Service humidification

Isothermal and adiabatic humidifiers

CAREL

ENG **User manual**

LEGGI E CONSERVA QUESTE ISTRUZIONI

READ AND SAVE THESE INSTRUCTIONS

Integrated Control Solutions & Energy Savings

WARNINGS

CAREL S.p.A. humidifiers are advanced products, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.carel.com. Each CAREL S.p.A. product, in relation to its advanced level of technology, requires setup/configuration/programming/commissioning to be able to operate in the best possible way for the specific application. The failure to complete such operations, which are required/indicated in the user manual, may cause the final product to malfunction; CAREL S.p.A. accepts no liability in such cases.
The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific final installation and/or equipment. CAREL S.p.A. may, based on prior agreements, act as a consultant for the installation/commissioning/use of the unit, however in no case does it accept liability for the correct operation of the humidifier and the final installation if the warnings or suggestions provided in this manual or in other product technical documents are not heeded. In addition to observing the above warnings and suggestions, the following warnings must be heeded for the correct use of the product:

- **DANGER OF ELECTRIC SHOCK**

The humidifier contains live electrical components. Disconnect the mains power supply before accessing inside parts or during maintenance and installation.

- **DANGER OF WATER LEAKS**

The humidifier automatically and constantly fills/drains certain quantities of water. Malfunctions in the connections or in the humidifier may cause leaks.

Important:

- The installation of the product must include an earth connection, using the special yellow-green terminal available in the humidifier.
- The environmental and power supply conditions must conform to the values specified on the product rating labels.
- The product is designed exclusively to humidify rooms either directly or through distribution systems (ducts, atomising racks).
- Only qualified personnel who are aware of the necessary precautions and able to perform the required operations correctly may install, operate or carry out technical service on the product.
- For the production of atomised water, only use water with the characteristics specified in this manual. Important, demineralised drinking water must be used (as specified in the manual). In addition, the particles of water that are not absorbed by the air must be removed using the droplet collection tank (in the humidification section) and the droplet separator (at the end of the humidification section).
- All operations on the product must be carried out according to the instructions provided in this manual and on the labels applied to the product. Any uses or modifications that are not authorised by the manufacturer are considered improper. CAREL S.p.A. declines all liability for any such unauthorised use.
- Do not attempt to open the humidifier in ways other than those specified in the manual.
- Observe the standards in force in the place where the humidifier is installed.
- Keep the humidifier out of the reach of children and animals.
- Do not install and use the product near objects that may be damaged when in contact with water (or condensate). CAREL S.p.A. declines all liability for direct or indirect damage following water leaks from the humidifier.
- Do not use corrosive chemicals, solvents or aggressive detergents to clean the inside and outside parts of the humidifier, unless specifically indicated in the user manual.
- Do not drop, hit or shake the humidifier, as the inside parts and the linings may be irreparably damaged.

CAREL S.p.A. adopts a policy of continual development. Consequently, CAREL reserves the right to make changes and improvements to any product described in this document without prior warning. The technical specifications shown in the manual may be changed without prior warning.
The liability of CAREL S.p.A. in relation to its products is specified in the CAREL S.p.A. general contract conditions, available on the website www.carel.com and/or by specific agreements with customers; specifically to the extent where allowed by applicable legislation, in no case will CAREL S.p.A., its employees or subsidiaries be liable for any lost earnings or sales, losses of data and information, costs of replacement goods or services, damage to things or people, downtime or any direct, indirect, incidental, actual, punitive, exemplary, special or consequential damage of any kind whatsoever, whether contractual, extra-contractual or due to negligence, or any other liabilities deriving from the installation, use or impossibility to use the product, even if CAREL S.p.A. or its subsidiaries are warned of the possibility of such damage.

DISPOSAL

The humidifier is made up of metal parts and plastic parts. In reference to European Union directive 2002/96/EC issued on 27 January 2003 and the related national legislation, please note that:

1. WEEE cannot be disposed of as municipal waste and such waste must be collected and disposed of separately;
2. the public or private waste collection systems defined by local legislation must be used. In addition, the equipment can be returned to the distributor at the end of its working life when buying new equipment;
3. the equipment may contain hazardous substances: the improper use or incorrect disposal of such may have negative effects on human health and on the environment;
4. the symbol (crossed-out wheeled bin) shown on the product or on the packaging and on the instruction sheet indicates that the equipment has been introduced onto the market after 13 August 2005 and that it must be disposed of separately;
5. in the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

Warranty on materials: 2 years (from the date of production, excluding consumables).

Approval: the quality and safety of CAREL S.P.A. products are guaranteed by the ISO 9001 certified design and production system, as well as by the CE mark..

General content

compactSteam

Umidificatore a vapore per ambienti residenziali
Residential Steam Humidifier

Contents

1. Maintenance

1.1 Periodical checks

After one hour of operation: check for any water leaks.
Every fortnight or after no more than 300 operating hours: check for any water leaks and check the general operation of the cylinder. Check that during operation no sparks form between the electrodes.
Every three months or after no more than 1000 operating hours: check operation, check for any water leaks and, if necessary, replace the cylinder. Check for any blackened parts of the cylinder. If there are blackened parts in the cylinder, check the condition of the electrodes and, if necessary, replace the cylinder.
Every year or after no more than 2500 operating hours: replace the cylinder.

Important: always disconnect the power supply before performing any maintenance operations

Important: Always disconnect the power supply before touching the cylinder in the event of water leaks, as the water may be carrying current.

1.2 Cylinder maintenance

The life of the cylinder depends on several factors, including: the quantity and type of minerals present in the water, the correct operation and sizing of the humidifier, the capacity, as well as regular and careful maintenance.

Important warning: The humidifier and the cylinder contain live electrical components and very hot surfaces. All service and/or maintenance operations must be carried out by expert and qualified personnel who are aware of the necessary precautions. Before performing any operations on the cylinder, make sure that the humidifier is disconnected from the power supply. Remove the cylinder from the humidifier only after having drained it completely using the "manual drain" procedure described in paragraph 5.3. Check that the model and the power supply voltage of the new cylinder correspond to the data shown on the rating plate.

Replacing the cylinder

Important warning: The cylinder may reach high temperatures. Let it cool down before touching it or wear protective gloves.

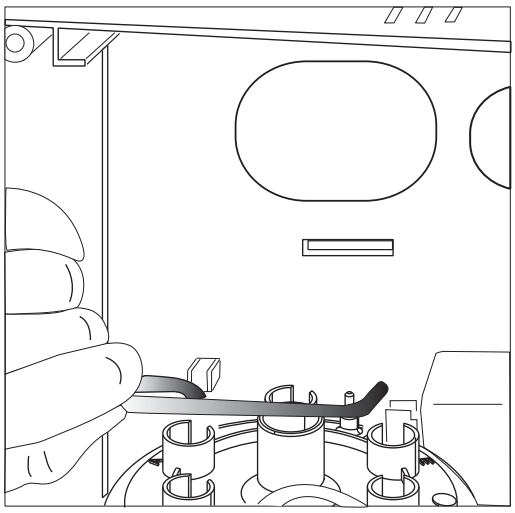

Fig. 1.a

To replace the cylinder:
- Completely drain the cylinder, holding the "drain" button until the cylinder is empty;
- Turn the humidifier off and disconnect the mains power supply;
- Remove the cover;

Version with injection in the duct:
- Remove the steam hose from the cylinder;
- Lift up the cylinder support bracket and lift it out of the unit;
- Disconnect the wiring from the top of the cylinder;
- Install the new cylinder in the humidifier, performing the same operations in the reverse order.

Version with room distribution:
- Unscrew the 2 bolts on the built-in fan;
- Lift up the cylinder support bracket to release it;
- Disconnect the blower from the cylinder and lift the cylinder out of the unit;
- Disconnect the wiring from the top of the cylinder;
- Install the new cylinder in the humidifier, performing the same operations in the reverse order.

Warning: the threaded nuts that fasten the electrical cables to the cylinder must be tightened to 2.5/3.3 Nm (22/29 pounds per sq. inch) to avoid the risk of fires.

Maintenance of the other components in the water circuit

Important warning:

- The power supply must be always disconnected when performing maintenance on the humidifier.
- Do not use detergents or solvents to clean the plastic components;
- Lime scale can be removed using a solution of vinegar or diluted acetic acid and a soft brush; rinse the cylinder completely with fresh water.

Cleaning the fill and drain valves:
Clean the tank from any mineral deposits and check that the water can flow freely from the tank to the drain through the drain valve. Cleaning the supply, fill and overflow hoses: make sure these are clean and not blocked and replace if necessary.

Cleaning the fill tank:
Clean the tank from any mineral deposits and check that the water can flow freely from the tank to the drain through the drain valve. Cleaning the supply, fill and overflow hoses: make sure these are clean and not blocked and replace if necessary.

Important warning: After having replaced or checked the water circuit, make sure the components have been connected correctly and the right gaskets have been fitted. Restart the humidifier and run a number of cleaning cycles (between 2 and 4, see paragraph 4.4 "Starting with a new cylinder"), then make sure there are no water leaks.

2. Spare parts

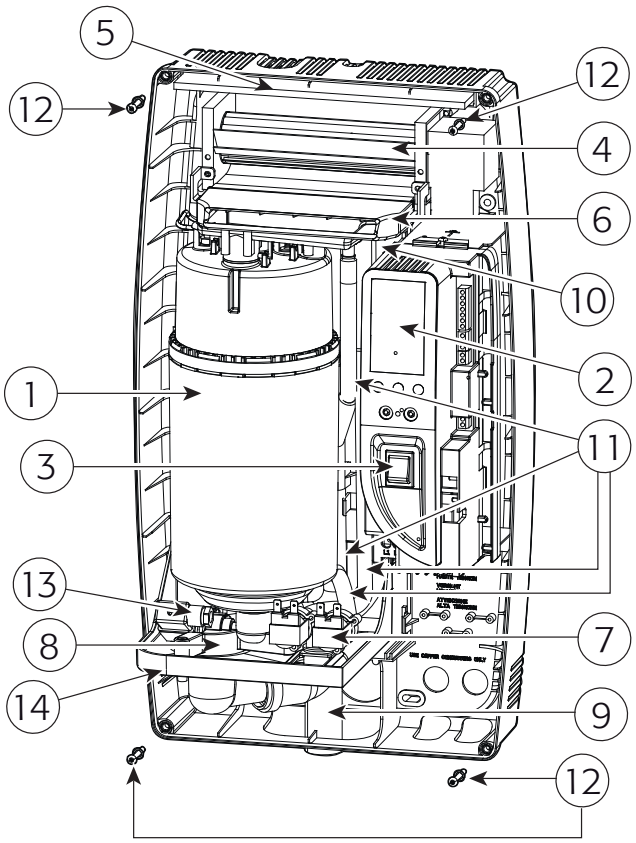

Fig. 2.a

Item	Component code	Description
1	CYLINDERS	SEE TABLE 7.b
2	CHM05V2000	CONTROL MODULE 5.4 kg/h 230V
2	CHM03V2000	CONTROL MODULE 3.2 kg/h 230V
2	CHM01V2000	CONTROL MODULE 1.6 kg/h 230V
2	CHM02V1000	CONTROL MODULE 2.5 kg/h 110V
2	CHM01V1000	CONTROL MODULE 1.6 kg/h 110V
3	CHKSW16000	ON-OFF SWITCH FOR COMPACTSTEAM
4	CHKFAN1000	FAN KIT 110V
4	CHKFAN2000	FAN KIT 230V
5	CHKFILT000	FAN FILTER
6	CHKDIST000	STEAM DISTRIBUTOR KIT
7	CHKFV01000	FILL SOLENOID VALVE + DRAIN TEMPERING 110 V
7	CHKFV02000	FILL SOLENOID VALVE + DRAIN TEMPERING 230 V
8	CHKDV01000	DRAIN SOLENOID VALVE 110 V WITH CONNECTOR
8	CHKDV02000	DRAIN SOLENOID VALVE 230 V WITH CONNECTOR
9	CHKD900000	TUBING TO CONNECT TO DRAIN 90°
10	UEKVASC000	FILL TANK + PLUG
11	CHKTR00000	ROOM TUBING KIT
11	CHKTD00000	DUCT TUBING KIT
12	CHKSCREW00	COVER FASTENING SCREWS
13	CHKCON1000	CONNECTOR FOR DRAIN SOLENOID VALVE 110V.
13	CHKCON2000	CONNECTOR FOR DRAIN SOLENOID VALVE 230V.
14	CHKBT00000	BOTTOM TANK
	CHKCAB1000	110 V WIRING KIT (until 24 May 2007)
	CHKCAB2000	230 V WIRING KIT (until 24 May 2007)
	MCH2004850	RS485 KIT
	98C425C001	RS232 - RS485 SERIAL CONVERTER

Tab.2.a

Cylinders

Cylinders (item 1)	Rated steam flow		Vac single-phase	Supply water conductivity (µS/cm)		Notes
CY0S1A0000	3.5 lbs/h	1.6 kg/h	110	normal	350-1250	Default in compactSteam
CY0S1A0000	3.5 lbs/h	1.6 kg/h	110	low	125-350	
CY0S1A0000	5.5 lbs/h	2.5 kg/h	110	normal	350-1250	Default in compactSteam
CY0S1A0000	5.5 lbs/h	2.5 kg/h	110	low	125-350	
CY0S1B0000	3.5 lbs/h	1.6 kg/h	230	normal	350-1250	Default in compactSteam
CY0S1C0000	3.5 lbs/h	1.6 kg/h	230	low	125-350	
CY0S1B0000	7 lbs/h	3.2 kg/h	230	normal	350-1250	Default in compactSteam
CY0S1C0000	7 lbs/h	3.2 kg/h	230	low	125-350	
CY0S1C0000	12 lbs/h	5.4 kg/h	230	normal	350-1250	Default in compactSteam
CY0S1D0000	12 lbs/h	5.4 kg/h	230	low	125-350	
KITCY0FG00						Internal filter and gasket valid for all cylinders

Tab. 2.b

3. Alarms

In the event of alarms, the red LED flashes, the alarm relay closes, activating the remote signal (if installed) and the alarm code flashes on the display.
There are two types of alarms: warnings and shutdown alarms. The former can be deleted by pressing the "reset/sel" button for 2 s, while the latter are displayed until maintenance is performed. Multiple alarms flash in sequence, alternating with the main display.
The table below (Tab. 3.a) shows all the alarm codes, with a description of the problems that cause these and the actions required to restore normal operation.

Display	Description	Action	Red LED	Alarm relay	Notes
- -	Remote ON/OFF open	Unit disabled	OFF	OFF	Jumper terminals AB-AB
EE	Internal memory error	Contact the service centre	ON	ON	Have the unit reprogrammed by the service centre
E0	Control board configuration not valid	Unit disabled	ON	ON	Have the unit reprogrammed by the service centre
E1	High current alarm	Unit disabled	ON	ON	1. Turn off; 2. Check the connections; 3. Check the cylinder (no bridges of lime scale between the electrodes); 4. Check that the electrodes are not shorted.
E2	Low production, low conductivity of the supply water or excessive foam/lime scale in the cylinder	Unit disabled. Press the "reset/sel" button for 1 second to delete the alarm	ON	ON	Check the conductivity of the supply water and if necessary replace the cylinder with the low conductivity version.
E4	Fill alarm, water not filling or fill too slow (the current does not increase within the set time)	Press the "reset/sel" button for 1 second to delete the alarm; otherwise, the signal will be automatically reset every 10 minutes until the supply water is available again.	ON	ON	1. Check the water supply and the fill valve; 2. Check for any leaks from the drain valve; 3. Make sure the filter on the fill solenoid valve is not blocked; 4. Check that the steam outlet is not working against excessive backpressure, preventing the flow of water into the cylinder by gravity; 5. Check that the steam outlet hose is not choked or that there are no pockets of condensate; 6. Check that the power cables are connected to the cylinder.
E5	Drain alarm, cannot perform the drain (the current does not decrease within the set time)	Press the "reset/sel" button for 1 second to delete the alarm	ON	ON	1. Make sure the drain valve is not blocked 2. Check that there are no blockages in the drain connection.
E6	Cylinder exhausted (critical performance)	The signal is reset automatically if compactSteam can satisfy demand, otherwise turn the unit off and on again.	OFF	OFF	Replace the cylinder (urgent)
E7	Foam detected	Press the "reset/sel" button for 1 second to delete the alarm	OFF	OFF	If the problem persists, perform a number of cleaning cycles
E9	High temperature of the control device (above 80°C / 176°F)	The signal is automatically reset if the temperature falls below 80 °C / 176 °F.	OFF	OFF	Replace the control device.

Tab. 3.a

4. Troubleshouting

Problem	Cause	Solution
The humidifier does not start	1. No electrical power 2. Humidifier ON/OFF switch in position 0 (off) 3. Control connectors badly connected 4. Broken fuses 5. Controller fault	1. Check the protection devices upstream from the humidifier and the presence of power 2. Close the ON/OFF switch: position I (on) 3. Check that the connectors are properly inserted in the terminal block 4. Check the condition of the fuses 5. Check that this is activated and the correct voltage is connected
The humidifier does not start	1. Remote ON/OFF contact open 2. The humidistat has not been connected correctly 3. Humidistat fault 4. Control signal not compatible with the type set 5. Value measured by the sensor/sensors higher than the corresponding set point	1. Close the ON/OFF contacts (terminals AB-AB) 2. Check the external connections 3. Replace the humidistat
The humidifier fills with water without producing steam	1. High steam backpressure 2. Fill valve filter blocked 3. Minerals in the fill tank 4. Leaks from the drain solenoid valve	1. Check that the steam hose is not twisted or curved downwards, thus trapping the condensate 2. Clean the fill valve filter 3. Clean the fill tank 4. Check the voltage on the drain solenoid valve and/or replace the drain solenoid valve
The humidifier wets the duct	1. Distributor not installed correctly (too near the top of the duct or the condensate return is blocked) 2. System oversized 3. Humidifier active when the fan in the duct is off	1. Check that the steam distributor is installed correctly 2. Decrease the set steam production 3. Check the connection of the device (flow switch or differential pressure switch) slaving the humidifier to the fan in the duct
The humidifier wets the floor below	1. Humidifier drain blocked 2. The supply water or overflow circuit has leaks 3. The condensate drain hose pipe does not carry the water to the tank 4. The steam hose is not fastened to the cylinder correctly	1. Clean the drain circuit and the fill tank 2. Check the entire water circuit 3. Check the correct position of the condensate drain hose in the drain tank 4. Check the fastening of the hose clamps on the steam outlet
Sparks form inside the cylinder a few hours after starting	1. The supply water contains considerable quantities of iron, copper or other conductive contaminants.	1. If using a softener, check the salts used. If these contain additives, stop use, rinse all the lines and use non-softened water. 2. Check the electrodes in the cylinder to make sure they have not been damaged during transport.
The cylinder fills with water and drains continually, without producing steam	1. The minerals have formed a bridge between the electrodes. 2. Backpressure from the steam hoses or the duct. 3. The flow controller on the fill valve is broken or not calibrated. 4. High conductivity of the water. 5. Excessive foam forms.	1. Replace the cylinder. 2. Check if the steam hoses have twists or sags that may trap the condensate. 3. Replace the fill valve. 4. Consider using a mixture of demineralised water and untreated water. 5. Check the cylinder and replace it if exhausted.

Tab. 4.a

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Humidifiers

Content

1. Maintenance

1.1 Cleaning and maintenance of the cylinder

Replacement

Important: he cylinder must be only be replaced by qualified personnel, and with the humidifier unplugged from the power supply.

In normal conditions, the **disposable cylinders should be replaced after one year** (or 2500 hours of operation, if cleaned periodically), while the **openable cylinders last 5 years** (or 10,000 hours of operation, if cleaned periodically). They must be replaced immediately – even before the specified intervals – if any anomalies occur. For example, when the lime scale inside the cylinder prevents the correct flow of electric current.

Replacement procedure::

1. empty all the water;
2. turn off the humidifier (switch "0"), and open the mains disconnect switch on the power supply (safety procedure);
3. wait for the humidifier and the cylinder to cool down;
4. remove the front cover;
5. disconnect the electrical cables from the cylinder;
6. release the cylinder from the locking device and lift it to remove it;
7. insert the new cylinder (make sure that the model and the power supply of the new cylinder correspond to the rated data);
8. fasten the cylinder;
9. reconnect the electrical cables to the cylinder;
10. replace the front cover;
11. switch on the humidifier;
12. reset cylinder operating hour counter;
13. Activate the wash new cylinder procedure, pressing ENTER + DOWN for 5 seconds

Periodical checks

- **After one hour** of operation: check for any significant water leaks.
- **Every 15 days** or no more than 300 operating hours: check operation, the absence of significant water leaks, the general conditions of the casing. Check that during operation there are no arcs or sparks between the electrodes.
- **Every 3 months** or no more than 1000 operating hours:
  - disposable cylinders: check operation, the absence of significant water leaks and if necessary replace the cylinder;
  - openable cylinders: if there are significantly blackened areas, check the deposits on the electrodes and clean them, using the specific electrode and gasket kit.
- **Every year** or no more than 2500 operating hours:
  - disposable cylinders: replace;
  - openable cylinders: if there are significantly blackened areas, check the deposits on the electrodes and clean them, using the specific electrode and gasket kit.
- **After 5 years** or no more than 10,000 operating hours: replace the openable cylinder.

After extended operation, or when using water rich in salts, the solid deposits that naturally form on the electrodes may grow until attaching to the inside wall of the cylinder. If these deposits are conductive the heat generated may overheat the plastic until it melts, with the risk of very hot water being released.

Important: In the event of water leaks, disconnect the power supply from the humidifier as the water may conduct electricity.

1.2 Mechanically draining the water in the cylinder

Drain due to gravity without activating the humidifier, recommended if:

- humidifier decommissioned;
- to empty the cylinder without switching the humidifier on.

Mechanical drain:

- make sure that the humidifier is not powered;
- remove the cover;
- activate the mechanical device under the cylinder (see part A, Fig. 1.a).

Models UE001 to UE018 | Models UE025 to UE065

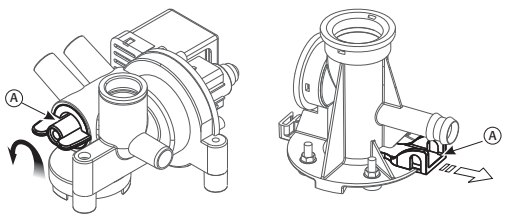

Fig. 1.a

1.3 Cylinder connection, three-phase models UE025 to UE065

production (kg/h)	conductivity (µS/cm)	power supply (V)	
		230	400
25	75/350 µS/cm	A	B
	350/1250 µS/cm	B	B
35	75/350 µS/cm	A	B
	350/1250 µS/cm	A	B
45	75/350 µS/cm	A	A
	350/1250 µS/cm	A	B
65	75/350 µS/cm	/	A
	350/1250 µS/cm	/	B

Tab. 1.a

The cable ends must be tightened with the top nut to 3 Newton • m. (units with BL*T5* cylinder only)

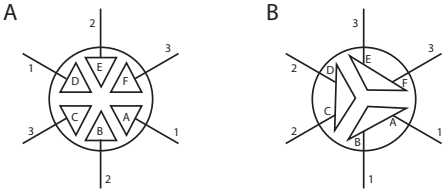

Fig. 1.b

Cylinder connection for single-phase, three-phase UE01 to UE018 models

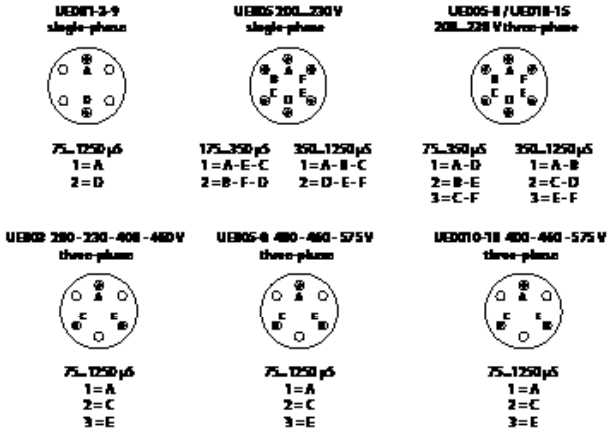

Fig. 1.c

1.4 Cleaning and maintenance of the other components

- when cleaning plastic components do not use detergents or solvents;
- scale can be removed using a solution of 20% acetic acid and then rinsing with water.

Maintenance checks on other components:

- fill solenoid valve. After having disconnected the cables and the tubing, remove the solenoid valve and make sure the inlet filter is clean; if necessary, clean with water and a soft brush;
- manifold with drain pump. Check that there are no solid residues in the cylinder attachment, remove any impurities. Check that the gasket (o-ring) is not damaged or cracked, replace if necessary. Check that there are no solid residues in the drain hose;
- drain pump. Disconnect the power supply, remove the pump and clean any impurities. Clean the tank from any deposits and check that the water flows freely from the tank to the drain (corresponding to the drain pump);
- fill tank. Check that there are no obstructions or solid particles and that the conductivity measuring electrodes are clean, remove any impurities and rinse;
- internal tubing kit. Check that the pipes and hoses are free and clear of impurities, remove any impurities and rinse.

Important: after having replaced or checked the water circuit, make sure that the connections are tight. Restart the unit and run a number of fill and drain cycles (from 2 to 4), after which, applying the safety procedure, check for any water leaks.

Fuses in the auxiliary circuits

Fuses	UE001...018	UE 025...065 (400 V)	UE025...045 (230V)
F1 e F2	1 A fast-blow, 10,3x38		2 A fast-blow, 10,3x38
F3	1 A fast-blow, 5x20 ceramic	1 A fast-blow, 10,3x38	
F4	2,5 A T fast-blow 5x20 ceramic		

Tab. 1.b

2. Spare parts

2.1 Spare parts for models UE001 to UE018

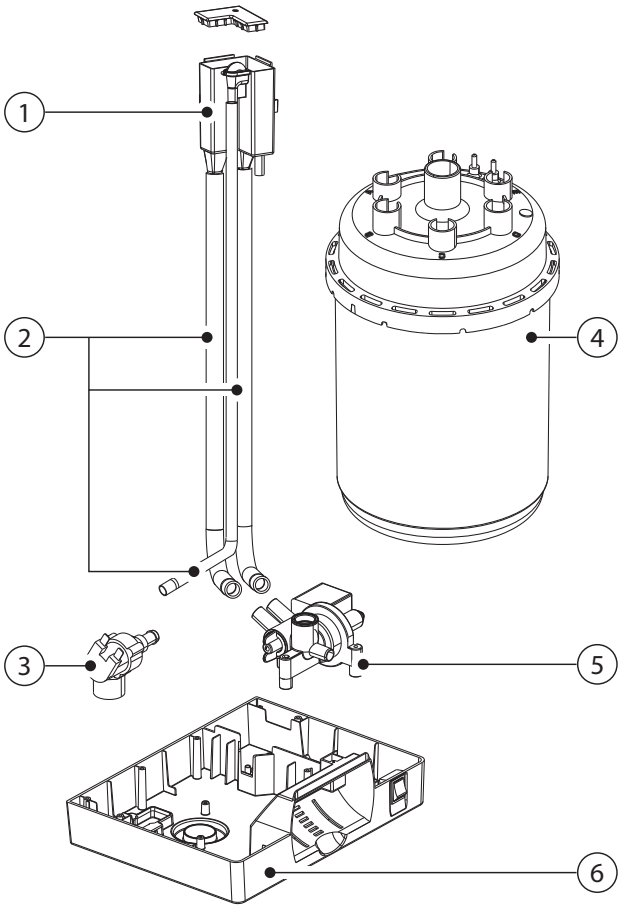

Fig. 2.a

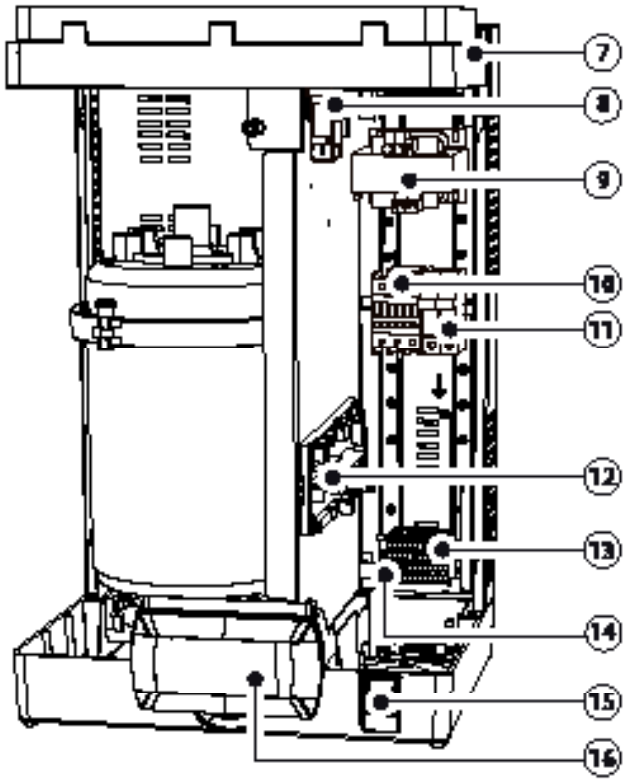

Fig. 2.b

Key to Figs. 2.a and 2.b:

1	fill tank
2	internal tubing kit
3	fill solenoid valve kit
4	cylinder
5	manifold with drain pump
6	plastic base
7	plastic humidifier top
8	TAM (transformer for measuring the current)
9	transformer
10	contactor
11	fuse holder F1-F2
12	electronic controller
13	power terminals
14	fuse holder F3
15	switch
16	terminal with display

Table of water circuit, electrical and electronic spare parts, UE001 to UE018

	spare part code									position	figure
	UE001	UE003	UE005 230-400 3ph	UE005 230 1ph	UE008	UE009	UE010	UE015	UE018		
Water circuit											
Fill tank + conductivity meter	UEKVASC100									1	2.a
Fill solenoid valve kit	KITVC10006					KITVC10011				3	2.a
Internal tubing kit	UEKT10000S					UEKT10000M				2	2.a
Plastic humidifier base	UEKBOTTOM0									6	2.b
Plastic humidifier top	UEKTOP0000									7	2.b
Assembled f/d manifold + 230V pump	UEKDRAIN01									5	2.a
Electrical and electronics											
Display terminal	HCTLEYW0w0 (3)									16	2.b
TAM (current transformer)	UEKTAM0000									8	2.b
Contactor	UEKCONT100			UEKCONT200						10	2.b
Power transformer: 230-400/24 V	UEKTR10000									9	2.b
Electronic controller (1)	UEYxxv0z0i(2)									13	2.b
Fuse carrier (F1,F2)	URKFH10000									11	2.b
Fuse carrier (F3)	UEKFH10000									14	2.b
F1 - F2 230 to 400 Vac power fuses	UEKFUSE100									-	see wiring diagrams
F3 Pump fuse	UEKFUSE200									-	see wiring diagrams
F4 Transformer secondary fuse	URKFUSE500									-	see wiring diagrams
Connection cable between terminal and electronic controller	S90CONN002									-	

Tab. 2.a

(1) when ordering, as well as the controller code specify the complete code and serial number of the humidifier.
(2) xx: kg/h (01,.....65)
v: power supply
z: match digit board
i: 0 single package / 1 multiple package
(3) w: match digit terminal

Table of spare part codes, Single-phase cylinders UE001 to UE009, electrode and gasket kit

Model		UE001	UE003	UE005	UE009
STANDARD disposable cylinders	200/230 Vac 1~, conductivity 350 to 1250 µS/cm	BL0S1F00H2	BL0S1F00H2	BL0S2E00H2	BL0S3F00H2
SPECIAL disposable cylinders	200/230 Vac 1~, conductivity 75 to 350 µS/cm	BL0S1E00H2	BL0S1E00H2	BL0S2E00H2	BL0S3E00H2
SPECIAL openable cylinders	200/230 Vac 1~, conductivity 75 to 350 µS/cm	BLCS1E00W2	BLCS1E00W2	BLCS2E00W2	BLCS3E00W2
	200/230 Vac 1~, conductivity 350 to 1250 µS/cm	BLCS1F00W2	BLCS1F00W2	BLCS2E00W2	BLCS3F00W2
Electrode and gasket kit	200/230 Vac 1~, conductivity 75 to 350 µS/cm	KITBLCS1E2	KITBLCS2E2	KITBLCS2E2	KITBLCS3E2
	200/230 Vac 1~, conductivity 350 to 1250 µS/cm	KITBLCS1F2	KITBLCS2F2	KITBLCS2E2	KITBLCS3F2
Filter gasket kit		KITBLC1FG0	KITBLC2FG0	KITBLC2FG0	KITBLC3FG0

Tab. 2.b

Table of spare part codes, three-phase cylinders UE003 to UE018, electrode and gasket kit

Model		UE003	UE005	UE008	UE010	UE015	UE018
STANDARD disposable cylinders	200/230 VAC 3~, conductivity 350 to 1250 µS/cm	BL0T1B00H2	BL0T2A00H2	BL0T2A00H2	BL0T3A00H2	BL0T3A00H2	--
	400 VAC 3~, conductivity 350 to 750 µS/cm	BL0T1C00H2	BL0T2C00H2	BL0T2C00H2	BL0T3C00H2	BL0T3C00H2	BL0T3C00H2
SPECIAL disposable cylinders	200/230 VAC 3~, conductivity 75 to 350 µS/cm	BL0T1A00H2	BL0T2A00H2	BL0T2A00H2	BL0T3A00H2	BL0T3A00H2	--
	400 VAC 3~, conductivity 75 to 350 µS/cm	BL0T1A00H2	BL0T2B00H2	BL0T2B00H2	BL0T3B00H2	BL0T3B00H2	BL0T3B00H2
	400 VAC 3~, conductivity 750 to 1250 µS/cm	BL0T1D00H2	BL0T2D00H2	BL0T2D00H2	BL0T3D00H2	BL0T3D00H2	BL0T3D00H2
SPECIAL openable cylinders	200/230 VAC 3~, conductivity 75 to 350 µS/cm	BLCT1A00W2	BLCT2A00W2	BLCT2A00W2	BLCT3A00W2	BLCT3A00W2	--
	400 VAC 3~, conductivity 75 to 350 µS/cm	BLCT1A00W2	BLCT2B00W2	BLCT2B00W2	BLCT3B00W2	BLCT3B00W2	BLCT3B00W2
	400 VAC 3~, conductivity 350 to 750 µS/cm	BLCT1C00W2	BLCT2C00W2	BLCT2C00W2	BLCT3C00W2	BLCT3C00W2	BLCT3C00W2
	400 VAC 3~, conductivity 750 to 1250 µS/cm	BLCT1D00W2	BLCT2D00W2	BLCT2D00W2	BLCT3D00W2	BLCT3D00W2	BLCT3D00W2
Electrode and gasket kit	Electrode kit 200/230 Vac 3~, 75 to 350 µS/cm	KITBLCT1A2	KITBLCT2A2	KITBLCT2A2	KITBLCT3A2	KITBLCT3A2	--
	Electrode kit 200/230 Vac 3~, 350 -1250 µS/cm	KITBLCT1B2	KITBLCT2A2	KITBLCT2A2	KITBLCT3A2	KITBLCT3A2	--
	Electrode kit 400 Vac 3~, 75 - 350 µS/cm	KITBLCT1A2	KITBLCT2B2	KITBLCT2B2	KITBLCT3B2	KITBLCT3B2	KITBLCT3B2
	Electrode kit 400 Vac 3~, 350 - 750 µS/cm	KITBLCT1C2	KITBLCT2C2	KITBLCT2C2	KITBLCT3C2	KITBLCT3C2	KITBLCT3C2
	Electrode kit 400 Vac 3~, 750 - 1250 µS/cm	KITBLCT1D2	KITBLCT2D2	KITBLCT2D2	KITBLCT3D2	KITBLCT3D2	KITBLCT3D2
	Filter gasket kit	KITBLC1FG0	KITBLC2FG0	KITBLC2FG0	KITBLC3FG0	KITBLC3FG0	KITBLC3FG0

Tab. 2.c

2.2 Spare parts for models UE025 to UE065

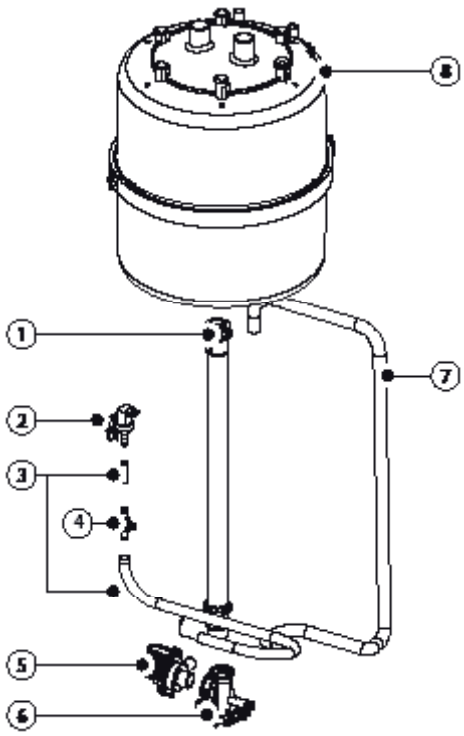

Fig. 2.c

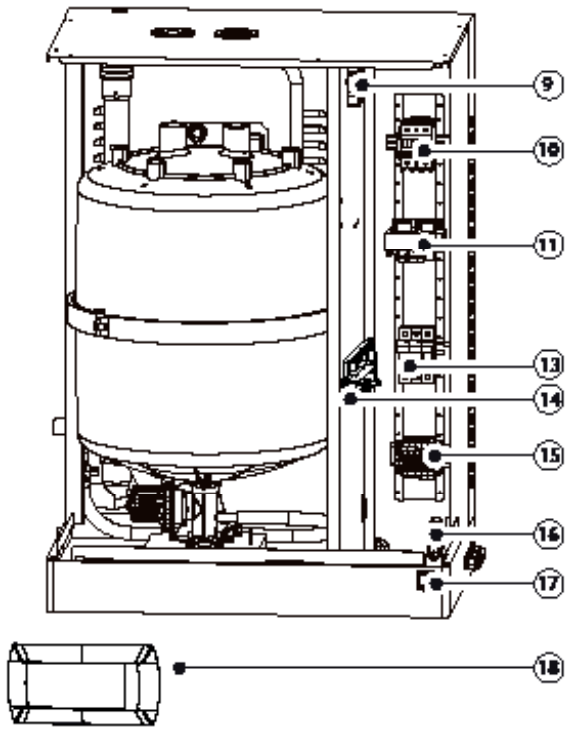

Fig. 2.d

Key:

1 drain circuit
2 fill solenoid valve kit
3 internal tubing kit
4 conductivity meter
5 drain pump kit
6 manifold
7 drain pump hose
8 cylinder
9 TAM (transformer for measuring the current)
10 contactor
11 transformer
13 fuse carrier
14 electronic controller
15 power terminals
16 cable clamp
17 switch
18 terminal with liquid crystal display (fitted on the cover of the electrical compartment)

Table of water circuit, electrical and electronic spare parts, UE025 to UE065

description	spare part code							position	figure
	UE025		UE035		UE045		UE065		
	230 V	400 V	230V	400V	400 V	230 V			
Water circuit									
Drain pump hose	UEKDH00000							7	2.c
Manifold	UEKCOLL000							6	2.c
Drain pump kit	KITPSE0000							5	2.c
Internal tubing kit	UEKT10000L						UEKT1000XL	3	
Double check valve kit	FWHDCV0000							-	
Conductivity meter kit	KITCN00000							4	
Fill solenoid valve kit	KITVC10058				KITVC10070			2	2.c
Drain circuit	UEKDC00000						UEKDC10000	1	2.c
Electrical and electronics									
Display terminal	HCTLEYF0w0 (3)							18	2.b
TAM (current transformer)	UEKTAM0000							9	2.d
Contactor	URKCONT300	UEKCONT200	URKCONT300	URKCONT400	URKCONT300			10	
Power transformer: 230/400-24V	UEKTR10000							11	2.d
Electronic controller	UEYxxv0z0i(2)							14	2.d
Fuse carrier	URKFH20000							13	2.d
Pump control relay	UEKRD00000							12	2.d
F1 - F2 230 to 400Vac power fuses	UEKFUSE100							-	see wiring diagrams
F3 Pump fuse	UEKFUSE300	UEKFUSE100	UEKFUSE300	UEKFUSE100	UEKFUSE300	UEKFUSE100	UEKFUSE100	-	see wiring diagrams
F4 Transformer secondary fuse	URKFUSE500							-	see wiring diagrams
Connection cable between terminal and electronic controller	S90CONN002							-	

Tab. 2.d

1. when ordering, as well as the controller code specify the complete code and serial number of the humidifier.
2. xx: kg/h (01,.....65)
   v: power supply
   z: match digit board
   i: 0 single package / 1 multiple package
3. w: match digit terminal

Table of spare parts for standard and special cylinders UE025 to UE065

Description		UE025	UE035	UE045	UE065
STANDARD disposable cylinders	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	BL0T4C00H2	BL0T4B00H2	BL0T5A00H1	-
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	BL0T4D00H2	BL0T4D00H2	BL0T4C00H2	BL0T5C00H0
SPECIAL disposable cylinders	200/230V 3ph cylinder, conductivity 75 to 350 µS/cm	BL0T4B00H2	BL0T4B00H2	BL0T5A00H1	--
	400V 3ph cylinder, conductivity 75 to 350 µS/cm	BL0T4C00H2	BL0T4C00H2	BL0T4B00H2	BL0T5B00H0
SPECIALI openable cylinders	200/230V 3ph cylinder, conductivity 75 to 350 µS/cm	BLCT4B00W2	BLCT4B00W2	BLCT5A00W0	--
	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	BLCT4C00W2	BLCT4B00W2	BLCT5A00W0	--
	400V 3ph cylinder, conductivity 75 to 350 µS/cm	BLCT4C00W2	BLCT4C00W2	BLCT4B00W2	BLCT5B00W0
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	BLCT4D00W2	BLCT4D00W2	BLCT4C00W2	BLCT5C00W0
Electrode and gasket kit	200/230V 3ph cylinder, conductivity 75 to 350 µS/cm	KITBLCT4B2	KITBLCT4B2	KITBLCT5A0	--
	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4C2	KITBLCT4B2	KITBLCT5A0	--
	400V 3ph cylinder, conductivity 75 to 350 µS/cm	KITBLCT4C2	KITBLCT4C2	KITBLCT4B2	KITBLCT5B0
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4D2	KITBLCT4D2	KITBLCT4C2	KITBLCT5C0
Gasket and filter kit		KITBLC4FG0	KITBLC4FG0	KITBLC4FG0	KITBLC5FG0

Tab. 2.e

3. Allarms

code display and symbol		meaning	causes	solution	reset (press)	alarm relay activation	effect	red LED signal on board (*) (if terminal not connected)
E0	-	calibration parameter software verification errora	internal memory error	if the problem persists, contact the CAREL service center	--	yes	humidification stopped	3 fast flashes
E1	-	parameter configuration error	error in the parameters user	if the problem persists, contact the CAREL service center	--	yes	humidification stopped	4 fast flashes
EH	A	excess current	over-current at the electrodes; probable electrode malfunction or water conductivity temporarily too high (especially when starting after a short stop)	1. check the operation of the drain pump 2. check the seal of the fill electrovalve when not energised 3. drain part of the water and re-start	AUTO	yes	humidification stopped	2 fast flashes
EP		no production	excessive reduction in production , or cylinder completely depleted or water	Perform maintenance on the cylinder	ESC	yes	humidification stopped	4 slow flashes
CY		cylinder life pre-alarm	the cylinder full limit of 1500 h (default)	perform maintenance and/ or replace the cylinder	ESC (the alarm is reactivated after 50 hrs)	no	signal only	7 fast flashes
EF		no water		Check: water supply and fill valve; whether the manual drain is open; blockage of the filter on the fill solenoid valve; whether there is excessive backpressure in steam outlet, preventing the flow of water into the cylinder by gravity; that the steam outlet hose is not choked or that there are no pockets of condensate; that the power cables are connected to the cylinder	automatic (after 10 minute waiting time)	yes (in 10 minute waiting time)	humidification stopped for 10 minutes only	3 slow flashes
Ed		failed drain		check the drain pump and drain connection	ESC	yes	humidification stopped	5 slow flashes
CP		cylinder being depleted signal		cylinder life ending, perform maintenance and/ or replace the cylinder	ESC	no	signal only	6 slow flashes
CL		cylinder depleted signal		cylinder life ended, perform maintenance and/or replace the cylinder	--	no	signal only	10 slow flashes
EA		foam	excessive foam in the cylinder during boiling. the formation of foam is generally due to the presence of surfactants in the water (lubricants, solvents, detergents, water treatment agents, softeners) or an excessive concentration of dissolved salts.	1. drain the water supply lines 2. clean the cylinder 3. check for the presence of softeners (in this case, use another type of water or reduce the softening)	ESC	no	signal only	9 slow flashes
Mn		end of cylinder life		the cylinder has exceeded the limit of 2000 hours, replace the cylinder	reset hour counter	yes	humidification stopped	8 fast flashes
EU		cylinder full	excessive water level when unit producing steam	with the machine off: 1. check for any leaks from the fill electrovalve or the condensate return pipe 2. check that the level sensors are clean total shut-down pipe 2. check that the level sensors are clean total shut-down	--	no	signal only	8 slow flashes

code display and symbol		meaning	causes	solution	reset (press)	alarm relay activation	effect	red LED signal on board (*) (if terminal not connected)
EC	***µS/cm***	high conductivity	high supply water conductivity	1. check water conductivity 2. if the problem persists, change the source of supply water or install a suitable treatment system (demineralisation, even partial). N.B.: the problem will not be resolved by softening the supply water.	AUTO	no (b5) yes (b6)	signal only humid. stopped	5 fast flashes
E3	-	failed connection of modulating signal	Cable interrupted / disconnected / improperly connected.	check the reference signal in 4 to 20 mA or 2 to 10V mode)	ESC	yes	humidification stopped	7 slow flashes
PC	-	cylinder cleaning started signal			--	--	--	none
dr	-	cylinder drain activated			--	--	--	none
dr / TOT	-	complete drain due to inactivity			--		--	(both codes alternate on display)
AF		antifoam active			--	--	--	none

Tab. 3.a

Press ESC once to mute the buzzer, press ESC a second time to reset the alarm.

