EN

Original installation and operation manual

Compressed air refrigeration dryer
DRYPOINT® RA III

> 20	> 370
> 35	> 490
> 50	> 630
> 70	> 750
> 110	> 750 WC
> 135	> 870
> 190	> 870 WC
> 240	> 960
> 330	> 960 WC

05-317

Table of Contents

1. Notes about the documentation

This documentation contains all the necessary steps for use of the product and the accessories.

1.1 Contact

Manufacturer	Customer service and tools
BEKO TECHNOLOGIES GmbH Im Taubental 7 | 41468 Neuss Tel. + 49 2131 988 - 1000 info@beko-technologies.com www.beko-technologies.com	**BEKO** TECHNOLOGIES GmbH Im Taubental 7 | 41468 Neuss Tel. + 49 2131 988 - 1000 service-eu@beko-technologies.com www.beko-technologies.com

INFORMATION	Country-specific manufacturer representation
	You can contact the country-specific manufacturer's representative via the address listed in the address section on the rear cover or by using the contact form on the manufacturer's website.

1.2 Information regarding installation and operation manual

INFORMATION	Copyright protection
	The contents of the installation and operation manual in the form of text, figures, illustrations, photographs, technical drawings, diagrams and other representations are protected by the copyright of the manufacturer. The distribution as well as the duplication of this document, the exploitation and the communication of its contents are prohibited unless expressly authorised.

Publication date	Revision	Version	Reason for amendment	Scope of amendment
01. December 2023	00	00	New product	New document

The installation and operation manual, hereinafter referred to as the manual, must always be kept close to the product and be in a permanently legible condition.

The manual must be handed over along with the product if it is sold or passed on.

NOTE	Follow the instructions given in the manual
	This manual contains all the basic information required for safe operation of the product and must be read before any actions are performed. Otherwise personal and material hazards as well as malfunction and device failure are possible.

1.3 Other applicable documents

- Safety data sheet of refrigerant fluid
- **BEKOMAT®** Installation and operation manual
- Wiring diagrams
- Modbus configuration description

2. Safety

2.1 Use

2.1.1 Intended use

The **DRYPOINT® RA III**, also termed product or device in the following, is a compressed-air refrigeration dryer used to separate the moisture in the compressed air, where the compressed air does not treat foodstuffs and is not used for breathing purposes.

The product is intended only for the separation of moisture in compressed air. Any use of this product other than the use described in this manual is hereby deemed to be non-intended and can cause a hazard for the safety of people and the environment.

The following must be noted for intended use:

- Read and follow the manual.
- Only use the product and accessories within the operating parameters given in the technical data and the agreed delivery conditions.
- Only use the product and accessories with media which are free of caustic, aggressive, corrosive, toxic, flammable, oxidising or inorganic components. In cases of doubt an analysis must be carried out.
- Only use the product and accessories in areas which are free of toxic and corrosive chemicals and gases.
- Only use the product and accessories within piping system designed for the technical data with appropriate connections, pipe diameters and assembly clearances.
- Only use the product and accessories outside potentially explosive atmospheres.
- Only use the product and accessories away from direct solar radiation and heat sources as well as areas subject to frost.
- Only combine the product and accessories with the products and components named and recommended by **BEKO** TECHNOLOGIES in the manual.
- Adhere to the prescribed maintenance schedules.

Before using the product and the accessories, the operating company must make sure that all conditions and prerequisites for intended use are given.

The product and the accessories have been exclusively designed for stationary use in a commercial or industrial area. All of the assembly, installation, operation, maintenance, disassembly and disposal work described may only be performed by qualified skilled technical personnel.

2.1.2 Reasonably foreseeable inappropriate use

Reasonably foreseeable inappropriate use is deemed to have occurred if the product or the accessories are used in any other way than that described in the section "2.1.1 Intended use" on page 8.

Reasonably foreseeable inappropriate use includes the use of the product or the accessories in a manner not intended by the manufacturer or supplier but which may result from foreseeable human behaviour.

Reasonably foreseeable inappropriate use includes:

- The use of treated air for foodstuffs and or breathing purposes.
- The execution of any kind of modification, in particular constructive and process-technology related interventions.
- The suspension, bridging or non-application of existing or recommended safety equipment.

This list is not exhaustive as not all possible inappropriate use can be foreseen in advance. If the operating company is aware of any inappropriate use of the product or accessories which are not listed here, the manufacturer must be informed immediately.

2.2 Responsibility of operating company

The responsible operating company must ensure the following to prevent accidents, incidents and adverse effects on the environment:

- Before all actions, check to ensure that the manual available does in fact belong to the product.
- The product and accessories are used, serviced and repaired in accordance with the intended use.
- The product and accessories are only used with the recommended and fully operable safety equipment.
- All assembly, installation and maintenance work is carried out by qualified skilled technical personnel only.
- Personnel have the necessary personal protective equipment available and also use this equipment.
- Suitable technical safety measures are taken so that the permissible operating parameters are adhered to.
- Keep all safety symbols and the type plate on the product and accessories in a legible state. Replace damaged and illegible markings immediately.

2.3 Target group and personnel

This manual addresses the personnel listed below who are involved with work on the product or the accessories.

INFORMATION	Personnel requirements
	Minors are strictly prohibited from working with and on the product and its accessories. The personnel may not execute any actions on the product or the accessories when they are under the influence of drugs, medications, alcohol or other substances that may impair their consciousness.

Operating personnel
Operating personnel are persons who are able to operate the product and the accessories safely on the basis of knowledge of the manual and instruction at the product and accessories. Operating personnel can recognise possible malfunctions and dangerous situations independently and arrange for corresponding measures.

Skilled technical personnel - transport and storage
Skilled technical personnel - transport and storage are people who, due to their training, professional experience and qualifications, have all the necessary skills to safely execute all actions in connection with the transport and storage of the product, to instruct, to recognise possible dangerous situations independently and to execute measures to avoid danger. The capabilities include, in particular, experience with hoists, forklifts and lifting equipment and knowledge of local laws, standards and guidelines relating to transport and storage.

Skilled technical personnel – pressure equipment and systems
Skilled technical personnel specialising in pressure equipment and systems are people who, as a result of their training, professional experience, qualifications and further training, have all the requisite skills to safely perform all actions related to pressurised fluids and systems, to instruct, to independently identify potentially hazardous situations and to implement appropriate measures to avert any danger. The skills required include, in particular, experience in using measuring equipment and control equipment, as well as familiarity with locally applicable laws, standards and regulations for pressurized systems.

Skilled technical personnel - refrigeration engineering

Skilled technical personnel - refrigeration engineering are people who, as a result of their training, professional experience, qualifications and further training, have all the requisite skills to safely perform all actions related to refrigerant fluids, to instruct, to independently identify potentially hazardous situations and to implement appropriate measures to avert any danger.

The skills required include, in particular, experience in handling refrigerant fluids, using refrigerant circuits, measurement and control technology, as well as familiarity with locally applicable laws, standards and regulations for dealing with refrigerant fluids technology.

Skilled technical personnel - electrical engineering

Skilled technical personnel - electrical engineering are people who, as a result of their training, professional experience, qualifications and further training, have all the requisite skills to safely perform all actions related to electricity, to instruct, to independently identify potentially hazardous situations and to implement appropriate measures to avert any danger.

The skills required include, in particular, experience in using electrical plants, measurement and control technology as well as familiarity with locally applicable laws, standards and regulations for dealing with electrical technology.

Skilled technical personnel – customer service

Skilled technical personnel - customer service are people who have the skills and qualifications of the skilled personnel definitions named above. Skilled technical personnel - customer service must have documented proof of training for all work on the product and be authorised.

2.4 Explanation of the symbols used

The symbols used below indicate safety-relevant and important information which must be adhered to when handling the product and to ensure safe and optimum operation.

Symbol	Description / explanation
	General warning symbol (danger, warning, caution)
	Danger: pressurised system
	Danger: electric voltage
	Warning: hot surfaces
	Observe the installation and operation manual
	General mandatory sign
	Wear safety footwear
	Use respiratory protection, protection class FFP 3 (particle-filtering half mask)
	Use self-contained respiratory protection
	Use protective gloves (cut-proof, liquid-resistant, chemicals-proof)
	Wear safety goggles with side shields
	General information

2.5 Safety instructions and warning notices

This section provides an overview of all important safety aspects for personal protection as well as for the safe and problem-free operation of the product and accessories.

The following sections list the dangers posed by this product and the accessories even with intended use. To minimise the risk of personal injury and damage to property and to avoid dangerous situations, observe the safety instructions listed and adhere to the warning notices in the other sections of this manual.

Basic warning notices and the necessary qualifications of skilled technical personnel are always listed at the beginning of the section in the “Warning notices” section.

Warning notices related to specific actions are printed directly before potentially hazardous procedures or sequences of actions.

2.5.1 General applicable safety instructions

- Before starting work, refer to the technical documentation for the entire system and observe the overall operating instructions.
- Carry out a risk assessment before starting work on site (last minute risk assessment).
- Use suitable personal protective equipment (PPE) for all work.
- Set up a safety area around the working area during all installation, maintenance and repair work.
- Use existing plant-specific Lockout Tagout (LOTO) procedure for safe shutdown and isolation from energy hazards.

2.5.2 Safe operation

The following actions may result in serious personal injury or death:

- Commissioning and operation of the product and accessories outside the permissible limit values and operating parameters.
- Unauthorised interference and unauthorised modifications of the product and accessories.
- To guarantee safe operation of the product and accessories, observe the following points:
  1. Observe the limits and operating parameters specified in the type plate and in the manual.
  2. Check whether the permissible operating parameters have been changed or restricted by the use of accessories.
  3. Observe the assembly conditions and the ambient conditions.
  4. Adhere to the maintenance intervals.

2.5.3 Pressurised systems

The following may result in serious personal injury or death:

- Contact with fast or suddenly escaping fluids.
- Bursting system parts.
- Whipping movements of pressurized hoses and pipes during separation.

For the safe handling of pressurised systems, observe the following points:

- Observe the following safety rules during all work:
  1. Shut down the system or system section.
  2. Secure the system or system section against restarting.
  3. Reduce the pressure in the system or all system sections to ambient pressure.
  4. e.g. by slowly releasing the pressure in a controlled manner via relief valves.
  5. Secure against pressure being applied again.
- Check pressurised systems for safety, contamination and possible damage.
- Before pressurisation, check all system connections for leak tightness and tighten if necessary.
- Only pressurise systems slowly.
- Avoid pressure blows and high differential pressures.
- Compensate any vibrations occurring in the pipe network by using vibration dampers.

2.5.4 Electric voltage

Contact with live components may result in serious personal injuries or death.

To ensure the safe handling of live components, observe the following points:

- Only connect the product and the accessories to the voltage supply if they are undamaged.
- Comply with all regionally applicable regulations and requirements during installation.
- Provide a circuit breaker in the power supply within easy reach of the product. The circuit breaker disconnects all current-carrying conductors.
- Connect the protective conductor (earth connection) according to regulations.
- Only operate the product and accessories with the cover complete and closed and the electronics housing closed.
- Before starting work on the product:
  1. Disconnect.
     → Disconnect the product from all poles and all sides.
  2. Secure against restarting.
  3. Determine the absence of voltage at all poles.
     → With suitable and permissible measuring device (e.g. voltage tester).
  4. Earth and short circuit.

2.5.5 Transport and storage

Inappropriate transport or storage may result in personal injury or damage to property.

For safe transport and storage of the product and accessories, observe the following point:

- Handle the packaging, the product and accessories carefully.
- Transport and handle the packaged product and accessories according to the markings on the packaging (note lifting gear attachment points, the centre of gravity and alignment e.g. keep vertical, do not throw, etc.).
- Only use proper means of transport and lifting equipment that is in proper working order.
- Always adhere to the permissible storage parameters.
- Store the product and accessories only outside of areas exposed to direct sunlight and heat sources.

2.5.6 Installation

Inappropriate assembly or electrical installation of the product and accessories may result in personal injury and damage to property as well as impair operation.

For safe assembly and electrical installation, observe the following points:

- Assemble the product and all parts, accessories and materials used free of mechanical stress.
- Check all plug-type connections for a correct fit.
- Avoid stumbling risks by routing cables and hoses accordingly.
- Avoid mechanical strain on the cables.
- Fix and fasten hoses in such a way that they cannot flap around.
- Install air inlet/outlet line and drain line as a fixed pipes.

2.5.7 Maintenance

Improper performance of maintenance and repair work may result in serious personal injuries or death.

For safe maintenance and repair, observe the following points:

- Before starting work, depressurise the pressurised product and accessories and secure them against unintentional pressurisation.
- Before starting work, disconnect the product and accessories and secure them against being switched back ON again unintentionally.
- The product contains fluorinated greenhouse refrigerant fluid. Observe the requirements indicated on the safety data sheet of the refrigerant fluid during all maintenance, repair and emptying operations of the refrigerant circuit.

- Only use materials approved for the respective application.
- Use only suitable tools that are in proper working order.
- Only use cleaned pipes and hoses that are free of dirt and corrosion.
- Never use abrasive or aggressive cleaning agents or solvents which could damage the outer coating (e.g. markings, type plate, corrosion protection, etc.).
- Never clean the product with hard or pointed implements.
- Use only the specified materials and media for cleaning.
- Observe statutory, local and in-house hygiene regulations.
- Pay attention to order and cleanliness during maintenance and repair work. Prevent contamination from entering the opened product and accessories. Store disassembled components and accessories directly in a safe place.
- After completing maintenance and repair work, remove all tools and cleaning agents used, as well as all parts that are no longer needed, from the work area.
- Only dispose of product and accessories when cleaned and freed of any residue.
- Dispose of all components, parts, operating and auxiliary materials as well as cleaning agents professionally and in accordance with all locally applicable regulations and standards.
- Dispose of electrical and electronic components using a specialist disposal company or return them to manufacturer.
- Dispose of the refrigerant fluid in accordance with applicable national and local regulations and in accordance with the requirements indicated on the safety data sheet of the refrigerant fluid.

2.5.8 Handling hazardous substances

Contact with condensate containing substances which endanger health and the environment can pose a health hazard, causing irritation and/or damage to the eyes, skin and mucous membranes. In addition, polluted condensate must be prevented from entering the sewerage system, waters or the ground.

For the safe handling of polluted condensate the following points must be observed:

- Use suitable protective equipment when handling condensate.
- Pick up and dispose of any leaking or spilled condensate in accordance with applicable regional laws and requirements.

The product contains fluorinated greenhouse refrigerant fluid. Improper handling of the refrigerant fluid can be harmful to your health and cause damage to the environment.

For the safe handling of refrigerant fluid the following points must be observed:

- Use suitable protective equipment when handling refrigerant fluid. Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance, repair and dismantling works on refrigerant circuit.
- Pick up and dispose the refrigerant fluid in accordance with all nationally and locally applicable regulations. Discharge to atmosphere in large quantities should be avoided.

2.5.9 Use of spare parts, accessories or materials

Use of incorrect spare parts, accessories, materials, auxiliary and operating materials, may result in death or serious injury. Malfunction, device failure or material damage may occur.

- Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work.
- Only use the materials approved for the respective application and suitable tools in proper working order.
- Only use cleaned pipes that are free of dirt and corrosion.
- Only use electrical components and materials that comply with regionally applicable specifications and regulations (standards, directives, etc.) for electrical safety.

2.6 Warning notices

Warning notices warn against dangers when handling the product and accessories.

In order to prevent accidents, personal injury and damage to property as well as impairments during operation, it is essential to adhere to the warning notices.

Structural set up:

SIGNAL WORD	Type and source of danger
 Symbol	Possible consequences if the danger is ignored • Measures to prevent the danger

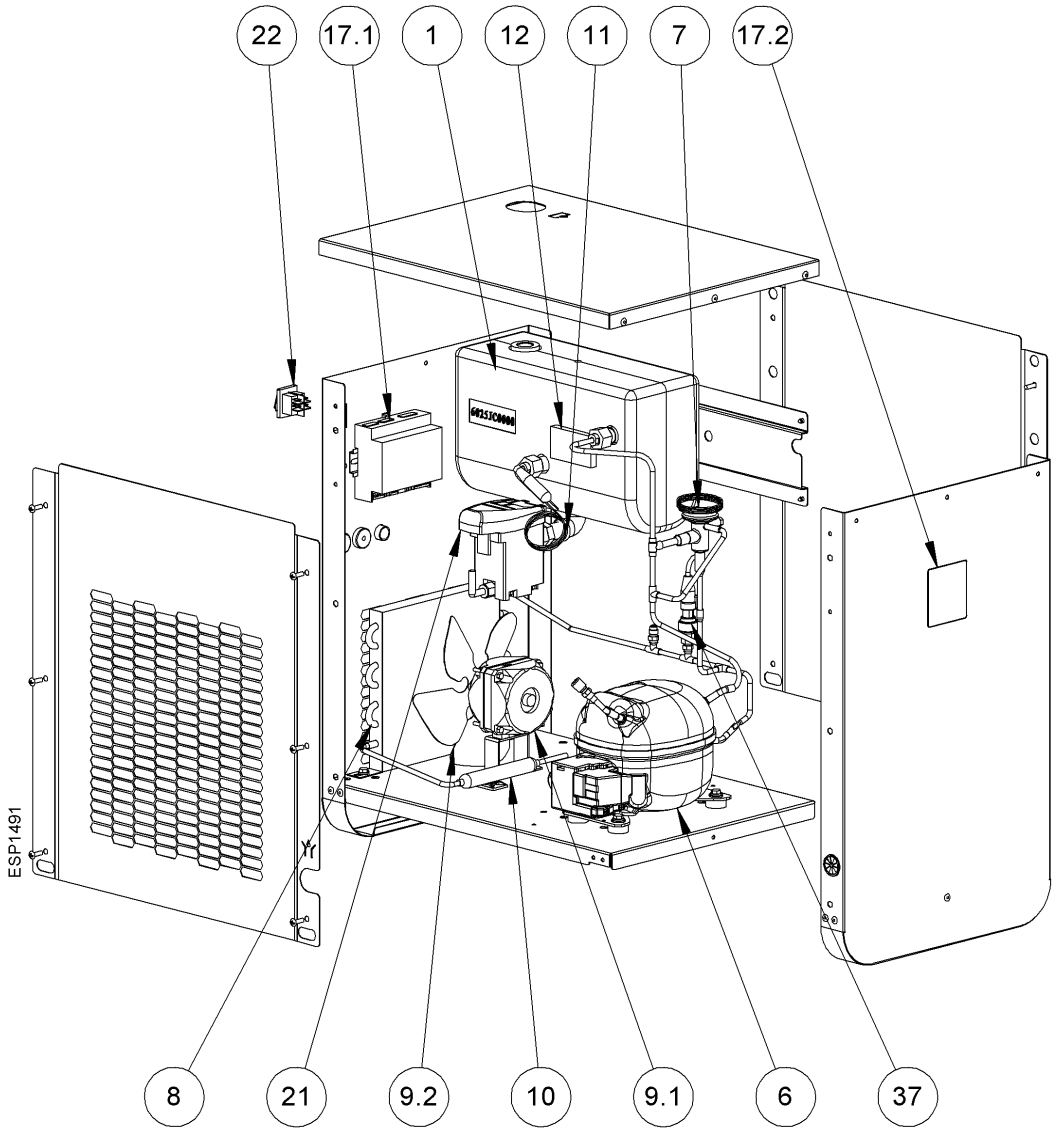
Signal words:

DANGER	**Imminent hazard** Consequences of non-compliance: Death or serious personal injury
WARNING	**Imminent hazard** Consequences of non-compliance: Death or serious personal injury are possible
CAUTION	**Potential hazard** Consequences of non-compliance: Personal injury or damage to property are possible
NOTE	**Additional notes** Consequences of non-compliance: Damage to property, malfunction and device failure are possible. No hazard to people or endangerment of safe operation

3. Product information

3.1 Product overview

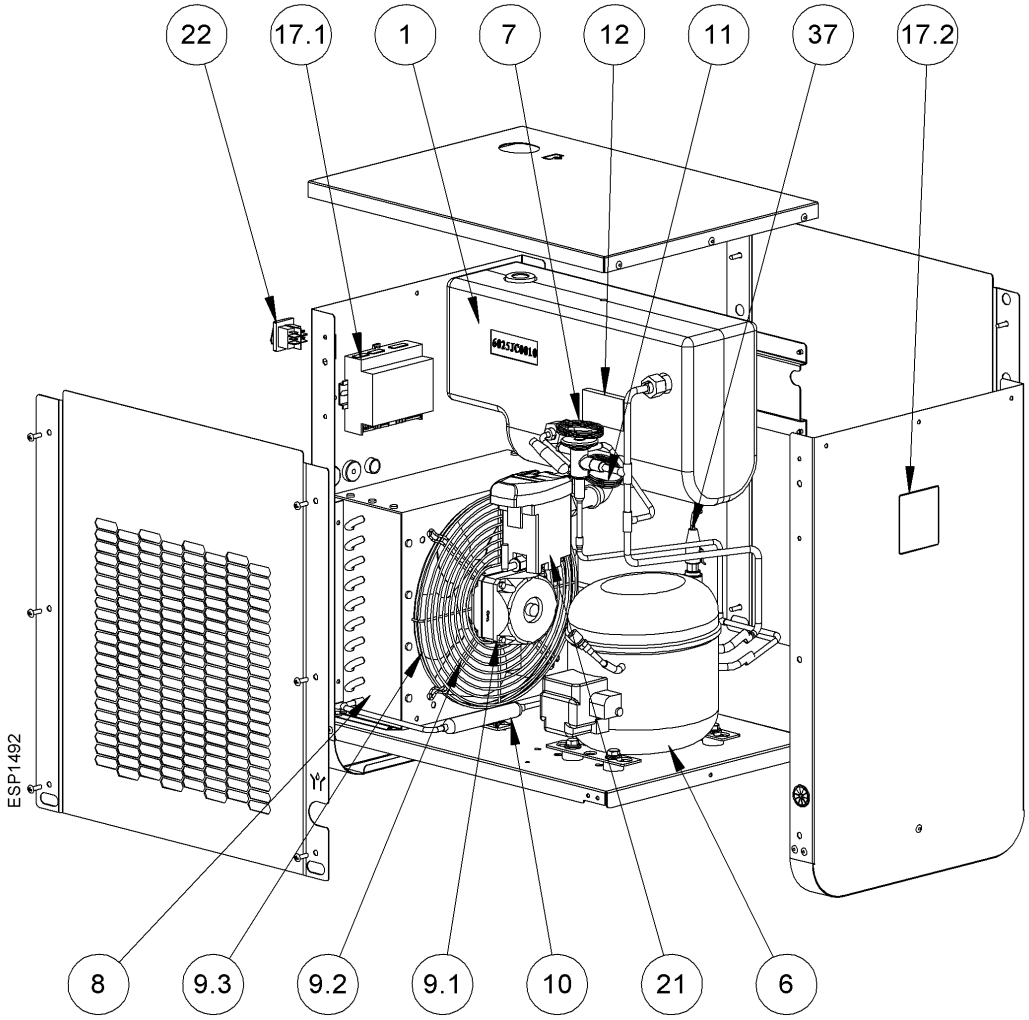
3.1.1 DRYPOINT® RA III 20, 35, 50



Pos. No.	Description / explanation
[1]	Heat exchanger
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9.1]	Cooling fan – motor
[9.2]	Cooling fan - blade
[10]	Filter of refrigerant fluid

Pos. No.	Description / explanation
[11]	Capillary tube
[12]	Temperature probe BT1
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP

