

OPERATING INSTRUCTIONS

EN

Translation of the Original

DRY CHILLER MODULE 90

Sample chiller

Disclaimer of liability

These operating instructions describe all models and variants of your product. Note that your product may not be equipped with all features described in this document. Pfeiffer Vacuum constantly adapts its products to the latest state of the art without prior notice. Please take into account that online operating instructions can deviate from the printed operating instructions supplied with your product.

Furthermore, Pfeiffer Vacuum assumes no responsibility or liability for damage resulting from the use of the product that contradicts its proper use or is explicitly defined as foreseeable misuse.

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We reserve the right to make changes to the technical data and information in this document.

Table of contents

1	About this manual	5
1.1	Validity	5
	1.1.1 Products concerned	5
	1.1.2 Applicable documents	5
1.2	Target group	5
1.3	Conventions	5
	1.3.1 Pictographs	5
	1.3.2 Instructions in the text	5
	1.3.3 Labels	6
	1.3.4 Abbreviations	7
2	Safety	8
2.1	General safety information	8
	2.1.1 Safety instructions	8
	2.1.2 Precautions	10
2.2	Refrigeration unit safeties	10
2.3	Information on the refrigerants	12
2.4	Intended use	12
2.5	Foreseeable misuse	12
3	Transportation and Storage	13
3.1	Product receipt	13
3.2	Handling	13
3.3	Storage	14
4	Product description	15
4.1	Product identification	15
4.2	Scope of delivery	15
4.3	Connection interface	15
5	Installation	16
5.1	Installing the sample chiller	16
5.2	Product description	16
5.3	Connecting thermocouple probes	17
5.4	Connecting the part to be cooled	17
5.5	Connecting the vacuum chamber	18
6	Commissioning	19
6.1	Starting up the sample chiller	19
6.2	Switching off the sample chiller	19
7	Operation	20
7.1	Use conditions	20
7.2	Prerequisites for optimizing use	20
7.3	Conditions for the sample to be chilled	20
7.4	Description of the controller	21
7.5	Temperature calibration	22
7.6	Starting/stopping a cooling cycle	22
7.7	Temperature rise of cooled elements	23
7.8	Defrosting	23
7.9	Cleaning	24
8	Advanced settings	25
8.1	Configuring the setpoint temperature	25
8.2	Temperature control	25
8.3	Setting the temperature unit	26

9	Decommissioning	27
9.1	Shutting down for longer periods	27
9.2	Disposal	27
9.2.1	Restriction of Hazardous Substances (RoHS)	27
9.2.2	Electrical and Electronic Equipment (EEE)	27
10	Malfunctions	29
10.1	What happens in the event of a failure	29
10.2	Troubleshooting guide	29
11	Maintenance	30
11.1	Prerequisites	30
11.2	Removing the refrigeration unit	30
11.3	Cleaning the refrigeration unit	31
11.4	Air filter maintenance	32
12	Service solutions by Pfeiffer Vacuum	33
13	Accessories	35
14	Technical data and dimensions	36
14.1	Technical characteristics	36
14.2	Dimensions	36
	EC Declaration of Conformity	38

1 About this manual



IMPORTANT

Read carefully before use.
Keep the manual for future consultation.

1.1 Validity

These operating instructions are a customer document of Pfeiffer Vacuum. The operating instructions describe the functions of the named product and provide the most important information for the safe use of the device. The description is written in accordance with the valid directives. The information in these operating instructions refers to the product's current development status. The document shall remain valid provided that the customer does not make any changes to the product.

1.1.1 Products concerned

This document applies to products with the following part numbers:

Part Number	Description
805914	Dry Chiller Module 90 (120 VAC - 60 Hz)
805917	Dry Chiller Module 90 (220 VAC - 50 Hz) Dry Chiller Module 90 (230 VAC - 60 Hz)

1.1.2 Applicable documents

Document	Part Number
AMI 1000 Operating instructions	127258 (standard version) 130361 (personalized version)
ASM 2000 Operating instructions	127888
EC Declaration of conformity	Supplied with this manual
UKCA Declaration of conformity	Supplied with this manual

1.2 Target group

This user manual is intended for all persons in charge of transport, installation, commissioning/decommissioning, use, maintenance or storage of the product.

The work described in this document must only be carried out by persons with suitable technical training (specialized staff) or persons who have undergone Pfeiffer Vacuum training.

1.3 Conventions

1.3.1 Pictographs

Pictographs used in the document indicate useful information.



Note



Tip

1.3.2 Instructions in the text

Usage instructions in the document follow a general structure that is complete in itself. The required action is indicated by an individual step or multi-part action steps.

Individual action step

A horizontal, solid triangle indicates the only step in an action.

- ▶ This is an individual action step.

Sequence of multi-part action steps

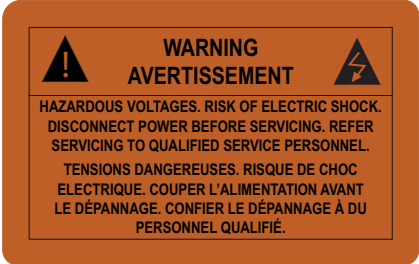



The numerical list indicates an action with multiple necessary steps.

1. Step 1
2. Step 2
3. ...

1.3.3 Labels

COOL	Cooling indicator
POWER	ON/OFF switch
COM PORT	Communication connector

<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">FR AEOF 00165062 - assurance qualité / quality control</div> <div style="border: 1px solid black; padding: 5px;"> PFEIFFER VACUUM CE <small>98 avenue de Brogny F-74000 ANNECY Made in France</small> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 25%;">1 Kg</td> <td style="width: 25%;">2 V</td> <td style="width: 25%;">3 Hz</td> <td style="width: 25%;">4 W</td> </tr> <tr> <td>P/N : 5</td> <td colspan="2"></td> <td>6</td> </tr> <tr> <td>S/N : 7</td> <td colspan="2">8</td> <td></td> </tr> </table>	1 Kg	2 V	3 Hz	4 W	P/N : 5			6	S/N : 7	8			<p>This label guarantees to the user that the product packaging has not been opened since leaving the factory.</p> <p>Rating plate for the sample chiller.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%;">1</td> <td style="width: 70%;">Weight</td> <td style="width: 5%;">5</td> <td style="width: 15%;">Part Number</td> </tr> <tr> <td>2</td> <td>Use voltage</td> <td>6</td> <td>Designation</td> </tr> <tr> <td>3</td> <td>Use frequency</td> <td>7</td> <td>Serial number</td> </tr> <tr> <td>4</td> <td>Maximum power consumption</td> <td>8</td> <td>Date of manufacture</td> </tr> </table>	1	Weight	5	Part Number	2	Use voltage	6	Designation	3	Use frequency	7	Serial number	4	Maximum power consumption	8	Date of manufacture														
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	<p>This label indicates that some of the internal parts are electrically live and could cause electrical shock in case of contact.</p> <ul style="list-style-type: none"> • Disconnect the main power supply cable from the product before servicing the product. • Product maintenance must be carried out by Pfeiffer Vacuum-trained personnel.
	<p>This label indicates danger from handling and exposure to elements at very low temperatures.</p> <ul style="list-style-type: none"> • Wait until the cooled items are at room temperature before handling them.
	<p>This label indicates danger following the handling of heavy loads.</p>
	<p>This label indicates a risk of crushing the hand following the handling of heavy items.</p>

1.3.4 Abbreviations

LTM	Low temperature module
NFPA	National fire protection association
OSHA	Occupational safety and health administration
GWP	Global warning potential
HFC	Hydrofluorocarbon
PID	Proportional integral derivative
NIST	National institute of standards and technology

2 Safety

2.1 General safety information

The following 4 risk levels and 1 information level are taken into account in this document.

⚠ DANGER
<p>Immediately pending danger</p> <p>Indicates an immediately pending danger that will result in death or serious injury if not observed.</p> <ul style="list-style-type: none"> ▶ Instructions to avoid the danger situation

⚠ WARNING
<p>Potential pending danger</p> <p>Indicates a pending danger that could result in death or serious injury if not observed.</p> <ul style="list-style-type: none"> ▶ Instructions to avoid the danger situation

⚠ CAUTION
<p>Potential pending danger</p> <p>Indicates a pending danger that could result in minor injuries if not observed.</p> <ul style="list-style-type: none"> ▶ Instructions to avoid the danger situation

NOTICE
<p>Danger of damage to property</p> <p>Is used to highlight actions that are not associated with personal injury.</p> <ul style="list-style-type: none"> ▶ Instructions to avoid damage to property

i	<p>Notes, tips or examples indicate important information about the product or about this document.</p>
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2.1.1 Safety instructions

All safety instructions in this document are based on the results of the risk assessment carried out in accordance with Low-Voltage Directive 2014/35/EU regarding electrical safety, as well as the instructions of the refrigeration unit manufacturer.