(*) Quick flash: 0.2 seconds ON and 0.2 seconds OFF
Slow flash: 1 second ON and 1 second OFF

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Humidifiers for steam baths

Content

1. Maintenance

1.1 Cleaning and maintenance of the cylinder

Replacement

Important: the cylinder must be only be replaced by qualified personnel, and with the humidifier unplugged from the power supply.

In normal conditions, the **disposable cylinders should be replaced after one year** (or 2500 hours of operation, if cleaned periodically), while the **openable cylinders last 5 years** (or 10,000 hours of operation, if cleaned periodically). They must be replaced immediately – even before the specified intervals – if any anomalies occur. For example, when the lime scale inside the cylinder prevents the correct flow of electric current.

Replacement procedure:

1. empty all the water;
2. turn off the humidifier (switch "0"), and open the mains disconnect switch on the power supply (safety procedure);
3. wait for the humidifier and the cylinder to cool down;
4. remove the front cover;
5. disconnect the electrical cables from the top of the cylinder;
6. release the cylinder from its fastening device and lift it up to remove it;
7. insert the new cylinder (make sure that the model and the power supply of the new cylinder correspond to the rated data);
8. fasten the cylinder;
9. reconnect the electrical cables to the top of the cylinder;
10. replace the front cover;
11. switch on the humidifier.

Periodical checks

- **After one hour** of operation: check for any significant water leaks.
- **Every 15 days** or no more than 300 operating hours: check operation, the absence of significant water leaks, the general conditions of the casing. Check that during operation there are no arcs or sparks between the electrodes.
- **Every 3 months** or no more than 1000 operating hours:
  - disposable cylinders: check operation, the absence of significant water leaks and if necessary replace the cylinder;
  - openable cylinders: if there are significantly blackened areas, check the deposits on the electrodes and clean them, using the specific electrode and gasket kit (see Tab. 2.c).
- **Every year** or no more than 2500 operating hours:
  - disposable cylinders: replace;
  - openable cylinders: if there are significantly blackened areas, check the deposits on the electrodes and clean them, using the specific electrode and gasket kit (see Tab. 2.c).
- **After 5 years** or no more than 10,000 operating hours: replace the openable cylinder.

After extended operation, or when using water rich in salts, the solid deposits that naturally form on the electrodes may grow until attaching to the inside wall of the cylinder. If these deposits are conductive the heat generated may overheat the plastic until it melts, with the risk of very hot water being released.

Important: In the event of water leaks, disconnect the power supply from the humidifier as the water may conduct electricity.

1.2 Cylinder connection, three-phase models UE025 to UE065

production (kg/h)	conductivity (µS/cm)	power supply (V)	
		230	400
25	125/350 µS/cm	A	B
	350/1250 µS/cm	B	B
35	125/350 µS/cm	A	B
	350/1250 µS/cm	A	B
45	125/350 µS/cm	A	A
	350/1250 µS/cm	A	B
65	125/350 µS/cm	/	A
	350/1250 µS/cm	/	B
	350/1250 µS/cm	/	B

Tab. 1.a

The cable ends must be tightened with the top nut to 3 Newton • m.

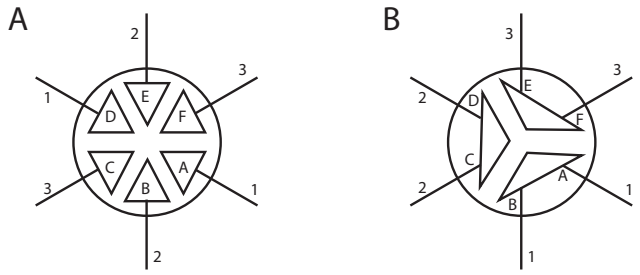


Fig. 1.a

1.3 Cleaning and maintenance of the other components

Important:

- when cleaning the plastic components do not use detergents or solvents;
- scale can be removed using a solution of 20% acetic acid and then rinsing with water.

Maintenance checks on other components:

- fill solenoid valve (Fig. 2.a part. 3 and Fig. 2.c part. 2). After having disconnected the cables and the tubing, remove the solenoid valve and make sure the inlet filter is clean; if necessary, clean with water and a soft brush;
- manifold with drain pump (Fig. 2.a part. 5). Check that there are no solid residues in the cylinder attachment, remove any impurities. Check that the gasket (o-ring) is not damaged or cracked, replace if necessary. Check that there are no solid residues in the drain hose;
- drain pump (Fig. 2.c part. 4). Disconnect the power supply, unscrew the fastening screws and remove any impurities (Fig. 2.a part. 6). Clean the tank from any deposits and check that the water flows freely from the tank to the drain (corresponding to the drain pump);
- tank (Fig. 2.a part. 1). Check that there are no obstructions or solid particles and that the conductivity measuring electrodes are clean, remove any impurities and rinse;
- internal pipe kit (Fig. 2.a part. 2 and Fig. 2.c part. 3). Check that the pipes and hoses are free and clear of impurities, remove any impurities and rinse.

Important: after having replaced or checked the water circuit, make sure that the connections are tight. Restart the unit and run a number of fill and drain cycles (from 2 to 4), after which, applying the safety procedure, check for any water leaks.

Fuses in the auxiliary circuits

Fuses	UE001 to 018	UE 025 to 065
F1 & F2	4 A fast-blow. 10.3x38	1 A fast-blow. 10.3x38
F3	-	1 A fast-blow. 10.3x38
F41 (s 1) F42 (s 2)	5 A T slow-blow 5x20 ceramic 2 Amp. T slow-blow 5x20 ceramic	2.5 A T slow-blow 5x20 ceramic -
F5 & F6	1 A T slow-blow 5x20 glass	1 A T slow-blow 5x20 glass
AP1 & AP2	6.3 A T slow-blow 5x20 ceramic	6.3 A T slow-blow 5x20 ceramic
controller fuse PF1	2 A T slow-blow 5x20 glass (minimum size of connection cables 1.5 mm^2)	2 A T slow-blow 5x20 glass (minimum size of connection cables 1.5 mm^2)

Tab. 1.b

2. Spare parts

2.1 Spare parts for models UE001 to UE018

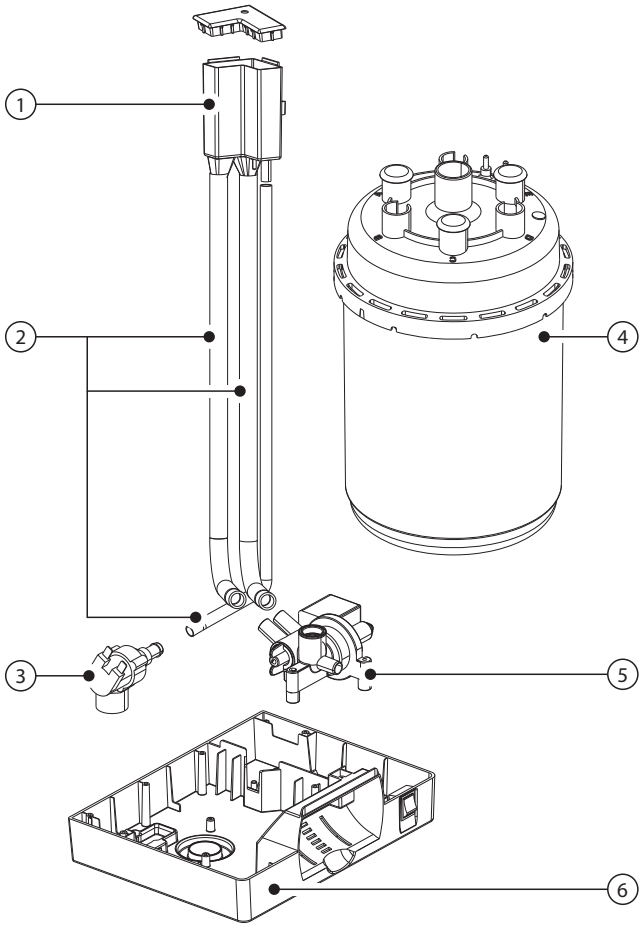


Fig. 2.a

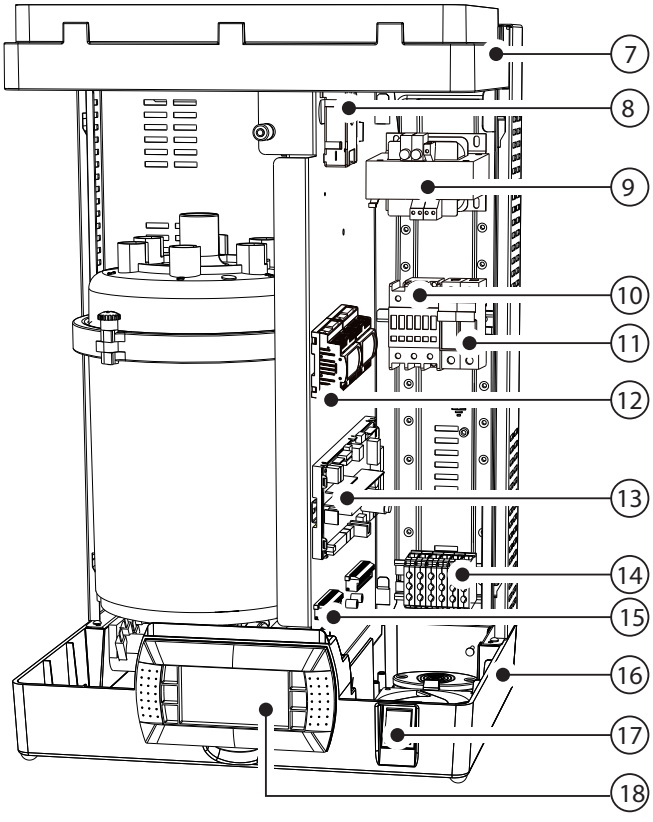


Fig. 2.b

Key to Figs. 2a and 2.b:

1 tank
2 internal pipe kit
3 fill solenoid valve kit
4 cylinder
5 manifold with drain pump
6 plastic base
7 plastic humidifier top
8 TAM (transformer for measuring the current)
9 transformer
10 contactor
11 fuse carrier
12 pCOe expansion board (controller I/O expansion)
13 microprocessor electronic controller
14 power terminals
15 utility terminal block
16 plastic base
17 switch
18 terminal with liquid crystal display

Table of water circuit, electrical and electronic spare parts, UE001 to 018

	spare part code								position	figure
	UE001	UE003	UE005	UE008	UE009	UE010	UE015	UE018		
Water circuit										
Fill tank + conductivity meter	UEKVASC000								1	2.a
Fill solenoid valve kit	KITVC10006				KITVC10011				3	2.a
Internal pipe kit	UEKT10000S				UEKT10000M				2	2.a and 2.c
Plastic humidifier base	18C565A019								16	2.b
Plastic humidifier top	18C476A011								7	2.b
Assembled f/d manifold + pump	18C565A018								3	2.a
Electrical and electronics										
Display terminal	HCT1EWF000								11	2.b
TAM (current transformer)	09C565A042								8	2.b and 2.d
Contactor	0203012AXX		0203013AXX							
Power transformer: 230-400/24-24 V	09C565A016								9	2.b and 2.d
Microprocessor electronic controller	HCA0EW0000								13	2.b and 2.d
pCOe expansion board (Controller I/O expansion)	PCOE00TLN0								12	2.b
Fuse carrier	0606192AXX								11	2.b and 2.d
F1 - F2 230 to 400 Vac power fuses	0605321ALG								-	see wiring diagrams
F4 Transformer secondary fuse (F41)	0605581AXX (F41) 0605620AXX (F42)								-	see wiring diagrams
F5 - F6 pCOe fuse	0605615AXX								-	
AP1 - AP2 Terminal fuse	0605595AXX								-	see wiring diagrams
Connection cable between terminal and electronic controller	S90CONN002								-	
PF1 Controller fuse	0605604AXX								-	see wiring diagrams

Tab. 2.a

Table of spare part codes, single-phase cylinders UE001 to 005, electrode and gasket kit

Model		UE001	UE003	UE005	UE009
STANDARD disposable cylinders	200/230 Vac 3~, conductivity 350 to 1250 µS/cm	BL0S1F00H1	BL0S1F00H1	BL0S2F00H0	BL0S3F00H0
SPECIAL disposable cylinders	200/230 Vac 3~, conductivity 125 to 350 µS/cm	BL0S1E00H1	BL0S1E00H1	BL0S2E00H0	BL0S3E00H0
SPECIAL openable cylinders	200/230 Vac 3~, conductivity 125 to 350 µS/cm	BLCS1E00W1	BLCS1E00W1	BLCS2E00W0	BLCS3E00W0
	200/230 Vac 3~, conductivity 350 to 1250 µS/cm	BLCS1F00W1	BLCS1F00W1	BLCS2F00W0	BLCS3F00W0
Electrode and gasket kit	200/230 Vac 3~, conductivity 125 to 350 µS/cm	KITBLCS1E0	KITBLCS2E0	KITBLCS2E0	KITBLCS3E0
	200/230 Vac 3~, conductivity 350 to 1250 µS/cm	KITBLCS1F0	KITBLCS2F0	KITBLCS2F0	KITBLCS3F0
Electrode gasket kit		KITBLC1FG0	KITBLC2FG0	KITBLC2FG0	KITBLC3FG0

Tab. 2.b

Table of spare part codes, three-phase cylinders UE003 to 018, electrode and gasket kit

Model		UE003	UE005	UE008	UE010	UE015	UE018
STANDARD disposable cylinders	200/230 VAC 3~, conductivity 350 to 1250 µS/cm	BL0T1B00H1	BL0T2B00H0	BL0T2B00H0	BL0T3B00H0	BL0T3A00H0	BL0T3B00H0
	400 VAC 3~, conductivity 350 to 750 µS/cm	BL0T1C00H1	BL0T2C00H0	BL0T2C00H0	BL0T3C00H0	BL0T3B00H0	BL0T3B00H0
SPECIAL disposable cylinders	200/230 VAC 3~, conductivity 125..350 µS/cm	BL0T1A00H1	BL0T2A00H1	BL0T2A00H1	BL0T3A00H1	BL0T3A00H1	BL0T3A00H1
	400 VAC 3~, conductivity 125 to 350 µS/cm	BL0T1A00H1	BL0T2B00H0	BL0T2B00H0	BL0T3B00H0	BL0T3B00H0	BL0T3B00H0
	400 VAC 3~, conductivity 750 to 1250 µS/cm	BL0T1D00H1	BL0T2D00H0	BL0T2D00H0	BL0T3D00H0	BL0T3D00H0	BL0T3D00H0
SPECIAL openable cylinders	200/230 VAC 3~, conductivity 125..350 µS/cm	BLCT1A00W1	BLCT2A00W1	BLCT2A00W1	BLCT3A00W1	BLCT3A00W1	BLCT3A00W1
	400 VAC 3~, conductivity 125 to 350 µS/cm	BLCT1A00W1	BLCT2B00W0	BLCT2B00W0	BLCT3B00W0	BLCT3B00W0	BLCT3B00W0
	400 VAC 3~, conductivity 350 to 750 µS/cm	BLCT1C00W1	BLCT2C00W0	BLCT2C00W0	BLCT3C00W0	BLCT3B00W0	BLCT3B00W0
	400 VAC 3~, conductivity 750 to 1250 µS/cm	BLCT1D00W1	BLCT2D00W0	BLCT2D00W0	BLCT3D00W0	BLCT3D00W0	BLCT3D00W0
Electrode and gasket kit	Electrode kit 200/230 Vac 3~, 125/350 µS/cm	KITBLCT1A0	KITBLCT2A0	KITBLCT2A0	KITBLCT3A0	KITBLCT3A0	KITBLCT3A0
	Electrode kit 200/230 Vac 3~, 350/1250 µS/cm	KITBLCT1B0	KITBLCT2B0	KITBLCT2B0	KITBLCT3B0	KITBLCT3B0	KITBLCT3B0
	Electrode kit 400 Vac 3~, 125/350 µS/cm	KITBLCT1A0	KITBLCT2B0	KITBLCT2B0	KITBLCT3B0	KITBLCT3B0	KITBLCT3B0
	Electrode kit 400 Vac 3~, 350/750 µS/cm	KITBLCT1C0	KITBLCT2C0	KITBLCT2C0	KITBLCT3C0	KITBLCT3C0	KITBLCT3C0
	Electrode kit 400 Vac 3~, 750/1250 µS/cm	KITBLCT1D0	KITBLCT2D0	KITBLCT2D0	KITBLCT3D0	KITBLCT3D0	KITBLCT3D0
	Electrode gasket kit	KITBLC1FG0	KITBLC2FG0	KITBLC2FG0	KITBLC3FG0	KITBLC3FG0	KITBLC3FG0

Tab. 2.c

2.2 Spare parts, models UE025 to UE065

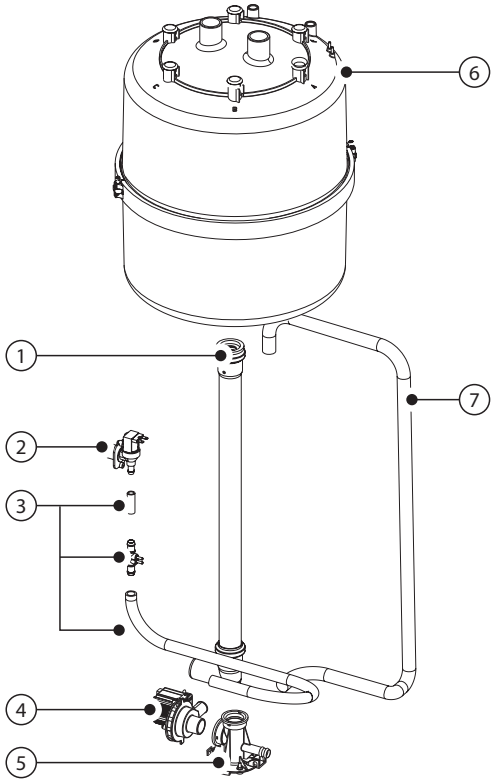


Fig. 2.c

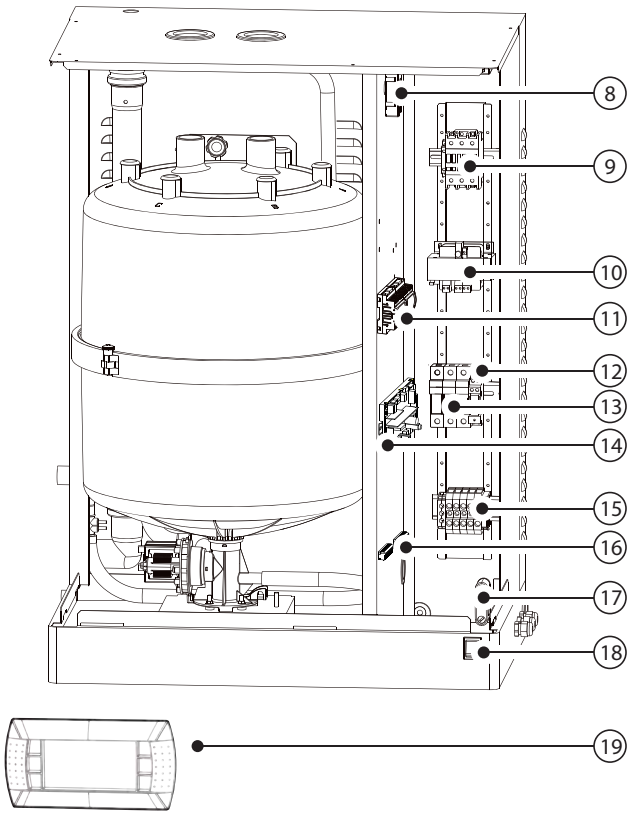


Fig. 2.d

Key:

1 drain circuit
2 fill solenoid valve kit
3 internal pipe kit
4 drain pump kit
5 manifold
6 cylinder
7 drain pump hose
8 TAM (transformer for measuring the current)
9 contactor
10 transformer
11 pCOe expansion board (controller I/O expansion)
12 pump control relay
13 fuse carrier
14 microprocessor electronic controller
15 power terminals
16 utility terminal block
17 cable clamp
18 switch
19 terminal with liquid crystal display (fitted on the cover of the electrical compartment)

Table of water circuit, electrical and electronic spare parts, UE025 to UE065

description	spare part code					position	figure
	UE025	UE035	UE045		UE065		
			400 V	230 V			
Water circuit							
Drain pump hose	13C479A001					7	2.c
Manifold	18C499A001					5	2.c
Drain pump kit	KITPS00000					4	2.c
Internal pipe kit	UEKT10000L			UEKT1000XL		3	2.a and 2.c
Double check valve kit	FWHDCV0000					-	
Conductivity meter kit	KITCN00000					-	
Fill solenoid valve kit	KITVC10058		KITVC10070	KITVC10070	KITVC10070	2	2.c
Drain circuit	13C565A031					1	2.c
Electrical and electronics							
Display terminal	HCT1EWF000					19	2.b
pCOe expansion board (controller I/O expansion)	PCOE00TLN0					11	2.d
TAM (current transformer)	09C565A042					8	2.b and 2.d
Contactor (V= 400)	0203013AXX	0203014AXX			0203007AXX		
Power transformer: 230/400-24V	09C565A044					10	2.b and 2.d
Microprocessor electronic controller	HCA0EW0000					14	2.b and 2.d
Fuse carrier	0606193AXX					13	2.b and 2.d
Pump control relay	0102001AXX					12	2.d
F1 - F2 230 to 400Vac power fuses	0605319AXX					-	see wiring diagrams
F3 Pump fuse	0605319AXX					-	see wiring diagrams
F4 Transformer secondary fuse	0605624AXX					-	see wiring diagrams
F5 - F6 pCOe fuse	0605615AXX					-	see wiring diagrams
AP1 - AP2 Terminal fuse	0605595AXX					-	see wiring diagrams
Connection cable between terminal and HHPC	S90CONN002					-	
PF1 Controller fuse	0605604XXX					-	see wiring diagrams

Tab. 2.d

Table of spare parts for standard and special cylinders UE025 to UE065

Description		UE025	UE035	UE045	UE065
STANDARD disposable cylinders	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	BL0T4C00H0	BL0T4B00H0	BL0T5A00H1	-
	400V 3ph Cylinder, conductivity 350 to 1250 µS/cm	BL0T4C00H0	BL0T4D00H0	BL0T4C00H0	BL0T5C00H0
SPECIAL disposable cylinders	200/230V 3ph Cylinder, conductivity 125 to 350 µS/cm	BL0T4B00H0	BL0T4B00H0	BL0T5A00H1	--
	400V 3ph Cylinder, conductivity 125 to 350 µS/cm	BL0T4C00H0	BL0T4C00H0	BL0T4B00H0	BL0T5B00H0
SPECIAL openable cylinders	200/230V 3ph Cylinder, conductivity 125 to 350 µS/cm	BLCT4B00W0	BLCT4B00W0	BLCT5A00W0	--
	200/230V 3ph Cylinder, conductivity 350 to 1250 µS/cm	BLCT4C00W0	BLCT4B00W0	BLCT5A00W0	--
	400V 3ph Cylinder, conductivity 125 to 350 µS/cm	BLCT4C00W0	BLCT4C00W0	BLCT4B00W0	BLCT5B00W0
	400V 3ph Cylinder, conductivity 350 to 1250 µS/cm	BLCT4C00W0	BLCT4D00W0	BLCT4C00W0	BLCT5C00W0
Electrode and gasket kit	200/230V 3ph Cylinder, conductivity 125 to 350 µS/cm	KITBLCT4B0	KITBLCT4B0	KITBLCT5A0	--
	200/230V 3ph Cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4C0	KITBLCT4C0	KITBLCT5A0	--
	400V 3ph Cylinder, conductivity 125 to 350 µS/cm	KITBLCT4C0	KITBLCT4C0	KITBLCT4B0	KITBLCT5B0
	400V 3ph Cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4D0	KITBLCT4D0	KITBLCT4C0	KITBLCT5C0
Gasket kit		KITBLC4FG0	KITBLC4FG0	KITBLC4FG0	KITBLC5FG0

Tab. 2.e

3. Displaying the alarms

From the alarm log submenu, press ENTER to display the alarms (type of alarm, date and time)
The humidifier saves up to 200 alarms.

alarm	meaning and cause	solution	reset	alarm relay	consequence
Alarm: EP Low Production (cylinder OFF)	excessive reduction in steam production, or excessive foam in the cylinder.	Perform maintenance on the cylinder	manual	active	stop steam production
Alarm: EF Lack of water (cylinder OFF)	no water in the cylinder	1. check that the supply hose and the internal hoses are not blocked or choked and that there is sufficient pressure (0.1 to 0.8 MPa, 1 to 8 bars); 2. check the operation of the fill solenoid valve; 3. check that the steam outlet is not operating with excessive backpressure, preventing the flow of water into the cylinder by gravity; 4. check that the steam outlet hose is not choked and that there are no pockets of condensate	automatic (automatic water return procedure)	active	stop steam production
Alarm: Ed Drain alarm(Cylinder OFF)	drain malfunction	check the water drain circuits and the correct operation of the electric drain pump	manual	active	stop steam production
Alarm: EL Low urrent (Cylinder OFF)	power not available; when the unit is activated no steam is produced	with the unit off and disconnected from the mains, check the electrical connections.	manual	active	stop steam production
Alarm: EH High current (Cylinder OFF)	probable fault in the electrodes or water temporarily too conductive(especially when restarting after a short stop)	1. check the operation of the electric drain pump; 2. check the seal of the fill solenoid valve when not energised; drain some of the water and re-start.	manual	active	stop steam production
Alarm: EC High conductivity (Cylinder OFF)	high supply water conductivity	1. check the limit threshold set; 2. switch the unit off and clean the electrodes that measure of the conductivity of the water; if the problem persists, change the origin of the supply water or use a suitable treatment system (partial demineralisation). **Note:** the problem is not resolved by softening the supply water	manual	active	stop steam production
Warning: Ec High conductivity	pre-alarm: high supply water conductivity	1. check the conductivity of the supply water, if necessary use a suitable treatment system (partial demineralisation). **Note:** the problem is not resolved by softening the supply water	automatic	not active	signal only
Alarm: E= High temp.	pre-alarm: high temperature	check the operation of the probe and the high temperature parameter	automatic	not active	signal only
Alarm: E_ Low temp.	pre-alarm: low temperature	check the operation of the probe and the low temperature parameter	automatic	not active	signal only
Alarm: E3 Probe 1 fault or offline	1st probe disconnectedor faulty alarm	check the connection of the probe, and the type of probe selected on the: "type of probe" screen ("Maint HW" submenu)	automatic	active	stop steam production
Alarm: E4 Probe 2 fault or offline	2nd probe disconnectedor faulty alarm	check the connection of the probe, and the type of probe selected on the: "type of probe" screen ("Maint HW" submenu)	automatic	not active	stop steam production
Warning: EA Foam cylinder	excessive foam in the cylinder during boiling	the entrainment of foam is generally due to the presence of surfactants in the water (lubricants, solvents, detergents, water treatment agents, softeners) or an excessive concentration of dissolved salts: 1. drain the water supply lines; 2. clean the cylinder make sure a softener is not used (if so, use another source of water or reduce the softening).	manual	not active	signal only
Warning: CP Pre-exhaustion cylinder	pre-alarm: cylinder being depleted	perform maintenance and/or replace the cylinder	manual	not active	signal only
Alarm: EU full cylinder (cylinder OFF)	cylinder full with unit off	with the unit off: 1. check for any leaks from the fill solenoid valve or the condensate return from the hose, check that the level sensors are clean	manual	active	stop steam production
Warning: CL Exhaustion cylinder	cylinder depleted	perform maintenance and/or replace the cylinder	manual	active	stop steam production
Warning: CY Cylinder maintenance recommended	cylinder maintenance recommended	perform maintenance and/or replace the cylinder	manual (reset countertatore)	not active	signal only
Alarm: Mn Cylinder maintenance mandatory (cylinder OFF)	cylinder maintenance required	Replace the cylinder	manual (reset counter)	active	stop steam production

alarm	meaning and cause	solution	reset	alarm relay	consequence
Clock board fault	Clock error backup battery completely discharged or general problems with the clock	Electronic microprocessor controller installed inside the humidifier electrical compartment	manual	not active	signal only
Alarm: utility board 1 or 2	utilities board offline or faulty	- connect the board - deactivate the utility functions relating to the alarm signal	automatic	active	signal only

Tab. 3.a

Cylinder OFF= the cylinder is not able to produce steam

The alarm button performs a number of actions, depending on how many times it is pressed.

Action/Pressing the button	Effect
first time	display the alarm code; if more than one alarm is active at the same time, the codes are displayed in sequence by pressing UP or DOWN.
second time	if the cause of the alarm has been resolved, the alarm is no longer displayed and the corresponding relay is deactivated (if fitted)
third time	the cause of the alarm has been resolved, the alarm is no longer displayed, the corresponding relay is deactivated and the display shows: No Active Alarm
fourth time	return to the main screen

Tab. 3.b

3.1 Info-menu

Series of screens that describe the functions and the use of the screens in the management menu.
Enabling "info-menu" (disabled by default), all access to the submenus will be preceded by a descriptive screen (to continue navigating, press ENTER).

Enabling info-menu
From the "utility" submenu press:
- ENTER to confirm;
- DOWN until displaying the screen with the "enable info?" parameter;
- ENTER to move the cursor to the value of the parameter (YES/NO);
- UP or DOWN to enable the info-menu function (YES);
- ESC repeatedly to return to the "Main" screen;

3.2 Mechanically draining the water in the cylinder

Drain due to gravity without activating the humidifier, recommended if:
- the humidifier is decommissioned, to empty the cylinder without switching on the humidifier;
- to eliminate the residual water following a drain cycle by pump.

Mechanical drain:
- make sure that the humidifier is not powered;
- remove the cover;
- activate the mechanical device under the cylinder (see part. A Fig. 3.a).

Models UE001 to UE018 | Models UE025 to UE065

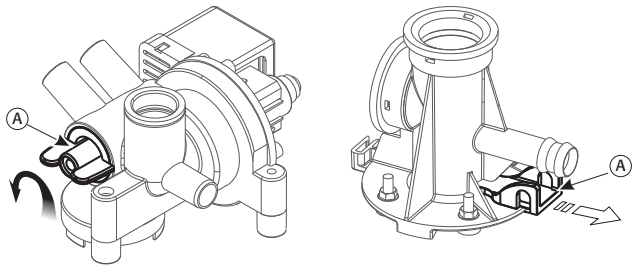


Fig. 3.a

Other types of drains:
- manual (from "ON/OFF quick access" screen; and manual procedure;
- automatic (see par. "Automatic water drain").

humiSteam x-plus

Umidificatori
Humidifiers

Content

1. Maintenance

1.1 Cleaning and maintenance of the cylinder

Replacement

Important: the cylinder must be only be replaced by qualified personnel, and with the humidifier unplugged from the power supply.

In normal conditions, the disposable cylinders should be replaced after one year (or 2500 hours of operation, if cleaned periodically), while the openable cylinders last 5 years (or 10,000 hours of operation, if cleaned periodically). They must be replaced immediately – even before the specified intervals – if any anomalies occur. For example, when the lime scale inside the cylinder prevents the correct flow of electric current.

Replacement procedure:

1. empty all the water (cylinder replacement procedure, see maintenance menu);
2. turn off the humidifier (switch "0"), and open the mains disconnect switch on the power supply (safety procedure);
3. wait for the humidifier and the cylinder to cool down;
4. remove the front cover;
5. disconnect the electrical cables from the cylinder and steam hose;
6. release the cylinder from the locking device and lift it to remove it;
7. insert the new cylinder (make sure that the model and the power supply of the new cylinder correspond to the rated data);
8. fasten the cylinder;
9. reconnect the electrical cables to the cylinder;
10. replace the front cover;
11. switch on the humidifier;
12. reset cylinder operating hour counter (see maintenance menu);
13. Activate the wash new cylinder procedure (see maintenance menu).

1.2 Mechanically draining the water in the cylinder

Drain due to gravity without activating the humidifier, recommended if:

- humidifier decommissioned;
- to empty the cylinder without switching the humidifier on.

Mechanical drain:

- make sure that the humidifier is not powered;
- remove the cover;
- activate the mechanical device under the cylinder (see the figure below).

Models UE001 to UE018 Models UE025 to UE130

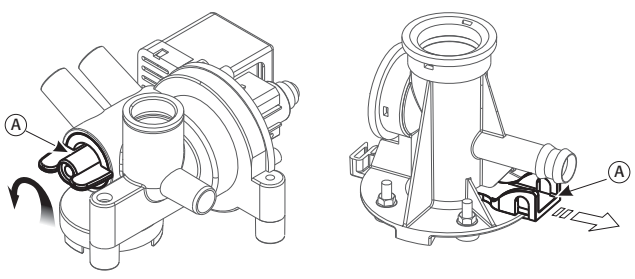


Fig. 1.a

Periodical checks

- After one hour of operation: check for any significant water leaks.
- Every 15 days or no more than 300 operating hours: check operation, the absence of significant water leaks, the general conditions of the casing. Check that during operation there are no arcs or sparks between the electrodes.
- Every 3 months or no more than 1000 operating hours:
  - disposable cylinders: check operation, the absence of significant water leaks and if necessary replace the cylinder;
  - openable cylinders: if there are significantly blackened areas, check the deposits on the electrodes and clean them, using the specific electrode and gasket kit.
- Every year or no more than 2500 operating hours:
  - disposable cylinders: replace;
  - openable cylinders: if there are significantly blackened areas, check the deposits on the electrodes and clean them, using the specific electrode and gasket kit.
- After 5 years or no more than 10,000 operating hours: replace the openable cylinder.

After extended operation, or when using water rich in salts, the solid deposits that naturally form on the electrodes may grow until attaching to the inside wall of the cylinder. If these deposits are conductive the heat generated may overheat the plastic until it melts, with the risk of very hot water being released.

Important: In the event of water leaks, disconnect the power supply from the humidifier as the water may conduct electricity.

1.3 Cylinder connection, three-phase models UE025 to UE130

production (kg/h)	conductivity (µS/cm)	power supply (V)	
		230	400
25	75/350 µS/cm	A	B
	350/1250 µS/cm	B	B
35	75/350 µS/cm	A	B
	350/1250 µS/cm	A	B
45	75/350 µS/cm	A	A
	350/1250 µS/cm	A	B
65	75/350 µS/cm	/	A
	350/1250 µS/cm	/	B
90	75/350 µS/cm	/	A
	350/1250 µS/cm	/	B
130	75/350 µS/cm	/	A
	350/1250 µS/cm	/	B

Tab. 1.b

The cable ends must be tightened with the top nut to 3 Newton • m. (units with BL*T5* cylinder only)

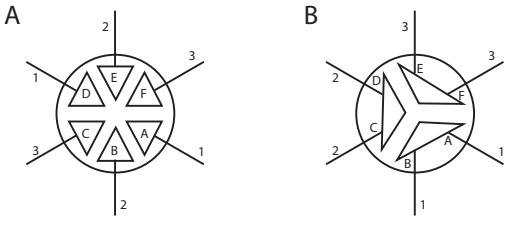


Fig. 1.b

Collegamento cilindro monofase, trifase UE001 a UE018

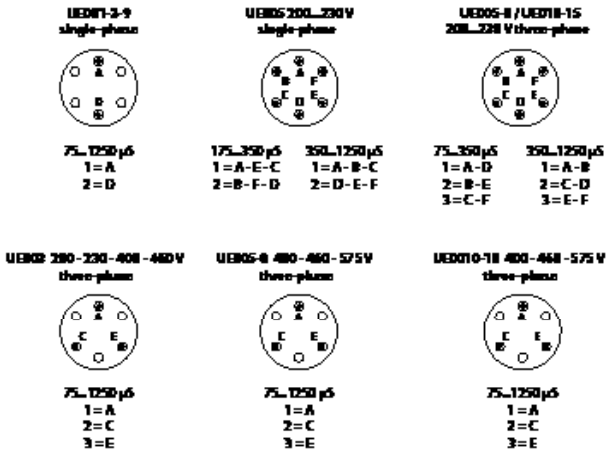


Fig. 1.c

1.4 Cleaning and maintenance of the other components

Important:

- when cleaning plastic components do not use detergents or solvents;
- scale can be removed using a solution of 20% acetic acid and then rinsing with water.

