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LABOPORT®

Chemically-resistant Laboratory Pumps
with Modular Accessories



Operating Instructions
for Laboratory Pumps

UN810FTP
UN820FTP
UN840FTP
UN810.3FTP
UN820.3FTP
UN840.3FTP
UN840.1.2.FTP
UN842.3FTP

and for LABOPORT Systems
SR..., SH…, SC…, SCC…

CE

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1. About this document

1.1. Using the Operating Instructions

The Operating Instructions are part of the pump/system.

➔ Carefully study the Operating Instructions before using a pump or system.

➔ Always keep the Operating Instructions handy in the work area.

➔ Pass on the Operating Instructions to the next owner.

Project systems and pumps

Customer-specific project systems or pumps (systems and pump models which begin with “PU” or “MPU”) may differ from the Operating Instructions.

For project systems and pumps, also observe the agreed upon specifications.

1.2. Symbols and Markings

Warning



WARNING

A danger warning is located here.

Possible consequences of a failure to observe the warning are specified here. The signal word, e.g. Warning, indicates the danger level.

➔ Measures for avoiding the danger and its consequences are specified here.

Danger levels

Signal word	Meaning	Consequences if not observed
DANGER	warns of immedi-ate danger	Death or serious injuries and/or serious damage are the consequence.
WARNING	warns of possible danger	Death or serious injuries and/or serious damage are possible.
CAUTION	warns of a possibly dangerous situa-tion	Minor injuries or damage are possible.

Tab. 1

Other information and symbols

➔ An activity to be carried out (a step) is specified here.

1. The first step of an activity to be carried out is specified here. Additional, consecutively numbered steps follow.

i This symbol refers to important information.

2. Use

2.1. Proper Use

The pump/system is exclusively intended for transferring gases and vapors.

Owner's responsibility

Operating parameters and conditions

Only install and operate the pump/system under the operating parameters and conditions described in chapter 5, Technical data.

Make sure that the installation location is dry and the pump/system is protected against rain, splash, hose and drip water.

Requirements for transferred medium

Before using a medium, check the compatibility of the materials of the pump head, diaphragm and valves with the medium.

Before using a medium, check whether the medium can be transferred danger-free in the specific application case.

Only transfer gases which remain stable under the pressures and temperatures occurring in the pump.

High performance condenser

The high performance condenser must be installed on the outlet side of the pump; if it is installed on the inlet side there is a danger of implosion.

Observe the correct usage of the gas- and cooling liquid-connections on the high performance condenser. Inlet and outlet connections for the gas are not interchangeable.

Accessories

Laboratory equipment or additional components connected to a pump/system have to be suitable for use with the pneumatic capabilities of the pump (see chapter 5.1, page 10).

2.2. Improper Use

The pump/system may not be operated in an explosive atmosphere.

The pump/system is not suitable for transferring dusts.

The pump/system is not suitable for transferring liquids.

For LABOPORT systems with vacuum controller: The vacuum system must not be used if the entry of air or gas into the vacuum system during venting (pump vent valve) could result in the creation of reactive, explosive or otherwise hazardous mixtures (e.g. with the medium).

The pump/the system must not be used to create vacuum and overpressure simultaneously.

An overpressure must not be applied to the suction side of the pump/ the system.

3. Safety

Note the safety precautions in chapters *7. Installation, mounting and connection,* and *8. Operation*.

The pump/system is built according to the generally recognized rules of technology and in accordance with the occupational safety and accident prevention regulations. Nevertheless, dangers can result during their use which leads to injuries to the user or others, or to damage to the pump/system or other property.

Only use the pump/system when it is in a good technical and proper working order, in accordance with its intended use, observing the safety advice within the operating instructions, at all times.

Personnel

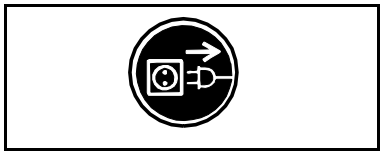
Make sure that only trained and instructed personnel or specially trained personnel work on the pump/system. This especially applies to assembly, connection and servicing work.

Make sure that the personnel has read and understood the operating instructions, and in particular the "Safety" chapter.

Working in a safety-conscious manner

Observe the accident prevention and safety regulations when performing any work on the pump/system and during operation.

Do not expose any part of your body to the vacuum.



Open housing parts with notice sticker (see fig. 1) only after separating mains plug from power source.

Fig. 1: Notice sticker

Handling dangerous media

When transferring dangerous media, observe the safety regulations when handling these media.

Handling flammable media

Be aware that the pump/system is not designed to be explosion-proof.

Make sure the temperature of the medium is always sufficiently below the ignition temperature of the medium, to avoid ignition or explosion. This also applies for unusual operational situations.

Note that the temperature of the medium increases when the pump compresses the medium.

Hence, make sure the temperature of the medium is sufficiently below the ignition temperature of the medium, even when it is compressed to the maximum permissible operating pressure of the pump. The maximum permissible operating pressure of the pump is stated in the technical specifications (see chapter 5.1, page 10).

If necessary, consider any external sources of energy, such as radiation, that may add heat to the medium.

In case of doubt, consult the KNF customer service.

Environmental protection

Store all replacement parts in a protected manner and dispose of them properly in accordance with the applicable environmental protection regulations. Observe the respective national and international regulations. This especially applies to parts contaminated with toxic substances.

Standards

The KNF LABOPORT® pumps conform to the safety regulations of the EC Directive 2004/108/EC concerning Electromagnetic Compatibility and the EC Directive 2006/42/EC concerning Machinery. The requirements of the following harmonised standards are fulfilled:

- DIN EN 61010-1
- DIN EN 61326-1
- DIN EN 61000-3-2/3

The pumps correspond to IEC 664:

- the overvoltage category II
- the pollution degree 2

Customer service and repairs

Only have repairs to the pump/system carried out by the KNF Customer Service responsible.

Only authorized personnel should open those parts of the housing that contain live electrical parts.

Use only genuine parts from KNF for servicing work.

4. System overview

1 Electrical supply unit
2 Vacuum controller
3 Vent valve at vacuum controller
4 On/off switch of vacuum controller
5 Pump vent valve
6 Vacuum valve
7 High performance condenser
8 Hose connector
9 Angled nozzle for coolant
10 Spring clamp
11 Flask for condenser
12 Support for high performance condenser
13 Locating pin for pump
14 Separator
15 Holder for Separator
16 Support for vacuum controller
17 Baseplate
18 Vacuum pump
19 On/off switch of pump

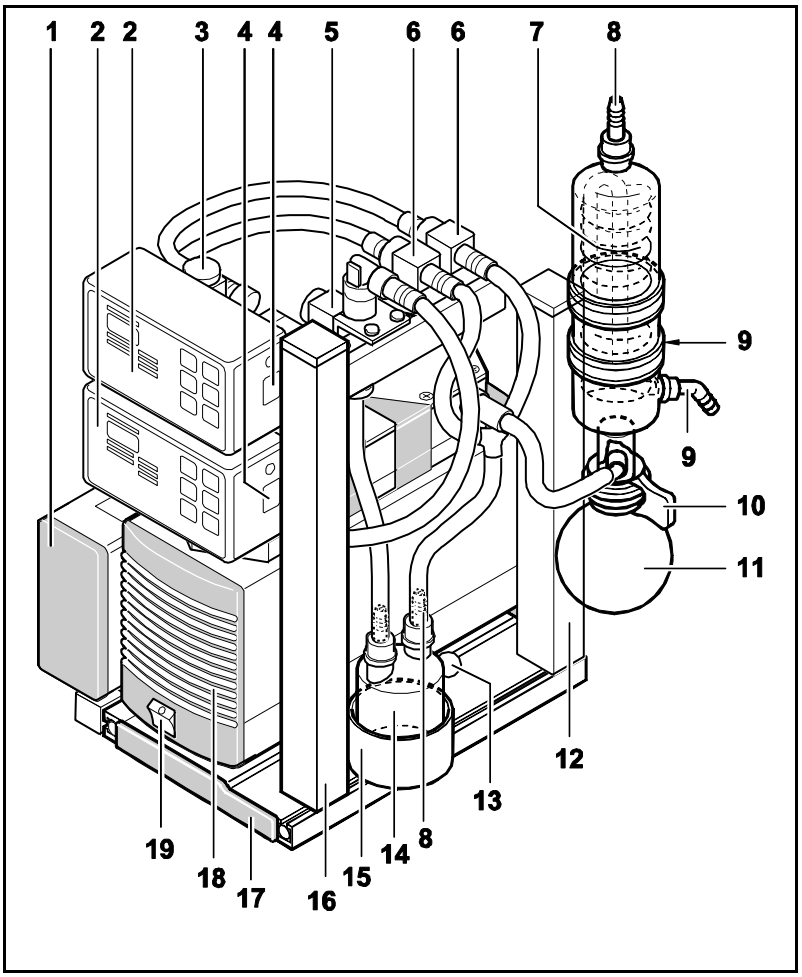


Fig. 2: Full expanded LABOPORT System SCC..., for example pump model N 840.3 FT.18 (symbolic)