Where applicable, all life cycle phases of the product were taken into account.

⚠ WARNING
<p>Risk of electric shock due to non-compliant electrical installations</p> <p>This product uses mains voltage for its electrical supply. Non-compliant electrical installations or installations not done to professional standards may endanger the user's life.</p> <ul style="list-style-type: none"> ▶ Only qualified technicians trained in the relevant electrical safety and EMC regulations are authorized to work on the electrical installation. ▶ This product must not be modified or converted arbitrarily.

⚠ WARNING
<p>Electric shock hazard</p> <p>Voltage and current can cause electric shock.</p> <p>Only skilled, authorized people may carry out maintenance work.</p> <ul style="list-style-type: none"> ▶ Insulate and lock the power supply circuit by positioning the circuit breaker on O. ▶ Disconnect the power supply cable from all power sources before working on the product and/or removing the covers.

⚠ WARNING**Risk of electric shock in case of contact with products that are not electrically isolated**

When powering off _mains switch to O_, certain components located between the mains connection and the circuit breaker will still contain an electric charge (live). There is a risk of electric shock in case of contact.

- ▶ Make sure that the mains connection is always visible and accessible so that it can be unplugged at any time.
- ▶ Disconnect the mains cable from the electrical network before working on the product.
- ▶ Wait for the control panel screen to turn off completely before working on the product and/or removing the cover(s).

⚠ WARNING**Risk of serious injury due to falling objects**

When transporting parts/items by hand, there is a danger of loads slipping and falling down.

- ▶ Carry small and medium-size parts/items with two hands.
- ▶ Wear safety shoes with steel toe according to directive EN 347.

⚠ WARNING**Risk of burns in case of contact with cold surfaces**

The cold probe and any liquid or solid item in contact with the cold probe can reach extremely low temperatures ($> -100^{\circ}\text{C}$ (-148°F)).

- ▶ Wait until it has completely warmed up before working on the product.
- ▶ Protective gloves must be worn in accordance with standard EN ISO 21420.

⚠ CAUTION**Risk of crushing related to product tilting**

Although the product fully complies with the EU safety regulations, there is a risk of tilting when it is not properly installed or used.

- ▶ Place the product on a flat, hard floor.
- ▶ Do not place the product on a slope: because of its weight, it will drag the operator with it.
- ▶ Use the product brakes to immobilize it during use (product powered on).
- ▶ Keep the product on its 4 wheels.
- ▶ Only use the casters for moving the equipment over short distances.
- ▶ Do not leave anything pressing against the product.
- ▶ Do not press on the sides of the product.
- ▶ Do not push the product sideways.

⚠ CAUTION**Risk of the product tilting during unpacking/packing**

The transport pallet for the sample chiller packaging is equipped with an access ramp.

Product should be removed from its packaging only by personnel qualified and trained in handling heavy materials.

- ▶ Ensure a space equivalent to the length of the sample chiller is free in alignment with the access ramp.
- ▶ Do not hold the sample chiller by the cold probe, or the vacuum chamber (if applicable), to steer or brake it on the access ramp.

⚠ CAUTION**Risk of pinching fingers**

Occasionally, it may be necessary to remove the cover(s) during a maintenance operation.

- ▶ Keep hands away from the sides while handling the cover(s).

2.1.2 Precautions



Duty to provide information on potential dangers

The product holder or user is obliged to make all operating personnel aware of dangers posed by this product.

Every person who is involved in the installation, operation or maintenance of the product must read, understand and adhere to the safety-related parts of this document.



Obligation to provide personal protective equipment

The operators or employers are obliged to provide the user of the product with the necessary personal protective equipment (PPE).

Persons responsible for installing, operating and repairing the product must wear PPE for safety.



Infringement of conformity due to modifications to the product

The Declaration of Conformity from the manufacturer is no longer valid if the operator changes the original product or installs additional equipment.

- Following the installation into a system, the operator is required to check and re-evaluate the conformity of the overall system in the context of the relevant European Directives, before commissioning that system.



Installation and use of the accessories

The products can be fitted with special accessories.

The installation, use and refurbishment of the connected accessories are described in detail in the respective operating instructions.

- Only use original accessories.
- Accessory part numbers (see chapter "Accessories").

Only qualified personnel trained in safety regulations (EMC, electrical safety, chemical pollution) are authorized to carry out the installation and maintenance described in this manual. Our service centers can provide the necessary training.

- ▶ Follow the safety and accident prevention requirements.
- ▶ Regularly check compliance with all precautionary measurements.
- ▶ Do not turn on the product if the cover is not in place.
- ▶ Do not move the product while it is in use (product powered on).
- ▶ Use the product brakes to immobilize it during use (product powered on).

2.2 Refrigeration unit safeties

Refrigerant types and properties

The refrigeration unit is equipped with a cascade refrigeration system consisting of 2 separate compressors which use 3 separate refrigerants. The gases used for each stage, as well as their quantity, are indicated on the sample chiller nameplate.

The risk assessment linked to the use of these gases is set out in the following table.

	Properties	R1270 (Propylene)	R290 (Propane)	R1150 (Ethylene)
Assessment by the National Fire Protection Association (NFPA)	Health	Risk level: 1 Following exposure, irritation with only minor residual injury	Risk level: 2 Intense or continuous, but not chronic, exposure may result in temporary disability or possible residual injury.	Risk level: 1 Following exposure, irritation with only minor residual injury
	Flammability	Risk level: 4 Rapid or complete evaporation at atmospheric pressure and normal temperature Easy dispersion in air and easy combustion	Risk level: 4 Rapid or complete evaporation at atmospheric pressure and normal temperature Easy dispersion in air and easy combustion	Risk level: 4 Rapid or complete evaporation at atmospheric pressure and normal temperature Easy dispersion in air and easy combustion
	Instability	Risk level: 0 Normally stable, even when exposed to fire Not reactive with water	Risk level: 0 Normally stable, even when exposed to fire Not reactive with water	Risk level: 2 Violent chemical reaction at high temperatures and pressures Violent reaction with water Formation of explosive mixtures with water
	Special	-	-	-
Additional information	Health	This product is a gas at normal temperature and pressure, and in ultra-low quantities. This makes inhalation or ingestion very unlikely. No damage is expected if the gas makes contact with the skin and eyes. However, liquefied gas can cause frostbite.		
	Personal safety information	When handling cylinders, wear gloves and OSHA-approved eye and foot protection.		
	Inhalation	Asphyxia: effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitement, excessive salivation, vomiting and loss of consciousness. Lack of oxygen can kill.		

Maximum risk level: 4

Refrigeration unit

The refrigeration unit compressors are equipped with two safety devices for protection against low voltages or high temperatures.

- If the voltage drops below the voltage needed for the compressor to operate, an overcurrent device turns off the compressor.
- If the compressor temperature rises too much due to insufficient air cooling, a high temperature thermostat turns off the compressor.

High compressor temperature may be caused by blocked air flow or a malfunctioning fan motor.

The compressor starts automatically when the condition is corrected, but turns off again if the voltage is too low or the temperature is too high.

WARNING

Risk of damage to the refrigeration unit

Using the sample chiller despite the recurring loss of performance may result in chiller failure.

1. Turn off the sample chiller if it repeatedly loses performance.
2. Investigate the cause of the recurring loss of performance and resolve it before turning the sample chiller back on.

2.3 Information on the refrigerants

European regulation on fluorinated gases (517/2014)

The refrigeration unit uses hydrofluorocarbon (HFC) refrigerants and foaming agents.

The importation and use of these HFC refrigerants within the European Union (EU) is regulated by the EU F-Gas Regulation (517/2014).

All refrigeration units containing HFCs are labeled (see chapter "Labels").

The F-Gas label indicates:

- the type of HFC refrigerants used
- the quantity of HFC refrigerants expressed in weight (kg)
- the global warming potential (GWP) of HFC refrigerants
- the total CO₂ equivalent (CO₂e) of the HFC refrigerants contained in the refrigeration unit.

The following F-Gas information corresponds to the refrigeration unit integrated into the sample chiller. This information also appears on the F-Gas label on the refrigeration unit.

Gas	F-Gas	Load (kg)	GWP	Total CO ₂ e (tonne)
Gas#1	R1270	0.032	5.0	0.000
Gas#2	R290	0.006	3.3	
Gas#3	R1150	0.033	3.7	

EU general compliance guidelines: Leak prevention and verification

Any equipment with less than 5 tonnes of CO₂e (non-sealed) or 10 tonnes of CO₂e (in hermetically sealed systems (see note below)) is exempt from leak testing under EU F-Gas regulation as of January 1, 2017.