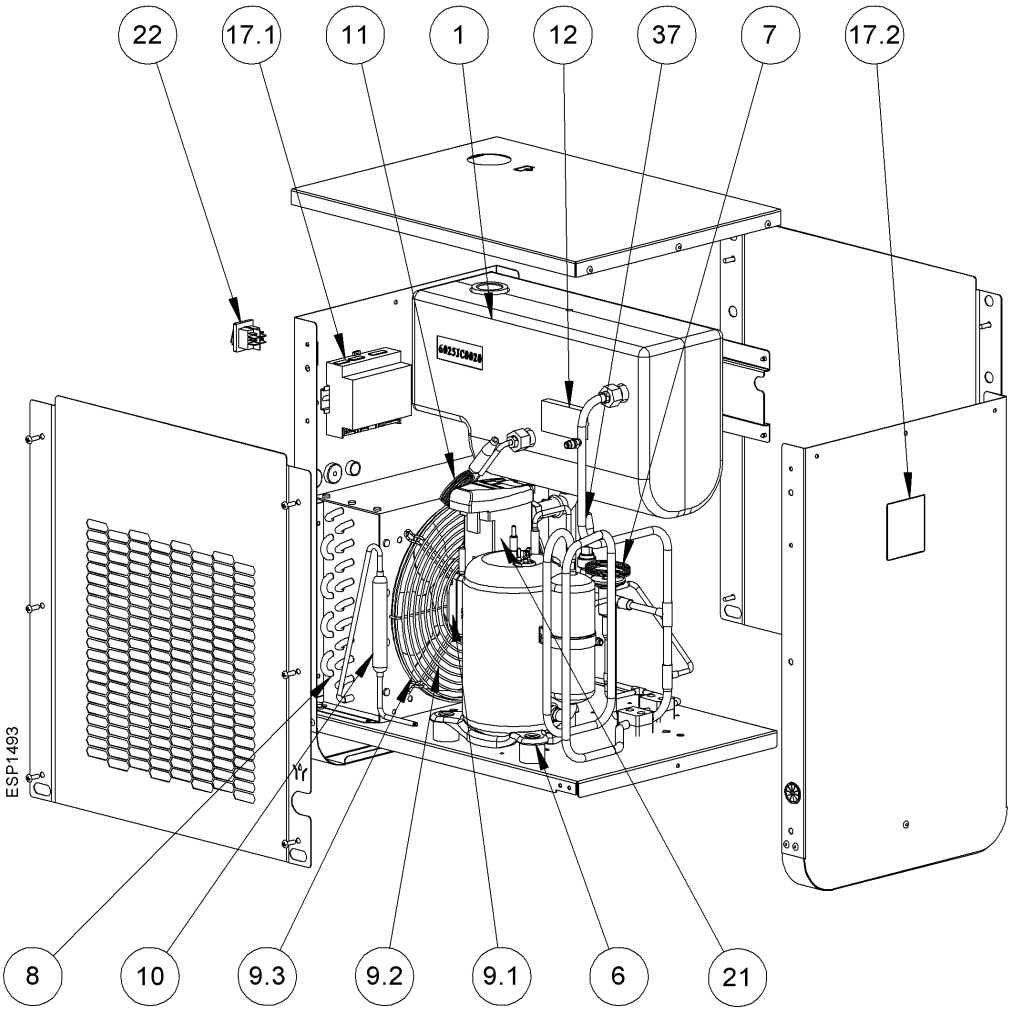
3.1.2 DRYPOINT® RA III 70, 110



Pos. No.	Description / explanation
[1]	Heat exchanger
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9.1]	Cooling fan - motor
[9.2]	Cooling fan - blade
[9.3]	Cooling fan - grid
[10]	Filter of refrigerant fluid

Pos. No.	Description / explanation
[11]	Capillary tube
[12]	Temperature probe BT1
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP

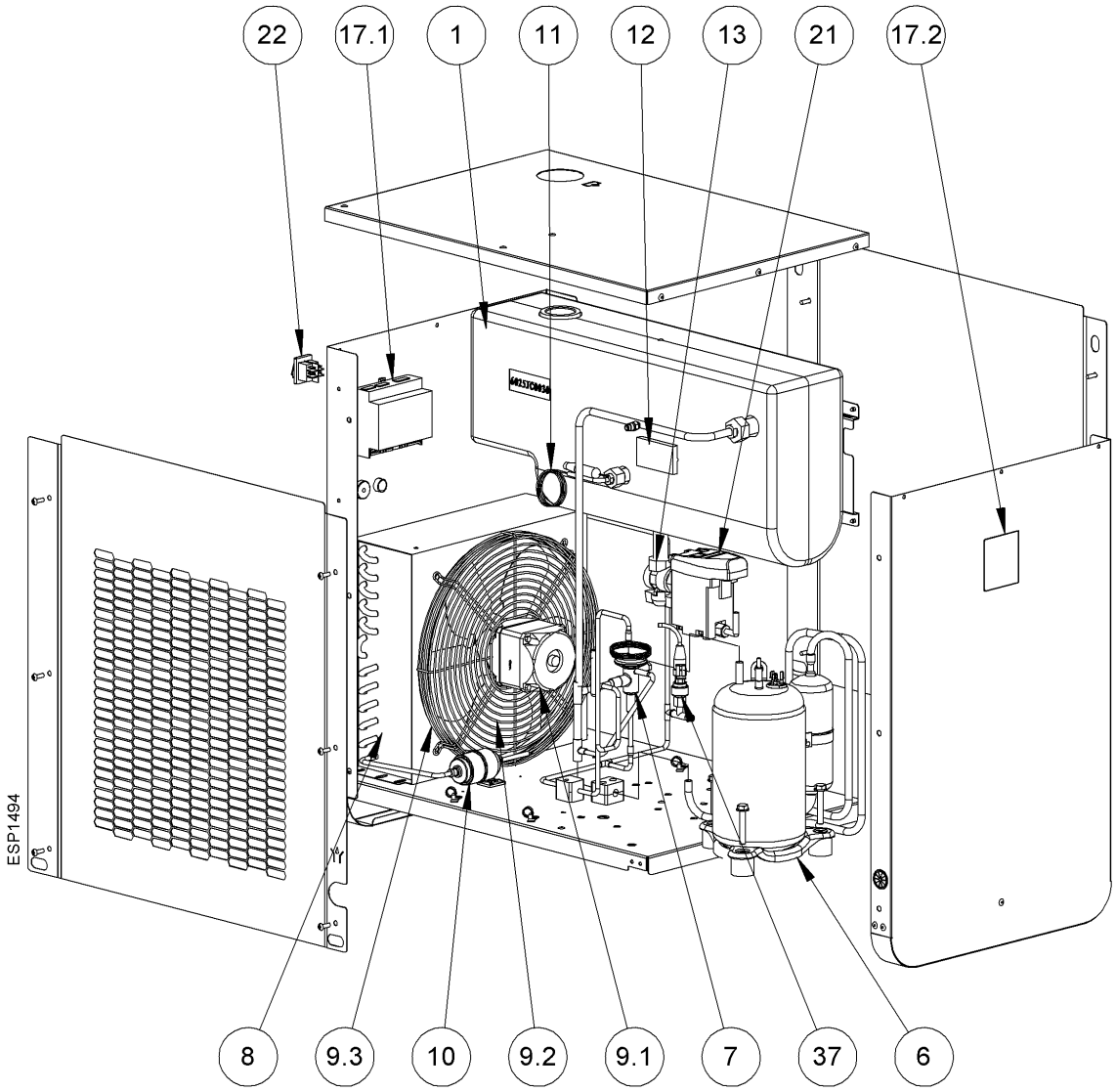
3.1.3 DRYPOINT® RA III 135



Pos. No.	Description / explanation
[1]	Heat exchanger
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9.1]	Cooling fan - motor
[9.2]	Cooling fan - blade
[9.3]	Cooling fan - grid
[10]	Filter of refrigerant fluid

Pos. No.	Description / explanation
[11]	Capillary tube
[12]	Temperature probe BT1
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP

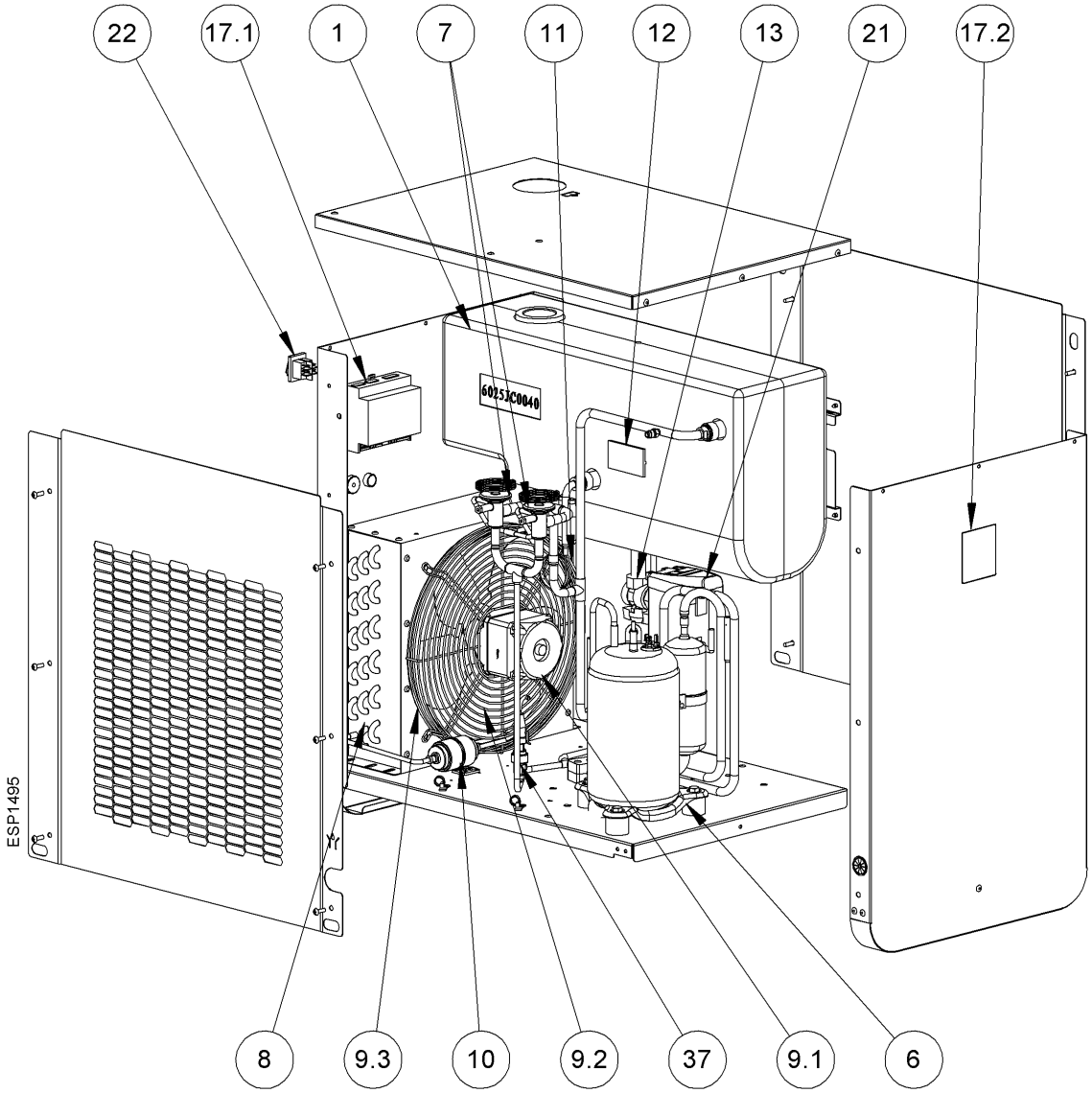
3.1.4 DRYPOINT® RA III 190, 240



Pos. No.	Description / explanation
[1]	Heat exchanger
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9.1]	Cooling fan - motor
[9.2]	Cooling fan - blade
[9.3]	Cooling fan - grid
[10]	Filter of refrigerant fluid

Pos. No.	Description / explanation
[11]	Capillary tube
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP

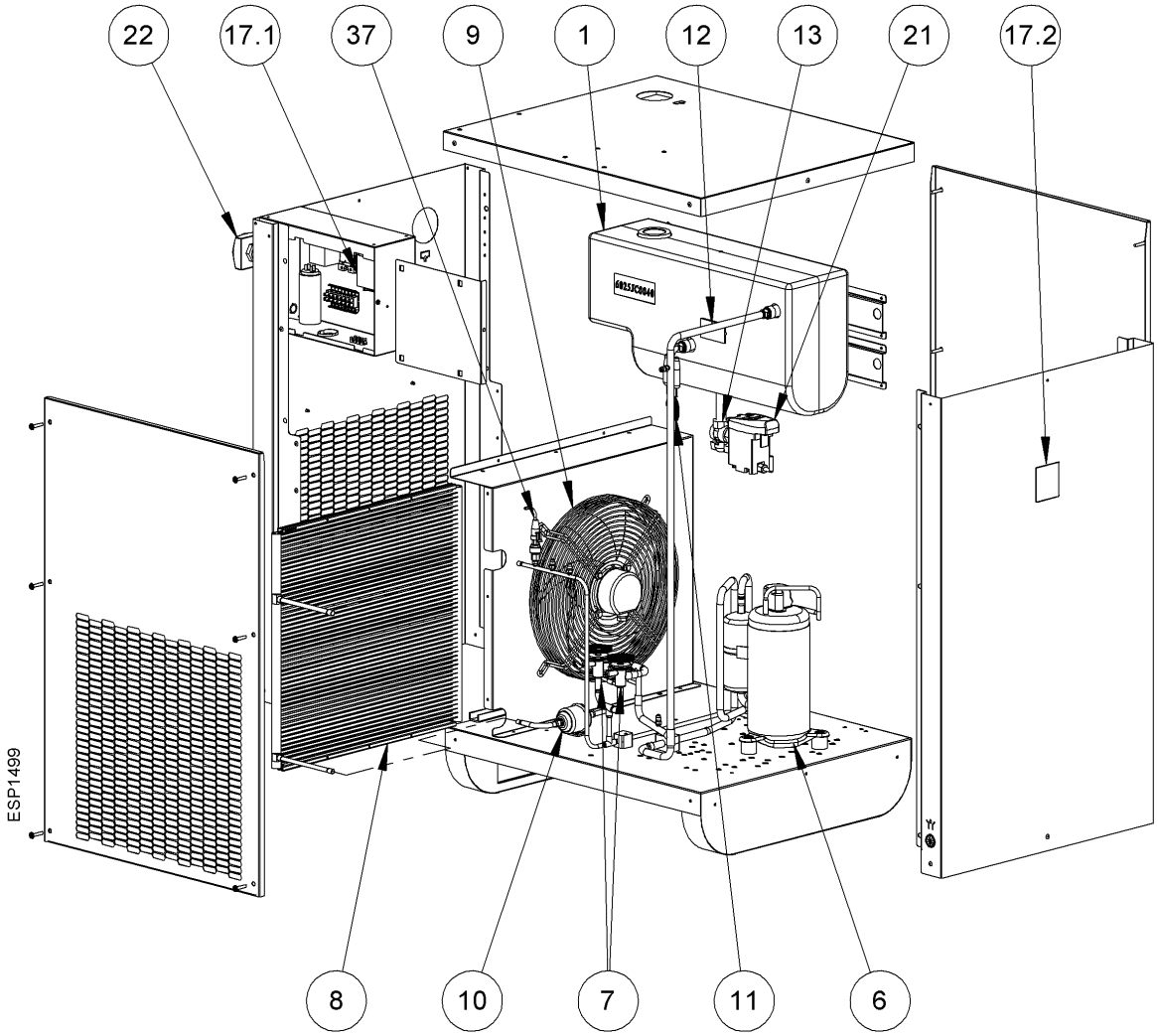
3.1.5 DRYPOINT® RA III 330



Pos. No.	Description / explanation
[1]	Heat exchanger
[6]	Refrigerant compressor
[7]	Hot gas by-pass valves
[8]	Condenser
[9.1]	Cooling fan - motor
[9.2]	Cooling fan - blade
[9.3]	Cooling fan - grid
[10]	Filter of refrigerant fluid

Pos. No.	Description / explanation
[11]	Capillary tube
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP

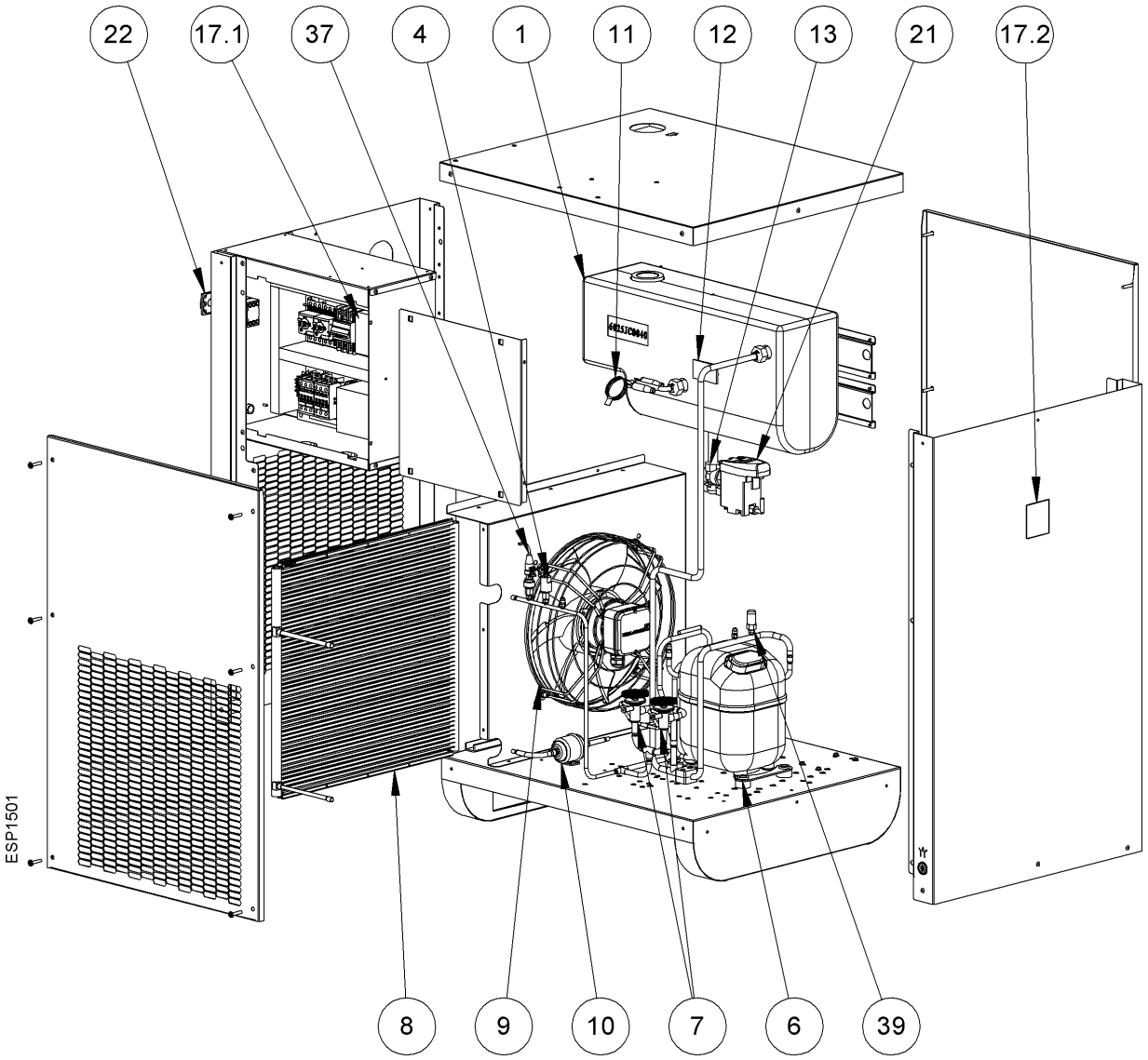
3.1.6 DRYPOINT® RA III 370, 490 1ph+N



Pos. No.	Description / explanation
[1]	Heat exchanger
[6]	Refrigerant compressor
[7]	Hot gas by-pass valves
[8]	Condenser
[9]	Cooling fan
[10]	Filter of refrigerant fluid
[11]	Capillary tube

Pos. No.	Description / explanation
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP

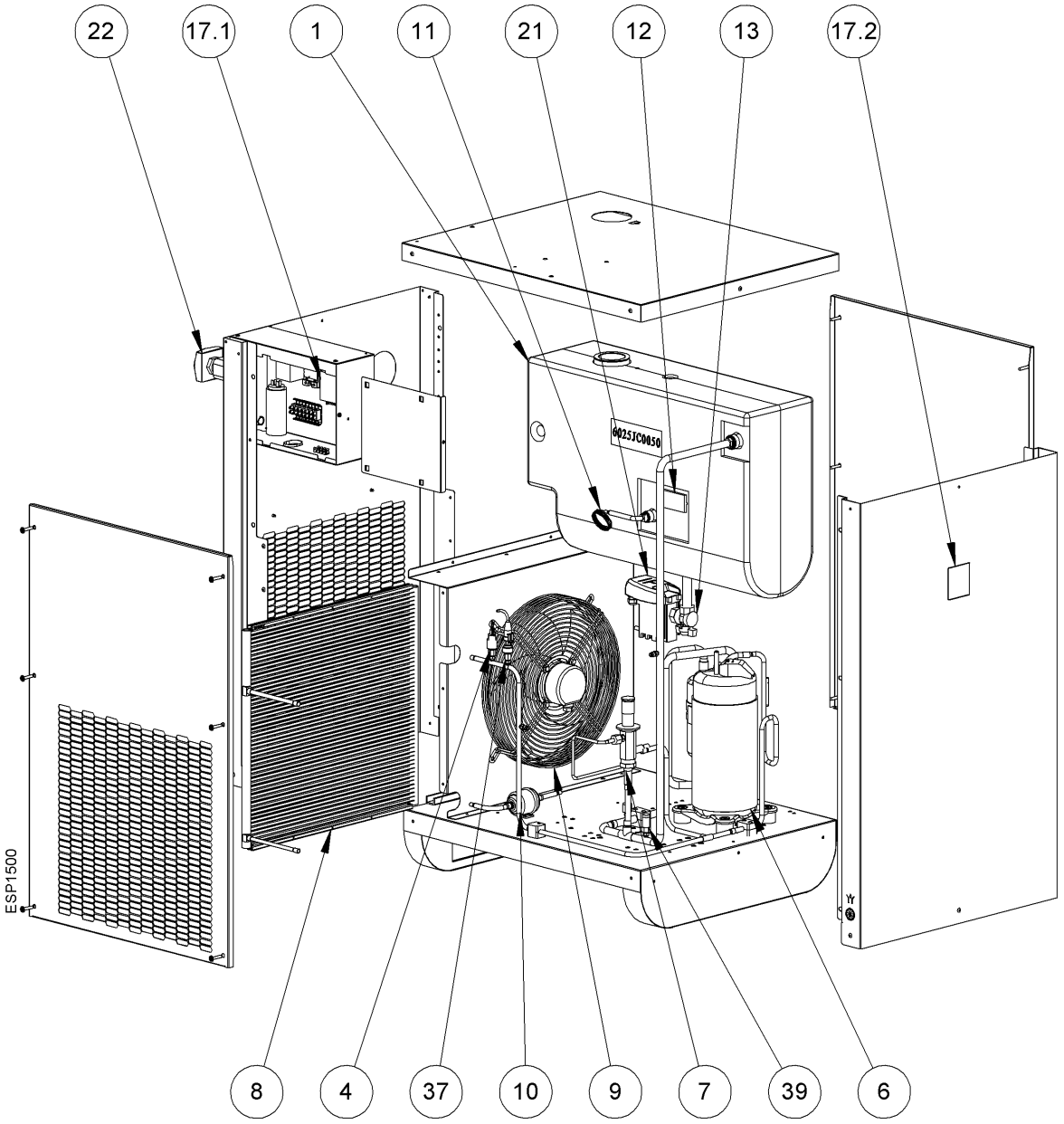
3.1.7 DRYPOINT® RA III 370, 490 3ph



Pos. No.	Description / explanation
[1]	Heat exchanger
[4]	High pressure switch HPS
[6]	Refrigerant compressor
[7]	Hot gas by-pass valves
[8]	Condenser
[9]	Cooling fan
[10]	Filter of refrigerant fluid
[11]	Capillary tube