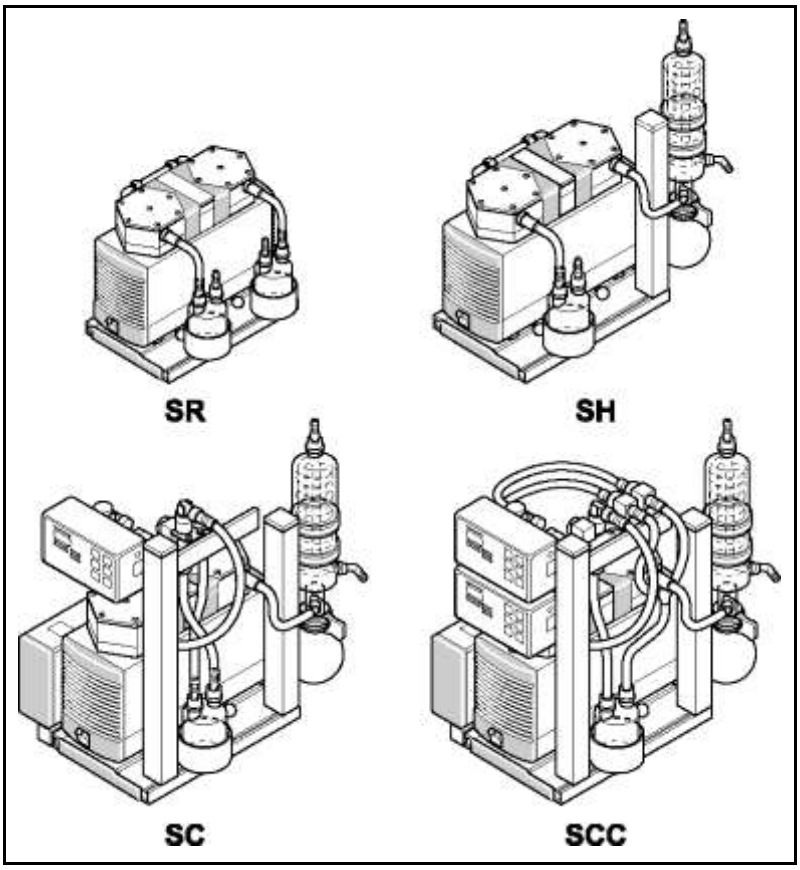


Fig. 3: LABOPORT Systems

	System			
Module	*SR...*	*SH...*	*SC...*	*SCC...*
Pump	X	X	X	X
Baseplate	X	X	X	X
2 separators	X			
1 separator		X	X	X
High performance condenser		X	X	X
Electrical supply unit			X	X
1 vacuum controller			X	
2 vacuum controllers				X

Tab. 2

Each pump and all systems can be expanded modularly up to a full system SCC… (see chapter 7.7, page 28).

5. Technical Data

5.1. Pumps

All pumps are secured against overheating with thermal switches and are equipped with a mains fuse.

*Pump materials (for all pump types) **	
Pump head	PTFE
Diaphragm	PTFE coated
Valve	FFPM

Tab. 3 **according to DIN ISO 1629 and 1043.1*

Refer to the type plate for the pump's electrical configuration.

UN810FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 100		
Delivery rate at atm. pressure [l/min]*	max. 10		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	5.9		
Dimensions: L x H x W [mm]	256 x 187 x 146		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consump-tion [A]	1.4	1.3	0.6
Power consumption pump [W]	110	110	100
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	2.5	2.5	1.25
Protection class motor	IP44		

Tab. 4 ** Liters in standard state (1,013 mbar)*

UN820FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 100		
Delivery rate at atm. pressure [l/min]*	max. 20		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	7.1		
Dimensions: L x H x W [mm]	268 x 207 x 159		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	2.2	1.9	0.9
Power consumption pump [W]	145	145	130
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	4.0	3.15	2.0
Protection class motor	IP44		

Tab. 5 ** Liters in standard state (1,013 mbar)*

UN840FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 100		
Delivery rate at atm. pressure [l/min]*	max. 34		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	10.3		
Dimensions: L x H x W [mm]	297x 226 x 171		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	4.4	3.2	1.5
Power consumption pump [W]	200	220	180
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	6.3	6.3	3.15
Protection class motor	IP44		

Tab. 6 ** Liters in standard state (1,013 mbar)N 810.3 FT.18*

UN810.3FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 8		
Delivery rate at atm. pressure [l/min]*	max. 10		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	6.9		
Dimensions: L x H x W [mm]	281 x 187 x140		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	1.4	1.3	0.6
Power consumption pump [W]	100	110	90
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	2.5	2.5	1.25
Protection class motor	IP44		

Tab. 7 **Liters in standard state (1,013 mbar)*

UN820.3FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 8		
Delivery rate at atm. pressure [l/min]*	max. 20		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	9.3		
Dimensions: L x H x W [mm]	312 x 207 x 144		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	1.8	1.2	0.7
Power consumption pump [W]	130	130	120
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	3.15	2.5	1.6
Protection class motor	IP44		

Tab. 8 **Liters in standard state (1,013 mbar)*

UN840.3FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 8		
Delivery rate at atm. pressure [l/min]*	max. 34		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	12.6		
Dimensions: L x H x W [mm]	341 x 226 x 166		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	4.4	3.2	1.5
Power consumption pump [W]	220	250	245
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	6.3	6.3	3.15
Protection class motor	IP44		

Tab. 9 **Liters in standard state (1,013 mbar)*

UN840.1.2FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 90		
Delivery rate at atm. pressure [l/min]*	max. 60		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	12.6		
Dimensions: L x H x W [mm]	341 x 226 x 160		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	5.1	4.2	1.9
Power consumption pump [W]	275	280	270
Maximum permitted mains voltage fluctuation	+/- 10 %	+/- 10 %	+/- 10 %
Fuse pump (2x) T [A]	6.3	6.3	3.15
Protection class motor	IP44		

Tab. 10 **Liters in standard state (1,013 mbar)*

UN842.3 FTP

Pneumatic performance			
Max. permissible operating pressure [bar g]	1.0		
Ultimate vacuum [mbar abs.]	≤ 2		
Delivery rate at atm. pressure [l/min]*	max. 34		
Pneumatic connection			
Hose connection [mm]	ID 10		
Ambient and media temperature			
Permissible ambient temperature	+ 5 °C to + 40 °C		
Permissible media temperature	+ 5 °C to + 40 °C		
Other parameters			
Weight [kg]	13.4		
Dimensions: L x H x W [mm]	341 x 223 x 167		
Maximum permissible ambient relative humidity	80 % for temperatures up to 31 °C, decreasing linearly to 50 % at 40 °C		
Maximum altitude of site [m above sea level]	2000		
Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Maximum current consumption [A]	4.4	3.2	1.5
Power consumption pump [W]	260	290	245
Fuse pump (2x) T [A]	6.3	6.3	3.15
Protection class motor	IP44		

Tab. 11 **Liters in standard state (1,013 mbar)*

5.2. Electrical Supply Unit

Electrical Data			
Voltage [V]	100	115	230
Frequency [Hz]	50/60	60	50
Power consumption* [W]	270	300	295
Fuse pump (2x) T [A]	6.3	6.3	3.15

Tab. 12

** includes the power consumption of the whole system (inclusive pump and vacuum controller); for pumps UN840.1.2 FTP and UN842.3FTP power consumption raises by approx. 50 W.*

5.3. Vacuum Controller

See Operating Manual of the vacuum controller.