'Hermetically sealed system' means equipment in which all parts containing fluorinated greenhouse gases are sealed by welding, brazing or a similar permanent connection, which may include capped valves or capped service ports that allow for correct repair or disposal, and which have a leak rate of less than 3 g/year under a pressure of at least one quarter of the maximum permissible pressure.

Service

Any operation requiring intervention in the refrigeration circuit must be carried out by a Pfeiffer Vacuum service center

2.4 Intended use

The Dry Chiller Module 90 sample chiller is intended for cooling samples placed in a vacuum chamber.

The Dry Chiller Module 90 sample chiller achieves its maximum efficiency when used in combination with a vacuum chamber.

The product may be used in an industrial environment.

2.5 Foreseeable misuse

Misuse of the product will render the warranty and any claims void. Any use, whether intended or not, that diverges from the uses already mentioned will be treated as non-compliant; this includes but is not limited to:

- launching a cooling cycle without cleaning and defrosting the cold probe and/or element in contact with the cold probe.
- the use of accessories which are not named in this manual
- operating the module in potentially explosive areas
- bringing the cold probe into contact with corrosive products.

This cart is not designed to support heavy loads and should not be used to transport heavy loads or people, nor used as a seat or stepladder, or for any other similar use.

3 Transportation and Storage

3.1 Product receipt



Condition of the delivery

- Check that the product has not been damaged during transport.
- If the product is damaged, take the necessary measures with the carrier **and** notify the manufacturer.

- ▶ Keep the product in its original packaging so it stays as clean as it was when dispatched by us: only unpack the product once it has arrived at the location where it will be used.
- ▶ Keep the blank-off flange on the inlet port (inlet) when the product is not in use.



Keep the packaging (recyclable materials) in case the product needs to be transported or stored.

3.2 Handling

WARNING

Risk of crushing during product handling

Given the weight of the product, there is a risk of crushing during handling operations. Under no circumstances shall the manufacturer be liable if the following instructions are not followed:

- ▶ Only qualified staff trained in handling heavy objects are authorized to handle the product.
- ▶ The lifting devices provided **must be used** for the product and the procedures set out in this document must be followed.

WARNING

Risk of crushing related to product tilting

Although the product fully complies with the EU safety regulations, there is a risk of tilting when it is moved over the floor or is not properly secured or used.

- ▶ Do not place the product on a plane with an incline greater than 3° (or 6%): its weight could cause the operator to be dragged.
- ▶ Place the product on a flat, hard floor.
- ▶ Use the wheels to move the product.
- ▶ Do not push the product sideways.
- ▶ Do not press on the sides of the product.
- ▶ Do not leave anything pressing against the product.

CAUTION

Risk of crushing related to product tilting

Although the product fully complies with the EU safety regulations, there is a risk of tilting when it is not properly installed or used.

- ▶ Place the product on a flat, hard floor.
- ▶ Do not place the product on a slope: because of its weight, it will drag the operator with it.
- ▶ Use the product brakes to immobilize it during use (product powered on).
- ▶ Keep the product on its 4 wheels.
- ▶ Only use the casters for moving the equipment over short distances.
- ▶ Do not leave anything pressing against the product.
- ▶ Do not press on the sides of the product.
- ▶ Do not push the product sideways.

⚠ CAUTION

Risk of injury due to heavy loads

The weight of the equipment may injure the user if it is handled incorrectly and is therefore hazardous to health.

The sample chiller must be immobilized when it is being used or maintained.

- ▶ Engage the brakes to immobilize it.
- ▶ Do not hold the sample chiller by the cold probe, or the vacuum chamber (if applicable), to move it.
- ▶ The manufacturer cannot be held liable for the consequences of using other handling equipment.

NOTICE

Damage to the equipment if the sample chiller is handled while switched on

If it is necessary to move or work on the product, the user must first make sure that the sample chiller is fully shut down, otherwise there is a risk of damage to some of the components. When the main switch/circuit breaker is set to **O**:

- ▶ Unplug the power cable.
- ▶ Wait 5 minutes after power-off before working on the product and/or removing the cover(s).

NOTICE

Damage to the refrigeration unit of the sample chiller

Sudden shaking or dropping the sample chiller may damage the refrigeration unit.

- ▶ Transport the sample chiller with care.
- ▶ Always store, move and use the sample chiller and refrigeration unit in an upright position.

3.3 Storage



Pfeiffer Vacuum recommends storing the products in their original transport packaging.

⚠ CAUTION

Risk of damage to the refrigeration unit

If the refrigeration unit is not stored vertically, the balance of heat transfer fluid pressures may be disrupted. The oil contained in the compressor may move.

- ▶ Always store, move and use the sample chiller and refrigeration unit in an upright position.
- ▶ If the sample chiller or refrigeration unit has been stored in a horizontal position, leave it in a vertical position for at least 24 hours before turning it on.

Storing a new product

- ▶ Leave the product in its packaging.
- ▶ Store the module in a clean and dry environment according to the permitted temperature conditions (see chapter “Technical data”).
- ▶ Beyond 3 months, factors such as temperature, humidity, salt in the air, etc. could damage some components (elastomers, lubricants, etc.). If this happens, contact your service center.

Extended storage

- ▶ Beyond 3 months, factors such as temperature, humidity, salt in the air, etc. could damage some components (elastomers, lubricants, etc.). If this happens, contact your service center.
- ▶ The sample chiller does not control the defrosting of the cold probe and the elements in contact with it. Defrosting must be carried out by the operator.

The sample chiller must be defrosted (see chapter “Defrosting”) and cleaned (see chapter “Cleaning”) before storage.

4 Product description

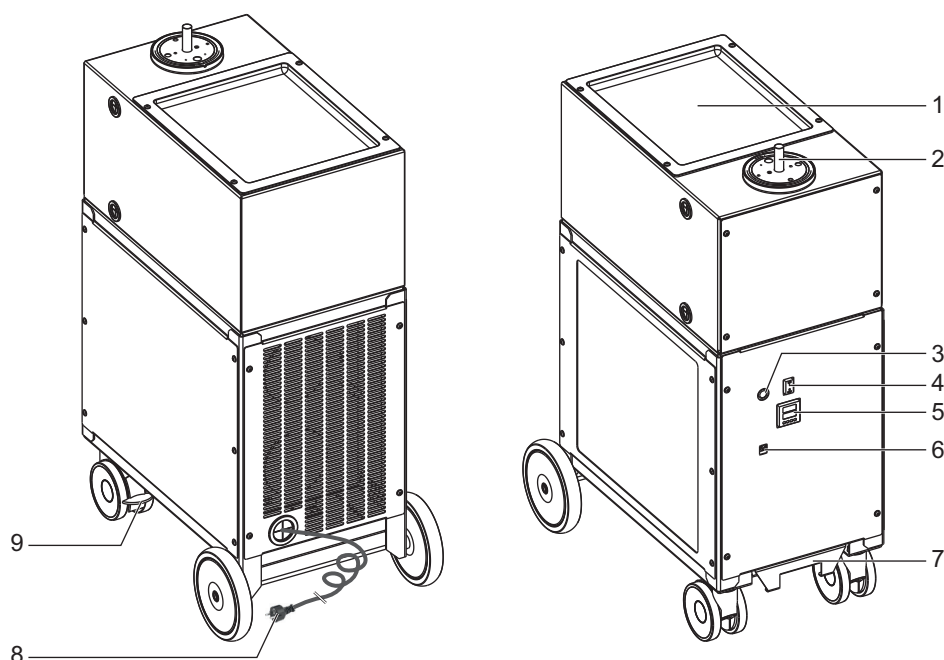
4.1 Product identification

To correctly identify the product when communicating with our service center, always have the information from the product rating plate available (see chapter "Labels").

4.2 Scope of delivery

- 1 sample chiller
- 1 operating instructions
- 1 main power supply cable for Europe (France/Germany) and/or 1 power cable for US
- 1 protective cover for the test chamber

4.3 Connection interface



- 1 Tray
- 2 Cold probe
- 3 Cooling indicator (**COOL**) (green if cooling in progress)
- 4 ON/OFF switch (**POWER**)
- 5 Process temperature controller

- 6 Communication connector (**COM PORT**)
- 7 Refrigeration unit access handle
- 8 Power supply cable
- 9 Brakes

5 Installation

5.1 Installing the sample chiller

NOTICE

Ventilating the sample chiller

The sample chiller can generate up to 1 kW of heat.

In cases of poor ventilation, there is a risk that the heat could damage the sample chiller's internal components.