Pos. No.	Description / explanation
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP
[39]	Pressure transducer BLP

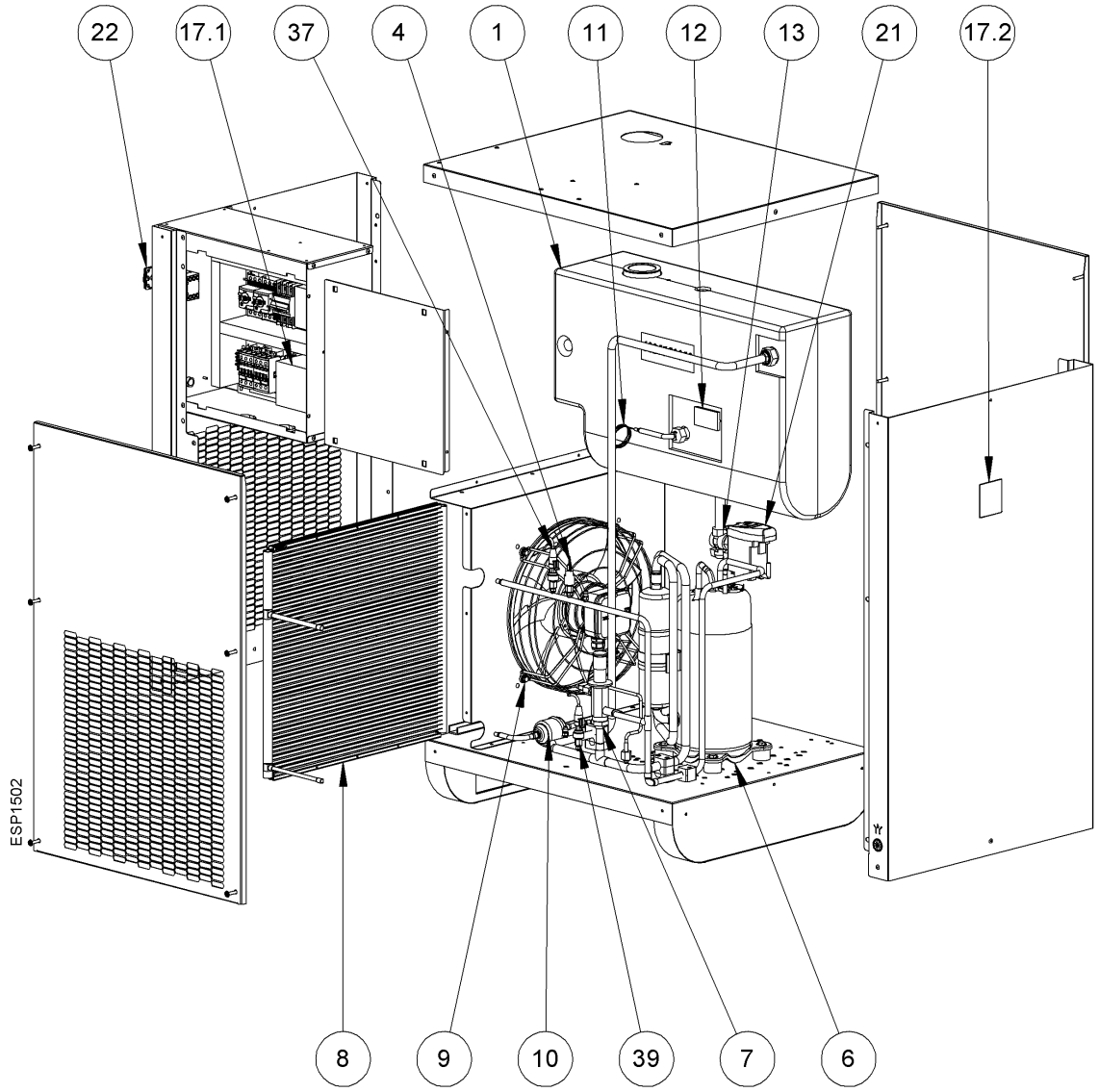
3.1.8 DRYPOINT® RA III 630 1ph+N



Pos. No.	Description / explanation
[1]	Heat exchanger
[4]	High pressure switch HPS
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9]	Cooling fan
[10]	Filter of refrigerant fluid
[11]	Capillary tube

Pos. No.	Description / explanation
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP
[39]	Pressure transducer BLP

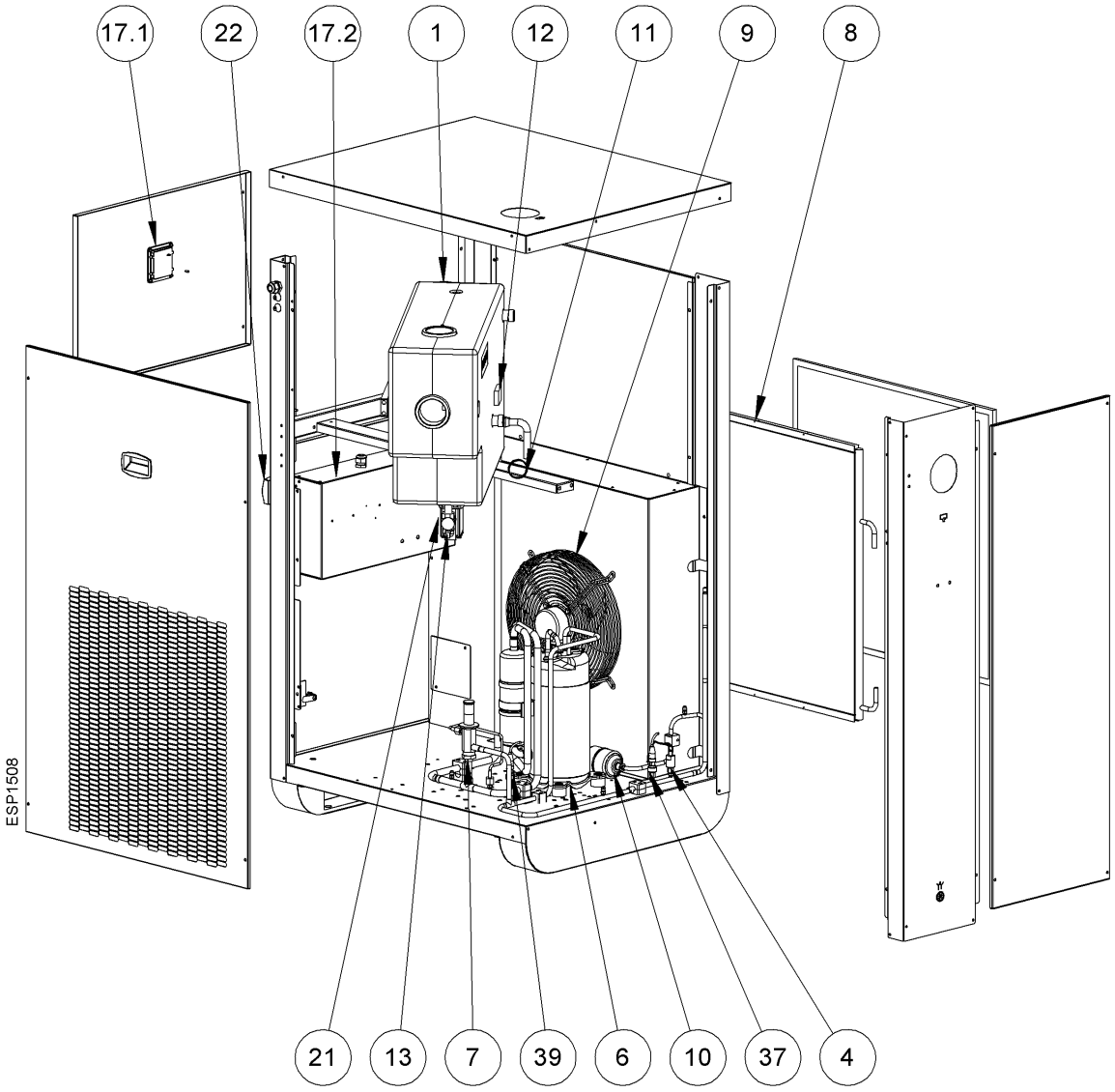
3.1.9 DRYPOINT® RA III 630 3ph



Pos. No.	Description / explanation
[1]	Heat exchanger
[4]	High pressure switch HPS
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9]	Cooling fan
[10]	Filter of refrigerant fluid
[11]	Capillary tube

Pos. No.	Description / explanation
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP
[39]	Pressure transducer BLP

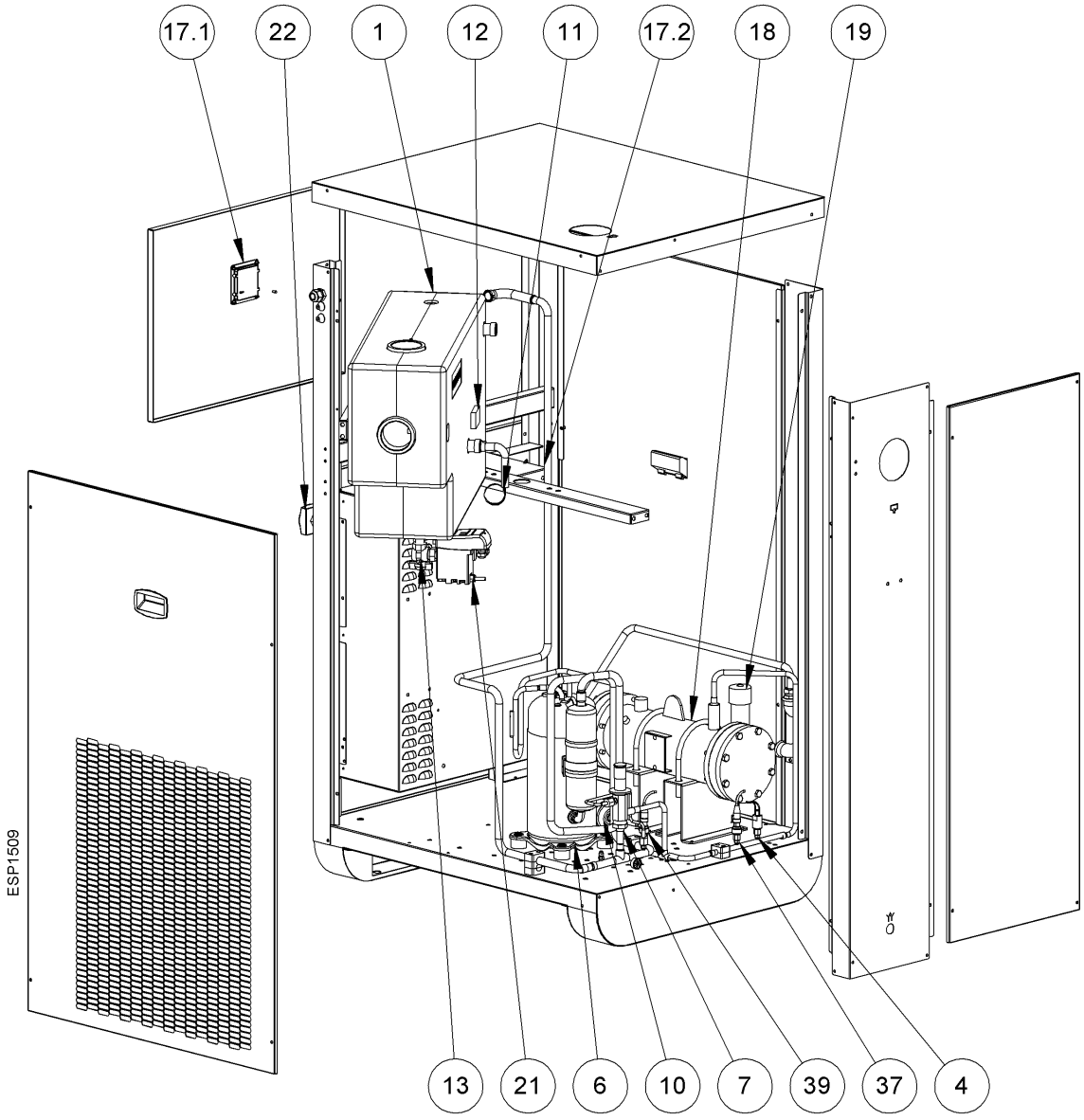
3.1.10 DRYPOINT® RA III 750, 960 1ph+N & 3ph



Pos. No.	Description / explanation
[1]	Heat exchanger
[4]	High pressure switch HPS
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9]	Cooling fan
[10]	Filter of refrigerant fluid
[11]	Capillary tube

Pos. No.	Description / explanation
[12]	Temperature probe BT1
[13]	Condensate drain service valve
[17.1]	Electronic Control Unit, inside electrical box
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP
[39]	Pressure transducer BLP

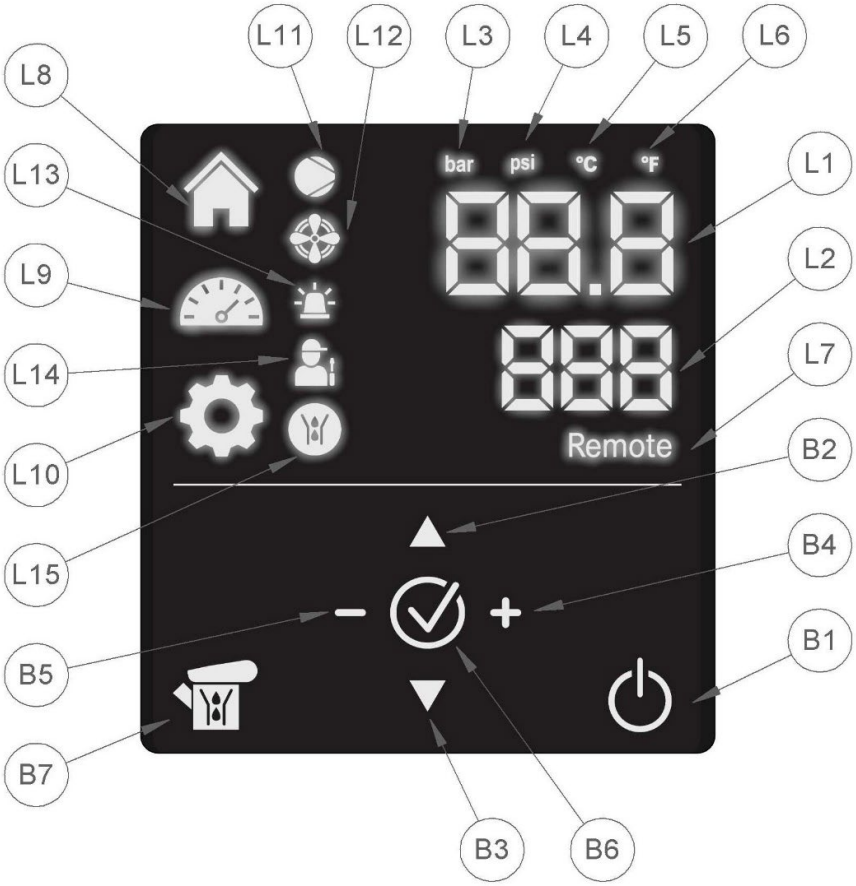
3.1.11 DRYPOINT® RA III 750, 960 1ph+N & 3ph, water-cooled



Pos. No.	Description / explanation
[1]	Heat exchanger
[4]	High pressure switch HPS
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[10]	Filter of refrigerant fluid
[11]	Capillary tube
[12]	Temperature probe BT1
[13]	Condensate drain service valve

Pos. No.	Description / explanation
[17.1]	Electronic Control Unit, inside electrical box
[17.2]	User Interface
[18]	Water condenser
[19]	Water regulating valve
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP
[39]	Pressure transducer BLP

3.2 User Interface

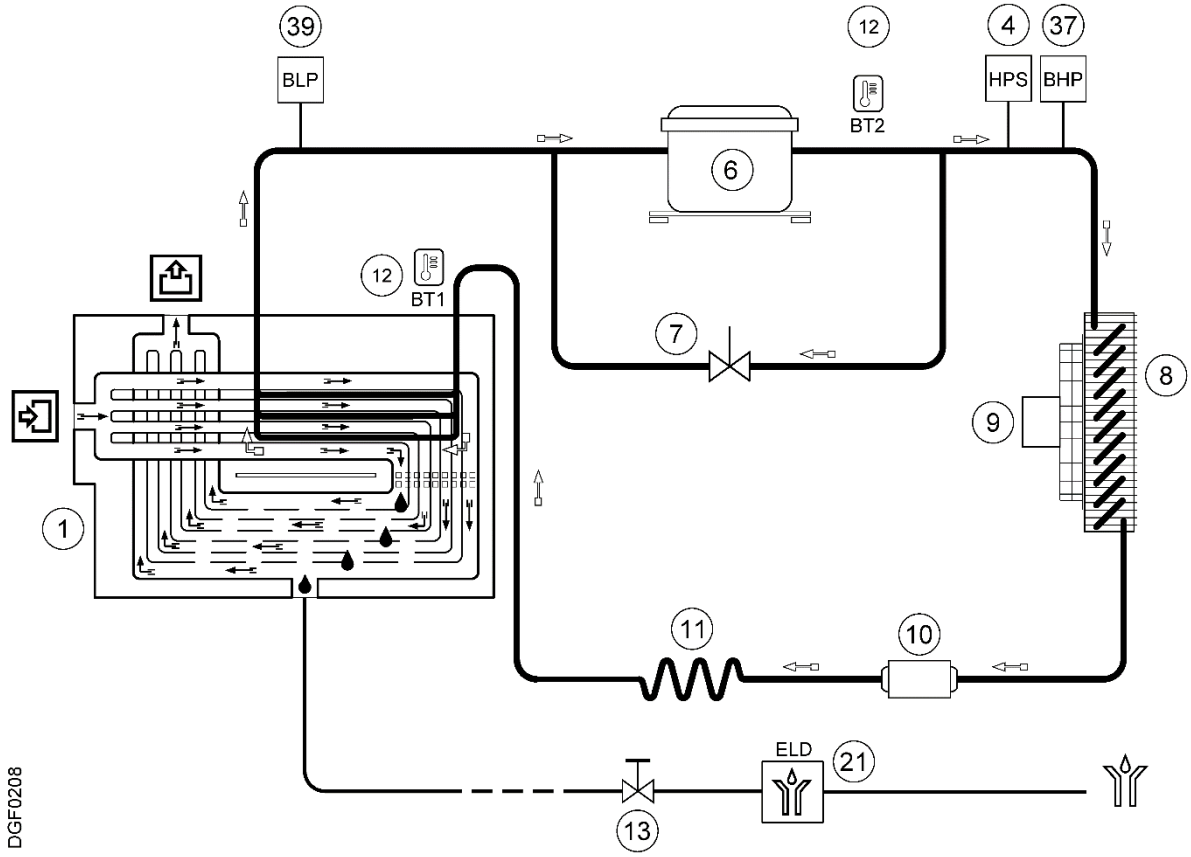


Display elements	
Pos. No.	**Description / explanation**
[L1]	7-segment display MAIN
[L2]	7-segment display SECONDARY
[L3]	Status LED PRESSURE IN BAR
[L4]	Status LED PRESSURE IN PSI
[L5]	Status LED TEMPERATURE °C
[L6]	Status LED TEMPERATURE °F
[L7]	Status LED REMOTE MODE
[L8]	Status LED HOME
[L9]	Status LED LIVE DATA
[L10]	Status LED SETUP
[L11]	Status LED REFRIGERANT COMPRESSOR
[L12]	Status LED COOLING FAN
[L13]	Status LED ALARM
[L14]	Status LED WARNING
[L15]	Status LED CONDENSATE DRAIN

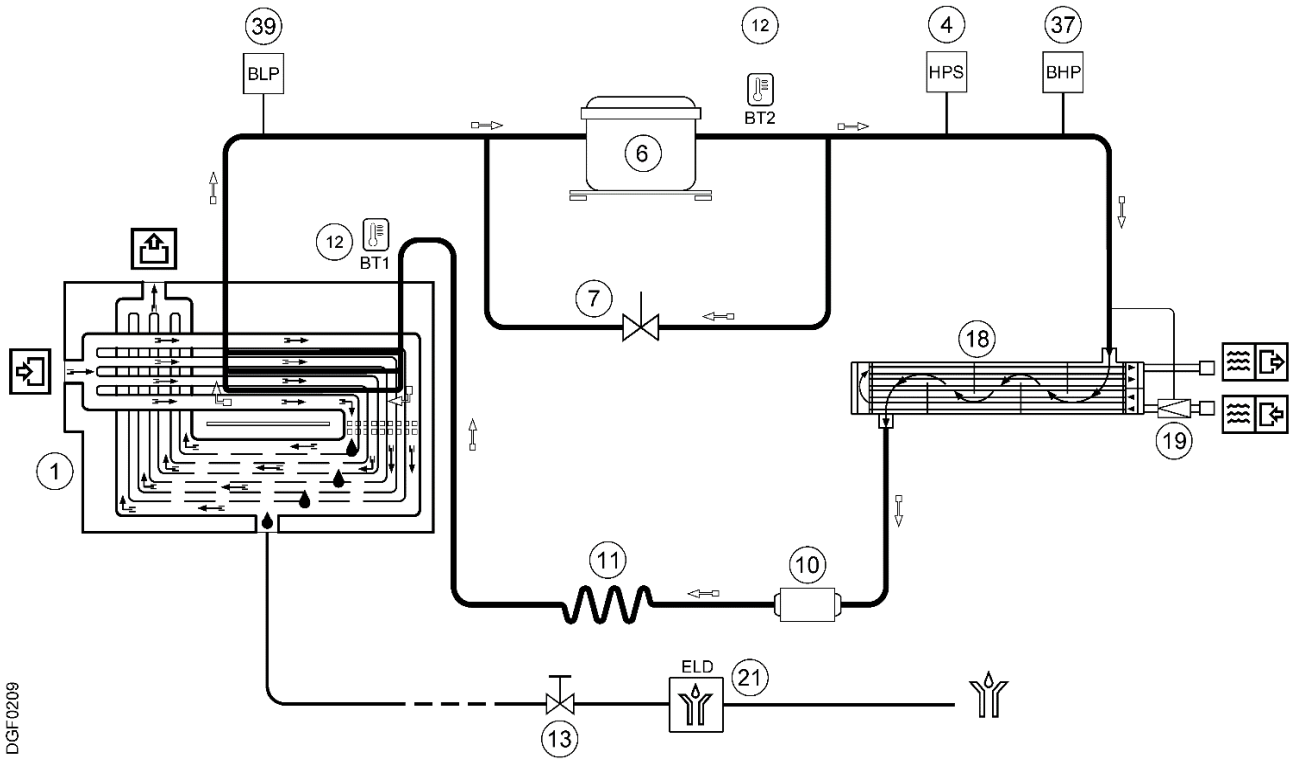
Controls	
Pos. No.	**Description / explanation**
[B1]	START-STOP button
[B2]	NAVIGATION UP button
[B3]	NAVIGATION DOWN button
[B4]	INCREASE button
[B5]	DECREASE button
[B6]	ENTER/CONFIRM button
[B7]	CONDENSATE DRAIN TEST button

3.3 Function description

3.3.1 Flow diagram, air-cooled models



3.3.2 Flow diagram, water-cooled models



3.3.3 Compressed air flow

The hot, humid air enters the heat exchanger **[1]**, cools and reaches a temperature of approximately 2 °C. At this temperature the humidity present in the air changes to a liquid state, precipitates to the bottom of the exchanger **[1]** and is expelled through the automatic condensate drain **[21]**. The cold, dry air is then channelled and heated again until it reaches a temperature at the outlet of the exchanger that is approximately 8°C lower than the temperature of the incoming air.

