



TURBOLAB 850/950 i/iX

Instruction manual

Operating instructions 501592TLB110001_002_C1



GE/15316/A

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Published: 4/22/2026

Supplementary publications

Publication title	Reference	Link
TURBOVAC TURBO.CONTROL i instructions	300702826	https://4vac.io/n8mvs3
ECODRY plus multi-stage roots vacuum pump instructions	300902516	https://4vac.io/ay5i4r
TURBOVAC 850 i/iX, 950 i/iX, 1350 i, 1450 i instructions	300855170	https://4vac.io/lbit2j

Associated publications

Publication title	Reference	Link
TURBO.POWER 800 power supply instructions	300903162	https://4vac.io/6ttscg

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We accept no liability for loss of profit, loss of market or any other indirect or consequential loss whatsoever.

Product warranty and limit of liability are dealt with in our standard terms and conditions of sale or negotiated contract under which this document is supplied.

You must use this product as described in this manual. Read the manual before you install, operate, or maintain the product. For manual enquiries, email documentation@leybold.com.

Ordering information

Code		Pump type	Inlet connection	Backing pump	Vent valve	Not used		Power supply
501592	TL	B TURBOVAC 850 i	1 ISO 160	1 ECODRY 35 plus	0 Manual vent	0	0	1 220-240V 50/60Hz Europe
			2 CF 160					
-	-	C TURBOVAC 950 i	3 ISO 200	-	1 Vent valve	-		2 220-240V 50/60Hz USA
			4 CF 200					
-	-	D TURBOVAC 850 iX	5 ISO 160	-	-	-		3 200V 50/60Hz Japan
			6 CF 160					
-	-	E TURBOVAC 950 iX	7 ISO 200	-	-	-		4 220-240V 50/60Hz UK
			8 CF 200					

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Safety and compliance

1 Safety and compliance

For safe operation from the start, read these instructions carefully before you install or commission the equipment and keep them safe for future use. Read all the safety instructions in this section and the rest of this manual carefully and make sure that you obey these instructions.

The instruction manual is an important safety document that we often deliver digitally. It is your responsibility to keep the instruction manual available and visible while working with the equipment. Please download the digital version of the instruction manual for use on your device or print it if a device will not be available.

1.1 Definition of Warnings and Cautions

Important safety information is highlighted as warning and caution instructions which are defined as follows. Different symbols are used according to the type of hazard.

WARNING:

If you do not obey a warning, there is a risk of injury or death.

CAUTION:

If you do not obey a caution, there is a risk of minor injury, damage to equipment, related equipment or process.

NOTICE:

Information about properties or instructions for an action which, if ignored, will cause damage to the equipment.

We reserve the right to change the design and the stated data. The illustrations are not binding.

1.2 Trained personnel

For the operation of this equipment "trained personnel" are:

- skilled workers with knowledge in the fields of mechanics, electrical engineering, pollution abatement and vacuum technology and
- personnel specially trained for the operation of vacuum pumps

Safety and compliance

1.3 Safety symbols

The safety symbols on the products show the areas where care and attention is necessary.

The safety symbols that we use on the product or in the product documentation have the following meanings:

	Warning/Caution Risk of injury and/or damage to equipment. An appropriate safety instruction must be followed or a potential hazard exists.
	Warning - Dangerous voltage Risk of injury. Identifies possible sources of hazardous electrical shock.
	Warning - Heavy object Risk of injury or damage to equipment. Identifies a possible hazard from a heavy object.
	Warning - Trip hazard Risk of injury. Identifies spilled liquids, trailing cords, pipes and other low-lying objects that may result in slipping, tripping or falling.
	Warning - Vacuum hazard Risk of injury. Identifies the source of a dangerous vacuum.
	Mandatory - Read the manual Failure to comply with this action may result in injury or damage to equipment.
	Warning - Use protective equipment Risk of injury. Use appropriate Personal Protective Equipment (PPE) when performing the task.

Introduction

2 Introduction

2.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for our TURBOLAB 850/950 i/iX supplied under Leybold product number. Read this manual carefully before you install and operate the pumping cart. You must use the equipment as specified in this manual and the supplementary instruction manuals supplied with the equipment.

A full list of Supplementary Publications is provided at the end of the contents list of this manual (refer to [TABLE: Supplementary publications](#) on page 2). A number of these Supplementary publications will be supplied with your pumping cart. The Supplementary publications supplied will be the instructions for the components in your pumping cart.

The units used throughout this manual conform to the SI international system of units of measurement.