5.4. Vacuum Systems

Ambient temperature	
Permissible ambient temperature	+ 5 °C to + 40 °C
Operating parameters of coolant (only for high performance condensers)	
Permissible pressure [bar g]	3
Permissible temperature	- 15 °C to + 20 °C
Condenser connectors	For tube 8mm ID

Tab. 13

6. Design and Function

6.1. Pump

Design

1 Connection piece
2 Pneumatic connection
3 Pump head
4 Outlet (pressure side)
5 Inlet (suction side)
6 Power switch

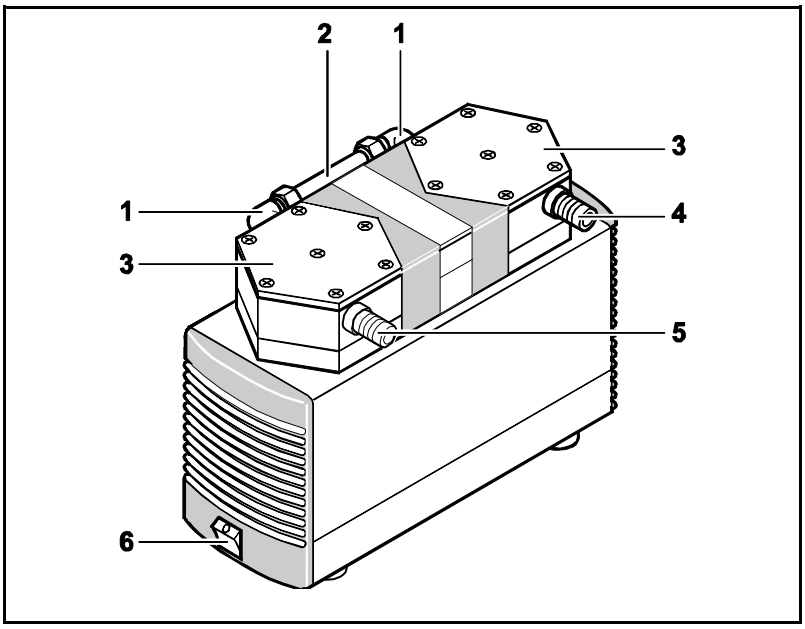


Fig. 4: Diaphragm pump (shown: pump UN840.3 FTP)

Function Diaphragm pump

1 Outlet valve
2 Inlet valve
3 Transfer chamber
4 Diaphragm
5 Eccentric
6 Connecting rod
7 Pump housing

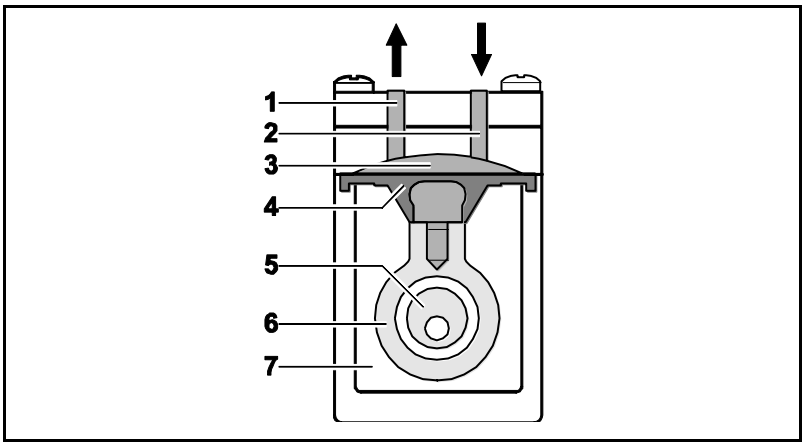


Fig. 5: Pump head

Diaphragm pumps transfer, compress (depending on pump version) and evacuate gases and vapors.

The elastic diaphragm (**4**) is moved up and down by the eccentric (**5**) and the connecting rod (**6**). In the downward stroke it aspirates the gas to be transferred via the inlet valve (**2**). In the upward stroke, the diaphragm presses the medium out of the pump head via the outlet valve (**1**). The transfer chamber (**3**) is hermetically separated from the pump housing (**7**) by the diaphragm.

6.2. Separator

Design

1 Tubing
2 Hose nozzle
3 Separator container
4 Holder for separator

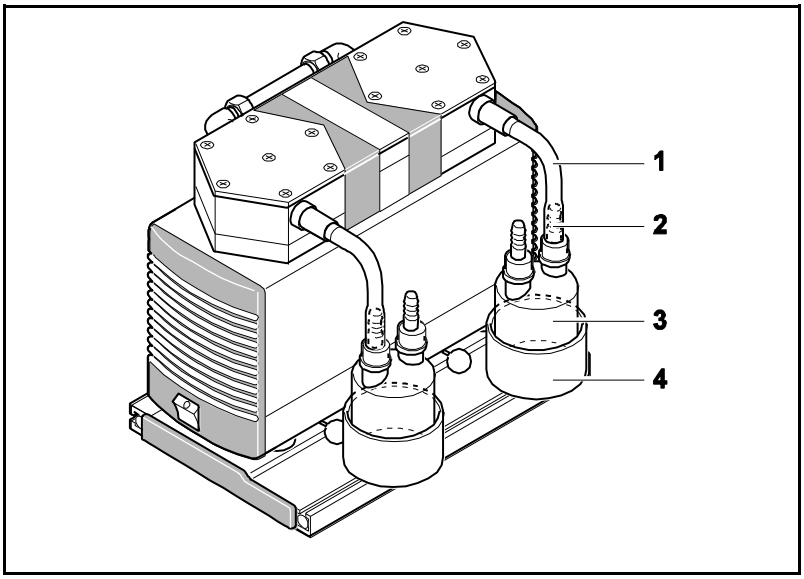


Fig. 6: Separator (shown: LABOPORT system SR with pump UN840.3FTP as example)

Function

Condensable components in the gas can be separated on the pressure side of the pump. On the suction side the separator collects particular matter and droplets. This protects the pump from contamination.

The separator is made of a specially treated glass and features implosion protection.

6.3. High Performance Condenser

Design

1 Hose nozzle
2 High Performance Condenser
3 Angled nozzle for coolant
4 Tubing
5 Spring clamp
6 Flask
7 Support

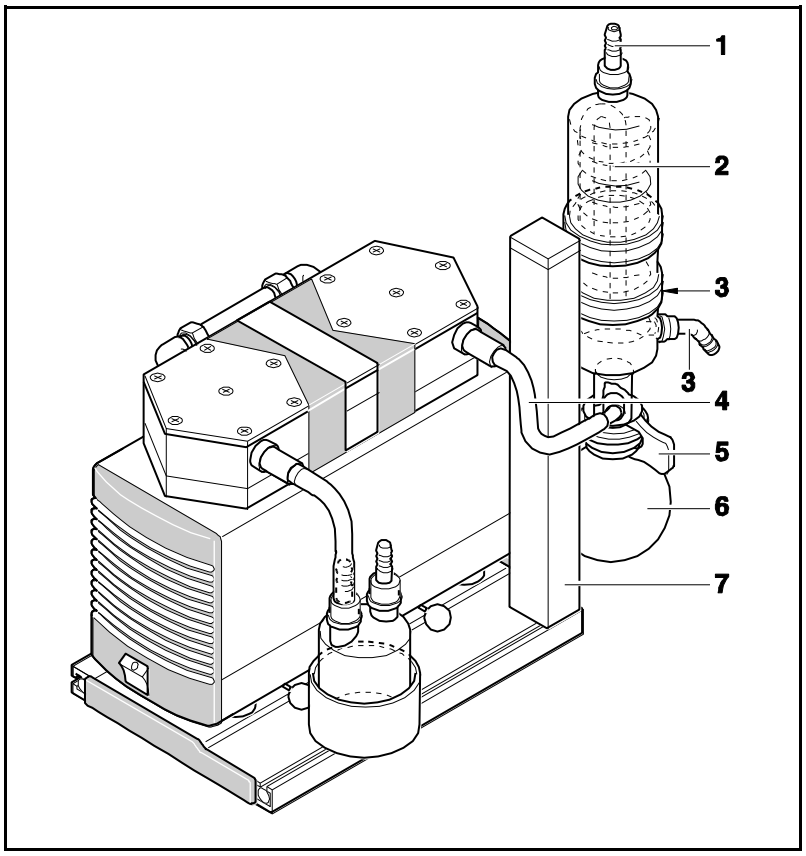


Fig. 7: High performance condenser (shown: LABOPORT system SH with pump UN840.3FTP as example)

Function

The high performance condenser at pump outlet enables condensable components in the vapor to be separated out.

The condensate is collected in a glass flask. The flask is attached to the condenser flange with a clamp. The condensation temperature is maintained by running cold water or re-circulating coolant through the condenser.