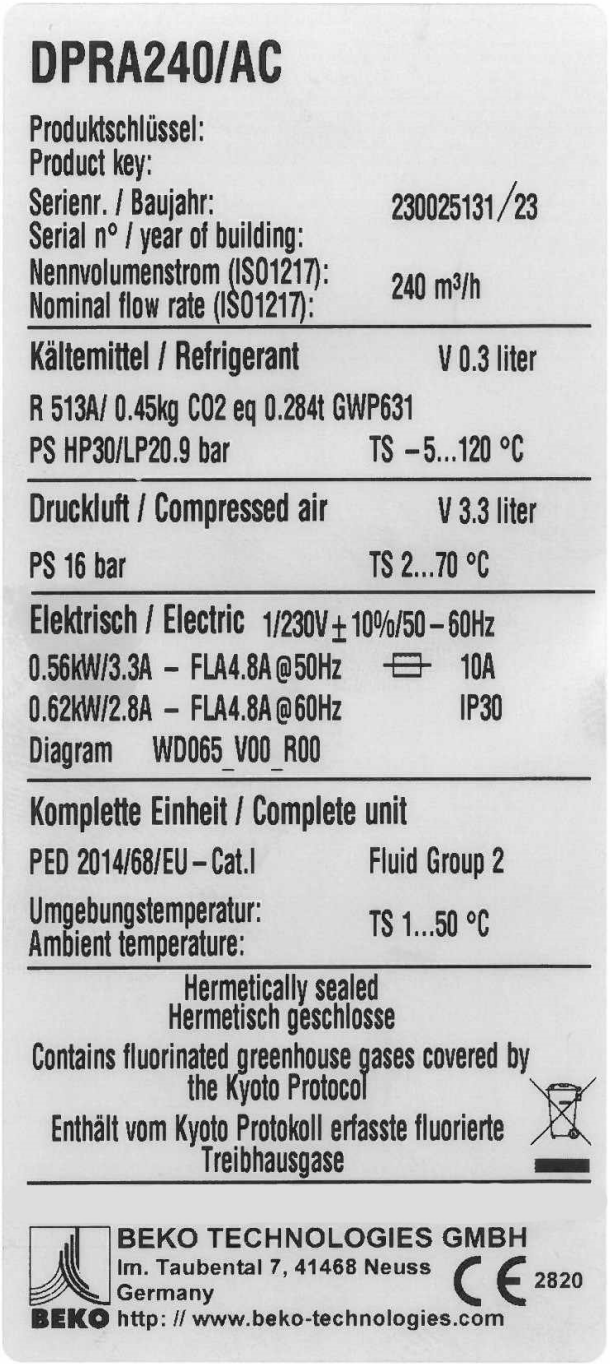
3.3.4 Refrigerating cycle

The refrigerant compressor **[6]** compresses the refrigerant fluid and conveys it at high pressure towards the condenser **[8]** inside which the gas cools and becomes liquid at high pressure. The liquid refrigerant passes through the filter drier **[10]** and the capillary tube **[11]** where, due to the pressure drop, it reaches the preset temperature. The low pressure liquid refrigerant enters the heat exchanger **[1]** and the heat present in the environment is transferred to the liquid refrigerant causing its evaporation. The low pressure and low temperature refrigerant fluid then returns to the refrigerator compressor **[6]** where it is compressed again and the cycle starts again from the beginning.

In case of low thermal load (use of compressed air at a flow rate lower than the nominal flow rate of the dryer), the excess refrigerant is automatically diverted from the delivery side by the refrigeration compressor **[6]** towards the suction side via the hot gas by-pass valve **[7].**

3.4 Type plate

3.4.1 Type plate of DRYPOINT® RA III 240



3.5 Scope of delivery

Illustration	Description / explanation
	Product **DRYPOINT® RA III**
	Original installation and operation manual

4. Technical data

4.1 Operating parameters

INFORMATION	Nominal conditions
	The nominal condition refers to an ambient temperature of +25 °C (+77.0 °F) with inlet air at 7 bar(g) (101.5 psi(g)) and +35 °C (+95.0 °F).

INFORMATION	Refrigerant quantity
	Refrigerant quantity stated in the following is the design value. The type plate records the actual quantity of refrigerant used in each particular device.

Operating parameters		
Parameter	**Unit**	**Value**
Pressure dew point at nominal conditions	°C (°F)	+3 (+37.4)
Nominal ambient temperature		+25 (+77.0)
Min. ... max. ambient temperature		+1 ... +50 (+33.8 ... +122.0)
Nominal inlet air temperature		+35 (+95.0)
Max. inlet air temperature		+70 (+158.0)
Nominal inlet air pressure	bar(g) (psi(g))	7 (101.5)
Max. inlet air pressure		16 (232.1)
Refrigerant fluid	Type	R513A
	GWP	631
Max. noise level at 1 m	dbA	< 70

4.1.1 DRYPOINT® RA III 20 ... 135

Parameter	Unit	DRYPOINT® RA III					
		20	35	50	70	110	135
Air flow rate at nominal conditions	m^3/h	21	33	51	72	108	138
	l/min	350	550	850	1200	1800	2300
	scfm	12	19	30	42	64	81
Air pressure drop	Bar (psi)	0,03 (0.44)	0,06 (0.87)	0,06 (0.87)	0,11 (1.60)	0,04 (0.58)	0,06 (0.87)
Cooling air fan flow	m^3/h (cfm)	200 (118.7)			300 (176.6)		
Heat rejection	kW (btu/h)	0,56 (1911)	0,88 (3003)	1,20 (4095)	1,70 (5801)	2,60 (8872)	3,30 (11260)
Refrigerant quantity	Kg (oz)	0,14 (5)	0,16 (5.¾)	0,20 (7)	0,24 (8.½)	0,28 (10)	0,35 (12.¼)
Power supply	V/ph/f	230/1/50-60					
Nominal electric consumption @ 50 Hz	kW	0,12	0,19	0,20	0,30	0,32	0,54
	A	0,8	1,3		2,1		3,1
Nominal electric consumption @ 60 Hz	kW	0,13	0,20		0,35	0,37	0,56
	A	0,8	1,2		2,0		2,5
Full load amperage	A	1,0	1,8		3,3		5,3

4.1.2 DRYPOINT® RA III 190 ... 330

Parameter	Unit	DRYPOINT® RA III		
		190	240	330
Air flow rate at nominal conditions	m³/h	186	240	330
	l/min	3100	4000	5500
	scfm	110	141	194
Air pressure drop	bar (psi)	0,05 (0.73)	0,06 (0.87)	0,04 (0.58)
Cooling air fan flow	m³/h (cfm)	380 (223.7)		
Heat rejection	kW (btu/h)	4,40 (15013)	5,70 (19449)	7,60 (25932)
Refrigerant quantity	kg (oz)	0,38 (13.½)	0,45 (15.¾)	0,47 (16.½)
Power supply	V/ph/f	230/1/50-60		
Nominal electric consumption @ 50 Hz	kW	0,55	0,56	0,95
	A	3,1	3,3	8,1
Nominal electric consumption @ 60 Hz	kW	0,60	0,62	0,96
	A	2,7	2,8	4,7
Full load amperage	A	4,8	4,8	8,5

4.1.3 DRYPOINT® RA III 370 ... 630

Parameter	Unit	DRYPOINT® RA III					
		370	490	630	370 3ph	490 3ph	630 3ph
Air flow rate at nominal conditions	m^3/h	372	486	630	372	486	630
	l/min	6200	8100	10500	6200	8100	10500
	scfm	219	286	371	219	286	371
Air pressure drop	bar (psi)	0,05 (0.73)	0,04 (0.58)	0,05 (0.73)	0,05 (0.73)	0,04 (0.58)	0,05 (0.73)
Cooling air fan flow	m^3/h (cfm)	2400 (1412.6)			2500 (1471.4)		
Heat rejection	kW (btu/h)	8,60 (29344)	11,00 (37534)	14,00 (47770)	9,00 (30709)	11,00 (37534)	14,00 (47770)
Refrigerant quantity	kg (oz)	0,80 (28.¼)					
Power supply	V/ph/f	230/1/50			400/3/50		
Nominal electric consumption	kW	1,00	1,40		0,90	1,10	1,90
	A	6,5	11,0	9,8	1,8	2,3	4,2
Full load amperage	A	7,4	11,0	12,2	2,3	2,7	6,5

4.1.4 DRYPOINT® RA III 750 ... 960

Parameter	Unit	DRYPOINT® RA III					
		750	870	960	750 3ph	870 3ph	960 3ph
Air flow rate at nominal conditions	m^3/h	750	870	960	750	870	960
	l/min	12500	14500	16000	12500	14500	16000
	scfm	442	512	565	442	512	565
Air pressure drop	Bar (psi)	0,04 (0.58)	0,05 (0.73)	0,06 (0.87)	0,04 (0.58)	0,05 (0.73)	0,06 (0.87)
Cooling air fan flow	m^3/h (cfm)	2800 (1648.0)			2900 (1706.9)		3500 (2060.0)
Heat rejection	kW (btu/h)	17,00 (58006)	19,00 (64831)	21,00 (71655)	17,00 (58006)	19,00 (64831)	21,00 (71655)
Refrigerant quantity	Kg (oz)	1,30 (45.¾)					
Power supply	V/ph/f	230/1/50			400/3/50		
Nominal electric consumption	kW	1,70	1,80		1,90		
	A	11,0	12,0		4,2		
Full load amperage	A	14,2	16,0		6,5		

4.1.5 DRYPOINT® RA III 750 ... 960, (WC)

Parameter	Unit	DRYPOINT® RA III					
		750 WC	870 WC	960 WC	750 3ph WC	870 3ph WC	960 3ph WC
Air flow rate at nominal conditions	m^3/h	750	870	960	750	870	960
	l/min	12500	14500	16000	12500	14500	16000
	scfm	442	512	565	442	512	565
Air pressure drop	bar (psi)	0,04 (0.58)	0,05 (0.73)	0,06 (0.87)	0,04 (0.58)	0,05 (0.73)	0,06 (0.87)
Cooling water flow @ 30°C	m^3/h (cfm)	0,93 (0.547)	0,94 (0.553)	0,95 (0.559)	0,93 (0.547)	0,94 (0.553)	0,95 (0.559)
Heat rejection	kW (btu/h)	17,00 (58006)	19,00 (64831)	21,00 (71655)	17,00 (58006)	19,00 (64831)	21,00 (71655)
Refrigerant quantity	Kg (oz)	1,90 (67)					
Power supply	V/ph/f	230/1/50			400/3/50		
Nominal electric consumption	kW	1,50	1,60	1,70	1,70		
	A	10,0	11,0		3,3		
Full load amperage	A	13,4	15,8		6,1		

4.2 Correction factors

Corrections factors (CF)														
Parameter	Unit	Value												
Ambient Temp.	°C	≤ +25	+30	+35	+40	+45	+50							
	(°F)	(+77.0)	(+86.0)	(+95.0)	(+104.0)	(+113.0)	(+122.0)							
CF		1,00	0,96	0,91	0,85	0,76	0,64							
Inlet air Temp.	°C	≤ +25	+30	+35	+40	+45	+50	+55	+60	+65	+70			
	(°F)	(+77.0)	(+86.0)	(+95.0)	(+104.0)	(+113.0)	(+122.0)	(+131.0)	(+140.0)	(+149.0)	(+158.0)			
CF		1,48	1,23	1,00	0,82	0,67	0,54	0,46	0,41	0,38	0,36			
Inlet air pressure	bar(g)	4	5	6	7	8	10	12	14	15	16			
	(psi(g))	(58.0)	(72.5)	(87.0)	(101.5)	(116.0)	(145.0)	(174.0)	(203.1)	(217.6)	(232.1)			
CF		0,77	0,86	0,93	1,00	1,05	1,14	1,21	1,27	1,30	1,33			
Dew point	°C	+3	+5	+7	+10									
	(°F)	(+37.4)	(+41.0)	(+44.6)	(+50.0)									
CF		1,00	1,09	1,19	1,37									

4.3 Cooling water parameters, water-cooled models

Parameter	Unit	Value
Min. ... max. water temperature	°C (°F)	+15 ... +30 (+59.0 ... +86.0)
Min. ... max. water pressure	bar(g) (psi(g))	3 ... 10 (43.5 ... 145.0)
Required head pressure	bar (psi)	> 3 (> 43.5)
PH value	-	7,5 ... 9,0
Total hardness	°dH	6.0 ... 15
Conductivity	µS/cm	10 ... 1000
Sulphates (SO_4^{2-})	mg/l or ppm	< 100
Hydrogen carbonate / Sulphates (HCO_3 / SO_4^{2-})		> 1
Ammonia (NH_3)		< 0,5
Manganous ion (Mn^{2+})		< 0.05
Chlorides (Cl^-)		< 50
Free chlorine		< 0,5
Oxygen content		< 0,1
Carbon dioxide (CO_2)		< 50
Hydrogen sulphide (H_2S)		< 0,05
Phosphate (PO_4^{3-})		< 2
Ferric ion (Fe^{3+})		< 0,5

4.4 Storage parameters

Parameter	Unit	DRYPOINT® RA III					
		20	35	50	70	110	135
Min. ... max. temperature	°C (°F)	+1 ... +50 (+33.8 ... +122.0)					
Relative humidity	%	Max 80% without condensation					
Weight	kg (lbs)	27 (60)	28 (62)	29 (64)	33 (73)	37 (82)	40 (88)

Parameter	Unit	DRYPOINT® RA III					
		190	240	330	370	490	630
Min. ... max. temperature	°C (°F)	+1 ... +50 (+33.8 ... +122.0)					
Relative humidity	%	Max 80% without condensation					
Weight	Kg (lbs)	51 (112)	52 (115)	59 (130)	91 (201)	104 (229)	110 (243)

Parameter	Unit	DRYPOINT® RA III					
		370 3ph	490 3ph	630 3ph	750	870	960
Min. ... max. temperature	°C (°F)	+1 ... +50 (+33.8 ... +122.0)					
Relative humidity	%	Max 80% without condensation					
Weight	Kg (lbs)	111 (245)	124 (273)	130 (287)	183 (403)	183 (403)	184 (406)

Parameter	Unit	DRYPOINT® RA III					
		750 3ph	870 3ph	960 3ph	750 WC	870 WC	960 WC
Min. ... max. temperature	°C (°F)	+1 ... +50 (+33.8 ... +122.0)					
Relative humidity	%	Max 80% without condensation					
Weight	Kg (lbs)	203 (448)	203 (448)	204 (450)	195 (430)	195 (430)	196 (432)

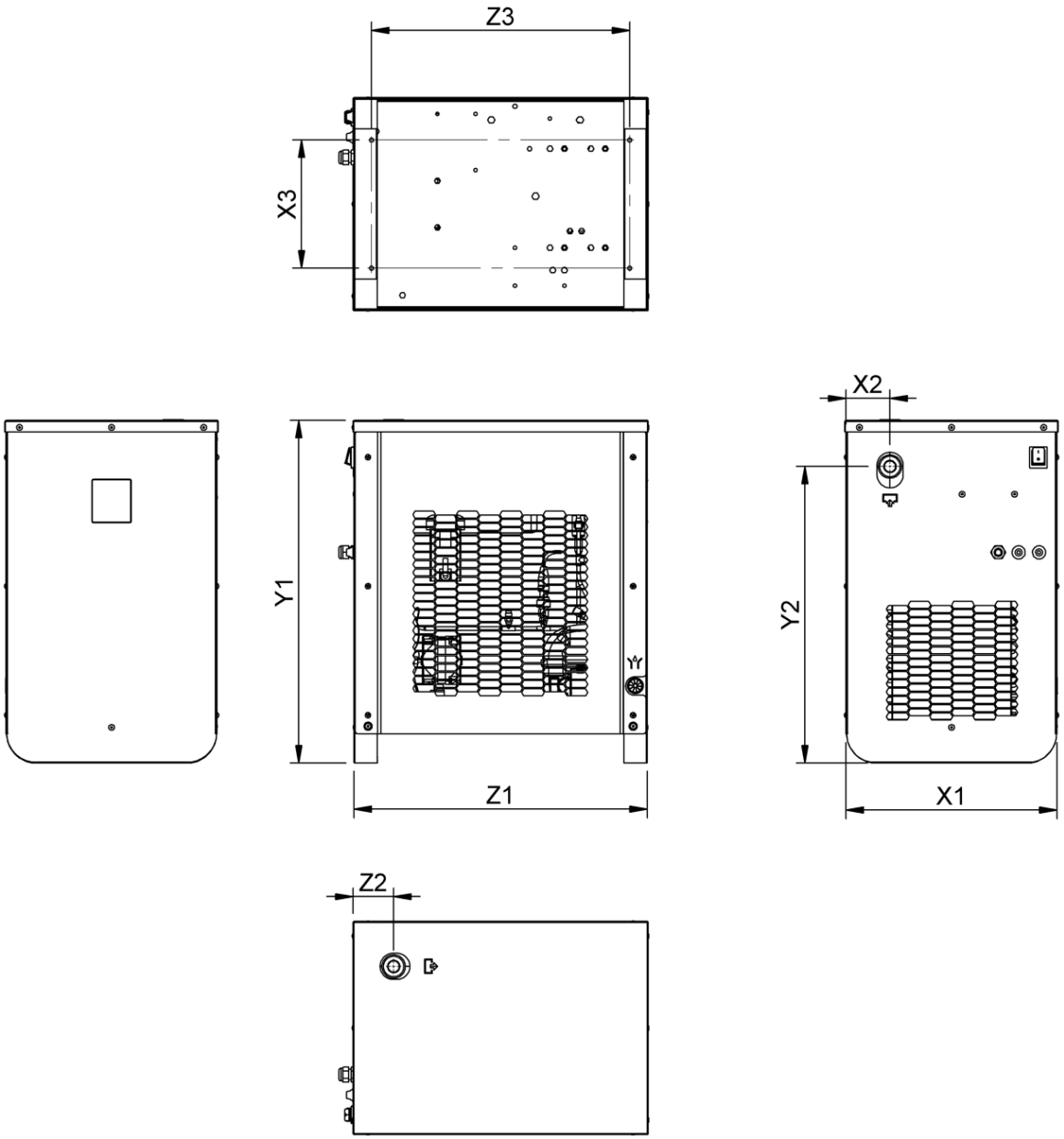
Parameter	Unit	DRYPOINT® RA III		
		750 3ph WC	870 3ph WC	960 3ph WC
Min. ... max. temperature	°C (°F)	+1 ... +50 (+33.8 ... +122.0)		
Relative humidity	%	Max 80% without condensation		
Weight	Kg (lbs)	215 (474)	215 (474)	216 (476)

4.5 Materials

Component	Material
Housing and supports	Structural steel, epoxy paint
Refrigerant compressor	Steel, copper, aluminium, oil
Heat exchanger	Aluminium
Condenser	Aluminium, copper, structural steel
Pipes	Copper
Fan	Aluminium, copper, steel
Valves	Brass, steel
BEKOMAT® condensate drain	Aluminium, plastic mix and electronics
Insulant material	Synthetic rubber, polystyrene, polyurethane
Electronic Control Unit	Plastic mix and electronics
Electric cables, electric parts	Copper, brass, PVC, plastic mix

