

heaterSteam

**Electric Element
Steam Humidifiers**



**Installation
& Maintenance
Manual**

*Read and Save
these Instructions*

CAREL

IMPORTANT WARNINGS



BEFORE INSTALLING OR HANDLING THIS HUMIDIFIER, PLEASE CAREFULLY READ AND FOLLOW THE INSTRUCTIONS AND SAFETY STANDARDS DESCRIBED IN THIS MANUAL AND ILLUSTRATED BY THE LABELS ON THE MACHINE.

This humidifier produces non-pressurized, steam by means of heating elements immersed in water inside the boiling tank (also called the cylinder); the steam produced can be used to humidify environments or industrial processes, using special distributors.

This humidifier may use any quality of the water including demineralized, but **softened water must be avoided**.

This humidifier is produced exclusively to directly humidify rooms or ducts, using a distribution system. It is suitable for this purpose as long as: installation, use and maintenance are carried out according to the instructions contained in this manual and on the labels applied internally and externally on the machine.

The condition of the environment and the power supply voltage must comply with the specified values. All other uses or modifications made to the device which are not expressly authorized by the manufacturer are considered to be incorrect and void the warranty.

Liability for injury or damage caused by the incorrect use of the humidifier lies exclusively with the user.

Please note that this device utilizes powered electrical devices and hot surfaces. All service and/or maintenance operations must be performed by expert and qualified personnel who are aware of the necessary precautions and are capable of performing these operations correctly in accordance with the National Electrical Code and local regulations. Local and national safety standards must be applied in all cases.

Disconnect the machine from the main power supply before accessing any internal parts.

Disposal of the humidifier:

The humidifier is made up of metallic and plastic parts. All parts must be disposed of according to the local standards on waste disposal.

Certification: the quality and safety of Carel Products are guaranteed by Carel's **ISO 9001**certified design

and production system, as well as  ,  &  certification.

WARNING: Your humidifier requires water to operate. Do NOT mount it above materials or machinery that could be damaged if a leak occurs. Carel assumes no responsibility for consequential or inconsequential damage as a result of any leaks.

Installation, Operation & Maintenance Manual

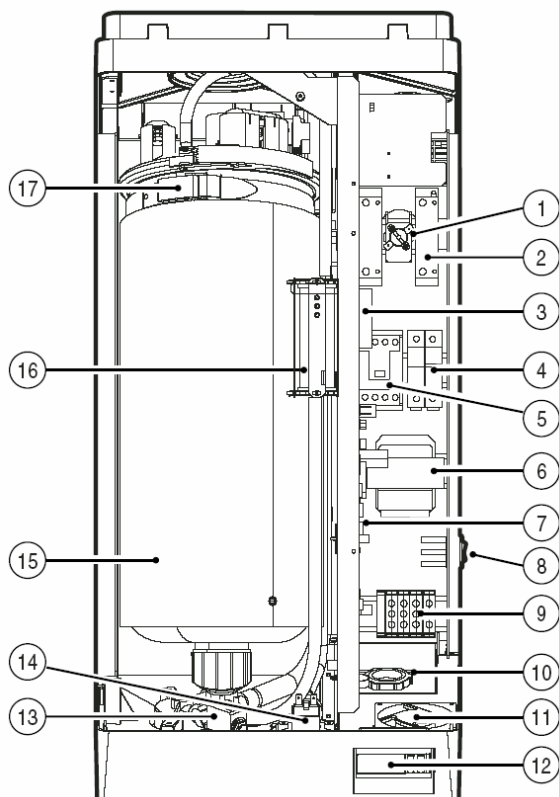
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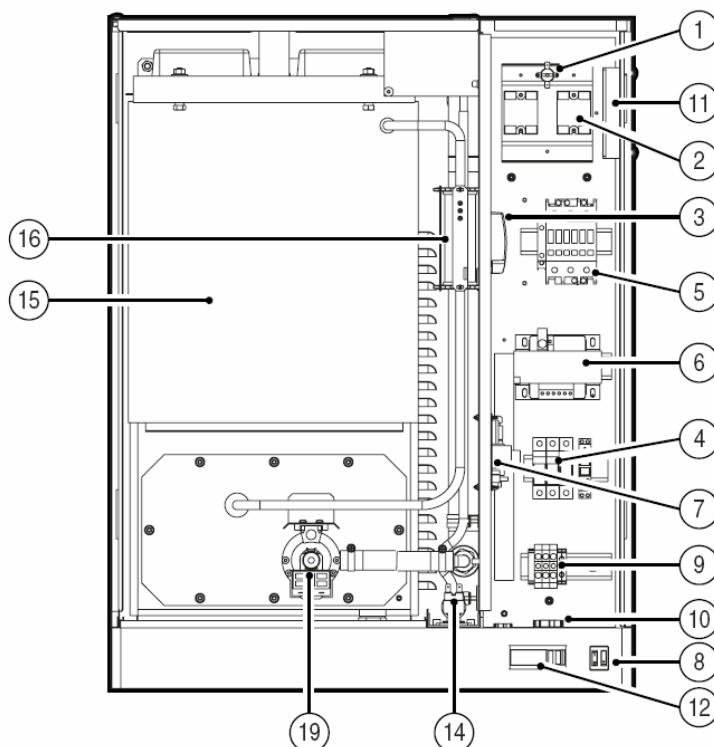
How The heaterSteam Works

Electric immersion resistance heaters are contained inside a stainless steel canister. When humidity is needed, the elements heat the water into steam. The heaterSteam is unique in that the heating elements are encased in Aluminum to permit them to operate dry without burning up. Special electronics even detect when maintenance is needed.

UR002 to UR010



UR020 to UR060



1. Klixon temperature sensor
2. Solid State Relay(s)
3. Motor protector
4. Fuses
5. Power contactor
6. Power transformer
7. Relay board

8. On/Off – Manual drain switch
9. Power terminals
10. Power cable strain relief
11. Cooling fan
12. Controller
13. Drain valve

14. Fill Valve
15. Cylinder
16. Level floats
17. Locking lever
19. Drain pump

Operation:

On a call for humidity, the HeaterSteam humidifier first checks the incoming water conductivity, water level and then runs diagnostics. The heating elements are then energized, and if modulating, the SSRs are pulsed to control the steam output to match demand. Periodically, the humidifier will drain away part of the cylinder water and replace it with fresh water to dilute the minerals in the cylinder and extend the maintenance cycle. Full diagnostics monitor the incoming water conductivity, foaming action in the steam cylinder, heater operation and output, and water level.

Features:

- Automatic level control and draining by conductivity
- Overheat protection of heaters to prevent burn-out and predict maintenance
- Backflow prevention
- Anti-Foaming System

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IMPORTANT: BEFORE beginning installation:

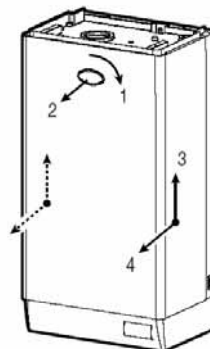
- Check for shipping damage to cartons. Mark the shipping waybill accordingly.
- Open cartons and check for any hidden damage. Mark the shipping waybill accordingly.
- Check packing slip to insure all items have been received. Notify Carel immediately of any shortages or damaged parts. **You must notify Carel within 5 working days of any shortages.**

Your heaterSteam humidifier will consist of:

- Steam humidifier unit
- Steam distributor pipe(s) or Steam blower if ordered
- Steam hose & condensate hose, hose clamps if ordered
- Mounting bracket, mounting hardware and water fill quick connect fitting
- Humidity sensors or controllers, if ordered

Opening The heaterSteam Cabinet

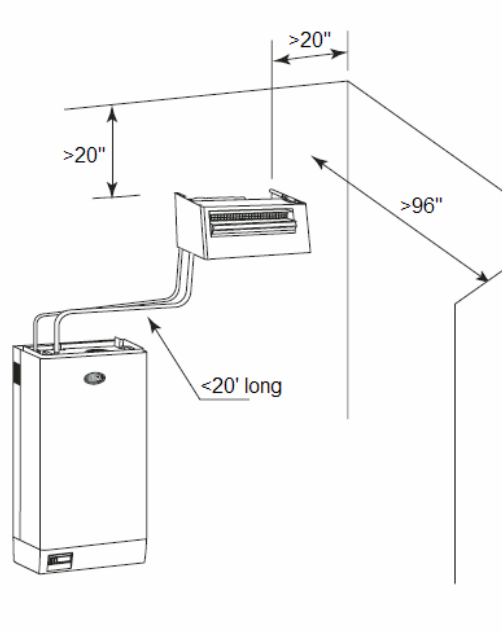
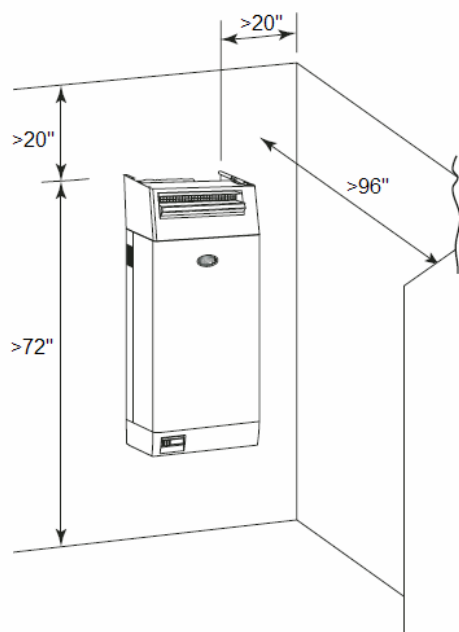
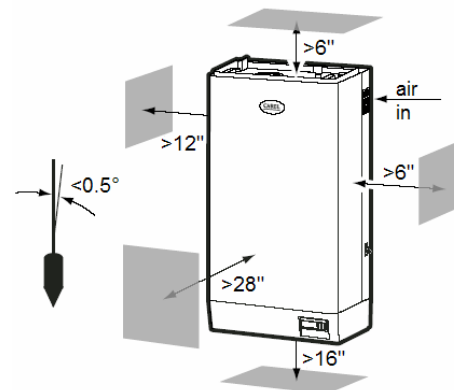
1. Turn the logo 90° to reveal the cabinet capture screw underneath;
2. Use a Phillips screwdriver to remove the capture screw;
3. Lift the cabinet cover up;
4. Pull it out off of the unit.



1 Installing The HeaterSteam

Mount the humidifier unit as close to the steam distributor pipe or ventilated distributor as possible to minimize condensate. Mount the humidifier unit below the steam distributor pipe or RDU whenever possible and NEVER more than 3 feet above. Insure that a slope can be maintained in the steam hoses. Avoid kinks, sags and sharp elbows in steam hoses which can trap condensate and cause problems.