6.4. Vacuum Controller

1 Tubing
2 Power switch
3 Support
4 Electrical supply unit
5 Vacuum controller

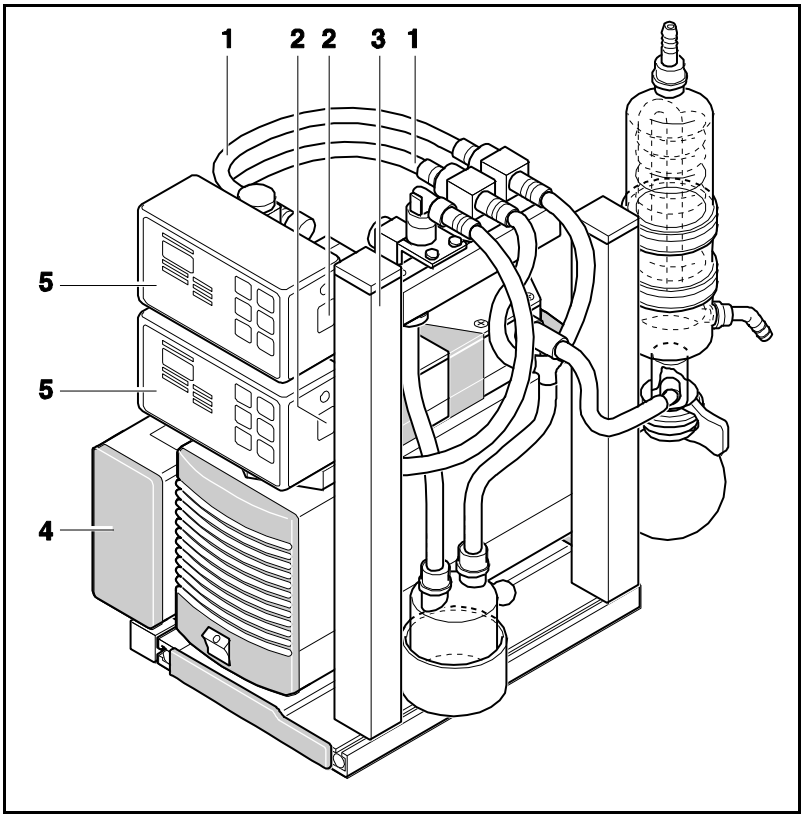


Fig. 8: Vacuum controller (shown: LABOPORT system SCC with pump UN840.3FTP as example)

Function

In laboratory systems without a vacuum controller the pump runs continuously and works against its vacuum. If there is a vacuum controller, it will switch the pump off once the selected target vacuum has been reached.

With two vacuum controllers it becomes possible to simultaneously run two different and independent processes with just one pump.

Once one vacuum controller's set point has been reached, that vacuum controller will close the valve it is controlling. If two vacuum controllers are used, the pump will continue to work until the second controller's set point has been reached. Then the second vacuum controller will close the valve it is controlling. The pump switches off and the pump vent valve is opened.

If one of the two vacuum values falls below the hysteresis range, the pump will switch back on.

Refer to the vacuum controller's operating instructions for more information.

7. Installation, mounting and connection

Only install and operate the pumps/systems under the operating parameters and conditions described in chapter 5, Technical data.

Observe the safety precautions (see chapter 3, page 6).

➔ Before installation, store the pump/the accessories at the installation location to bring it up to room temperature.

Dimensions
➔ See chapter 5, Technical data, for the dimensions of system.

Cooling air supply
➔ Install the pump/system so that the motor fan can intake sufficient cooling air.

Installation location
➔ Make sure that the installation location is dry and the pump/system is protected against rain, splash, hose and drip water.

➔ Choose a safe location (flat surface) for the pump/system.

➔ Protect the pump/system from dust.

➔ Protect the pump/system from vibrations and jolts.

7.1. Connect pump

Connected components
➔ Only connect components to the pump which are designed for the pneumatic data of the pump (see chapter 5.1, page 10).

Pump exhaust
➔ If the pump is used as a vacuum pump, safely discharge the pump exhaust at the pump's pneumatic outlet.

i A marking on the pump head shows the direction of flow.

1. Remove the protective plugs from the pneumatic connectors of the pump.
2. Connect the suction line and pressure line.
3. Lay the suction and pressure line at a downward angle to prevent condensate from running into the pump.
4. Insert the power cable's plug into a properly installed shockproof socket.

7.2. Baseplate

Condition

- Pump disconnected from mains

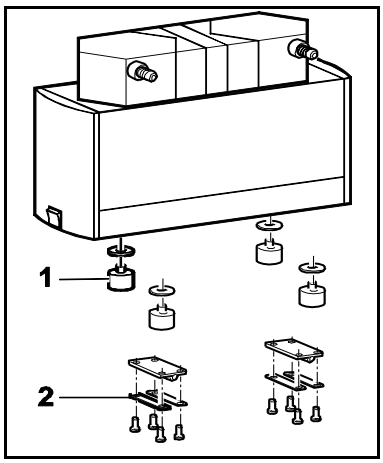


Fig. 9: Installation of the mounts at the pump

1. Unscrew the pump`s rubber feet (**1**) anti-clockwise.
2. Install the mounts (**2**) onto the pump.
3. Stand the pump (fitted with the mounts) onto the baseplate
4. Aligne the mounts on the pump and the baseplate.
5. Slide the locating pin (see fig. 2/**13**) through the mount holes on the baseplate and on the pump until they are fully engaged.
6. Check that the pump is securely fastened to the baseplate via both mounts.

7.3. Separator

Conditions

- Baseplate mounted (see chapter 7.2)
- Pump disconnected from mains

Tools and material

Qty	Material
1	Phillips-head screwdriver No. 3

Tab. 14

1. Slide the container for the separator (see fig. 6/**4**) into the baseplate’s upward-pointing slotted bar.
2. Fix the holders by tighten the screw in the bottom of them.
3. Place the glass separators into the holders.

Laying hoses: depending on system configuration see chapter 7.7.1 (system SR), 7.7.2 (system SH), 7.7.3 (system SC), 7.7.4 (system SCC) or 7.7.5 (retrofitting from system SC to system SCC).

7.4. High Performance Condenser

The high performance condenser is delivered installed on a support.

Conditions

- Baseplate mounted (see chapter 7.2, page 24)
- Pump disconnected from mains and de-energized

Touls and material

Qty	Material
1	Allen key 5 mm

Tab. 15

Installing the high performance condenser



WARNING

Danger of implosion if installed improperly

There is a danger of implosion if the high performance condenser is installed on the pump inlet.

➔ Connect the high performance condenser to the pump outlet only.

1. Slide the support of high performance condenser (see fig. 7/**7**) into the baseplate's upward-pointing slotted bar.
2. Fix the support to the baseplate by tightening the allen screw.
3. Align the high performance condenser so that the hose connection at the inlet is lower than the pump outlet.

Laying hoses: depending on system configuration see chapter 7.7.2 (system SH), 7.7.3 (system SC), 7.7.4 (system SCC) or 7.7.5 (retrofitting from system SC to system SCC).

7.5. Electrical Supply Unit and Vacuum Controller

The vacuum controller(s) is (are) delivered with the ventilation valve and pump vent valve installed on a support.

When retrofitting from system SC to system SCC, the second vacuum controller is delivered complete with the ventilation valve installed on a new support. Install the existing vacuum controller on the new support. For more information about retrofitting from system SC to system SCC, refer to chapter 7.7.5, page 32.

Conditions

- Baseplate mounted (see chapter 7.2, page 24)
- Pump disconnected from mains

Tools and material

Qty	Material
1	Allen key 4 mm
1	Allen key 5 mm

Tab. 16

Mounting the electrical supply unit

1. Slide the electrical supply unit (see fig. 8/**4**) with both tightening nuts into the baseplate's lateral slotted bar.

2. Tighten the allen screws at the bottom of the electrical supply unit.

Mounting the vacuum controller

1. Slide the support's attachment part (see fig. 8/**3**) into the baseplate's lateral, upward-pointing slotted bar.
2. Tighten the allen screw at the bottom of the support.

Wire and connect with each other the electrical supply unit and the vacuum controller

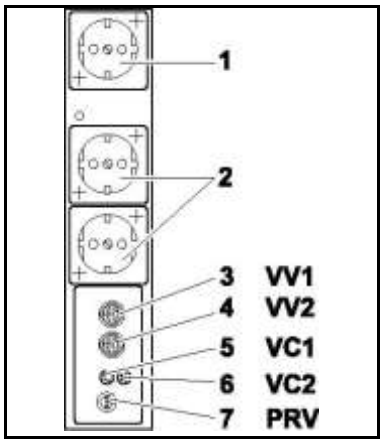


Fig. 10: Connections of the electrical supply unit

Figures 11 and 12 provide an overview of the electrical connections for LABOPORT systems SC and SCC.

1. Connect signal socket of the vacuum controller with the eletrical supply unit socket marked VC 1 (fig. 10/**5**) using the connection cable.
2. When using two vacuum controllers, connect the second vacuum controller's signal socket to the electrical supply unit's VC2 connection (**6**).
3. Insert the vacuum controller power cord plug into the designated electrical supply unit socket (**2**).
4. When using two vacuum controllers, insert the vacuum valves' plugs into the electrical supply unit's VV1 (**3**) und VV2 (**4**) connections.
5. Insert the pump vent valve plug into the electrical supply unit socket marked PRV (**7**).
6. Insert the vacuum pump power cord plug into the designated electrical supply unit socket (**1**).
7. Tuck all of the wires into the electrical supply unit and secure the cover.
8. Make sure power switches on the pump and on the vacuum controller(s) are switched off.
9. Insert the electrical supply unit`s system power cord plug into a shockproof socket.