2.2 Legislation and standards

The legislation and standards with which the pumping cart complies are listed in full on the Declaration of Conformity supplied with the system document package.

2.3 Description

2.3.1 Overview

The pumping cart is a fully TurboControl i controller mobile pumping system, all components within the system are managed by the TurboControl i controller. The TurboControl i controller is provided with a large clear graphic display and easy-to-use control interface via a touch sensitive keypad. The TurboControl i controller incorporates an RJ45 interface for control and data monitoring on a remote PC.

Vacuum Isolation Valve (VIV) and THERMOVAC TTR91RN fitted as a standard accessory.

TURBOVAC iX version provides control of backing pump via attached Relay Box interface.

2.3.2 General description of the pumping cart major components

For the general description of the major components used on the pumping cart refer to the following supplementary instruction manuals.

TURBO.CONTROL i	300702826_002_C0
ECODRY 35 plus	300902516_002_C0
TURBOVAC 850/950 i/iX	300855170_002_C8
TURBO.POWER 800	300903162_002

2.3.3 Electrical protection

USA version pump:

The pumping cart has a standard 220-240V AC mains supply, connected by NEMA 6-15 standard plug. All electronic components have thermal and

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overload protection. Due to High current, it is not possible to use LV 110VAC for this bigger turbomolecular pumps.

This cart is designed for the United States, Industrial Control Panel according to UL 508A.

Europe version:

The pumping cart has a standard 220-240V AC mains supply, connected by EU Schuko VDE standard plug. All electronic components have thermal and overload protection.

UK version:

The pumping cart has a standard 220-240V AC mains supply, connected by UK BS1363 standard plug. All electronic components have thermal and overload protection.

Japan version:

The pumping cart has a standard 200V AC mains supply, connected by JIS C 8303 standard plug. All electronic components have thermal and overload protection.

2.3.4 Accessories

A wide range of standard accessories are available for the major components of the pumping cart; refer to the relevant product instruction manual.

Technical Data

3 Technical Data



Note:

The operating, storage conditions and performance of the pumping cart depends on the major components fitted to the combined outfit; refer to the technical data in the appropriate supplementary publications listed under [TABLE: Supplementary publications](#) on page 2.

3.1 Electrical data

	USA version 220-240 V a.c.	Europe version 220-240 V a.c.
Connector	USA NEMA 6-15 P/15 A (2 m)	EU Schuko VDE/16 A (2 m)
Electrical supply	220-240 V a.c./1 ph/60 Hz	220-240 V a.c./1 ph /50 Hz/60 Hz
Power consumption (maximum)	2.88 kW	2.88 kW
Current (maximum)	12 A	12 A
Short circuit current	10 kA	10 kA
Recommended fuse	15 A, RCD must be provided	10 A (15 A)*, RCD must be provided

	UK version 220-240 V a.c.	Japan version 200 V a.c.
Connector	UK BS1363/13 A (2 m)	JIS C 8303/15 A (2 m)
Electrical supply	220-240 V a.c./1 ph/50/60 Hz	200 V a.c./1 ph/50/60 Hz
Power consumption (maximum)	2.88 kW	2.88 kW
Current (maximum)	12 A	12 A
Short circuit current	10 kA	10 kA
Recommended fuse	10 A (15 A)*, RCD must be provided	10 A (15 A)*, RCD must be provided

3.2 Performance, operating and storage data

Ultimate pressure	< 3 x 10 ⁻⁸ mbar (ISO) / < 3 x 10 ⁻¹⁰ mbar (CF)
Degree of protection (to IEC34-5: 1981)	IP20
Ambient operating temperature range	5 °C to 40 °C
Ambient storage temperature range	-15 °C to 70 °C
Maximum ambient operating humidity	Maximum 90% RH non-condensing at 40 °C
Maximum operating altitude	2000 m maximum

3.3 Mechanical data

Dimensions	455 (W) x 816 (H) x 859 (D) mm
Mass (minimum)	106 kg
Mass (maximum)	130 kg

3.4 Electrical connections (Ethernet)

Connector type	RJ45 Connector
----------------	----------------

Refer to TurboControl i controller instruction manual section 2.4.6 for electrical and protocol details.

