592V00040000</b> <b>501592V01040000</b>	<b>501592V00050000</b> <b>501592V01050000</b>
Cart with SCROLLVAC SC 30 D DN 63 ISO-K DN 63 CF	<b>501592V00060000</b> <b>501592V01060000</b>	<b>501592V00070000</b> <b>501592V01070000</b>
Cart with TRIVAC D 4 B DN 63 ISO-K DN 63 CF	<b>501592V00120000</b> <b>501592V01120000</b>	<b>501592V00080000</b> <b>501592V01080000</b>
Cart with TRIVAC D 8 B DN 63 ISO-K DN 63 CF	<b>501592V00130000</b> <b>501592V01130000</b>	<b>501592V00090000</b> <b>501592V01090000</b>
Cart with SOGEVAC SV 16 D DN 63 ISO-K DN 63 CF	<b>501592V00100000</b> <b>501592V01100000</b>	
Table top unit without Forevacuum pump DN 63 ISO-K DN 63 CF	<b>501592V00200000</b> <b>501592V01200000</b>	
Cart without Forevacuum pump DN 63 ISO-K DN 63 CF	<b>501592V00210000</b> <b>501592V01210000</b>	

## Ordering Information

## TURBOLAB 250 i

	Part. No.	Part. No.
Pump system with TURBOVAC 250 i	230 V, 50/60 Hz	110 V, 50/60 Hz
Table top unit with DIVAC 3.0 DN 63 ISO-K DN 63 CF	<b>501592V08001000</b> <b>501592V09001000</b>	
Cart with SCROLLVAC SC 5 D DN 63 ISO-K DN 63 CF	<b>501592V08020000</b> <b>501592V09020000</b>	<b>501592V08030000</b> <b>501592V09030000</b>
Cart with SCROLLVAC SC 15 D DN 63 ISO-K DN 63 CF	<b>501592V08040000</b> <b>501592V09040000</b>	<b>501592V08050000</b> <b>501592V09050000</b>
Cart with SCROLLVAC SC 30 D DN 63 ISO-K DN 63 CF	<b>501592V08060000</b> <b>501592V09060000</b>	<b>501592V08070000</b> <b>501592V09070000</b>
Cart with TRIVAC D 4 B DN 63 ISO-K DN 63 CF	<b>501592V08120000</b> <b>501592V09120000</b>	<b>501592V08080000</b> <b>501592V09080000</b>
Cart with TRIVAC D 8 B DN 63 ISO-K DN 63 CF	<b>501592V08130000</b> <b>501592V09130000</b>	<b>501592V08090000</b> <b>501592V09090000</b>
Cart with SOGEVAC SV 16 D DN 63 ISO-K DN 63 CF	<b>501592V08100000</b> <b>501592V09100000</b>	
Table top unit without Forevacuum pump DN 63 ISO-K DN 63 CF	<b>501592V08200000</b> <b>501592V09200000</b>	
Cart without Forevacuum pump DN 63 ISO-K DN 63 CF	<b>501592V08210000</b> <b>501592V09210000</b>	

## Ordering Information

## TURBOLAB 350 i

	Part. No.	Part. No.
Pump system with TURBOVAC 350 i	230 V, 50/60 Hz	110 V, 50/60 Hz
Table top unit with DIVAC 3.0 DN 100 ISO-K DN 100 CF	<b>501592V04001000</b> <b>501592V05001000</b>	
Cart with SCROLLVAC SC 5 D DN 100 ISO-K DN 100 CF	<b>501592V04020000</b> <b>501592V05020000</b>	<b>501592V04030000</b> <b>501592V05030000</b>
Cart with SCROLLVAC SC 15 D DN 100 ISO-K DN 100 CF	<b>501592V04040000</b> <b>501592V05040000</b>	<b>501592V04050000</b> <b>501592V05050000</b>
Cart with SCROLLVAC SC 30 D DN 100 ISO-K DN 100 CF	<b>501592V04060000</b> <b>501592V05060000</b>	<b>501592V04070000</b> <b>501592V05070000</b>
Cart with TRIVAC D 4 B DN 100 ISO-K DN 100 CF	<b>501592V04120000</b> <b>501592V05120000</b>	<b>501592V04080000</b> <b>501592V05080000</b>
Cart with TRIVAC D 8 B DN 100 ISO-K DN 100 CF	<b>501592V04130000</b> <b>501592V05130000</b>	<b>501592V04090000</b> <b>501592V05090000</b>
Cart with SOGEVAC SV 16 D DN 100 ISO-K DN 100 CF	<b>501592V04100000</b> <b>501592V05100000</b>	
Table top unit without Forevacuum pump DN 100 ISO-K DN 100 CF	<b>501592V04200000</b> <b>501592V05200000</b>	
Cart without Forevacuum pump DN 100 ISO-K DN 100 CF	<b>501592V04210000</b> <b>501592V05210000</b>	