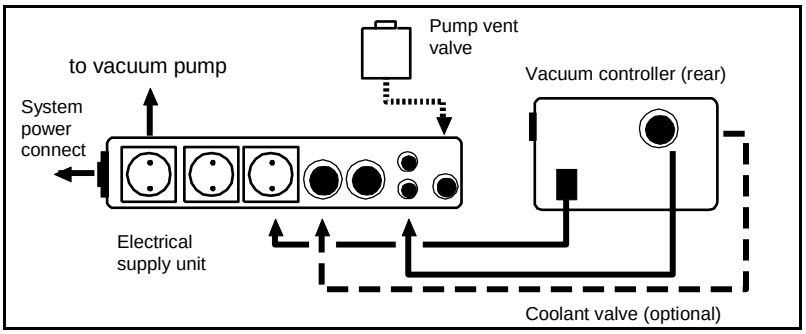


Fig. 11: Electrical connection LABOPORT System SC

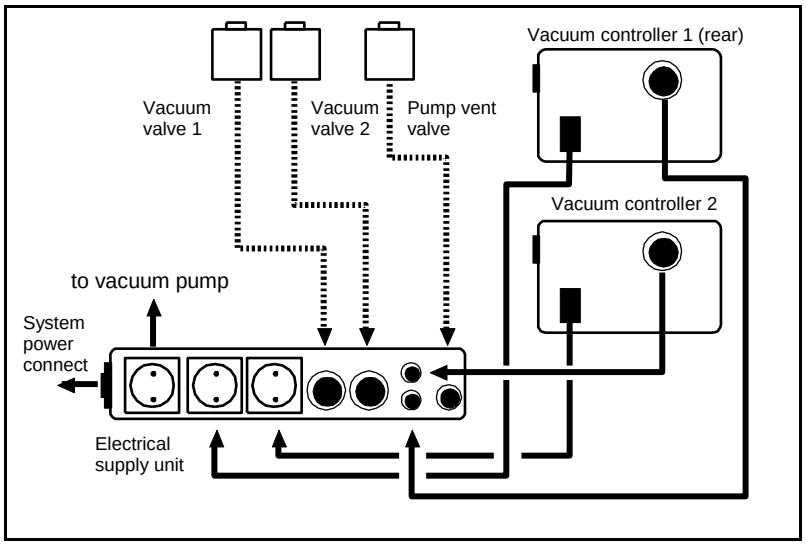


Fig. 12: Electrical connection LABOPORT System SCC

Laying hoses: depending on system configuration see chapter 7.7.3 (system SC), 7.7.4 (system SCC) or 7.7.5 (retrofitting from system SC to system SCC).

Mounting coolant valve for high performance condenser (optional)

With a coolant valve it becomes possible to stop the flow of coolant if the system's control operation is interrupted or terminated.

WARNING

Danger of the high performance condenser bursting

➔ Make sure that the coolant valve is mounted between the coolant supply and the coolant inlet port of high performance condenser.

1. Connect the coolant valve to the coolant supply.
2. Insert the coolant valve's plug into the vacuum controller's VV1 socket (see fig. 10/**3**).

See fig. 16, page 29 for coolant inlet and outlet.

7.6. Gas Ballast

Only for two-headed pumps.

Condition

- Motor disconnected from mains and de-energized

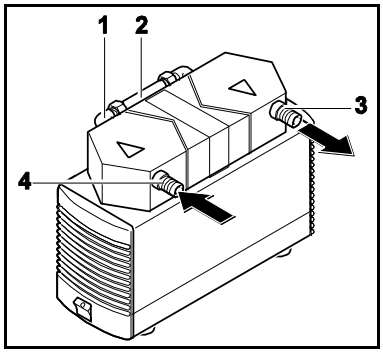


Fig. 13: Mounting the gas ballast

Mounting

1. Disconnect the tubes from the inlet (**4**) and the outlet (**3**) of the pump.
2. Remove the pump from the baseplate.
3. Open the connection (**2**) of the pump heads.
4. Screw out the connecting piece (**1**) of the vacuum side head.
5. Screw the gas ballast into the pump head.
6. Remount the connection (**2**) between the both pump heads.

7.7. Mounting of Systems

The displayed system tube configuration is for two-headed pumps only.

Contact KNF Service for information about laying tubes for one-headed pumps and pumps with aluminum heads (“A” in the type designation).

7.7.1. System SR

The system SR consists of:

- baseplate
- two separators

Tools and material

Qty	Material
1	Phillips-head screwdriver No. 3
2	Tubes (see fig. 14) ▪ Resistant to the medium employed ▪ Inside diameter 10 mm ▪ Length: approx. 150 mm

Tab. 17

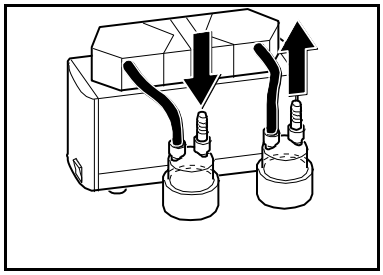


Fig. 14: Tubing system SR

1. Attach pump to the baseplate (see chapter 7.2, page 24).
2. Install the separators (chapter 7.3, page 24).
3. Lay tubes for separators (see fig. 14).

7.7.2. System SH

The system SH consists of:

- Baseplate
- 1 separator
- 1 high performance condenser

Tools and material

Qty	Material
1	Phillips-head screwdriver No. 3
1	Allen key 5 mm
2	Tubes (see fig. 15) ▪ Resistant to the medium employed ▪ Inside diameter 10 mm ▪ Length: (**1**) approx. 150 mm, (**2**) approx. 220 mm

Tab. 18

WARNING

Danger of the high performance condenser bursting

➔ Make sure that the high performance condenser´s upper gas outlet is not blocked.

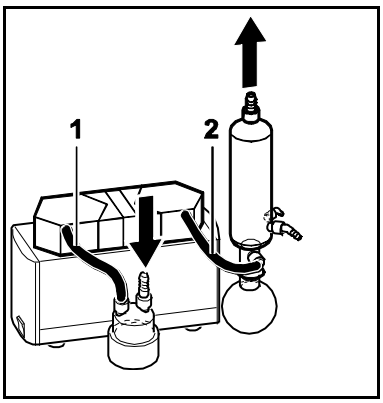


Fig. 15: Tubing system SH

DANGER

Improper laying of hoses will result in damage to the pump

➔ Correctly assign gas and coolant hose connections.

➔ Do not reverse the gas connections' inlets and outlets.

1. Attach pump to the baseplate (see chapter 7.2, page 24).
2. Install the separator (see chapter 7.3, page 24).
3. Install the high performance condenser (see chapter 7.4, page 25).
4. Lay hoses for system (see fig. 15).

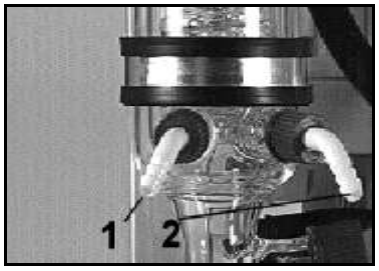


Fig. 16: Coolant supply of high performance condenser

1 Coolant inlet
2 Coolant outlet

The condenser-connectors for the coolant require connection tubing with an inside diameter of 8 mm.
Coolant inlet and outlet see fig. 16.

When using a coolant valve:

WARNING

Danger of the high performance condenser bursting

➔ Make sure that the coolant valve is mounted between the coolant supply and the coolant inlet port of high performance condenser.

7.7.3. System SC

The system SC consists of:

- Baseplate
- 1 separator
- 1 high performance condenser
- Electrical supply unit with 1 vacuum controller

Tools and material

Qty	Material
1	Phillips-head screwdriver No. 3
1	Allen key 4 mm
1	Allen key 5 mm
4	Tubes (see fig. 17) ▪ Resistant to the medium employed ▪ Inside diameter 10 mm ▪ Length: (**1,4**) approx. 220 mm, (**2**) approx. 300 mm, (**3**) approx. 150 mm

Tab. 19

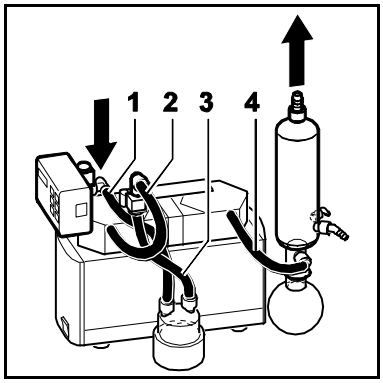


Fig. 17: Tubing system SC

1. Attach pump to the baseplate (see chapter 7.2, page 20).
2. Install the separator (see chapter 7.3, page 20).
3. Install the high performance condenser (see chapter 7.4, page 21).
4. Install the electrical supply unit and the vacuum controller (see chapter 7.5, page 21).
5. Lay hoses for system (see fig. 17).