- ▶ Comply with the ambient operating temperature (see chapter "Technical characteristics").
- ▶ Ensure that the ambient operating temperature is maintained during use.
- ▶ Do not obstruct the ventilation grids.
- ▶ Ventilation grids should be cleaned regularly.
- ▶ Leave a free space of at least 11 cm around the sample chiller.
- ▶ Do not store anything under the sample chiller.

CAUTION

Risk of crushing related to product tilting

Although the product fully complies with the EU safety regulations, there is a risk of tilting when it is not properly installed or used.

- ▶ Place the product on a flat, hard floor.
- ▶ Do not place the product on a slope: because of its weight, it will drag the operator with it.
- ▶ Use the product brakes to immobilize it during use (product powered on).
- ▶ Keep the product on its 4 wheels.
- ▶ Only use the casters for moving the equipment over short distances.
- ▶ Do not leave anything pressing against the product.
- ▶ Do not press on the sides of the product.
- ▶ Do not push the product sideways.

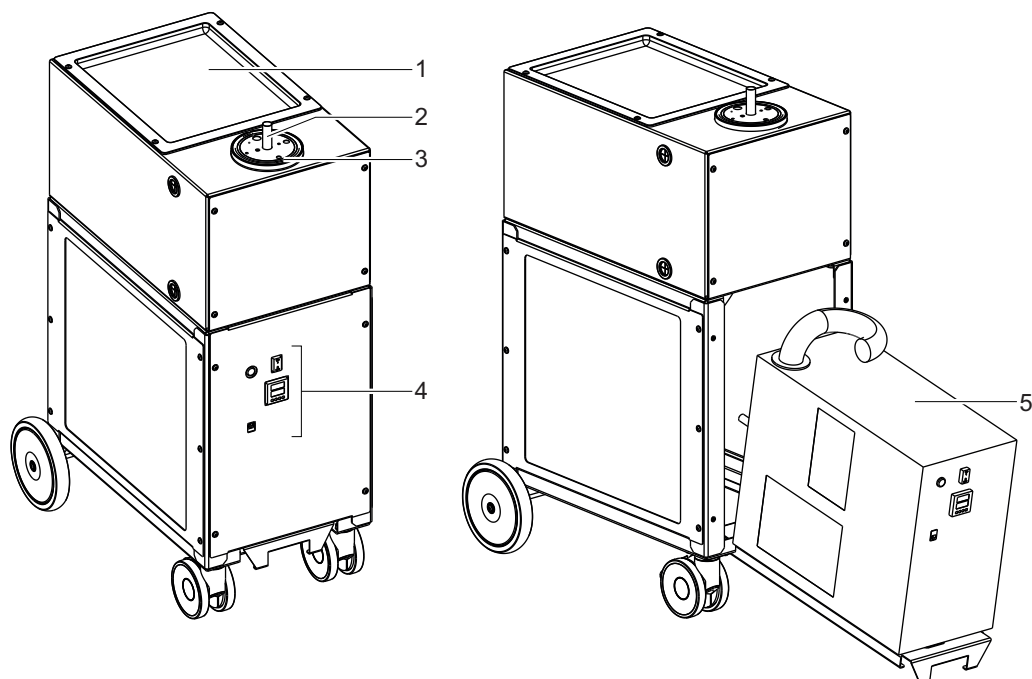
- Environmental conditions: see chapter "Technical characteristics"
- The inlet pressure must be no higher than atmospheric pressure. Pressure that is too high can damage the refrigeration unit.
- The sample chiller's performance depends on the type of accessories used.
- Comply with these recommendations to optimize the cooling cycle (see chapter "Pre-requisites for optimizing use").
- The total weight of the part to be cooled and the elements in contact with the cold probe must not exceed 1 kg.
- ▶ Select the location for installation according to the dimensions of the sample chiller (see chapter "Dimensions").
- ▶ Do not hold the sample chiller by the cold probe, or the vacuum chamber (if applicable), to move it (see chapter "Handling").
- ▶ The sample chiller must be installed on a flat, horizontal surface, resting on its casters.
- ▶ Ensure that the cycling area is not polluted by high concentrations of salts or sulfur (ventilated room).

5.2 Product description

The Dry Chiller Module 90 is a sample chiller. It consists of a refrigeration unit, placed in a cart. It is directly connected to a cold probe. This cold probe is then brought into contact:

- either directly with an element to be cooled (i.e. a sample)
- or with an element to be cooled via the use of an intermediate heat transfer element (at the customer's expense) in which the element to be cooled is placed.

The Dry Chiller Module 90 is regulated in tandem with a heating cartridge placed in contact with the elements to be cooled.



- | | |
|-------------------------|--------------------------------|
| 1 Tray | 4 Refrigeration unit interface |
| 2 Cold probe | 5 Refrigeration unit |
| 3 Bottom of the chamber | |

5.3 Connecting thermocouple probes



The sample chiller is an independent cooling system.
It can be coupled with leak testing equipment (at the customer's expense).

The sample chiller can accommodate up to 4 Type K thermocouple probes.

The connection for the 'process' probe of the sample chiller is located on the bottom of the chamber. The female connector is identified with a yellow color and is numbered '1'.

'Process' thermocouple probe

The sample chiller is controlled by the measurement of a temperature probe called a 'process probe'.

The thermocouple probe, called the 'process' probe, is used to regulate the temperature of the refrigeration unit: it is essential for the sample chiller's operation.

A thermocouple wire, coming directly from the refrigeration unit, is connected to the 'process' thermocouple socket. This 'process' thermocouple socket is yellow. It is mandatory to place the 'process' probe directly in contact with an element to be cooled or in an intermediate heat transfer element (at the customer's expense) in order for regulation to be effective.

The 'process' probe must be connected before starting a cooling cycle.

In the absence of the 'process' probe, the refrigeration unit faults and does not operate.

If the 'process' probe is no longer connected during the cooling cycle, the chiller immediately goes into fault and stops all cooling until the 'process' probe is connected again.

If the 'process' probe is not in contact with the element to be cooled or the cold probe, the refrigeration unit cools to its maximum capacity. The elements in contact with the cold probe are therefore cooled beyond the requested temperature.

5.4 Connecting the part to be cooled

The maximum weight allowed on the sample chiller tray is 5 kg.

The total weight of the part to be cooled and the elements in contact with the cold probe must not exceed 1 kg.

5.5 Connecting the vacuum chamber

The vacuum chamber is an accessory that the customer must pay for.

The vacuum chamber is customized for each application. Contact the manufacturer to create a vacuum chamber.

To achieve the lowest temperatures, the elements to be cooled as well as the cold probe of the refrigeration unit can be placed in a vacuum chamber.

The total weight of the part to be cooled and the elements in contact with the cold probe must not exceed 1 kg.

6 Commissioning

6.1 Starting up the sample chiller

WARNING

Risk of damage to the compressor

Due to the nature of the refrigeration unit and its compressor, the sample chiller should never be re-started immediately after being powered down.

- ▶ Wait ≈ 5 min between powering off and restarting the sample chiller.

1. Install the 'process' probe (see chapter “Connecting thermocouple probes”).
2. Connect the main power supply cable.
3. Position the mains switch to **I**.
4. The current temperature of the 'process' probe and the setpoint temperature are displayed on the controller. The setpoint temperature can be modified immediately.
5. After a preheating period (5–10 min), the cooling indicator (**COOL**) is lit (green light): cooling begins. A cooling cycle can be started

6.2 Switching off the sample chiller

WARNING

Risk of damage to the compressor

Due to the nature of the refrigeration unit and its compressor, the sample chiller should never be re-started immediately after being powered down.

- ▶ Wait ≈ 5 min between powering off and restarting the sample chiller.

1. Position the mains switch to **O**.
 - Cooling stops.
 - The controller no longer displays the values.
2. Disconnect the mains power cable.
3. Defrost the cold probe and the elements in contact with the cold probe (see chapter “Defrosting”).

Pump stop due to power failure

When a power outage occurs, the sample chiller does not switch off.

1. Position the mains switch to **O**.
2. Wait ≈ 5 minutes.
3. Position the mains switch to **I**.

7 Operation

7.1 Use conditions

⚠ CAUTION

Risk of significant damage to the refrigeration unit

Using a damaged refrigeration unit may result in the deterioration of the refrigeration unit.

- ▶ Never use a damaged sample chiller, whether there is visible deterioration of the chiller or damage to the cold probe.
- ▶ Never use a sample chiller if the refrigeration unit has a leak, which will cause a significant reduction in its performance.

NOTICE

Ventilating the sample chiller

The sample chiller can generate up to 1 kW of heat.

In cases of poor ventilation, there is a risk of deterioration of the refrigeration unit's internal components by heating.