## Ordering Information

## TURBOLAB 450 i

	Part. No.	Part. No.
Pump system with TURBOVAC 450 i	230 V, 50/60 Hz	110 V, 50/60 Hz
Table top unit with DIVAC 3.0 DN 160 ISO-K DN 160 CF	<b>501592V06001000</b> <b>501592V07001000</b>	
Cart with SCROLLVAC SC 5 D DN 160 ISO-K DN 160 CF	<b>501592V06020000</b> <b>501592V07020000</b>	<b>501592V06030000</b> <b>501592V07030000</b>
Cart with SCROLLVAC SC 15 D DN 160 ISO-K DN 160 CF	<b>501592V06040000</b> <b>501592V07040000</b>	<b>501592V06050000</b> <b>501592V07050000</b>
Cart with SCROLLVAC SC 30 D DN 160 ISO-K DN 160 CF	<b>501592V06060000</b> <b>501592V07060000</b>	<b>501592V06070000</b> <b>501592V07070000</b>
Cart with TRIVAC D 4 B DN 160 ISO-K DN 160 CF	<b>501592V06120000</b> <b>501592V07120000</b>	<b>501592V06080000</b> <b>501592V07080000</b>
Cart with TRIVAC D 8 B DN 160 ISO-K DN 160 CF	<b>501592V06130000</b> <b>501592V07130000</b>	<b>501592V06090000</b> <b>501592V07090000</b>
Cart with SOGEVAC SV 16 D DN 160 ISO-K DN 160 CF	<b>501592V06100000</b> <b>501592V07100000</b>	
Table top unit without Forevacuum pump DN 160 ISO-K DN 160 CF	<b>501592V06200000</b> <b>501592V07200000</b>	
Cart without Forevacuum pump DN 160 ISO-K DN 160 CF	<b>501592V06210000</b> <b>501592V07210000</b>	



## Ordering Information

## TURBOLAB 90 i    TURBOLAB 250 i    TURBOLAB 350 i / 450 i

	Part. No.	Part. No.	Part. No.
<b>Accessories</b>			
Mains cable TURBOLAB 230 V, 5.0 m 110 V, 5.0 m 230 V, UK, 5.0 m		<b>800103V0030</b> <b>800103V0031</b> <b>800103V0037</b>	
Accessory cable TURBOVAC i (air cooling & valve connection) M 8 - M 8, 0.3 m M 8 - M 8, 2.0 m		<b>800103V0001</b> <b>800110V0016</b>	
Y cable TURBOVAC i, M 8		<b>800110V0020</b>	
Start stop switch for connection to X1 Remote		<b>800110V0021</b>	
USB cable 2.0, Type A/B, 1.8 m		<b>800110V0108</b>	
Accessory cable TURBOLAB M 8 - M 8, 0.3 m (air cooling & valve connection) M 8 - M 8, 5.0 m (air cooling & valve connection) M 12 - M 12, 5.0 m (DIVAC 0.8, 3.0) C13 - C14, 5.0 m (SOGEVAC) C14 - NEMA, 5.0 m (SCROLLVAC 110 V) C14 - Schuko, 5.0 m (SCROLLVAC 230 V) C14 - C16-1 (230 V), 5.0 m (TRIVAC 230 V) C14 - C16-1 (110 V), 5.0 m (TRIVAC 110 V)		<b>800103V0001</b> <b>800103V0003</b> <b>800103V0005</b> <b>800103V0017</b> <b>800103V0008</b> <b>800103V0011</b> <b>800103V0014</b> <b>800103V0016</b>	
Accessory cable TURBOLAB TURBOVAC i, 5.0 m (24 V DC voltage supply)		<b>800103V0020</b>	
Communication TURBOLAB – TMP 5.0 m 1.0 m		<b>800103V0029</b> <b>800103V0027</b>	
Connection cable Type A 1.5 m 5.0 m		<b>800103V0032</b> <b>12426</b>	
Connection cable C14 – valve plug, 1.8 m (Control 110/230 V AC SECUVAC valve)		<b>800103V0033</b>	
Connection cable C14 – valve plug, 5 m (Control 110/230 V AC SECUVAC valve)		<b>800103V0035</b>	
Connection cable C14 – valve plug, 1.8 m (Control 24 V DC SECUVAC valve)		<b>800103V0034</b>	
Connection cable C14 – valve plug, 5 m (Control 24 V DC SECUVAC valve)		<b>800103V0036</b>	
LEYASSIST software for TMPs		<b>230439V01</b>	
Air cooling TURBOVAC 90 i radial	<b>800136V0007</b>	-	-
Air cooling TURBOVAC 200 i / 250 i radial	-	<b>800136V0009</b>	-
Air cooling TURBOVAC 350 i / 450 i radial	-	-	<b>800136V0005</b>
Water cooling TURBOVAC 350 i / 450 i with G 1/8" connections	-	-	<b>800135V0005</b>
Water cooling TURBOVAC 350 i / 450 i with G 1/8" connections	-	-	<b>800135V0006</b>