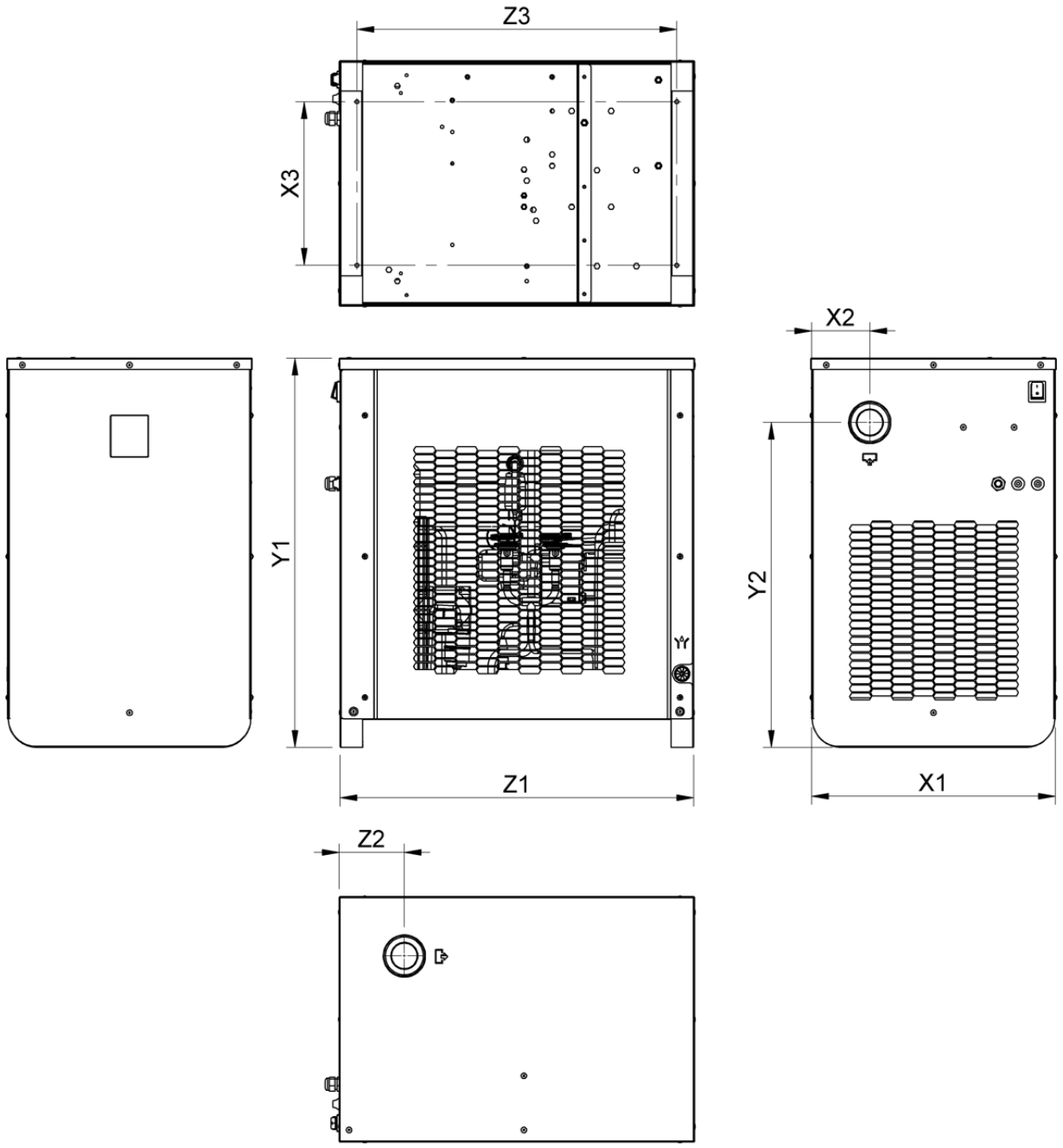
4.6 Dimensions

4.6.1 DRYPOINT® RA III 20 ... 135



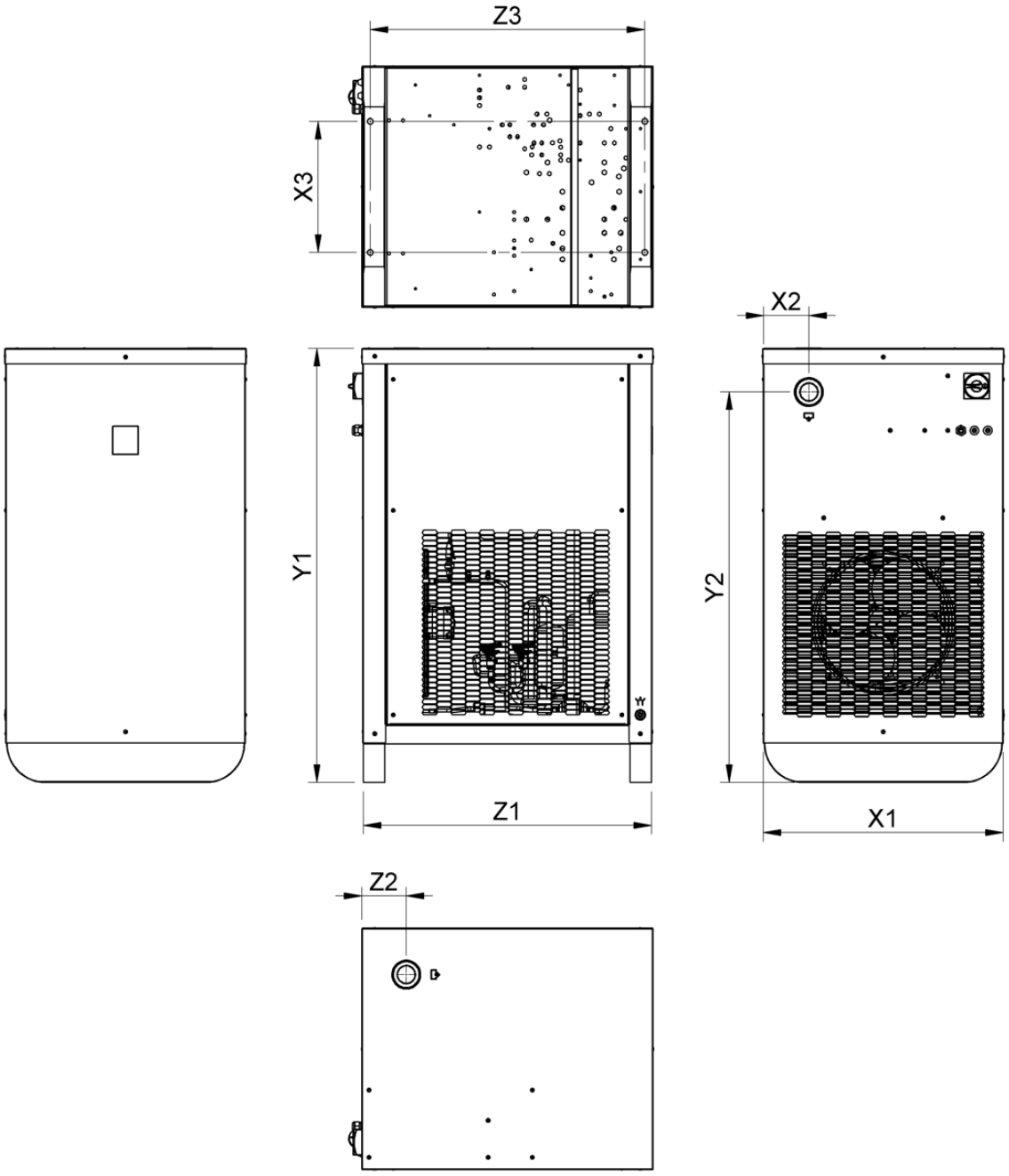
Pos. No.	Unit	DRYPOINT® RA III					
		20	35	50	70	110	135
[X1]	mm (in)	365 (14.37)					
[X2]		75 (2.95)				86 (3.39)	
[X3]		220 (8.66)					
[Y1]		590 (23.23)					
[Y2]		510 (20.08)		495 (19.49)			
[Z1]		505 (19.88)					
[Z2]		70 (2.76)		75 (2.95)			
[Z3]		443 (17.44)					

4.6.2 DRYPOINT® RA III 190 ... 330



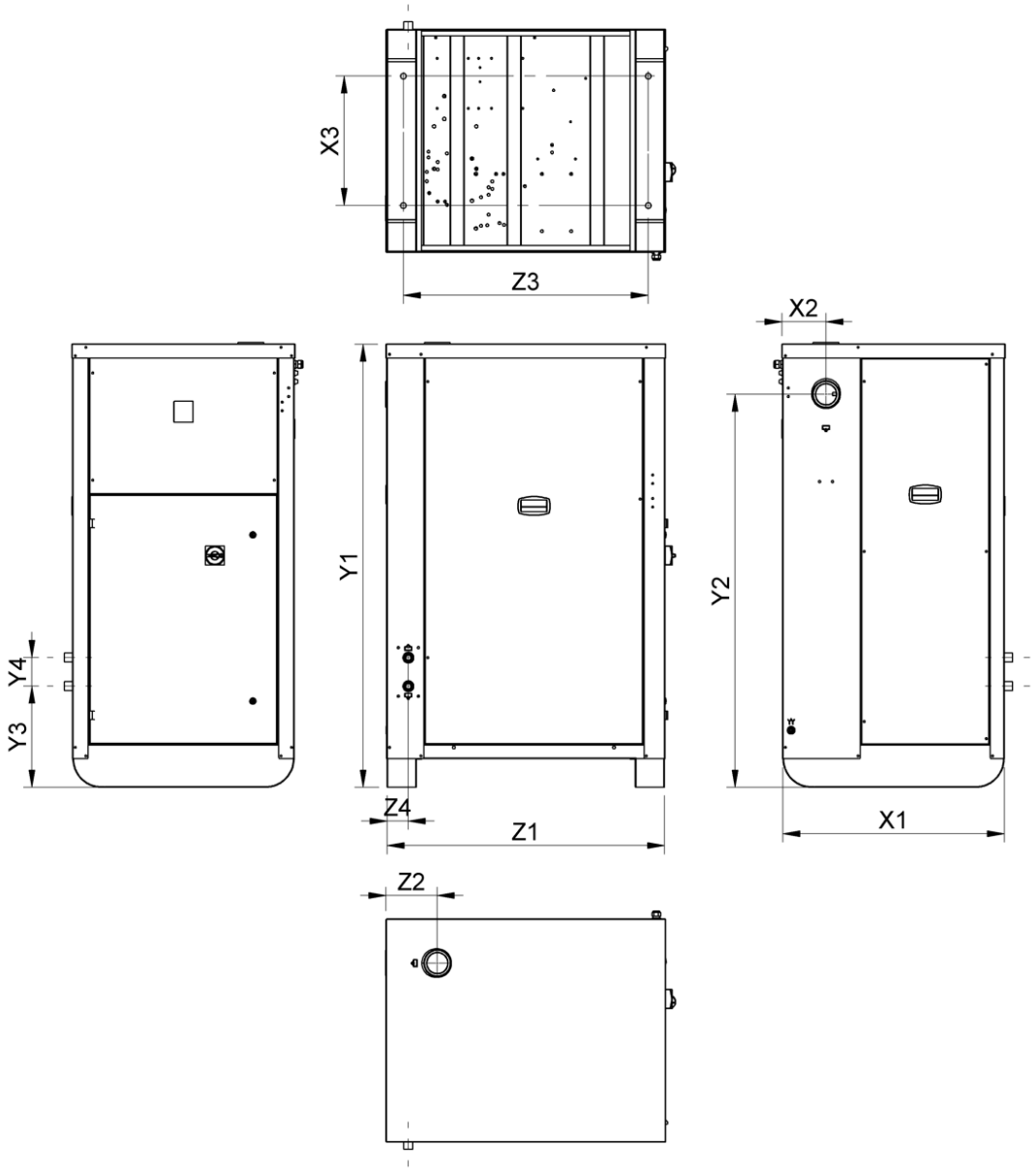
Pos. No.	Unit	DRYPOINT® RA III		
		190	240	330
[X1]	mm (in)	432 (17.00)		
[X2]		85 (3.35)		103 (4.06)
[X3]		290 (11.42)		
[Y1]		690 (27.17)		
[Y2]		580 (22.83)		575 (22.64)
[Z1]		630 (24.80)		
[Z2]		112 (4.41)		115 (4.53)
[Z3]		567 (22.32)		

4.6.3 DRYPOINT® RA III 370 ... 630



Pos. No.	Unit	DRYPOINT® RA III		
		370	490	630
[X1]	mm (in)	625 (24.61)		
[X2]		118 (4.65)	135 (5.31)	
[X3]		340 (13.39)		
[Y1]		1130 (44.49)		
[Y2]		1018 (40.08)	955 (37.60)	
[Z1]		755 (29.72)		
[Z2]		115 (4.53)	176 (6.93)	
[Z3]		715 (28.15)		

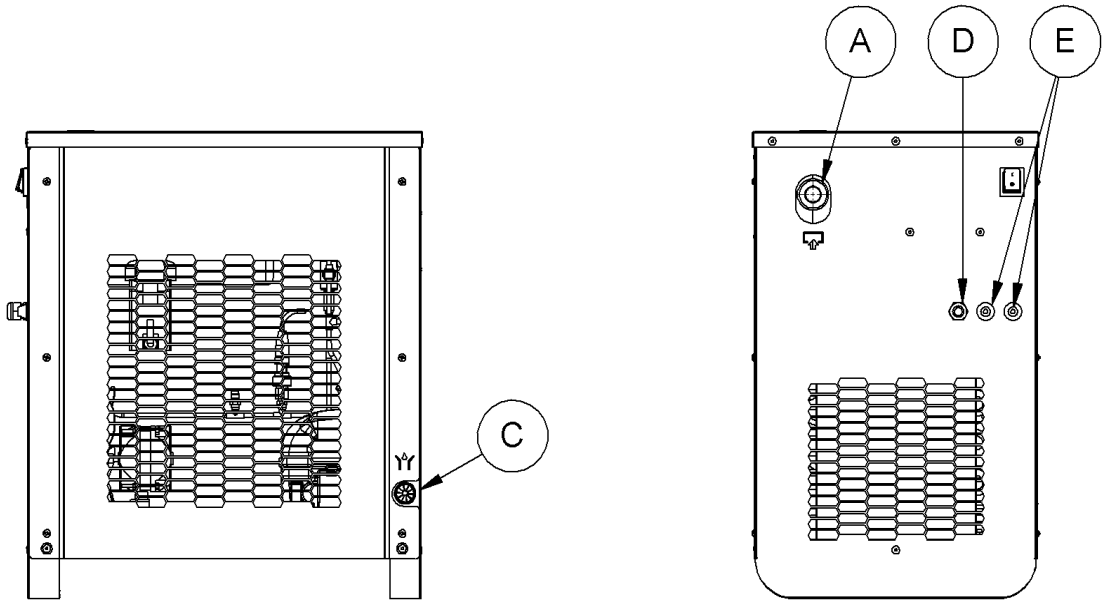
4.6.4 DRYPOINT® RA III 750 ... 960

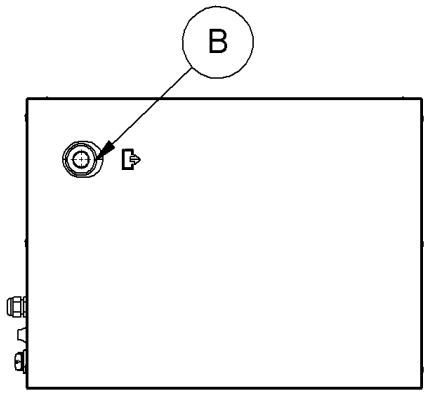


Pos. No.	Unit	DRYPOINT® RA III		
		750	870	960
[X1]	mm (in)	775 (30.51)		
[X2]		150 (5.91)		
[X3]		453 (17.83)		
[Y1]		1550 (61.02)		
[Y2]		1375 (54.13)		
[Y3]		354 (13.94)		
[Y4]		100 (3.94)		
[Z1]		975 (38.39)		
[Z2]		178 (7.01)		
[Z3]		856 (33.70)		
[Z4]		75 (2.95)		

4.7 Connections

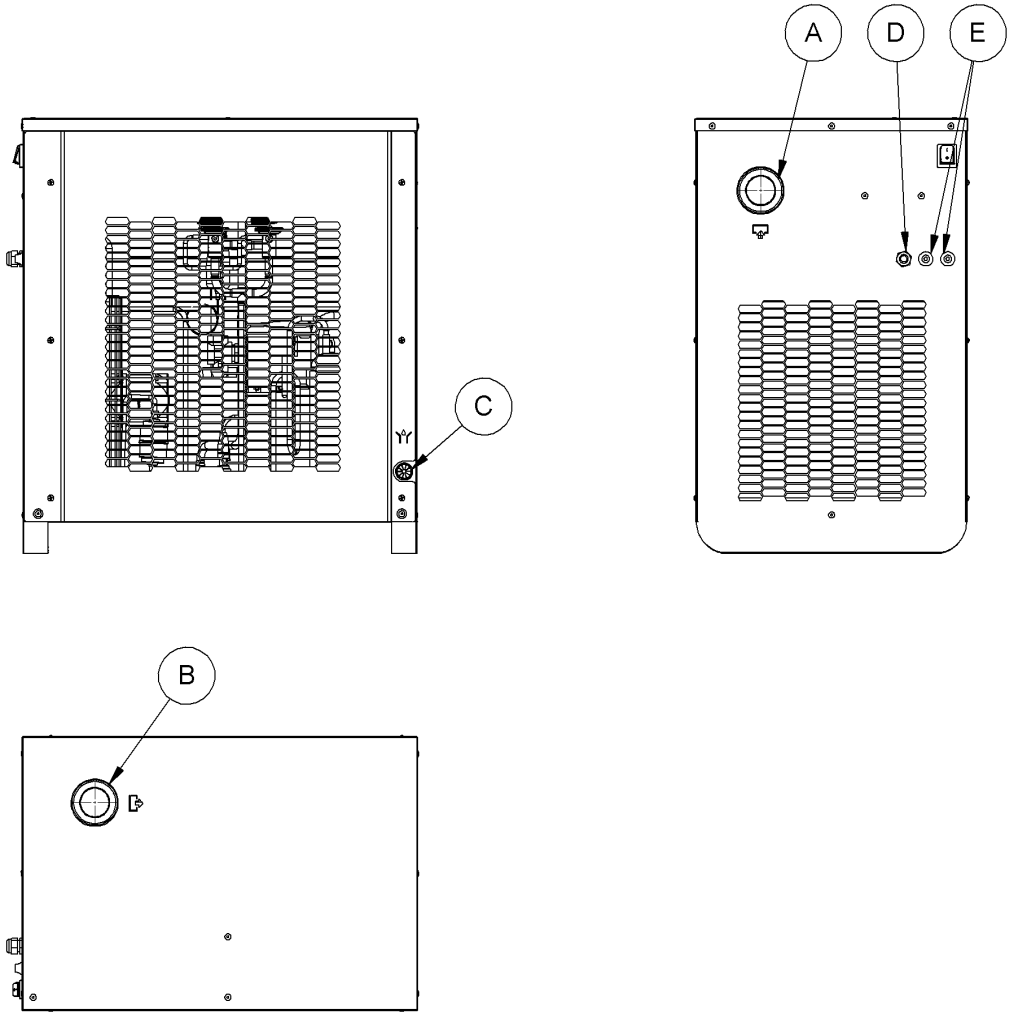
4.7.1 DRYPOINT® RA III 20 ... 135





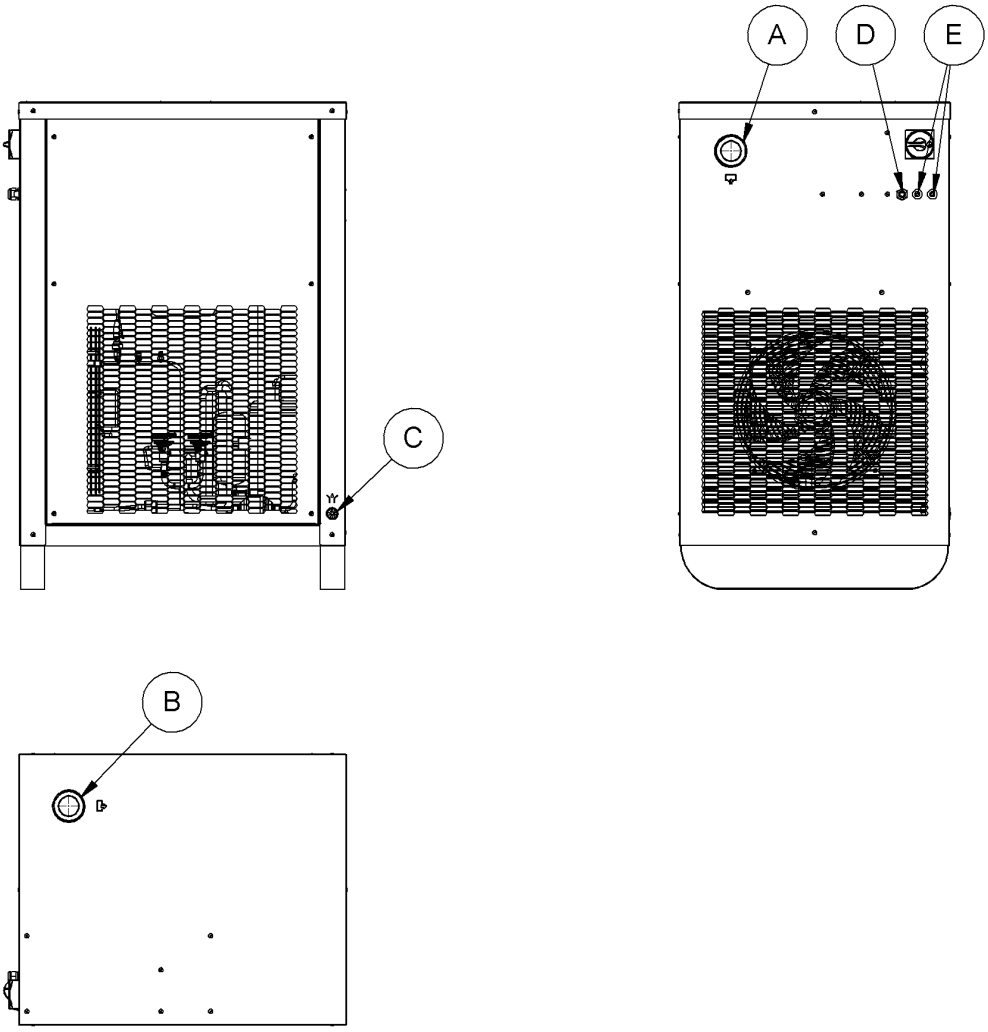
DRYPOINT® RA III	Pos. No.	Connection	Description / explanation
20 ... 70	**[A]**	G ½”	Sleeve connection, connection for compressed air inlet
	[B]	G ½”	Sleeve connection, connection for compressed air outlet
110, 135	**[A]**	G 1”	Sleeve connection, connection for compressed air inlet
	[B]	G 1”	Sleeve connection, connection for compressed air outlet
20 ... 135	**[C]**	8 mm (0.31 in)	Rubber hose, connection for condensate outlet
	[D]	-	Cable with plug, connection for external power supply
	[E]	PG 11	Rubber grommets, connection for auxiliary wiring

4.7.2 DRYPOINT® RA III 190 ... 330



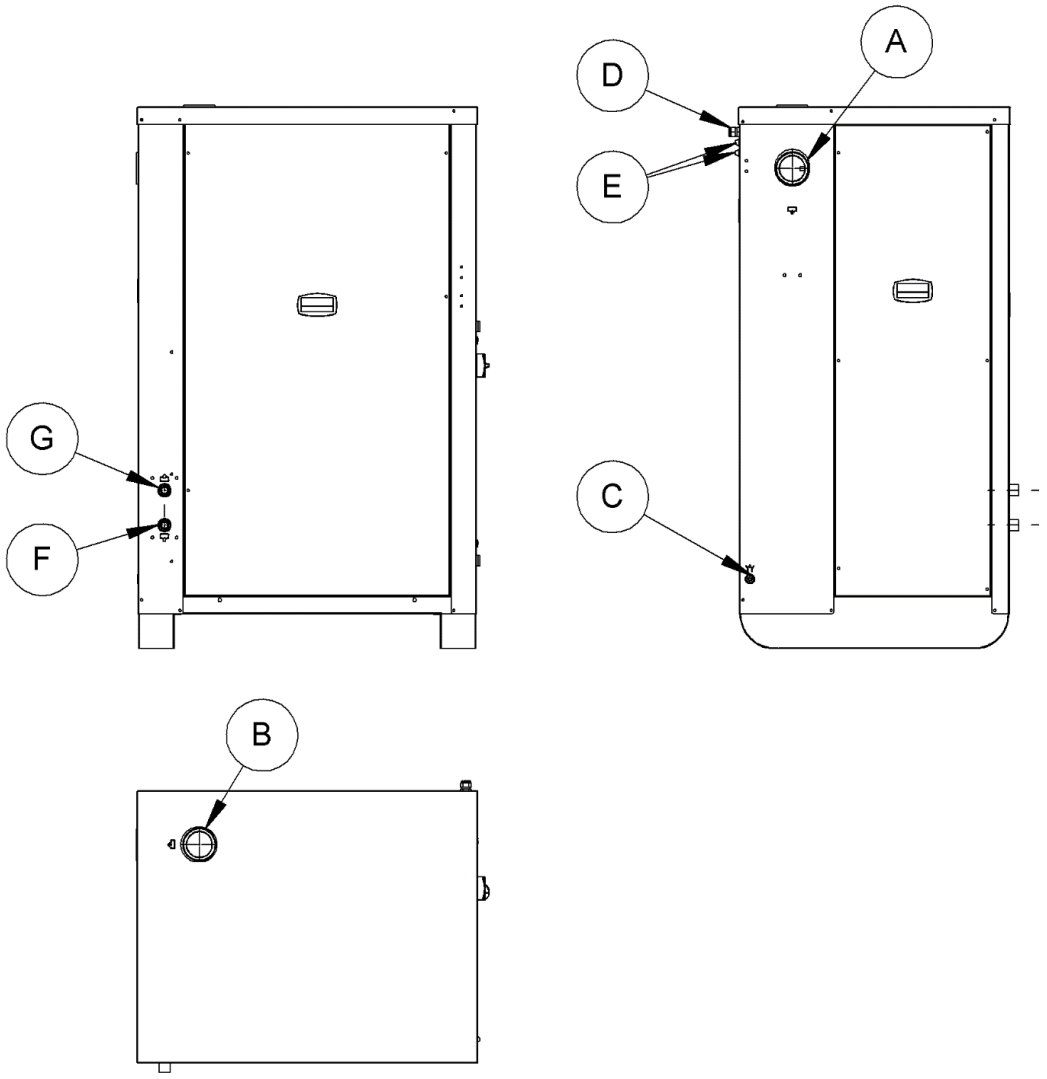
DRYPOINT® RA III	Pos. No.	Connection	Description / explanation
190, 240	**[A]**	G 1 ¼”	Sleeve connection, connection for compressed air inlet
	[B]	G 1 ¼”	Sleeve connection, connection for compressed air outlet
330	**[A]**	G 1 ½”	Sleeve connection, connection for compressed air inlet
	[B]	G 1 ½”	Sleeve connection, connection for compressed air outlet
190 ... 330	**[C]**	8 mm (0.31 in)	Rubber hose, connection for condensate outlet
	[D]	-	Cable with plug, connection for external power supply
	[E]	PG 11	Rubber grommets, connection for auxiliary wiring