Maintenance checks on other components:

- fill solenoid valve. After having disconnected the cables and the tubing, remove the solenoid valve and make sure the inlet filter is clean; if necessary, clean with water and a soft brush;
- manifold with drain pump. Check that there are no solid residues in the cylinder attachment, remove any impurities. Check that the gasket (o-ring) is not damaged or cracked, replace if necessary. Check that there are no solid residues in the drain hose;
- drain pump. Disconnect the power supply, remove the pump and clean any impurities. Clean the tank from any deposits and check that the water flows freely from the tank to the drain (corresponding to the drain pump);
- fill tank. Check that there are no obstructions or solid particles and that the conductivity measuring electrodes are clean, remove any impurities and rinse;
- internal tubing kit. Check that the pipes and hoses are free and clear of impurities, remove any impurities and rinse.

Important: after having replaced or checked the water circuit, make sure that the connections are tight. Restart the unit and run a number of fill and drain cycles (from 2 to 4), after which, applying the safety procedure, check for any water leaks.

Fuses in the auxiliary circuits

Fuses	UE001 to 018	UE 025 to 045 (230V)	UE 025 to 065 (400V)	UE 090 to 130
F1. F2	1 A fast-blow, 10.3x38	2 A fast-blow, 10.3x38	1 A fast-blow, 10.3x38	2 A fast-blow, 10.3x38
F3	1 A fast-blow, 5x20 ceramic	1 A fast-blow, 10.3x38		
F4	2.5 A T slow-blow 5x20 ceramic			4 A T slow-blow 5x20 in ceramic

Tab. 1.b

2. Spare parts

2.1 Spare parts for models UE001 to UE018

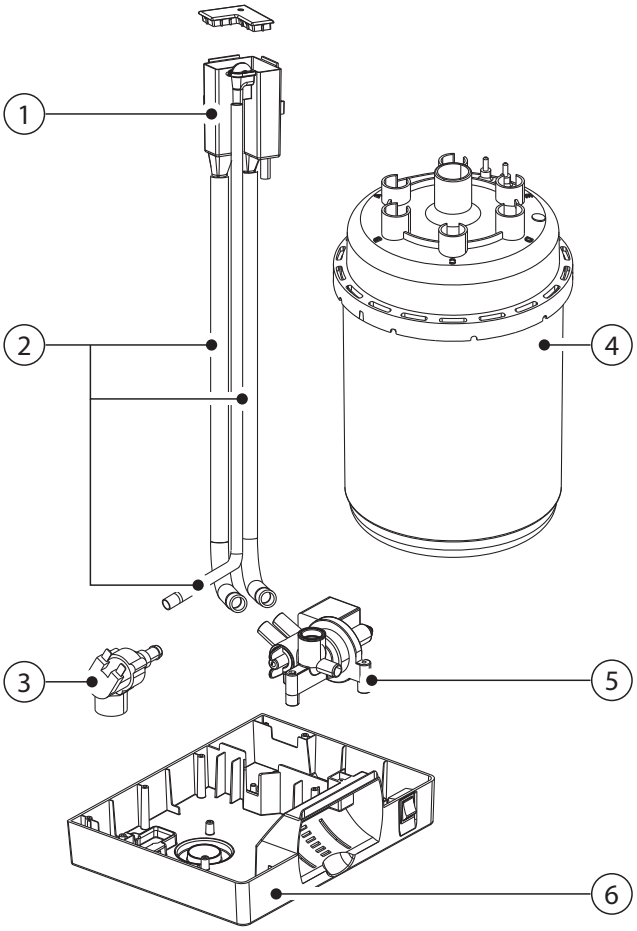


Fig. 2.a

Key

1 fill tank
2 internal tubing kit
3 fill solenoid valve kit
4 cylinder
5 manifold with drain pump
6 plastic base
7 plastic humidifier top
8 TAM (transformer for measuring the current)
9 transformer
10 contactor
11 fuse holder F1-F2
12 electronic controller
13 power terminals
14 fuse holder F3
15 switch
16 terminal with display

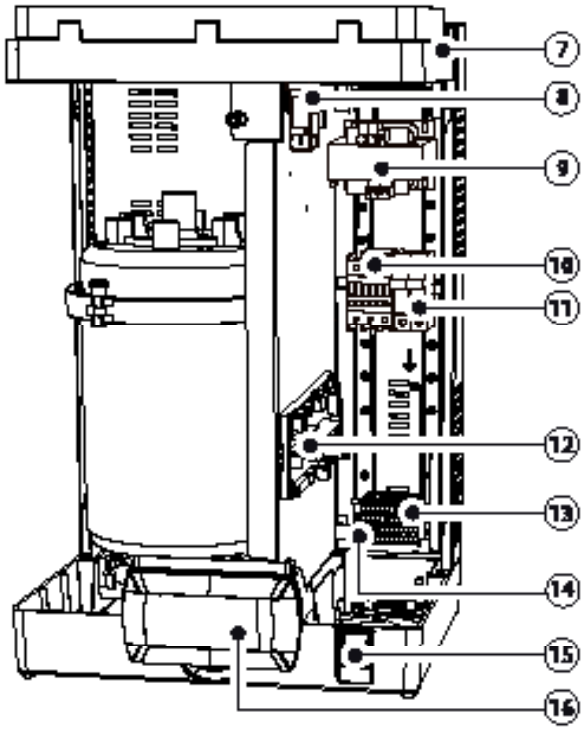


Fig. 2.b

Table of water circuit, electrical and electronic spare parts, UE001 to 018

	spare part code								position	figura
	UE001	UE003	UE005		UE008	UE009	UE010	UE015	UE018		
			230-400 3ph	230 1ph							
Parte idraulica											
Fill tank + conductivity meter	UEKVASC000									1	2.a
Fill solenoid valve kit	KITVC10006					KITVC10011				3	2.a
Internal tubing kit	UEKT10000S					UEKT10000M				2	2.a
Plastic humidifier base	UEKBOTTOM0									6	2.b
Plastic humidifier top	UEKTOP0000									7	2.a
Assembled f/d manifold + 230V pump	UEKDRAIN01									5	2.a
Electrical and electronics											
Display terminal	HCT1EXW000									16	2.b
TAM (current transformer)	UEKTAM0000									8	2.b
Contactor	UEKCONT100			UEKCONT200						10	2.b
Power transformer: 230-400/24 V	UEKTR10000									9	2.b
Electronic controller[1]	HCzXxxxvi0[2]									12	2.b
Fuse carrier (F1,F2)	URKFH10000									11	2.b
Fuse carrier (F3)	UEKFH10000									14	2.b
F1 - F2 230 to 400 Vac power fuses	UEKFUSE100									-	see electrical diagram
F4 Transformer secondary fuse	UEKFUSE200									-	see electrical diagram
F3 Pump fuse	URKFUSE500									-	see electrical diagram
Connection cable between terminal and electronic controller	S90CONN002									-	

Tab. 2.a

1. To make an order specify the complete product code and the serial number of your humidifer.
2. z: board version (A: basic version up to UE65; B: with espantion board for UE90-130)
   XX: kg/h (01...130)
   v: voltage
   i: 0 single packing; 1: multiple packing

Table of spare part codes, single-phase cylinders UE001 to 009, electrode and gasket kit

Model		UE001	UE003	UE005	UE009
STANDARD disposable cylinders	200/230 Vac 1~, conductivity 350 to 1250 µS/cm	BL0S1F00H2	BL0S1F00H2	BL0S2E00H2	BL0S3F00H2
SPECIAL disposable cylinders	200/230 Vac 1~, conductivity 75 to 350 µS/cm	BL0S1E00H2	BL0S1E00H2	BL0S2E00H2	BL0S3E00H2
SPECIAL openable cylinders	200/230 Vac 1~, conductivity 75 to 350 µS/cm	BLCS1E00W2	BLCS1E00W2	BLCS2E00W2	BLCS3E00W2
	200/230 Vac 1~, conductivity 350 to 1250 µS/cm	BLCS1F00W2	BLCS1F00W2	BLCS2E00W2	BLCS3F00W2
Electrode and gasket kit	200/230 Vac 1~, conductivity 75 to 350 µS/cm	KITBLCS1E2	KITBLCS2E2	KITBLCS2E2	KITBLCS3E2
	200/230 Vac 1~, conductivity 350 to 1250 µS/cm	KITBLCS1F2	KITBLCS2F2	KITBLCS2E2	KITBLCS3F2
Filter gasket kit		KITBLC1FG0	KITBLC2FG0	KITBLC2FG0	KITBLC3FG0

Tab. 2.b

Table of spare part codes, three-phase cylinders UE003 to 018, electrode and gasket kit

Model		UE003	UE005	UE008	UE010	UE015	UE018
STANDARD disposable cylinders	200/230 VAC 3~, conductivity 350 to 1250 µS/cm	BL0T1B00H2	BL0T2A00H2	BL0T2A00H2	BL0T3A00H2	BL0T3A00H2	--
	400 VAC 3~, conductivity 350 to 750 µS/cm	BL0T1C00H2	BL0T2C00H2	BL0T2C00H2	BL0T3C00H2	BL0T3C00H2	BL0T3C00H2
SPECIAL disposable cylinders	200/230 VAC 3~, conductivity 75-350 µS/cm	BL0T1A00H2	BL0T2A00H2	BL0T2A00H2	BL0T3A00H2	BL0T3A00H2	--
	400 VAC 3~, conductivity 75 to 350 µS/cm	BL0T1A00H2	BL0T2B00H2	BL0T2B00H2	BL0T3B00H2	BL0T3B00H2	BL0T3B00H2
	400 VAC 3~, conductivity 750 to 1250 µS/cm	BL0T1D00H2	BL0T2D00H2	BL0T2D00H2	BL0T3D00H2	BL0T3D00H2	BL0T3D00H2
SPECIAL openable cylinders	200/230 VAC 3~, conductivity 75-350 µS/cm	BLCT1A00W2	BLCT2A00W2	BLCT2A00W2	BLCT3A00W2	BLCT3A00W2	--
	400 VAC 3~, conductivity 75 to 350 µS/cm	BLCT1A00W2	BLCT2B00W2	BLCT2B00W2	BLCT3B00W2	BLCT3B00W2	BLCT3B00W2
	400 VAC 3~, conductivity 350 to 750 µS/cm	BLCT1C00W2	BLCT2C00W2	BLCT2C00W2	BLCT3C00W2	BLCT3C00W2	BLCT3C00W2
	400 VAC 3~, conductivity 750 to 1250 µS/cm	BLCT1D00W2	BLCT2D00W2	BLCT2D00W2	BLCT3D00W2	BLCT3D00W2	BLCT3D00W2
Electrode and gasket kit	Electrode kit 200/230 Vac 3~, 75/350 µS/cm	KITBLCT1A2	KITBLCT2A2	KITBLCT2A2	KITBLCT3A2	KITBLCT3A2	--
	Electrode kit 200/230 Vac 3~, 350/1250 µS/cm	KITBLCT1B2	KITBLCT2A2	KITBLCT2A2	KITBLCT3A2	KITBLCT3A2	--
	Electrode kit 400 Vac 3~, 75/350 µS/cm	KITBLCT1A2	KITBLCT2B2	KITBLCT2B2	KITBLCT3B2	KITBLCT3B2	KITBLCT3B2
	Electrode kit 400 Vac 3~, 350/750 µS/cm	KITBLCT1C2	KITBLCT2C2	KITBLCT2C2	KITBLCT3C2	KITBLCT3C2	KITBLCT3C2
	Electrode kit 400 Vac 3~, 750/1250 µS/cm	KITBLCT1D2	KITBLCT2D2	KITBLCT2D2	KITBLCT3D2	KITBLCT3D2	KITBLCT3D2
	Filter gasket kit	KITBLC1FG0	KITBLC2FG0	KITBLC2FG0	KITBLC3FG0	KITBLC3FG0	KITBLC3FG0

Tab. 2.c

2.2 Spare parts for models UE025 to UE065

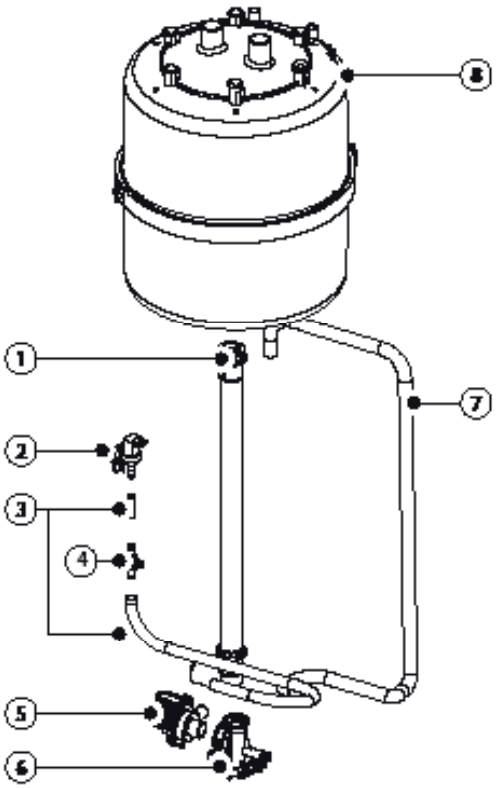


Fig. 2.c

Key:

1 drain circuit
2 fill solenoid valve kit
3 internal tubing kit
4 conductivity meter
5 drain pump kit
6 manifold
7 drain pump hose
8 cylinder
9 TAM (transformer for measuring the current)
10 contactor
11 transformer
12 pump control relay
13 fuse carrier
14 electronic controller
15 power terminals
16 cable clamp
17 switch
18 terminal with liquid crystal display (fitted on the cover of the electrical compartment)

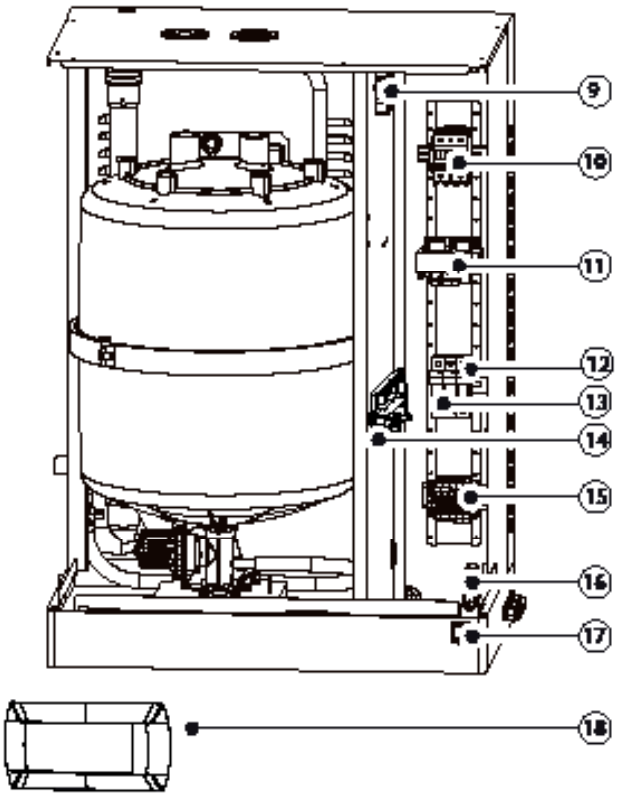


Fig. 2.d

Tabella codici ricambio parte idraulica, elettrica ed elettronica UE025…UE065

description	spare part code							position	figure
	UE025		UE035		UE045		UE065		
	230 V	400 V	230V	400V	400 V	230 V			
Water circuit									
Drain pump hose	UEKDH00000							7	2.c
Manifold	UEKCOLL000							6	2.c
Drain pump kit	KITPSE0000							5	2.c
Internal tubing kit	UEKT10000L						UEKT1000XL	3	2.c
Kit double check valve	FWHDCV0000							-	
Conductivity meter kit	KITCN00000							4	2.c
Fill solenoid valve kit	KITVC10058				KITVC10070			2	2.c
Drain circuit	UEKDC00000						UEKDC10000	1	2.c
Electrical and electronics									
Display terminal	HCT1EXF000							18	2.d
TAM (current transformer)	UEKTAM0000							9	2.d
Contactor	URKCONT300	UEKCONT200	URKCONT300	URKCONT400	URKCONT300			10	
Power transformer: 230/400-24V	UEKTR10000							11	2.d
Electronic controller [1]	HCzXxxxvi0[2]							14	2.d
Fuse carrier	URKFH20000							13	2.d
Pump control relay	UEKRD00000							12	2.d
F1 - F2 230 to 400Vac power fuses	UEKFUSE300	UEKFUSE100	UEKFUSE300	UEKFUSE100	UEKFUSE100	UEKFUSE300	UEKFUSE100	-	vedi schemi elettrici
F3 Pump fuse	URKFUSE300							-	vedi schemi elettrici
F4 Transformer secondary fuse	URKFUSE500							-	vedi schemi elettrici
Connection cable between terminal and electronic controller	S90CONN002							-	

Tab. 2.d

3. To make an order specify the complete product code and the serial number of your humidifer.
4. z: board version (A: basic version up to UE65; B: with espantion board for UE90-130)
   XX: kg/h (01...130)
   v: voltage
   i: 0 single packing; 1: multiple packing

Table of spare parts for standard and special cylinders UE025 to UE065

Description		UE025	UE035	UE045	UE065
STANDARD disposable cylinders	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	BL0T4C00H2	BL0T4B00H2	BL0T5A00H1	-
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	BL0T4D00H2	BL0T4D00H2	BL0T4C00H2	BL0T5C00H0
SPECIAL disposable cylinders	200/230V 3ph cylinder, conductivity 75 to 350 µS/cm	BL0T4B00H2	BL0T4B00H2	BL0T5A00H1	--
	400V 3ph cylinder, conductivity 75 to 350 µS/cm	BL0T4C00H2	BL0T4C00H2	BL0T4B00H2	BL0T5B00H0
SPECIAL openable cylinders	200/230V 3ph cylinder, conductivity 75 to 350 µS/cm	BLCT4B00W2	BLCT4B00W2	BLCT5A00W0	--
	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	BLCT4C00W2	BLCT4B00W2	BLCT5A00W0	--
	400V 3ph cylinder, conductivity 75 to 350 µS/cm	BLCT4C00W2	BLCT4C00W2	BLCT4B00W2	BLCT5B00W0
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	BLCT4D00W2	BLCT4D00W2	BLCT4C00W2	BLCT5C00W0
Electrode and gasket kit	200/230V 3ph cylinder, conductivity 75 to 350 µS/cm	KITBLCT4B2	KITBLCT4B2	KITBLCT5A0	--
	200/230V 3ph cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4C2	KITBLCT4B2	KITBLCT5A0	--
	400V 3ph cylinder, conductivity 75 to 350 µS/cm	KITBLCT4C2	KITBLCT4C2	KITBLCT4B2	KITBLCT5B0
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4D2	KITBLCT4D2	KITBLCT4C2	KITBLCT5C0
Gasket and filter kit		KITBLC4FG0	KITBLC4FG0	KITBLC4FG0	KITBLC5FG0

Tab. 2.e

2.3 Spare parts for models UE090 to UE130

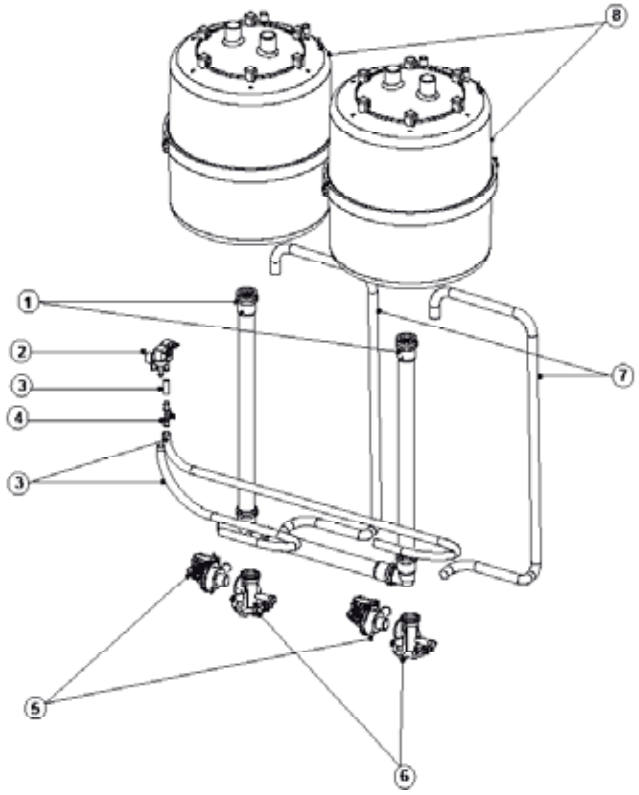


Fig. 2.e

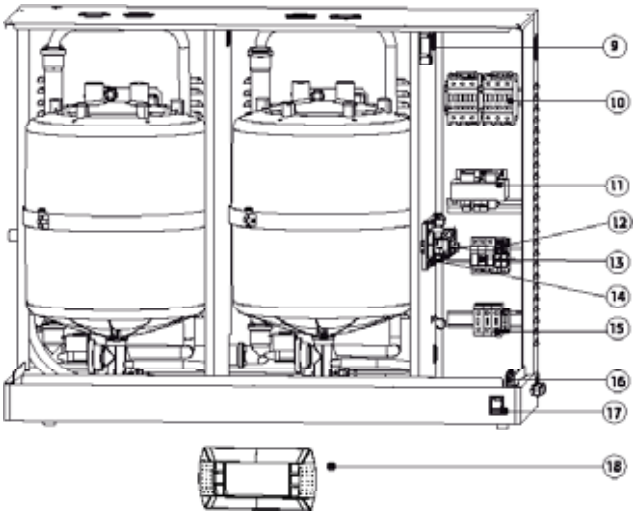


Fig. 2.f

Key:

1 drain circuit
2 fill solenoid valve kit
3 internal tubing kit
4 conductivity meter
5 drain pump kit
6 manifold
7 drain pump hose
8 cylinder
9 TAM (transformer for measuring the current)
10 contactor
11 transformer
12 pump control relay
13 fuse carrier
14 electronic controller
15 power terminals
16 cable clamp
17 switch
18 terminal with liquid crystal display (fitted on the cover of the electrical compartment)

Table of water circuit, electrical and electronic spare parts, UE090 to UE130

description	spare part code UE090	spare part code UE130	position	figure
Water circuit				
Drain pump hose	UEKDH00000		7	2.e
Manifold	UEKCOLL000		6	2.e
Drain pump kit	KITPSE0000		5	2.e
Internal tubing kit	UEKT100XXL		3	2.e
Double check valve kit	FWHDCV0000		-	
Conductivity meter kit	KITCN00000		4	2.e
Fill solenoid valve kit	KITVC10140		2	2.e
Drain circuit	UEKDC20000		1	2.e
Electrical and electronics				
Display terminal	HCT1EXF000		18	2.f
TAM (current transformer)	UEKTAM0000		11	2.f
Contactor	URKCONT300			2.f
Power transformer	UEKTR20000		11	2.f
Electronic controller [1]	HCzXxxxvi0[2]		14	2.f
Fuse carrier	URKFH20000		13	2.f
Pump control relay	UEKDT00000		12	2.f
F1 - F2 power fuses	UEKFUSE300		-	see electrical diagram
F3 Pump fuse	URKFUSE300		-	see electrical diagram
F4 Transformer secondary fuse	UEKFUSE400		-	see electrical diagram
Connection cable between terminal and electronic controller	S90CONN002		-	

Tab. 2.f

5. To make an order specify the complete product code and the serial number of your humidifer.
6. z: board version (A: basic version up to UE65;
   B: with espantion board for UE90-130)
   XX: kg/h (01...130)
   v: voltage
   i: 0 single packing; 1: multiple packing

Table of spare parts for standard and special cylinders UE090 to UE130

Description		UE090	UE130
STANDARD disposable cylinders	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	BL0T4C00H2	BL0T5C00H0
SPECIAL disposable cylinders	400V 3ph cylinder, conductivity 75 to 350 µS/cm	BL0T4B00H2	BL0T5B00H0
SPECIAL openable cylinder	400V 3ph cylinder, conductivity 75 to 350 µS/cm	BLCT4B00W2	BLCT5B00W0
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	BLCT4C00W2	BLCT5C00W0
Electrode and gasket kit	400V 3ph cylinder, conductivity 75 to 350 µS/cm	KITBLCT4B2	KITBLCT5B2
	400V 3ph cylinder, conductivity 350 to 1250 µS/cm	KITBLCT4C2	KITBLCT5C2
Gasket and filter kit		KITBLC4FG0	KITBLC5FG0

Tab. 2.g

3. Allarms

When an alarm is activated, the alarm button starts flashing intermittently.
In these conditions, pressing the alarm button once displays the type of alarm (and the code, in line with the CAREL humidifier standard).

In the case of potentially dangerous alarms, the controller automatically stops the production of steam. For some alarm events, the alarm relay is also activated at the same time as the signa (see the table below).

Once the causes of the alarm are no longer present, the humidifier and the alarm relay output can be reset automatically or manually, according to the type of fault, while the message displayed is reset manually (see the table below). Even if no longer active, the alarm status continues to be displayed until the "reset display" button is pressed.

Active alarm states cannot be reset.
If more than one alarm is active, the display shows all the codes in sequence, after having pressed the alarm button once and then pressing the "UP" or "DOWN button.

alarms displayed (2)= alarm relating to cylinder 2	meaning	cause	solution	reset	alarm relay	consequence
Alarm: EP Low Production (Cylinder1(2)Off)	Low production alarm	excessive reduction in production	cylinder completely depleted or water with excessive foam. Perform maintenance on the cylinder	Manual	active	Stop production
Alarm: EF Lack of water Cylinder 1(2)	No water	no supply water	1. check that the supply hose from the mains to the humidifier and the internal hoses are not blocked or choked and that there is sufficient pressure (0.1 to 0.8 MPa, 1 to 8 bar); 2. check the operation of the fill solenoid valve; 3. check that the steam outlet is not operating with excessive backpressure, preventing the flow of water into the cylinder by gravity; 4. check that the steam outlet hose is not choked and that there are no pockets of condensate	Automatic (automatic water return procedure) Manual	active	Stop production
Alarm: Ed Drain alarm (Cylinder1(2)Off)	Drain alarm	drain malfunction	check the water drain circuits and the correct operation of the electric drain pump, and check the condition of the filter inside the cylinder	Manual	active	Stop production
Alarm: EL Low current (Cylinder1(2)Off)	Low current alarm	power not available; when the unit is activated no steam is produced	with the unit off and disconnected from the mains, check the electrical connections inside	Manual	active	Stop production
Alarm: EH High current(Cylinder1(2)Off)	High current alarm	excess current in the electrodes; probable fault with the electrodes or water temporarily too conductive (especially when restarting after a short stop)	1. check the operation of the electric drain pump; 2. check the seal of the supply solenoid valve when not energised; 3. drain some of the water and restart. 4. check for bridges between the electrodes. 5. cylinder replacement and/or maintenance	Manual	active	Stop production
Alarm: EC Highconductivity (Cylinders Off)	High conductivity alarm	high conductivity of the supply water	1. check the limit threshold set; 2. switch the unit off and clean the electrodes that measure of the conductivity of the water; if the problem persists, change the origin of the supply water or use a suitable treatment system (partial demineralisation). N.B.: the problem is not resolved by softening the supply water..	Manual	active	Stop production
Warning: Ec Highconductivity	High supply water conductivity pre-alarm	high water conductivity alarm warning	1. check the conductivity of the supply water, if necessary use a suitable treatment system. N.B.: the problem is not resolved by softening the supply water	Automatic	not active	signal only
Warning: E> High humidity	Main probe pre-alarm	high humidity in the room (high temp. if the temperature probe is used)	check the operation of the probe and the upper limit set by parameter	Automatic	not active	signal only.
Warning: E_ Low humidity	Main probe low humidity pre-alarm	low humidity in the room (low temp. if the temperature probe used)	check the operation of the probe and the lower limit set by parameter	Automatic	not active	signal only
Warning: E= Highhumiditylimit probe	Limit probe humidity warning	limit probe high humidity reading	check the operation of the limit probe	Automatic	not active	signal only.
Alarm: E3Mainprobefault or offline	Main probe disconnected alarm	main probe not connected	check the connection of the probe, and the setting of the parameters (probe type and signal type)	Automatic	active	Stop production

alarms displayed (2)= alarm relating to cylinder 2	meaning	cause	solution	reset	alarm relay	consequence
Alarm: E4 Limitprobefaultor offline	Limit probe disconnected alarm	limit probe not connected	check the connection of the probe, and the setting of the parameters (probe type and signal type)	Automatic	not active	Stop production
Warning: EA Foam Cylinder 1(2)	Foam alarm	excessive foam in the cylinder when boiling	1. flush the water supply lines; 2. clean the cylinder, make sure a softener is not used (if so, use another source of water or reduce the softening).	Manual	not active	signal only
Warning: CP Pre-exhaustion cylinder 1(2)	Cylinder being depleted	signal that the cylinder life is ending	perform maintenance and/or replace the cylinder	Manual	not active	signal only
Alarm: EU Cylinder1(2)full	Cylinder full	signal that the cylinder is full with the unit off	with the unit off: 1. check for any leaks from the fill solenoid valve or the condensate return from the hose, check that the level sensors are clean	Manual	active	Stop production
Warning: CL Exhaustioncylinder 1(2)	Cylinder depleted	cylinder depleted signal	perform maintenance and/or replace the cylinder	Manual	active	Stop production
Warning: CY Cylinder 1(2) Maintenance Recommended	Maintenance recommended	cylinder good operating hour limit exceeded	perform maintenance and/or replace the cylinder	Manual (reset counter. See Maintenance menu)	not active	signal only.
Alarm: Mn Cylinder 1(2) Maintenance Mandatory	Maintenance required	maximum cylinder operating hours exceeded	replace the cylinder	Manual (reset counter. See Maintenance menu)	active	Stop production
Clock Board Fault	Clock error	backup battery completely discharged or general problem with the clock	replace the controller	Manual	not active	signal only

Tab. 3.a

The alarm button performs a number of actions, depending on how many times it is pressed.

Action/Pressing the button	Effect
first time	display the alarm code; if more than one alarm is active at the same time, the screen shows NEXT, and the sequence of alarm codes can be scrolled using the DOWN button.
second time	the cause of the alarm has been resolved, the alarm is no longer displayed, the corresponding relay is deactivated and the display shows: NO ACTIVE ALARMS
third time	return to the main screen

Tab. 3.b

If the causes of the alarm persist, the alarm is not reset.

CAREL

ENG

heaterSteam

Umidificatore ad elettrodi immersi
Electrical heater humidifier

Content

1. Manutenzione

1.1 Maintenance of the cylinder-cylinder

For correct operation, the steam production cylinder must be periodically cleaned, at intervals linked to the quantity of salts or impurities dissolved in the supply water. This operation is necessary as the lime deposits that form inhibit the exchange of heat between the elements and the water.

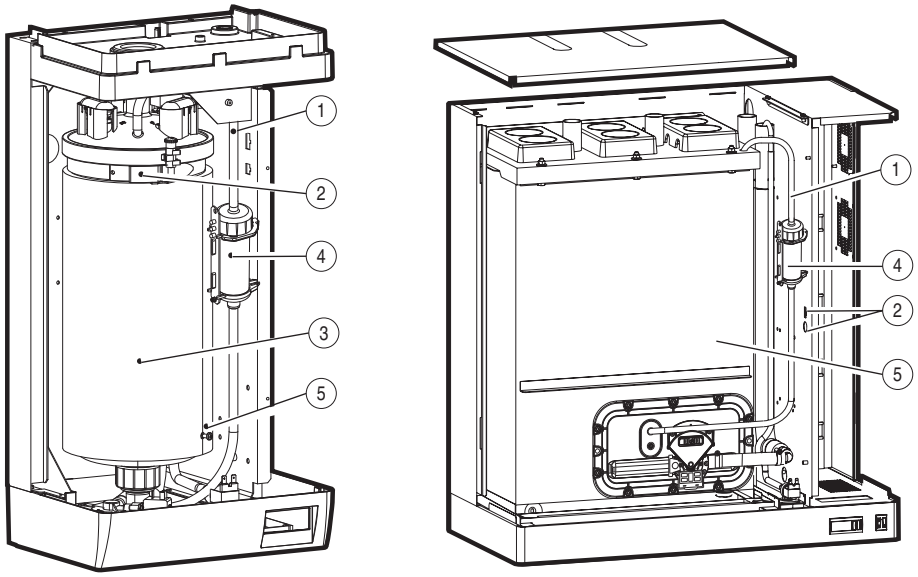
Important warning: do not use detergents or solvents to clean the components in the cylinder and all other plumbing.

The unit must be cleaned in any case when the element over-temperature alarm is activated (see ALARMS AND TROUBLESHOOTING), signalled by:
- the lighting up of LED 1 and 3, for the type C control module;
- the display of the message CL for the type H or T control module.

The cylinder may be hot! Let it cool before handling, or use protective gloves.

To access the cylinder:
- turn the appliance off and open the disconnecting switch on the power line (safety procedure);
- completely empty the water contained in the cylinder;
- open and remove the casing.

The layout of the humidifier is as in Fig. 1.a.



Key:

n.	description
1	pressure balancing pipe
2	cylinder fastener closing
3	level control
4	thermal lining (optional) with Velcro fastener
5	ground connection

Fig. 1.a

To remove and clean the cylinder, follow the procedure as described below:
1. remove the steam pipe from the upper pipe union of the cylinder (Fig. 1.b);
2. electronically disconnect the level sensor (Fig. 1.a, part. no. 3);
3. remove, from the cylinder cover , the pressure equalising pipe with the level control tank (Fig. 1.a, part. no. 1);
4. remove the protective covers of the element electrical connections (Fig. 2.a, part. no. 5) and disconnect the power cables;
5. remove the cylinder ground screw (Fig. 1.a, part. no. 5);
6. undo the cylinder fastener by the lifting the black plastic lever (Fig. 1.a, part. no. 2) and pushing it to the end of its stroke, thus releasing the stop system;
7. lift the cylinder to remove the upper pipe union from the drain unit and remove it from the machine, paying attention to any drops of water or deposits which may be released from the pipe union;
8. if present, remove the external thermal lining (Fig. 1.a, part. no. 4);
9. place the cylinder on a working surface which is protected by a material resistant to the water and lime-scale which could be released during the cleaning operations;
10. release the cover ring fastening lever and push it to the end of its stroke (Fig. 2.a, part. no. 11); remove the metal ring, the plastic cover and its connected parts from the cylinder (see Fig. 2.a that shows the cylinder exploded view).

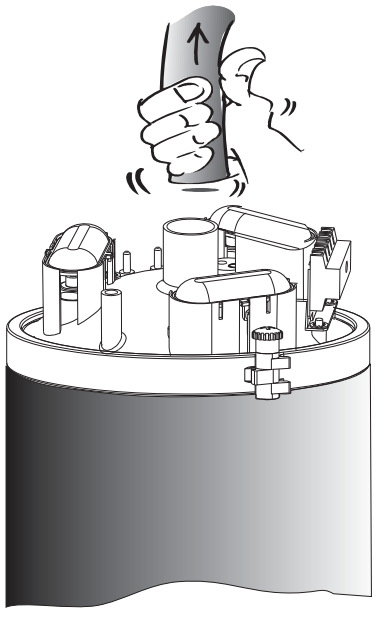


Fig. 1.b

Cleaning of the cylinder filter 20-27-40-60 kg/h (44-59.5-88-132.2 lbr/h):

1. disconnect the pump power supply cable and the connection to the drain pipe;
2. remove from the flange the level sensor pipe;
3. unscrew the fastening screws of the flange;
4. remove the flange from the cylinder and clean thefilter.

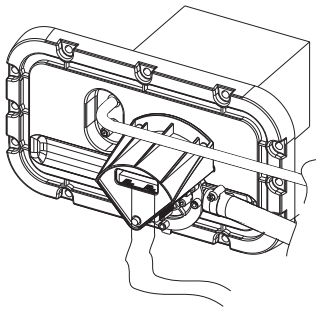


Fig. 1.c

To remove and clean the cylinder of the humidifiers from 20-27-40-60 Kg/h (44-59.5-88-132.2 lbr/h), follow the procedure as described below:

1. remove the cover of the machine (hydraulic side) unscrewing the screws (Fig. 1.a);
2. remove the steam pipe from the upper pipe union of the cylinder (Fig. 1.b);
3. electronically disconnect the level sensor (Fig. 1.b, part. no. 3);
4. remove, from the cylinder cover, the pressure equalising pipe of the level control (Fig. 1.a, part. no. 1);
5. remove the protective covers of the heating element electrical connections (Fig. 2.c part. no. 1) and disconnect the power cables;
6. remove the cylinder ground screw (Fig. 1.a, part. no. 5);
7. if present, remove the external thermal lining (Fig. 1.a, part. no. 4);
8. remove the use flange;
9. remove the cylinder making it run on the din rails;
10. place the cylinder on a working surface which is protected by a material resistant to the water and lime-scale which will be released during the cleaning operations;
11. remove the plastic cover and its connected parts from the cylinder Before handling the elements, ensure that they are not hot! Use protective gloves if necessary;
12. remove the non-stick film (optional), if present, from the internal wall of the cylinder, and eliminate any lime deposits from this using a jet of water;
13. for humidifiers up to 10 kg/h /22 lbr/h unscrew the ring nut on the lower cylinder pipe union and remove the bottom filter, which can be reused after cleaning any deposits; the gasket can be reused or, if damaged, can be replaced and ordered as a spare part (Fig.2.a, part. no.13-14);
14. the elements can also be cleaned without removing them from the upper cover; to do this, after having removed the flaky portion of lime, immerse the heating elements in a warm 20% solution of acetic acid for 30 minutes, removing the remaining surface deposits with a non-metallic spatula, then rinse well; if the plates are Teflon-coated, avoid using any type of metal tools so as to not damage the non-stick layer;
15. if necessary, the elements can be removed by unscrewing the fastening nut which holds them to the plastic cover; in this case the seal gasket should be replaced;
16. remove the deposits and rinse the internal walls of the cylinder and the probe wells.

Re-assemble the cylinder by repeating the above operations in the reverse order, remembering to re-fasten the ground screw (Fig. 1.a, part. no. 5). The procedure described above refers to the three-phase version (see Figg. 2.a and 2.b).
For the power connections follow: Electrical diagram of the heating element connection corresponding to the heads.