**Ordering Information**
**TURBOLAB 90 i    TURBOLAB 250 i    TURBOLAB 350 i /  
450 i**

	Part. No.	Part. No.	Part. No.
<b>Accessories</b>			
Venting valve 24 V DC, G 1/8"	-	<b>800120V0012</b>	
Power failure venting valve 24 V DC, G 1/8"	-	<b>800120V0022</b>	
Purge gas valve 24 V DC, G 1/8", 24 sccm	-	<b>800120V0013</b>	
Purge gas throttle G 1/8", 24 sccm	-	<b>800120V0014</b>	
Air filter for TMP G 1/8"	-	<b>800110V0022</b>	
Purge gas and venting valve 0.4 mbar x l/s at 1 bar, 24 V DC DN 10 KF – G1/4"	<b>800152V0013</b>	-	
Pump connection: Adapter M8 – DN 16 KF incl. O-Ring 9.25 x 1.78 and adapter centering ring DN 10/16 KF with sinter filter	<b>800110V0011</b>	-	
Gas side connection: G1/4" adapter with filter Including O-ring and gasket	<b>800110V0012</b>	-	
Connection cable: Accessory cable M8 – bare wire ends	<b>800110V0017</b>	-	
Venting valve 24 V DC	<b>800120V0011</b>	-	
Power failure venting valve 24 V DC	<b>800120V0021</b>	-	
Spare filter	<b>E 200 18 517</b>	-	
Flange heater DN 63 CF, 230 V	<b>800137V0003</b>	-	
DN 63 CF, 115 V	<b>800137V0004</b>	-	
DN 100 CF, 230 V	-	<b>800137V0005</b>	
DN 100 CF, 115 V	-	<b>800137V0006</b>	
DN 160 CF, 230 V	-	<b>800137V0007</b>	
DN 160 CF, 115 V	-	<b>800137V0008</b>	
Vibration absorber DN 63 ISO-K	<b>upon request</b>	-	
DN 63 CF	<b>upon request</b>	-	
DN 100 ISO-K	-	<b>800131V1100</b>	
DN 160 ISO-K	-	<b>upon request</b>	
DN 160 CF	-	<b>upon request</b>	
Centering ring with protection screen DN 63 ISO-K	<b>800133V0011</b>	-	
DN 100 ISO-K	-	<b>800133V0021</b>	
DN 160 ISO-K	-	<b>800133V0031</b>	
Centering ring with splinter guard DN 63 ISO-K	<b>800133V0012</b>	-	
DN 100 ISO-K	-	<b>800133V0022</b>	
DN 160 ISO-K	-	<b>800133V0032</b>	
Splinter guard DN 63 CF	<b>800132V0012</b>	-	
DN 100 ISO-K coarse)	-	<b>800132V0101</b>	
DN 100 ISO-K (fine)	-	<b>800132V0102</b>	
DN 100 CF (0.8 mm)	-	<b>800132V0022</b>	
DN 160 CF (0,8 mm.	-	<b>800132V0032</b>	
Protection screen DN 63 CF	<b>800132V0011</b>	-	
DN 100 CF (3.2 mm)	-	<b>800132V0021</b>	
DN 160 CF (3.2 mm)	-	<b>800132V0031</b>	