3.5 Mechanical connections

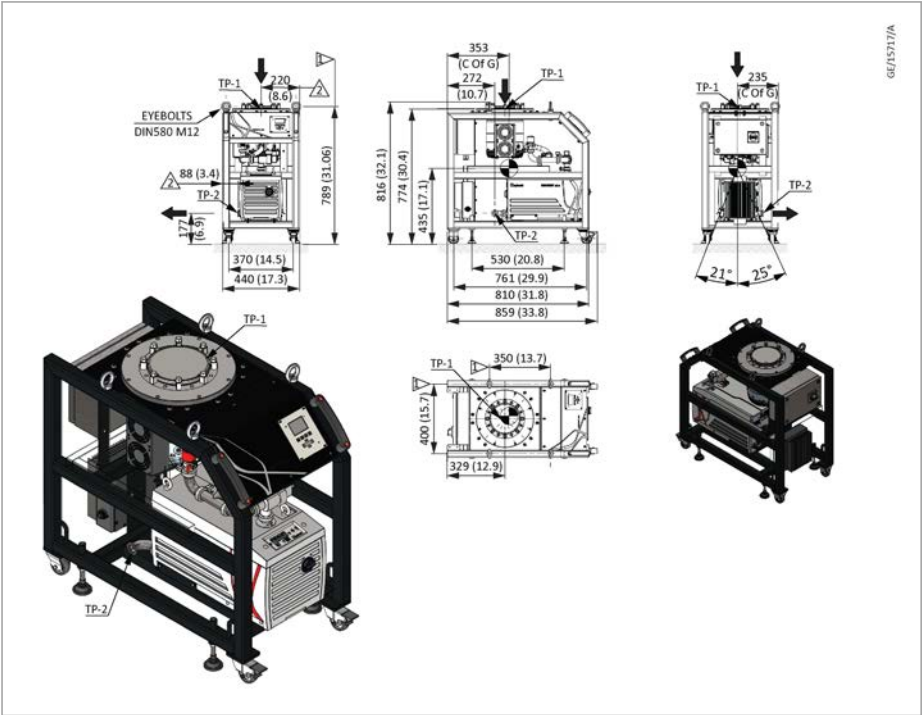
High vacuum inlet port ISO-K (based on Turbo pump)	DN160 ISO-K, DN200 ISO-K
High vacuum inlet port CF (based on Turbo pump)	DN160 CF, DN200 CF
Exhaust outlet (all variants)	NW25

3.6 Noise

Sound pressure measured at ultimate vacuum	Typically less than 60 dB(A) at 1 m to ISO 11201
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Installation drawing:

Please note that inlet port TP-1 is variable based on chosen turbomolecular pump type. Outer dimensions are same for all types.



Installation

4 Installation



WARNING: INSTALLATION SAFETY

Risk of injury or damage to equipment. Obey the safety instructions given below and take note of appropriate precautions.



WARNING: VACUUM HAZARD

Risk of injury. Prevent any part of the human body from coming into contact with the vacuum.

-
- When you refer to a manual supplied as a supplementary publication, listed under [TABLE: Supplementary publications](#) on page 2, you must obey all of the WARNING and CAUTION instructions in the manual.
 - A suitable trained and supervised technician must install the pumping cart.
 - Check that all required parts are available and of the correct type before you start work.
 - Make sure that the installation technician is familiar with the safety procedures which relate to the products pumped. Wear the appropriate safety-clothing when you come into contact with contaminated components.
 - Isolate the other components in your system from the electrical supply so that they cannot be operated accidentally.
 - Take care to protect sealing-faces from damage.
 - Leak test the system after installation and seal any leaks found.

Remove all protective covers and check the equipment. Inspect the system for any damage. If the equipment is damaged, notify your supplier and the carrier in writing within three days; state your order number and invoice number. Retain all packing materials for inspection, do not use the system if damaged. Check that your packaging contains the items listed in table below. If any items are missing, notify your supplier within three days.

Table 1. Checklist of components

Qty	Description	Check ☒
1	Pumping cart	☐
1	Instruction manual package (USB)	☐

4.1 Locate the Turbolab 850/950 i/iX



WARNING: HEAVY OBJECT

Risk of injury. You must use suitable lifting equipment when moving the pumping cart. It is too heavy to lift by hand.



WARNING: PUMP EJECTION

Risk of injury or damage to equipment. To ensure the safety of the people working around the pumping cart in the possible event of a turbomolecular pump failure, you must either fit four lashing straps around each cart corner or use anchoring bolts to secure the system to the floor. Both methods are described below.

Before attempting to lift the pumping cart ensure that you provide a firm level base. Make sure you use suitable lifting equipment when moving the pumping cart, four DIN 580 - M12 x 20,5 eyebolts situated on the top of the equipment have been provided for this purpose, we advise you ensure each eyebolt is securely fixed before attempting this operation.