- ▶ Comply with the ambient operating temperature (see chapter "Technical characteristics").
- ▶ Ensure that the ambient operating temperature is maintained during use.
- ▶ Do not block the ventilation grilles of the sample chiller.
- ▶ Ventilation grids should be cleaned regularly.
- ▶ Leave a free space of at least 11 cm around the sample chiller.
- ▶ Do not store anything under the sample chiller.

Environmental conditions: see chapter "Technical characteristics".

7.2 Prerequisites for optimizing use

To optimize the use of the sample chiller:

- ▶ Ensure that the atmosphere in the cycling area is not saturated with salt or sulfur.
- ▶ No fault message should be displayed on the refrigeration unit controller.
- ▶ Calibrate the sample chiller (see chapter "Calibration"). The refrigeration unit's 'process' temperature measurement system was calibrated with the 'process' probe supplied with the sample chiller. If the 'process' probe is changed, the measuring system must be recalibrated by comparing it to a certified measuring system.

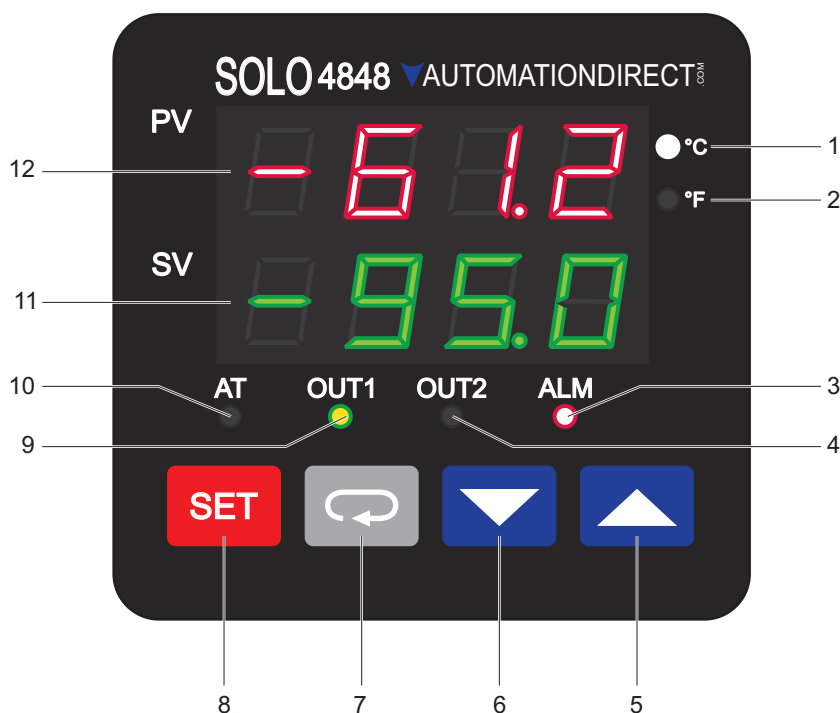
Before each switched on:

- ▶ Become familiar with the safety instructions.
- ▶ Check that all the connections are correct.

7.3 Conditions for the sample to be chilled

The samples to be chilled must be clean, dry, and have no labels.

7.4 Description of the controller



1	Selected °C temperature unit indicator (°C)
2	Selected °F temperature unit indicator (°F)
3	Alarm status indicator light (ALM)
4	Output 2 status indicator (OUT2)
5	Setting button to increase a value [UP]
6	Setting button to decrease a value [DOWN]
7	Navigation button in the [ROTATE] menu
8	Button for validating a setting and navigation [SET]
9	Output 1 status indicator (OUT1)
10	Status indicator for the 'Auto adjustment' function (AT)
11	Process value reject point (SV)
12	'Process' value (PV)

PV	The 'process' value indicates the current temperature at the cold probe.
SV	The setpoint temperature indicates the configured temperature setpoint.
[SET]	The [SET] button: <ul style="list-style-type: none"> confirms the set value: short press on the [SET] button accesses the advanced settings: press and hold the [SET] button for 3 seconds
[ROTATION]	The [ROTATION] button lets you navigate through the menus of the selected mode of use.
[UP] / [DOWN]	Setting button to decrease or increase a value The [UP] / [DOWN] buttons can increase/decrease the process value displayed (SV). Pressing and holding this button accelerates the rate at which increasing/decreasing increments are displayed.
AT	The status indicator flashes when the 'Automatic adjustment' function is enabled (flashing green LED). This function is not used in sample chiller operation.
OUT1 / OUT2	The status indicator lights up when the respective output (1/2) is enabled (green LED).

ALM	The status indicator lights up when an alarm is activated (red LED).
°C / °F	Selected temperature unit indicator The temperature unit indicator indicates whether the controller displays the temperature in degrees Celsius (°C) or degrees Fahrenheit (°F). To change the temperature display unit, see chapter "Setting the temperature unit".

7.5 Temperature calibration



The refrigeration unit's 'process' temperature measurement system was calibrated with the 'process' probe supplied with the sample chiller. If the 'process' probe is changed, the 'process' temperature must be recalibrated by comparing it to a measurement carried out via an independent and certified measuring element.

Calibration of the 'process' temperature optimizes the precision of the system. It is carried out in the factory using a traceable NIST-certified measuring instrument.

The calibration is linked to the refrigeration unit and the 'process' probe. It must be performed again in the following cases:

- when changing the 'process' probe
- when changing the refrigeration unit
- where zero drift appears over time due to component aging.

The 'process' temperature is calibrated directly on the controller of the sample chiller's refrigeration unit.

Equipment needed

To recalibrate the "process' probe/refrigeration unit' system, an independent measuring instrument with a reference probe is required to compare the actual readings to the readings displayed on the controller.

Dry Chiller Module 90 calibration procedure

1. Check that the 'process' probe is correctly connected to the sample chiller.
2. Check that the 'process' probe is in contact with the cooled element (if necessary, use thermal paste).
3. Place a certified sensor (with independent measuring instrument) or a thermometer in the same cooled element as the 'process' probe (as close as possible to the 'process' probe).
4. Adjust the setpoint temperature to -80°C (-112°F) with the controller (or other required temperature).
5. Allow the temperature of the refrigeration unit to stabilize (≈ 10 minutes after reaching the setpoint temperature).
6. If the controller is locked, press the controller's **[SET]** and **[ROTATE]** buttons simultaneously to unlock it.
7. Press the **[SET]** button to confirm the setting.
8. Press the **[ROTATE]** button until the menu for adjusting the 'process' probe offset (**tPoF** menu) is displayed.
9. Match the temperature displayed on the controller to the value displayed on the certified temperature indicator by adjusting the 'process' probe offset.
 - Use the **[DOWN]** and **[UP]** buttons to adjust the value.
10. Press the **[ROTATE]** button until the Loc adjustment menu (**Loc** menu) is displayed.
11. Use the **[DOWN]** and **[UP]** buttons until the Loc2 adjustment menu (**Loc2** menu) is displayed.
12. Press the **[SET]** button to accept and lock the controller.

7.6 Starting/stopping a cooling cycle

WARNING

Risk of burns in case of contact with cold surfaces

The cold probe and any liquid or solid item in contact with the cold probe can reach extremely low temperatures (> -100°C (-148°F)).

- ▶ Wait until it has completely warmed up before working on the product.
- ▶ Protective gloves must be worn in accordance with standard EN ISO 21420.

Prerequisite

- Prepare the sample to be cooled (see chapter “Connecting the part to be cooled”).
1. Switch on the sample chiller (see chapter “Starting the chiller”).
 - After a preheating period (5–10 min), the cooling indicator (**COOL**) is lit (green light): cooling begins.
 2. Set the setpoint temperature if necessary (see chapter “Setting the setpoint temperature”).
 - At start-up, the cold probe temperature (PV) and the set setpoint temperature (SV) are displayed on the controller.
 3. Once the temperature cycle is completed, carry out defrosting (see chapter “Defrosting”).
 4. Clean the cold probe and the elements in contact with the cold probe (see chapter “Cleaning”).

7.7 Temperature rise of cooled elements

The sample chiller is equipped with a heating cartridge that enables the temperature of the cooled elements to rise. It is thus possible to accelerate their rise in temperature.

In order to avoid the formation of frost when raising the temperature of the cooled elements, it is necessary to carry out this rise under vacuum.

WARNING

Risk of thermal burn

At low temperatures, the cold probe can cause burns.

Before any manipulation:

1. Wait for the temperature of the cooled elements to finish rising: temperature above 10°C (50°F).
2. Turn off the sample chiller.

7.8 Defrosting

If the temperature rise occurs at atmospheric pressure, frost may form on the surface of the cooled elements.

Defrosting must be carried out by the operator.

Defrosting the cold probe and the elements in contact with the cold probe must be carried out:

- when switching off the sample chiller
- after each sample cooling cycle.