Certain mounting clearances must be maintained to allow access for maintenance, and for steam discharge from a ventilated distributor. Maximum length of rubber steam hose is 20 feet. Insulated copper tubing to 40 feet. Additional clearances are needed when the blower unit is used:

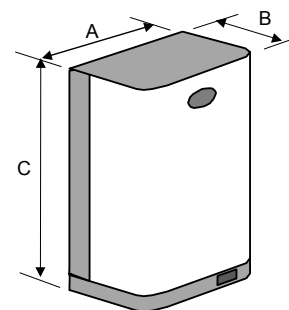


1.1 Mount The Steam Humidifier

The HeaterSteam unit is designed to mount to the wall or it can be placed on a floor stand (supplied by installer). The mounting structure must be able to support the operating weight shown in the following table.

1.1.1 Sizes and Weights

	UNIT MODEL NUMBER							
	UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
A. Width – in.	14.4	14.4	14.4	14.4	27.2	27.2	27.2	34.5
B. Depth – in.	10.8	10.8	10.8	10.8	17.2	17.2	17.2	17.2
C. Height – in.	24.4	24.4	28	28	34.9	34.9	34.9	34.9
Ship Wt. – Lbs.	57	57	68	68	161	161	169	216
Oper. Wt. – Lbs.	59	59	77	77	213	213	251	341

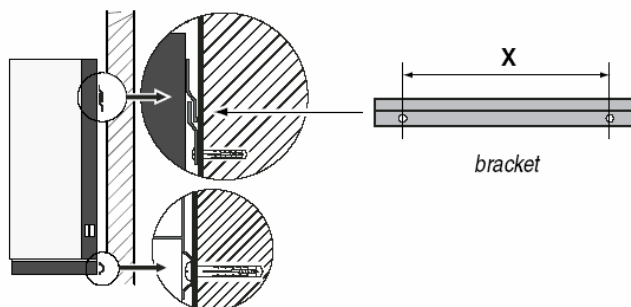


Remove the wall mounting bracket from the back of the humidifier.

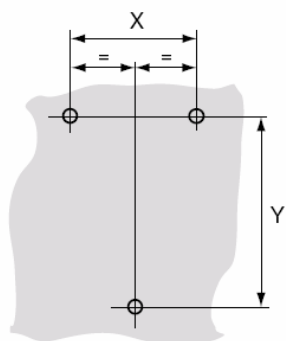
Drill holes in the wall or structure to accept screws, bolts or lag shields.

Drilling template dimensions:

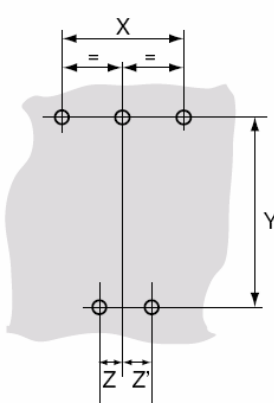
	UR002 UR004	UR006 UR010	UR020 UR027	UR040 UR060
X (in.)	8.7	8.7	19.5	26.9
Y (in.)	19.7	23.3	29.2	29.2
Z (in.)	-	-	6.2	9.8
Z (in.)	-	-	6.2	9.8



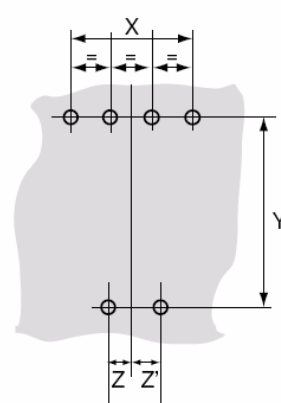
UR 2-10 kg



UR 20-27-40 kg



UR 60 kg



Attach the mounting bracket to the wall using screws, bolts or lag bolts. **Make sure the bracket is level.** The humidifier comes complete with plastic lag shields and screws for masonry wall mounting only.

Hang the humidifier on the bracket and attach the humidifier to the wall using the hole on the back part of the case, easily accessible from the bottom. Confirm that the humidifier is level and plumb, and that necessary clearances have been maintained.

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1.2 Connect Water Feed and Drain Plumbing

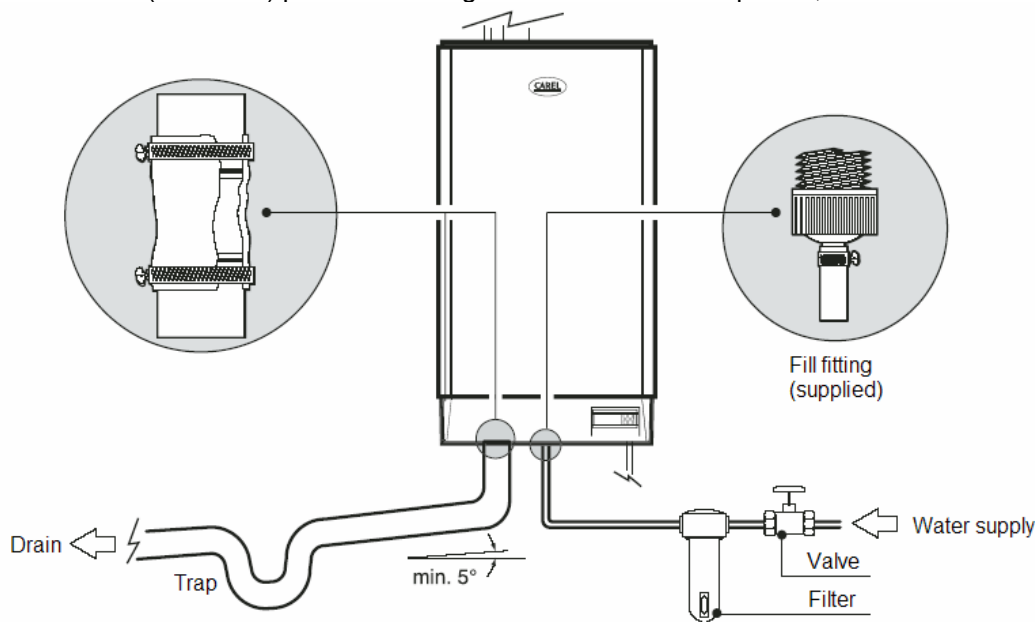
1.2.1 Feed Water Quality

The supply water to the humidifier must be potable raw or demineralized water and must not be corrosive, or contain contaminants that can produce odors. Softened water should NOT be used as it is corrosive to the aluminum heating elements. Generally, the following limits apply to the feed water:

	Unit	Minimum	Maximum
Conductivity at 20°C	MicroMhos	1	1500
Total dissolved solids (TDS)	mg/l	1	1000
Fixed residual at 180°C	mg/l	1	1000
Hydrogen activity		6	8.5
Total hardness	mg/l CaCO ₃	0	400
Temporary hardness	mg/l CaCO ₃	0	300
Chlorides	ppm Cl	=	50
Iron + Manganese	mg/l Fe+Mn	=	0.2
Silica	mg/l SiO ₂	=	20
Residual Chlorine	mg/l Cl-	=	0.2
Calcium sulphate	mg/l CaSO ₄	=	100
Metallic impurities	mg/l	0	0
Solvents, dilutents, detergents, lubricants	mg/l	0	0

1.2.2 Connect Water Feed

Connect the water feed (and drain) per the following sketch. The filter is optional, but recommended.

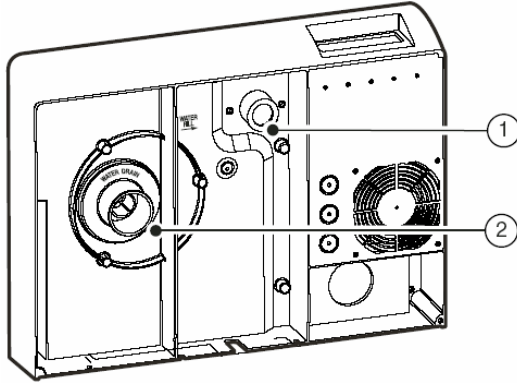


The feed water lines must be sized to supply water in the pressure and quantity required by the following table. As a rule, the water feed line should be 1/2" to within 3 feet of the unit, then reduced to 1/4" or 3/8" as shown.

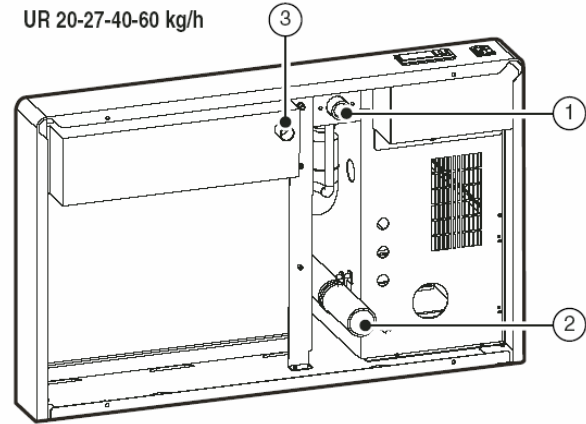
	UNIT MODEL NUMBER							
	UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
Feed Water	15 – 150 psi, <= 24 grains (418 ppm) hardness							
Instant Maximum Feed Water Flow	0.20 gpm		0.30 gpm		1.1 gpm		2.6 gpm	
Feed Water Attachment	1/4" O.D. Comp.				3/8" O.D. Comp.			

Water feed and drain connections are on the bottom of the humidifiers: 1=feed, 2&3=drain:

UR 2-10 kg/h



UR 20-27-40-60 kg/h



The water feed connection is a 3/4" MPS male connection on the bottom of the humidifier. Carel supplies a plastic adapter that screws onto the fill fitting and gives a 1/4" or 3/8" OD compression fitting for plastic or copper tubing.

Since there is a strainer built into the bottom of the fill valve fitting, you should use only the plastic adapter supplied as it is easily removable for maintenance.

A 1 1/2" air gap is built into the unit to pass all UL and local codes regarding backflow prevention.

WARNING: The plastic fill fitting should be hand tightened only. A wrench may be used on the compression fitting BEFORE connecting it to the unit.



We recommend using a 5 micron water filter on the water feed line to prevent sediment from entering the unit.

1.2.3 Connect Water Drain

The drain line can be 1-1/2" schedule 40 CPVC, 1-1/2" copper, or 1-1/2" Polypropylene. In all cases, the drain tube is slipped over the drain outlet on the bottom of the humidifier. It is not glued or otherwise attached to the humidifier, so it must be supported by itself.

If 1-1/4" schedule 40 CPVC is used, then a coupling should be used between the drain line and unit drain.

WARNING: Drain water can be up to 212°F.

WARNING: Do NOT use PVC piping unless the unit has the optional drain tempering valve installed.

The drain flow rates are listed in the following table:

	UNIT MODEL NUMBER							
	UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
Instant Maximum Drain Water Flow	1.3 gpm				6 gpm			
Drain Water Attachment	1 -1/2"							

Do not restrict the drain line in any way. The drain water must flow freely by gravity to an open drain.

NOTE: The drain line MUST be trapped just below or after the unit to prevent backflow of flash steam into the cabinet, which could short electrical components.