Anchoring the pumping cart

OPTION - 1:

Anchoring the pumping cart by lashing straps

1. Lock all roller brakes.
2. Please use four levelling foot.
3. Install four lashing straps around each cart corner and fasted securely to anchorage point.

Note

*That all steps are necessary for safe operation of the cart.
Anchorage point must be able to hold loads up to 2000 N.*



OPTION - 2:

Anchoring the pumping cart by anchoring foot

Optionally, for anchoring the system to the foundation can be used anchoring feet instead of levelling foot. (Recommended type is GN 23-80-M12-125-D1-S (ELESA+GANTER) + DROP-IN ANCHOR E M8 (MKT GmbH & Co)).

4.2 Removing the pumping cart from the transit pallet

There are two tapes over the cart to fix the pumping cart frame to the base, these must be removed before you attempt to lift the equipment.

4.3 Fit accessories (optional)

If you wish to fit accessories to the pumping cart, fit them now, before you start to install the pumping cart into your vacuum system. Install the accessories as described in the instruction manual supplied with the accessories.

Installation

4.4 Connect the pumping cart to your vacuum system

When coupling the high vacuum inlet to your vacuum flange make sure the sealing O ring is clean and free of any damage. Always tighten the bolts evenly to make sure a good seal, never re-use the copper gasket.

*Optionally the Turbomolecular pump can be disassembled and installed near to system cart, in this case, the user is fully responsible for any possible issues caused by pump disassembly and must follow the relevant instruction manual for this pump for safe installation. In this case would be needed longer bellows pipe as minimum.

4.5 Connect to your exhaust system



WARNING: HAZARDOUS GASES

Risk of inhalation injury. Connect the exhaust to a suitable treatment plant to prevent the discharge of dangerous gases or vapours to the surrounding atmosphere.

We recommend that you use an exhaust extraction system suitable for the use of the process gases you will pump. Make sure that the exhaust extraction system cannot become blocked or obstructed when the system is in operation. A small amount of tip seal wear product from the backing pump may collect in the exhaust duct. The dust may be blown out with the initial burst of air after the pump has been vented. This is quite common and the amount of dust will reduce over time.

4.6 Connect the electrical supply



WARNING: ELECTRICAL SAFETY

Risk of electric shock. Make sure that the electrical installation of the pumping system conforms with your local and national safety requirements. It must be connected to a suitably fused and protected electrical supply and a suitable earth (ground) point.



CAUTION: TRIP HAZARD

Risk of injury. Make sure the mains cord is routed so as not to cause a trip hazard.

Check that your electrical supply is suitable for this equipment. Refer to the [Electrical data](#) on page 12 for the electrical requirements for this system. The pumping cart uses a standard plug.

4.7 Additional earth bonding

The electrical supply cable normally provides protective earth for electrical safety. If this is not the case, or if additional earth bonding is required, then the earth stud located on the base at the rear of the system should be connected to a suitable earth point with M5 screw connection.

4.8 Configure the pumping cart

Functions of TURBO.CONTROL i

As supplied, the TurboControl i controller has been configured for the Pumping Station to provide the following basic function:

- Observe TURBOVAC i(X) during operation
- Pump start / stop / activate standby speed / error reset
- Show parameters on the main screen (nominal speed, current, bearing temperature, pressure values)
- Show warning and error memory with description
- Read and write parameters
- Set functions of the interface X1
- Set functions of the 24-VDC accessory connections X201, X202, X203
- Activate TURBOVAC i(X) depending on pressure
- Attach laptop and operate TURBOVAC i(X) via web server
- View logged data in real-time
- Read out logging memory and analyse with DataViewer PC tool
- Read out parameter set and error memory of the TURBOVAC i(X) with a PC

Figure 1. Front side



1. Status LEDs
2. Function keys
3. Arrow button Up
4. Arrow button Cancel/Return
5. Arrow button Confirm/Continue
6. Arrow button Down

4.9 Switching on

The display starts by applying the 24 VDC supply voltage. The communication between TURBO.CONTROL i and a turbo molecular pump can be established via RS485 or USB.

TURBO.CONTROL i automatically detects the pump and loads the appropriate setting. This process may take a few seconds.

Only one pump can be controlled and monitored.

Installation

4.10 Operation

- The meanings of the function keys F1 - F4 are shown in the lowest line of the display.
- A modified value or setting becomes active by confirming with green. If aborted with red, the old value remains valid.
- If the value is again saved by confirming, it remains after a power reset. All the values previously changed are saved by confirming the query.
- The saving procedure may take a few seconds. The pump must not be separated from the supply voltage during the saving procedure.