Coolant inlet and outlet see fig. 16.

When using a coolant valve:

WARNING

Danger of the high performance condenser bursting

➔ Make sure that the coolant valve is mounted between the coolant supply and the coolant inlet port of high performance condenser.

6. Wire and connect with each other the electrical supply unit and the vacuum controller (see chapter 7.5, page 21).

7.7.4. System SCC

The system SCC consists of:

- Baseplate
- 1 separator
- 1 high performance condenser
- Electrical supply unit with 2 vacuum controllers

Tools and material

Qty	Material
1	Phillips-head screwdriver No. 3
1	Allen key 4 mm
1	Allen key 5 mm
8	Tubes (see fig. 18) ▪ Resistant to the medium employed ▪ Inside diameter 10 mm ▪ Length: (**1**) approx. 320 mm, (**2**) approx. 260 mm, (**3,4**) approx. 120 mm, (**5**) approx. 220 mm, (**6**) approx. 135 mm, (**7**) approx. 175 mm, (**8**) approx. 350 mm

Tab. 20

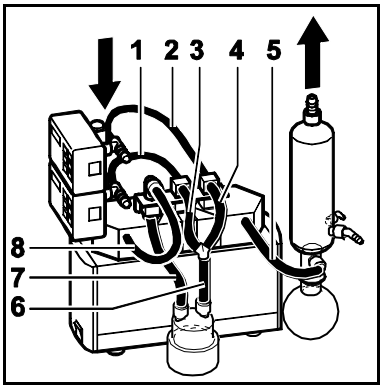


Fig. 18: Tubing system SCC

1. Attach pump to the baseplate (see chapter 7.2, page 20).
2. Install the separator (see chapter 7.3, page 20).
3. Install the high performance condenser (see chapter 7.4, page 21).
4. Install the electrical supply unit and both vacuum controllers (see chapter 7.5, page 21).
5. Lay hoses for system (see fig. 18).

Coolant inlet and outlet see fig. 16.

When using a coolant valve:

WARNING

Danger of the high performance condenser bursting

➔ Make sure that the coolant valve is mounted between the coolant supply and the coolant inlet port of high performance condenser.

6. Wire and connect with each other the electrical supply unit and the vacuum controller (see chapter 7.5, page 21).

7.7.5. Retrofitting from System SC to System SCC

The second vacuum controller is delivered complete with the vent valve installed on a new support (length: 410 mm). Install the existing vacuum controller on the new support.

Conditions

- Pump removed from operation (see chapter 8.2, page 35)
- Pump disconnected from mains

Tools and material

Qty	Material
1	Allen key 4 mm
1	Allen key 5 mm
	See chapter 7.7.4 for the required hoses

Tab. 21

Removing the existing vacuum controller

The following item numbers refer to fig. 2, page 8.

1. Disconnect the tubes from the pump vent valve (**5**) as well as from the controller (**2**) vent valve (**3**).
2. Pull out all plugs from the electrical supply unit (**1**).
3. Remove the vacuum controller from the support (**16**) after loosening the clamp assembly.
4. Remove the lateral support from the main support after loosening the clamp assembly.
5. Loosen the allen screw at the foot of the main support.
6. Slide the support out of the baseplate (**17**) mounting slot assembly.

Mount new vacuum controller

The following item numbers refer to fig. 2, page 8.

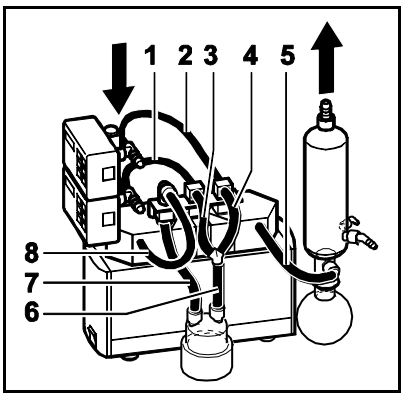


Fig. 19: Tubing system SCC

1. Slide the removed vacuum controller (**2**) into the slot on the new support (**16**) and fix it in place with the clamp connection.
2. Slide the support's attachment part into the baseplate's (**17**) lateral upward-pointing slotted bar.
3. Tighten the allen screw at the foot of the support.
4. Mount the lateral support onto the main support.
5. Slide two additional vacuum valves(**6**) onto the lateral support mounting slot and fix the device with help of the clamping assembly.
6. Lay hoses for system (see fig. 19).
7. Wire and connect with each other the electrical supply unit and the vacuum controller (see chapter 7.5, page 25).

8. Operation

8.1. Pump

8.1.1. Preparing for Start-up

Before switching on the pump/system, observe the following points:

	Operational requirements
Pump	▪ All hoses attached properly
Pump/ System	▪ Fan openings not blocked ▪ Specifications of the power supply correspond with the data on the pump's/the electrical supply unit's type plate. ▪ The pump outlet is not closed or constricted. ▪ When using two vacuum controllers: The media are compatible with each other (when running two different processes simultaneously) ▪ When using a gas ballast: No explosive or poisonous mixtures may be produced when ventilating the vacuum system through the air inlet.
System	▪ Clamp connections are tight ▪ All cables attached properly

Tab. 22

8.1.2. Starting

➔ Only operate the pump under the operating parameters and conditions described in chapter 5, Technical data.

➔ Make sure the pumps are used properly (see chapter 2.1, page 5).

➔ Make sure the pumps are not used improperly (see chapter 2.2, page 5).

➔ Observe the safety precautions (see chapter 3, page 6).



WARNING

Hazard of the pump head bursting due to excessive pressure increase

➔ Do not exceed max. permissible operating pressure (see chapter 5.1, page 10).

➔ Monitor pressure during operation.

➔ If the pressure exceeds the maximum permissible operating pressure, immediately shut down pump and eliminate fault (see chapter 10, page 42).

➔ Only throttle or regulate the air or gas quantity in the suction line to prevent the maximum permissible operating pressure from being exceeded.

➔ If the air or gas quantity in the pressure line is throttled or regulated, make sure that the maximum permissible operating pressure of the pump is not exceeded.

i Excessive pressure (with all of the related hazards) can be prevented by placing a bypass line with a pressure-relief valve between the pressure and suctions sides of the pump. For further information, contact our technical adviser.

Pump standstill

➔ With the pump at a standstill, open pressure and suction lines to normal atmospheric pressure.



WARNING

Automatic starting can cause personal injury and pump damage

When the operation of the pump is interrupted by the thermal switch, the pump will restart automatically after cooling down.

➔ After triggering of the thermal protection or in the event of power failure, remove the pump's mains plug from the socket so that the pump cannot start uncontrollably.

➔ Attempt work on the pump or system only if the pump/system is separated from mains power.

8.2. Switching Pump/System on and off

Switching pump on

The pump may not start up against overpressure during switch-on. This also applies in operation following a brief power failure. If a pump starts against pressure, it may block. This activates the thermal switch, and the pump switches off.

➔ Make sure that no pressure is present in the lines during switch-on.

➔ Switch on pump with mains switch (see fig. 2/**19**)

Switching off the pump/removing from operation

➔ When transferring aggressive media, flush the pump prior to switch-off to increase the service life of the diaphragm (see chapter 9.2.1, page 37).

➔ Switch off pump with mains switch (see fig. 2/**19**).

➔ Open pressure and suction lines to normal atmospheric pressure.

➔ Disconnect the power source.

8.3. Notices related to System Operation

8.3.1. Separators

You can move the holders for the separator vessels after loosening the attachment screw.

8.3.2. High Performance Condenser



CAUTION

Danger of high performance condenser bursting

➔ Make sure that the high performance condenser's upper gas outlet is not blocked.

A high performance condenser may be used only with a cold-water connection or recirculated cooling system.

Adjustment of the high performance condenser altitude level

Tools and material

Qty	Material
1	Allen key 5 mm

Tab. 23

1. Loosen the both allen screws at the foot of the high performance condenser.
2. Remove the high performance condenser's clamp assembly in the support mounting slot.
3. Retighten the allen screws.

8.3.3. Vacuum Controller

WARNING

Personal injury caused by poisoning or explosion and damage to the pump.