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1.3A Install Steam Distributor Pipes

NOTE: If the ventilated steam distributor is to be used, then go to section 4B.

Each unit has either a 1-1/4" (30 mm) diameter outlet or 1-5/8" (40 mm) diameter outlets. The model UR060 has 2 outlets. The duct distributors and steam hose must be matched in size to the diameter of the steam outlets for the units:

	UNIT MODEL NUMBER							
	UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
Steam Outlets	1-1/4" (30mm)				1-5/8" (40mm)			1-5/8" (40mm) x 2

Duct steam distributors must also be matched to the duct size they will be inserted into:

Nominal Duct Size, Inches	Distributor Length, Inches	Ordering Code	Description	Quantity Per Unit		
				Humidifier Steam Outlets, mm		
				Humidifier Steam Outlets, inches		
				30	40	2x40
				1-1/4	1-5/8	2x1-5/8
				UR 002, 004, 006, 010	UR 020, 027, 040	UR 060

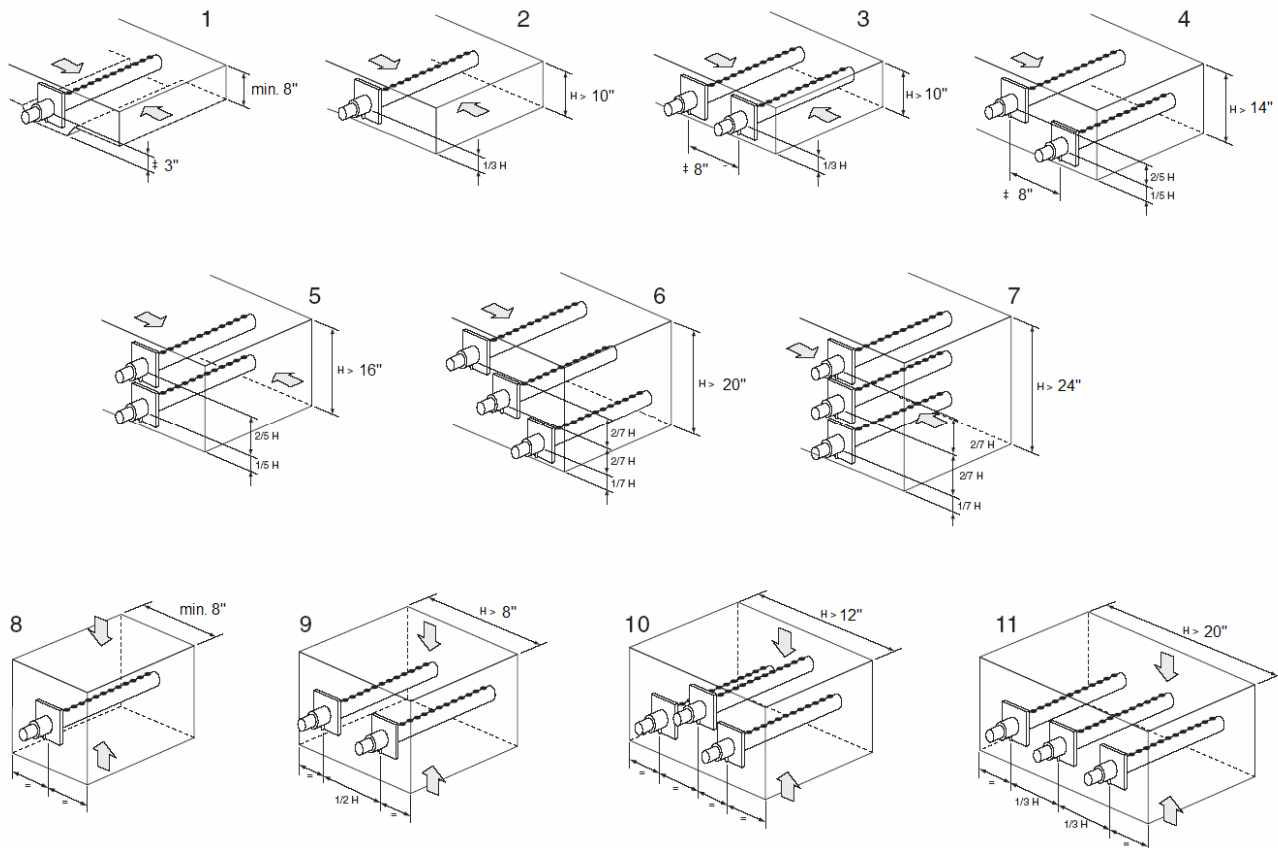
30 mm Duct Distributors:

12	11.9	DP030D30RU	Duct steam distributor, 30mm, 12", 33 lbs/hr	1	
18	17.8	DP045D30RU	Duct steam distributor, 30mm, 18", 42 lbs/hr	1	
24	23.7	DP060D30RU	Duct steam distributor, 30mm, 24", 42 lbs/hr	1	
36	33.5	DP085D30R0	Duct steam distributor, 30mm, 36", 47 lbs/hr	1	
48	41.4	DP105D30R0	Duct steam distributor, 30mm, 48", 47 lbs/hr	1	
60	49.3	DP125D30R0	Duct steam distributor, 30mm, 60", 47 lbs/hr	1	
72	65	DP165D30R0	Duct steam distributor, 30mm, 72", 47 lbs/hr	1	

40 mm Duct Distributors:

24	23.7	DP060D40RU	Duct steam distributor, 40mm, 24", 99 lbs/hr		1	2
36	33.5	DP085D40R0	Duct steam distributor, 40mm, 36", 103 lbs/hr		1	2
48	41.4	DP105D40R0	Duct steam distributor, 40mm, 48", 103 lbs/hr		1	2
60	49.3	DP125D40R0	Duct steam distributor, 40mm, 60", 103 lbs/hr		1	2
72	65	DP165D40R0	Duct steam distributor, 40mm, 72", 103 lbs/hr		1	2
84	80.8	DP205D40R0	Duct steam distributor, 40mm, 84", 103 lbs/hr		1	2

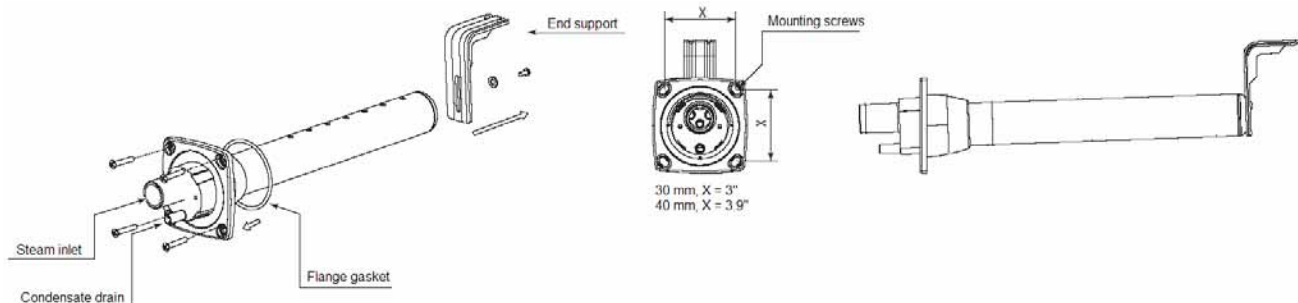
Distributor pipes should be mounted per the diagrams shown below, with a minimum of 6" from the center of the distributor pipe to the top of the duct and 3" minimum to the bottom.



In vertical flow ducts, the maximum downflow velocity is 1000 fpm. Then a baffle must be used to force the air flow around the distributor.

To install the distributor pipes:

1. Cut a key shaped hole in the side of the duct to match the steam pipe and condensate return.
2. Apply silicone sealant to the mounting plate and insert the pipe through the hole and secure it with 4 sheet metal screws.
3. Connect the steam and condensate hoses using the hose clamps supplied.
4. Make sure that the distributor pipe maintains the built-in pitch (that the mounting plate is vertically plumb).
5. End supports are provided on the larger distributors.



IMPORTANT: Allow 2 feet of straight duct downstream of the distributor pipes when the air temperature will be $>55^{\circ}\text{F}$. Allow 3 feet of straight duct if the air temperature will be $<50^{\circ}\text{F}$. Always allow 2 feet upstream. Turbulent air flow may require longer lengths.

1.3B Install the Ventilated Steam Distributor

The following are general rules. You should also consult the manual for the specific ventilated steam distributor being used.

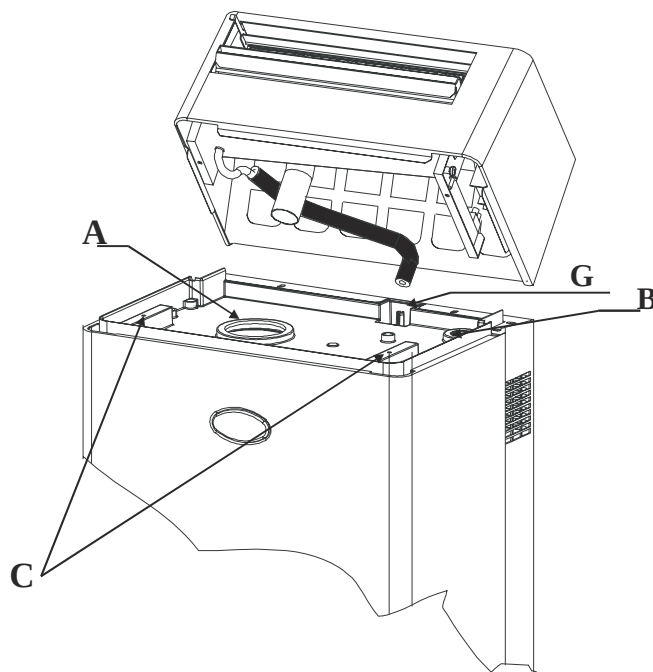
1.3B.1 Positioning

The ventilated distributor may be fitted to the top of the humidifier or alternatively there is a bottom mounting plate that allows for remote mounting, connected to the humidifier by steam hose. In both cases, the following rules should be followed.

1. Observe the rules in section 1.4 for running the steam hose;
2. The length of the steam pipe from the humidifier to the RDU must be less than 20 feet (4m);
3. Observe the rules for clearances shown in section 1.