2. Spare parts

Exploded of the cylinder 6-10kg/h (13.2-22 lbs/h)

			Spare Parts Code		
n.	description		UR006 – 1 ~ *	UR006 – 3~**	UR010 – 3~**
1	PTC probe wire terminals		URKTB00000		
2	NTC Probe		URKNTC0000		
3	Wire terminal bracket		URK0000022		
4	NTC well		URKNTCCAS1		
5	Power connection protection cover		URKCOPC00M		
6	Cylinder cover				
8	Cylinder gasket		URKG100000		
11	Cylinder cover locking clamp		URKBR00000		
7	PTC probe		URKPTCS000		
9	Heating elements:				
	with antiadherent film	208V	URKH00A347	URKH00A347	URKH00A346
		230V	URKH00A320	URKH00A320	URKH00A322
		400V		URKH00A320	URKH00A322
		460V		URKH00A344	URKH00A347
		575V		URKH00A341	URKH00A342
	without antiadherent film	208V	URKH00R347	URKH00R347	URKH00R346
		230V	URKH00R320	URKH00R320	URKH00R322
		400V		URKH00R320	URKH00R322
		460V		URKH00R344	URKH00R347
		575V		URKH00P341	URKH00R342
10	Heating element centring spring 13C453A048				
12	Cylinder		URKB100000		
13	Filter, ring nut and pipe union		UEKF000000		
-	Gasket kit		URKG00000M		

Tab. 2.a

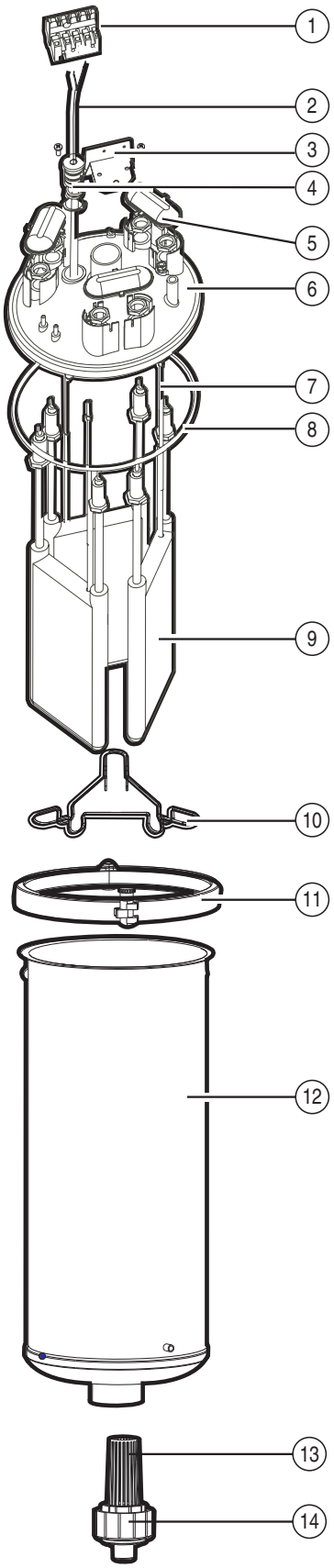


Fig. 2.a

Exploded of the cylinder 2-4 kg/h (4.4 - 8.8 lbs/h)

			Spare Parts Code	
n.	description		UR002	UR004
1	NTC probe		URKNTC0000	
2	NTC well		URKNTCCAS2	
3	PTC probe wire terminals		URKTB00000	
4	Terminal fastening bracket		URK0000022	
5	Power connection protection cover		URKCOPC00S	
6	Cylinder cover			
8	Cylinder gasket		URKG100000	
10	Cylinder cover locking clamp		URKBR00000	
7	PTC probe		URKPTCS000	
9	Heating elements:			
	with antiadherent film	208V	URKH00A348	URKH00A349
		230V	URKH00A348	URKH00A349
	without antiadherent film	208V	URKH00R348	URKH00P349
		230V	URKH00R348	URKH00P349
11	cylinder		URKB040000	
12 13	filter, ring nut and pipe union		UEKF000000	
-	Gasket kit		URKG00000M	

Tab. 2.b

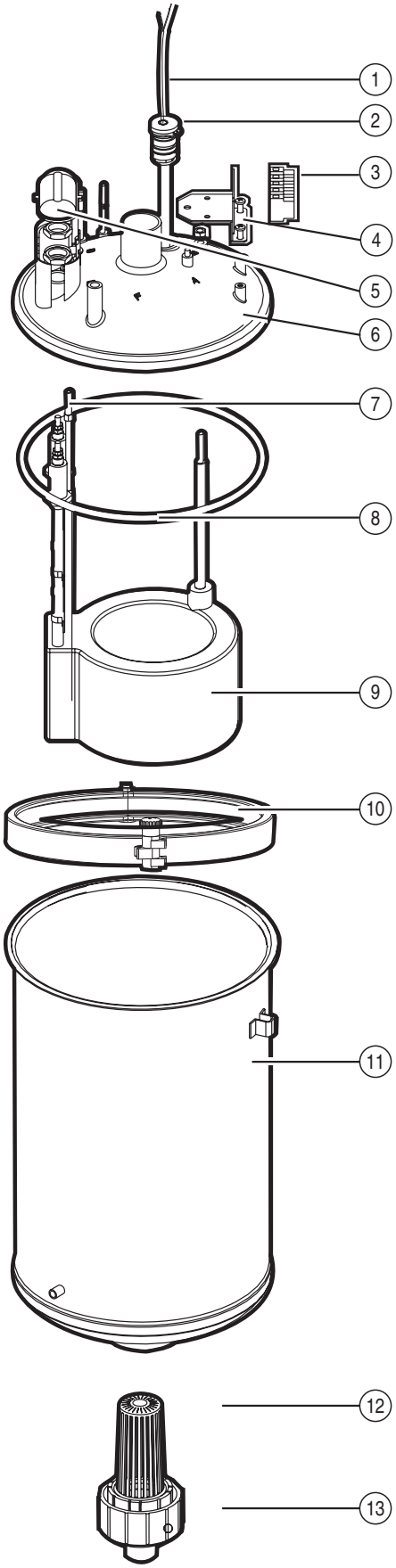


Fig. 2.b

Exploded of the cylinder 20-27-40-60 kg/h (44.1-59.5-88.1-132.3 lbs/h)

			Spare Parts Code			
n.	description		UR020	UR027	UR040	UR060
1	Heating element protection		----			
2	PTC probe		URKPTCL000			
3	PTC probe wire terminals		URKTB00000	URKTB00000	URKTB00000	URKTB00000
4	Cylinder cover		URKCOP4000	URKCOP4000	URKCOP4000	URKCOP6000
5	Anti-foaming system		URKFS00000			
6	Heating element assembly		---	--	--	--
7	Cylinder gasket		URKG400000	URKG400000	URKG400000	URKG600000
8	Heating element		6 x	6 x	6 x	9 x
	with antiadherent film	208V	URKH00A382	URKH00A383		
		230V	URKH00A381	URKH00A382		
		400V	URKH00A381	URKH00A382	URKH00A387	URKH00A387
		460V	URKH00A386	URKH00A381	URKH00A390	URKH00A390
		575V	URKH00A385	URKH00A380	URKH00A389	URKH00A389
	without antiadherent film	208V	URKH00R382	URKH00R383		
		230V	URKH00R381	URKH00R382		
		400V	URKH00R381	URKH00R382	URKH00R387	URKH00R387
		460V	URKH00R386	URKH00R381	URKH00R390	URKH00R390
		575V	URKH00R385	URKH00R380	URKH00R389	URKH00R389
9	Heating element centring spring		----			
10	Cylinder		URKB270000		URKB400000	URKB600000
11	NTC probe		URKNTC0000			
12	Use filter		URKF0000XL			
13	Use flange		URKFLAN000			
14	Pump fastening braket		URKFLAN000			
15	Drain pump		KITPSR0000			
-	Gasket kit		URKG0000XL			URKG000XXL

Tab. 2.c

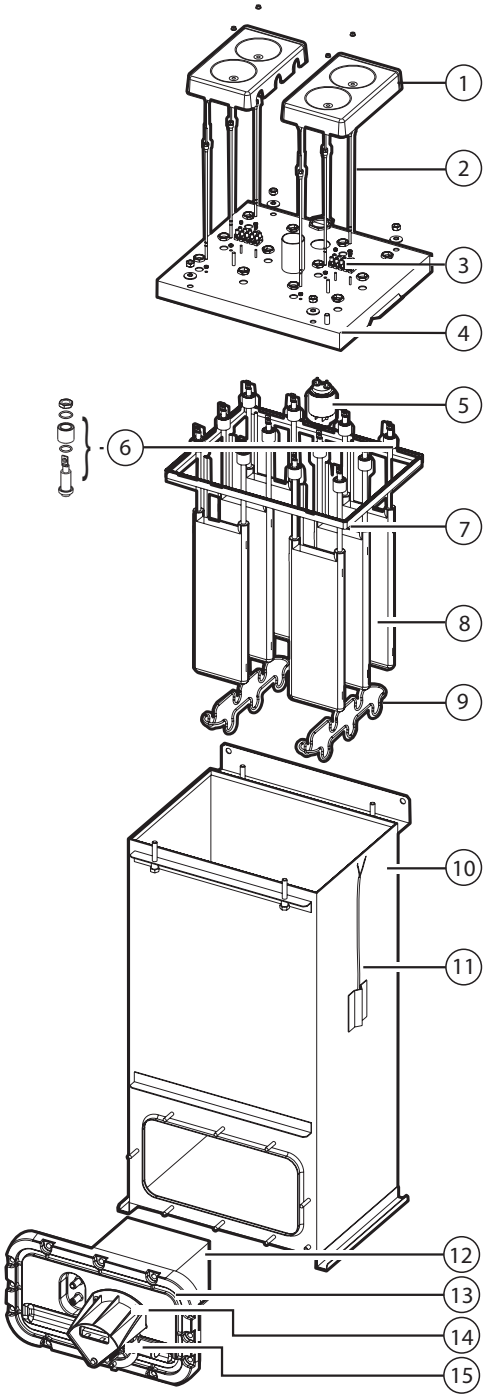


Fig. 2.c

2.1 Maintenance of the other plumbing components

Importat warning: do not use detergents or solvents to clean the plastic components. To remove the deposits use a 20% acetic acid solution, then rinse thoroughly with water..

Water parts ur 2-10kg/h (4.4 - 22 lbs/h)

		Spare part codes	
n.	description	UR002 to UR004	UR006 to UR010
1	tank	UEKVASC000	
2	Supply pipe	URKT00000S	URKT00000M
3	Fill electrovalve	KITVC00006	KITVC0012
4	Level control:	URKSL00004	
4a	sensor cap		
4b	o-ring		
4c	sensor floating		
4d	sensor pipe		
4e	control board		
5	Drain electrovalve	URKDRAIN00	URKDRAIN00
6	A/D manifold (fill - drain)		
7	Drain pipe	URKT00000S	URKT00000M
8	Overflow pipe		

Tab. 2.d

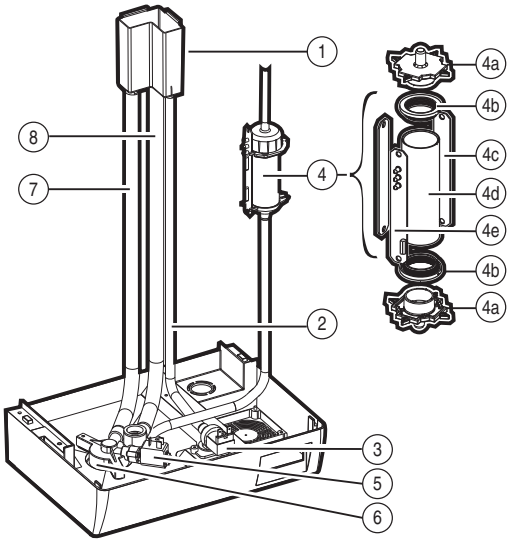


Fig. 2.d

Water parts ur 20-27-40-60 kg/h (44.1-59.5-88.1-132.3 lbs/h)

		Spare part codes			
n.	description	UR020	UR027	UR040	UR060
1	Overflow pipe	URKDC00000			
2	Drain column				
3	Supply pipe	URKT0000XL	URKT0000XL	URKT000XXL	URKT000XXL
4	Level control:	URKSL00004			
4a	Sensor cap				
4b	o-ring				
4c	sensor floating				
4d	sensor pipe				
4e	control board				
5	Drain pump	KITPS00000			
6	Fill electrovalve	KITVC00040			KITVC00100
7	Drain tank	--	--	--	--

Tab. 2.e

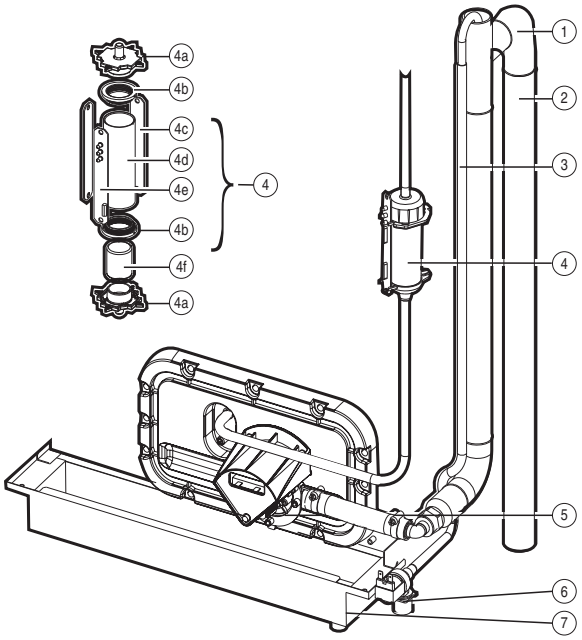


Fig. 2.e

- **Fill electrovalve** (Fig. 2.d, part. n. 3 - Fig. 2.e, part. n. 6)

After having disconnected the cables and the pipe, remove the electrovalve and check the state of the inlet filter, cleaning it if necessary using water and a soft brush.

- **Supply and drain manifold** (Fig. 2.d, part. n. 6)

Check that there are no solid residues at the cylinder coupling; remove any impurities.
Check that the O-ring is not damaged or cracked; replace it if necessary.

- **Drain electrovalve/drain pump** (Fig. 2.d, part. n. 5 – Fig. 2.e, part. n.5)

Disconnect the power cables, remove the bobbin and remove the valve block after having unscrewed the two fastening screws from the manifold; remove any impurities and rinse; as regards the pump it is sufficient to screw the clamping screw and remove possible impurities;

- **Fill tank** (Fig. 2.d, part. n. 1)

Check that there are no blockages or solid particles and that the conductivity measuring electrodes are clean, remove any impurities and rinse.

- **Supply, fill, overfill pipe** (Fig. 2.d, part. n. 2-8 – Fig. 2.e, part. n. 3-1)

Check that they are free and do not contain any impurities; remove any impurities and rinse.

- **Level control** (Fig. 2.d, part.4 – Fig. 2.e, part. n. 4)

The level control must be released from the partition wall of the cabinet. Disconnect the connector from the terminals of the electronic board, take off the connection pipes. Release the spacers and the board, then take off the caps. Check that the o-rings are not damaged or cracked; replace them if necessary. Check the cleanliness and free sliding of the two float switches.
Clean all the components and reassemble and replace the device.

Carefully check that the connection pipes are properly fitted and that they are not blocked or choked at any point.

Important warning: after having replaced or checked the plumbing components, check that the connections have been carried out correctly, with their corresponding seals. Re-start the machine and run through a number of fill and drain cycles (from 2 to 4), at the end of which, applying the safety procedure, check for any water leaks.

2.2 Replacing the components

Non-stick film

If requested as an option, the internal wall of the cylinder is lined with a non-stick film to avoid lime being deposited on the internal walls of the cylinder. To clean or replace the film, remove the cylinder following the procedure described in Maintenance of the cylinder-cylinder and then:

- slowly remove the film towards the mouth of the cylinder, without forcing it to avoid damage;
- open the film after having released the click-on couplings;
- clean the film with water and a plastic spatula if necessary; replace the film if damaged;
- wind the film around itself, reinserting the click-on couplings, and place it into the cylinder after the latter has been carefully cleaned and freed from deposits.

Elements

To replace the elements remove the cylinder following the procedure described in Maintenance of the cylinder-cylinder and loosen the fastening nuts from the threaded spigots of the elements.
Before reassembling the elements, check the state of the gaskets and replace them if necessary.

PTC overtemperature sensor

The PTC sensors (one for each heating element) do not require regular maintenance; they should only be replaced if the safety thermostat is activated due to operation without water: in fact, the intervention of just one PTC will cause the control module to shut-down operation.
To replace the sensors, remove the cylinder following the procedure described in Maintenance of the cylinder-cylinder and then:

- disconnect the PTC sensor terminals;
- remove the electrical elements corresponding to the sensors being replaced;
- unscrew the PTC sensor (fig. 2.a, part. no. 7 or Fig. 2.b part. no. 7 or Fig. 2.c part. no. 2) using a spanner on the hexagonal spigot, accessible from the under side of the cover;
- reassemble a new PTC sensor, replacing the o-ring and screwing it tight; reconnect the terminals;
- reposition the electric heating elements, making sure the PTC sensor enters into the corresponding sheath in the aluminium casting.

NTC temperature sensor (version with type H or T control module only)

As for the PTC sensors, the NTC sensor controlling the water temperature does not require regular maintenance.
To replace this sensor, remove the cylinder following the procedure described in Maintenance of the cylinder-cylinder and then:

- disconnect the terminals of the NTC sensor;
- remove the sensor from the well housed in the measuring sheath (fig. 2.a part. no. 2, or Fig. 2.b part. no. 1, or Fig. 2.d part. no. 11);
- reposition and connect the new sensor in the place of the old one.

Fuses (uxiliary circuit)

These measure 10.3x38 mm and are housed in the fuse cartridge; to check the state of the fuses, check their continuity using a tester.
Use the types of fuses indicated in table 2.e.

	models								
	UR002	UR004	UR006 - 1~*	UR006 -3~**	UR010	UR020	UR027	UR040	UR060
fuses 1 and 2 transformer power supply	All fast blow and capacity 1 A, GL, 10,3x38 contained in fuse carrier on Omega rail								
fuses 3 pump protection (on humidifiers from 20 to 60kg/h) (44.1 to 132.3 lbs/h)						1 A GL , 10,3x38 FAST			
Fuse 4 transformer secondary						2,5 A,T 5x20 in pottery			

Tab. 2.f

*: single-phase **: three-phase

Load protection fuses (humidifiers UR027 at 208-230 V, UR060 at 460 V)

Dimension of the fuses 27x60 mm rapid, housed in fuse carrier bases that can be selected. Check their continuity using a tester.

	UR027	UR060
fuses F5, F6, F7	40 A, GG	35 A, GG
fuses F8, F9, F10	40 A, GG	50 A, GG

Tab. 2.g

Solid state relays (version with type H or T control module only)

The solid-state relays (one in the single-phase unit, two in the three-phase unit) can malfunction in one of two ways: by short-circuit or burn-out. The respective consequences for the supply of power are: continuous conduction or permanent opening.
In the event of malfunctioning, check the conduction of the relay using a tester.
For the replacement of the solid-state relay:

- turn the humidifier off;
- open the disconnection switch in the power line (safety procedure);
- disconnect the power and auxiliary cables from the solid-state relay terminal block;
- remove the relay from the electrical panel by using a screwdriver to lower the fastening lever to the omega guide;
- replace the new relay on the omega guide and reconnect the wires as before.

Cooling fan and circuit breaker (version with type H or T control module only)

The SSR relays are cooled by a fan placed in the upper part, on the right side of the machine for the 20-60 kg/h (44-132.2 lbr/h) models, or placed on the base of the humidifier for the models up to 10kg/h (22 lbr/h).
With insufficient ventilation the temperature of the electrical panel may rise excessively until, reaching 65 °C, power to the solid-state relays is cut by a special Klixon (heat sensor, used in this application as circuit breaker - hereafter: circuit breaker), with manual reset (indicated by S2 in the wiring diagram) and without an activation signal. In this case, check:

- Whether the thermoprotective placed in the din rail near to the SSR relays has been working, or placed in front of the baffle pressing the reset button (see Fig. 2.f);
- that the fan power board, fitted in front of the baffle, is powered (input terminals: 24 Vac) and in turn powers the fan (output terminals: 24 Vdc), (only for models up to).

If the fan is faulty:

- in the models up to 10 Kg/h (22 lbs/h):
  - remove the baffle, after having unscrewed the two side nuts for fastening to the partition of the appliance;

In case of malfunction, the thermoprotective can be replaced unscrewing the fastening screws;

- in the 20-27-40-60 Kg/h (44.1-59.5-88.1-132.3 lbs/h) models:
  - unscrew the 4 fastening screws placed on the right side of the structural work and extract the fan from the inside of the panel.

In case of malfunction, the thermoprotective can be replaced removing the polycarbonate transparent protection of the solid state relays and unscrewing the fastening screws.

Key:

1	Klixon (thermoprotective - where fitted)
2	solid state relay (SSR) (where fitted)
3	fan (where fitted)
4	heatsink

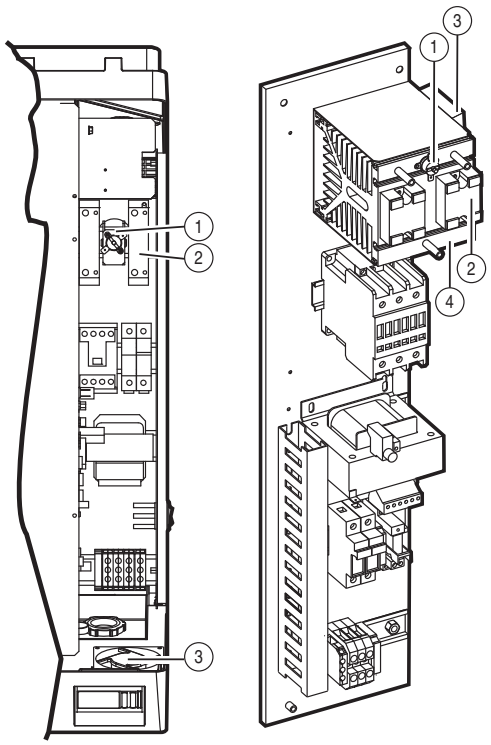


Fig. 2.f

2.3 Spare parts

Models		UR002	UR004	UR006 - 1~*	UR006 - 3~**	UR010	UR020	UR027	UR040	UR060
plumbing										
humidifier gasket kit		URKG00000M	URKG00000M	URKG00000M	URKG00000M	URKG00000M	URKG0000XL	URKG0000XL	URKG0000XL	URKG000XXL
Cylinder gasket kit		URKG100000	URKG100000	URKG100000	URKG100000	URKG100000	URKG400000	URKG400000	URKG400000	URKG600000
cylinder cover kit		URKCOPC00S	URKCOPC00S	URKCOPC00M	URKCOPC00M	URKCOPC00M	URKCOP4000	URKCOP4000	URKCOP4000	URKCOP6000
boiler cover locking bracket		URKBR00000	URKBR00000	URKBR00000	URKBR00000	URKBR00000				
cylinder filter kit		UEKF000000	UEKF000000	UEKF000000	UEKF000000	UEKF000000	URKF0000XL	URKF0000XL	URKF0000XL	URKF0000XL
							URKFLAN000	URKFLAN000	URKFLAN000	URKFLAN000
Teflon-coated heating elements										
	208 V	URKH00A348	URKH00A349	URKH00A347	URKH00A347	URKH00A346	URKH00A382	URKH00A383		
	230 V	URKH00A348	URKH00A349	URKH00A320	URKH00A320	URKH00A322	URKH00A381	URKH00A382		
	400 V				URKH00A320	URKH00A322	URKH00A381	URKH00A382	URKH00A387	URKH00A387
	460 V				URKH00A344	URKH00A347	URKH00A386	URKH00A381	URKH00A390	URKH00A390
	575 V				URKH00A341	URKH00A342	URKH00A385	URKH00A380	URKH00A389	URKH00A389
non-Teflon heating elements										
	208 V	URKH00R348	URKH00R349	URKH00R347	URKH00R347	URKH00R346	URKH00R382	URKH00R383		
	230 V	URKH00R348	URKH00R349	URKH00R320	URKH00R320	URKH00R322	URKH00R381	URKH00R382		
	400 V				URKH00R320	URKH00R322	URKH00R381	URKH00R382	URKH00R387	URKH00R387
	460 V				URKH00R344	URKH00P347	URKH00R386	URKH00R381	URKH00R390	URKH00R390
	575 V				URKH00R341	URKH00R342	URKH00R385	URKH00R380	URKH00R389	URKH00R389
cylinder fastening strap		URKBLOCK00	URKBLOCK00	URKBLOCK00	URKBLOCK00	URKBLOCK00	---	--	--	--
steel cylinder		URKB040000	URKB040000	URKB100000	URKB100000	URKB100000	URKB270000	URKB270000	URKB400000	URKB600000
fill tank		UEKVASC000	UEKVASC000	UEKVASC000	UEKVASC000	UEKVASC000	---	--	--	--
drain electrovalve kit		URKDRAIN00	URKDRAIN00	URKDRAIN00	URKDRAIN00	URKDRAIN00	--	--	--	--
drain pump kit							KITPS00000	KITPS00000	KITPS00000	KITPS00000
drain pipe kit							URKT0000XL	URKT0000XL	URKT000XXL	URKT000XXL
fill valve		KITVC00006	KITVC00006	KITVC00012	KITVC00012	KITVC00012	KITVC00040	KITVC00040	KITVC00040	KITVC00100
internal pipe kit		URKT00000S	URKT00000S	URKT00000M	URKT00000M	URKT00000M	URKT0000XL	URKT0000XL	URKT000XXL	URKT000XXL
level control with sensor		URKSL00004	URKSL00004	URKSL00004	URKSL00004	URKSL00004	URKSL00004	URKSL00004	URKSL00004	URKSL00004
non-stick film		URKBAG0400	URKBAG0400	URKBAG1000	URKBAG1000	URKBAG1000	---	--	--	--
external terminal covering		URKTI04000	URKTI04000	URKTI10000	URKTI10000	URKTI10000	URKTI27000	URKTI27000	URKTI40000	URKTI60000
electrical parts										
contactor										
voltage	208 V	URKCONT100	URKCONT100	URKCONT100	URKCONT100	URKCONT100	URKCONT400	URKCONT400		
	230 V							URKCONT300		
	400 V				URKCONT100	URKCONT100	URKCONT200	URKCONT200	URKCONT200	URKCONT300
	460 V				URKCONT100	URKCONT100	URKCONT100	URKCONT200	URKCONT400	URKCONT300
	575 V				URKCONT100	URKCONT100	URKCONT100	URKCONT200	URKCONT200	URKCONT300
power supply transformer										
voltage	230 - 400 V	URKTR10000	URKTR10000	URKTR10000	URKTR10000	URKTR10000	URKTR40000	URKTR40000	URKTR40000	URKTR40000
	208 - 208 - 460 - 575 V	URKTR20000	URKTR20000	URKTR20000	URKTR20000	URKTR20000	URKTR30000	URKTR30000	URKTR30000	URKTR30000
fuse carrier		URKFH10000	URKFH10000	URKFH10000	URKFH10000	URKFH10000	URKFH20000	URKFH20000	URKFH20000	URKFH20000
voltage	460 V									URKFH30000
	208-230 V							URKFH30000		
fuses										
F1, F2	208-230 V	URKFUSE100	URKFUSE100	URKFUSE100	URKFUSE100	URKFUSE100	URKFUSE200	URKFUSE200		
	400V				URKFUSE300	URKFUSE300	URKFUSE300	URKFUSE300	URKFUSE300	URKFUSE300
	460-575 V				URKFUSE100	URKFUSE100	URKFUSE100	URKFUSE100	URKFUSE100	URKFUSE100
F3	400V						URKFUSE300	URKFUSE300	URKFUSE300	URKFUSE300
	208-230-460-575 V						URKFUSE400	URKFUSE400	URKFUSE400	URKFUSE400
F4						URKFUSE500	URKFUSE500	URKFUSE500	URKFUSE500	
F5, F6, F7, F8, F9, F10	from 40 A (208-230V)							URKFUSE700		
F5, F6, F7	from 35 A (460V)									URKFUSE600
F8, F9, F10	from 50 A (460V)									URKFUSE800
fan		URKFANS000	URKFANS000	URKFANS000	URKFANS000	URKFANS000	URKFANL000	URKFANL000	URKFANL000	URKFANL000
Motor protector		THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000
							URKKL00000	URKKL00000	URKKL00000	URKKL00000
socket for pre-heater probe		URKNTCCAS2	URKNTCCAS2	URKNTCCAS1	URKNTCCAS1	URKNTCCAS1				
electronic parts										
version C control module		URCxxvppri (for further information see the CAREL instruction sheet code +050003700)								
version H control module		URHxxvppri (for further information see the CAREL instruction sheet code +050003700)								
version T control module		URSxxvppri (for further information see the CAREL instruction sheet code +050003700)								
main control board		URI0000000	URI000000i	URI000000i	URI000000i	URI000000i	URI000000i	URI000000i	URI000000i	URI000000i
flat connection cable		59C460A003	59C460A003	59C460A003	59C460A003	59C460A003	59C486A003	59C486A003	59C486A003	59C486A003
fan and SSR motorprotector		URKKL10000	URKKL10000	URKKL10000	URKKL10000	URKKL10000	URKKL10000	URKKL10000	URKKL10000	URKKL10000
boiler motorprotector							URKKL00000	URKKL00000	URKKL00000	URKKL00000
fan circuit breaker		6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX
fan control board		URKCFAN000	URKCFAN000	URKCFAN000	URKCFAN000	URKCFAN000				
solid state relay										
	208 V	URKSSR1000	URKSSR1000	URKSSR2000	URKSSR1000	URKSSR2000	URKSSR3000	URKSSR3000		
	230 V	URKSSR1000	URKSSR1000	URKSSR2000	URKSSR1000	URKSSR1000	URKSSR3000	URKSSR3000		
	400 V	URKSSR1000	URKSSR1000		URKSSR1000	URKSSR1000	URKSSR3000	URKSSR3000	URKSSR3000	URKSSR3000
	460 V	URKSSR1000	URKSSR1000		URKSSR1000	URKSSR1000	URKSSR3000	URKSSR3000	URKSSR3000	URKSSR3000
	575 V				URKSSR1000	URKSSR1000	URKSSR3000	URKSSR3000	URKSSR3000	URKSSR3000
PTC probe (res. without antiadherent film)		URKPTCS000	URKPTCS000	URKPTCS000	URKPTCS000	URKPTCS000	URKPTCL000	URKPTCL000	URKPTCL000	URKPTCL000
NTC probe (res. with antiadherent film)		URKNTC0000	URKNTC0000	URKNTC0000	URKNTC0000	URKNTC0000	URKNTC0000	URKNTC0000	URKNTC0000	URKNTC0000

Tab. 2.h

*: single-phase **: three-phase

2.4 Disposal of the parts of the humidifier

The humidifier is made up of metallic and plastic parts, refer to Figs. 2.a e 1.a.
All these parts must be disposed of according to the local standards regarding product waste disposal.

3. Allarms

3.1 Alarm summary table

When an alarm is activated a message identifying the alarm is displayed on the control module.
In the case of potentially dangerous alarms, the control module automatically shuts the humidifier down.
For some alarm events (see Table 3.a), the signalling of the alarm is accompanied by the activation of an alarm relay, as described in: Other auxiliary contacts.
If the cause of the alarm is no longer valid, the humidifier and alarm relay output can be reset automatically or manually, according to the type of problem, while the message displayed is deactivated manually by pressing the reset-PRG button.
If no longer active, the alarm status continues to be indicated until the reset-PRG button is pressed.

Still active alarms can not be reset.

In the type C control module the presence of an alarm is indicated by the lighting up of LED 9 and a combination of the LEDs 5 (Fig. 3.a); in the event of more than one alarm, these are indicated in sequence, at 2 second intervals.
In the type H or T control module, if not in programming phase, in the presence of an alarm LED 9 (see fig. 3.b) begins flashing, while the display 5 indicates the alphanumeric alarm code.
The message is displayed cyclically, for a duration of two seconds, alternating with the measurement normally displayed (if the measurement normally displayed corresponds to a disconnected probe, the measurement is not displayed; this will automatically return to the display if the probe is reconnected).
In the event of more than one alarm, the display indicates all the corresponding codes in sequence, at two second intervals.
The alarm Ec cannot be reset.
In the event of the alarm CL (regular maintenance required), the alarm can be reset only by resetting the hour counter; see **Resetting the hour counter**.

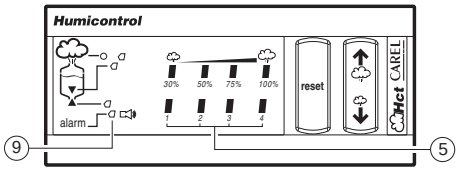


Fig. 3.a

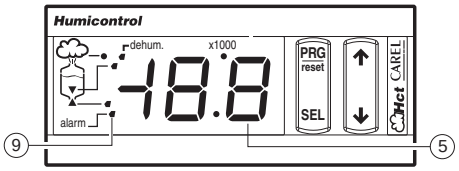
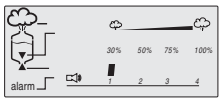
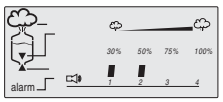
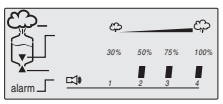
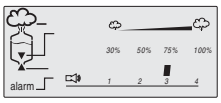
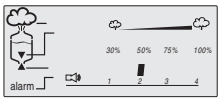
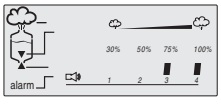
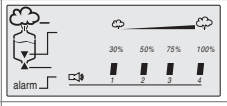
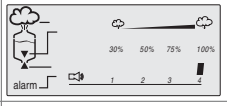
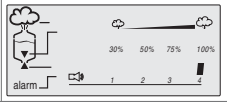


Fig. 3.b

The alarm E1 may appear in two distinct cases:
1. **Malfunction when reading from the parameter memory** (typically on start-up). The default parameters are temporarily recalled, without being saved in the parameter memory (the parameters can be accessed and the correct values restored). In any case the default parameter recall procedure is recommended; see Recalling the default parameters.
2. **Malfunction when writing to the parameter memory** (typically on pressing the PRG button). Any modifications made will be cancelled; the parameters can be accessed, the values modified and save operation repeated.

Table 3.a lists the alarm indications, the causes, the conditions and the possible solutions.
The remote terminal column indicates the alarm message that appears on the LCD display of the CAREL humivisor remote control panel, if one is connected to the humidifier.

code displayed							
H and T controller	C controller	CAREL Humivisor remote terminal	cause	solution (once having tried the suggestion, if the problem persists, contact the CAREL service department)	action	reset	alarm relay
Et		E202	•activation of safety thermostat • Klixon activation •the thp output is open	· check the earth current of the heaters, and if replace necessary. · manually reset the Klixon · problem dependent mainly on operation without water; · turn the machine off and, once it has cooled down,reactivate the thermostat on the cylinder cover after having cleaned the cylinder and the level control, checking the efficiency of the components; · check that the electrical and water connections are in order and that the machine is supplied correctly; · it may be necessary to replace the PTC sensors if installed		not available	active if Et remain in order at least a minute.
EL		E204	contradiction of the float	· check the correct supply of water to the cylinder; · turn the machine off and clean: the cylinder, the level control and the fill electrovalve	see procedure "AR"	manual	only if EE appears during AR
EC	non previsto	E205	high conductivity of the supply water	· turn the machine off and clean the water conductivity measuring electrodes; · if the problem persists, change the source of the supply water or install a suitable treatment system (demineralisation, even partial); · the problem will not be resolved by softening the supply water	total shutdown	auto available	active
EE		E211	autotest failed; probable problems in: supply water, level control or electrovalve	· ensure that the machine is supplied with water; · turn the machine off and clean the level control and the fill valve	see procedure "AR"	manual	active only on the second EP or after EE during AR

code displayed							
H and T controller	C controller	CAREL Humivisor remote terminal	cause	solution (once having tried the suggestion, if the problem persists, contact the CAREL service department)	action	reset	alarm relay
EP		E213	• electrical power not available; on machine start-up no steam is produced or the water is not pre-heated •float locked in high level position.	with the machine off and disconnected from mains power supply, check that there are no defective of malfunctioning electrical connections	see procedure "AR"	manual	active only on the second EP or after EE during AR
EF		E214	no water	· check that the supply pipe from the water supply to the humidifier and the internal pipe is not blocked or choked and that the pressure is sufficient (1-8 bar); · check the operation of the fill electrovalve; · check that the steam supply does not have to work against excessive back-pressure, preventing the flow of water into the cylinder due to gravity; · check that the steam supply pipe is not choked or that there are no pockets of condensation	humidifier disabled after waiting 10 min the alarm is automatically reset and a new fill cycle is attempted	manual or automatic (if after waiting 10 min the water supply returns)	active
EA		E215	formation of foam in the cylinder during boiling	· the formation of foam is usually due to the presence of surfactants in the water (lubricants, solvents, detergents, water treatment or softening agents) or an excessive concentration of dissolved salts. Drain the water supply line; · clean the cylinder	signal only	manual	not active
Ec	not featured	E231	high water conductivity pre-alarm	· check the conductivity of the supply water; · if necessary, install a suitable water treatment system; · the problem will not be resolved by softening the supply water	humidifier disabled	auto available	not active
E-	not featured	E221	high ambient humidity (high temperature in T control)	check the operation of the probe and the limit set by parameter P2	signal only	auto available	active
E_	not featured	E222	low ambient humidity low temperature in T control)	check the operation of the probe and the limit set by parameter P3	signal only	auto available	active
E=	not featured	E224	high outlet humidity	check the operation of the outlet probe	signal only	auto available	active
E0		E201	internal memory error	contact the CAREL service department	humidifier disabled	reprogram CAREL	active
E1	not featured	E212	user parameter error	with the machine off check that there are no defective or malfunctioning electrical connections	humidifier disabled	reprogram parameters	active
E2	not featured	E230	hour counter error	reset the hour counter (see Resetting the hour counter)	hour counter saving disabled	manual hour counter reset	not active
E3	not featured	E220	room probe not connected	check the connection of the probe and the setting of parameter A0 for ON/OFF configuration (see Reading and programming the parameters)	humidifier disabled	auto available	active
E4	not featured	E223	outlet probe not connected (if featured)	check the connection of the probe or the setting of parameter A0 (see Reading and programming the parameters)	humidifier disabled	auto available	active
E5	not featured	E225	NTC probe for measuring the water temperature not connected (if featured)	· check the pre-heating operation and the setting of parameters b1, b2, b3 (see Reading and programming the parameters); · check the connections to the terminal block on the cylinder cover	pre heating disabled	auto available	active
CL	not featured	E232	regular maintenance signal	stop the machine and carry out a complete maintenance routine on the humidifier, resetting the hour counter (see Resetting the hour counter)	signal only	manual	not active
Ed		E216	no drain pre-alarm or filter blocked	· check the drain valve/pump; · check if the pipes or the manifold are blocked; · check if the level sensor is faulty or the pipes are blocked; · the filter inside the boiler may be clogged.	see procedure "AR"	manual	active on the second "Ed"
EU		E233	boiler full of water with no humidification demand pre-alarm	· check if the fill valve is leaking; · check if the high level sensor is dirty.	signal only	auto available	not active

Tab. 3.a

3.2 Autotest Retry procedure (Fault tolerance)

AUTOTEST RETRY ("AR")

Step	Description	Drain status	Fill status	Contactor status	Duration	Condition that can stop "AR" Display	
1	Stop production. Open contactor	Off	Off	Off	3 sec	No	
2	Drain by time	On	Off	Off	If at the end of a set time the float is below to the minimum reed, the procedure goes to step 3, otherwise it drains again and then goes to step 3	High level sensor active	EE
3	Wait for level to stabilise	Off	Off	Off	3 sec	High level sensor active	EE
4	Fill water	Off	On	Off	Ends when the float reaches the control reed	Contradiction of the levels	EE
						High level sensor active	
						The fill time exceeds a maximum limit	
5	Wait for level to stabilise	Off	Off	Off	10 sec	Contradiction of the levels	EE
						High level sensor	
6	Drain	On	Off	Off	Ends when the float reaches the control reed	Contradiction of the levels	EE
						High level sensor active	
						The drain time exceeds a maximum limit	
7	Wait for level to stabilise	Off	Off	Off	1 sec	Contradiction of the levels	EE
						High level sensor active	

Tab. 3.b

Note:
- During the Autotest Retry procedure the display shows the code "AR" alternating with the alarm code that triggered the procedure.
- If the PRG button is pressed during the Autotest Retry procedure, the procedure is stopped and normal humidifier operation resumes.

4. Troubleshooting

Problem	Cause	Solution
The control does not turn on	1. no electrical power supply; 2. external switch in position 0 (open); 3. control connectors poorly installed; 4. fuses blown; 5. transformer malfunction.	1. check the protection devices upstream of the humidifier and the mains power supply; 2. close the switch: position I; 3. check that the connector are properly installed on the terminal block; 4. check the state of fuses F1/F2; 5. check that the secondary of the transformer has an output of 24 Vac.
The humidifier does not start	1. remote ON/OFF contact open (relay/terminals 7I - 8I); 2. the external regulator/humidistat or probe has not been connected correctly; 3. probe/humidistat malfunction; 4. parameters not set correctly; 5. safety thermostat activated; 6. fan circuit breaker activated (H or T control);	1. close ON/OFF contacts (relay/terminals 7I - 8I); 2. check the external connection; 3. check the external signal; 4. reprogram the parameters correctly; 5. reset the thermostat after having eliminated the cause of the problem; 6. reset the circuit breaker after having eliminated the cause of the problem;
The humidifier fills with water without producing steam	1. steam outlet back-pressure too high; 2. leaking flow regulator in the water fill electrovalve (with leaks in the water circuit); 3. level control malfunction; 4. cylinder inlet filter blocked; 5. lime in the fill tank; 6. drain electrovalve malfunction;	1. check that the steam outlet pipe is not bent or choked; 2. replace the fill electrovalve; 3. clean the level control or replace if necessary; 4. clean the filter; 5. clean the fill tank; 6. check for the presence of 24Vac at the drain electrovalve; clean the drain electrovalve;
Line circuit breaker is activated	1. the line circuit breaker is rated too low; 2. resistors short-circuited	1. check that the circuit breaker is rated for a current of at least 1.5 times the rated current of the humidifier; 2. check, by measuring, the value of the resistors and replace them if necessary
The humidifier wets the duct	1. the distributor is not installed correctly; 2. the system is rated too high; 3. the humidifier is active when the duct fan is off;	1. check that the steam distributor has been installed correctly; 2. diminish the steam production set on the control; 3. check the connection of the device (flow switch or differential pressure switch) linked to the humidifier for ventilation in the duct (terminals 7I - 8I)
The humidifier wets the floor below	1. the humidifier pipe is blocked; 2. the water supply or overfill circuit has leaks; 3. the condensate drain pipe does not drain the water back to the fill tank; 4. the steam outlet pipe is not properly attached to the cylinder;	1. clean the pipe in the bottom tank; 2. check the entire water circuit; 3. check the correct positioning of the condensate drain pipe in the fill tank; 4. check the fastening of the pipe clamp on the steam outlet pipe;

Tab. 4.a

gaSteam

Umidificatore a gas
Gas Steam Humidifier

Content

1. Maintenance

BEFORE ALL OPERATIONS:
- disconnect the appliance from the mains power supply;
- close the mains water and gas taps;
- drain the water circuit using the manual electric pump function, or drain.