Figure 2. Monitoring of the operation conditions

LED	Symbol	LED Status	Display	Meaning
		Off		No System Error
		Flashing		System Warning TURBO.CONTROL i runs up
		Steady		System Error
		Steady		Turbo Pump lost communication
		Off		Pump not turning/ no start command active
		Flashing 50 ms on, 500 ms off		Start delay > 0 (P36)
		Flashing slowly 1/s		Running up
		Flashing fast 3/s		Running down
		Steady		Normal Operation
		Steady		Ethernet Communication Active

4.11 Operation via display

Control priority

When TURBO.CONTROL i is connected with a TURBOVAC i(X), the pump at first cannot be controlled.



To do so, press the function key F2 (REMOTE).
Now Start / Stop / Error Reset are possible



The pump can be started and stopped with F1.
With F2 the control priority is reset (DIS.REM). By resetting, an imminent start instruction is also reset.

Main screen



In the main screen you can switch from the values indicated in the list on the right to a large view (nominal speed, current, bearing temperature, pressure values - the pressure value of the TURBOVAC iX is at the end).



Installation

Menu



F3 opens 4 menus

- Error memory
- Configuration (gauge heads, TMP, accessory connections). If no pump is attached, only a reduced selection is available.
- Parameters
- System

Error memory



The complete error memory of the pump is shown in the error memory. A selected error or a selected warning can be indicated in plain text.



Configuration



The 24-VDC connections (accessory), the interface X1 (I/O X1), the gauge heads (gauges) and the TURBOVAC i(X) (TMP) can be configured under "Configuration".

Figure "Configuration of the 24 VDC connection X201" below shows an example of the configuration of the 24-VDC connection X201. For function codes and settings see the instructions for use 300450826 Serial Interfaces for TURBOVAC i/iX.



Figure: Configuration of the 24 VDC connection X201"

Gauges

In the gauge menu the connected gauge heads can be configured (change of unit torr, pascal, mbar, setting a gas correction factor and the gauge head parameters of the TURBOVAC iX).

The gauge heads are automatically recognized and allocated:

- Gauge head 1 = connection Gauge 1 at the TURBO.CONTROL i
- Gauge head 2 = connection Gauge 2 at the TURBO.CONTROL i
- Gauge head 3 = connection Gauge at the TURBOVAC iX



Installation

TMP

In the TMP menu the connected TURBOVAC i(X) can be configured.

Start function:

- Start the TURBOVAC i(X) when start command active (default setting)
- Start of TURBOVAC i(X) depending on pressure. The turbo pump starts depending on pressure, if the value of the selected gauge head is under\-cut.
 - Pressure 1 = connection Gauge 1 at the TURBO.CONTROL i
 - Pressure 2 = connection Gauge 2 at the TURBO.CONTROL i
 - Pressure 3 = connection Gauge at the TURBOVAC iX

The value can be adapted under "Pressure Value".



Parameters: Activation of standby speed and reading/writing of selected parameters of the TURBOVAC i(X)



Service: Start of the bearing run-in function and status of the bearing run-in.

The bearing run-in is shown via a warning message on the TURBOVAC i(X) and the TURBO.CONTROL i.



Service: Resetting the parameters of the TURBOVAC i(X) to factory setting (resets all changed parameters of the pump).

The reset parameters become active only after a restart (power on/off) of the pump.

This will not reset the internal parameters of the TURBO.CONTROL i.



Address: Setting the RS 485 or Profibus address of the TURBOVAC i(X).



Parameters

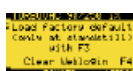
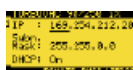
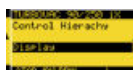
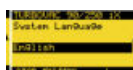
Here parameters of the attached TURBOVAC i(X) and the internal parameters of the TURBO.CONTROL i can be read and written.



Installation

System

Refer to Figure: System settings below



Language: Switching between English/German

Control hierarchy: Control of TURBOVAC i(X) via display or web server.

If the control hierarchy is transferred to Ethernet Remote (web server), a start/stop of the pump via the display is no longer possible.

Brightness of the display

Timeout display: Display dims after the set time

Logging cycle: Sampling rate of internal data logging feature (see section "Storage Capacity")

Setting time and date

System information: Software version, serial number
TURBOVAC i(X), etc.