1.3B.2 Installation

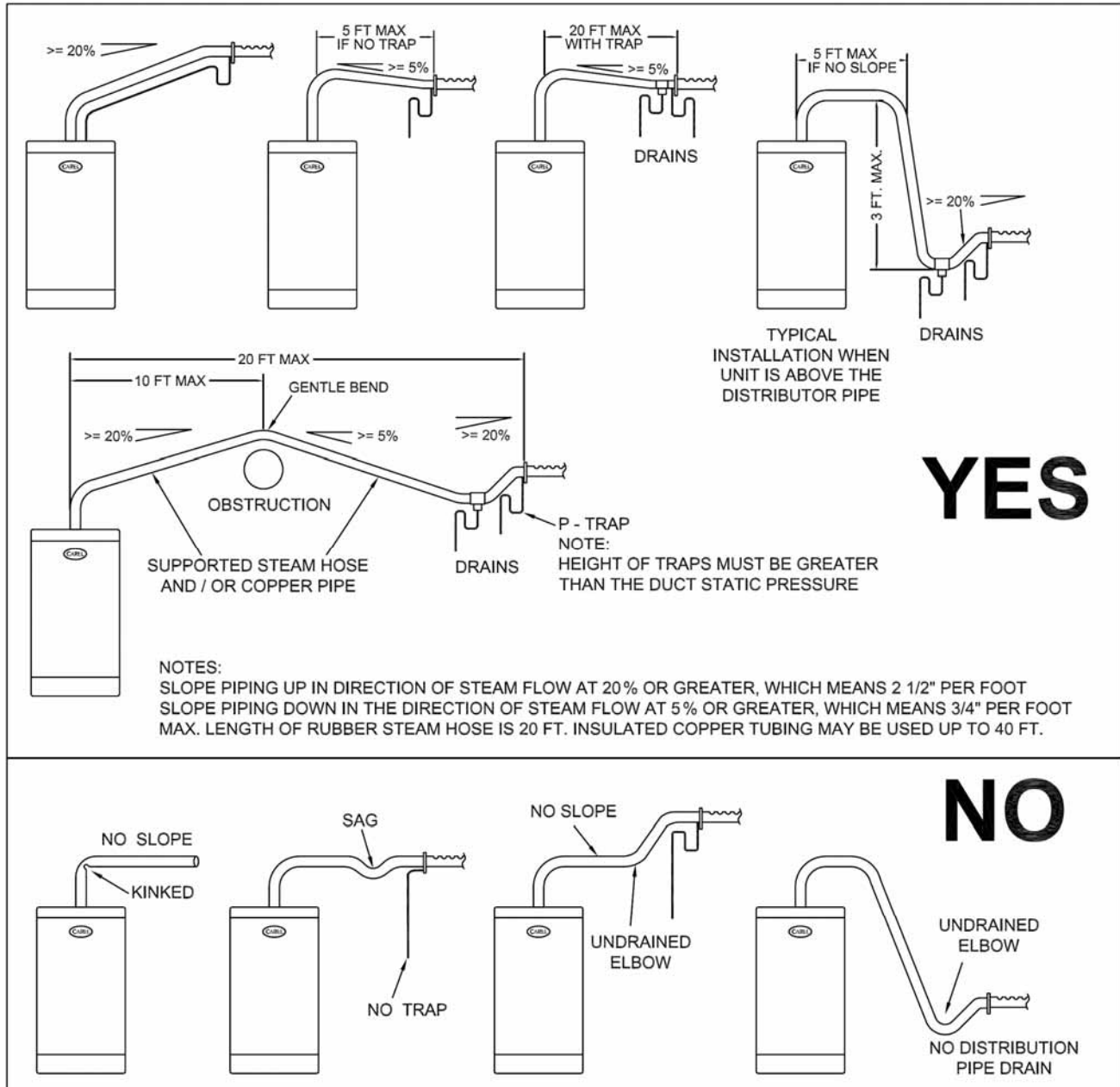
1. Remove cap A from the top of the humidifier;
2. Remove the front cover of the humidifier;
3. Open hole B located on the top of the humidifier;
4. Remove the protective guard from the ventilated distributor (see the Ventilated Steam Distributor Manual);
5. Connect one end of the steam hose to the distributor inlet and fasten it using one of the clamps supplied;
6. Connect the condensate drain hose to the special fitting inside the distributor;
7. Place the ventilated steam distributor on top of the humidifier, inserting the steam hose into hole A and connecting the condensate drain pipe to fitting G;
8. Cut the steam hose supplied to length so that it fits over the steam cylinder outlet;
9. Using the 2nd clamp supplied, fasten the steam hoses to the steam outlet on the humidifier cylinder;
10. Connect the power and ground cables from inside the humidifier to the distributor, passing them through hole B;
11. Fasten the distributor to the top of the humidifier using the two self-threading plastic screws, placed in holes C;
12. Replace the protective guard on the ventilated distributor (see the Ventilated Steam Distributor Manual) and the front cover on the humidifier.



1.4 Install Steam Hoses

NINETY PERCENT (90%) OF ALL OPERATION PROBLEMS ARE CREATED BY IMPROPER STEAM PIPING FROM THE HUMIDIFIER UNIT TO THE DUCT DISTRIBUTOR PIPES. To avoid these problems, remember one simple fact when running the steam hose: steam naturally flows up hill, and condensate naturally flows down hill. Nothing must impede the free flow of either steam to the distributor pipes or condensate back to the heaterSteam unit or the drain. Run the steam hose or piping to avoid any kinks, sharp elbows, or low spots that could collect or restrict the flow of steam to the distributor pipe, or the flow of condensate back to the humidifier. Support the hose adequately to avoid sags.

The following diagrams are to provide you with some guidelines. If you have a situation you are unsure of, please contact the factory for instructions.



IMPORTANT: Maximum length of rubber steam hose is 20 feet. Insulated copper tubing may be up to 40 feet. In all cases, minimize sharp bends and elbows – use 2-45° elbows instead of 90°s.

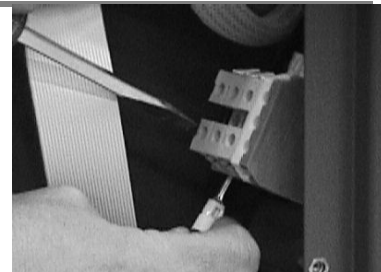
Hose size for UR 002, 004, 006, & 010 = 1 1/4" I.D. (30 mm)

Hose size for UR 020, 027, 040 and 060 = 1 5/8" I.D. (40 mm). UR 060 requires 2 hoses and distributors.

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1.5 Connect Power Wiring

Before connecting any power supply, check the data label found inside the electrical compartment door and insure that the unit is configured for the electrical supply to be connected. If it does not match, do not connect power - call your Carel representative. On the bottom of all units are wiring holes that permit external wiring to enter the unit. Insert the power wires through these holes and secure the strain reliefs.



Inside the electrical compartment of the humidifier are power terminals marked N and L for single phase, and L1, L2 and L3 for three phase units. A ground terminal is also provided. Connect power wiring to these terminals only. An external, fused disconnect should be provided according to local and national electrical codes.

V Ph.	FACTOR	UNIT MODEL NUMBER, CAPACITY, AMPERAGE, WATTAGE							
		UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
208 1	Lbs/hr	4.4	7.3	13.6					
	Kg/hr	2	3.3	6.22					
	Amps	7	11.8	22.2					
	Watts	1500	2500	4600					
230 1	Lbs/hr	5.3	8.8	13.2					
	Kg/hr	2.4	4	6					
	Amps	7.8	13	19.6					
	Watts	1800	3000	4500					
208 3	Lbs/hr			13.6	22	47.5	63.4		
	Kg/hr			6.2	10	21.6	28.8		
	Amps			12.8	20.8	45.1	60		
	Watts			4600	7500	16200	21600		
230 3	Lbs/hr			13.2	22	43.3	58.1		
	Kg/hr			6	10	19.7	26.4		
	Amps			11.3	18.8	37.1	49.8		
	Watts			4500	7500	14700	19800		
460 3	Lbs/hr			13.2	22	46.2	57.9	88.9	133.3
	Kg/hr			6	10	21	26.3	40.4	60.6
	Amps			5.7	9.4	19.7	24.7	38.1	57.1
	Watts			4500	7500	15700	19700	30300	45500
575 3	Lbs/hr			13.2	22	43.1	57.2	88.2	132.2
	Kg/hr			6	10	19.6	26	40.1	60.1
	Amps			4.5	7.5	14.8	19.4	30.2	45.3
	Watts			4500	7500	14600	19500	30000	45100

Allowed voltage tolerance: +-10% of rated voltage.

Internal fuses

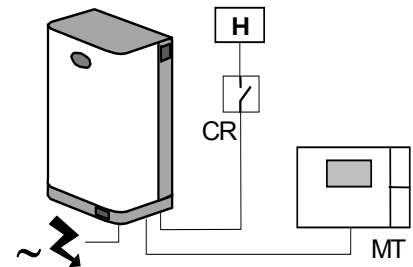
	Fuse Sizes for Models								
	UR002	UR004	UR006-1Ph.	UR006-3Ph.	UR010	UR020	UR027	UR040	UR060
Fuses 1, 2 transformer primary	1A, 10.3x38mm fast blow					0.5A, 10.3x38mm (460,575V) fast blow 1A, 10.3x38mm (208,230V) fast blow			
Fuse 3 drain pump	1A, 10.3x38mm, fast blow								
Fuse 4 transformer secondary	2.5A, 5x20 ceramic, slow blow								
Fuses F5, F6, F7 (208,230V)							40A, J		35A, J
Fuses F8, F9, F10 (208,230V)							40A, J		50A, J

1.6 Connect Control Wiring

1.6.1 Control Schemes

Control type: ON/OFF

The humidifier can be controlled either by a mechanical humidistat (H) or by a remote voltage-free contact (CR) or by a combination of the two options. The control system can also be connected to an RS485 serial line using either a CAREL remote display control panel (MT) or a remote supervisor.

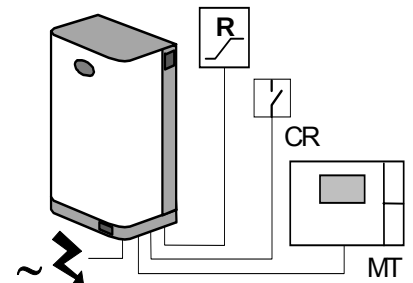


Control type: MODULATING

The humidifier comes with a solid state relay which allows you to modulate its capacity from 0 up to 100%, depending on your application requirements. There are four different control modes for the H type control models.

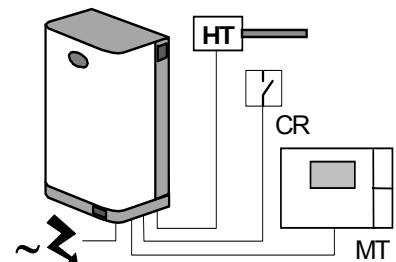
- **DDC mode, using a signal from an external controller**

Steam production is controlled by an external controller (R) which provides a modulating signal to the humidifier controller. The signal can be: 0-1Vdc; 0-10Vdc; 2-10Vdc; 0-20mAac; 4-20mAac.



- **DDC mode with high-limit humidity sensor**

Steam production is controlled by an external controller, but a relative humidity sensor is connected to allow high-limit protection.