Important warning:
- do not use detergents or solvents to clean the plastic components.
- descaling can be performed using a 20% acetic acid solution, then rinsing with plenty of water.

1.1 Boiler maintenance

Access the boiler as described in "Removing and reassembling the front cover".
Remove panels A and B, as follows (Fig. 1.b):
- remove the boiler steam hose, T;
- undo screws V and V1;
- undo the inside and outside screws that secure panel B;
- remove panels A, B and C.

To remove the exchanger, proceed as follows (Figs. 1.a and 1.b):
- disconnect the cables from the burner electrodes (the detection electrode should be disconnected from the burner control board, Fig. 1.c position "A");
- remove the fan manifold by undoing the screws B (Fig. 1.c) and remove the burner combustion head (Fig. 1.d);
- disconnect the cables from the foam detection electrode F (Fig. 1.a);
- unscrew and remove the fastening knobs G;
- remove the boiler cover;
- undo the nuts E from the side of the burner;
- remove the heat exchanger H and clean it using a 20% acetic acid solution, removing any deposits using implements that do not scratch the lining on the exchanger (e.g. wood or plastic material);
- disconnect the power cable and all the pipes connected to the electric pump and the panel O;
- undo the panel fastening nuts and remove the panel, making sure not to damage the gasket L;
- unscrew screws M to free the steel filter N and clean it using a 20% acetic acid solution;
- using a wooden or plastic scraper, scrape the inside of the vaporiser chamber and clean it using a 20% acetic acid solution.

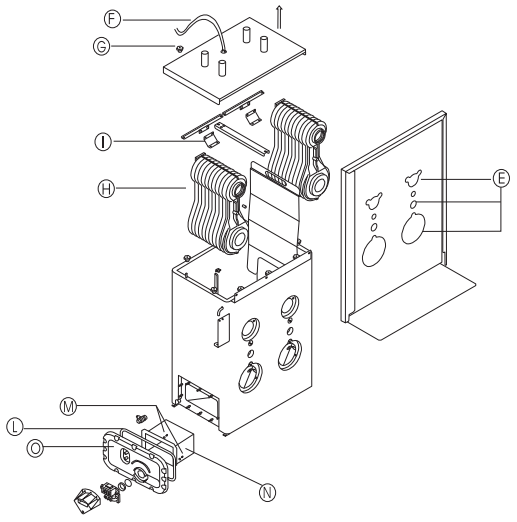
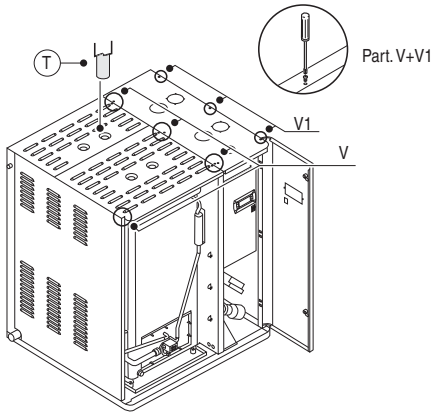


Fig. 1.a



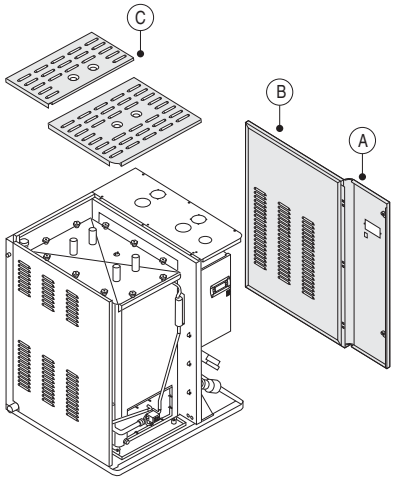


Fig. 1.b

1.2 Cleaning the burner

The burner must be checked by authorised and qualified personnel once or twice a year, according to use.
Before performing any maintenance on the burner, check its general condition, carrying out the operations listed below:
- remove the burner head as described previously;
- using a brush, clean the inside of the burner head; make sure not to crush the metal mesh (Fig. 1.e);
- remove all gas and electrical connections from the burner assembly;
- check for dust deposits on the fan and if necessary remove the parts required to clean it (Fig. 1.f).
- clean the fan using a brush (Fig. 1.g).

Warning: to avoid damaging the fan, never use a jet of compressed air when cleaning it.

When reassembling the parts, check:
- the condition of the gaskets (replace if necessary);
- that the position of the electrodes corresponds to Fig. 1.c.

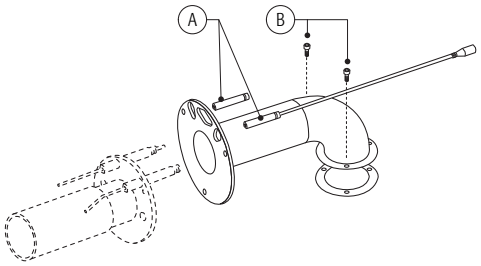


Fig. 1.c

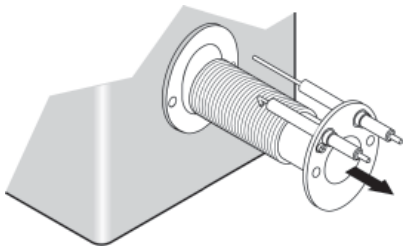


Fig. 1.d

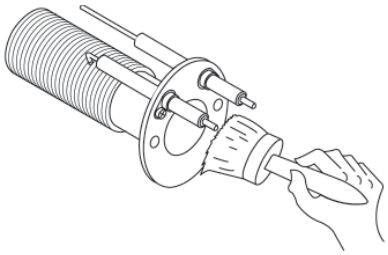


Fig. 1.e

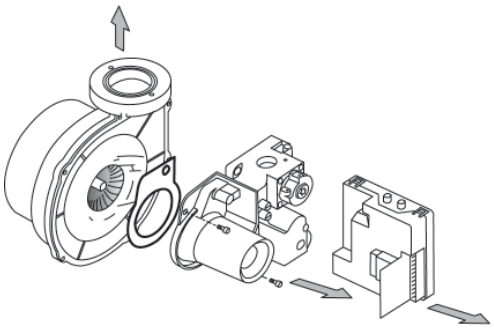


Fig. 1.f

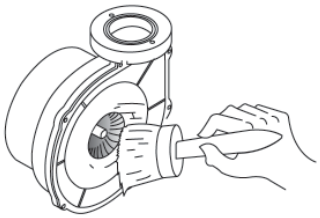


Fig. 1.g

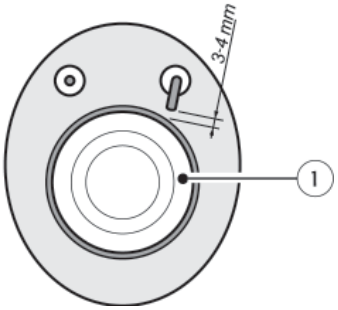


Fig. 1.h

1.3 Operating anomalies - checking the ionisation current

The ionisation current is checked by placing a microammeter set to 10 µA full scale (direct current) in series with the flame detection electrode.
The wrong positioning of the electrode may lead to a decrease in the ionisation current and shut the burner down due to incorrect flame detection. In this case, check the correct position and condition of the electrode, its electrical connections, and the earth connection of the burner. The ionisation current is normally 5 µA.

Important warning: after having replaced or checked the parts in the water circuit, make sure that the connections have been completed correctly and are tight. Start the unit again and run a number of fill and drain cycles (2 to 4), after which, applying the safety procedure, check for any water leaks.

For details of the spare parts, see the SPARE PARTS section.

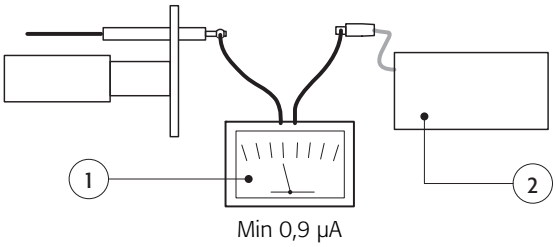


Fig. 1.i

Key:

1	microammeter with 10 µA full scale
2	test equipment

1.4 Heat exchanger

See the procedure in paragraph 1.1

1.5 Flue gas temperature sensor

The flue gas temperature sensor is located in the flue and does not require periodical maintenance.
If the sensor needs to be replaced due to a fault, proceed as follows:

- stop the humidifier by moving the rocker switch on the control panel to 0 and then checking that the display is off;
- open the electrical compartment to access to the panel;
- loosen terminals 10T and 11T (or 10Z and 11Z) (see the wiring diagram) on the terminal block in the bottom of the electrical panel and the probe holder nut on the adapter joint (see the spare parts manual, code +030220532) and then remove the probe and the electrical cable.

Then replace the sensor by following the same procedure in reverse.

1.6 Water temperature sensor

This does not require periodical maintenance.

To replace the sensor, proceed as follows:

- stop the humidifier by moving the rocker switch on the control panel to 0 and then checking that the display is off;
- open the panels to access the water circuit (Fig. 1.b);
- using the Velcro strip on the insulation (left wall of the cylinder), open enough insulation to allow good visibility of the sensor (see the spare parts manual, code +030220532);
- use a special tool to remove the probe-holder split pin, and then remove the sensor from its housing;
- loosen terminals 12T and 13T (see the wiring diagram) on the terminal block in the bottom and remove the probe.

Then replace the sensor by following the same procedure in reverse.

1.7 Fuses

Fuses 1, 2, 3 measure 10.3x38 mm and are contained inside the fuse carrier; while fuse 4 measures 6.3x20 mm; to check the fuses, test continuity using a tester.
Use fuses with the ratings indicated in table 1.a.

model	UG045
fuses 1 and 2	Slow-blow, 3 A
fuse 3	Fast-blow, 1A
fuse 4	Slow-blow, 3.15A

Tab. 1.a

1.8 Cooling fan

The cooling fan starts when the unit is switched on, and is used to keep the operating temperature of the electrical panel and the electronics within the designed limits.
If the fan is faulty:
- disconnect the electrical connections;
- replace the fan after having unscrewed the fastening screws;

N.B: being thermally protected, the fan may switch off temporarily if it overheats, and then will start again after having cooled down.

2. Spare parts

2.1 UG045

Burner Kit

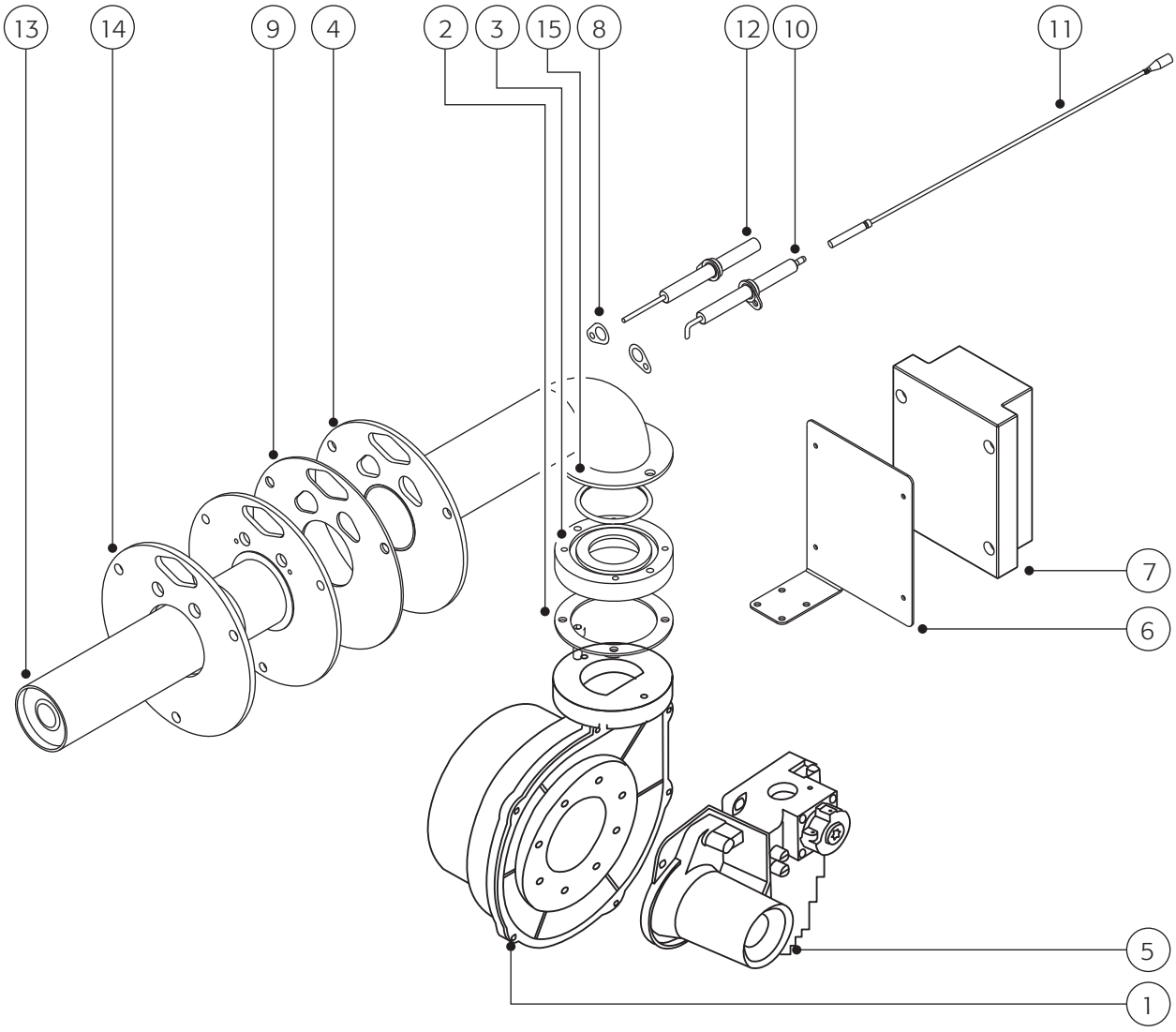


Fig. 2.a

BURNER KIT FOR UG045: UGKBRUC045

The burner kit can be supplied already assembled and tested, code UGKBRUC045, complete with all the parts shown on the exploded diagram, or the individual components shown in the table can be supplied.

position	description	code	fig.
1	centrifugal fan	-	2.a
3	fan compensation flange	-	
4	flanged fan support	-	
5	valve assembly + Honeywell Venturi	13C514A009	
6	Honeywell board support bracket	-	
7	Honeywell board	UGCB00000M	
10	ignition electrode	61C483A016	
11	ignition electrode cable		
12	detection electrode	61C483A009	
13	UG045 combustion head	13C547A014	
2	centrifugal fan gasket	* (present in the gasket kit, see Tab. 2.b)	
8	electrode gasket		
9	UG045 head/burner flange gasket		
14	UG045 combustion head gasket		
15	4212 NBR o-ring		

Tab. 2.a

2.2 UG045-090

Complete view

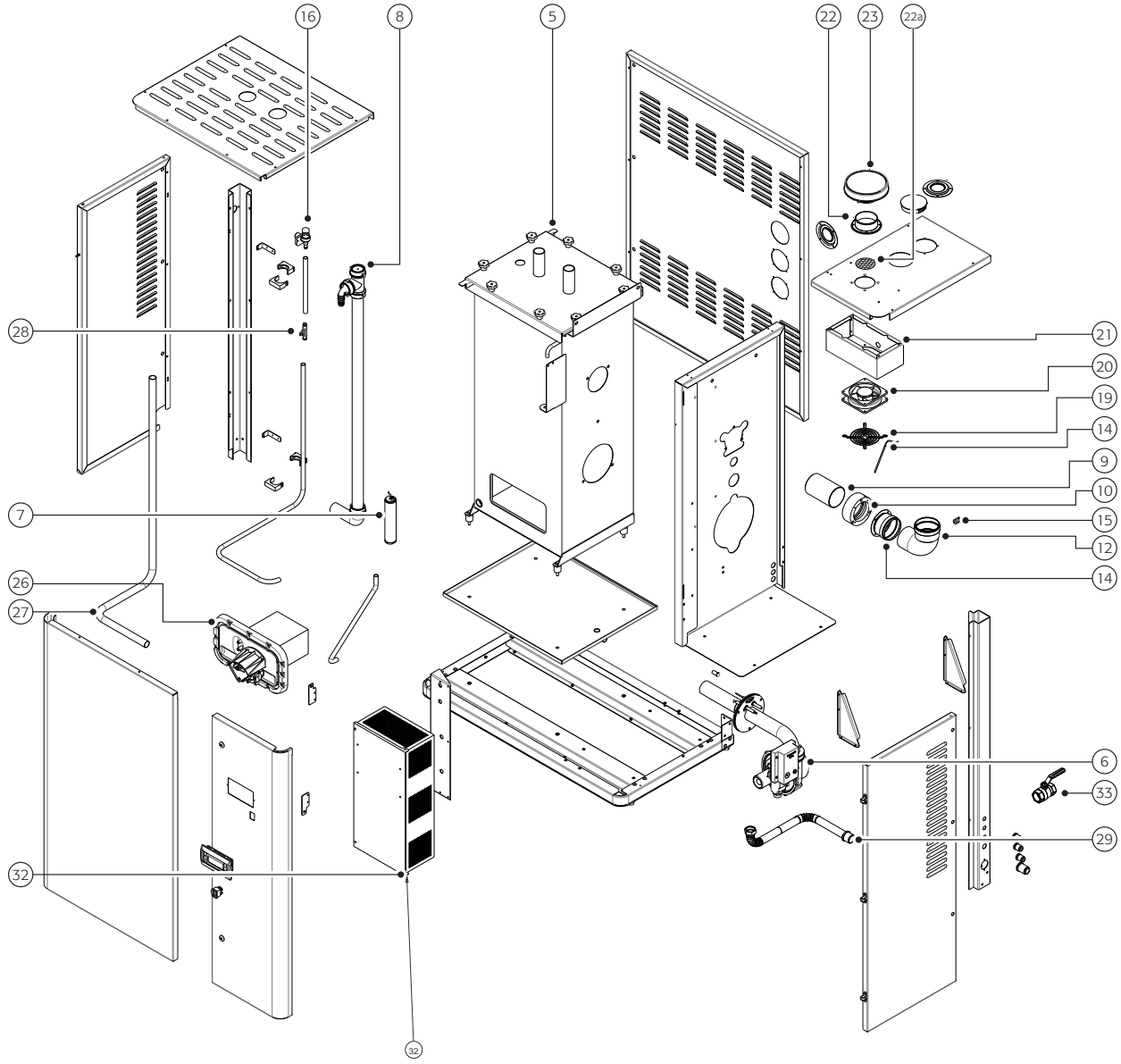


Fig. 2.b

position	description	code	fig.
5	boiler	14C514A005	2.b
6	burner kit for gasteam 45	UGKBRUC045	
7	level sensor kit	UGKSL00000	
9	flue section dia. 80 L= 120	EXHT080120	
10	chimney fastening joint	1312249AXX	
11	flanged section dia. 80 L= 56	EXHL080056	
12	90° bend dia. 80 r= 0.75 RAL= 9016	EXHC080080	
14	PT1000	61C547A010	
15	bimetal thermostat with manual reset 175°	6132501AXX	
16	water fill valve	KITVC00100	
8	gasteam 90-180 draining column	1312250AXX	
19	flat grill	UGKVENT000	
20	cooling fan		
21	hot air flow conveyor		
22	flanged attachment with collar		
22a	air filter		
23	rain hood		
26	gasteam 45/90/180 utility flange assembly	URKFLAN000	
27	corrugated drain pump pipe	13C479A001	
28	conductivity meter	KITCN0000	
29	AISI 304 burner gas connection pipe	--	
32	electrical panel	UGQE090000	
33	1" F-F ball valve	1312804AXX	

Tab. 2.b

Hydraulic part view

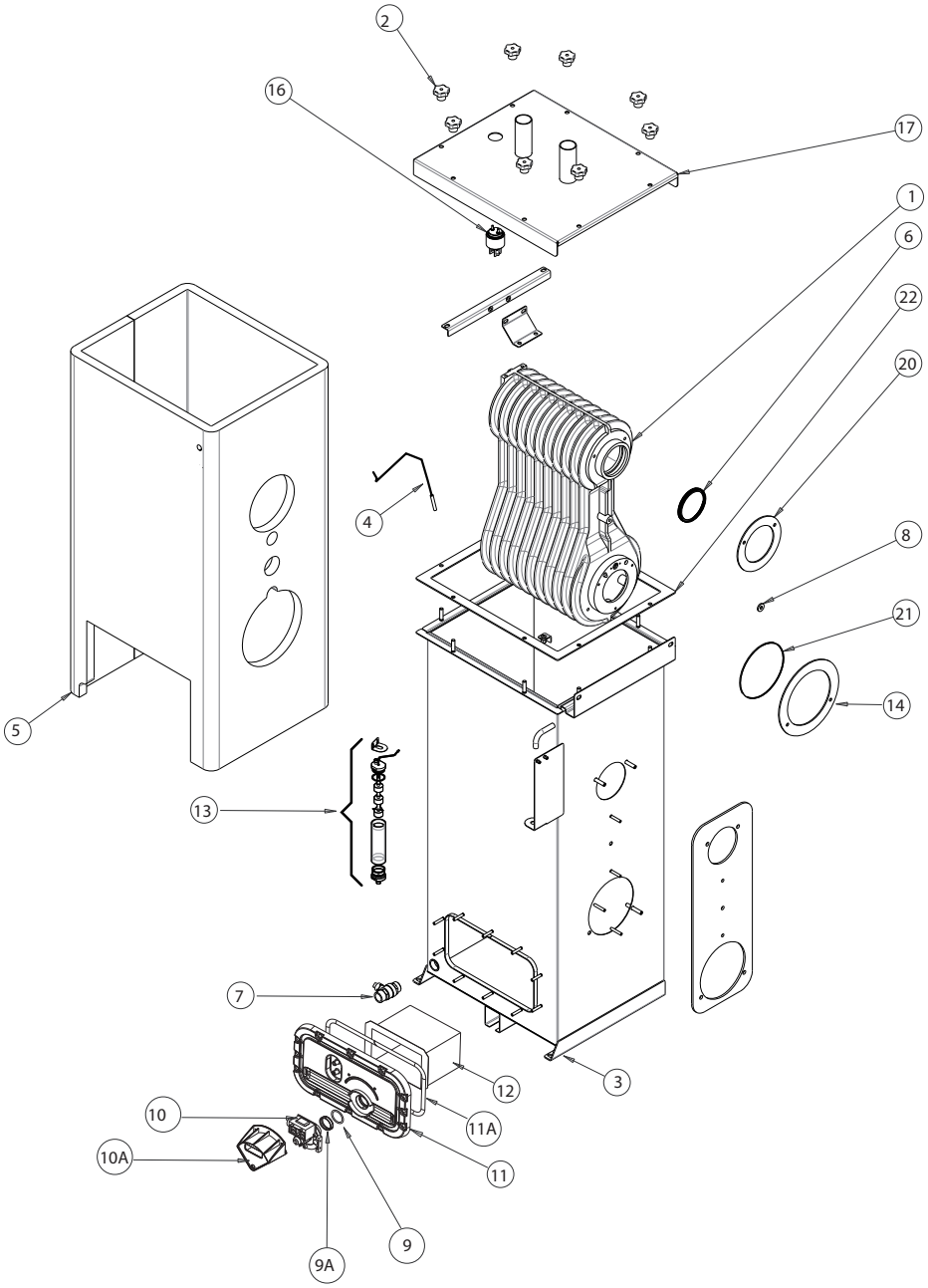


Fig. 2.c

position	description	code	fig.
1	heat exchanger UG45-90-180	19C514A003	2.c
2	cover fastening knobs	1209593AXX	
3	boiler	14C514A005	
4	NTC probe	NTC030HT00	
5	boiler lining	1614301AXX	
7	3/4" MM drain tap	1312805AXX	
10	drain pump kit	KITPS00000	
13	sensor level kit	UGKSL00000	
16	foam sensor assembly	18C547A001	
17	UG45-90 boiler cover	14C514A006	
9	o-ring	URKFLAN000	
9A	pump collar		
10A	pump cover bracket		
11	utility flange		
11A	utility flange gasket		
12	filter	14C479A156	
6	flue gasket dia. 80	UGKGUAR045	
8	middle exchanger gasket		
14	bottom exchanger gasket		
20	top exchanger gasket		
21	3575 silicon o-ring		
22	cover gasket		
2	centrifugal fan gasket		2.a
8	electrode gasket		
9	UG045 head/burner flange gasket		
14	UG045 combustion head gasket		
15	4212 NBR o-ring		

2.3 UG045-090-180

Electrical panel

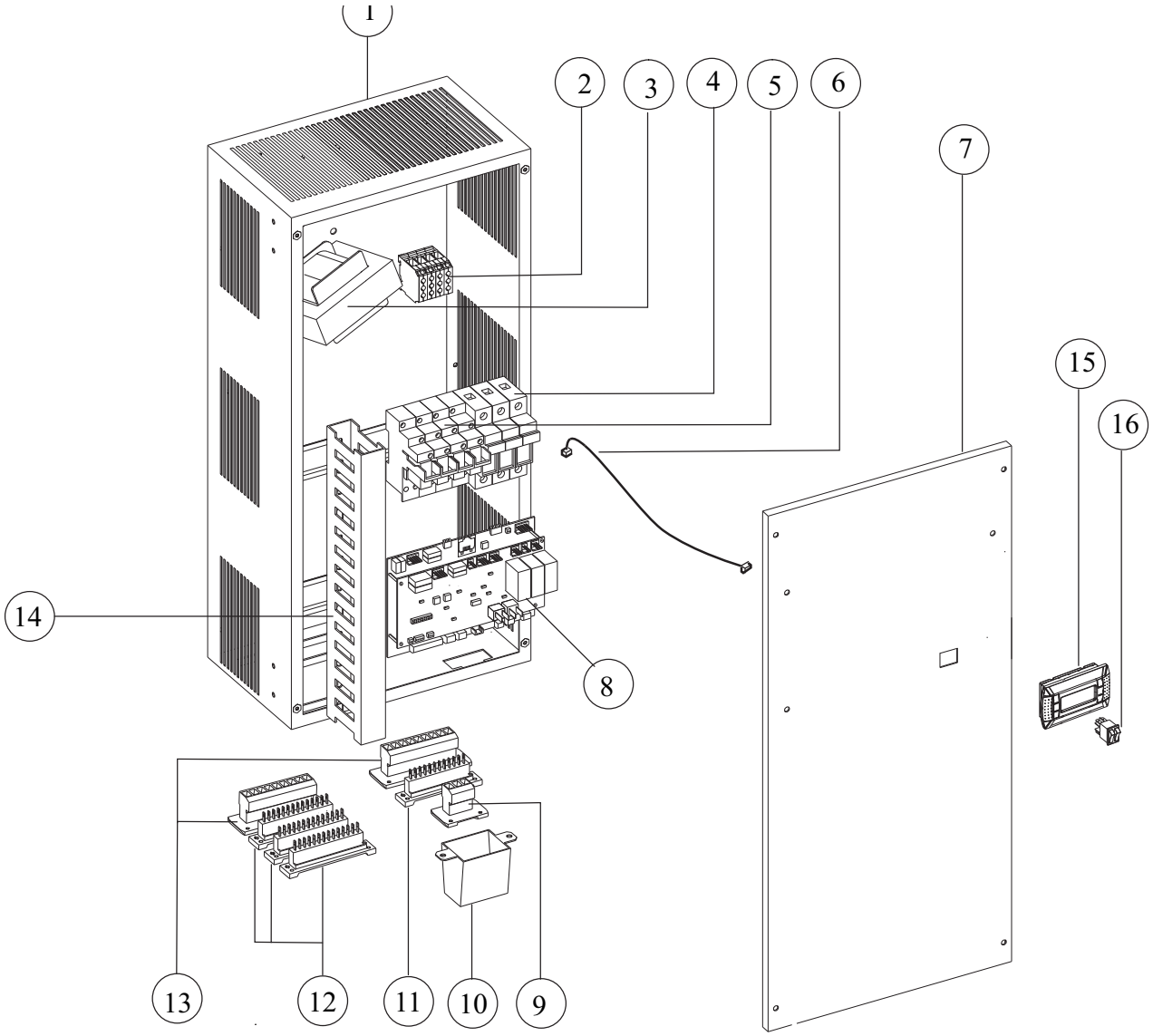


Fig. 2.d

ELECTRICAL PANEL UG045-090-180

The electrical panel can be supplied already assembled and tested, code UGQE090000[1] for the UG045-090, and code UGQE180000 for the UG180, complete with all the parts shown on the exploded diagram, or the individual components shown in the table can be supplied:

position	description	code	fig.
1	electrical panel	14C547A003	2.d
2	terminals	2214007AXX	
3	transformer	0907647AXX	
4	fuse carrier	0606193AXX	
5	control relay	0102001AXX	
6	telephone cable	S90CONN000	
7	electrical panel door	14C547A003	
8	main control board	HHPCAB0010[1]	
9	3 pin plug	2219963AXX	
10	electrical connection bracket	14C483A020	
11	14 pin plug	2219972AXX (not present on UG045-090)	
12	12 pin plug	2219971AXX	
13	9 pin plug	2219962AXX	
14	cable conduit	1209504ABC	
15	pGD dysplay	PGD0PH0F00	
16	switch	0504343AXX	

Tab. 2.d

[1]: the configuration must be requested, by specifying the model of gaSteam they will be installed on.

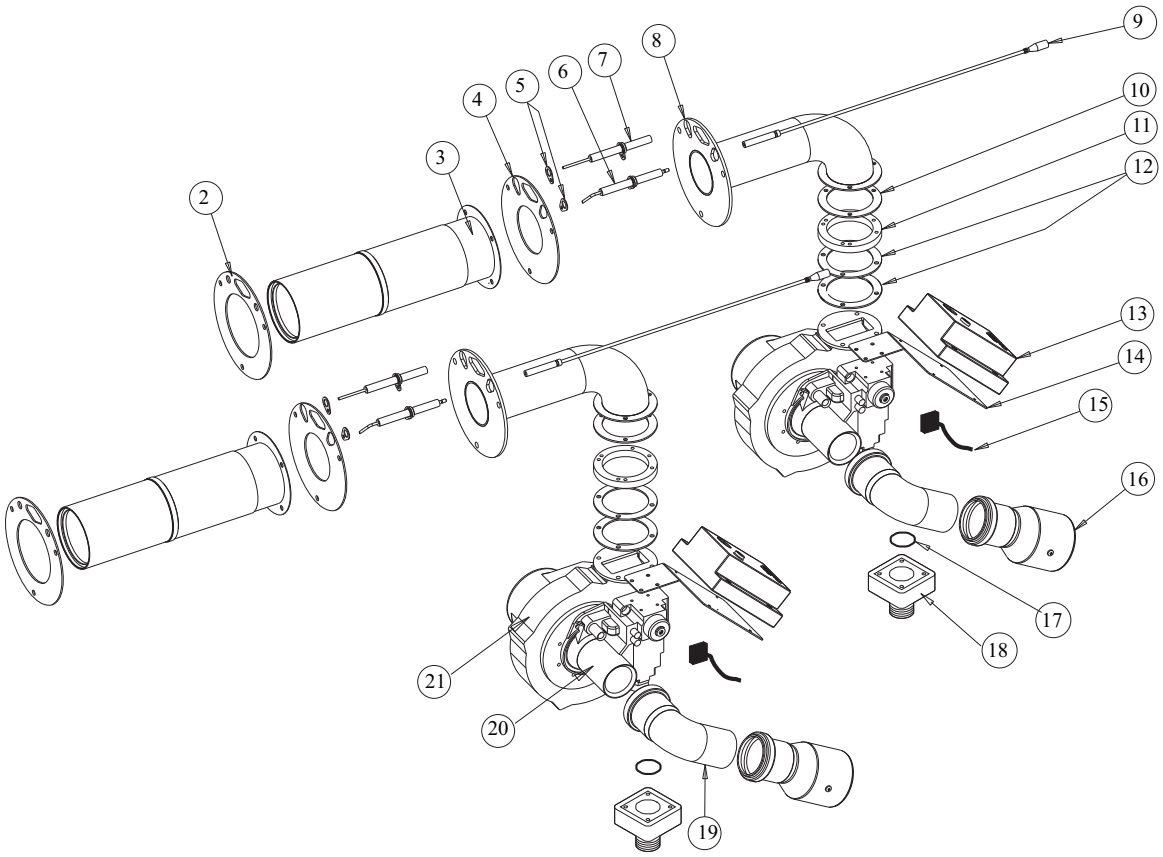


Fig. 2.e

BURNER KIT FOR UG090-180: UGKBRUC090

The burner kit can be supplied already assembled and tested, code UGKBRUC090, complete with all the parts shown on the exploded diagram, or the individual components shown in the table can be supplied.

position	description	code	fig.
3	UG090/180 combustion head	13C514A002	2.e
7	detection electrode	61C483A009	
8	fan support pipe	---	
6	ignition electrode	61C514A003	
9	ignition electrode cable		
11	fan flange	---	
13	Honeywell board	UGCB00000M	
14	Honeywell board support bracket	---	
15	Honeywell connector	5931900AXX	
16	intake damper assembly	---	
18	aluminium flange	---	
19	87.5° curve diam.50 PP	---	
20	UG090/180 gas valve	13C514A004	
21	UG090/180 burner fan	1312802AXX	
2	combustion head gasket	* (present in the gasket kit, see Tab. 2.b for UG090 and 2.g for UG180)	
4	gasket between head and fan support		
5	detection electrode gasket		
10	fan flange-flanged curve gasket		
12	fan gasket		
17	OR 3087 gasket		

Tab. 2.e

Important: for the UG090 order 1 of code UGKBRUC090, for the UG180 order 2 of code UGKBRUC090.

2.4 UG180

Complete view

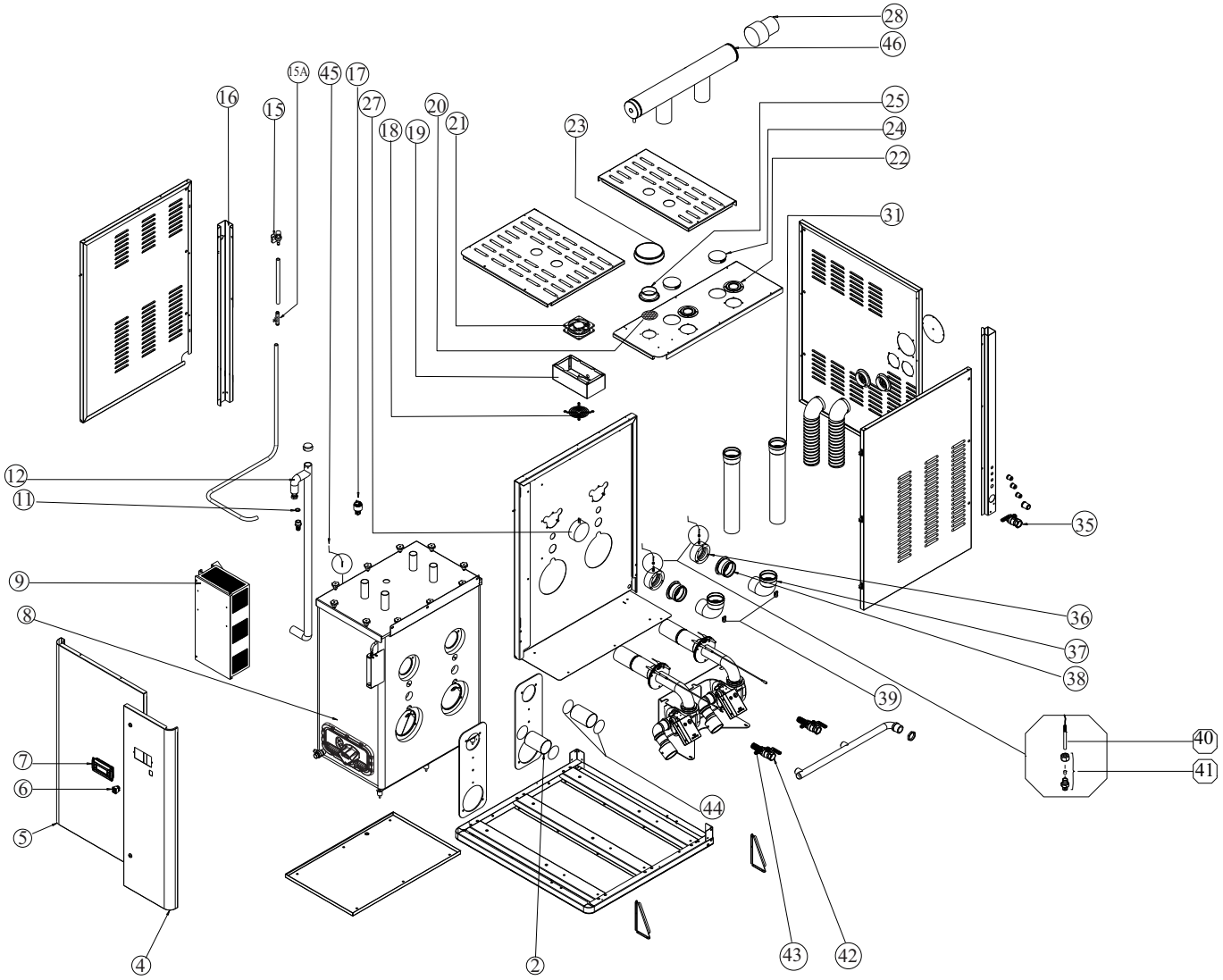


Fig. 2.f

position	description	code	fig.
2	flue section ø80 mm L= 120 mm	EXHT080120	2.f
6	rocker switch	0504343AXX	
7	pGD	PGD0PH0F00	
8	heat insulation for UG180 boiler	1614302AXX	
9	electrical panel	UGQE180000	
12	drain column	1312250AXX	
15	water fill valve	KITVC00180	
15A	Conductivity meter	KITCN0000	
17	foam sensor assembly	18C547A001	
18	flat grill	UKGVENT000	
19	hot air flow conveyor		
20	cable gland		
21	cooling fan		
22	air intake closing disk		
23	rain hood		
27	pressure switch	1309662AXX	
28	bushing ø120 ø5"	EXHR12050I	
31	extension	EXHP080500	
35	1" 1/4 F-F ball valve	1312803AXX	
36	chimney fastening joint	1312249AXX	
37	90° bend ø80 mm	EXHC080080	
38	flanged section ø80 mm L= 56 mm	EXHL080056	
39	UG090/180 safety thermostat	6132501AXX	
40	PT1000 temperature probe	61C547A010	
41			
42	man. gas valve	1312800AXX	
43	vibration-damping joint	1312253AXX	
45	preheating temperature probe	NTC030HT00	
46	flue manifold	EXHM80B120	
11	3/4 gasket	* (present in the gasket kit, see Tab. 2.g)	
44	flue section gasket		

Hydraulic part view

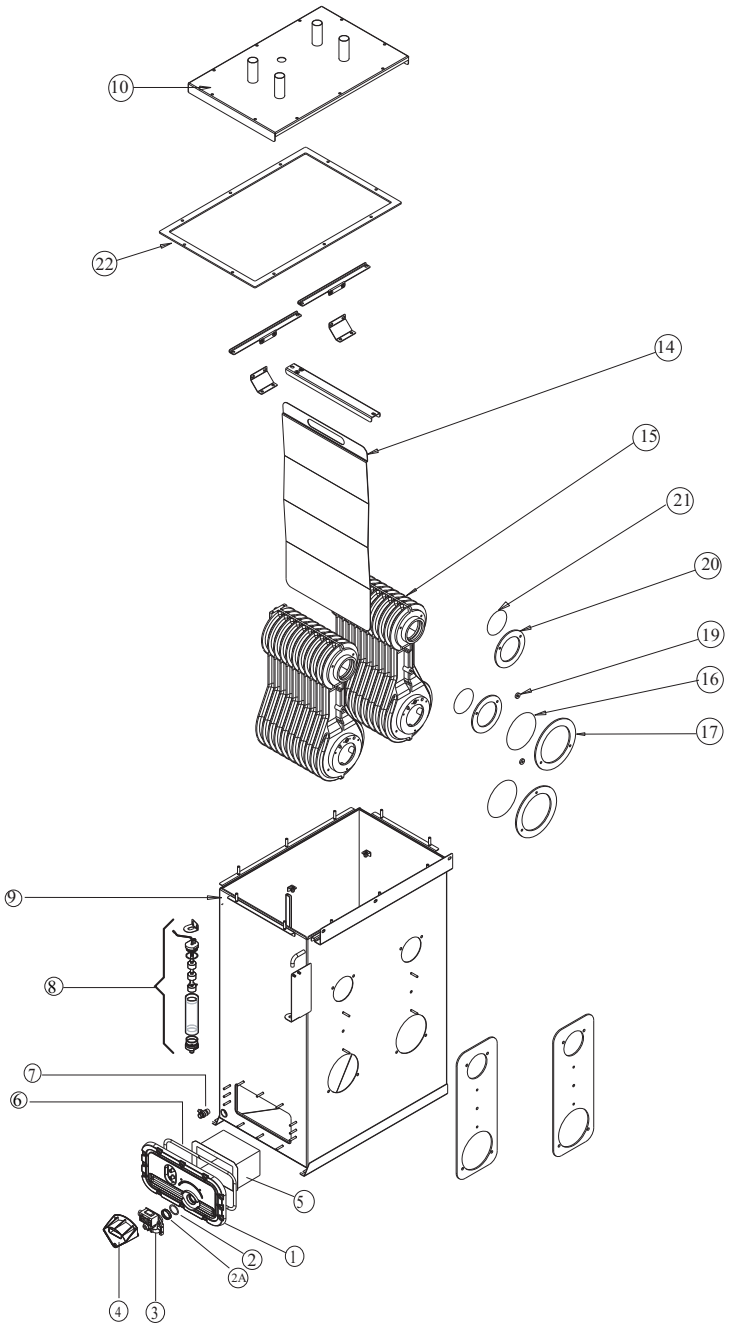


Fig. 2.g

pos.	description	code	fig.
3	drain pump kit	KITPS00000	2.g
7	3/4" MM drain tap	1312805AXX	
8	level sensor kit	UGKSL00000	
9	boiler	14C547A004	
10	boiler cover	14C547A007	
14	thermal separator	14C547A008	
15	exchanger body	19C514A003	
1	utility flange	URKFLAN000	
2	o-ring		
2a	o-ring locking ring		
4	pump cover bracket		
5	steel filter		
6	flange gasket		
16	3575 red silicone o-ring	UGKGUAR180	2.f 2.e
17	bottom exchanger gasket		
19	middle exchanger gasket		
20	top exchanger gasket		
21	flue gasket dia. 80		
22	cover gasket		
11	3/4 gasket		
44	flue section gasket		
2	combustion head gasket		
4	gasket between head and fan support		
5	detection electrode gasket		
10	fan flange-flanged curve gasket		
12	fan gasket		
17	OR 3087 gasket		

Tab. 2.g

3. Alarms and troubleshouting

3.1 Alarms

When an alarm is activated, the Alarm button starts flashing intermittently.
In these conditions, pressing the Alarm button once displays the type of alarm (and the code, in line with the standard for CAREL humidifiers).