Network settings: IP address and subnet mask

DHCP off – setting if you wish to set a static address
DHCP on – automatic address assignment via DHCP,
e.g. a router, PC or company network

With DHCP off/on (2x F3) a new IP address with a connected network, PC or router is assigned.

Opening the web server via QR link

Resetting the parameters of the TURBOVAC i(X) and the TURBO.CONTROL i to factory setting. The TURBO.CONTROL i then restarts.

The reset parameters of the TURBOVAC i(X) become active only after a restart (power on/off) of the pump.
Reset of web server user name and password via F4.

Figure: System settings

Installation

4.12 Commission the installation

After you have installed the pumping cart, use the following procedure to test the equipment.

1. Make sure that the electrical connection is secure.
2. Switch on the electrical supply and your exhaust-extraction system (if available).
3. Turn ON the equipment at the mains supply. To start-up the pumping cart, refer to [TurboControl i controller quick guide](#) on page 22 and manual of ECODRY 35 (300902516_002_C0) or the TurboControl i controller instruction manual for further details. Check that the system operates as desired.
4. Inspect the vacuum, exhaust and pipeline connections and check there are no leaks.
5. Wait until the turbomolecular pump has reached full speed. To turn OFF the pumping cart refer to [TurboControl i controller quick guide](#) on page 22 or the TurboControl i controller instruction manual for further details, check that both pumps have stopped.

4.13 TurboControl i controller quick guide

Press "F1" to enable TurboMolecular pump start at the desired backing pressure.

4.13.1 Pumping cart start-up

1. Move the main switch to ON position.
2. Press F1 on the controller to enable start turbopump.
3. Press the backing pump start switch.

4.13.2 Pumping cart shut down

1. Press F1 on the controller to STOP turbopump.
2. Press the backing pump stop switch.
3. Wait for TurboPump decelerate.
4. Move the main switch to OFF position.

5 Operation



WARNING: PUMP EJECTION

Risk of injury or damage to equipment. All anchoring feet must be installed when the system is in operation. If you do not and the turbomolecular pump seizes, movement of the system may damage equipment and injure people.

5.1 Start-up

Use the following procedure to operate the pumping cart.

1. Switch on the electrical supply to the pumping cart and your extraction system (if available).
2. Switch on the main switch located on back side of this cart.
3. To operate the equipment, refer to Connecting the serial interface or the TurboControl i controller instruction manual.

5.2 Shut-down

Use the following procedure to shut down the pumping cart.

1. Refer to Connecting the serial interface or the TurboControl i controller instruction manual to stop the TMP and backing pump operation.
2. Switch off the main switch.
3. Switch off the mains power to the pumping cart.

5.3 UHV performance



WARNING: ELECTRIC SHOCK HAZARD

Risk of injury or damage to equipment. If you intend to remove the equipment panels for any reason you must make sure that the earth bonding lead is connected when the panel is replaced.



CAUTION: OVERHEAT

Risk of damage to equipment. Exceeding the maximum temperature for the components could cause damage and lead to a malfunction of the equipment.

The equipment should achieve a good ultimate pressure as specified, however you might not achieve a good ultimate if for example there is a high rate of outgassing within the equipment vacuum components or the equipment is pumping a high rate of water vapour. To avoid such problems it is advisable that you do not leave the inlet exposed to atmosphere for long periods, we would also advise that the equipment is vented using dry nitrogen this is especially important if you intend to store the equipment for long periods. Please refer to turbomolecular pump manual for further information of connecting purge gas.

If your equipment does not achieve a good ultimate pressure while isolated from your chamber you may need to leave the equipment running for a period of time until the required pressure has been reached. In addition, the performance may also be improved by reducing any outgassing, this can be accomplished by baking the UHV components. Below you will find the

Operation

maximum permitted temperature for the TurboControl i controller parts used on the equipment.

6 Maintenance



WARNING: MAINTENANCE SAFETY

Risk of injury or damage to equipment. Obey the safety instructions given below and take note of appropriate precautions. If you do not, you can cause injury to people and damage to equipment.

- When you refer to a manual supplied as a supplementary publication, you must obey all of the WARNING and CAUTION instructions in the manual.
- A suitably trained and supervised technician must maintain the pumping cart.
- Isolate the system from the electrical supply so that they cannot be operated accidentally.
- Allow the pumps to cool to a safe temperature before you start maintenance work.
- Check that the required parts are available and of the correct type before you start work.
- Ensure that the maintenance technician is familiar with the safety procedures which relate to the products pumped. Wear the appropriate safety-clothing when you come into contact with contaminated components. Dismantle and clean contaminated components in a fume-cupboard.
- Do not reuse 'O' rings and Co-seals if they are damaged.
- Protect sealing faces from damage.
- Do not touch or inhale the thermal breakdown products of fluoroelastomer seals. These breakdown products are very dangerous and may be present if the vacuum fittings have been heated to 260 °C and above.
- Leak-test the system after maintenance and seal any leaks found if you have disconnected any vacuum connections.