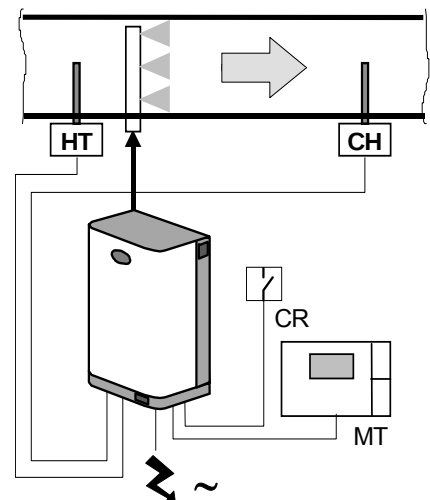


- **Stand-alone control with relative humidity sensor**

This configuration includes the use of an internal control connected to a humidity sensor (HT) which fully controls the humidifier depending on the level of humidity measured. The level of humidity is displayed on the controller, and set points and differential are entered on the keypad.

- **Stand-alone control with relative humidity sensor and a second sensor to limit the humidity of the supply air**

This configuration includes an internal control connected to a humidity sensor (HT) which fully controls the humidifier depending on the level of humidity measured, but limits the steam output by the level of relative humidity measured by the supply duct sensor (CH).



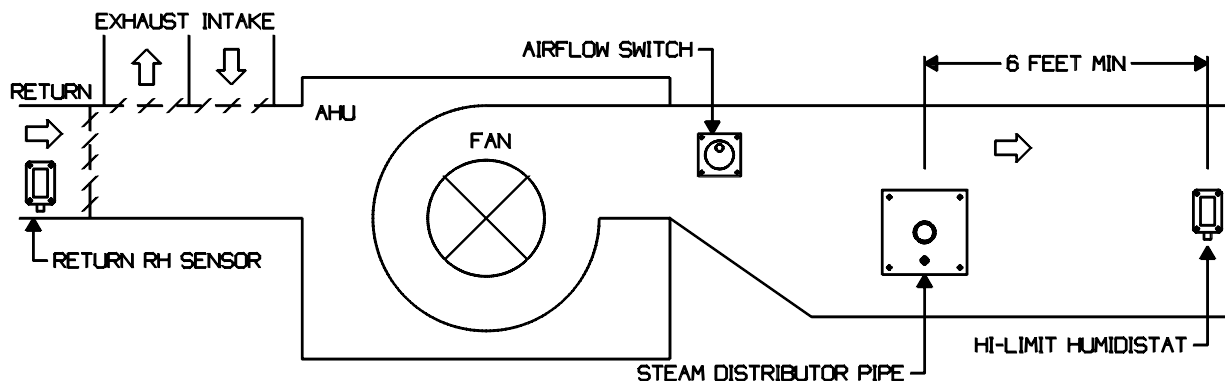
1.6.2 Controls Placement

A typical humidifier control system includes a wall or return duct sensor or controller, a high limit duct humidistat, and an air proving switch. Placement of these devices is critical to proper operation of the overall system.

The return air RH sensor must always be located BEFORE any outside air intake, in order to insure accurate sensing of the air from the space. Alternatively, a room RH sensor or humidistat can be used. Room sensors should be located on an inside wall or post and should not be hit by any discharge air streams from ducts. In a 100% outside air system, the RH sensor may be placed in the supply duct, at least 10 feet down stream of the distributor pipe to act as both hi-limit and control.

The airflow switch must be positioned to accurately open on a loss of air flow, to prevent the humidifier from running when there is no air to absorb the moisture.

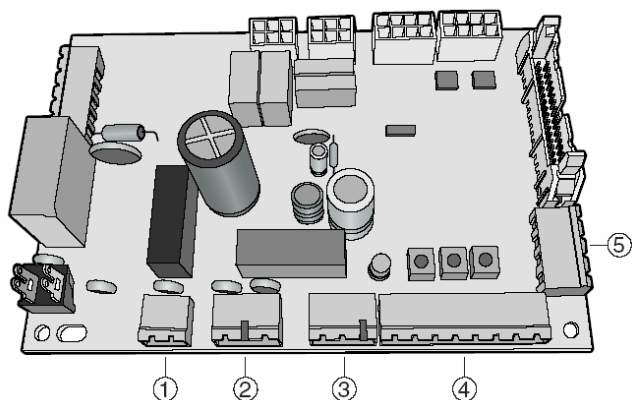
The hi-limit humidistat must be positioned far enough down stream of the steam distributor pipe(s) to prevent it from getting wet, but still allow it to accurately prevent over-humidification of the duct that could result in condensation.



1.6.3 Control Wiring

Control wiring to the heaterSteam is done directly to Terminal Block I on the UR control board located inside the electrical compartment.

The connection to these terminals is done according to the unit and mode of operation ordered and shipped from the factory.



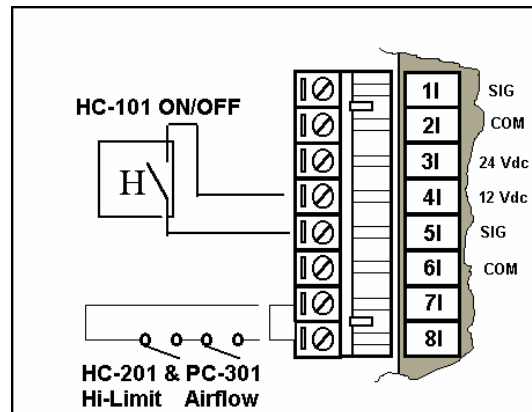
Key:

1. Terminal block G (dehumidify contact);
2. Terminal block H (alarm contact);
3. Remote manual Drain command terminal block K;
4. Terminal block I (control signals);
5. Terminal block J (to remote terminal or supervisor system)

1.6.4 Control Wiring for On/Off Operation

This control program is for On/Off operation in response to an external closed contact as from a humidistat or DDC relay. Parameter A0=0

If the Hi-Limit and Airflow switches are not used, then place a jumper across terminals 7I and 8I. **WARNING: connect an external dry contact to terminals 7I and 8I. Do not apply any voltage to these terminals. Max. 50 ohm resistance. DO NOT apply voltage to any input in On/Off control.**

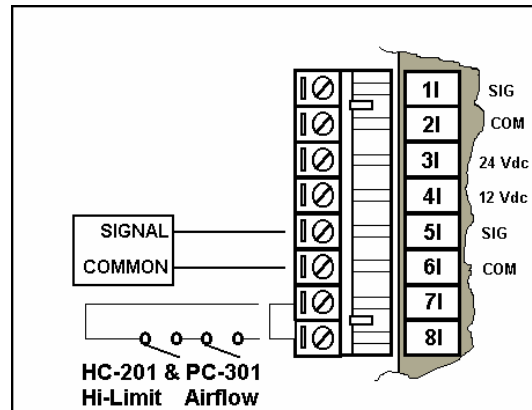


1.6.5 Control Wiring for Modulation to External Signal

This control program is designed to accept various modulating input signals: 0-10 Vdc, 2-10 Vdc, 0-20 mAdc, and 4-20 mAdc. Parameter A0=1.

If the Hi-Limit and Airflow switches are not used, then place a jumper across terminals 7I and 8I. **WARNING: connect an external dry contact to terminals 7I and 8I. Do not apply any voltage to these terminals. Max. 50 ohm resistance.**

NOTE: The modulating signal must come from a controller or DDC system, not a sensor. This control program follows the input signal, being off at low signal and full on at high signal.

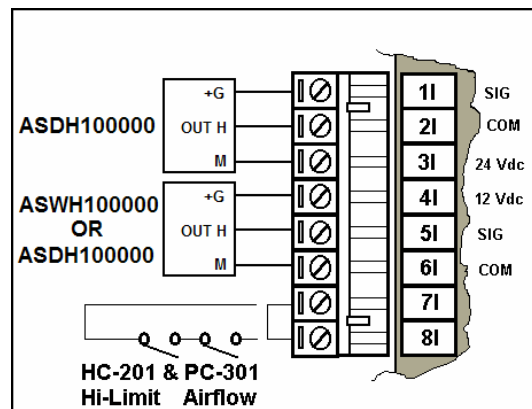
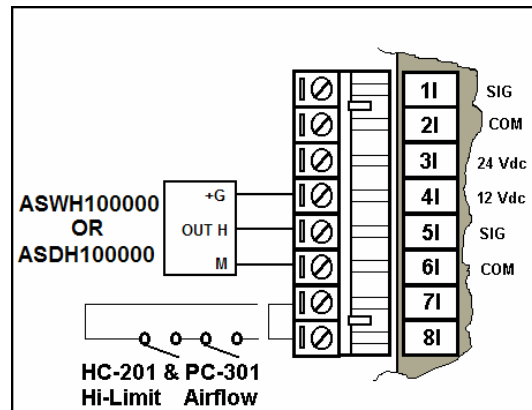


1.6.6 Control Wiring for Stand-Alone Modulation with Humidity Display

This control program is designed to accept an input signal from a humidity sensor (not controller). Parameter A0=2. This input signal is then displayed on the controller as the relative humidity. Set point and differential are entered into the controller, making it stand-alone. To the right is the wiring for the ASWH10000 wall mount sensor and the ASDH10000 duct mount sensor.

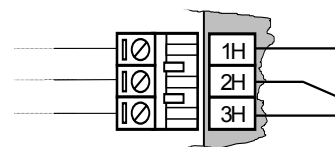
This control program can also accept a second sensor (in this example shown as an ASDH10000 duct sensor), which acts as a high limit and will modulate the output down on approaching either the main set point or the high limit set point. Parameter A0=3. This is a very useful feature in VAV systems where the air flow can vary, and also in high precision applications where the on/off cycling of a high limit humidistat would be detrimental to precision.

If the Hi-Limit and Airflow switches are not used, then place a jumper across terminals 7I and 8I. **WARNING: connect an external dry contact to terminals 7I and 8I. Do not apply any voltage to these terminals. Max. 50 ohm resistance.**



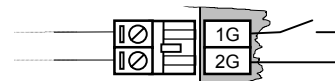
1.6.7 Alarm Contact

The controller also provides a SPDT relay contact for the remote indication of any alarm conditions. Connection to the alarm contact (max. voltage 250 Vac; max. capacity: 8A res. - 2A ind.) is made through the plug-in H terminal block, as shown at right. See Parameter b1 for setting N/O or N/C mode of relay.



1.6.8 Dehumidification Contact

In the H Type control program, a SPST – N/O relay contact is available, which can be programmed to actuate an external dehumidifier. Connection to the dehumidifier contact (max. voltage 250 Vac; max. capacity: 8A res. - 2A ind.) is made through the plug-in G terminal block, as shown at right.

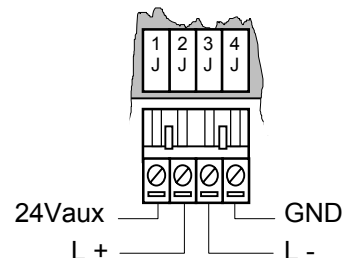


1.6.9 Remote Terminal/Supervisor System

The controller of the humidifier can be connected to an RS485 serial line as shown at right, to ultimately connect to:

- a Carel control panel (see dedicated manual) to manage up to 4 humidifiers;
- a remote supervisor system.