In the event of potentially dangerous alarms, the controller automatically stops the production of steam.
For some alarm events (see Table 3.a), as well as the signal, the alarm relay is activated.
If the causes of the alarm are no longer present, the humidifier and alarm relay can be reset automatically or manually, depending on the type of fault, while the message displayed is cancelled manually (see Table 3.b).
Even if no longer active, the alarm status continues to be indicated until the "reset display" button is pressed.

The alarms that are still active cannot be reset.
In the event where more than one alarm is active, the display indicates all the codes in sequence, only if after having pressed the Alarm button once, the "UP" or "DOWN" button is also pressed.

3.2 Alarm management and signals

Table of alarms

meaning	causes	solution	reset	alarm codes displayed (2)= alarm relating to cylinder 2	alarm relay	action
Low production alarm	• power not available; • with the unit on, there is no steam production; • flue or air inlet blocked; • gas tap closed; • malfunction of the burner and/or the controller.	• check the pressure of the gas and that the gas tap is open; • check that the air inlet is free; • check the power connection to the fan; • check the operation of the brushless fan, the flue and the air inlet; • burner flame malfunction; • check the connections between the flame control board and the burner and between the electrical panel and the flame control board; • check the connections between the control unit and the terminal block inside the electrical panel.	manual	Alarm: EP Low Production (Burners Off)	active	strop production
No water	no water supply	1. check that the supply pipe to the humidifier and the internal tubing are not blocked or choked and that there is enough pressure (0 to 1 to 0.8 MPa, 1 to 8 bar); 2. check the operation of the fill solenoid valve and that the filter is clean; 3. check that there is not excessive back-pressure in the steam outlet, causing the activation of the overflow; 4. check that the steam outlet pipe is not choked or that there are no pockets of condensate	automatic	Alarm: EF No Water (Burners Off)	active	activate automatic procedure
High conductivity alarm	high conductivity of the supply water	1. check the threshold set; 2. switch the machine off and clean the electrodes that measure the conductivity of the water; if the problem persists, change the origin of the supply water or add a suitable treatment system, (demineralisation, even partial). **N.B.:** the problem is not resolved by softening the supply water.	manual	Alarm: EC High Conductivity (Burners Off)	active	strop production
High conductivity warning	high water conductivity pre-alarm	1. check the conductivity of the supply water; if necessary, add a suitable water treatment system. **N.B.:** the problem is not resolved by softening the supply water	automatic	Pre-alarm: Ec High Conductivity	not active	signal only
High humidity warning	high humidity in the room	check the operation of the probe and the value set for the upper limit parameter	automatic	Pre-alarm: E- High Humidity	not active	signal only
Low humidity warning	low humidity in the room	check the operation of the probe and the value set for the lower limit parameter	automatic	Pre-alarm: E_ Low Humidity	not active	signal only
High temperature warning	high temperature in the room	check the operation of the probe and the value set for the upper limit parameter	automatic	Pre-alarm: E> High Temperature	not active	signal only
Low temperature warning	low temperature in the room	check the operation of the probe and the value set for the lower limit parameter	automatic	Pre-alarm: E_ Low Temperature	not active	signal only
High outlet humidity alarm	high outlet humidity	check the operation of the outlet probe	Automatic	Pre-alarm: E= Humidity Limit Probe Alarm	not active	signal only

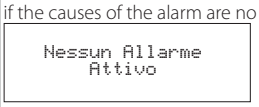
meaning	causes	solution	reset	alarm codes displayed (2)= alarm relating to cylinder 2	alarm relay	action
Main probe disconnected alarm	room probe not connected	check the connection of the probe, the parameter A2 for the room probe and the setting of parameter A0	automatic	Alarm: E3 Room Probe Not Connected or Damaged	active	stop production
Outlet probe disconnected alarm	outlet probe not connected	check the connection of the probe, the outlet humidity limit parameter and the setting of the "type of control" parameter	automatic	Alarm: E4 Limit Probe Not Connected or Damaged	not active	signal only
Foam alarm	excessive foam in the cylinder during the boiling phase	the formation of foam is generally due to the presence of surfactants in the water (lubricants, solvents, detergents, water treatment or softening agents) or an excessive concentration of dissolved salts: 1. purge the water supply lines; 2. clean the cylinder; check for the presence of a softener (in this case, use another type of water or reduce the softening).	automatic	Pre-alarm: EA Foam Present	not active	signal only
Cylinder full	cylinder full signal with unit off	with the machine off: 1. check for any leaks from the fill solenoid valve or the return of condensate from the pipe; 2. check the cleaning of the level sensors	automatic	Pre-alarm: EU Boiler Full	not active	signal only
Test alarm	Auto-test failed; probable problems in water supply, level control or water drain cycle	Make sure that the unit receives water (1 to 8 bar; 0 to 1-0.8 MPa; 14.5 to 116 PSI); Make sure that the unit drains the water; Switch the machine off and clean the level control and the fill valve, the pump and the drain filter	manual; turn the unit off and on again	Alarm: EE Test Alarm (burners off)	active	Strop production
Low level alarm	Low level of the water in the cylinder or fault with the level control	Check the correct supply of water to the cylinder; Switch the machine off and clean: the cylinder, the level control and the fill solenoid valve	manual	Alarm: EL Min. Water Level (burners off)	active	stop production
NTC probe disconnected	NTC water temperature not connected	Check the operation of the preheating function and the setting of the parameters; check the connections on the terminal block on the cover of the cylinder	automatic	Alarm: E5 NTC Probe Not Connected or Damaged	active	preheating deactivated.
System fan 1 (2) alarm	fan error	Check the electrical connections between the control board and the fan; if necessary, remove the brushless fan and check its operation	manual	Alarm: Ed Fan Alarm 1 (2) (burner 1 (2) off)	active	stop production of the correspond-ing burner
System thermostat 1 (2) alarm	safety thermostat activated due to abnormal overheating of the cylinder sue to operation without water	Stop the unit and perform complete maintenance on the cylinder	Manual	Alarm: Et Klixon 1 (2) (burner 1 (2) off)	active	stop production of the correspond-ing burner
Clock error	backup battery completely discharged or general problems with the clock	Replace the pHC controller	manual	Clock Card Alarm	not active	signal only
High flue gas temperature warning: Maintenance recommended	Flue gas temperature higher than normal operation, presence of lime scale	Carry out maintenance and/or clean the exchanger	automatic	Pre-alarm: ER - High Flue Gas Temp. (2) Boiler Maintenance 135 °C= UG45 180 °C= UG90-180	not active	signal only
High flue gas temperature alarm	Flue gas temperature excessively high, boiler full of lime scale	Switch the machine off, clean the exchanger, check burner calibration	manual	Alarm: ER High Flue Gas Temp. (2) (Burner off) 145 °C= UG45 190 °C= UG90-180	active	stop production of the correspond-ing burner
Level sensor blocked warning	Lime scale on the sensor	Carry out maintenance on the level sensor	automatic	Pre alarm: EL - Level sensor blocked	not active	activate automatic procedure
Level sensor blocked alarm	No more attempts to unblock	Carry out maintenance on the level sensor	manual	Alarm: EL - Level sensor fault	active	stop production
Drain warning	Filter blocked, level sensor tube blocked, drain pump malfunctioning	Carry out maintenance	automatic	Pre-alarm: CL - Drain maintenance	not active	signal only
Drain alarm	Drain pump broken, Filter blocked, level sensor tube blocked	Carry out maintenance	manual	Alarm: CL - Drain maintenance	active	stop production

Tab. 3.a

Resetting the alarms

The alarms are signalled by the flashing of the Alarm button and display of the alarm icon ⚠.

The alarms are reset in the sequence shown in the following table:

sequence	effect
Pressing once	Display the Alarm code. (NOTE: in the event where more than one alarm is present, to display all the alarms, after pressing the Alarm button the first time, press the "UP" or "DOWN" buttons)
Pressed a second time	if the causes of the alarm are no longer present, resets the alarm and the alarm relay (in the alarms where this is activated)
Pressed a third time	if the causes of the alarm are no longer present, resets the display of the alarm and cancels the following screen: 
Pressed a fourth time	return to main screen

Tab. 3.b

CAREL

humiFog

Sistemi di distribuzione
Distribution systems

Content

1. Prevetive maintenance

Check	After the first 50 hours	Monthly	Every 2000 hours(1)	Every 3000/4000 hours(1)
Pump:				
initial oil change	X			
water filters			X	
check oil level		X		
change oil				X
replace gasket				X
replace valve				X
Rack and room distribution system:				
nozzles blocked			X	
water leaks			X	
solenoid valve			X	
accessories				
check drain			X	
check droplet separator		X		

Tab. 1.a

(1): "HD" version with SW rel. 0.1 and 1.0 and "SL" version with SW rel. 0.1

Installations in AHU or ducts must, in addition, comply with the national maintenance standards (ASHRAE 12-2000, VDI 6022, etc.)

Please note that:
- the personnel in charge of maintenance are responsible for any malfunctions due to a lack of preventive maintenance. The controller will show the maintenance warning code "C5" after the first 50 hours and, subsequently, the routine maintenance warning code "CL" every 2000 hours as a reminder for the following operations;
- the personnel in charge of maintenance must reset the hour counter after having performed the preventive maintenance operations listed in the columns "AFTER 50 HOURS", "EVERY 2000 HOURS", "EVERY 4000 HOURS". If the hour counter is not reset, the maintenance warnings will no longer be signalled;
- the maintenance signals do not stop the operation of humiFog.

1.1 Maintenance parameters

The maintenance parameters are:
- d4: hour counter (alarm "CL" every 2000 hours);
- d8: 1st maintenance flag (alarm "C5" after the first 50 hours).

Hour counter "d4"

The hour counter parameter "d4" is associated with a timer that counts the operating hours starting from the last maintenance operation, between a minimum of 0 and a maximum of 19,900 hours.
Once the initial period of 50 hours has expired, the maintenance warning "C5" is activated. If the maintenance personnel has reset hour counter d4, the maintenance warning "CL" will be issued every 2000 hours.
The value of d4 corresponds to reality only if the maintenance personnel complete the maintenance operations.

To reset hour counter d4, proceed as follows:

1	Access the normal view: N.B.: press and release PRG to save any changes to the parameters;
2	Access the Px parameters: • press PRG for 5 seconds until displaying P0;
3	Move to d4: • scroll the parameters using the ⊠, ⊠ arrows until displaying d4;
4	Access d4: • press SEL; • the value of d4 is displayed (e.g. 1'5, equal to 2000 hours);
5	Reset d4: • press ⊠ and ⊠ at the same time until displaying 00 (around 5 seconds);
6	Exit: • press and release PRG.

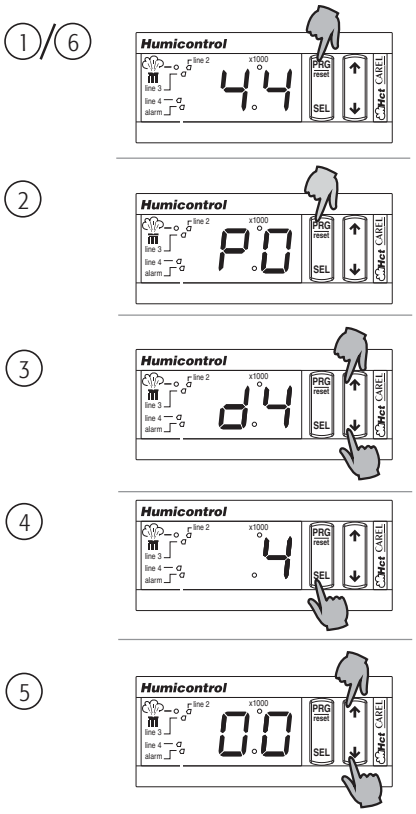


Fig. 1.a

First maintenance flag d8

The 1st maintenance flag associated with parameter "d8" is a read-only parameter. Before humiFog is started, the flag is equal to 0.
If the hour counter d4 is reset after the initial maintenance warning "C5" is issued, the controller sets d8 to 1, assuming that the oil has been changed.
Please note that the value of "d8" only corresponds to reality if the relevant personnel complete the maintenance operations.

1.2 Preventive maintenance of the water filter

1. access the water circuit;
2. open the external water supply valve;
3. check the pressure drop across the water filters.

ΔP = PIN - PUSC ≤ 0,5 bar?	YES ☒ complete the remaining maintenance operations
	NO ☒ replace the cartridges: see the spare parts manual

Tab. 1.b

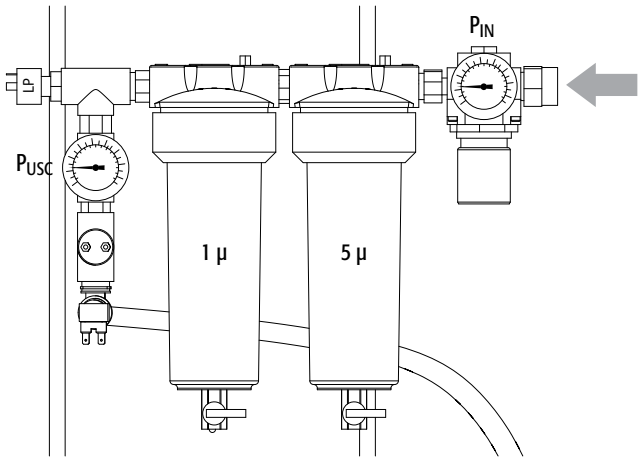


Fig. 1.b

1.3 Preventive maintenance of the pump: checking the oil level

1. access the water circuit;
2. check that the oil level is correct (see the drawing below).

oil level correct?	SI ☒ complete the remaining maintenance operations
	NO ☒
	3. identify the oil leaks (see the pump manual)
	4. add or remove oil until reaching the correct level.

Tab. 1.c

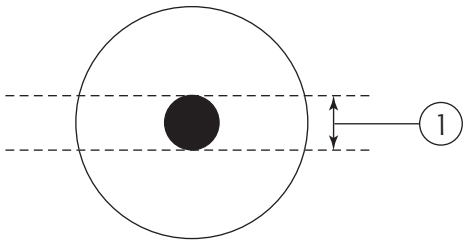


Fig. 1.c

The drawing shows the front of the transparent Plexiglas oil level indicator.

2. Spare parts

2.1 Spare parts for the cabinet

How to identify the spare parts:
- identify the spare part in the following drawings and read the reference number;
- identify the spare part code in the spare parts list from the reference number.

Attenzione: the spare parts list for the pump is divided into two sub-lists: one for the standard version and one for the stainless steel version.

Contact your nearest CAREL representative for any components not listed in the following chapters.

2.1.1 Spare parts for the pump inlet line
2.1.2 Spare parts for the motor and pump
2.1.3 Spare parts for the electrical panel
Version "HD1"

2. Spare parts

2.1 Spare parts for the cabinet

How to identify the spare parts:
- identify the spare part in the following drawings and read the reference number;
- identify the spare part code in the spare parts list from the reference number.

Attenzione: the spare parts list for the pump is divided into two sub-lists: one for the standard version and one for the stainless steel version.

Contact your nearest CAREL representative for any components not listed in the following chapters.

2.1.1 Spare parts for the pump inlet line

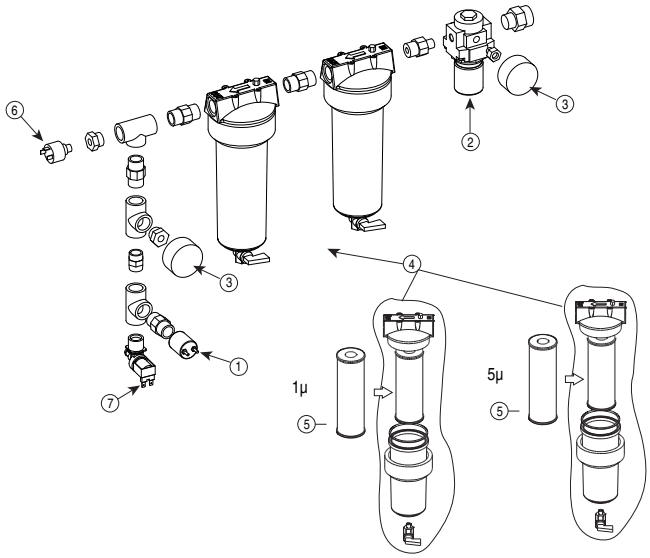


Fig. 2.a.a

2.1.2 Spare parts for the motor and pump

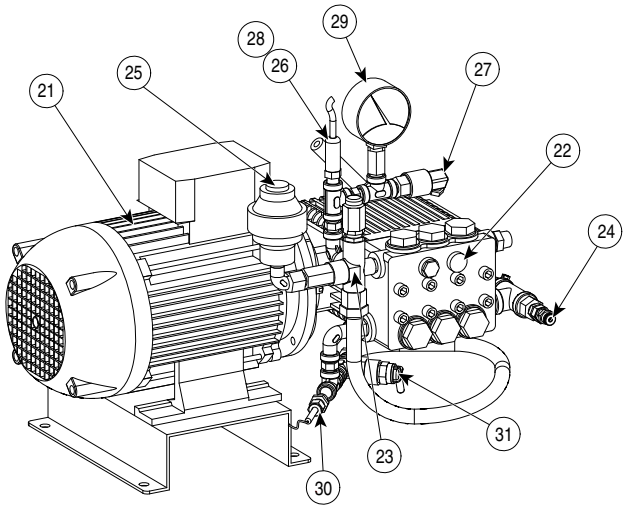


Fig. 2.a.b

2.1.3 Spare parts for the electrical panel

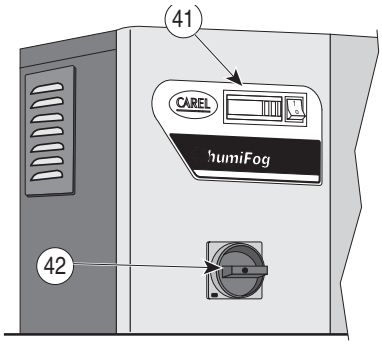


Fig. 2.a.c

Version "HD1"

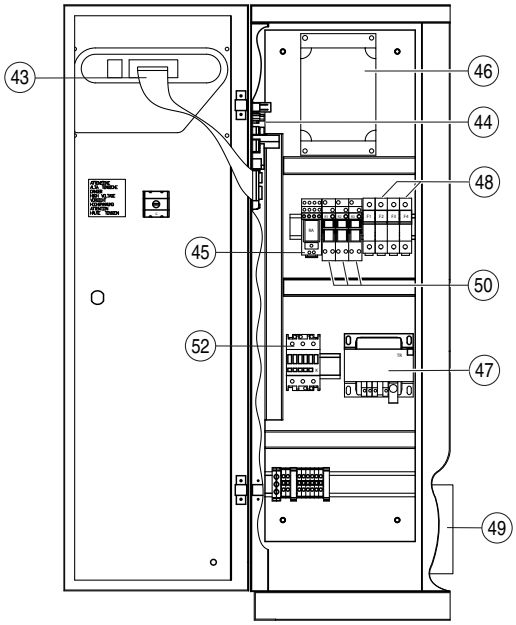


Fig. 2.a.d

Version "HD2"

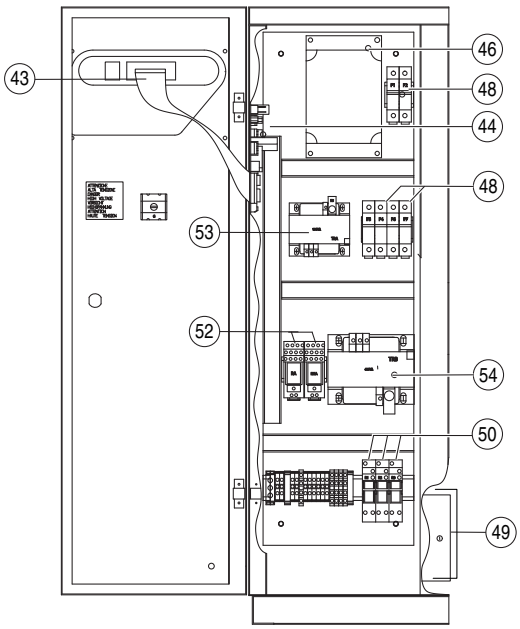


Fig. 2.a.e

Version "SL"

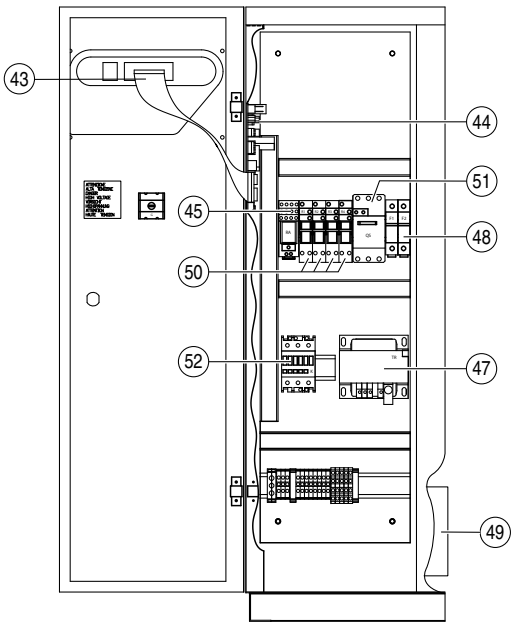


Fig. 2.a.f

2.1.4 Service spare parts

Water filter kit (93)

Fig. 2.a.g

Bottle of oil for the pump (94)

Fig. 2.a.h

Liquid Teflon (95)

Fig. 2.a.i

Valve kit for the pump

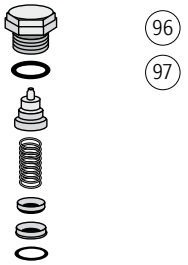


Fig. 2.a.j

Gasket kit for the pump

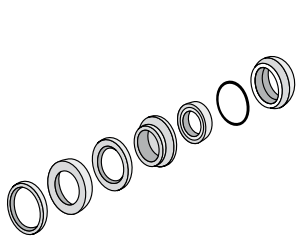


Fig. 2.a.k

2.1.5 Spare parts list

Spare parts for the pumps in versions "HD2X0 and "SLXX0"

List of the water circuit and mechanical parts relating to the standard version of the pump, with brass and stainless steel parts.

ref.	description	UA060...UA180	UA250...350	UA500	see Fig. no.	notes
1	Conductivity meter 0 to 5000 µS/cm		13C153A005			
2	Inlet press. reg. 0 to 10 bar		1309834AXX			
3	Inlet pressure gauge		1309717AXX			
4	Water filter case		1309500AXX		2.a.a	
5	Water filter kit (1 µ + 5 µ)		UAKFW0000			
6	Water inlet LP switch		1309503AXX			
7	Fill solenoid valve		KITVC00100			
21	Motor		Contact CAREL			
22	Pump		Contact CAREL			
23	Recirculation valve		Contact CAREL			
24	Pressure-relief valve 3-7 bar		Contact CAREL			
25	AISI 316 pump damper (optional)		1309513AXX			
26	Pressure probe		1309510AXX		2.a.b	"HD" versions only
27	Max. pressure switch 90 bar		1309517AXX			
28	Min. pressure switch 15 bar		1309661AXX			"SL" versions only
29	High pressure gauge 100 bar		1309508AXX			
30	NTC water temp. probe IP68		NTC030WP00			
31	Stainless steel thermal valve 55 °C		1309549AXX			

Tab. 2.a

Spare parts for the pumps in the stainless steel versions "HD2X1" and "SLXX1"

List of the water circuit and mechanical parts relating to the stainless steel pump, with all the parts in contact with the water made from stainless steel.

ref.	description	UA060...UA216	UA250...420	UA500…600	see Fig. no.	notes
1	Conductivity meter 0-5000 µS/cm	13C153A005				
2	Inlet press. reg. 0-10 bar	1309844AXX	1309845AXX	1309846AXX		
3	Inlet pressure gauge	1309720AXX				
4	Water filter case	1309500AXX			2.a.a	
5	Water filter kit (1µ + 5µ)	UAKFW0000				
6	Water inlet LP switch	1309654AXX				
7	Fill solenoid valve	KITVC00100				
21	Motor	Contact CAREL				
22	Pump	Contact CAREL				
23	Recirculation valve	Contact CAREL				
24	Pressure-relief valve 3-7 bar	Contact CAREL				
25	Pump damper (optional)	1309513AXX				
26	Pressure probe	1309510AXX			2.a.b	"HD" versions only
27	Max. pressure switch 90 bar	1309517AXX				
28	Min. pressure switch 15 bar	1309517AXX				"SL" versions only
29	High pressure gauge 100 bar	1309508AXX				
30	NTC water temp. probe IP68	NTC030WP00				
31	Stainless steel thermal valve 55 °C	1309551AXX				

Tab. 2.b

Electrical spare parts

For versions "HD2XX"

ref.	description	UA060...UA180	UA250...UA300	UA500	replacement: see …
41	Controller with interface	See tab. 2.f			2.a.c
42	Main switch	UAKINT0000			2.a.c
43	Flat cable	59C486A003			2.a.e
44	I/O board	URI0000000			2.a.e
45	Relays A and RNA	0100711AXX			2.a.e
46	VFD	Contact CAREL			2.a.e
48	Fuse carrier	0606192AXX			2.a.e
49	Fan	1312545AXX			2.a.e
50	Rack valve relays	0102001AXX			2.a.e
53	Transformer A, 100 VA	09C565A001			2.a.e
54	Transformer B, 400 VA	0907694AXX			2.a.e
	VFD motor fuse (F1+ F2)	0605324AXX	0605326AXX	0605327AXX	2.a.e
	Fuse for transformer A (F3 + F4)	0605319AXX			2.a.e
	Fuse for transformer B (F6+F7)	0605321ALG			2.a.e

Tab. 2.c

For versions "HD1XX"

ref.	description	UA072...UA216	UA300...420	UA600	see Fig. no.	notes
41	Controller with interface	See Table 2.f				
42	Main switch	UAKINT0000				
43	Flat cable	59C486A003				
44	I/O board	URI0000000				
45	Start relay	0100711AXX				
46	VFD	Contact CAREL				
47	Transformer 250 VA	0907612AXX			2.a.d	
48	Fuse carrier	0606192AXX				
49	Fan	1312545AXX				
50	Rack valve relays	0102001AXX				
53	Transformer, 100 VA	-	-	0203000AXX		
	VFD motor fuse (F1+F2)	0605324AXX	0605326AXX	0605327AXX		
	Transformer fuse (F3+F4)	0605320ALG				

Tab. 2.d

For versions "SLXXX"

ref.	description	UA060...UA180	UA250...350	UA500	see Fig. no.	notes
41	Controller with interface	See Table 2.f				
42	Main switch	UAKINT3000				
43	Flat cable	59C486A003				
44	I/O board	URI0000000				
45	Start relay	0100711AXX				
47	Transformer	0907612AXX				
48	Fuse carrier	0606192AXX			2.a.f	
49	Fan	1312545AXX				
50	NC/NO valve relays for distribution in the room	0102001AXX				
51	Motor protector	0402004AXX	0402005AXX	0402005AXX		
52	Contactor	0203000AXX				
	Transformer fuse (F3+F4)	0605320ALG				

Tab. 2.e

humiFog controllers

ref.	description	code
41	Controller with interface/display for all humiFog models, not configured	UAH0010000*
41	Controller with interface configured for UA060HD2XX	UAH6010000
41	Controller with interface configured for UA120HD2XX	UAHA210000
41	Controller with interface configured for UA180HD2XX	UAHA810000
41	Controller with interface configured for UA250HD2XX	UAHB510000
41	Controller with interface configured for UA350HD2XX	UAHC510000
41	Controller with interface configured for UA500HD2XX	UAHE010000
41	Controller with interface configured for UA072HD1XX	UAH7210000
41	Controller with interface configured for UA144HD1XX	UAHA410000
41	Controller with interface configured for UA216HD1XX	UAHB110000
41	Controller with interface configured for UA300HD1XX	UAHC010000
41	Controller with interface configured for UA420HD1XX	UAHD210000
41	Controller with interface configured for UA600HD1XX	UAHF010000
41	Controller with interface configured for UA060SLXXX	UAS6000000
41	Controller with interface configured for UA120SLXXX	UASA200000
41	Controller with interface configured for UA180SLXXX	UASA800000
41	Controller with interface configured for UA250SLXXX	UASB500000
41	Controller with interface configured for UA350SLXXX	UASC500000
41	Controller with interface configured for UA500SLXXX	UASE000000

Tab. 2.f

*: to be configured by the user with the configuration software: HUMISET000

Accessories

ref.	description	code	notes
	Remote control – English version	TELUA0E000	
	Remote control – Italian version	TELUA0I000	
	humiVisor. Remote terminal with graphic display.	URT0000000	

Tab. 2.g

Service spare parts

ref.	descritpion	code	notes
93	Water filter kit: one 1µ filter + one 5µ filter	UAKFW00000	
94	Bottle of oil for the INTERPUMP pump, SAE 20÷30	5024646AXX	for versions: UAXXXHD1X0; UAXXXSLXX0
95	Liquid Teflon for high pressure water fittings, 100ml.	5024612AXX	
96	Inlet / outlet valve kit, brass	1309611AXX	for versions: UAXXXHDXX0; UAXXXSLXX0.
97	Inlet / outlet valve kit, stainless steel	1309612AXX	for versions: UAXXXHDXX1; UAXXXSLXX1.
98	Gasket kit for pump with dia. 15 piston, brass	1309613AXX	for versions: UA060/180/250HDXX0; UA060/180/250SLXX0
99	Gasket kit for pump with dia. 18 piston, brass	1309614AXX	for versions: UA120/350/500HDXX0; UA120/350/500SLXX0
100	Gasket kit for pump with dia. 15 piston, stainless steel	1309615AXX	for versions: UA060/180/250HDXX0; UA060/180/250SLXX0
101	Gasket kit for pump with dia. 18 piston, stainless steel	1309616AXX	for versions: UA120/350/500HDXX1; UA120/350/500SLXX1

Tab. 2.h

2.2 Replacing the components in the pump inlet line

Attenzione: use liquid Teflon guaranteed for water pressure up to 100 bar, to seal the water connections; wait 3 hours for the Teflon to set.

2.1.1 Water cartridges

1. Switch humiFog off;
2. Close the external water supply;
3. Access the water circuit;
4. Drain the filters: open the valves on the bottom of the filter, press the locking plugs at the top to completely drain the filters.
5. Open the filters: release the nut using the tool for opening the filter, supplied;
6. Replace the cartridges: important: do not reverse them!
   - 5 µm cartridge on the right;
   - 1 µm cartridge on the left;
7. Close the filters
8. Fill the filters with water:
   - close the valves on the bottom of the filter;
   - open the water supply valve (external);
   - press the black plug located on the top of the 5 µm filter to the right, until water is released around the plug;
   - press the black plug located on the top of the 1 µm filter to the left, until water is released around the plug;
   - dry the water that has been released.
9. Close the water circuit;
10. Switch humiFog on;
11. The cartridges are made from polypropylene: these must be disposed of in compliance with local standards/laws.

2.1 Pump inlet line

1. Switch humiFog off
2. Close the external water supply;
3. Access the water circuit;
4. Drain the filters (see point 4, Fig. 2.b.a);
5. Disconnect the water inlet pipe;
6. Disconnect the pipe between the inlet valve and the pump;
7. Remove the pump inlet line: remove the screws and the inlet line from the cabinet;
8. Remove the damaged components and replace them, seal the connections using liquid Teflon;
9. Fit the pump inlet line;
10. Connect the pipe from the inlet valve to the pump;
11. Connect the water inlet pipe;
12. Open the external water valve;
13. Fill the filters with water (see point 8, Fig. 2.b.a);
14. Close the water circuit;
15. Switch humiFog on.

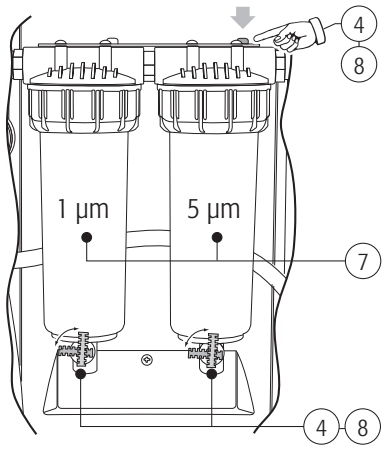


Fig. 2.b.a

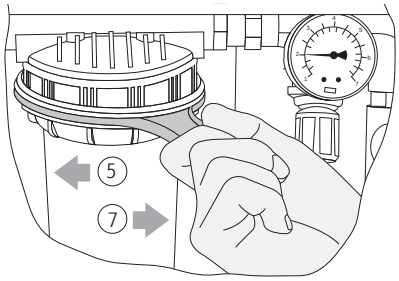


Fig. 2.b.b

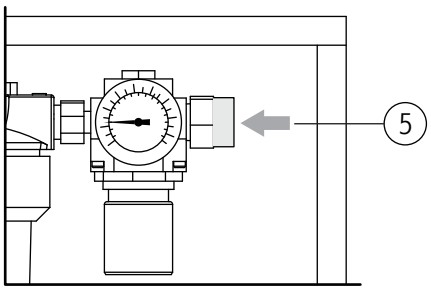


Fig. 2.b.c

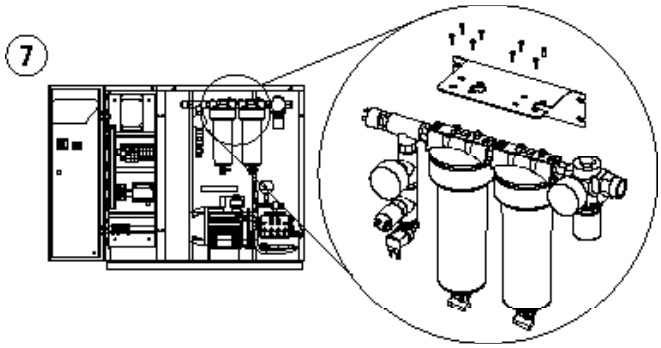


Fig. 2.b.d

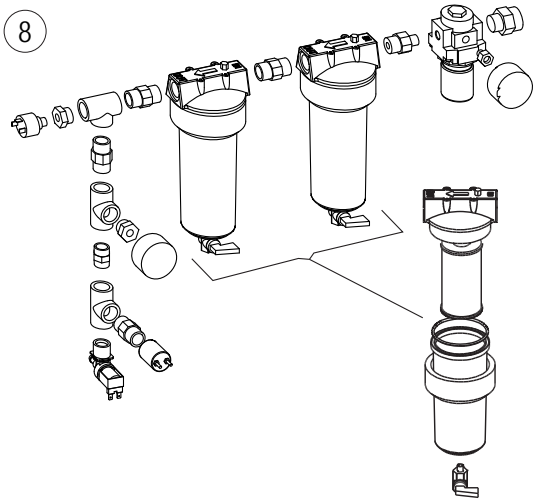


Fig. 2.b.e

2.2.3 Replacing the motor and pump components

Changing the oil in the pump

16. Switch humiFog off
17. Close the external water supply
18. Access the water circuit
19. Remove the top and bottom plugs
20. Change the oil:
    - Drain the oil and close the bottom oil plug
    - Dispose of the oil according to local legislation
    - Fill with (ISO 68) SAE 20 W - 30 W oil to the level shown (to fill correctly use 350 ml of oil)
    - Close the top oil plug again
21. Close the water circuit
22. Switch humiFog on

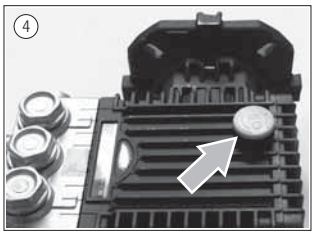


Fig. 2.b.f

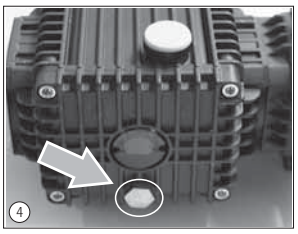


Fig. 2.b.g

Motor, pump and related components

This chapter provides explanations on how to replace the motor, the pump and all the external components directly relating to these
To replace the parts inside the pump, such as valves and gaskets, please see pump manual.

1. Repeat points from 1 to 6, as described in paragraph 2.2.1
2. Remove the power cable from the motor, noting which terminals the cables are connected to!