4.7.3 DRYPOINT® RA III 370 ... 630



DRYPOINT® RA III	Pos. No.	Connection	Description / explanation
370	**[A]**	G 1 ½”	Sleeve connection, connection for compressed air inlet
	[B]	G 1 ½”	Sleeve connection, connection for compressed air outlet
490, 630	**[A]**	G 2”	Sleeve connection, connection for compressed air inlet
	[B]	G 2”	Sleeve connection, connection for compressed air outlet
370 ... 630	**[C]**	8 mm (0.31 in)	Rubber hose, connection for condensate outlet
	[D]	-	1ph+N models: cable with plug, connection for external power supply
		PG 13,5	3ph models: cable gland, connection for external power supply
	[E]	PG 11	Rubber grommets, connection for auxiliary wiring

4.7.4 DRYPOINT® RA III 750 ... 960



DRYPOINT® RA III	Pos. No.	Connection	Description / explanation
750 ... 960	[A]	G 2 ½”	Sleeve connection, connection for compressed air inlet
	[B]	G 2 ½”	Sleeve connection, connection for compressed air outlet
	[C]	8 mm (0.31 in)	Rubber hose, connection for condensate outlet
	[D]	-	1ph+N models: cable with plug, connection for external power supply
		PG 13,5	3ph models: cable gland, connection for external power supply
	[E]	PG 11	Rubber grommets, connection for auxiliary wiring
	[F]	G ¾”	Sleeve connection, connection for cooling water inlet, water-cooled models
	[G]	G ¾”	Sleeve connection, connection for cooling water outlet, water-cooled models

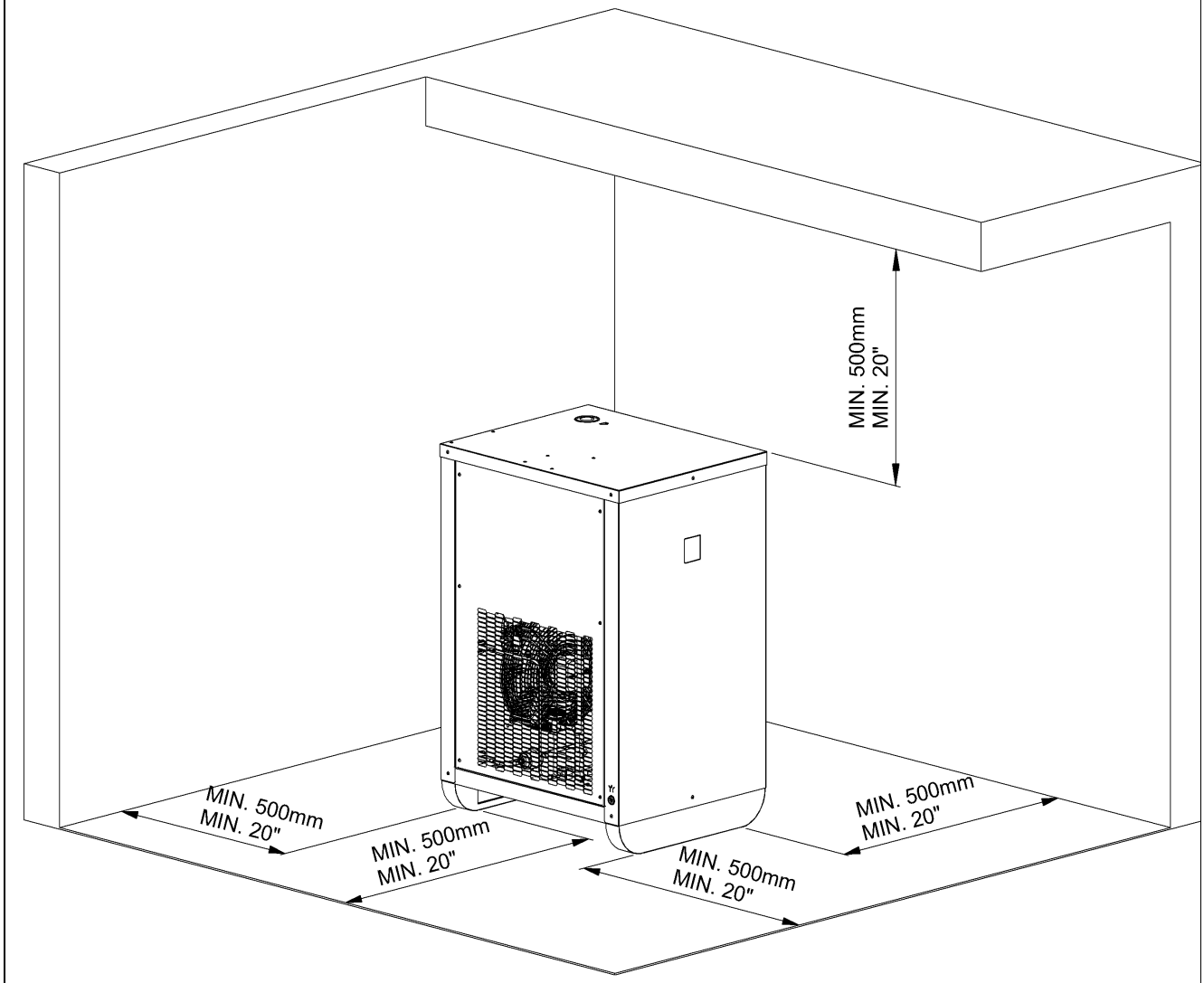
4.8 Assembly conditions

Observe the following conditions when setting up and selecting the place of installation:

- The place of installation is clean and dry, protected from direct sunlight, rain, frost, sources of heat and fire. Unlimited exchange of air and sufficient ventilation is guaranteed, refer to section “4.8.1 Minimum distance from adjacent structures” on page 54.
- The place of installation has sufficient space for all actions at the product, e.g. assembly and maintenance.
- The set-up area is level, smooth and suitable to bear the weight of the product.
- Sealed set-up area or spill protection basin are available. In the event of damage, no untreated condensate or oil may get into the sewer system or the soil.
- A customer-side compressed air supply line is available.
- A customer-side condensate collection line is available.
- A customer-side 1ph+N+E / 3ph+E power supply line is available.
- A customer-side cooling water line is available for water-cooled models. Cooling water meets the requirements specified in section “4.3 Cooling water parameters, water-cooled models” on page 41.

4.8.1 Minimum distance from adjacent structures

Illustration



5. Transport and storage

5.1 Warning notices

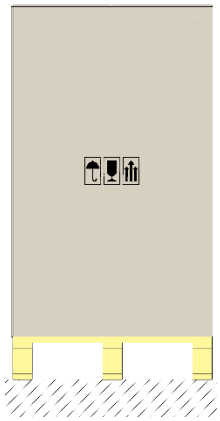
WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in transport and storage.

CAUTION	Inappropriate transport or storage
	Inappropriate transport or storage may result in personal injury or damage to property.
	• Use personal protective equipment during all work with packaging material. • Handle the packaging, product and accessories with care. • Pack all parts impact-proof using suitable material. • Transport and handle the packaging according to the markings (note lifting gear attachment points, the centre of gravity and alignment e.g. keep vertical, do not throw, etc.). • Only use proper means of transport and lifting equipment that is in proper working order. • Always adhere to the permissible transport and storage parameters. • Store the product and accessories only outside of areas exposed to direct sunlight and heat sources.

NOTE	Handling packaging material
	Inappropriate disposal of packaging materials can cause environmental damage.
	• Dispose of the packaging material in accordance with the applicable legal requirements and provisions of the country and place of use.

5.2 Transport

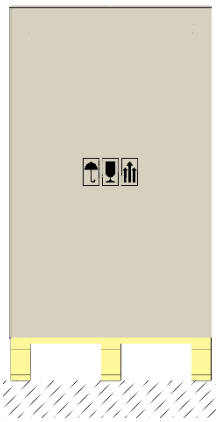
NOTE	Incorrect handling of the product
	Damage to product will occur if laid on its side or placed upside down during the transport. Heavy blows will cause irreparable damage.
	• Transport the product with care, in an upright position and do not tilt it.

Transport work	
Illustration	**Description / explanation**
	• Only transport the product and accessories in their original and undamaged packaging. • Use a suitable trolley or a forklift truck to move the packaged product and accessories.

5.3 Storage

NOTE	Incorrect storage of the product
	Damage to product will occur if laid on its side or placed upside down.
	• Only store the product in an upright position.

NOTE	Long term storage
	After a long storage period the components and the functioning of the device must be checked by the manufacturer.
	• Contact the manufacturer if storage period exceeds 12 months.

Storage work	
Illustration	**Description / explanation**
	• Only store the product and accessories in their original and undamaged packaging. • Adhere to the storage conditions in section “4.4 Storage parameters” on page 42. • The storage location is dry, frost-free and lockable. • Protect against external influences of the weather, direct sunlight, and sources of heat. • Secure against falling over and protect against vibrations.

6. Assembly

6.1 Warning notices

DANGER	Use of incorrect spare parts, accessories or materials
	Use of the incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunctions and device failure as well as material damage can occur.
	• Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work. • Only use the materials approved for the respective application and suitable tools in proper working order. • Only use pipes that are free of dirt, damage and corrosion.

DANGER	Pressurised system
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurise the pressurised system and secure it against unintentional pressurisation. • Set up a safety area around the working area during assembly, installation, maintenance and repair work. • Assemble all pipes and hoses free of mechanical stress.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in pressure equipment and systems.

WARNING	Inappropriate assembly
	Inappropriate assembly of the product and the accessories can lead to personal injury and damage to property and/or impaired operation.
	• Assemble the product and all the parts, accessories and materials used free from mechanical stress. • Fix hoses in such a way that they do not flap around.

6.2 Assembly work

For assembly work to be carried out, the following protective equipment must be always worn and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Preparatory tasks	
1.	Select and set up the place of installation according to the specifications in section “4.8 Assembly conditions” on page 53.
2.	The compressed air supply line, the condensate collection line, the cooling water line provided by the customer are pressureless and secured against unintentional pressure build up.
3.	Have the necessary tools and materials ready.
4.	Prepare the required connection materials suitable for the pressure and temperature range.
5.	Check the product for damage, only use the product in an undamaged state.
6.	The section “4.7 Connections” on page 49 was read and applied.

Assembly work	
1.	Align the product in such a way that the User Interface is easy visible and all connection elements are easy accessible.
2.	Fix the product to the floor, if necessary.
3.	Compressed air: connect the threaded connection to the compressed air line.
4.	Cooling water, water-cooled models: connect the threaded connection to the cooling water line.
5.	Condensate drain: connect the condensate drain hose to the drain collection line.
6.	Install collision protection, if necessary.

7. Electrical installation

7.1 Warning notices

DANGER	Use of incorrect spare parts, accessories or materials
	Use of the incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunctions and device failure as well as material damage can occur.
	• Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work. • Only use the materials approved for the respective application and suitable tools in proper working order. • Only use electric components and materials that comply with regionally applicable specifications and regulations for electrical safety.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage. Malfunction and device failure as well as material damage can occur.
	• Only carry out installation, maintenance and repair work on the product and accessories when they have been disconnected and secured against being switched back on again unintentionally. • Set up a safety area around the working area during assembly, installation, maintenance and repair work. • Comply with all regionally applicable regulations and requirements during installation. • Provide a circuit breaker in the power supply within easy reach of the product. The circuit breaker disconnects all current-carrying conductors. • Connect the protective conductor (earth connection) according to regulations.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in electrical engineering.

WARNING	Inappropriate electrical installation
	Improper electrical installation of the product and the accessories can lead to personal injury and damage to property as well as impairments in operation.
	• Check all plug-type connections for a correct fit. • Avoid stumbling hazard through appropriate cable routing. • Avoid mechanical strain on the cables.

WARNING	Ingress of moisture or foreign bodies
	Removing components or opening the product may allow water or foreign bodies to enter the opened product. Ingress of water or foreign bodies can lead to accidents, personal injury and damage to property as well as impairments in operation.
	• Protect the product from splashing water or moisture. • Only open the product or remove components in a dry place. • Do not insert any foreign bodies into openings of the product. • Keep all contact surfaces and openings free of dirt and moisture.

7.2 Connection work

For electrical installation work to be carried out, the following protective equipment must be always worn and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Preparatory tasks	
1.	1ph+N models: A protective contact socket is installed within reach of the place of installation.
2.	3ph models: A protective contact socket or a terminal box is installed within reach of the place of installation.
3.	Fusing of protective contact socket / terminal box is correctly dimensioned for the power consumption.
4.	Assembly of the product is complete.
5.	**ON-OFF** switch of the product is in **OFF** position.
6.	Have the necessary tools and materials ready.
7.	3ph models: a power cable correctly dimensioned for the power consumption of the product and with a suitable length is ready and available.
8.	The section “4.7 Connections” on page 49 was read and applied.

7.2.1 1ph+N external power supply

Connection work	
1.	Guide the power cable up to the protective contact socket.
2.	Plug the protective contact plug into the protective contact socket.
3.	Make sure that power cable is free of mechanical stress and mechanically protected.

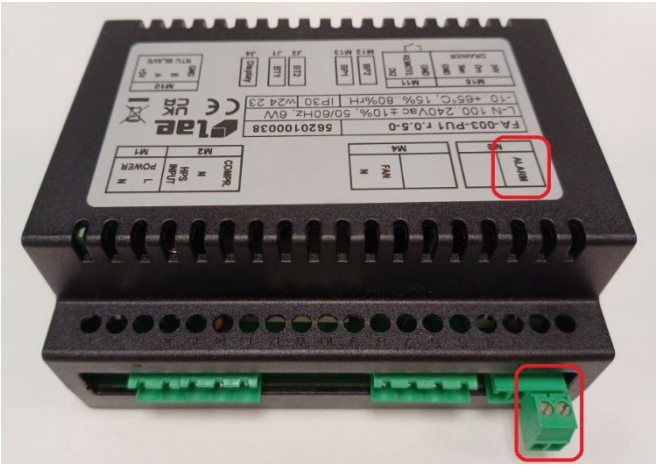
7.2.2 3ph external power supply

NOTE	Wrong phase sequence
	Incorrect phase sequence L1, L2, L3 will cause following malfunctions: • **DRYPOINT® RA III 370, 490**, the wrong rotation direction of the cooling fan. • **DRYPOINT® RA III 630 ... 960**, the lack of starting of the refrigerant compressor.
	• Phases L1, L2, L3 must be connected to the device with correct phase sequence.

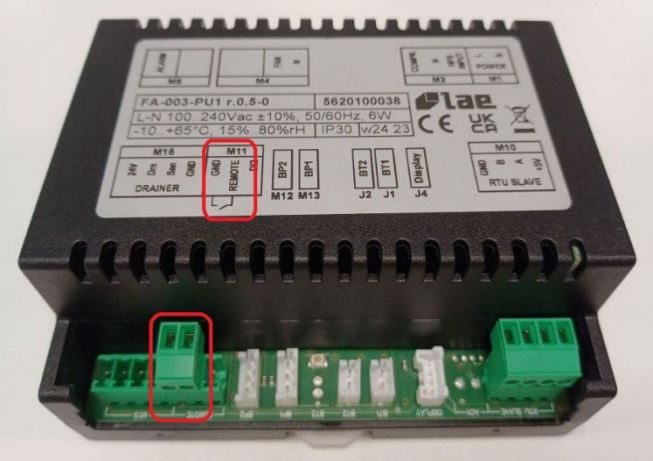
Connection work	
1.	Guide the power cable through the arranged cable gland on the product.
2.	Product side: Connect the cable to terminals L1, L2, L3, EARTH.
3.	Plant side: connect the cable to the protective contact socket / terminal box.
4.	Make sure that power cable is free of mechanical stress and mechanically protected.

7.2.3 WARNING / ALARM, digital output signal

NOTE	WARNING / ALARM digital output failure
	The WARNING / ALARM contact is a potential-free contact. Using the contact with unsuitable voltages and currents will cause its failure.
	• The WARNING / ALARM contact must only be used with very low safety voltage (SELV) 30Vdc / 1A max.

Connection work	
Illustration	**Description / explanation**
	1. Guide a two-wires signal cable through the arranged rubber grommet on the product. 2. Product side: connect the cable to the connector M8 ALARM of Electronic Control Unit. 3. Plant side: connect the cable to the supervisory system of the plant. 4. Make sure that power cable is free of mechanical stress and mechanically protected.

7.2.4 Remote START-STOP, digital input signal

Connection work	
Illustration	**Description / explanation**
	1. Guide a two-wires signal cable through the arranged rubber grommet on the product. 2. Product side: Connect the cable to the connector M11 REMOTE/GND of Electronic Control Unit. 3. Plant side: connect the cable to the supervisory system of the plant. 4. Make sure that power cable is free of mechanical stress and mechanically protected.

7.2.5 Remote management, Modbus RTU data signal

INFORMATION	Modbus RTU installation and configuration
	For further information on the Modbus RTU installation and configuration, refer to the section “1.3 Other applicable documents” on page 7.

8. Commissioning

8.1 Warning notices

DANGER	Operation outside the permissible limit range
	Operation of the product or accessories outside the permissible limits and operating parameters, unauthorised intervention and modifications may result in death or serious injury.
	• Adhere to the limits and operating parameters specified on the type plate and in the manual. • Check whether the operating parameters have been amended or restricted by the use of accessories.

DANGER	Pressurised system
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before pressurisation, check all system pipe connections for leak tightness and tighten if necessary. • Slowly pressurise the system. • Avoid pressure blows and high differential pressures.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage. Malfunction and device failure as well as material damage can occur.
	• Only operate the product and accessories with the cover complete and closed and the electronics housing closed. • Check the product and accessories before commissioning in accordance with the locally applicable legal requirements and regulations.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in pressure equipment and systems and skilled technical personnel specializing in electrical engineering.

8.2 Initial commissioning

For initial commissioning work to be carried out, the following protective equipment must be always worn and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Preparatory tasks	
1.	Assembly of the product is complete.
2.	Compressed air inlet/outlet valves are closed.
3.	Electrical installation of the product is complete.
4.	The section “3.1 Product overview” on page 18 was read and applied.
5.	The condensate drain service valve is open.
6.	The section “3.2 User Interface” on page 29 was read and applied.

8.2.1 1ph+N models

NOTE	Refrigerant compressor failure
	Start and stop the device too often could damage the refrigerant compressor in an unrepairable way.
	• Wait at least 5 minutes between a stop and a new start. • Start / stop actions on the device must be limited to 6 times an hour.

INFORMATION	Dew point value
	A dew point between 0 °C (+32 °F) and +10 °C (+50 °F) displayed on the User Interface is considered to be correct according to the possible operating conditions e.g. flow rate, air inlet temperature, ambient temperature, etc.

Commissioning work	
1.	Establish the mains supply.
2.	Power the product acting on the **ON-OFF** switch. Refer to section “3.1 Product overview” on page 18.
3.	Start the product pushing for 3 seconds the **START-STOP** button on the User Interface. Refer to section “3.2 User Interface” on page 29.
4.	Check the power consumption complies with the values engraved on the type plate.
5.	Wait for the cooling fan to run.
6.	Wait until the dew point value displayed on the User Interface is stable. Refer to section “3.2 User Interface” on page 29.
7.	Establish the compressed air supply.
8.	Slowly open the air inlet valve.
9.	Slowly open the air outlet valve.
10.	Check the air connections for air leakage.
11.	Wait for the condensate drain to works.
12.	Check the condensate drain works correctly.

8.2.2 3ph models

NOTE	Refrigerant compressor failure
	Starting the product with the refrigeration compressor oil still cold can irreparably damage the refrigeration compressor.
	• Wait at least 2 hours before starting the product.

NOTE	Refrigerant compressor failure
	Start and stop the product too often could damage the refrigerant compressor in an unrepairable way.
	• Wait at least 5 minutes between a stop and a new start. • Start / stop actions on the device must be limited to 6 times an hour.

INFORMATION	Dew point value
	A dew point between 0 °C (+32 °F) and +10 °C (+50 °F) displayed on the User Interface is considered to be correct according to the possible operating conditions, e.g. flow rate, air inlet temperature, ambient temperature, etc.

INFORMATION	Short-term inactivity
	During short-term inactivity, max. 2 / 3 days, it is advisable to leave the product connected to the power supply and leave **ON** the **ON-OFF** switch.

Commissioning work	
1.	Establish the mains supply.
2.	Power the product acting on the **ON-OFF** switch. Refer to section "3.1 Product overview" on page 18.
3.	Wait 2 hours to allow the heat up of oil of refrigerant compressor.
4.	Water-cooled models: establish the cooling water supply.
5.	Water-cooled models: check the regular water flow in the water circuit.
6.	Start the product pushing for 3 seconds the **START-STOP** button on the User Interface. Refer to section "3.2 User Interface" on page 29.
7.	**DRYPOINT® RA III 630 ... 960**, if the refrigerant compressor does not start, stop the commissioning work and refer to section "7.2.2 3ph external power supply" on page 63.
8.	Check the power consumption complies with the values engraved on the type plate.
9.	Wait for the cooling fan to run.
10.	**DRYPOINT® RA III 370, 490**: check the direction of air flow generated by the cooling fan. The air flow must enter the device from the protection grid of the condenser. If the air flows in the opposite direction, stop the commissioning work and refer to section "7.2.2 3ph external power supply" on page 63.
11.	Wait until the dew point value displayed on the User Interface is stable. Refer to section "3.2 User Interface" on page 29.
12.	Establish the compressed air supply.
13.	Slowly open the air inlet valve.
14.	Slowly open the air outlet valve.
15.	Check the air connections for air leakage.
16.	Wait for the condensate drain to works.
17.	Check the condensate drain works correctly.

9. Operation

9.1 Warning notices

DANGER	Operation outside the permissible limit range
	Operation of the product or accessories outside the permissible limits and operating parameters, unauthorised intervention and modifications may result in death or serious injury.
	• Adhere to the limits and operating parameters specified on the type plate and in the manual. • Observe the assembly conditions and the ambient conditions. • Check whether the operating parameters have been amended or restricted by the use of accessories. • Adhere to the maintenance intervals.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage. Malfunction and device failure as well as material damage can occur.
	• Only operate the product and accessories with the cover complete and closed and the electronics housing closed.

NOTE	Operating personnel
	Insufficient knowledge of the product and the accessories can lead to damage to property and the environment as well as impair operation.
	• The product and accessories may only be operated and used by qualified operating personnel.