6.1 Maintenance plan

Refer to the supplementary instruction manuals listed under [TABLE: Supplementary publications](#) on page 2.

6.2 Inspect the pipelines and connections

- Inspect all of the electrical connections and check that they are secure. Tighten any loose connections.
- Inspect all of the cables and check that they are not damaged and have not overheated. Replace or repair any damaged or overheated cables.
- Inspect all of the vacuum and exhaust connections and check that they are secure. Tighten any loose connections.
- Inspect all vacuum and exhaust pipelines and check that they are not corroded or damaged and that they do not leak. Replace any corroded or damaged components and seal any leaks found.

Fault finding

7 Fault finding

Refer to the Product Manuals TMP listed under the [TABLE: Supplementary publications](#) on page 2.

8 Storage and disposal



Note:

We recommend that you avoid long-term storage of the pumping cart. If you will store the equipment for several months, refer to the storage instructions in the turbomolecular pump instruction manual.

8.1 Storage

Use the following procedure to store the pumping cart:

1. Shut down the pumping cart as described in section 4.7
2. Isolate the pumping cart from the electrical supply and disconnect it from the vacuum system.
3. Place protective covers over the inlet and outlet-flanges.
4. Store the TurboControl i controller combined outfit in cool, dry conditions until required for use.

8.2 Disposal

Dispose of the pumping cart and any components safely in accordance with all local and national safety and environmental requirements.

TurboControl i controller care must be taken with components which have been contaminated with dangerous process substances.

Spares and accessories

9 Spares and accessories

9.1 Introduction

Our products, spares and accessories are available from company's worldwide network or distributors. The majority of these centres employ service engineers who have undergone our comprehensive training courses.

Order spare parts and accessories from your nearest company's location or distributor. When you order, state for each part required:

- Model and item number of your equipment
- Serial number (if any)
- Item number and description.

Fit accessories as described in the supplementary publications and in the instruction manual supplied with the accessory.

9.2 Spares

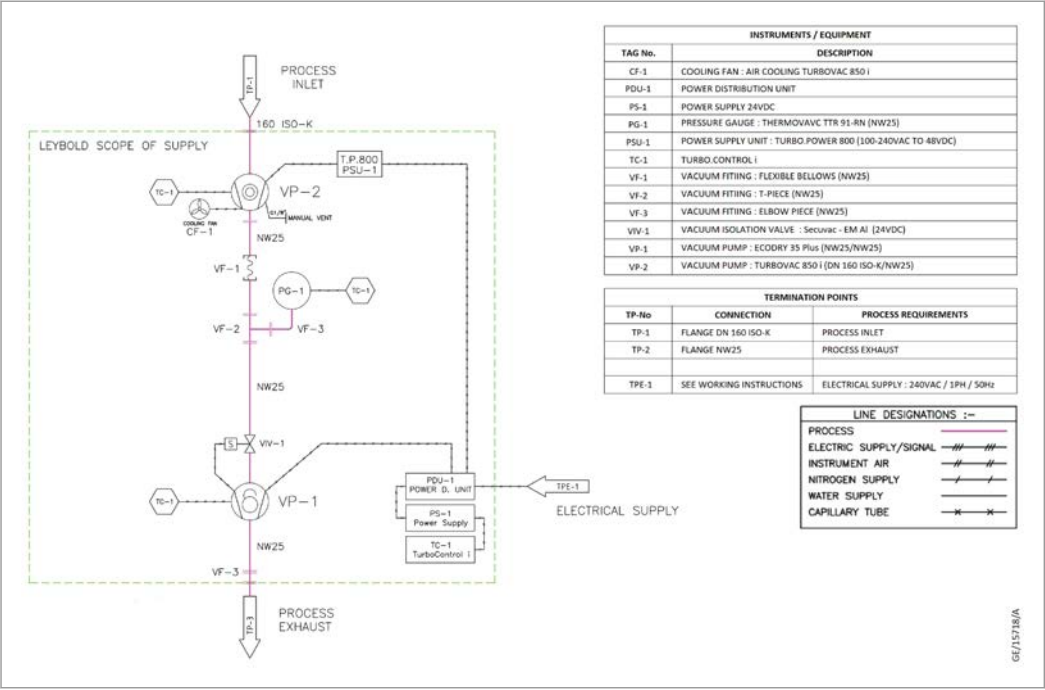
For accessories on the pumping cart, refer to the following documents.