WARNING

Risk of damage to the compressor

Due to the nature of the refrigeration unit and its compressor, the sample chiller should never be restarted immediately after being powered down.

- ▶ Wait ≈ 5 min between powering off and restarting the sample chiller.

WARNING

Risk of burns in case of contact with cold surfaces

The cold probe and any liquid or solid item in contact with the cold probe can reach extremely low temperatures (> -100°C (-148°F)).

- ▶ Wait until it has completely warmed up before working on the product.
- ▶ Protective gloves must be worn in accordance with standard EN ISO 21420.

Best practice

The following indications are directions for use to avoid damage to the cold probe.

The sample chiller must be turned off during defrosting (see chapter “Switching off the cooler”).

It is possible to let the sample chiller rise to temperature without intervention.

- ▶ Wait until the temperature of the elements in contact with the cold probe is above 10°C.
- ▶ Do not move the cold probe or the cord which connects it to the cold unit until it is defrosted.
- ▶ Do not carry out any maintenance operations until the cold probe is defrosted

7.9 Cleaning

WARNING

Risk of burns in case of contact with cold surfaces

The cold probe and any liquid or solid item in contact with the cold probe can reach extremely low temperatures ($> -100^{\circ}\text{C}$ (-148°F)).

- ▶ Wait until it has completely warmed up before working on the product.
- ▶ Protective gloves must be worn in accordance with standard EN ISO 21420.

The cold probe and the elements in contact with the cold probe must be cleaned after defrosting (see chapter "Defrosting").

Procedure

1. Carefully clean the cold probe and the elements in contact with the cold probe.
 - If necessary, remove all traces of thermal paste with alcohol.
2. If there are drips or condensation on the various elements of the sample chiller, dry them with a dry, clean, lint-free cloth.
3. Carefully dry the cold probe and the elements in contact with the cold probe.
 - Blow ambient air.
 - Blow hot air at a maximum temperature of 30°C (86°F).

8 Advanced settings



This chapter describes the available functions and how they work. This chapter helps the user and/or the integrator to configure the pump parameters according to the requirements during the process.

8.1 Configuring the setpoint temperature

Prerequisite

See chapter “Starting up the chiller”

At start-up, the cold probe temperature (PV) and the set setpoint temperature (SV) are displayed on the controller.

‘PID’ mode

‘PID’ mode is the sample chiller’s default mode.

It corresponds to the manual temperature adjustment mode using the controller interface attached to the front panel of the sample chiller.

1. Set the setpoint temperature using the **[UP]** and **[DOWN]** buttons on the controller.
2. Press the **[SET]** button to confirm the setting.
 - The setpoint temperature is now defined.

The regulator uses the regulation profile defined by the parameters of its PID (configuration made by the manufacturer).

SOLO configuration software

The manufacturer of the sample chiller’s refrigeration unit controller makes the ‘SOLO configuration software’ software available on its site: <http://support.automationdirect.com/downloads.html>.

This software enables you to configure the refrigeration unit controller without using the controller interface attached to the front panel of the sample chiller.

This software provides access to parameters which when modified, can impact the performance of the refrigeration unit.

This software may not be validated by the sample chiller manufacturer.

8.2 Temperature control

Temperature-controlled operation

Temperature control is by a PID microprocessor controller.



Conversion formulas

- $^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$
- $^{\circ}\text{F} = (^{\circ}\text{C} \times 1.8) + 32$

		Setting limit
PV	Read only The 'process' value indicates the regulation temperature ('process' probe).	-
SV	To be set The setpoint temperature (set value) is the target cooling temperature at which the refrigeration unit regulates. Do not set the temperature above 20°C (68°F): if this is the case, the desired setpoint cannot be achieved.	-99.5 – +20°C (-146.2 – +68°F)

At start-up, the cold probe temperature (PV) and the set setpoint temperature (SV) are displayed on the controller.

1. Set the setpoint temperature using the **[UP]** and **[DOWN]** buttons on the controller.
2. Press the **[SET]** button to confirm the setting.

8.3 Setting the temperature unit



Conversion formulas

- $^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$
- $^{\circ}\text{F} = (^{\circ}\text{C} \times 1.8) + 32$

The controller displays the temperature in degrees Celsius ($^{\circ}\text{C}$) or degrees Fahrenheit ($^{\circ}\text{F}$).

1. Press the **[SET]** button for 3 seconds to access advanced settings.
 - If the controller is locked, press the controller's **[SET]** and **[ROTATE]** buttons simultaneously to unlock the controller.
2. Press the **[ROTATE]** button until the temperature units adjustment menu (**tPUn** menu) is displayed.
3. Use the **[DOWN]** and **[UP]** buttons to toggle between degrees C ($^{\circ}\text{C}$) and degrees F ($^{\circ}\text{F}$).
 - The **[DOWN]** and **[UP]** buttons are used to increase or decrease the setpoint temperature or navigate the menus. Holding down one of these buttons causes the scrolling speed to gradually increase.
 - Holding down one of these buttons causes the scrolling speed to gradually increase.
4. Press the **[SET]** button to confirm the setting.
5. Press the **[ROTATE]** button until the high temperature range adjustment menu (**tP-H** menu) is displayed.
6. Use the **[DOWN]** and **[UP]** buttons to set the setpoint temperature to 20°C (68°F).
 - Extended control range (overheat safety): -99.5°C (-139°F) \leq setpoint temperature $\leq 20^{\circ}\text{C}$ (68°F)
7. Press the **[SET]** button to confirm the setting.
8. Press the **[ROTATE]** button until the low temperature range adjustment menu (**tP-L** menu) is displayed.
9. Use the **[DOWN]** and **[UP]** buttons to set the setpoint temperature to -99.9°C (-147°F).
10. Press the **[SET]** button to confirm the setting.
11. Press the **[SET]** button a second time to exit the menu.
12. Press the **[ROTATE]** button to access the 'Use' mode parameters.
13. Press the **[ROTATE]** button until the Loc2 adjustment menu (**Loc2** menu) is displayed.
14. Press the **[SET]** button a second time to accept (= enter the menu).

9 Decommissioning

9.1 Shutting down for longer periods

If the sample chiller must be shut down for an extended period of time, after use, you are advised to follow this procedure.

1. Apply the extended storage procedure (see chapter "Storage").
2. Keep the sample chiller in its original packaging and protected from dust.
3. Recommission according to the instructions in the chapter "Operation". If a problem occurs, contact your Pfeiffer Vacuum service center.

9.2 Disposal



Environmental protection

The product and its components **must be disposed of in accordance with the applicable regulations relating to environmental protection and human health**, with a view to reducing natural resource wastage and preventing pollution.

Our products contain various recyclable materials: iron, steel, stainless steel, cast iron, brass, aluminum, nickel, copper, PTFE, FEP.

Familiarize yourself with the service request procedure and fill in the declaration of contamination when returning products to our service centers ([see chapter "Service solutions by Pfeiffer Vacuum", page 33](#)).

HFC refrigerants and foaming agents

Refrigeration unit owners and users must be aware of and comply with the legal obligations regarding the recovery of HFC refrigerants and foaming agents at the end of the life of all sizes of equipment.

Pfeiffer Vacuum assumes no responsibility for the disposal and/or recovery of HFC refrigerants and foaming agents.

9.2.1 Restriction of Hazardous Substances (RoHS)



The 'Restriction of Hazardous Substances' (RoHS) directive

The RoHS directive lays down rules on the restriction of the use of hazardous substances in electrical and electronic equipment (EEE) with a view to contributing to the protection of human health and the environment, including the environmentally sound recovery and disposal of WEEE.

The manufacturer must ensure that EEE placed on the market, including cables and spare parts intended for repair, reuse, update or capacity building, contain hazardous substances subject to limitation to the extent permitted by law.

9.2.2 Electrical and Electronic Equipment (EEE)

Electrical and Electronic Equipment (EEE) contain polluting material (electronic boards, batteries, screens, capacitors, mercury, etc.)

Depollution and subsequent recycling of this equipment are necessary to preserve our natural resources and particularly strategic raw materials.

The manufacturer shall only be required to take back EEE marked Pfeiffer Vacuum sold by Pfeiffer Vacuum:

- EEE subject to applicable regulations for recycling end-of-life products;
- Complete, non modified EEE using original Pfeiffer Vacuum spare parts and including all of their assemblies and sub-assemblies, excluding batteries.

Product on sale on French soil



In the absence of any specific contract and pursuant to current applicable legislation (and Articles R543-172 et seq. of the Environment Code in particular), all EEEs sold by Pfeiffer Vacuum on French soil are covered by the organization and financing of removal and treatment of waste from EEEs provided by Pfeiffer Vacuum.