   Attenzione: from this moment on, water may be released from the pipes
3. Remove the temperature probe
4. Remove the connectors from the pressure probe and the maximum pressure switch
5. Unscrew the pump support from the cabinet
6. Remove the motor and the pump from the cabinet
7. Remove the screws between the pump and the motor and remove the pump
8. Unscrew the motor from the plate

   Attenzione: do not lose the plug between the motor and the pump
   Now the motor can be replaced (continue for the pump)
9. Remove all the required components in the sequence shown
10. Remove the recirculation valve in the sequence shown. Now the pump can be replaced
11. Replace all the components in the reverse order
12. Open the external water supply
13. Fill the filters with water (see point 8, Fig. 2.b.a)
14. Close the water circuit
15. Switch humiFog on

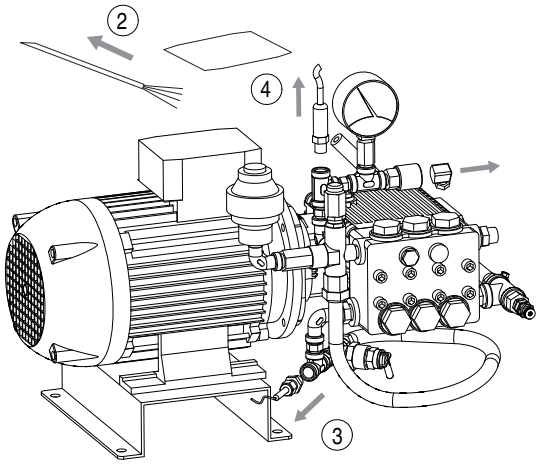


Fig. 2.b.h

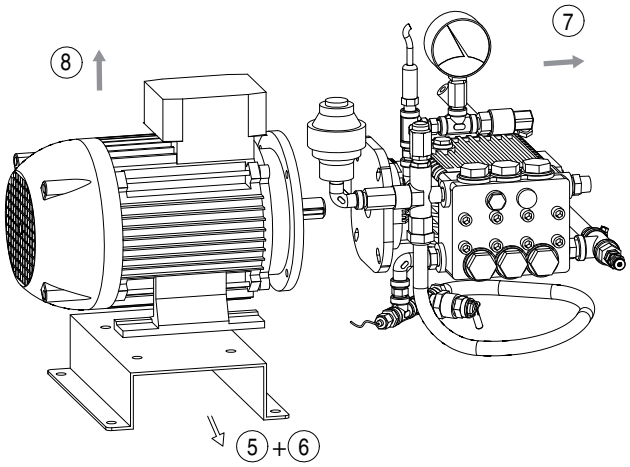


Fig. 2.b.i

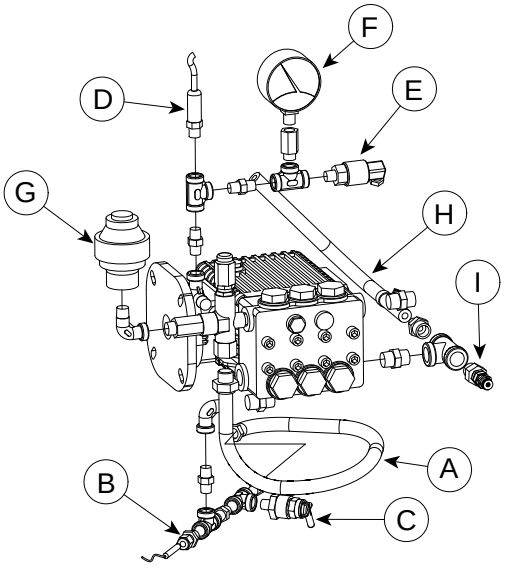


Fig. 2.b.j

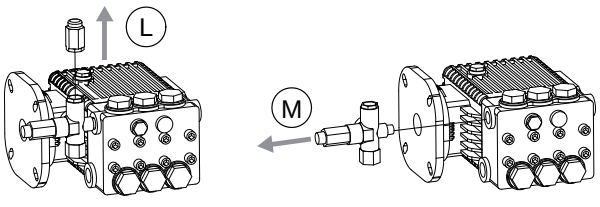


Fig. 2.b.k

- For versions "HD1X1" and "SLXX1" (with stainless steel pump), see the following figure

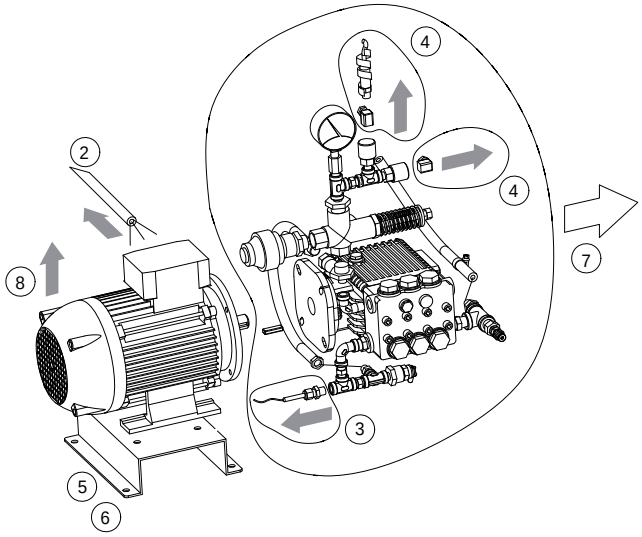


Fig. 2.b.l

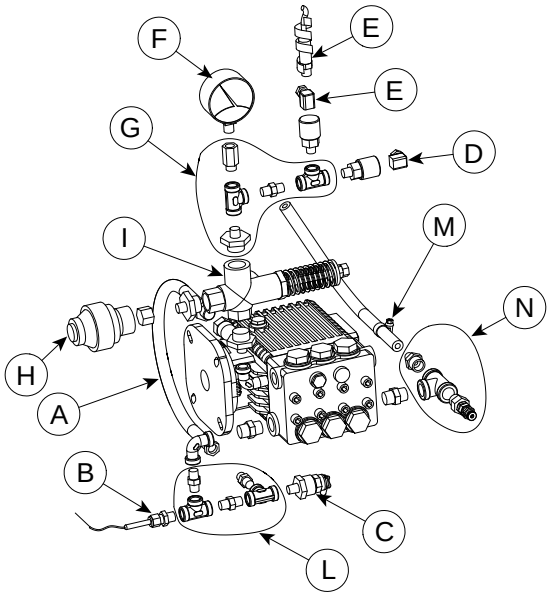


Fig. 2.b.m

Version "HD1"

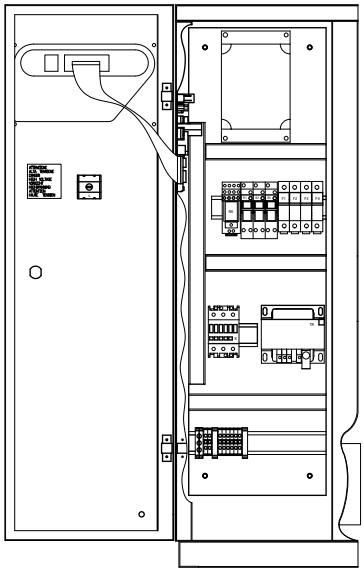


Fig. 2.b.n

Version "HD2"

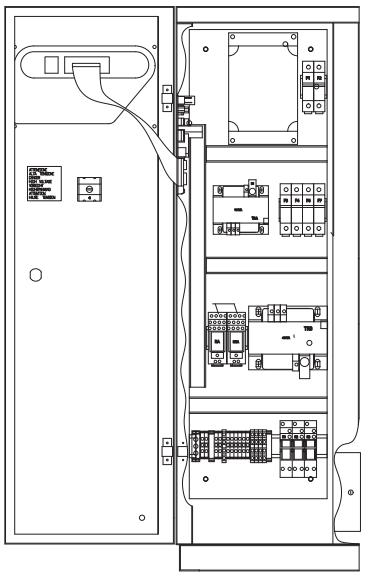


Fig. 2.b.o

Version "SL"

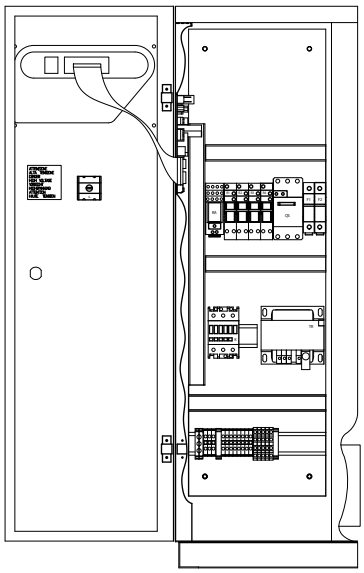


Fig. 2.b.p

2.2.4 Replacing the electrical components in the cabinet

1. Switch humiFog off
2. Close the external water supply
3. Open the line disconnecting switch
4. Access the electrical section
   - Transformer
   - Fuses and fuse carrier
   - Relays
   - Main switch
   - Fan
5. Replace with extreme care
6. Respect the electrical connections

I/O board

7. Replace with extreme care
8. Observe the correct electrical connections

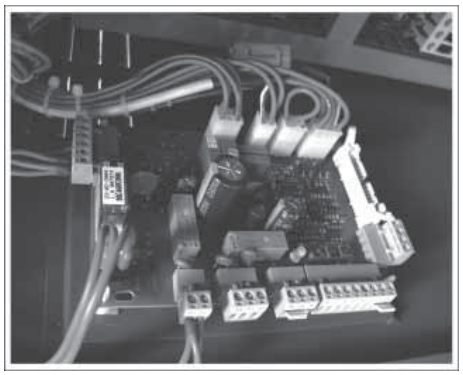


Fig. 2.b.q

Controller - Flat cable

9. Replace with extreme care

Fig. 2.b.r

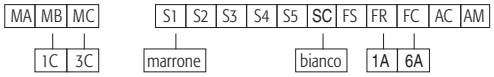
Inverter

10. Remove the cover on the terminal
11. Disconnect the cables
12. Unscrew the inverter with extreme care
13. Replace with a new inverter

Fig. 2.b.s

14. Reconnect the cables:

Control terminal block



Power terminal block

Fig. 2.b.t

15. Check the correct earthing of the shield on the control (S1, SC) and power cables (U, V, W, PE)
16. Replace the cover on the terminal
17. Close the electrical section
18. Switch humiFog on

2.3 Spare parts for the rack

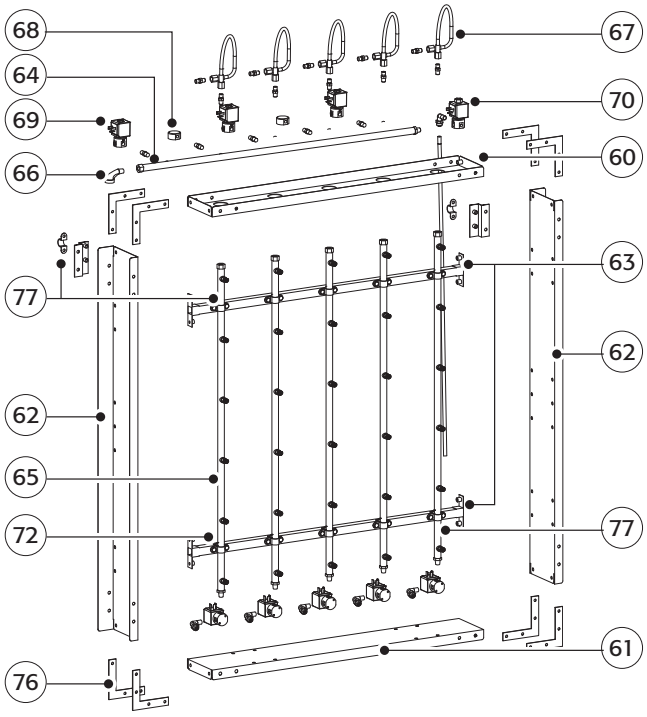


Fig. 2.c.a

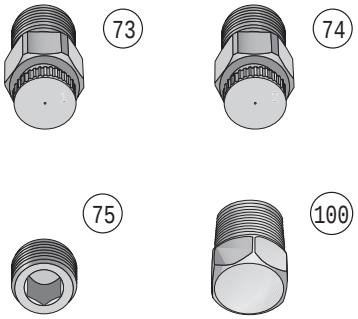


Fig. 2.c.b

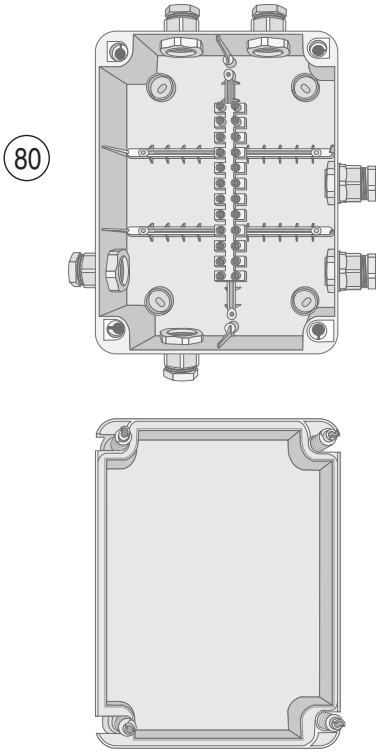


Fig. 2.c.c

2.3.1 List of parts in the duct distribution system

ref.	description	code	notes
60	frame top side	14C585A1**	** = 00 to 15 depending on the length
61	frame bottom side	14C470A1**	** = 00 to 15 depending on the length
62	side shoulder	14C585A1**	** = 20 to 35 depending on the length
63	vertical manifold support bar	14C470A1**	** = 40 to 55 depending on the length
64	horizontal manifold	14C585A1**	** = 80 to 95 depending on the length
65	vertical manifold	14C585A1**	** = 60 to 75 depending on the length
66	M/F G1/4" elbow connector	1309610AXX	
67	G1/8" hose	14C531A097	
68	90 degree water connector	14C470A096	
69	stainless steel solenoid valve, 24 V 50 HZ NC	1312079AXX	
70	stainless steel solenoid valve, 24 V 50 Hz NO	1312155AXX	
71	kit of washers and M6 bolts for complete rack assembly	UAKVITIM60	
72	kit of 15 M3 screws for adjusting manifold angle	UAKVITIM30	
75	M G1/8" plug	1309633AXX	
73	atomising nozzle MTP1 2.8 kg/h marked "1"	UAKMTP1000	
74	atomising nozzle MTP2 4.0 kg/h marked "2"	UAKMTP2000	
76	kit of 8 brackets	UAKS000000	
77	kit for vertical manifold assembly with screws and washers	UAKMOR0000	
100	M 1/8" NPT plug	1309639AXX	
79	atomising nozzle MTP0 1.5 kg/h	UAKMTP0000	
80	junction box		

Tab. 2.i

2.4 Replacing and cleaning the components in the rack

Attention: use liquid Teflon guaranteed for water pressure up to 100 bar, to seal the water connections; wait 3 hours for the Teflon to set.

2.4.1 Water leaks

1. Repair all the connections without o-rings or rubber washers using liquid Teflon;
2. If necessary, replace the components as described in the following paragraph.

2.4.2 Cleaning

1. remove the components to be cleaned;
2. remove any components not made from stainless steel (for example nozzle o-rings);
3. soak the stainless steel parts in a solution of water and vinegar for 12 hours (use 4/5 water and 1/5 vinegar);
4. rinse with water;
5. for particularly resistant scale use pure vinegar for 12 hours;
6. replace the components in the reverse order.

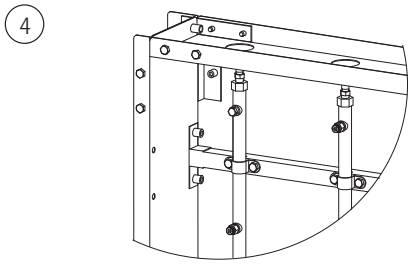
2.4.3 Replacement

1. Switch humiFog off;
2. Close the external water supply valve;
3. Remove the connectors from the solenoid valve.

Nozzles and plugs

Attention: remember the positions of the nozzles/ plugs

4. Replace with extreme care.



Fg. 2.d.a

Vertical manifolds

Attention:
- remember the angle of each manifold;
- make sure the NO valve and direct connection remain intact;

5. Remove the hose;
6. Remove the coil from the NO solenoid valve;
7. Remove the screw marked "PH0";
8. Remove the bolts marked "D";
9. Remove the adapter "E" for connecting the hose;
10. Unscrew the NO solenoid valve.

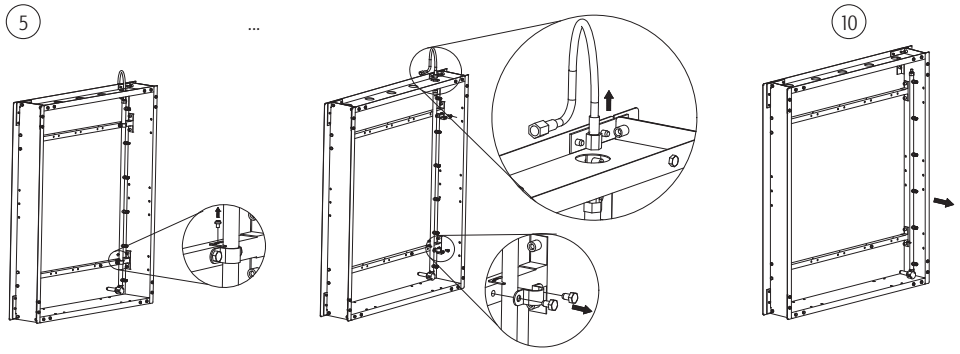


Fig. 2.d.b

NC valves and direct connections

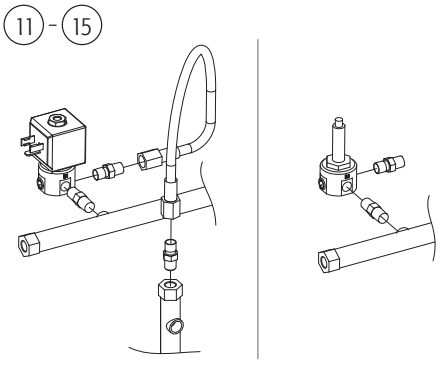


Fig. 2.d.c

11. Solenoid valve: remove the coil;
12. Unscrew part "H";
13. Unscrew the NC solenoid valve/direct connectors with the G18" nipple;
14. Unscrew the G1/8" nipple from the valve body/direct connector;
15. Unscrew the adapter for hose "E";

Hose

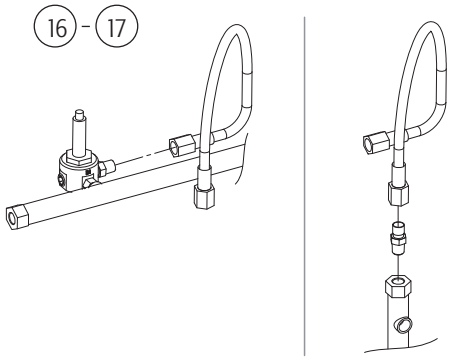


Fig. 2.d.d

16. Unscrew the parts marked "H";
17. Install the new hose.

Horizontal manifold

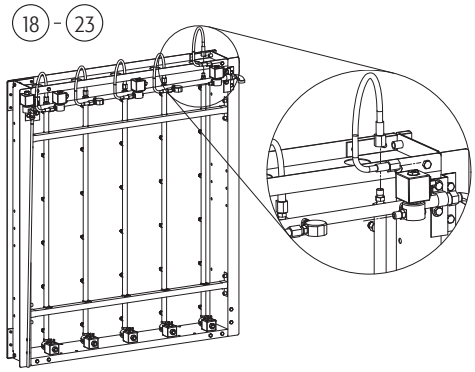


Fig. 2.d.e

18. Solenoid valve: remove the coil;
19. Unscrew all the parts marked "H"
20. Remove the bolts marked "D";
21. Unscrew the NC solenoid valve/direct connectors, with the G18" nipple
22. Remove the 90 degree elbow connector for draining the NO solenoid valve
23. Unscrew the M/F G1/4" elbow

2.5 Spare parts for the room distribution system

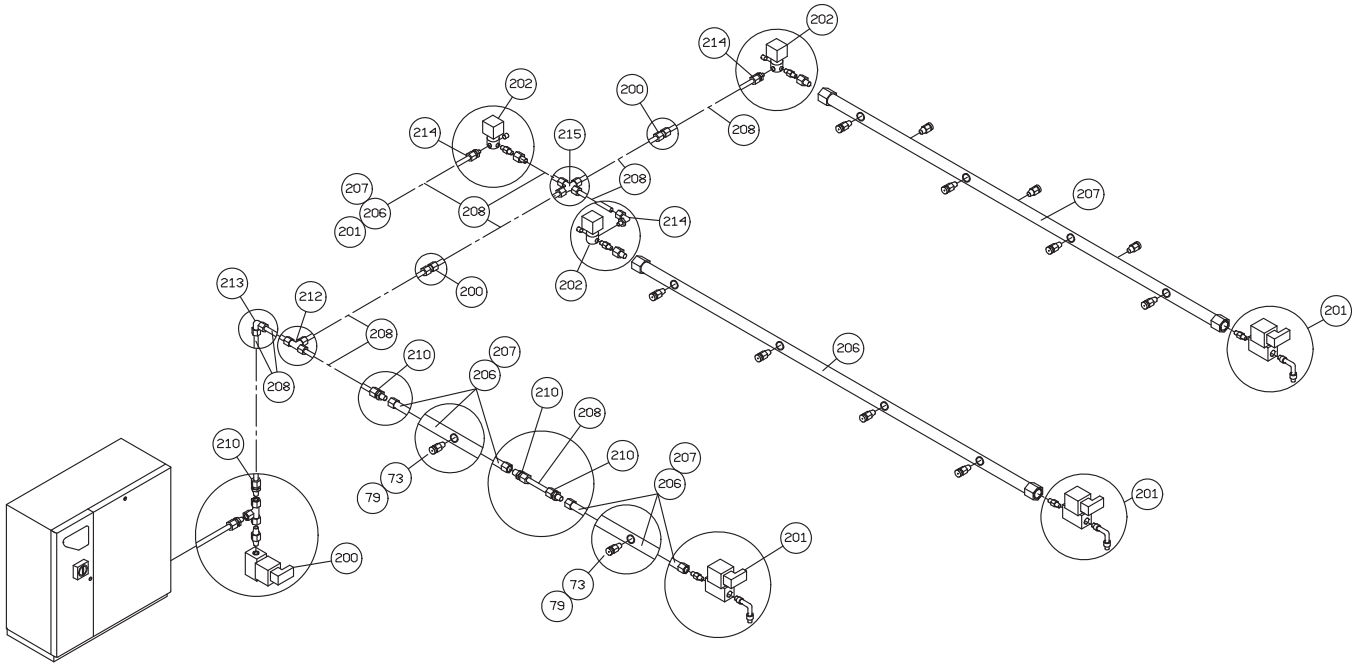


Fig. 2.e.a

2.5.1 List of spare parts for the room distribution system

ref.	description	code
75	M G1/8" plug	1309633AXX
73	Atomising nozzle MTP1 2.7 l/h	UAKMTP1000
100	M 1/8" NPT plug	1309639AXX
79	Atomising nozzle MTP0 1.45 l/h	UAKMTP0000
200	Central drain solenoid valve kit	UAKCD00000
201	Drain solenoid valve kit for manifold	UAKVAL0000
202	Capacity-control solenoid valve kit	UAKVALNC00
206	Manifold with 4 holes for nozzles, step 600 (4 holes on one side)	UAKC4FP600
207	Manifold with 7 holes for nozzles, step 300 (4+3 holes on two sides)	UAKC7FP300
213	Elbow compression fitting, pipe to pipe, for 10 mm stainless steel pipes	UAKTG00000
214	Straight compression fitting, from 10 mm stainless steel pipe to 1/8" GAS	UAKTD18000
215	"X" compression fitting, pipe-to-pipe, for 10 mm stainless steel pipes	UAKTX00000

Tab. 2.j

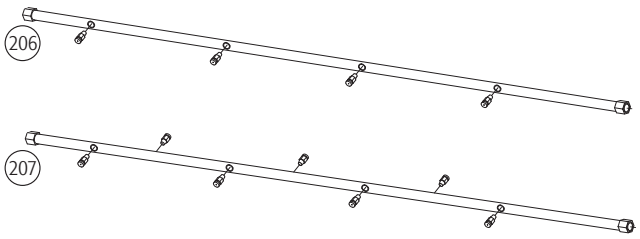


Fig. 2.e.b

2.6 Replacing and cleaning the distribution system components

Before performing the following operations, make sure humiFog is off and the supply water valve is closed. Water may be released when disconnecting the various components in the water circuit.

2.6.1 Water leaks

X. Repair all the connections without o-rings or rubber washers using liquid Teflon
Y. If necessary, replace the components

2.6.2 Cleaning

1. Remove the components to be cleaned;
2. Remove any components not made from stainless steel (for example, nozzle o-rings);
3. Soak the stainless steel parts in a solution of water and vinegar for 12 hours (use 4/5 water and 1/5 vinegar);
4. Rinse with water;
5. For particularly resistant scale use pure vinegar for 12 hours;
6. Replace the components in the reverse order.

2.6.3 Replacement

1. Switch humiFog off;
2. Close the external water supply valve.

Replacing the nozzles and plugs

Attention: remember the positions of the nozzles (A) and the plugs (B).
Replace with extreme care.

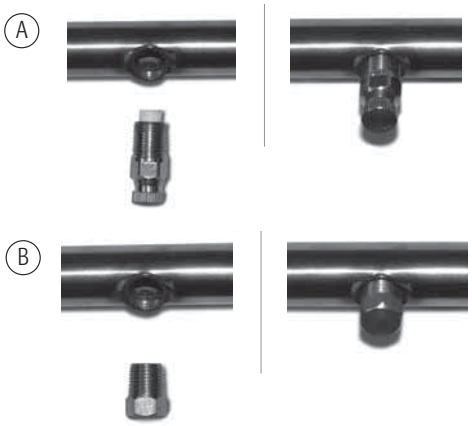


Fig. 2.f.a

Replacing the NC on-off valves

Attention: the on-off valves are "normally closed" solenoid valves; the valve body has three F G1/8" connections (see the figure 2.f.b).

Remember that the water inlet is the hole in the centre, while the two side holes are the two outlets available:

- individually, closing the outlet that is not used with a M G1/8" plug;
- together if this simplifies the water connections.

(3) – (7)

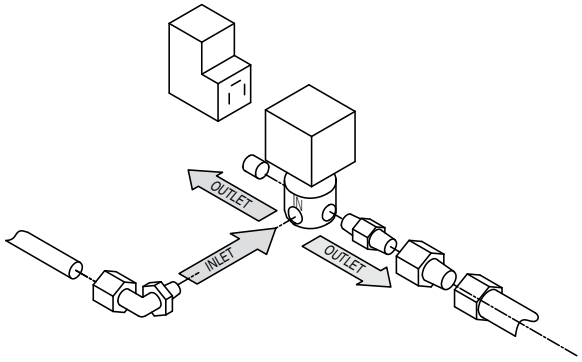


Fig. 2.f.b

3. Remove the electrical connector;
4. Disconnect the pressurised water supply pipe;
5. Unscrew the valve from the fittings;
6. Unscrew the valve inlet connection;
7. Unscrew the plug from the valve water outlet that is not used.

Replacing the NO drain valves at the end of the line

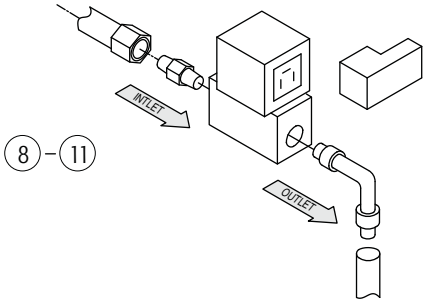


Fig. 2.f.c

8. Remove the electrical connector;
9. Disconnect the water drain pipe;
10. Unscrew the drain pipe connection from the valve;
11. Unscrew the valve and the nipple from the distribution manifold.

Replacing the NO drain valves between the pump and the distribution system

(12) – (15)

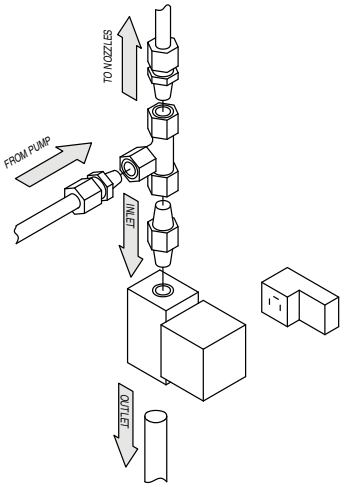


Fig. 2.f.c

12. Remove the electrical connector;
13. Disconnect the water drain pipe;
14. Unscrew the drain pipe connection from the valve;
15. Unscrew the valve and the nipple from the "T".

2.7 Spare parts between humifog and the distribution system

2.7.1 Spare parts for connection between humiFog and the distribution system

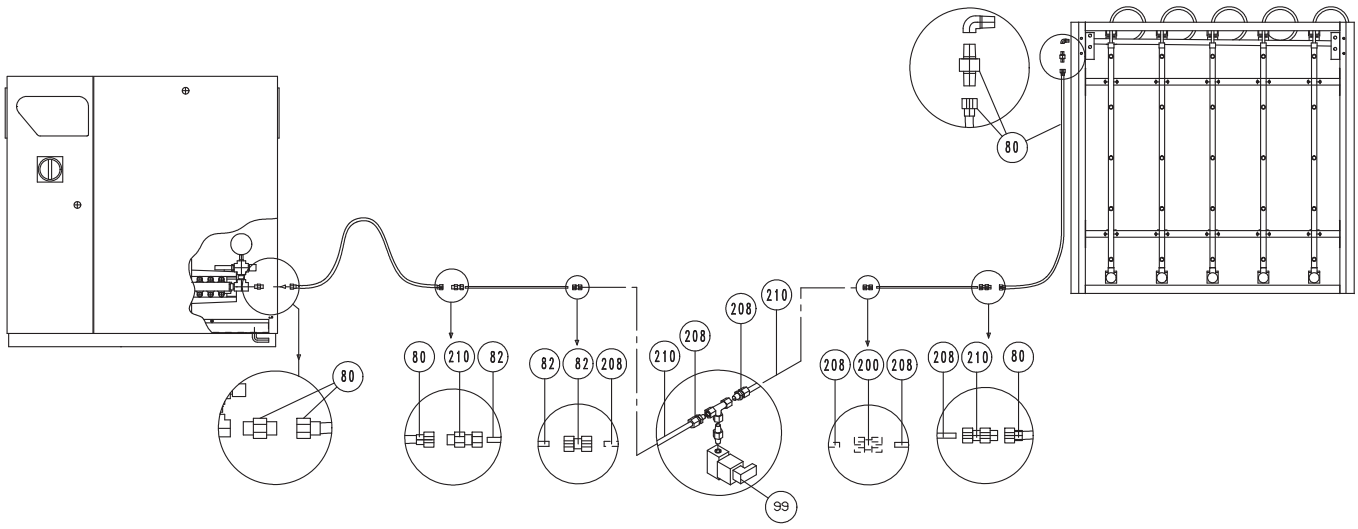


Fig. 2.g.a

Short hose kit (L= 2m)

Fig. 2.g.b

Extension hose kit (L= see Table 7.a)

Fig. 2.g.d

Kit of 2 short hoses (L= 2m) + Extension pipe kit (L= 1.5 m)

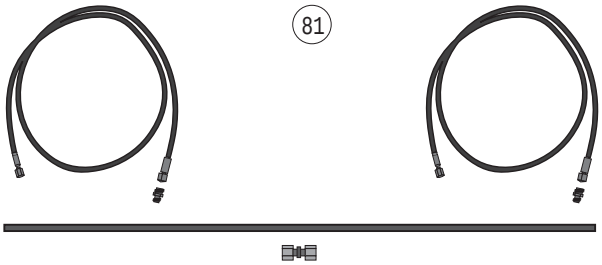


Fig. 2.g.c

Extension pipe kit (L= 1.5 m)

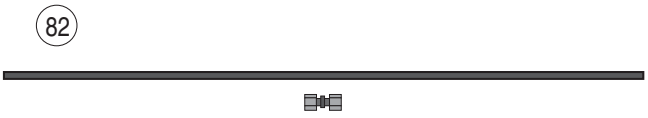


Fig. 2.g.e

2.7.2 Spare parts list for connection between humiFog and the distribution system and accessories

Spare parts list - accessories

ref.	description	code	notes
80	Short connection kit L= 2 m - Hose and adapter	UAKT100000	
81	Long connection kit L= 5.5 m - Two hoses, one steel pipe and adapters	UAKT200000	
82	Extension pipe kit L= 1.5 m - One stainless steel pipe and adapter	UAKT300000	
83	Extension hose kit L= 2 m	UAKT400000	
	Extension kit L= 0.5 m	UAKT500000	
	Extension kit L= 1 m	UAKT600000	
	Extension kit L= 5 m	UAKT700000	
	Extension kit L= 10 m	UAKT800000	
	Extension kit L= 20 m	UAKT900000	
208	Extension pipe kit dia. 10 L= 3 m - One stainless steel pipe	UAKT030000	
208	Extension pipe kit dia. 10 L= 6 m - Two stainless steel pipes	UAKT060000	
208	Extension pipe kit dia. 10 L= 12 mFour stainless steel pipes	UAKT012000	
208	Extension pipe kit dia. 10 L= 18 mSix stainless steel pipes	UAKT018000	
209	Straight terminal for dia. 10 pipe	UAKTD00000	
210	Straight M G1/4" terminal for dia. 10 pipe	UAKTD14000	
211	Straight M G1/8" terminal for dia. 10 pipe	UAKTD18000	
212	Female "T" for dia. 10 pipe	UAKTT00000	
213	Female elbow for dia. 10 pipe	UAKTG00000	
214	Female 1/8" elbow for dia. 10 pipe	UAKTG18000	
215	Female "X" for dia. 10 pipe	UAKTX00000	

Tab. 2.k

3. Alarms

3.1 Types of alarm

humiFog features three types of alarm: shutdown, disable and warning.

3.2 List of alarms for the HD version

humiFog display code	humivisor code, if connected	Cause of the alarm	Warning	Solution	Alarm relay: NO contact (opposite for NC contact)	Notes
E0	E401	Internal checksum error	Shutdown	Reprogramming by CAREL	Closed	Contact the nearest CAREL service centre
E1	E412	Parameter checksum error	Disable	User reconfiguration	Closed	See chap. 19
E2	E430	Error in hour counter d4	Warning	Manual reset of d4	Open (not influenced)	See paragraph 21.1.1
E3	E421	Room probe/external controller not connected correctly	Disable	Automatic reset	Closed	Active if A0 = 1, 2, 3 or 4
E4	E423	Limit probe not connected correctly	Disable	Automatic reset	Closed	Active if A0= 2 or 4
E5	E425	Temperature probe fault or disconnected	Shutdown	Automatic reset	Closed	---
E6	E406	Discharge pressure probe fault or disconnected	Disable	Manual reset	Closed	---
E7	E404	Low discharge pressure. The alarm is generated: • after start-up if the discharge pressure <0.7 x b2; • during normal operation if the discharge pressure < 0.3 x b2	Shutdown	Reset not possible	Closed	For example, due to water leaks downstream of the pump
E8	E410	High discharge pressure (>1.15 x b3) or low discharge pressure (<0.7 x b2) during normal operation	Warning	Automatic reset	Closed	For example, due to a blocked solenoid valve, blocked nozzles or leaks from the manifolds
E9	E407	High discharge pressure with the pump off	Warning	Manual reset	Closed	Check that the "always open" manifold is installed in the rack
Ec	E431	High conductivity warning	Warning	Automatic reset	Open (not influenced)	---
EC	E405	High conductivity alarm	Shutdown	Reset not possible	Closed	---
EP	E402	Inverter fault	Shutdown	Reset not possible	Closed	---
E•	E408	High water bypass temperature (> 70 °C)	Disable	Manual reset	Closed	---
E¯	E421	High room % rH	Warning	Automatic reset	Closed	Only with remote ON/OFF contact closed
E_	E422	Low room % rH	Warning	Automatic reset	Closed	
E¯	E424	High % rH from limit probe	Warning	Automatic reset	Closed	
LP	E409	Low water inlet pressure	Disable	Manual reset within the first 3 s, then automatic	Closed	Check supply water connection and pressure
HP	E414	High water discharge pressure (from pressure switch)	Disable	Manual reset	Closed	---
CL	E432	Preventive maintenance warning (every 2000 hours)	Warning	Manual reset of d4	Closed	---
C5	E413	Initial maintenance warning (after the first 50 hours)	Warning	Manual reset of d4	Closed	---

Tab. 3.a

3.3 List of alarms for the SL version

humicontrol code	humivisor code	Cause of the alarm	Warning	Validity	Reset (action)	Alarm relay
E0	E401	Internal checksum error	Shutdown	Always	Reprogram parameters	Active
E1	E412	Parameter checksum error	Disable	Always	Reprogram parameters	Active
E2	E430	Hour counter error	Warning	Always	Manually reset the counter	Not active
E3	E420	Probe 1 disconnected	Disable	Always (in prop. and controller mode)	Automatic	Active
E4	E423	Probe 2 disconnected	Disable limitation	Always (in outlet limit mode)	Automatic	Active
E5	E425	Temperature probe disconnected	Disable	Always (with temperature probe option)	Automatic	Active
E6	E434	High water bypass temperature pre-alarm (>b4)	Warning	Always (with temperature probe option)	Automatic	Active
E8	E436	Low pressure in the outlet circuit (<20 bar for b2 minutes)	Disable	Not during wash cycle	Manual	Active
Ec	E431	Conductivity pre-alarm	Warning	Always (with conductivity meter option)	Automatic with relative hysteresis set by parameter "L6"	Not active
EC	E405	Conductivity alarm	Shutdown	Sempre (con opzione conducimetro)	Not available	Active
EP	E402	Motor protector	Shutdown	Always	Not available	Active
E°	E408	High water bypass temperature alarm (>70 °C)	Disable	Always (with temperature probe option)	Manual	Active
E_`	E421	High humidity	Warning	Control enabled	Automatic with relative hysteresis set by parameter "L6"	Active
E_	E422	Low humidity				
E=	E424	High humidity with outlet limit				
LP	E409	Low inlet press. switch activated	Disable	Always	Automatic if not reset manually within a certain delay (3 s)	Active
HP	E414	High dis. press. switch activated	Disable	Always	Manual	Active
CL	E432	Routine maintenance	Warning	Always	Manually reset the counter	Active
C5	E413	First maintenance	Warning	Always	Manually reset the counter	Active

Tab. 3.b

4. Troubleshooting

The identification and solution of the problem may vary depending on the version of the software.

4.1 Troubleshooting for the HD version

PROBLEM	POSSIBLE CAUSES	CHECKING PROCEDURE	SOLUTION
no power supply (controller doesn't start).	Incorrect power supply or fuses on the transformer primary blown.	Use a tester and check the power supply at the terminals on the terminal block. Refer to the wiring diagram	230 Vac 3 ph power supply. Replace any blown fuses. See the wiring diagram
	Fuse on transformer low voltage side blown	Use a tester to check the electrical continuity at the ends of the fuse.	Replace the fuse.
	Transformer defective.	Use a tester to check for 24 volts at the secondary	Replace the transformer
	Controller or board defective	Use a tester to check the correct power supply to the board and the controller.	Replace controller and board
	Is the main switch on?	Check the position of the main switch.	Turn the knob on the main switch located on the door of the electrical panel
no atomisation at all or insufficient atomisation	Is the remote ON-OFF contact closed?	Check the connection (or presence of jumper) at terminals 7I and 8I.	Connect terminals 7I and 8I to the remote contact, if not jumper the two terminals.
	Check control algorithm.	Refer to parameter "A0"	Set parameter A0;
	No supply water	Check for LP alarm on the controller display	Check the water supply upstream and downstream of the filters and restore the water supply
	Low supply water pressure		Calibrate the pressure of the supply water to 2 bar
	1 µ and from 5 µ water filters blocked	Check the pressure measured by the pressure gauges upstream and downstream of the water filters	Replace the 1 and 5 µ water filters
	Water leaks from the rack or the connection circuit between humiFog and rack.	Alarm E7	Repair the causes of any water leaks.
	Low discharge pressure		replace the worn gaskets and valves on the pump: (see the spare parts manual or pump manual)
	Activation of VFD protection	Alarm EP	Check VFD configuration
		Alarm EP, VFD on and high motor temperature	Electric motor overload
	Nozzles blocked	Nozzles do not atomise or atomise incorrectly	Clean the nozzles
		Alarms Ec, EC,E8	Check the quality of the supply water
	Capacity control solenoid valves blocked	Incorrect electrical connection	Connect the power supply of the solenoid valve correctly (see wiring diagram)
		Solenoid valve position not vertical	Reposition the solenoid valve correctly
		Check configuration of control parameter b7	Enter the correct number of capacity control branches for parameter "b7"
some nozzles do not atomise correctly	Some capacity control solenoid valves not open	Position of solenoid valve not correctly vertical	Reposition the solenoid valve
	Too many nozzles for the flow-rate of the pump	With maximum production demand some solenoid valves do no open	Choose a larger pump or decrease the number of nozzles
droplets atomised by the nozzles too large	Low pressure.	Check the pressure displayed by the pressure gauge, this must be between the 60-75 bar.	Adjust the pressure using the cap on the high pressure regulator
	Too many nozzles for the flow-rate of the pump	Check the flow-rate of the pump and the distribution system installed	Decrease the number of the nozzles; choose a pump with a higher flow-rate
high discharge pressure alarm	Some lines downstream of the pump are choked/blocked	Check the pressure on the pressure gauge located on the pump	Restore the discharge circuit, high pressure side, freeing the circuit from any obstructions.
continuous discharge of water by the thermal valve	Water temperature in the bypass above 60ºC	Check that there are no blockages downstream of the pump	Restore the discharge circuit, high pressure side, freeing the circuit from any obstructions.
		Check if alarm E° is displayed	
excessive discharge of water from the pressure relief valve.	Supply water pressure adjustment too high.	Check the pressure measured by the pressure gauges on the low pressure side: with the unit on the pressure should settle at 2 bar.	Adjust the supply water pressure to 2 bar using the pressure regulator.
	Pressure relief valve pressure adjustment too low	Check the pressure measured by the pressure gauges on the low pressure side: at a pressure of 2 bar the pressure relief valve must not discharge.	Turn the knob on the pressure relief valve clockwise to increase the activation pressure to a value above 2 bar.
	Pressure relief valve defective	The water loss still continues when adjusting the pressure.	Replace the pressure relief valve.
the humiFog starts at maximum production even with minimum demand.	Humidity probe powered with incorrect voltage	Check the setting of parameter A2	Configure parameter A2 according to the power supply of the humidity probe connected.
the humiFog starts at minimum production even with maximum demand.	Humidity probe powered with incorrect voltage	Check the setting of parameter A2	Configure parameter A2 according to the power supply of the humidity probe connected.