Instruction manual TURBO.CONTROL i	300702826_002_C0
Instruction manual for Backing pump ECODRY 35 plus	300902516_002_C0
Instruction manual for turbomolecular pump TURBOVAC 850/950 i/iX	300855170_002_C8
TURBO.POWER 800 Power supply manual	300903162_002

10 Appendix

10.1 Turbolab 850/950 i/iX

Please refer document P&ID



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EU Declaration of Conformity CE

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Leybold GmbH
Bonner Strasse 498
D-50968 Köln
Germany

Documentation Officer
T: +49(0) 221 347 0
documentation@leybold.com

The product specified and listed below:

Product TURBOLAB 850/950 i/iX
The code number 501592TLxxx00x
Identifier where "x" depending on specification in below table

Code		Pump type	Inlet connection	Backing pump	Vent valve	Not used		Power supply
501592	TL	B TURBOVAC 850 i	1 ISO 160	1 ECODRY 35 plus	0 Manual vent	0	0	1 220-240V 50/60Hz Europe
			2 CF 160					
-		C TURBOVAC 950 i	3 ISO 200	-	1 Vent valve	-		2 220-240V 50/60Hz USA
			4 CF 200					
-		D TURBOVAC 850 iX	5 ISO 160	-	-	-		3 200V 50/60Hz Japan
			6 CF 160					
-		E TURBOVAC 950 iX	7 ISO 200	-	-	-		4 220-240V 50/60Hz UK
			8 CF 200					

Is in conformity with the relevant Union harmonisation legislation:

2006/42/EC Machinery directive
Note: The safety objectives of the Low Voltage Directive 2014/35/EU were complied with in accordance with Annex 1 No. 1.5.1 of this directive.

2014/30/EU Electromagnetic compatibility (EMC) directive
Class A Emissions , Industrial Immunity

2011/65/EU Restriction of certain hazardous substances (RoHS) directive as amended by Delegated Directive (EU) 2015/863

Based on the relevant requirements of harmonised standards:

EN ISO 12100:2010 Safety of machinery. General principles for design. Risk assessment and risk reduction

EN 1012-2:1996 +A1:2009 Compressors and vacuum pumps. Safety requirements. Vacuum pumps

EN 60204-1:2018 Safety of machinery. Electrical equipment of machines. General requirements.

EN 61010-1:2010 +A1:2019 Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
This product also complies with EN IEC 61326-1:2021

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

This declaration, based on the requirements of the listed Directives and EN ISO/IEC 17050-1, covers all product serial numbers from
this date on: 2026-03-10

You must retain the signed legal declaration for future reference.

This declaration becomes invalid if modifications are made to the product without prior agreement.



Robert Stolle
Systems HazLoc Champion and Technical Manager
Cologne, GER



Jiri Baklik, Ph.D.
Manufacturing Manager, Systems, Lutin, CZ

ADDITIONAL LEGISLATION AND COMPLIANCE INFORMATION (EU/UK)

EMC (EU, UK): Industrial equipment

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

RoHS (EU, UK): Material Exemption Information

This product is compliant with the following Exemptions (UKCA equivalent given in brackets).

Annex III:

- 6(c): Copper alloy containing up to 4% **lead** by weight (Table 1-18)

REACH (EU, UK)

This product is a complex article which is not designed for intentional substance release. To the best of our knowledge the materials used comply with the requirements of REACH. The product manual provides information and instruction to ensure the safe storage, use, maintenance and disposal of the product including any substance based requirements.

Article 33.1 Declaration (EU, UK)

This product contains Candidate List Substances of Very High Concern above 0.1%ww by article as clarified under the 2015 European Court of Justice ruling in case C-106/14.

- Lead (Pb)
This substance is present in certain brass components.

Additional Applicable Requirements

The product is in scope for and complies with the requirements of the following:

TSCA PBTs	Regulation of Persistent, Bioaccumulative, and Toxic Chemicals under TSCA Section 6(h) This product does not knowingly or intentionally contain substances in contravention with the above requirements.
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Pioneering products. Passionately applied.

Leybold GmbH
Bonner Strasse 498
50968 Cologne
GERMANY
+49-(0)221-347-0
info@leybold.com
www.leybold.com