In order to fulfill its obligations, Pfeiffer Vacuum finances the collection and recycling of waste from EEE by subscribing to **ecosystem**. This voluntary arrangement enables owners of EEEs on French soil to benefit from easy, free solutions to ensure that EEEs subject to the regulations are recycled.

To find out more about the collection solutions, contact **ecosystem** who will inform you of the best collection solution for your needs: www.ecosystem.eco

For further details, consult the General Conditions of Sale available in French on the Pfeiffer Vacuum website.

Product on sale outside of France



In the absence of any specific contract and pursuant to Directive 2012/19/EU on the treatment of waste from EEE, for all EEE sold by Pfeiffer Vacuum outside of France (European Union and third countries), the owner shall be exclusively responsible for organizing and financing the collection and treatment of waste from EEE sold by Pfeiffer Vacuum.

The owner is exclusively responsible, in particular, for its collection (gathering, sorting and storage of waste for its transportation to the treatment site), recycling, recovery and/or disposal, unless otherwise required by legal provisions applicable in the country where the owner is located, which must be reported to Pfeiffer Vacuum by the owner.

10 Malfunctions

10.1 What happens in the event of a failure

Refrigeration unit failure

In the event of a fault, the sample chiller refrigeration unit may lose cooling capacity:

- temperature limit not reached
- significant increase in temperature drop times.

Probe degradation

The 'process' probe may be damaged.

- In this case, if the refrigeration unit does not recognize it, the message “No Cont” (“No Contact”) is displayed on the controller screen instead of the temperature.
- Measurement chain calibration: the controller enables the calibration of the 'process' thermocouple (see chapter “Calibration”).

Alarm: Excessive temperature measured

An alarm is installed in the refrigeration unit to announce a fault in the event of an excessive temperature measurement by the 'process' probe. The refrigeration unit immediately stops cooling and the alarm status indicator (ALM) turns red.

Fault: 'Process' probe disconnected/not connected

If the refrigeration unit's 'process' probe is not connected, the message “No Cont” (“No Contact”) is displayed on the controller screen and refrigeration stops until the 'process' probe is connected again.

10.2 Troubleshooting guide

Do not work on the sample chiller if there is a malfunction.

In the event of a malfunction, contact us.

Any user intervention to troubleshoot the sample chiller voids the warranty and right to claim.

11 Maintenance

11.1 Prerequisites



Personnel authorized for maintenance

Product maintenance must be carried out by personnel with manufacturer training.
Contact our nearest service center.



Obligation to provide personal protective equipment

The operators or employers are obliged to provide the user of the product with the necessary personal protective equipment (PPE).

Persons responsible for installing, operating and repairing the product must wear PPE for safety.

WARNING

Risk of serious injury due to falling objects

When transporting parts/items by hand, there is a danger of loads slipping and falling down.

- ▶ Carry small and medium-size parts/items with two hands.
- ▶ Wear safety shoes with steel toe according to directive EN 347.

WARNING

Risk of burns in case of contact with cold surfaces

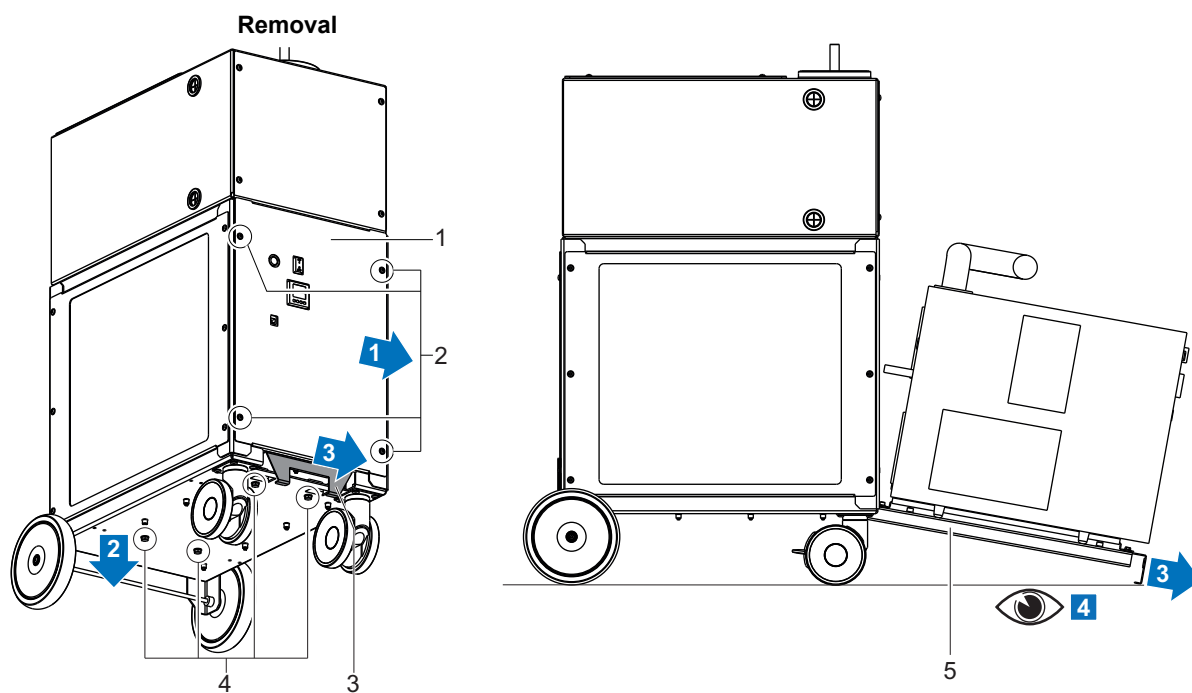
The cold probe and any liquid or solid item in contact with the cold probe can reach extremely low temperatures (> -100°C (-148°F)).

- ▶ Wait until it has completely warmed up before working on the product.
- ▶ Protective gloves must be worn in accordance with standard EN ISO 21420.

11.2 Removing the refrigeration unit

Prerequisite

1. Apply the brakes.
2. Ensure that the refrigeration unit is switched off and disconnect it from all power sources.



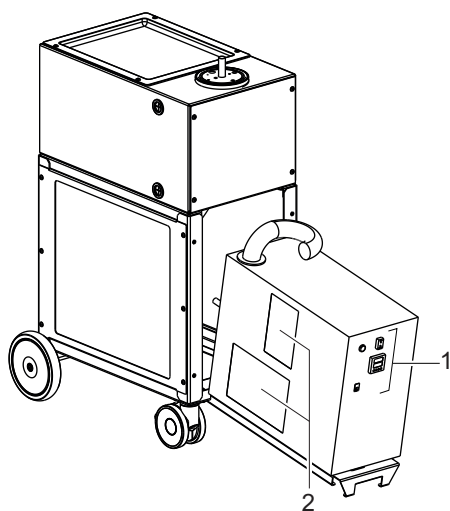
The handle rests on the ground after removing the sliding plate.

- | | |
|-------------------------------|-------------------------------|
| 1 Front panel | 4 Sliding plate locking screw |
| 2 Front panel fixing screws | 5 Sliding plate |
| 3 Handle of the sliding plate | |

Installing the refrigeration unit

1. Follow the procedure in reverse order to removal.
2. Make sure that the sliding plate is at the stop before replacing the 4 sliding plate locking screws.

11.3 Cleaning the refrigeration unit



- | | |
|--------------------------------|--------------|
| 1 Refrigeration unit interface | 2 Inlet vent |
|--------------------------------|--------------|

Prerequisite

- ▶ Remove the refrigeration unit (see chapter "Removing the refrigeration unit").
1. Clean the surfaces of the refrigeration unit cover with a damp cloth.
 2. Vacuum the dust accumulated at the inlet vents and the refrigeration unit interface.
 3. Remove the refrigeration unit cover.

4. Blow the entire interior of the refrigeration unit with compressed air, starting at the top of the refrigeration unit.
5. Check to see if any areas of the refrigeration unit have frozen during previous cooling cycles.
 - Contact us if frozen areas are identified.
6. Replace the refrigeration unit cover.
7. Replace the refrigeration unit (see chapter “Removing the refrigeration unit”).

11.4 Air filter maintenance

The air filter is located inside the side panel on the ventilation side (panel with holes).

CAUTION

Laceration hazard

The metal sheets on the edges of the air filter can be sharp.

- ▶ Protective gloves must be worn in accordance with standard EN ISO 21420.

Prerequisite

- ▶ Ensure that the refrigeration unit is switched off and disconnect it from all power sources.
1. Remove the side panel on the ventilation side (panel with holes)
 2. Remove the air filter by sliding it along the panel.
 3. Clean the air filter using a cloth dampened with water.
 4. Refit the filter in the side ventilation panel of the cart by sliding it along the panel.
 5. Screw the ventilation side panel back into place

12 Service solutions by Pfeiffer Vacuum

We offer first-class service

High vacuum component service life, in combination with low downtime, are clear expectations that you place on us. We meet your needs with efficient products and outstanding service.