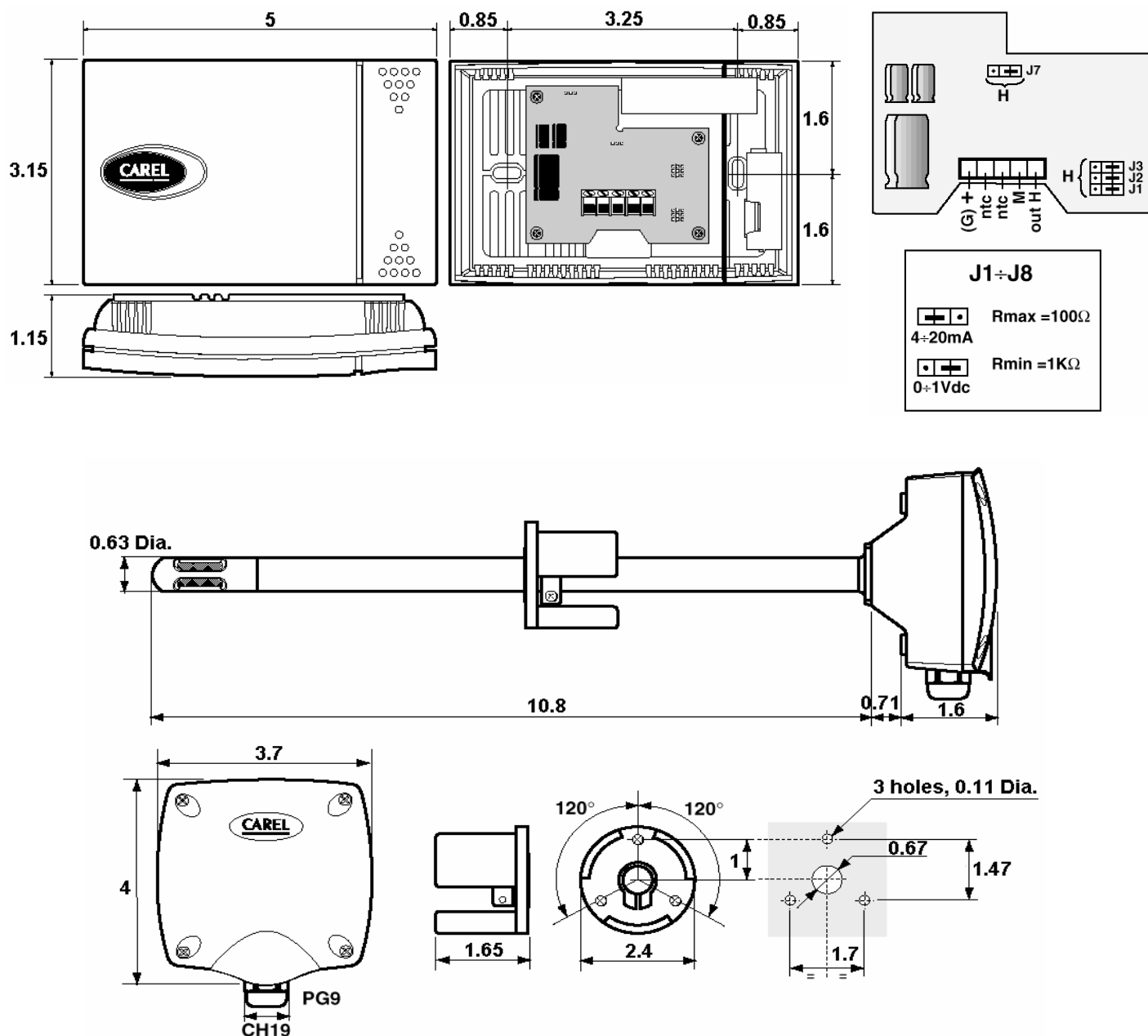
Maximum network distance = 1 mile.



Data sheets of the controls commonly supplied by Carel USA with the HeaterSteam humidifier are following.

ASWH / ASDH – ASDH / ASDC Wall – Duct Temperature/Humidity Sensors

Model	Description	
Humidity (0-1 VDC or 4-20 mADC)		Temperature: NTC thermistor, 10 Kohm at 25°C (77°F) (ASWC/ASDC only) Accuracy: +- 0.25°C from 0 to 50°C (32 to 122°F)
ASWH100000	Wall Humidity sensor (replaces SHWOOP)	Humidity: Thin film capacitor Linear 0-1 Vdc or 4-20 mAdc from 10 to 90%RH Accuracy: +- 3%RH from 20 to 90%RH calibrated at 55%RH and 25°C (77°F) +- 5%RH above 90%RH and below 20%RH
ASDH100000	Duct Humidity sensor (replaces SSDOMH00/1)	
Temperature & Humidity (NTC temp, 0-1 VDC or 4-20 mADC humidity)		Response time: 60 seconds Power: 12 to 24 Vac/dc or +12 to -12 Vdc Housing: Wall: ABS with glassfiber fill Certifications: Calibrated to NIST traceable humidity/temperature standard, CE Approved
ASWC111000	Wall Temp/hum sensor (replaces SWNTCTH0/1 & STHONTC0/1)	
ASWC110000	Wall Temp/hum sensor (replaces STHOAP)	
Temperature & Humidity (0-1 VDC or 4-20 Madc temp & humidity)		
ASDC111000	Duct temp/hum sensor (replaces SDNTCTH0/1)	
ASDC110000	Duct temp/hum sensor (replaces SSDOMHT0/1)	



Installation, Operation & Maintenance Manual

HC-101 and HC-201 Wall and Duct Humidistats

Mounting the HC-101 room humidistat: Mount the HC-101 humidistat to an inside wall or post in the area to be humidified. Position it so that no drafts from registers or outlets are blowing on it. Be sure that it is not placed over a device that could generate heat or vapor ie: stove, machinery, cleaning vat. The unit has three wire leads, Orange, Brown and Red. Use the Orange and Brown leads for control operation. Use the Orange and Red leads for hi-limit operation.



HC-101



HC-201

Mounting the HC-201 duct humidistat: Cut a hole in the side of the duct and mount the HC-201 humidistat to the duct, using the screws provided, at least 6 feet down stream of any live steam or mist. The unit has three wire leads, Orange, Brown and Red. Use the Orange and Brown leads for hi-limit operation.

Wiring Diagram

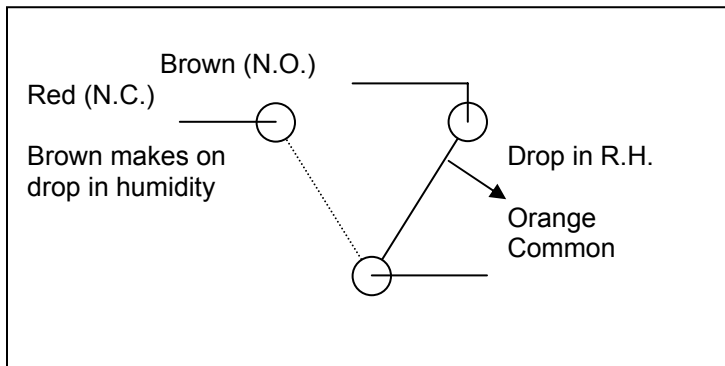


TABLE 1. SPECIFICATIONS

Part No.	Type	Scale Range %RH	Diff. %RH	Operating Limits °F	Shipping & Storage °F	Connection	Cover	Dimensions In.
HC-101	Wall	10 to 90	5	40 to 125	-40 to 140	6" color coded leads	Beige plastic	4-3/8 x 2-7/8 x 1-5/8
HC-201	Duct	15 to 95	5	40 to 125	-40 to 140	Coded screw terminals	Metal	4-3/4 x 6-1/2 x 2-1/4

TABLE 2. MAXIMUM ELECTRICAL RATINGS

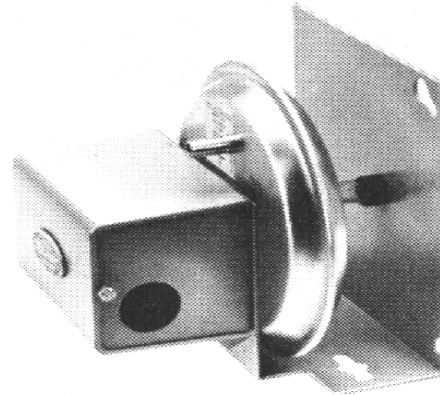
Part No.	AC Volt 50/60 Hz	FLA	LRA	Resistive Amps	Pilot Duty VA
HC-101	24	-	-	8	60
HC-201	120	7.2	43.2	8	345
	240	3.6	21.6	8	345

PC-301 Air Proving Switch

Mounting the PC-301 air flow switch:

Mount the airflow switch in the supply or return duct using the screws supplied. Mount the device so that the diaphragm is in a vertical position as shown at right.

If the airflow switch is to be mounted on the return duct (vacuum), then mount it in a vertical position by the small plate. Drill a 7/16" hole in the side of the duct and connect the supplied tubing to the low pressure tap on the airflow switch and then run it through the drilled hole in the duct. Put no more than 2" of tubing into the duct. Caulk around the tubing where it enters the duct. The high pressure tap is left open to atmosphere.



If the airflow switch is to be mounted to the supply duct (pressure), then simply drill a 7/16 hole in the side of the duct, apply caulking to the large plate, and mount the device with the large plate to the duct and the high pressure tap/tubing mated the hole. The low pressure tap is left open to atmosphere.