9.2 Daily operating checks

With the product in normal running condition, every day check the:

- Stability of dew point value.
- Functioning of condensate drain.
- Cleanliness of the condenser.
- Cyclical run/stop of the cooling fan.
- Noiseless of normal running condition.

9.3 Operate on the User Interface

For operation of the product, the preparatory tasks must have been completed.

Preparatory tasks	
1.	The procedure on section “8 Commissioning” on page 66 was carried out.
2.	The product is switched **ON** and started.
3.	Compressed air flows into the air circuit.
4.	Water-cooled models: cooling water flows into the water circuit.
5.	The condensate is regularly discharged.
6.	The section “3.2 User Interface” on page 29 was fully read and applied.

INFORMATION	Callouts
	All callouts **[L#]** and **[B#]** mentioned in the following are referred to the section “3.2 User Interface” on page 29.

9.3.1 Normal running status

INFORMATION	Dew point value
	A dew point between 0 °C (+32 °F) and +10 °C (+50 °F) displayed on the User Interface is considered to be correct according to the possible operating conditions, e.g flow rate, air inlet temperature, ambient temperature, etc.

INFORMATION	Refrigerant compressor running
	During the normal running status, the refrigerant compressor runs continuously. The product must remain started during the entire compressed air usage time, even if the air compressor works periodically.

Illustration	Description / explanation
	**Normal running status** • Status LED **HOME [L8]** is lit. • Status LED **REFRIGERANT COMPRESSOR [L11]** is lit. • Status LED **TEMPERATURE** °C **[L5]** is lit. • **MAIN** display **[L1]** shows the dew point temperature. • **SECONDARY** display **[L2]** shows **PdP** • If the cooling fan is running, the status LED **COOLING FAN [L12]** is lit.

9.3.2 Stopping and starting

NOTE	Refrigerant compressor failure
	Start and stop the product too often could damage the refrigerant compressor in an unrepairable way.
	• Wait at least 5 minutes between a stop and a new start. • Start / stop actions on the device must be limited to 6 times an hour.

Illustration	Description / explanation
	**Stopping the device** Status LED **HOME [L8]** is lit. Press and hold the **START-STOP** button **[B1]** for 3 seconds. → The device stops. → **MAIN** display **[L1]** shows **oFF**
	**Starting the device** Status LED **HOME [L8]** is lit. Press and hold the **START-STOP** button **[B1]** for 3 seconds. → The device starts. → Status LED **COMPRESSOR [L11]** is lit. → Status LED **TEMPERATURE** °C **[L5]** is lit. → **MAIN** display **[L1]** shows the dew point value. → **SECONDARY** display **[L2]** shows **PdP**.

9.3.3 Condensate drain test

INFORMATION	Condensate drain test
	The condensate drain test can be performed at any time, regardless the status of the device and any display indication.

Illustration	Description / explanation
	Condensate drain test Status LED HOME [L8] is lit. 1. Press and hold the **CONDENSATE DRAIN TEST** button **[B7]**. → Status LED **CONDENSATE DRAIN [L15]** is lit. 2. Release the button to stop the test.

9.3.4 Live data

Code	Description / explanation
	**t1** – Dew point temperature
	**t2** – Temperature of refrigerant fluid detected on discharge side of compressor
	**LP** – Pressure of refrigerant fluid detected on suction side of compressor
	**HP** – Pressure of refrigerant fluid detected on discharge side of compressor
	**HrS** – Working hours of the device
	**SrV** – Hours remaining to next programmed service

Illustration	Description / explanation
	**Live data** 1. With the device in normal running status, press the **NAVIGATION UP** button **[B2]** or **NAVIGATION DOWN** button **[B3]** to select **LIVE DATA**. → Status LED **LIVE DATA [L9]** is lit.

Illustration	Description / explanation
	2. Press the **ENTER/CONFIRM** button **[B6]**. → **MAIN** display **[L1]** shows the first detected value, dew point temperature. → **SECONDARY** display **[L2]** shows the code **t1** 3. Press repeatedly the **NAVIGATION DOWN** button **[B3]** to scroll all data of the menu **t1 → t2 → LP → HP → HrS → SrV →ESC** or Press repeatedly the **NAVIGATION UP** button **[B2]** to scroll all data of the menu in the reverse order. 4. Select **ESC** and press the **ENTER/CONFIRM** button **[B6]** to exit the **LIVE DATA**.

9.3.5 WARNING status

The WARNING is an anomalous event related to a malfunction of the device. The WARNING does not compromise the functioning of the device and the safety of operators.

NOTE	WARNING status
	With the device in WARNING status the compressed air treatment may be improper.
	• Call immediately the maintenance personnel if one or more WARNINGS are detected. • Maintenance personnel will refer to section “16 Troubleshooting” on page 107.

INFORMATION	Behaviour of the device in presence of a WARNING
	• With the device stopped: the triggering of a WARNING is not shown on the User Interface. In a presence of a WARNING, normally, is possible to start the device. After the starting, the WARNING code will be shown on the User Interface. • With the device started: the triggering of a WARNING, normally, does not stop the device. • Only **HdP** WARNING can be set: ➞ - to prevent the starting of the device, if stopped. ➞ - to stop the device, if started.

Code	Description / explanation
	**HdP** – Dew point temperature too high.
	**LdP** – Dew point temperature too low.
	**drn** – Condensate drain, defective or faulty.
	**SrV** – Maintenance of the device, time expired.
	**dt** – Refrigerant fluid, temperature too high.
	**LEP** – Refrigerant fluid, low evaporating pressure.
	**HCP** – Refrigerant fluid, high condensing pressure.

Illustration	Description / explanation
	**e.g. High Dew Point Warning** With the device in normal running status, a too high dew point temperature is detected. • The **MAIN** display **[L1]** shows the dew point value. • **SECONDARY** display **[L2]** shows the code **HdP**. • Status LED **WARNING [L14]** flashes.

9.3.6 ALARM status

The ALARM is an anomalous event related to a malfunction or a fault of the device. The ALARM always stops the device to ensure the safety of the device and operators.

NOTE	ALARM status
	With the device in ALARM status the compressed air will not be treated.
	• Call immediately the maintenance personnel if one or more ALARMS are detected. • Maintenance personnel will refer to section “16 Troubleshooting” on page 107.

INFORMATION	Behaviour of the device in presence of an ALARM
	• With the device stopped: the triggering of an ALARM, normally, is not shown on the User Interface. In a presence of an ALARM is not possible to start the device. After a starting attempt, the ALARM code will be shown on the User Interface and the device remain stopped. • With the device started: the triggering of an ALARM always stops the device. • ALARMS LP, ICE, FLP are shown also with the device stopped.

Code	Description / explanation
	**HP** – Refrigerant fluid, pressure too high.
	**LP** – Refrigerant fluid, pressure too low.
	**Hdt** – Refrigerant fluid, temperature too high.
	**ICE** – Heat exchanger body, temperature too low.
	**PF2** – Temperature probe, defective or broken.
	**FLP** – Pressure transducer, defective or broken.
	**FHP** – Pressure transducer, defective or broken.
	**PF1** – Temperature probe, defective or broken.

Illustration	Description / explanation
	**Example: High Pressure Alarm** With the device in normal running status, the high pressure of refrigerant fluid, over safety limits, is detected. 1. The device immediately stops and **MAIN** display **[L1]** shows **oFF** 2. **SECONDARY** display **[L2]** shows the code **HP**. 3. Status LED **ALARM [L13]** flashes.

9.3.7 Remote mode

INFORMATION	Behaviour of the device in remote mode
	The device cannot be started and stopped from the local User Interface. The access of all other functions with the local User Interface remains permitted. The device starts and stops without any preliminary signalling on the local User Interface.

Illustration	Description / explanation
	**Remote mode** • The device is stopped. • Status LED **REMOTE MODE [L7]** is lit.
	• The device is started. • Status LED **REMOTE MODE [L7]** is lit.

9.3.8 User parameters

NOTE	Incorrect setting of user parameters
	The incorrect setting of user parameters can lead to unexpected behaviour of the device like improper air treatment due to wrong dew point, unexpected start and stop, unexpected signalling of one or more warnings / alarms, condensate drain malfunction, breakdown of Modbus communication.
	• Default user parameters must be modified with awareness, consistently with the specifications and the requirements of the compressed air plant.

Code	Description / explanation	Value range	Accuracy	Default value
	**drC – Local / Remote management** NO = local START-STOP mode YES = remote START-STOP via digital input signal Modbus = remote START-STOP via Modbus RTU.	NO, YES, Modbus	-	NO
	**HdA – High Dew Point Warning** Threshold temperature	0,0 ... 25,0 °C or 32 ... 77 °F	0,5 °C or 1 °F	20 °C or 68 °F
	**Hdd – High Dew Point Warning** Delay time of triggering	01 ... 20 minutes	1 minute	15
	**HdS – Behaviour of device due to High Dew Point Warning during normal running status** NO = device doesn't stops YES = device stops	NO, YES	-	NO
	**SrV – Device maintenance timer** Setting of countdown timer	0,0 ... 9,0 (x 1000) hours	0,5 (x 1000) hours	8,0
	**SCL – Units** °C = temperature in °C and pressure in bar °F = temperature in °F and pressure in psi	°C, °F	-	°C

Code	Description / explanation	Value range	Accuracy	Default value
	**AS – Automatic restart after a voltage drop** NO = device must be intentionally restarted YES = device restarts automatically, if it was running before voltage drop	NO, YES	-	NO
	**ACN – WARNING / ALARM contact management** Selects the triggering logic of the WARNING / ALARM contact 1 = any Alarm and High Dew Point Warning 2 = any Alarm and any Warning 3 = any Alarm	1, 2, 3	-	1
	**bNt – Condensate drain type** 1 = **BEKOMAT® 31 IF** 2 = **BEKOMAT® 32 IF**	1, 2	-	1
	**IPA – Modbus address**	1 … 255	-	1

Illustration	Description / explanation
	**Modification of a parameter** 1. With the device stopped or in normal running status, press the **NAVIGATION UP** button **[B2]** or **NAVIGATION DOWN** button **[B3]** to navigate and select **SETUP**. → Status LED **SETUP [L10]** is lit.

Illustration	Description / explanation
	2. Press the **ENTER/CONFIRM** button **[B6].** → **MAIN** display **[L1]** shows the value of the first parameter of the list. → **SECONDARY** display **[L2]** shows the code **drC** 3. Press repeatedly the **NAVIGATION DOWN** button **[B3]** to scroll all parameters of the menu **drC → HdA → Hdd → HdS → SrV → SEL → AS → ACN → bNt → IPA → ESC** or Press repeatedly the **NAVIGATION UP** button **[B2]** to scroll all parameters of the menu in the reverse order. 4. Press the **ENTER/CONFIRM** button **[B6]** to modify the value of the selected parameter. The value shown on **MAIN** display **[L1]** flashes. 5. Press the **INCREASE** button **[B4]** or the **DECREASE** button **[B5]** to modify the value. 6. Press the **ENTER/CONFIRM** button **[B6]** to confirm the modified value. or Press the **START-STOP** button **[B1]** to cancel the modified value and return to previous value. The value shown on **MAIN** display **[L1]** is stored and stops flashing. 7. Press **NAVIGATION DOWN** button **[B3]** or **NAVIGATION UP** button **[B2]** to select another parameter and repeat steps 8, 9, 10 8. Select **ESC** and press the **ENTER/CONFIRM** button **[B6]** to exit the parameter menu.

9.3.9 Modbus function

The Modbus function can be used to manage the operating functions and device information.

INFORMATION	Modbus configuration
	For further information on the Modbus function, refer to the section “1.3 Other applicable documents”on page 7.

10. Maintenance

10.1 Warning notices

DANGER	Pressurised system
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurise the pressurised system and secure it against unintentional pressurisation. • Set up a safety area around the working area during assembly, installation, maintenance and repair work. • Assemble all pipes and hoses free of mechanical stress. • Before pressurisation, check all system connections for leak tightness and tighten if necessary. • Slowly pressurise the system. • Avoid pressure blows and high differential pressures.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage. Malfunction and device failure as well as material damage can occur.
	• Only carry out installation, maintenance and repair work on the product and accessories when they have been disconnected and secured against being switched back on again unintentionally. • Set up a safety area around the working area during assembly, installation, maintenance and repair work.

DANGER	Use of incorrect spare parts, accessories or materials
	Use of the incorrect spare parts, accessories or materials, as well as auxiliary and operating materials, may result in death or serious injury. Malfunctions and device failure as well as material damage can occur.
	• Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work. • Only use the materials approved for the respective application and suitable tools in proper working order. • Only use pipes that are free of dirt, damage and corrosion. • Only use electric components and materials that comply with regionally applicable specifications and regulations for electrical safety.

WARNING	Refrigerant fluid
	The incorrect handling of refrigerant fluid may result in serious injury. Malfunctions and device failure as well as environment damage can occur. Refer to the indications on the type plate on the product as regards the type and amount of refrigerant fluid charged on the product.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in refrigeration engineering and customer service.

WARNING	Hot surfaces
	Contact with hot surfaces during work on the product and accessories can lead to burns, accidents and personal injury.
	• Switch the product OFF before all maintenance work and allow it to cool.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in customer service.

WARNING	Ingress of moisture or foreign bodies
	Removing components or opening the product may allow water or foreign bodies to enter the opened product. Ingress of water or foreign bodies can lead to accidents, personal injury and damage to property as well as impairments in operation.
	• Protect the product from splashing water or moisture. • Only open the product or remove components in a dry place. • Do not insert any foreign bodies into openings of the product. • Keep all contact surfaces and openings free of dirt and moisture.

CAUTION	Condensate
	Contact with condensate containing substances which endanger health and the environment can pose a health hazard, causing irritation and/or damage to the eyes, skin and mucous membranes.
	• Use suitable protective equipment when handling condensate. • Pick up and dispose of any leaking or spilled condensate in accordance with applicable regional laws and requirements.

10.2 Maintenance work

For maintenance work to be carried out, the following protective equipment must be always worn and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Preparatory tasks	
1.	The procedure on section “13 Decommissioning” on page 99 was carried out.

Maintenance work	Interval
• Clean the condenser using an air jet, max. 2 bar (g) (29 psi), inside out.	200 hours or monthly, which occurs first.
• Check the tightness of all electrical connections. • Check the integrity of insulation of electrical cables. • Check the integrity of electrical clamps. • Check the integrity of fasteners of electrical equipment. • Check the refrigeration circuit for signs of oil and/or refrigerant leaks. • Check the integrity of rubber hose of condensate drain.	1000 hours or annually, which occurs first.
• Check / clean / replace the condensate drain.	8000 hours.

Final tasks	
1.	Follow the procedure on section “8 Commissioning” on page 66.
2.	Follow the procedure on section “16.1.1 Resetting a WARNING” on page 107, table Resetting the WARNING **SrV** “maintenance time expired”

11. Adjustments

11.1 Warning notices

DANGER	Pressurised system
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Set up a safety area around the working area during assembly, installation, maintenance and repair work. • Slowly pressurise the system.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage. Malfunction and device failure as well as material damage can occur.
	• Set up a safety area around the working area during assembly, installation, maintenance and repair work.

WARNING	Refrigerant fluid
	The incorrect handling of refrigerant fluid may result in serious injury. Malfunctions and device failure as well as environment damage can occur. Refer to the indications on the type plate on the product as regards the type and amount of refrigerant fluid charged on the product.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in refrigeration engineering and customer service.

WARNING	Hot surfaces
	Contact with hot surfaces during work on the product and accessories can lead to burns, accidents and personal injury.
	• Pay attention to the hot surfaces during the adjustment work.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in customer service.

WARNING	Ingress of moisture or foreign bodies
	Removing components or opening the product may allow water or foreign bodies to enter the opened product. Ingress of water or foreign bodies can lead to accidents, personal injury and damage to property as well as impairments in operation.
	• Protect the product from splashing water or moisture. • Only open the product or remove components in a dry place. • Do not insert any foreign bodies into openings of the product. • Keep all contact surfaces and openings free of dirt and moisture.

11.2 Adjustment work

For adjustment work to be carried out, the following protective equipment must be always worn.

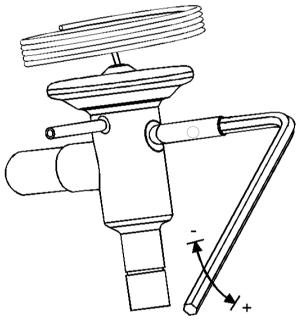
Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

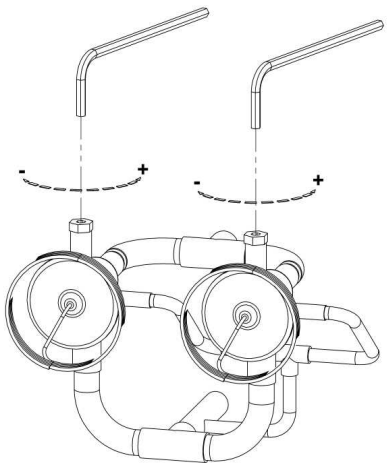
11.2.1 Adjustment of hot gas by-pass valve

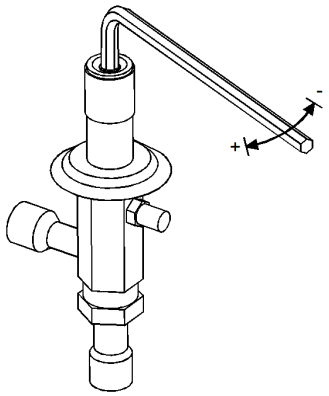
NOTE	Schrader service valve
	Each time a pressure gauge is connected to the Schrader service valve, a part of refrigerant fluid is discharged in the environment.
	• Connect the pressure gauge to the Schrader service valve only in case of real malfunction of the refrigerant circuit.

INFORMATION	Factory setting of hot gas by-pass valve
	The hot gas by-pass valve is adjusted by the manufacturer during the testing phase of the device and the adjusting screw is sealed with yellow sealant. In case of malfunction of refrigerant circuit, is possible to recalibrate the by-pass valve.

Preparatory tasks	
1.	The device is stopped.
2.	Inlet / outlet air valves are closed. Compressed air does not flow into the heat exchanger.
3.	Service panels are removed.
4.	A low pressure gauge is connected to the Schrader service valve on the low pressure side of refrigerant circuit.
5.	A set of hex keys is available.

Adjustment work	
Illustration	**Description / explanation**
	**DRYPOINT® RA III 20 ...240** 1. Start the device and wait few minutes. 2. Turn the adjustment screw clockwise to reduce the evaporation pressure or counterclockwise to increase it. 3. Wait for the evaporation pressure to stabilize, until the set point value 2,3 bar(g), +0,1/-0 bar (33.4 psi(g) +1.5/-0 psi) is reached.

Adjustment work	
Illustration	**Description / explanation**
	**DRYPOINT® RA III 330 ... 490** **CASE 1: Adjusting screws with the unbreached sealing.** 1. Start the device and wait few minutes. 2. On the first valve, turn the adjustment screw half a turn, clockwise to reduce the evaporation pressure or counterclockwise to increase it. 3. On the second valve, turn the adjustment screw half a turn in the same direction of the first valve. 4. Wait for the evaporation pressure to stabilize. 5. Repeat steps 2. and 3. until the set point value 2,3 bar(g), +0,1/-0 bar (33.4 psi(g) +1.5/-0 psi) is reached. **CASE 2: Adjusting screws with breached sealing.** 1. The device is already stopped. 2. On the first valve, turn the adjustment screw clockwise until is fully tightened. 3. On the first valve, turn the adjustment screw 5 turns counterclockwise. 4. On the second valve, turn the adjustment screw clockwise until is fully tightened. 5. On the second valve, turn the adjustment screw 5 turns counterclockwise. 6. Start the device and wait for the evaporation pressure to stabilize. 7. On the first valve, turn the adjustment screw half a turn, clockwise to reduce the evaporation pressure or counterclockwise to increase it. 8. On the second valve, turn the adjustment screw half a turn in the same direction of the first valve. 9. Wait for the evaporation pressure to stabilize. 10. Repeat steps 7. and 8. until the set point value 2,3 bar(g), +0,1/-0 bar (33.4 psi(g) +1.5/-0 psi) is reached.

Adjustment work	
Illustration	**Description / explanation**
	**DRYPOINT® RA III 630 ... 960/750 WC ... 960 WC** 1. Start the device and wait few minutes. 2. Turn the adjustment screw clockwise to increase the evaporation pressure or counterclockwise to reduce it. 3. Wait for the evaporation pressure to stabilize, until the set point value 2,3 bar(g), +0,1/-0 bar (33.4 psi(g) +1.5/-0 psi) is reached.

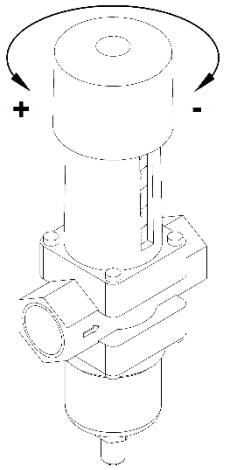
Final tasks	
1.	Disconnect the low pressure gauge from the refrigerant circuit.
2.	Reinstall the service panels.
3.	Slowly open the air inlet valve.
4.	Slowly open the air outlet valve.

11.2.2 Adjustment of cooling water regulating valve, water-cooled models

NOTE	Schrader service valve
	Each time a pressure gauge is connected to the Schrader service valve, a part of refrigerant fluid is discharged in the environment.
	• Connect the pressure gauge to the Schrader service valve only in case of real malfunction of the refrigerant circuit.

INFORMATION	Factory setting of cooling water regulating valve
	The cooling water regulating valve is adjusted by the manufacturer during the testing phase with a setup that covers the majority of operating conditions. In case of malfunction of refrigerant circuit due to extreme operating conditions, is possible to recalibrate the valve.

Preparatory tasks	
1.	The device is stopped.
2.	Inlet / outlet air valves are closed. Compressed air does not flow into the heat exchanger.
3.	Service panels are removed.
4.	Cooling water supply is available.
5.	A high pressure gauge is connected to the Schrader service valve on the high pressure side of refrigerant circuit.

Adjustment work	
Illustration	**Description / explanation**
	1. Start the device and wait few minutes. 2. Turn the adjustment knob clockwise to reduce the condensing pressure or counterclockwise to increase it. 3. Wait for the condensing pressure to stabilize, until the set point value 10 bar(g), +0,5/-0,5 bar (145.0 psi(g) +7.3/-7.3 psi) is reached.

Final tasks	
1.	Disconnect the high pressure gauge from the refrigerant circuit.
2.	Reinstall the service panels.
3.	Slowly open the air inlet valve.
4.	Slowly open the air outlet valve.

12. Spare parts

12.1 Order information

The spare parts list of each device is printed on a sticker applied on the internal side of the rear panel of the device. Each spare part is identified with its callout No. referred to section “3.1 Product overview” on page 18 and its Material Number.

BEKO TECHNOLOGIES customer service requires the following data for an inquiry or order:

- Product name and installation size (see type plate)
- Serial number (see type plate)
- Material number and designation of the part
- Required quantity of part to be delivered

The contact data for the **BEKO** TECHNOLOGIES customer service are listed in section “1.1 Contact” on page 6.

12.2 Spare parts

INFORMATION	Callouts
	All callouts **[#]** mentioned in the following are referred to the section “3.1 Product overview” on page 18.