- ➔ Make sure that no reactive or explosive mixtures will be produced when ventilating the vacuum system through the air inlet.
- ➔ Make sure that the media are compatible with each other (when running two different processes simultaneously).

Use the mains switch to switch the vacuum controller on and off.

Each vacuum controller can be set individually and will work independently of the other.

Refer to the vacuum controller's operating instructions for more information.

8.3.4. Gas Ballast

WARNING

Personal injury caused by poisoning or explosion and damage to the pump.

- ➔ Ensure that the creation of reactive, explosive or otherwise hazardous mixtures during the supply of air is prevented.

If the gas ballast valve is open the maximum achievable vacuum level is reduced. The gas ballast is adjusted with the button (see fig. 20).

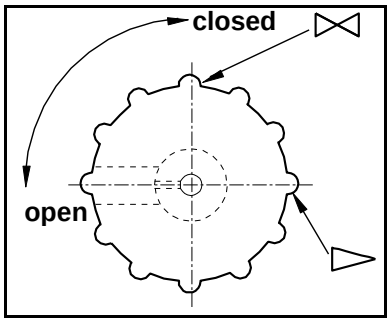


Fig. 20: Gas ballast operating knob

9. Servicing

9.1. Servicing Schedule

Component	Servicing interval
Pump/system	Regular inspection for external damage or leaks
Diaphragm and valve plates/sealings	Replace at the latest, when pump output decreases

Tab. 24

9.2. Cleaning

When cleaning, make sure that no liquids enter the inside of the housing.

9.2.1. Flushing Pump

➔ Before switching off the pump, flush it with air (if necessary for safety reasons: with an inert gas) for about five minutes under atmospheric conditions (ambient pressure).

9.2.2. Cleaning Pump

➔ Only clean pump with a damp cloth and non-flammable cleaning agents.

9.2.3. Emptying and Cleaning the Separator

1. Unscrew the connecting nozzles (fig. 2/**8**, page 8).
2. Remove separator (fig. 2/**14**) from the holder (fig. 2/**15**) and dispose of contents according to applicable regulations in your area. Then rinse out the separator.
3. Replace separator into the holder.
4. Screw the connecting nozzles back on.

9.2.4. Emptying and Cleaning the Condenser

1. Carefully remove the spring clamp (fig. 2/**10**) while supporting the flask (fig. 2/**11**).
2. Empty and clean the flask – observing safety precautions.
3. Re-connect the flask to the condenser and replace the spring clamp.

9.3. Changing Diaphragm and Valve Plates/Sealings

Conditions

- Pump is switched off and mains plug is removed from the socket
- Pump is clean and free of hazardous materials
- Tubes removed from pump's pneumatic inlet and outlet
- Pump is removed from baseplate (if pump is integrated into a system)

Tools and material

Qty	Material
1	Phillips-head screwdriver No. 2
1	Service Set (see chapter 11.1, page 46)
1	Felt-tip pen

Tab. 25

Information on procedure

➔ Always replace diaphragm and valve plates/sealings together to maintain the pump performance.

With multi-head pumps, parts of the individual pump heads can be confused.

➔ Replace the diaphragm and valve plates/sealings of the individual pump heads consecutively.



WARNING

Health hazard due to dangerous substances in the pump!

Depending on the substance transferred, caustic burns or poisoning are possible.

➔ Wear protective clothing if necessary, e.g. protective gloves.

➔ Flush pump before replacing the diaphragm and valve plates/sealings (see chapter 9.2.1, page 37).

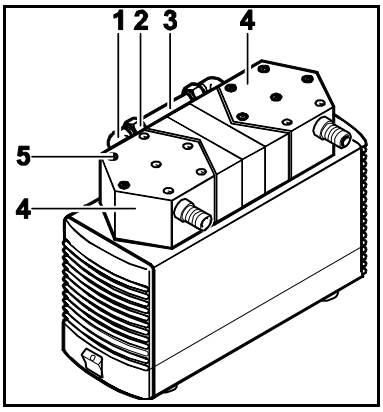


Fig. 21: Removing pump head

Removing pump head

Pump N 842.3 FT.18 has a round shape of head, not a hexagonal.

1. For two-headed pumps: On the pneumatic head connection (**3**), loosen the union nuts (**2**) by hand. Then slightly loosen the angle-fitting (**1**) in the pump head (**4**) by turning it counter-clockwise, so that the connecting tube can be pulled out.
2. Mark the position of top plate (fig. 24/**5**), head plate (fig. 24/**6**), intermediate plate (fig. 24/**8**) and adapter relatively to each other by a drawing line (for two-headed pumps: at both pump heads) with a felt-tip pen (**1**). This helps to avoid incorrect assembly later.

In version N 842.3 FT.18, twelve (instead of six) screws must be loosened in the next work step.

3. Loosen the outer screws (**5**) on the pump head/pump heads.
4. Carefully remove pump head / pump heads.

Change diaphragm

Replace the diaphragms of two-headed pumps consecutively in order to ensure that the same number of diaphragm spacers is used as before.

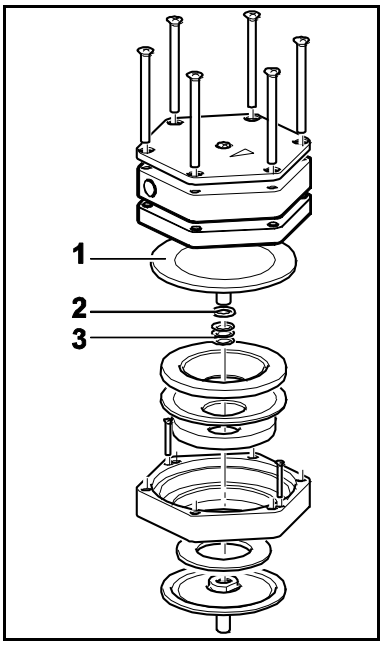


Fig. 22: Changing structured diaphragm

1. For two-headed pumps: Push down one diaphragm until other diaphragm is pushed upwards to its highest position.
2. Carefully unscrew the upper diaphragm (**1**) counter-clockwise using both hands.
3. Replace spacer thick (**2**) and spacers thin (**3**) onto the screw thread of the new diaphragm (same number and order).
4. Screw in the new diaphragm and tighten it by hand.
5. With a two-headed pump: Complete steps 1 through 4 for the second pump head.

Change valve plates/sealings

Replacing the valve plates/sealings of two-headed pumps consecutively.

In version N 842.3 FT.18, three (instead of one) screws must be loosened in the first work step.

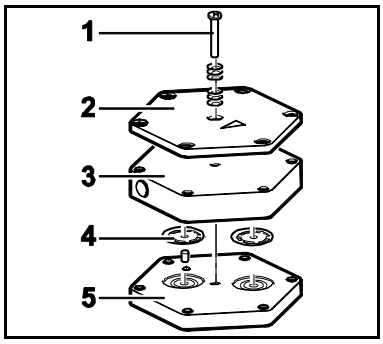


Fig. 23: Changing valve plates/sealings

1. Loosen screw(s) (**1**) in the center of the top plate (**2**). With a two-headed pump: loosen the screw(s) from just one pump head.
2. Remove top plate (**2**) and head plate (**3**) from intermediate plate (**5**).
   Valve plates/sealings are visible.
3. Remove old valve plate/sealings.
4. Clean intermediate plate (**5**) carefully (if there should be deposits in the recesses in the intermediate plate).
5. Insert new valve plates/sealings (**4**) in the recesses in the intermediate plate (**5**).
6. For two-headed pumps: Carry out the steps 1 to 5 for the second pump head.
7. Dispose of the old diaphragm(s) and valve plates/sealings properly.

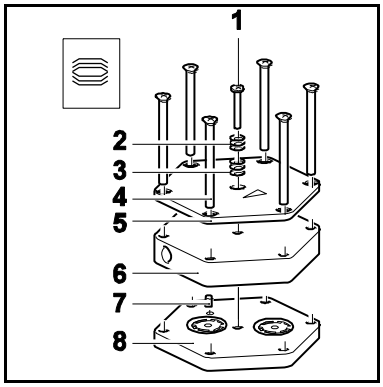


Fig. 24: Refitting pump head

Refitting pump head

1. Apply pressure all around the edge of the diaphragm. With a two-headed pump: Apply pressure to diaphragm on only one pump.
2. Place the intermediate plate (**8**) with valve plates/sealings on the adapter in accordance with the felt-tip pen marking.
3. Place the head plate (**6**) on the intermediate plate (**8**) in the position indicated by the guide pin (**7**).
4. Place the top plate (**5**) on the head plate (**6**) in accordance with the felt-tip pen marking.
5. Gently tighten screws (**4**) in diagonal order.