MOUNTING DIAGRAMS

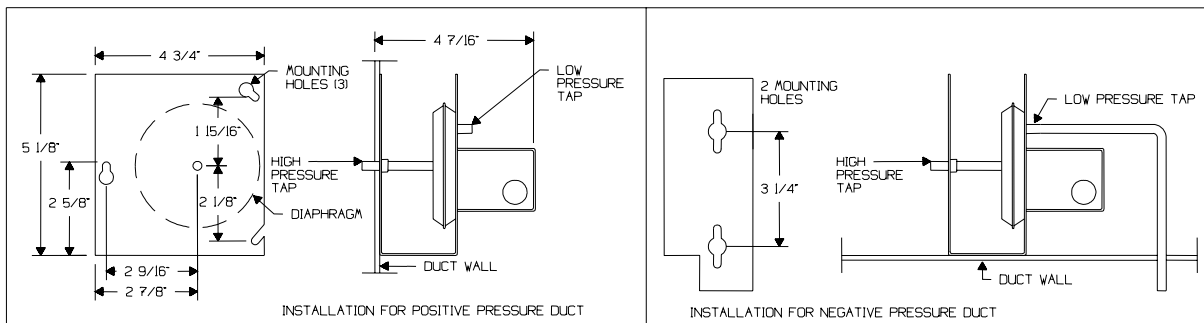
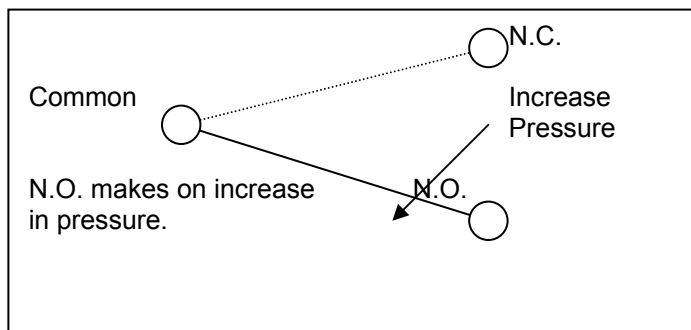


TABLE 1. MAXIMUM ELECTRICAL SWITCH RATINGS

Vac	Full Load Amps	Locked Rotor Amps	Pilot Duty (VA)	Non-Inductive Amps
24V	-	-	60	10
120V	6.25	37.5	300	10
240V	3.1	18.6	300	10
277V	2.7	16.2	300	10

WIRING DIAGRAM



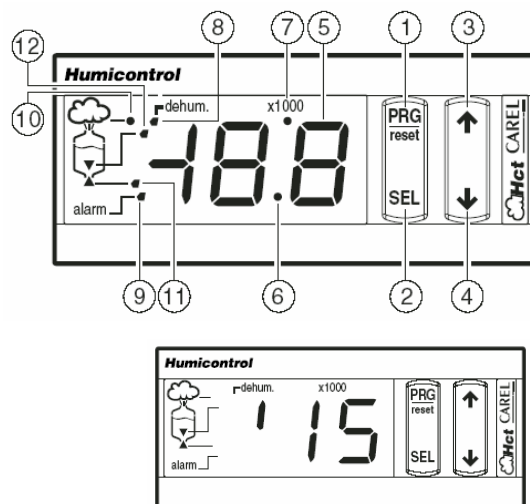
2 Start Up And Check Out Of The heaterSteam Humidifier

2.1 Startup Checklist

- ☐ 1. Water feed and drain lines are connected properly. Fittings are tight.
- ☐ 2. All power connections, including internal ones, are correct and tight.
- ☐ 3. Wires to the electric elements on top of the cylinder are tight.
- ☐ 4. Steam and condensate hoses are properly installed and supported to prevent sags.
- ☐ 5. Sensors and limits are connected per the instructions.
- ☐ 6. Airflow switch (if used) is set to close on air flow and open on air flow loss.
- ☐ 7. Hi-limit duct humidistat is set to open on humidity rise and is set for 80 to 85%RH.

2.2 The Display

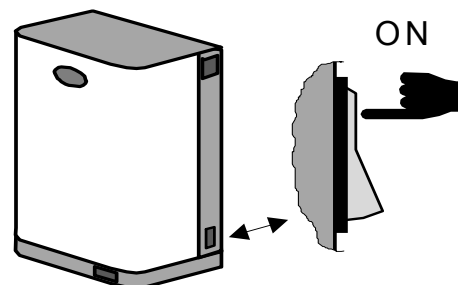
- 1 PRG and Reset button: accesses parameters and resets alarms;
- 2 SEL button: selects parameters and displays set point;
- 3 UP button: increases values or scrolls to next parameter;
- 4 DOWN button: decreases values or scrolls to previous parameter;
- 5 2-1/2 digit numeric display for values and codes;
- 6 LED indicating decimal point;
- 7 LED indicating value times 1000;
- 8 LED indicating dehumidify mode;
- 9 LED indicating alarms;
- 10 LED indicating steam production;
- 11 LED indicating fill function;
- 12 LED indicating drain function.



Numeric values from 200 to 255 are displayed with the symbol ¹ in place of the one hundreds digit.

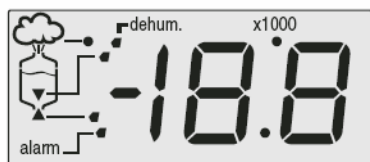
2.3 Turning on the Humidifier

Check that the voltage supply is correct then close the disconnect switch on the power supply to the humidifier (supplied by other), turn on the unit with the switch on the right lower frame of the humidifier as indicated in the picture at right. The start-up procedure includes an initial phase, self-test phase, and the operating phase. Depending on the control model of the humidifier, the start-up procedure will be shown by the indication LEDs as described below.



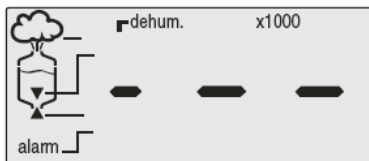
H type controller

1. POWER SUPPLY



During this phase, lasting about 1 second, all LEDs will be powered.

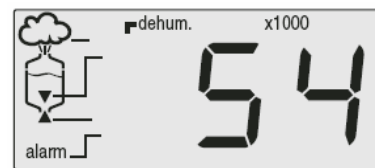
2. STARTING STEP



During this phase the self-test is running. This phase lasts about 4 seconds.

The self-test can be bypassed by pressing and holding the SEL button until "-nt" appears in the display.

3. OPERATING STEP



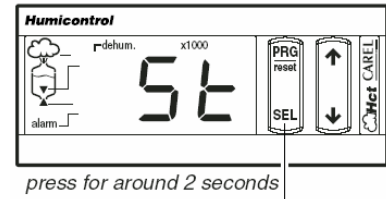
The humidifier is ready to work and the control indicates: steam output in the DDC control mode; the measure of the main sensor in the stand-alone mode; if the remote contact is open, the three dashes will be alternately displayed.

In the event of alarm, the LED near 'ALARM' will turn on and the corresponding alarm code will be displayed.

3 Operating the heaterSteam humidifier

3.1 Display/Set The Humidity Setpoint

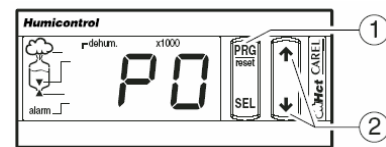
- Pressing SEL will first show the rH and value;
- Hold down SEL for about 2 seconds until "St" appears in the display;
- When you release the button, the display will show the unit of measure of the set-point for 1 second and, after that, its current value;
- To modify the set-point, press the UP and DOWN buttons until you reach the desired value;
- Press SEL or PRG to confirm the displayed value and exit the set-point programming procedure.



NOTE: Pressing UP at any time displays the control sensor value. Pressing DOWN displays the hi-limit value.

3.2 Display/Change Control Parameters

- Press and hold the PRG (1) button for 5 seconds until P0 is displayed;
- Press UP (2) to continue through the parameter list (P, d parameters) in order. Press DOWN (2) to reverse through the parameter list.
- To modify any parameter, press SEL. The unit will display for 1 second, followed by the value;
- Press UP or DOWN to increase or decrease the value;
- Press SEL when done to lock in the new value;
- Press UP or DOWN to continue through the parameters if desired;
- Press PRG when done to lock in all changes and exit programming mode.



3.3 Display/Change Configuration Parameters

- Press and hold the PRG and SEL buttons (1) simultaneously (or press the middle between the two buttons) for at least 5 seconds until "00" is displayed;
- Press UP and DOWN to enter "77", followed by SEL, after which "A0" will be displayed;
- Press UP (2) to continue through the parameter list (A, b, C, d parameters) in order. Press DOWN (2) to reverse through the parameter list.
- To modify any parameter, press SEL. The unit will display for 1 second, followed by the value;
- Press UP or DOWN to increase or decrease the value;
- Press SEL when done to lock in the new value;
- Press UP or DOWN to continue through the parameters if desired;
- Press PRG when done to lock in all changes and exit programming mode.



3.4 Control Parameters ("Px") And Measured Values ("Dx")

Code	Range	Default	Unit	Description	Notes
Control Parameters					
P0	10 to 100	100	%	maximum output	if modulation is disabled (b0=0), the output is always at 100% regardless of P0
P1	2.0 to 19.9	5.0	%RH	proportional band	can only be accessed in stand-alone mode (A0=2 or 3)
P2	(P3) to 100	100	%RH	high humidity alarm set point	
P3	0 to (P2)	0	%RH	low humidity alarm set point	
P4	0 to 100	5	minutes	alarm delay	
P5	2 to 100	10	%RH	dehumidify dead zone	can only be accessed with dehumidify function enabled (b1=2 or 3)

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Code	Range	Default	Unit	Description	Notes
P6	2.0 to 19.9	5.0	%RH	dehumidify differential	
P7	(St) to 100	100	%RH	hi-limit sensor set point	can only be accessed in stand-alone mode with outlet probe (A0=3)
P8	2.0 to 19.9	5.0	%RH	hi-limit sensor proportional band	
P9	0 to 100	100	%RH	hi-limit humidity alarm set point	
Display Parameters					
d1	0 to 100	display only	% %RH	external signal %RH reading from sensor	can only be accessed in proportional or stand-alone mode (A0=1, 2 or 3)
d2	0 to 100		%RH	%RH reading from hi-limit sensor	can only be accessed in stand-alone mode with hi-limit sensor (A0=3)
d3	0.0 to 199		kg/h	steam output	
d4	0 to 19900		h	run time hour counter	
d5	0 to 1500		mS/cm	water conductivity	
d6	0 to 100		°C	water temperature	can only be accessed with preheat function enabled (b1=1 or 3)
d9	0.0 to 199		kg/h	rated steam capacity	

3.5 Configuration Parameters (“Ax”, “bx”)

Code	Range	Default	Unit	Description	Notes
Standard Configuration Parameters					
A0	0 to 3	2		operating mode	0= On/Off 1= proportional to external signal 2= stand-alone with control sensor 3= stand-alone with control and hi-limit sensors
A1	0, 1	0		unit of measure	0= °C, kg/h 1= °F, lbs/hr
A2	0 to 4	0		control sensor signal type (only in proportional or stand-alone mode (A0=1, 2 or 3))	0= 0 to 1 Vdc 1= 0 to 10 Vdc 2= 2 to 10 Vdc 3= 0 to 20 mAdc 4= 4 to 20 mAdc
A3	0 to (A4)	0	%RH	control sensor minimum signal	
A4	(A3) to 255	100	%RH	control sensor maximum signal	
A5	-10.0 to 10.0	0	%RH	control sensor calibration	
A6	0 to 4	0	%RH	hi-limit sensor signal type (only in stand-alone with hi-limit mode (A0=3))	0= 0 to 1 Vdc 1= 0 to 10 Vdc 2= 2 to 10 Vdc 3= 0 to 20 mAdc 4= 4 to 20 mAdc
A7	0 to (A8)	0	%RH	hi-limit sensor minimum	
A8	(A7) to 100	100	%RH	hi-limit sensor maximum	
A9	-10.0 to 10.0	0	%RH	hi-limit sensor calibration	