No.	Designation
[1]	Heat exchanger
[4]	High pressure switch HPS
[6]	Refrigerant compressor
[7]	Hot gas by-pass valve
[8]	Condenser
[9]	Cooling fan
[9.1]	Cooling fan – motor
[9.2]	Cooling fan - blade
[9.3]	Cooling fan – grid
[10]	Filter of refrigerant fluid
[12]	Temperature probe BT1
[17.1]	Electronic Control Unit
[17.2]	User Interface
[21]	Condensate drain
[22]	ON-OFF switch
[37]	Pressure transducer BHP
[39]	Pressure transducer BLP

13. Decommissioning

The product must be decommissioned during longer periods of standstill, for example in the case of:

- Maintenance work to the product or accessories.
- Longer standstill of the entire system due to planned work (e.g. conversion work, major repairs, decommissioning of the overall system).
- Disassembly of the product.

13.1 Warning notices

DANGER	Pressurised system
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Set up a safety area around the working area before starting work.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage. Malfunction and device failure as well as material damage can occur.
	• Set up a safety area around the working area before starting work.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property and/or impaired operation.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in customer service.

13.2 Decommissioning work

For decommissioning work to be carried out, the following protective equipment must be always worn.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Decommissioning work	
1.	Slowly close the air inlet valve and secure it against unintentional opening.
2.	Slowly close the air outlet valve and secure it against unintentional opening.
3.	Wait few minutes and then stop the product pushing for 3 seconds the **START-STOP** button on the User Interface. Refer to section “3.2 User Interface” on page 29.
4.	Water-cooled models: interrupt the cooling water supply and secure it against unintentional opening.
5.	Turn off the power acting on the **ON-OFF** switch. Refer to section “3.1 Product overview” on page 18.
6.	Interrupt the mains supply and secure it against being established back on again unintentionally.
7.	Depressurise the air circuit on the product.
8.	Depressurise the water circuit on the product.

14. Disassembly

14.1 Warning notices

DANGER	Pressurised system
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Set up a safety area around the working area before starting work. • Before starting work, depressurise the pressurised system and secure it against unintentional pressurisation.

DANGER	Electric voltage
	There is a danger of death or serious injuries following contact with components which are in contact with electric voltage.
	• Set up a safety area around the working area before starting work. • Before starting work, disconnect the product and accessories and secure them against being switched back on again unintentionally.

WARNING	Refrigerant fluid
	The incorrect handling of refrigerant fluid may result in serious injury and environment damage can occur. Refer to the indications on the type plate on the product as regards the type and amount of refrigerant fluid charged on the product.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in refrigeration engineering and customer service. • Pick up the refrigerant fluid in accordance with applicable regional laws and requirements.

WARNING	Insufficient qualification
	If personnel carrying out work on the product and accessories is not properly qualified, this may result in accidents, personal injury and damage to property.
	• All work on the product and accessories must be carried out exclusively by skilled technical personnel specializing in refrigeration engineering and customer service.

CAUTION	Condensate
	Contact with condensate containing substances which endanger health and the environment can pose a health hazard, causing irritation and/or damage to the eyes, skin and mucous membranes.
	• Use suitable protective equipment when handling condensate. • Pick up and dispose of any leaking or spilled condensate in accordance with applicable regional laws and requirements.

14.2 Disassembly work

For disassembly work to be carried out, the following protective equipment must be always worn and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Preparatory tasks	
1.	The procedure on section “13 Decommissioning” on page 99 was carried out.
2.	Have the necessary tools ready.

Disassembly work	
1.	Disconnect the power cable from the protective contact socket / terminal box.
2.	Uninstall collision protection, if was installed.
3.	Disconnect the condensate drain hose to the drain collection line.
4.	Water-cooled models: disconnect the threaded connection to the cooling water line.
5.	Disconnect the threaded connection to the compressed air line.
6.	Remove fixing bolts if the product was fixed on the floor.
7.	Remove the service panels on the product.
8.	Remove from the place of installation all disassembled parts and accessories.
9.	Remove the refrigerant fluid from the refrigerant circuit.
10.	Clean the installation area from any fluid or oil leakage occurred during the disassembly work.

15. Disposal

15.1 Warning notices

NOTE	Inappropriate disposal
	Inappropriate disposal of components, parts, operating and auxiliary materials, refrigerant fluid as well as cleaning media can cause environmental damage.
	• Dispose of all components, parts, operating and auxiliary materials, refrigerant fluid as well as cleaning media professionally and in accordance with all nationally and locally applicable regulations and standards. • Do not discharge to atmosphere the refrigerant fluid. • Dispose of electrical and electronic components through a specialist waste disposal company. • In case of doubt, consult a local disposal company before disposal.

NOTE	Inappropriate storage
	Inappropriate storage of components, parts, operating and auxiliary materials, refrigerant fluid as well as cleaning media can cause environmental damage.
	• Store all components, parts, operating and auxiliary materials, refrigerant fluid as well as cleaning media properly and in accordance with all nationally and locally applicable regulations and standards.

INFORMATION	Disposal of electrical and electronic equipment
	Electrical and electronic equipment (EEE) contains materials, components and substances which can be dangerous and harmful for human health and the environment if the waste from electrical and electronic equipment (WEEE) is not disposed of properly. Electrical and electronic equipment are marked by the crossed-out rubbish bin. The crossed-out rubbish bin symbolises that electrical and electronic equipment must be collected separately and must not be disposed of together with unsorted domestic waste. For additional information regarding locally applicable laws and regulations concerning recycling electrical and electronic products, contact your local disposal companies or the responsible municipal authority.

15.2 Disposal of materials and components

For disposal work to be carried out, the following protective equipment must be always worn and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	

Preparatory tasks	
1.	The procedure on section “14 Disassembly” on page 101 was carried out.

Operating / auxiliary material	Material	EU waste code
Adsorption materials, filter materials, cleaning wipes and protective clothing – contaminated by oils or other hazardous substances	-	15 02 02
Adsorption materials, filter materials, cleaning wipes and protective clothing – with the exception of those classified by 15 02 02	-	15 02 03
Packaging	Paper / cardboard	15 01 01
	Plastic	15 01 02
	Wood	15 01 03

Component	Material	EU waste code
Whole device (with or without refrigerant fluid)	-	16 02 11
Refrigerant fluid	-	14 06 01
Refrigerant compressor (sealed, with oil included)	-	16 02 15
Filter of refrigerant fluid (sealed)		
Tubes of refrigerant circuit	Copper	17 04 01
Condenser (tubes)		
Condenser (frame)	Iron / carbon steel	17 04 05
Fan grid		
Hot gas by-pass valve		
Panels, mounting frame, supports, screws		

Component	Material	EU waste code
Heat exchanger	Aluminium	17 04 02
Condenser (fins)		
Fan blade		
Complete cooling fan	Electric / electronic components with their plastic parts	16 02 16
Fan motor (with capacitor removed)		
Temperature probes		
Pressure transducers		
Pressure switches		
ON-OFF switch		
Electronic Control Unit / User Interface		
Condensate drain		
Other electric / electronic components		
Capacitor (removed from motor of cooling fan)	-	16 02 15
Electrical wires	PVC / copper	17 04 11
Insulating material	Elastomeric foam	17 06 04
Other plastic parts	Plastic	15 01 02
Condensate drain hose	Contaminated plastic / rubber	16 01 21

16. Troubleshooting

INFORMATION	Applicable documents
	Following applicable documents are necessary and available: • **BEKOMAT®** Installation and operation manual. • Wiring diagrams.

INFORMATION	Applicable documents
	This section contains solutions to the most probable malfunctions/faults. In any case, it is not possible to predict in advance all possible malfunction/failure situations of the device. In the event of any malfunctions / faults which are not described here, malfunctions which cannot be acknowledged / eliminated or other related questions, contact BEKO Technologies customer service. Refer to section “1.1 Contact” on page 6.

16.1 Warnings and alarms

16.1.1 Resetting a WARNING

NOTE	Resetting a WARNING with the device in remote mode
	If the device operates in remote mode (**drC** parameter = **YES** or Modbus), is not possible to reset a WARNING. To reset a WARNING, the device must be switched in local mode.
	• Refer to section “9.3.8 User parameters” on page 83 and set the **drC** parameter = **NO** • After resetting the WARNING, set again the device in remote mode.

INFORMATION	Re-initializing of maintenance timer
	Maintenance timer can be re-initialized to its present value at any time, independently from the expiring of time.

Resetting a WARNING (except SrV “maintenance time expired”)	
1.	Refer to the section “3.2 User Interface” on page 29.
2.	Refer to the section “9.3.5 WARNING status” on page78.
3.	Fix the cause which has triggered the WARNING.
4.	The status LED WARNING **[L14]** is lit.
5.	Press 2 times the ENTER/CONFIRM button **[B6].**
6.	The status LED WARNING **[L14]** goes out.

Resetting the WARNING SrV “maintenance time expired”	
1.	Refer to the section “3.2 User Interface” on page 29.
2.	Refer to the section “9.3.4 Live data” on page 76.
3.	Follow steps 1. to 6. and select **SrV**
4.	Keep pressed the **ENTER/CONFIRM** button **[B6]** for 5 seconds, **MAIN** display **[L1]** shows “**rES**”.
5.	Press again the **ENTER/CONFIRM** button **[B6]** to initialize the maintenance timer to its present value.
6.	Press repeatedly the **NAVIGATION** button **[B2]** or **[B3]** to select **ESC**
7.	Press the **ENTER/CONFIRM** button **[B6]** to exit the **LIVE DATA**.

WARNING code	Cause	Action
	**HdP** – The value of parameter **HdA** is too low.	Increase the value of parameter.
	HdP – Probe BT1, the dew point temperature is too high.	Refer to section “16.2 Specific malfunctions” on page 112, “Probe BT1, dew point temperature too high”.
	**LdP** – Probe BT1, the dew point temperature is too low.	Refer to section “16.2 Specific malfunctions” on page 112, “Probe BT1, dew point temperature too low”.
	The condensate drain is defective or faulty	Consult the **BEKOMAT®** Installation and operation manual.
	drn – The electrical wiring between condensate drain and Electronic Control Unit is interrupted.	Restore the electrical wiring.
	Compressed air line is depressurised.	Pressurise the compressed air line.
	**SrV**– The maintenance time is expired	Refer to section “10.2 Maintenance work” on page 89.
	**dt** – Probe BT2, the temperature on discharge side of refrigerant compressor is too high.	Refer to section “16.2 Specific malfunctions” on page 112, “Probe BT2, compressor discharge temperature too high”.
	**LEP** – Transducer BLP, the evaporating pressure of the refrigerant fluid is too low.	Refer to section “16.2 Specific malfunctions” on page 112, “Transducer BLP, evaporating pressure of refrigerant fluid too low”.
	**HCP** – Transducer BHP, the condensing pressure of the refrigerant fluid is too high.	Refer to section “16.2 Specific malfunctions” on page 112, “Transducer BHP, condensing pressure of refrigerant fluid too high”.

16.1.2 Resetting an ALARM

NOTE	Resetting an ALARM with the device in remote mode
	If the device operates in remote mode (**drC** parameter = **YES** or Modbus), is not possible to reset an ALARM. To reset an ALARM, the device must be switched in local mode.
	• Refer to section “9.3.8 User parameters” on page 83 and set the **drC** parameter = **NO** • After resetting the ALARM, set again the device in remote mode.

Resetting an ALARM	
1.	Refer to the section “3.2 User Interface” on page 29.
2.	Refer to the section “9.3.6 ALARM status” on page 80.
3.	Fix the cause which has triggered the ALARM.
4.	The status LED **ALARM [L13]** is lit.
5.	Press 2 times the **ENTER/CONFIRM** button **[B6].**
6.	The status LED **ALARM [L13]** goes out.

ALARM code	Cause	Action
	**HP** – Safety pressure switch **HPS**, the pressure of the refrigerant fluid has reached the safety limit.	Refer to section “16.2 Specific malfunctions” on page 112, “Safety pressure switch HPS has triggered”.
	**LP** – Transducer **BLP**, the pressure of the refrigerant fluid has reached the minimum value allowed. There is a refrigerant leak in the refrigerant circuit.	Repair the refrigerant circuit.
	**Hdt** – Probe **BT2**, the temperature of the refrigerant fluid has reached the safety limit.	Refer to section “16.2 Specific malfunctions” on page 112, “Probe BT2, temperature of refrigerant fluid has reached the safety limit”.
	**ICE** – Probe **BT1**, the temperature of body of heat exchanger is under 0 °C.	Refer to section “16.2 Specific malfunctions” on page 112, “Probe BT1, dew point temperature too low”.
	**PF2** – Probe **BT2**, defective or faulty.	Replace the probe.
	PF2 – The electrical wiring between the probe and Electronic Control Unit is interrupted.	Restore the electrical wiring.
	**FLP** – Transducer **BLP**, defective or faulty.	Replace the transducer.
	FLP – The electrical wiring between the transducer and Electronic Control Unit is interrupted.	Restore the electrical wiring.
	Transducer BHP, defective or faulty.	Replace the transducer.
	FHP – The electrical wiring between the transducer and Electronic Control Unit is interrupted.	Restore the electrical wiring.
	**PF1** – Probe **BT1**, defective or faulty.	Replace the probe.
	PF1 – The electrical wiring between the probe and Electronic Control Unit is interrupted.	Restore the electrical wiring.

16.2 Specific malfunctions

Specific malfunction	Cause	Action
Probe BT1, dew point temperature too high.	The probe BT1 does not detect the temperature correctly.	Check / place the probe back in its correct position.
	The refrigerant compressor is stopped.	See specific malfunction “The refrigerant compressor is stopped”.
	The ambient temperature is too high or ventilation is insufficient.	Restore the nominal operating conditions.
	The temperature of inlet compressed air is too high.	
	The pressure of inlet compressed air is too low.	
	The flow rate of inlet compressed air is higher than the nominal flow rate of the device.	
	The condenser is dirty.	Clean the condenser.
	The cooling fan is stopped.	See specific malfunction “The cooling fan is stopped”.
	The device does not drain the condensate.	See specific malfunction “The device does not drain the condensate”.
	The hot gas by-pass valve is out of calibration.	Refer to section “11.2.1 Adjustment of hot gas by-pass valve” on page 92.
	There is a refrigerant leak in the refrigerant circuit.	Repair the refrigerant circuit.
	The temperature of cooling water is too high, water-cooled models.	Restore the nominal operating conditions.
	The flow rate of cooling water is too low, water-cooled models.	
Probe BT1, dew point temperature too low.	The ambient temperature is too low or the device is installed in a windy area.	Restore the nominal operating conditions.
	The cooling fan is running continuously.	Replace the Electronic Control Unit.
	The hot gas by-pass valve is out of calibration.	Refer to section “11.2.1 Adjustment of hot gas by-pass valve” on page 92.

Specific malfunction	Cause	Action
Probe BT2, compressor discharge temperature too high.	The probe BT2 does not detect the temperature correctly.	Check / place the probe back in its correct position.
	Excessive thermal load.	Restore the nominal operating conditions.
	The temperature of inlet compressed air is too high.	
	The ambient temperature is too high or ventilation is insufficient.	
	The condenser is dirty.	Clean the condenser.
From previous page Probe BT2, compressor discharge temperature too high.	The cooling fan is stopped.	See specific malfunction “The cooling fan is stopped”.
	There is a refrigerant leak in the refrigerant circuit.	Repair the refrigerant circuit.
	The hot gas by-pass valve is out of calibration.	Refer to section “11.2.1 Adjustment of hot gas by-pass valve” on page 92.
Transducer BLP, Evaporating pressure of refrigerant fluid too low.	There is a refrigerant leak in the refrigerant circuit.	Repair the refrigerant circuit.
	The hot gas by-pass valve is out of calibration.	Refer to section “11.2.1 Adjustment of hot gas by-pass valve” on page 92.
	The transducer BLP is defective.	Replace the transducer.
	The cooling fan is running continuously.	Replace the Electronic Control Unit.

Specific malfunction	Cause	Action
Transducer BHP, condensing pressure of refrigerant fluid too high.	The temperature of inlet compressed air is too high.	Restore the nominal operating conditions.
	The ambient temperature is too high or ventilation is insufficient.	
	The flow rate of inlet compressed air is higher than the nominal flow rate of the device.	
	The condenser is dirty.	Clean the condenser.
	The cooling fan is stopped.	See specific malfunction “The cooling fan is stopped”.
	The temperature of cooling water is too high, water-cooled models.	Restore the nominal operating conditions.
	The flow rate of cooling water is too low, water-cooled models.	
	The cooling water regulating valve is out of calibration, water-cooled models.	Refer to section “11.2.2 Adjustment of cooling water regulating valve, water-cooled models” on page 95.
	The transducer BHP is defective.	Replace the transducer.
The pressure of the refrigerant fluid has reached the safety limit. Safety switch HPS has triggered.	The temperature of inlet compressed air is too high.	Restore the nominal operating conditions, then press the reset button on the pressure switch.
	The flow rate of inlet compressed air is higher than the nominal flow rate of the device.	
	The ambient temperature is too high or ventilation is insufficient.	
	The condenser is dirty.	Clean the condenser, then press the reset button on the pressure switch.
	The cooling fan is stopped.	See specific malfunction “The cooling fan is stopped”, then press the reset button on the pressure switch.
	The temperature of cooling water is too high, water-cooled models.	Restore the nominal operating conditions, then press the reset button on the pressure switch.
	The flow rate of cooling water is too low, water-cooled models.	
	The pressure switch HPS is defective.	Replace the pressure switch.

Specific malfunction	Cause	Action
Probe BT2, temperature of refrigerant fluid has reached the safety limit.	The probe BT2 does not detect the temperature correctly.	Check / place the probe back in its correct position.
	Excessive thermal load.	Restore the nominal operating conditions.
	The temperature of inlet compressed air is too high.	
	The flow rate of inlet compressed air is higher than the nominal flow rate of the device.	
	The ambient temperature is too high or ventilation is insufficient.	
	The condenser is dirty.	Clean the condenser.
	The cooling fan is stopped.	See specific malfunction “The cooling fan is stopped”.
	The hot gas by-pass valve is out of calibration.	Refer to section “11.2.1 Adjustment of hot gas by-pass valve” on page 92.
	The temperature of cooling water is too low, water-cooled models.	Restore the nominal operating conditions.
	The cooling water regulating valve is out of calibration, water-cooled models.	Refer to section “11.2.2 Adjustment of cooling water regulating valve, water-cooled models” on page 95.
	There is a refrigerant leak in the refrigerant circuit.	Repair the refrigerant circuit.
The refrigerant compressor is stopped.	The internal heat protection, where available, has triggered.	Wait 30 minutes to cool down the compressor.
	The internal heat protection and/or the start-up relay and/or the starting capacitor, where available, are defective.	Replace the components.
	The electrical wiring is interrupted.	Restore the electrical wiring.
	The compressor is faulty.	Replace the compressor.

Specific malfunction	Cause	Action
The cooling fan is stopped.	The internal heat protection, where available, has triggered.	Wait 30 minutes to cool down the motor.
	The internal heat protection, where available, is defective.	Replace the motor.
	The starting capacitor, where available, is defective.	Replace the capacitor.
	There is a refrigerant leak in the refrigerant circuit.	Repair the refrigerant circuit.
	The electrical wiring is interrupted.	Restore the electrical wiring.
	The transducer BHP is defective.	Replace the transducer.
	The motor is faulty.	Replace the motor.
The device does not drain the condensate.	The pressure of compressed air is too low.	Restore the nominal operating conditions.
	The condensate service valve is closed.	Open the valve.
	The condensate is frozen.	See specific malfunction “Probe BT1, dew point temperature too low”.
	The **BEKOMAT®** condensate drain does not work properly.	Consult **BEKOMAT®** Installation and operation manual.
The device continuously drains condensate.	The **BEKOMAT®** condensate drain does not work properly.	Consult **BEKOMAT®** Installation and operation manual.
Excessive air pressure drop.	The condensate is frozen.	See specific malfunction “Probe BT1, dew point temperature too low.”
	The device does not drain the condensate.	See specific malfunction “The device does not drain the condensate.”
	The heat exchanger is clogged.	Check and clean the heat exchanger.

17. Notes

BEKO TECHNOLOGIES GmbH

Im Taubental 7
D - 41468 Neuss
Tel. +49 2131 988 0
Fax +49 2131 988 900
info@beko-technologies.com
service-eu@beko-technologies.com

DE

BEKO TECHNOLOGIES LTD.

Unit 11-12 Moons Park
Burnt Meadow Road
North Moons Moat
Redditch, Worcs, B98 9PA
Tel. +44 1527 575 778
info@beko-technologies.co.uk

GB

BEKO TECHNOLOGIES S.à.r.l.

Zone Industrielle
1 Rue des Frères Rémy
F - 57200 Sarreguemines
Tél. +33 387 283 800
info@beko-technologies.fr
service@beko-technologies.fr

FR

BEKO TECHNOLOGIES B.V.

Veenen 12
NL - 4703 RB Roosendaal
Tel. +31 165 320 300
benelux@beko-technologies.com
service-bnl@beko-technologies.com

NL

BEKO TECHNOLOGIES (Shanghai) Co. Ltd.

Rm.715 Building C, VANTONE Center
No.333 Suhong Rd.Minhang District
201106 Shanghai
Tel. +86 (21) 50815885
info.cn@beko-technologies.cn
service1@beko.cn

CN

BEKO TECHNOLOGIES s.r.o.

Na Pankraci 58
CZ - 140 00 Praha 4
Tel. +420 24 14 14 717 /
+420 24 14 09 333
info@beko-technologies.cz

CZ

BEKO Tecnológica España S.L.

Torruella i Urpina 37-42, nave 6
E - 08758 Cervelló
Tel. +34 93 632 76 68
Mobil +34 610 780 639
info.es@beko-technologies.es

ES

BEKO TECHNOLOGIES LIMITED

Room 2608B, Skyline Tower,
No. 39 Wang Kwong Road
Kwoloon Bay Kwoloon, Hong Kong
Tel. +852 2321 0192
Raymond.Low@beko-technologies.com

HK

BEKO TECHNOLOGIES INDIA Pvt. Ltd.

Plot No.43/1 CIEEP Gandhi Nagar
Balanagar Hyderabad
IN - 500 037
Tel. +91 40 23080275 /
+91 40 23081107
Madhusudan.Masur@bekoindia.com
service@bekoindia.com

IN

BEKO TECHNOLOGIES S.r.l

Via Peano 86/88
I - 10040 Leinì (TO)
Tel. +39 011 4500 576
Fax +39 0114 500 578
info.it@beko-technologies.com
service.it@beko-technologies.com

IT

BEKO TECHNOLOGIES K.K

KEIHIN THINK Building 8 Floor
1-1 Minamiwatarida-machi
Kawasaki-ku, Kawasaki-shi
JP - 210-0855
Tel. +81 44 328 76 01
info@beko-technologies.jp

JP

BEKO TECHNOLOGIES Sp. z o.o.

ul. Pańska 73
PL - 00-834 Warszawa
Tel. +48 22 314 75 40
info.pl@beko-technologies.pl

PL

BEKO TECHNOLOGIES S. de R.L. de C.

BEKO Technologies, S de R.L. de C.V.
Blvd. Vito Alessio Robles 4602 Bodega 10
Zona Industrial
Saltillo, Coahuila, 25107
Mexico
Tel. +52(844) 218-1979
informacion@beko-technologies.com

MX

BEKO TECHNOLOGIES CORP.

900 Great Southwest Pkwy SW
US - Atlanta, GA 30336
Tel. +1 404 924-6900
Fax +1 (404) 629-6666
beko@bekousa.com

US

www.beko-technologies.com