Tab. 4.a

4.2 Troubleshooting for the SL version

PROBLEM	POSSIBLE CAUSES	CHECKING PROCEDURE	SOLUTION
no power supply (controller doesn't start)	Incorrect power supply or fuses on the transformer primary blown.	Use a tester and check the power supply at the terminals on the terminal block. Refer to the wiring diagram	400 Vac 3 ph power supply. Replace any blown fuses
	Fuse on transformer low voltage side blown	Use a tester to check the electrical continuity at the ends of the fuse	Replace the fuse.
	Transformer defective.	Use a tester to check for 24 volts at the secondary	Replace the transformer
	Controller or board defective	Use a tester to check the correct power supply to the board and the controller	Replace controller and board
	Is the main switch on?	Check the position of the main switch	Turn the knob on the main switch located on the door of the electrical panel
no atomisation at all or insufficient atomisation	Is the remote ON-OFF contact closed?	Check the connection (or presence of jumper) at terminals 7I and 8I	Connect terminals 7I and 8I to the remote contact, if not jumper the two terminals
	Check control algorithm.	Refer to parameter "A0"	Set parameter A0;
	No supply water	Check for LP alarm on the controller display	Check the water supply upstream and downstream of the filters and restore the water supply
	Low supply water pressure		Calibrate the pressure of the supply water to 2 bar
	1 µ and from 5 µ water filters blocked	Check the pressure measured by the pressure gauges upstream and downstream of the water filters	Replace the 1 and 5 µ water filters
	Water leaks from the rack or the connection circuit between humiFog and rack.	Alarm E8	Repair the causes of any water leaks.
	Low discharge pressure		Replace the worn gaskets and valves on the pump: (see pump manual)
	Activation of motor protector	Alarm EP	Electric motor overload
	Nozzles blocked	Nozzles do not atomise or atomise incorrectly	Clean the nozzles
		Alarms Ec, EC,E8	Check the quality of the supply water
	Capacity control solenoid valves blocked	Incorrect electrical connection	Connect the power supply of the solenoid valve correctly (see wiring diagram)
		Solenoid valve position not vertical	Reposition the solenoid valve correctly
		Check configuration of control parameter b7	Enter the correct number of capacity control branches for parameter "b7"
alarm E8 is activated at start-up	Low discharge water pressure	Check the low discharge pressure alarm delay time	Set the low pressure alarm delay: parameter "b2"
		Check the flow-rate of the pump and the distribution system installed	Choose a larger pump or decrease the number of nozzles
droplets atomised by the nozzles too large	Low pressure	Check the pressure displayed by the pressure gauge, this must be between the 60-75Bar.	Adjust the pressure using the cap on the high pressure regulator
	Too many nozzles for the flow-rate of the pump	Check the flow-rate of the pump and the distribution system installed	Decrease the number of the nozzles; choose a humiFog with a higher flow-rate
high discharge pressure alarm	High pump discharge pressure	Check the calibration of the high pressure regulator valve using the pressure gauge located on the pump	Adjust the pressure using the cap on the high pressure regulator
high temperature alarm	Water temperature in the bypass above 55 °C	Check the number of nozzles in relation to the capacity of the pump	Distribution system with single circuit: check that the flow-rate of the system is not less than 50% of the flow-rate of the pump
		Check if warning E6 is shown	Distribution system with 2 or more circuits: check that the flow-rate of the first circuit (normally open) is not less than 25% of the flow-rate of the pump
continuous discharge of water by the thermal valve	Water temperature in the bypass above 60°C	Check the number of nozzles in relation to the capacity of the pump	Distribution system with single circuit: check that the flow-rate of the system is not less than 50% of the flow-rate of the pump
		Check if warning E° is shown	Distribution system with 2 or more circuits: check that the flow-rate of the first circuit (normally open) is not less than 25% of the flow-rate of the pump
		Check that there are no blockages downstream of the pump	Restore the discharge circuit, high pressure side, freeing the circuit from any obstructions.
excessive discharge of water from the pressure relief valve	Supply water pressure adjustment too high	Check the pressure measured by the pressure gauges on the low pressure side: at a pressure of 2 bar the pressure relief valve must not discharge	Turn the knob on the pressure relief valve clockwise to increase the activation pressure to a value above 2 bar.
	Pressure relief valve pressure adjustment too low	Check the pressure measured by the pressure gauges on the low pressure side: at a pressure of 2 bar the pressure relief valve must not discharge	Turn the knob on the pressure relief valve clockwise to increase the activation pressure to a value above 2 bar.
the filling/wash cycle is not activated	Pressure over 20 bar in the lines with the pump off	Check the water drained by the NO solenoid valves at the end of the line	Check the correct electrical connection of the NO solenoid valves.
	Atomisation starts without the lines being filled		Replace any defective solenoid valves

Tab. 4.b

MCmultizone

Umidificatori atomizzati
Atomising humidifiers

Content

1. Maintenance

1.1 Maintenance procedures

Even if the MC humidification system does not generally require special maintenance, preventive maintenance should be performed regularly, annually or before starting each season. The richer the water in salts or impurities, the more frequently checks are required.

Devices requiring checks:

Compressor: follow the manufacturer's instructions
Atomising heads: once a year remove and clean the nozzle, lubricate the o-ring with silicone grease and in case change them.
Air and water line: once a year the air and water lines should be bled to remove any sediments, traces of oil and dirt. To do this, follow the system start-up procedure.
Pressure regulators and solenoid valves: once a year open and clean to remove any debris and deposits.
pCO³ electronic controller + pGD terminal and humidity probes: once a year check the condition of the probes and recalibrate if necessary. Do not use compressed air or solvents to clean the probe sensor.

1.2 Kits & optional accessories for the air/water line

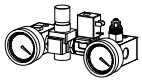
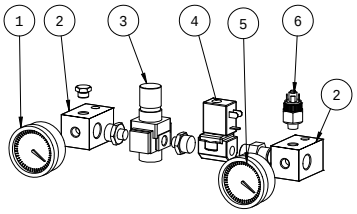
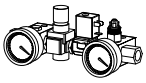
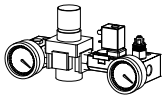
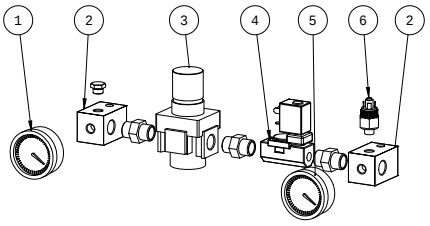
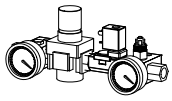
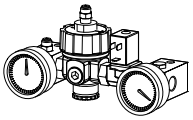
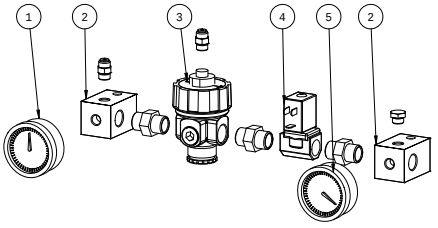
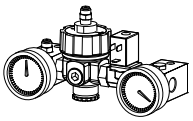
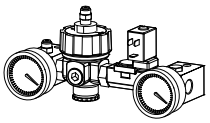
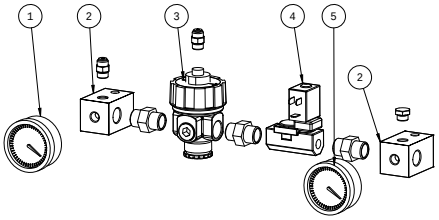
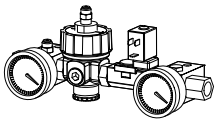
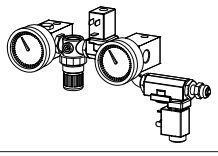
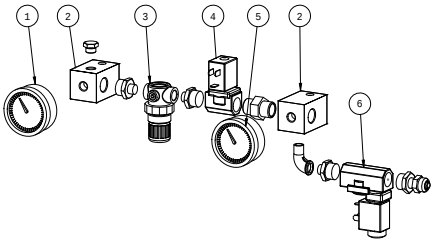
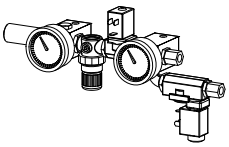
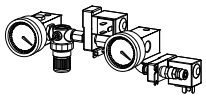
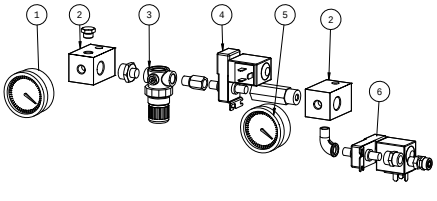
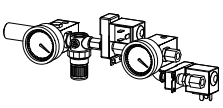
NO solenoid valve at end of line for NW	M	C	K	D	V	W	L	0	0	0
NO solenoid valve at end of line for AW	M	C	K	D	V	W	L	0	0	1
pressure transducer l=10 m	M	C	K	P	T	0	1	0	0	0
pressure transducer l=50 m	M	C	K	P	T	0	5	0	0	0
pressure transducer l=100 m	M	C	K	P	T	1	0	0	0	0
air outlet pressure gauge 0 to 4 bars	M	C	K	M	A	0	4	0	0	0
water outlet pressure gauge AW 0 to 2.5 bars	M	C	K	M	W	0	2	5	0	1
UV lamp sanitising kit	M	C	K	S	U	V	0	0	0	0
UV lamp	M	C	K	U	V	0	0	0	0	0
5" water filter container	M	C	F	I	L	W	A	T	0	5
5µ water filter cartridge	M	C	C	0	5	P	P	0	0	5
1/2" air filter	M	C	F	I	L	A	I	R	0	1
3/8" oil filter for air	M	C	F	I	L	O	I	L	0	1
humidity probes for ducts 10 to 90% rH	A	S	D	H	1	0	0	0	0	0
humidity probes for ducts 0 to 100% rH	A	S	D	H	2	0	0	0	0	0
ambient humidity probes 10 to 90% rH	A	S	W	H	1	0	0	0	0	0
temperature-humidity probes for industrial environments -10 to 70 °C/ 0 to 100% rH	A	S	P	C	2	3	0	0	0	0
temperature-humidity probes for industrial environments 0 to 50 °C / 10 to 90% rH	A	S	P	C	1	1	0	0	0	0

1.3 Kits & optional accessories for the atomising heads

Atomising head assembly kit	M	C	K	1	A	W	0	0	0	0
Atomising head mod. A 2.7 l/h	M	C	A	A	2	0	0	0	0	0
Atomising head mod. B 4.0 l/h	M	C	A	B	2	0	0	0	0	0
Atomising head mod. C 5.4 l/h	M	C	A	C	2	0	0	0	0	0
Atomising head mod. D 6.8 l/h	M	C	A	D	2	0	0	0	0	0
Atomising head mod. E 10 l/h	M	C	A	E	2	0	0	0	0	0

2. Spare parts

2.1 Spare parts for air/water line

line drawing	code & description	exploded drawing	component code	component description	n.
	MCKA060D00 ON/OFF air line 60 l/h		MCKMA12000	pressure gauge 0 to 12 bars	1
			MCKMNFD000	manifold	2
			MCKMR0A060	manual air pressure regulator 60 l/h	3
	MCKA060DU0 ON/OFF air line 60 l/h UL		MCKFSVBC00	NC air solenoid valve 60 l/h/ water NW	4
			MCKMA04000	air outlet pressure gauge 0 to 4 bars	5
			MCKPS00000	pressure switch	6
	MCKA230D00 ON/OFF air line 230 l/h		MCKMA12000	pressure gauge 0 to 12 bars	1
			MCKMNFD000	manifold	2
			MCKMR0A230	manual air pressure regulator 230 l/h	3
	MCKA230DU0 ON/OFF air line 230 l/h UL		MCKFSVAC00	NC air solenoid valve 230 l/h	4
			MCKMNFD000	manifold	2
			MCKPS00000	pressure switch	6
	MCKA060H00 modulating air line 60 l/h		MCKMA12000	pressure gauge 0 to 12 bars	1
			MCKMNFD000	manifold	2
			MCKAMVA000	modulating valve	3
	MCKA060HU0 modulating air line 60 l/h UL		MCKFSVBC00	NC air solenoid valve 60 l/h/water NW	4
			MCKMNFD000	manifold	2
	MCKA230H00 modulating air line 230 l/h		MCKMA12000	pressure gauge 0 to 12 bars	1
			MCKMNFD000	manifold	2
			MCKAMVA000	modulating valve	3
	MCKA230HU0 modulating air line 230 l/h UL		MCKFSVAC00	NC air solenoid valve 230 l/h	4
			MCKMNFD000	manifold	2
	MCKW000000 ON/OFF air line 230 l/h		MCKMA12000	pressure gauge 0 to 12 bars	1
			MCKMNFD000	manifold	2
			MCKMR0W000	manual water pressure regulator	3
	MCKW0000U0 ON/OFF air line 230 l/h UL		MCKFSVBC00	NC air solenoid valve 60 l/h/water NW	4
			MCKMW02500	water outlet pressure gauge NW 0 to 2.5 bars	5
			MCKDSVWC00	NO solenoid water valve AW	6
	MCKW000001 ON/OFF air line 230 l/h		MCKMW10001	inlet pressure gauge AW 0 to 10 bars	1
			MCKMNFD000	manifold	2
			MCKMR0W000	manual water pressure regulator	3
	MCKW0000U1 ON/OFF air line 230 l/h UL		MCKFSVWC01	NC water solenoid valve AW	4
			MCKMW02501	water outlet pressure gauge AW 0 to 2.5 bars	5
			MCKDSVWC01	NO solenoid water valve AW	6

NC air solenoid valve 60 l/h/water for NW	M	C	K	F	S	V	B	C	0	0
NC air solenoid valve 230 L/h	M	C	K	F	S	V	A	C	0	0
NO water solenoid valve for NW	M	C	K	D	S	V	W	C	0	0
NC water solenoid valve for AW	M	C	K	F	S	V	W	C	0	1
NO water solenoid valve for AW	M	C	K	D	S	V	W	C	0	1
pressure gauge 0 to 12 bars	M	C	K	M	A	1	2	0	0	0
inlet pressure gauge AW 0 to 10 bars	M	C	K	M	W	1	0	0	0	1
air outlet pressure gauge 0 to 4 bars	M	C	K	M	A	0	4	0	0	0
water outlet pressure gauge NW 0 to 2.5 bars	M	C	K	M	W	0	2	5	0	0
water outlet pressure gauge AW 0 to 2.5 bars	M	C	K	M	W	0	2	5	0	1
manual air pressure regulator 60 l/h	M	C	K	M	R	0	A	0	6	0
manual air pressure regulator 230 l/h	M	C	K	M	R	0	A	2	3	0
manual water pressure regulator	M	C	K	M	R	0	W	0	0	0
modulating valve regulator	M	C	K	A	R	V	A	0	0	0

2.2 Pre-programmed pCO³ controllers

pre-programmed pCO³ controller, 60 l/h ON/OFF Master CE	M	C	K	C	0	6	C	D	M	0
pre-programmed pCO³ controller, 60 l/h ON/OFF Master UL	M	C	K	C	0	6	C	1	M	0
pre-programmed pCO³ controller, 60 l/h ON/OFF Slave CE	M	C	K	C	0	6	C	D	S	0
pre-programmed pCO³ controller, 60 l/h ON/OFF Slave UL	M	C	K	C	0	6	C	1	S	0
pre-programmed pCO³ controller, 230 l/h ON/OFF Master CE	M	C	K	C	2	3	C	D	M	0
pre-programmed pCO³ controller, 230 l/h ON/OFF Master UL	M	C	K	C	2	3	C	1	M	0
pre-programmed pCO³ controller, 230 l/h ON/OFF Slave CE	M	C	K	C	2	3	C	D	S	0
pre-programmed pCO³ controller, 230 l/h ON/OFF Slave UL	M	C	K	C	2	3	C	1	S	0
pre-programmed pCO³ controller, 60 l/h modulating Master CE	M	C	K	C	0	6	H	D	M	0
pre-programmed pCO³ controller, 60 l/h modulating Master UL	M	C	K	C	0	6	H	1	M	0
pre-programmed pCO³ controller, 60 l/h modulating Slave CE	M	C	K	C	0	6	H	D	S	0
pre-programmed pCO³ controller, 60 l/h modulating Slave UL	M	C	K	C	0	6	H	1	S	0
pre-programmed pCO³ controller, 230 l/h modulating Master CE	M	C	K	C	2	3	H	D	M	0
pre-programmed pCO³ controller, 230 l/h modulating Master UL	M	C	K	C	2	3	H	1	M	0
pre-programmed pCO³ controller, 230 l/h modulating Slave CE	M	C	K	C	2	3	H	D	S	0
pre-programmed pCO³ controller, 230 l/h modulating Slave UL	M	C	K	C	2	3	H	1	S	0

2.3 Electrical panel kit and spare parts

manifold	M	C	K	M	N	F	D	0	0	0
pressure switch	M	C	K	P	S	0	0	0	0	0
power supply 110/230 Vac 12 Vdc 0.5 A	M	C	K	A	L	0	0	0	0	0
transformer	M	C	K	T	R	0	0	0	0	0
fuses	M	C	K	F	U	S	E	0	0	0
modulating valve	M	C	K	A	M	V	A	0	0	0
pCO graphic terminal, 120x32, panel mounting	P	G	D	0	0	0	0	F	0	0
pGD0 kit for setting pLAN address	P	G	D	0	0	0	2	F	0	K

3. Alarms

When an alarm is activated, the alarm button starts flashing intermittently.
In these conditions, pressing the alarm button once displays the type of alarm .

In the case of potentially dangerous alarms, the controller automatically stops production. For some alarm events, the alarm relay is also activated at the same time as the signal (see the table under).

alarms displayed	meaning	cause	solution	reset	alarm relay	action		notes
high humidity	humidity outside of set limits	value measured by the probe greater than the humidity alarm threshold	check the set parameter	manual	inactive	signal only	on	
low humidity	humidity outside of set limits	value measured by the probe less than the humidity alarm threshold	check the set parameter	manual	inactive	signal only	on	
humidity probe broken or disconnected	humidity probe broken or disconnected	main humidity probe disconnected or broken	check the connection & the operation of the probe	manual	active	stop production	on	
high humidity limit probe	limit humidity outside of set limits	value measured by the probe greater than the humidity alarm threshold	check the set parameter	manual	inactive	signal only	flash	can only be reset switching the unit off from "set", signalled only in sequence after other alarms but not when forced.
limit probe broken or disconnected	limit probe broken or disconnected	limit humidity probe disconnected or broken	check the connection & the operation of the probe	manual	active	stop production	on	
slave (2-3-4-5-6) unit offline	slave unit not connected to the pLAN	pLAN network disconnected	check connection of pLAN cable to terminals on controller	manual	active	signal only	on	
master unit offline	master unit not connected to the pLAN	pLAN network disconnected	check connection of pLAN cable to terminals on controller	manual	active	signal only	on	
low pressure alarm	insufficient air pressure	insufficient air pressure	check air line pressure	manual	active	stop production	on	for ON/OFF units
compressor	alarm from air compressor	compressor fault alarm	check air compressor	manual	active	signal only	on	
flow switch	alarm from AHU flow switch	no air in AHU alarm	check AHU	manual	active	signal only	on	
water treatment system	alarm from water treatment system	water treatment system fault alarm	check water treatment system	manual	active	signal only	on	
pressure sensor faulty or disconnected	pressure sensor faulty or disconnected	pressure sensor faulty or disconnected	check pressure sensor	manual	active	stop production	on	for proportional units with air pressure sensor
pressure off scale	air pressure outside of set limits	insufficient air pressure	check air supply pressure	manual	active	stop production	on	for proportional units with air pressure sensor
clock fault	clock error	backup battery completely discharged or generic clock fault	replace clock	manual	inactive	signal only	off	

Tab. 3.a

4. Troubleshouting

4.1 Tabella risoluzione problemi

line	problem	cause		solution	
1	alarm status displayed	C1	active alarm	S1	check the alarm in "table of alarms"
2	unit powered and enabled, the switch on the front is in position "1" yet the humidifier won't start.	C1	no power to the cabinet	S1	check that there is power at terminals LN
		C2	the fuses are blown	S2	check the fuses
		C3	remote ON/OFF contact open	S3.1	if terminals ID1-COM are connected to an external signal, check the status of the remote ON/OFF signal.
				S3.2	if no external ON/OFF signal is connected, jumper terminals ID1-COM
3	the system is on but won't start	C1	check in the "set menu" if the unit is off/auto	S1	select auto
4	saturation and condensation inside the duct caused by the fan stopping.	C1	failure to detect the flow switch alarm	S1	make sure the flow switch is connected to terminals ID6-COM on the unit
				S2	check the correct configuration of the flow switch alarm contact: installer menu>external alarms.
5	the air outlet pressure doesn't reach 2.1 bars	C1	compressor undersized	S1	check the flow-rate of the compressor in relation to the to the consumption expected for the installation
		C2	for proportional units, without the transducer at the end of the line: maximum limit pressure too low.	S2	check the maximum pressure set: installer menu>operating options
		C3	for ON/OFF units, pressure regulator set too low.	S3	check the calibration of the pressure regulator
6	in proportional systems: the air outlet pressure swings	C1	air line long and made from deformable material on the column	S1	decrease inlet pressure to the cabinet while ensuring the pressure at the heads reaches 2.1 bars
7	air line active yet the heads don't atomise water.	C1	the air outlet pressure is too low	S2.1	ON/OFF unit: check the inlet air pressure and the air pressure regulator
				S2.2	proportional unit, without pressure transducer end of the line: check air pressure limit, installer menu>operating options
		C2	water line NC solenoid valve not powered	S2	check 24Vdc power to the solenoid valve.
		C3	water line NO solenoid valve not powered	S3	check 24Vdc power to the solenoid valve.
		C4	water pressure regulator closed (fully unscrewed)	S4	adjust the pressure regulator so the outlet pressure is 0.35 bars
		C5	regulator not adjusted according to the height of the heads	S5	adjust the pressure regulator so the outlet pressure is 0.35 bars plus 0.1 bars for each metre of difference in height between the cabinet and distribution line
		C6	water pressure regulator dirty	S6	remove the water pressure regulator and clean any impurities.
8	water pressure reaches high values and is not controlled.	C1	water pressure regulator dirty	S1	remove the water pressure regulator and clean any impurities.
9	for duct installations: low absorption of atomised water and area under the atomisation heads wet	C1	air speed in the duct too high in relation to the free path between the atomising heads and droplet separator.	S1	check the sizing of the installation
		C2	overlapping sprays of atomised water or contact between the spray of atomised water and the walls of the duct	S2	optimise the positioning of the heads
10	water leaks from the NO solenoid valve in the cabinet or at the end of the line	C1	impurities in the solenoid valve that prevent complete closing.	S1	remove the solenoid valve, remove the coil, unscrew the sleeve, remove the impurities, clean the body and sleeve and reassemble.
11	with the unit off or in standby with the NC solenoid valve closed, water leaks	C1	impurities in the solenoid valve that prevent complete closing.	S1	remove the solenoid valve, remove the coil, unscrew the sleeve, remove the impurities, clean the body and sleeve and reassemble.
12	atomising heads with abnormal flow, adjusting the calibration screw brings no improvement.	C1	atomising heads dirty	S1	remove the head and clean.
		C2	air and water pressure at the heads outside the limits	S2	check the air and water pressure in the cabinet and at the end of the line
		C3	oil in the air line	S3	check the oil separator filter upstream of the cabinet.
13	the heads produce a jet of water when there is no air	C1	air/water connections reversed	S1	reverse the connection observing the markings on the heads
14	the ambient humidity stabilises at values below the set point	C1	the capacity of the installation is not sufficient to meet the requirements	S1.1	review the sizing of the installation
				S2.1	adjust the heads to increase production
					increase the number of the heads in relation to the maximum flow-rate of the cabinet. See points 8 and 9.

Tab. 4.a

CAREL

ENG

humiDisk

Umidificatore centrifugo
Centrifugal humidifier

Content

HUMIDISK

humiDisk is designed to ensure efficient and faultless operation for an extended time. However, a number of simple maintenance operations need to be carried out, at a frequency that depends on the environmental conditions that the humiDisk operates in and on the quality of the supply water.

Warning: Before carrying out any maintenance, open (switch off) the main switch and wait for the appliance to come to a complete stop. Close the water supply tap. Observe the general safety instructions shown in par. 1.1. Before starting the appliance again, duly complete all the checks, as described in this manual.

1.1 Cleaning the air filter

The filter must be cleaned periodically, as the accumulation of dirt and dust reduces air flow and thus the efficiency of the appliance.

humiDisk$_{10}$

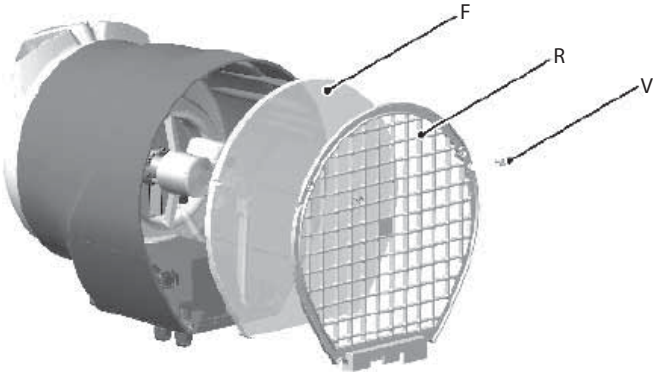


Fig. 1.a

With reference to Fig. 1.a:
- remove the filter by unscrewing the two fastening screws V;
- remove the grill R and the filter F;
- clean the filter F with a vacuum cleaner or alternatively dip it in slightly soapy water, and rinse: dry without wringing;
- at the end replace the assembly in the reverse order, making sure that the filter is correctly positioned inside the unit and the grill is fastened with the screws.

Attenzione: never start the humidifier without the air filter F fitted and the protective grill R correctly secured with the screws V!

humiDisk$_{65}$

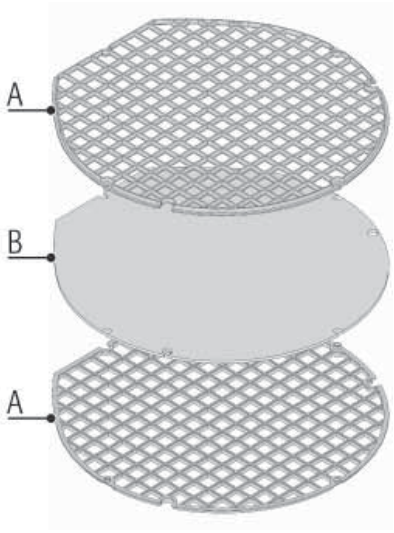


Fig. 1.b

With reference to Fig. 1.b:
- Remove the filter by unscrewing the three fastening screws;
- separate the two plastic grills A from the filter material B;
- clean the filter B with a vacuum cleaner or immerse it in slightly soapy water, and rinse: dry without wringing

Warning: never start the humidifier without the air filter fitted! The air filter is made up of three parts that must be assembled so that the filtering material B is enclosed between the two plastic grills A (see Fig. 1.b).

1.2 Inspecting and cleaning the drain siphon

The drain siphon may need to be cleaned periodically: the accumulation of dirt inside the siphon may compromise operation.
When cleaning is required, proceed as follows:

humiDisk$_{10}$ (Fig. 1.c)

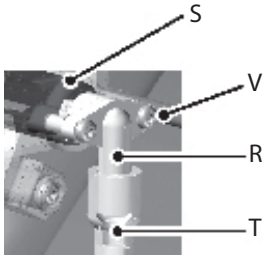


Fig. 1.c

- remove the air filter;
- remove the hose T from the tube R;
- unscrew the screws V;
- remove the tube R;
- clean both the tube R and the tube S, inside the tank;
- after cleaning replace all the parts.

humiDisk$_{65}$ (fig. 1.d)

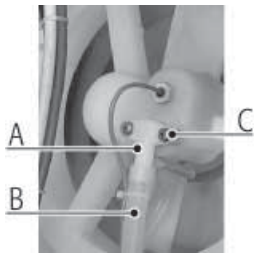


Fig. 1.d

- remove the air filter;
- slide out hose B from the drain siphon A;
- unscrew the screws C;
- remove component A;
- clean both part A and the hole it is inserted into, then reposition.

1.3 Inspecting and cleaning the fill solenoid valve

The fill solenoid valve is fitted with an inlet filter that must be checked and cleaned periodically.

humiDisk$_{10}$ (Fig. 1.e)

To access the filter, unscrew the fitting A on the supply hose: the filter is found inside the threaded bushing E on the solenoid valve.
If cleaning becomes too frequent, install a cartridge filter on the appliance water supply line.

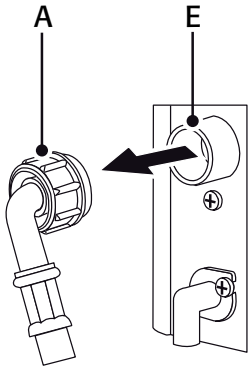


Fig. 1.e

humiDisk$_{65}$ (fig. 1.f)

To reach the filter, unscrew the fitting A on the supply hose: the filter is found inside the threaded bushing B on the solenoid valve.
If cleaning becomes too frequent, install a cartridge filter on the appliance water supply line.

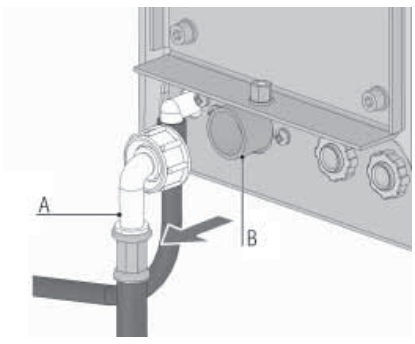


Fig. 1.f

1.4 Checking the washing/emptying cycle for humiDisk$_{65}$

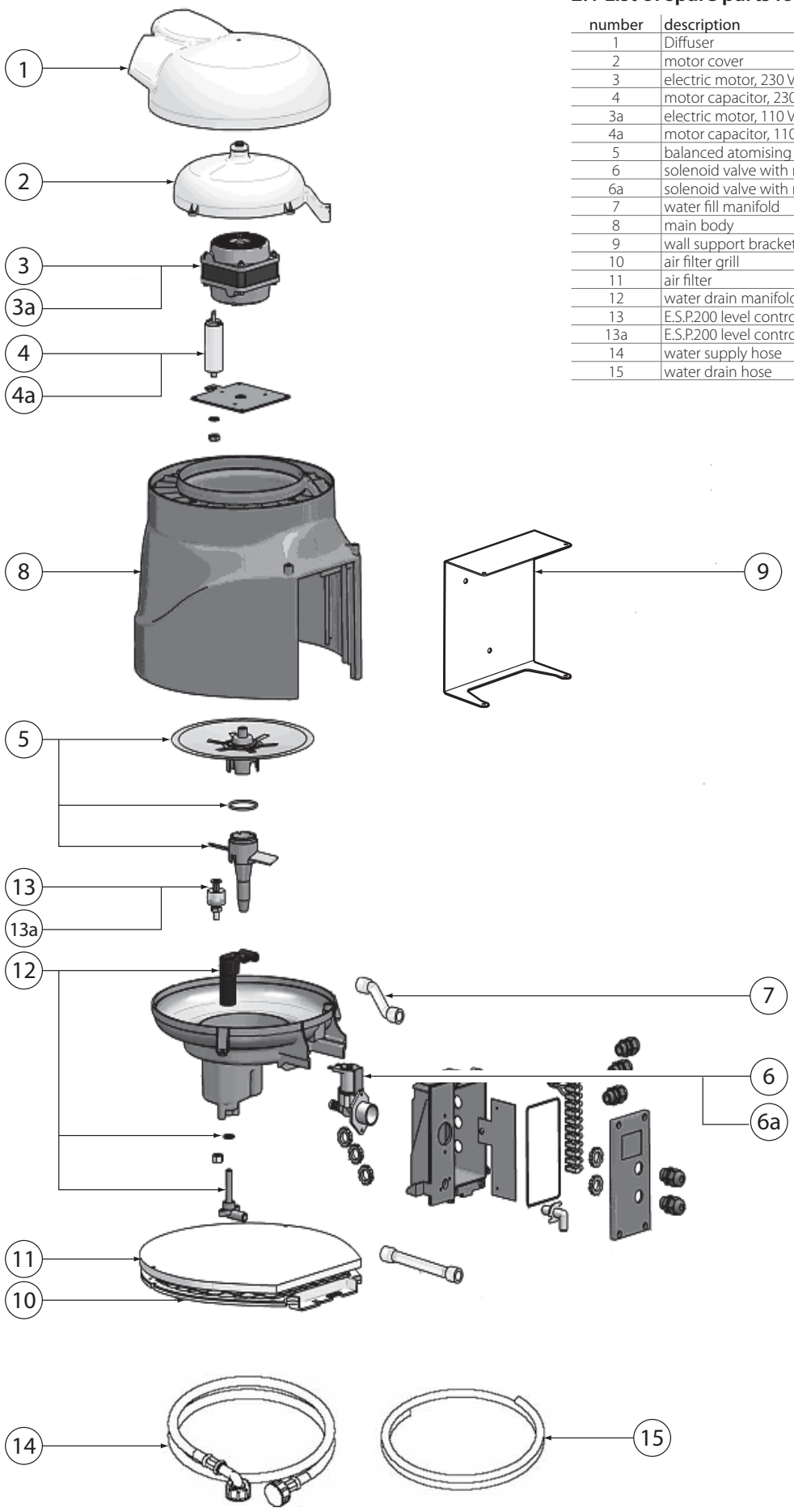
Check that the cycle is performed periodically.
To do this, proceed as follows:

- Remove the end of the drain hose not attached to the appliance and insert it into a container to collect the water that is drained.
- Stop the humidifier by turning off the control humidistat: this starts the washing cycle.

If the cycle does not continue normally, the water basin and the drain siphon must be cleaned.

Important: the humiDisk$_{65}$ is an air humidifier, and so any other use that the unit is not intended for (for example spraying insecticides, disinfectants, perfumes or any product other than water) may be dangerous or affect the correct operation of the appliance.

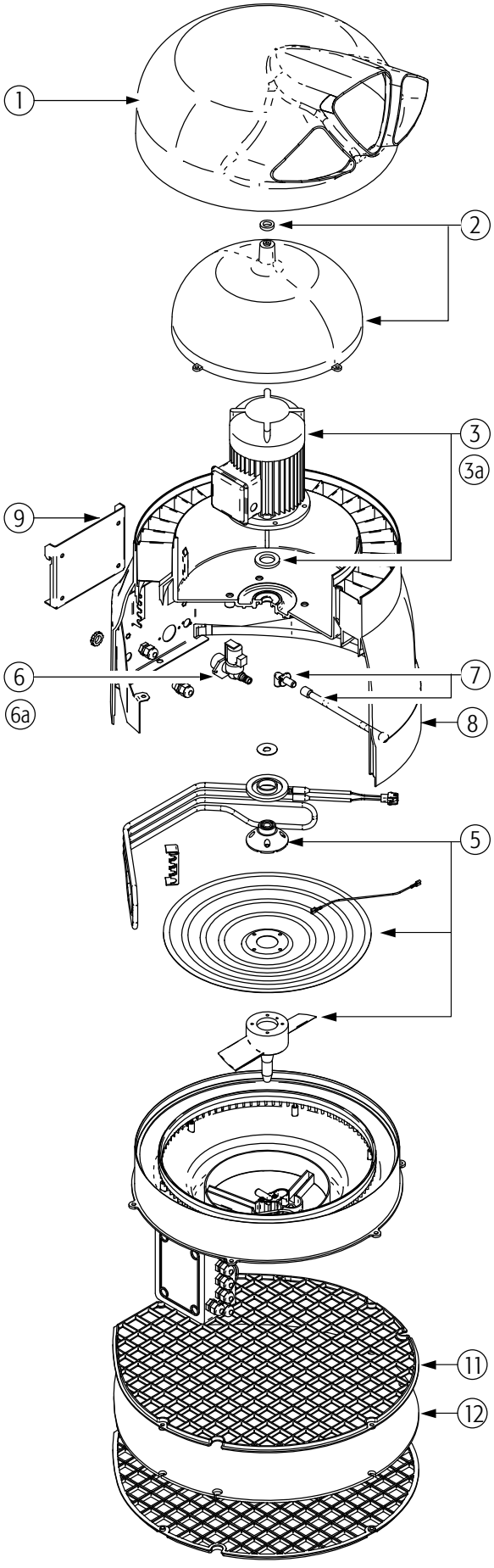
2. Spare parts



2.1 List of spare parts for humiDisk$_{10}$

number	description	CAREL code
1	Diffuser	UC10KD0000
2	motor cover	UC10KC0000
3	electric motor, 230 V 50 Hz	UC10KM0000
4	motor capacitor, 230 V 50 Hz	UC10KCM000
3a	electric motor, 110 V 60 Hz	UC10KM0010
4a	motor capacitor, 110 V 60 Hz	UC10KCM010
5	balanced atomising disk	UC10KDS000
6	solenoid valve with regulator, 230 V 50 Hz	UCKETV0000
6a	solenoid valve with regulator, 110 V 60 Hz	UCKETV0010
7	water fill manifold	UC10KCCA00
8	main body	UC10KCP000
9	wall support bracket	UC10KSSP00
10	air filter grill	UC10KRFA00
11	air filter	UC10KFA000
12	water drain manifold	UCKCSA0000
13	E.S.P.200 level controller 230 V 50 Hz	UC10KRL000
13a	E.S.P.200 level controller 110 V 60 Hz	UCKRL00010
14	water supply hose	FWH3415000
15	water drain hose	UCKTS00000

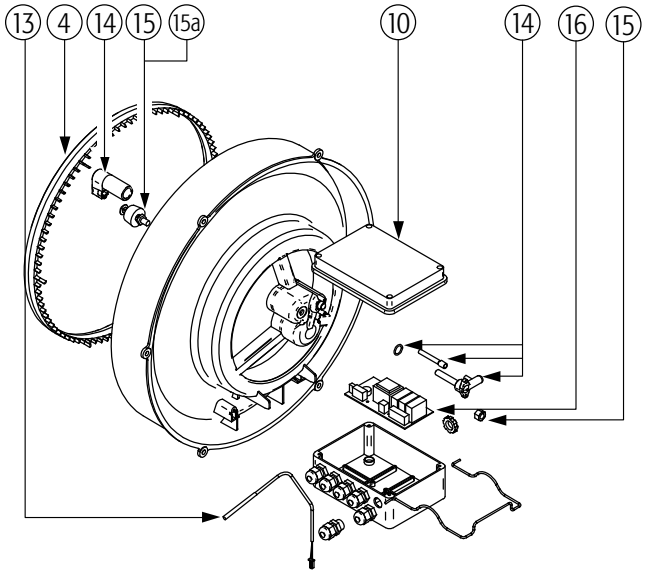
Tab. 2.a



2.2 List of spare parts for humiDisk$_{65}$

number	description	CAREL code
1	diffuser	UCKD000000
2	motor cover	UCKC000000
3	electric motor, 230 V 50 Hz	UCKM000000
3a	electric motor, 110 V 60 Hz	UC10KM0010
4	toothed ring	UCKCD00000
5	balanced atomising disk	UCKDS00000
6	solenoid valve with regulator	UCKETV0000
6a	solenoid valve with regulator 110 V 60 Hz	UCKETV0010
7	water fill manifold	UCKCCA0000
8	main body	UCKCP00000
9	wall support bracket	UCKSSP0000
10	junction box	UCKCCE0000
11	air filter grill	UCKRFA0000
12	air filter	UCKFA00000
13	temperature probe	UCKST00000
14	water drain manifold	UCKCSA0000
15	E.S.P.200 level controller	UCKRL00000
15a	E.S.P.200 level controller110 V 60 Hz	UCKRL00010
16	electronic board	UCKSE00000

Tab. 2.b



3. Alarms

3.1 Alarms and troubleshouting

message	description	causes	effect on control	reset	checks/solutions
Er0	probe error	probe faulty or disconnected	all outputs OFF	R: automatic V: manual	check the connections, check the probe signal
Er2	memory error	power failure during programming; memory damaged by electromagnetic interference	complete shutdown	R: automatic V: manual	restore the default values, turn the instrument off and on again while holding "PRG"; if the problem persists, replace the instrument
Er4	HIGH alarm	the input has exceeded P26 for a time >P28	no effect	R: automatic V: manual; (*)	check parameters P26,P27 and P28
Er5	LOW alarm	the input has fallen below P25 for a time >P28	no effect	R: automatic V: manual; (*)	check parameters P26,P27 and P28

Tab. 3.a

R= Control: control reset means restoring normal operating conditions of the controller once the alarm condition is no longer present;
V= Display: display and buzzer. Display reset means the return of the normal display;
(*): To reset a manual alarm, simply set a wide alarm differential (P27).

4. Troubleshouting

4.1 The humidifier won't start

Possible cause	Solution
No power supply	Check the electrical connections from the control panel to the terminal block in the humidifier.
The motor start capacitor has blown	Replace the capacitor with a similar part.

Tab. 4.a

4.2 Air comes out of the distributor, but not atomised water

Possible cause	Solution
No water reaches the tank	Check that the water supply is open. Check that the filter on the solenoid valve is not blocked, that the hoses are not choked or detached. Finally, check that the float inside the tank is free to move.
The cone with fan is clogged	Clean the cone with fan from any impurities that may have formed inside.

Tab. 4.b

4.3 The humidifier continuously drains water

Possible cause	Solution
The drain siphon is dirty	When dirt forms inside the drain siphon, this may be primed during operation. Remove the drain siphon and clean.
The unit is installed incorrectly	Check that the unit is installed
Less than 30 s have elapsed between stopping the humidifier and staring again, not allowing the siphon to completely drain the water	Turn the humidifier off and wait at least 30 s to allow the siphon to completely drain the water

Tab. 4.c

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