In version N 842.3 FT.18, three (instead of one) screws must be tightened in the next work step.

6. Insert screw(s) (**1**) with disk springs (**2**, **3**) in the center of the top plate (**5**). In doing so, make sure that the disk springs are arranged properly (see fig. 24).
7. Screw in the screw/screws (**1**) in the centre of the pump top plate (**5**) until it is flush with the top plate (they are flush with the top plate); then screw one final half turn to tighten.
8. For two-headed pumps: Carry out steps 1 to 7 for the second pump head.
9. For two-headed pumps: Refit the pneumatic head connection: Place tube onto the connecting part of the angle fitting, turn angle fitting to a straight position and tighten the union nut.

Final steps

1. Remount the pump to the baseplate (if applicable).
2. Reconnect suction and pressure line to the pump.
3. Reconnect the pump to the electricity supply.

10. Troubleshooting



DANGER

Extreme danger from electrical shock!

➔ Disconnect the pump power supply before working on the pump.

➔ Make sure the pump is de-energized and secure.

➔ Check the pump (see Tab. 26 to 35).

10.1. Pump/System without Vacuum Controller

Pump does not transfer	
Cause	Fault remedy
No voltage in the power source	➔ Check room fuse and switch on if necessary.
Thermal switch has operated following to over-heating.	➔ Disconnect pump from mains. ➔ Allow pump to cool. ➔ Trace cause of over-heating and eliminate it.
Connections or lines blocked.	➔ Check connections and lines. ➔ Remove blockage.
External valve is closed or filter is clogged.	➔ Check external valves and filters.
Condensate has collected in pump head.	➔ Detach the condensate source from the pump. ➔ Flush pump (see chapter 9.2.1, page 37).
Diaphragm or valve plates/ sealings are worn.	➔ Replace diaphragm and valve plates/sealings (see chapter 9.3, page 38).

Tab. 26

Flow rate, pressure or vacuum too low The system/the pump does not achieve the output specified in the Technical data or the data sheet.	
Cause	Fault remedy
Condensate has collected in pump head.	➔ Detach the condensate source from the pump. ➔ Flush pump (see chapter 9.2.1, page 37).
There is gauge pressure on pressure side and at the same time vacuum or a pressure above atmospheric pressure on suction side.	➔ Change the pressure conditions.
Pneumatic lines or connection parts have an insufficient cross section or they are throttled.	➔ Disconnect pump from system to determine output values. ➔ Eliminate throttling (e.g. valve) if necessary. ➔ Use lines or connection parts with larger cross section if necessary.
Leaks occur on connections, lines or pump head.	➔ Check that tubes sit correctly on hose nozzles. ➔ Replace leaky tubes. ➔ Eliminate leaks.
Connections or lines completely or partially jammed.	➔ Check connections and lines. ➔ Remove the jamming parts and particles.
Head parts are soiled.	➔ Clean head components.
Diaphragm or valve plates/sealings are worn.	➔ Replace diaphragm and valve plates/sealings, (see chapter 9.3, page 38).

Flow rate, pressure or vacuum too low The system/the pump does not achieve the output specified in the Technical data or the data sheet.	
Cause	Fault remedy
After diaphragm and valve plates/sealings have been replaced.	➔ Check that the spacers have been replaced onto the diaphragm screw thread. ➔ Check head connection and hose connections. ➔ Possibly carefully tighten the outer screws (fig. 21/**5**, page 39) of the top plate crosswise.

Tab. 27

Pump is switched on, but does not run, the on/off-switch on the pump is not lit	
Cause	Fault remedy
Pump is not connected with the power source.	➔ Connect pump to mains power.
No voltage in the power source	➔ Check room fuse and switch on if necessary.
Fuse in the pump is defective.	➔ Remove pump's mains plug from the socket. ➔ Loosen marked lid on underside of the pump. ➔ Select and replace suitable fuse (see chapter 5.1, page 10).

Tab. 28

Pump is switched on, but does not run, the on/off-switch on the pump is lit	
Cause	Fault remedy
The thermal switch has opened due to overheating.	➔ Remove pump's mains plug from the socket. ➔ Allow pump to cool. ➔ Trace cause of over-heating and eliminate it.

Tab. 29

10.2. System with one Vacuum Controller

i See also chapter 10.1, pump/system without vacuum controller, table 26 and 27.

Sufficient vacuum is not reached	
Cause	Fault remedy
Solid particles in the pump vent valve	➔ Clean pump vent valve.
Condensate in pump head	➔ Let the pumpe run to the ultimate vacuum (Drying Mode, see Operating Manual of Vacuum Controller).

Tab. 30

Vacuum Controller is switched on and set on "Regulation Mode", the desired vacuum level is not reached, pump does not run, the on/off-switch on the pump is not lit	
Cause	Fault remedy
Pump is not switched on.	➔ Switch on pump.
Incorrect electrical connection of controller	➔ Switch off system and separate from power supply. ➔ Check cabling.
Fuse in the pump is defective.	➔ Remove pump's mains plug from the socket. ➔ Loosen marked lid on underside of the pump. ➔ Select and replace suitable fuse (see chapter 5.1, page 10).

Tab. 31

Vacuum Controller is switched on and set on "Regulation Mode", the desired vacum level is not reached, pump does not run, the on/off-switch on the pump is lit	
Cause	Fault remedy
The thermal switch has opened due to overheating.	➔ Remove pump's mains plug from the socket. ➔ Allow pump to cool. ➔ Trace cause of over-heating and eliminate it.

Tab. 32

Vacuum Controller is switched on, no LED-indication	
Cause	Fault remedy
In the electrical supply unit the vacuum controller plug is plugged into the socket for the pump.	➔ Make sure that the vacuum controller's mains plug is plugged into the socket (on the electrical supply unit) for vacuum controllers (see fig. 10, page 26, position 2).
The fuse in the vacuum controller is defective.	➔ Switch off system and separate from power supply. ➔ Select an appropriate fuse (refer to the vacuum controller's operating instructions). ➔ Replace fuse above the circuit closer/circuit breaker.
The fuse in the electrical supply unit is defect.	➔ Switch off system and separate from power supply. ➔ Select suitable fuse (see chapter 5.2, page 17). ➔ Replace fuse on the front side, below the mains connection.

Tab. 33

Vacuum Controller shows unrealistic values	
Cause	Fault remedy
The factory-set pressure equalization has changed.	➔ Contact KNF (see page **Error! Bookmark not defined.**).
Sensor is defective	➔ Contact KNF (see page **Error! Bookmark not defined.**).

Tab. 34

10.3. System with two Vacuum Controllers

See also chapter 10.2, system with one vacuum controller.

System does not work, despite one Vacuum Controller (both controllers) being set on "Regulation Mode"	
Cause	Fault remedy
In the electrical supply unit the connecting wires for the vacuum controllers are plugged in incorrectly.	➔ Exchange the plugs between vacuum controller 1 and vacuum controller 2.
In the electrical supply unit the connecting wires for the vacuum valve are plugged incorrectly.	➔ Exchange the plugs between vacuum valve 1 and vacuum valve 2.

Tab. 35

10.4. Fault cannot be rectified

If you are unable to determine any of the specified causes, send the pump to KNF Customer Service (see page **Error! Bookmark not defined.** for the address).

1. Flush the pump to free the pump head of dangerous or aggressive gases (see chapter 9.2.1, page 37).
2. Remove the pump.
3. Clean the pump (see chapter 9.2.2, page 37).
4. Send the pump to KNF with a filled out decontamination declaration (see chapter 12) and specification of the medium transferred.

11. Ordering Information

11.1. Pumps and Spare Parts

A service set contains:

- 1 diaphragm and 2 valve plates/sealing combination

Note: (.1.2 & .3 style pumps require two kits to be used to renew a twin-head pump)

Pump type	Order-No. Spare Parts Kit Service Set
UN810FTP	072778
UN810.3FTP	072778
UN820FTP	072779
UN820.3FTP	072779
UN820ATP	072779
UN820.3ATP	072779
UN820ANP	073375
UN820.3ANP	073375
UN840FTP	072780
UN840.1.2FTP	072780
UN840.3FTP	072780
UN842.3FTP	072780

Tab. 36

12. Product Return

➔ KNF provides warranty and non-warranty repair services for all products.

➔ A Return Material Authorization (RMA) number is required for all product returns.

- To receive an RMA number, submit a completed Decontamination Declaration form to rma@knf.com

➔ The Decontamination Declaration form can obtained from our website or by contacting KNF Technical Services.

- www.knfusa.com/productreturns
- Phone: 609-890-8600

➔ Product return instructions will be provided when the RMA is issued.

KNF Neuberger, Inc
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Fax 609-890-8323

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