We are always focused on perfecting our core competence – servicing of vacuum components. Once you have purchased a product from Pfeiffer Vacuum, our service is far from over. This is often exactly where service begins. Obviously, in proven Pfeiffer Vacuum quality.

Our professional sales and service employees are available to provide you with reliable assistance, worldwide. Pfeiffer Vacuum offers an entire range of services, from [original replacement parts](#) to [service contracts](#).

Make use of Pfeiffer Vacuum service

Whether preventive, on-site service carried out by our field service, fast replacement with mint condition replacement products, or repair carried out in a [Service Center](#) near you – you have various options for maintaining your equipment availability. You can find more detailed information and addresses on our homepage, in the [Pfeiffer Vacuum Service](#) section.

You can obtain advice on the optimal solution for you, from your [Pfeiffer Vacuum representative](#).

For fast and smooth service process handling, we recommend the following:



1. Download the up-to-date form templates.
 - [Explanations of service requests](#)
 - [Service requests](#)
 - [Contamination declaration](#)



- a) Remove and store all accessories (all external parts, such as valves, protective screens, etc.).
 - b) If necessary, drain operating fluid/lubricant.
 - c) If necessary, drain coolant.
2. Complete the service request and contamination declaration.



3. Send the forms by email, fax, or post to your local [Service Center](#).

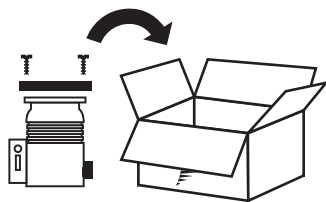


4. You will receive an acknowledgment from Pfeiffer Vacuum.

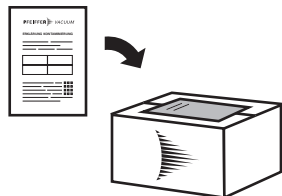
PFEIFFER VACUUM

Submission of contaminated products

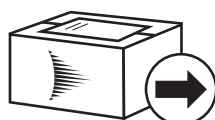
No microbiological, explosive, or radiologically contaminated products will be accepted. Where products are contaminated, or the contamination declaration is missing, Pfeiffer Vacuum will contact you before starting service work. Depending on the product and degree of pollution, **additional decontamination costs** may be incurred.



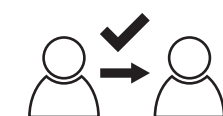
5. Prepare the product for transport in accordance with the provisions in the contamination declaration.
 - a) Neutralize the product with nitrogen or dry air.
 - b) Seal all openings with blind flanges, so that they are airtight.
 - c) Shrink-wrap the product in suitable protective foil.
 - d) Package the product in suitable, stable transport containers only.
 - e) Maintain applicable transport conditions.



6. Attach the contamination declaration to the **outside** of the packaging.



7. Now send your product to your local Service Center.



8. You will receive an acknowledgment/quotation, from Pfeiffer Vacuum.

PFEIFFER VACUUM

Our sales and delivery conditions and repair and maintenance conditions for vacuum devices and components apply to all service orders.

13 Accessories

Accessory	Description	Part Number
Vacuum chamber	Vacuum chamber whose format is adapted to the intermediate heat transfer element used	Contact us
Intermediate heat transfer element	Intermediate heat transfer element whose format is adapted to the sample to be chilled	Contact us

14 Technical data and dimensions

14.1 Technical characteristics

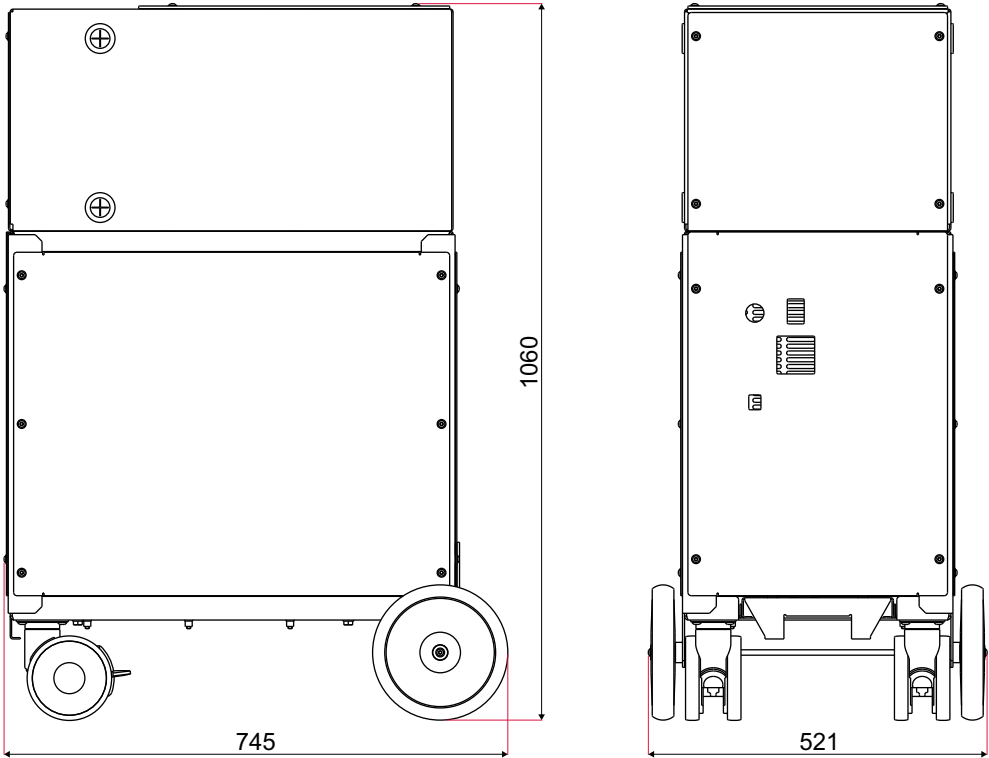
Characteristics	Dry Chiller Module 90
Dimensions (L x W x H)	745 x 521 x 1060 mm
Start-up time (at 20°C (68°F))	5 min
Sound level	61 dB (A)
Maximum power consumption	1600 W
Weight	110 kg
Cooling temperature range	Ambient at -99.5°C (211.1°F)
Power - Frequency	120 VAC - 60 Hz (operational range: 113–127 VAC) 220 VAC - 50 Hz (operational range: 211–240 VAC) 230 VAC - 60 Hz (operational range: 218–242 VAC)

Environmental conditions

Characteristics	Dry Chiller Module 90
Use temperature	15–22.5°C (59–72.5°F) Any use outside of this temperature range will impact the cooling capacity of the sample chiller and may void its warranty.
Storage temperature	10–45°C (50–113°F)
Maximum air hygrometry	30 to 65% (relative humidity without condensation)
Network overvoltage level	Category II
Use	Indoors, clean, dust-free room Ambient air free of sulfur or salt in large quantities
Maximum altitude above sea level	1000 m
Pollution degree	II

14.2 Dimensions

(mm)



EC Declaration of Conformity

This declaration of conformity has been issued under the sole responsibility of the manufacturer.

Declaration for product(s) of the type:

Sample chiller
Dry Chiller Module 90

We hereby declare that the listed product satisfies all relevant provisions of the following **European Directives**.

Machinery 2006/42/EC (Annex II, no. 1 A)
Low voltage 2014/35/EU
Electromagnetic compatibility 2014/30/EU
Restriction of the use of certain hazardous substances 2011/65/EU

Harmonized standards and national standards and specifications which have been applied:

EN 12100 : 2010
EN 60204-1 : 2006
EN 61310-1 : 2008
EN 61439-3 : 2012
EN 61000-6-1 : 2007
EN 61000-6-3 : 2007
EN 3744 : 2010
EN-61326-3-1 : 2017
EN 50581 : 2021
EN 62321 : 2014
EN 62474 : 2012

The person responsible for compiling the technical file is Mr. Julien Palisson, Pfeiffer Vacuum SAS, 98, avenue de Brogny B.P. 2069, 74009 Annecy cedex, France.

Signature:



(Guillaume Kreziak)
Managing Director

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Annecy, 2023-10-27





VACUUM SOLUTIONS FROM A SINGLE SOURCE

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

COMPLETE RANGE OF PRODUCTS

From a single component to complex systems:

We are the only supplier of vacuum technology that provides a complete product portfolio.

COMPETENCE IN THEORY AND PRACTICE

Benefit from our know-how and our portfolio of training opportunities!

We support you with your plant layout and provide first-class on-site service worldwide.

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Are you looking for a
perfect vacuum solution?
Please contact us

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