Code	Range	Default	Unit	Description	Notes
Accessory Device Configuration Parameters					
b0	0 to 199	**	s	period of modulation	if set to 0, modulation is disabled
b1	0 to 3	0		special functions (only when A0= 1, 2 or 3) Total up the functions to arrive at parameter setting.	0= no function +1= preheat stand-by +2 = dehumidification +4 = disables CL maint. alarm +8 = reverses alarm relay to N/C +16 = disables inactivity drain +32 = disables autotest
b2	2 to 19.9	3.0	% %RH	preheat start offset	
b3	70 to 90	80	°C	preheat temperature	
b4	0 to 2000	0	mS/cm	supply water conductivity	0= use sensor value; otherwise, entered value is used
b5	0 to 2000	1250	mS/cm	conductivity pre-alarm set point	
b6	0 to 2000	1500	mS/cm	conductivity alarm set point	
b7	0 to 100	50	%	anti-foaming control detection set point	0= anti-foam control disabled
b8	1 to 50	Factory Set		No. of cycles between drains	used to force a specific number of boil cycles before drain cycles are allowed
b9	0 to 100	0	minutes	minimum time to go from 0 to 100% steam output	
bA	20 to 100	100	%	fill duration	reducing this value can provide more precision, but more wear on the fill valve
bb	-19.9 to 19.9	0	%	offset to steam output display value	
bC	1 to 199	3	days	days of inactivity to trigger automatic drain down	b1 must be set to +4 of normal value. "idr" is displayed if unit drains for inactivity.
bD	0 to 190	100	%	dilution rate	0= no draining (Warning: use only with demineralized water). <100= reduced drain rate for higher precision, but could lead to more foaming and maintenance. >100 = increased drain rate for hard water.
bE	5 to 199	199	s	PWM fill mode	<199= sets time maximum for each fill operation to improve precision.

3.6 Serial and Remote Control Parameters ("Cx")

Code	Range	Default	Unit	Description	Notes
Serial and Remote Control Parameters					
C0	1 to 6	1		default display value	1= control sensor 2= hi-limit sensor 3= steam output level 4= run time hours 5= water conductivity 6= water temperature

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Code	Range	Default	Unit	Description	Notes
C1	0 to 4	4		enable keypad and remote control	Keypad: Remote control: 0= K: read all parameters, modify C1 R: read/modify P, d and St 1= K: read and modify all parameters R: read/modify P, d and St 2= K: read all parameters, modify C1 R: read P, d and St 3= K: read and modify all parameters R: read P, d and St 4= K: read and modify all parameters R: read/modify all
C2	0 to 99	0		code for enabling remote control	
C3	0 to 199	1		serial address	
C4	0 to 3	3		baud rate	0= 1200 1= 2400 2= 4800 3= 9600
C5	0 to 11	0		bits, parity, stop bits	0= 8,N,2 6= 7,N,2 1= 8,N,1 7= 7,N,1 2= 8,E,2 8= 7,E,2 3= 8,E,1 9= 7,E,1 4= 8,O,2 10= 7,O,2 5= 8,O,1 11= 7,O,1
C6	0 to 199	0	ms	serial reply send delay	
C7	0 to 3	0		graphic germinal configuration	0= standard terminal 1= terminal with On/Off command 2= terminal with On/Off and control sensor 3= terminal with On/Off and hi-limit sensor

3.7 Standard Configuration Settings

CODE	DDC 0-10 vdc	DDC 4-20ma	ON / OFF	STAND ALONE	STAND ALONE WITH HIGH LIMIT
A0	1	1	0	2	3
A1	1	1	1	1	1
A2	1	4	N/A	0	0
A3	N/A	N/A	N/A	0	0
A4	N/A	N/A	N/A	100	100
A5	N/A	N/A	N/A	0	0
A6	N/A	N/A	N/A	N/A	0
A7	N/A	N/A	N/A	N/A	0
A8	N/A	N/A	N/A	N/A	100
A9	N/A	N/A	N/A	N/A	0
b0	20	20	0	10	10
b1	0	0	0	0	0
b2	N/A	N/A	N/A	N/A	N/A
b3	N/A	N/A	N/A	N/A	N/A
b4	0	0	0	0	0
b5	1'2 (1200)	1'2 (1200)	1'2 (1200)	1'2 (1200)	1'2 (1200)
b6	2'0 (2000)	2'0 (2000)	2'0 (2000)	2'0 (2000)	2'0 (2000)
b7	50	50	50	50	50
b9	0	0	0	0	0
C0	1	1	1	1	1
C1	4	4	4	4	4
C2	0	0	0	0	0
C3	1	1	1	1	1
C4	3	3	3	3	3
C5	0	0	0	0	0
C6	0	0	0	0	0
C7	0	0	0	0	0
d1	*	*	*	*	*
d2	*	*	*	*	*
d3	*	*	*	*	*
d4	*	*	*	*	*
d5	*	*	*	*	*
d9	*	*	*	*	*
P1	N/A	N/A	N/A	0	0
P2	N/A	N/A	N/A	100	100
P3	N/A	N/A	N/A	0	0
P4	N/A	N/A	N/A	60	60
P5	N/A	N/A	N/A	N/A	N/A
P6	N/A	N/A	N/A	N/A	N/A
P7	N/A	N/A	N/A	N/A	0
P8	N/A	N/A	N/A	N/A	0
P9	N/A	N/A	N/A	N/A	0
ST	N/A	N/A	N/A	50	50

3.8 Manual Draining

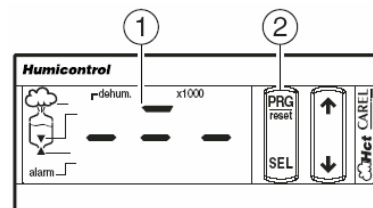
The humidifier may be manually drained by pressing and holding the manual drain switch, which is right next to the On/Off switch on the side of the unit. Or, the unit may be set to a manual drain mode:

- turn off the unit from the On/Off switch on the side;
- turn the unit back On;
- within 5 seconds, press and hold the UP and DOWN buttons simultaneously until the drain valve or pump activates.

3.9 Resetting Factory Set Values (Default Values)

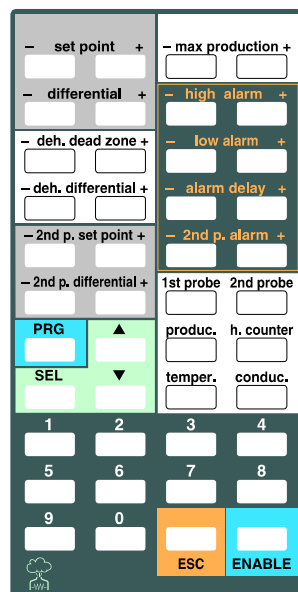
To automatically reset all values to factory set values in the control memory follow these instructions (**Caution:** resetting individual parameters per section 3.7 may be safer):

- turn the unit OFF;
- turn it ON again;
- press and hold the PRG button (2) within 5 seconds after turning on the unit: the three dashes will appear on the display; keep the button pressed and after about 5 seconds the upper dash (1) will blink, as indicated in the picture;
- release the PRG button within 3 seconds: all factory-set parameters will be restored. As confirmation, the display will show the symbols represented in the picture for 2 seconds.
- the operation is not carried out if you keep the PRG button pressed for more than 3 seconds, until the upper dash disappears.



3.10 The Remote Control

The remote control is optional and can be used only with type H or T modulating control humidifiers. Its code is: TELUR*000, where * = E and identifies the English text version.



The remote control allows parameters to be displayed and modified using a more comprehensive keypad. When passwords are engaged, it is also possible to use the remote control as a master control.

Description and functions of the buttons

The buttons can be divided into three groups, according to their functions:

- buttons used to activate/deactivate the use of the remote control
- pre-programmed buttons used to modify the values of the main parameters
- buttons used to control the unit keypad via remote control

Buttons used to activate/deactivate the use of the remote control

These buttons enable/disable the use of the remote control unit. They also allow you to store new parameter values.

BUTTON	FUNCTION
START	Enables the use of the remote control
PRG	Ends the programming procedure and stores the new parameter values;
CANCEL	Cancels possible modifications;
Numeric keypad	Allows you to select the access code to parameters (buttons from 0 to 9)

Buttons used to modify the main parameters (direct access buttons)

The most frequently used parameters are directly indicated on the remote control. They are grouped in three different colored zones according to their function. Each parameter, which can be modified, has two buttons: the one marked “+” allows you to increase the value, the one marked “-” allows you to decrease the value. The buttons without “+” or “-” allow you only to display the value given to each parameter.

Buttons used to control the instrument keypad via remote control

The green/blue section on the remote control allows you to:

BUTTON	FUNCTION
PRG	stores all modifications and ends the programming procedure;
SEL	displays the unit of measure and the value of the selected parameter; confirms the modified value and displays the parameter;
▲	goes to the next parameter; increases the displayed value during the setting of the parameter values;
▼	goes to the previous parameter; decreases the displayed value during the setting of the parameter values;

Enabling the control when there is no identification code (single unit)

Press the START button to enable the use of the remote control, making sure you are not in the programming mode, the first accessible parameter appears. Whenever two figures are displayed, an operating code is necessary to modify the parameters.

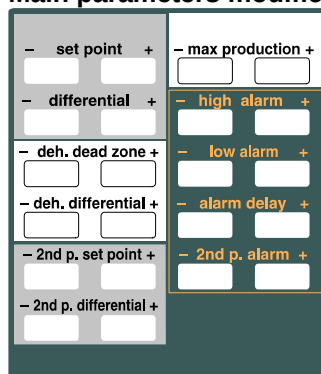
Enabling the control when there IS an identification code (multiple units)

Press the START button to enable the use of the remote control, making sure you are not in the programming mode. All the humidifiers within the infra-red beam will display their own identification code. To modify the parameter values of any unit, use the numeric keypad on the remote control to enter the address of the unit you want to operate. If the code is correct, the first accessible parameter is displayed, and you can then modify it.

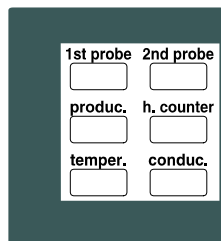
Activation and deactivation of the access code (C2 parameter)

It is possible to activate and deactivate the access code for the remote control by entering the Level 3 (77) password configuration mode. By giving the C2 parameter a value other than 0, the access code is activated; vice-versa, by giving the C2 parameter a value of 0, it is possible to use the remote control directly.

Main parameters modification



- press either the “+” or “-” button of the parameter whose value is to be modified: the display will show the code of the selected parameter;
- press again the selected button to display its value;
- then press the “+” or “-” button to increase or decrease the value.



to display one of the sensor values, press the respective button twice

If you are not in the programming mode, the SEL (limited to the display of the unit of measure), PRG (limited to the alarm reset function) and display only buttons are always enabled.

Modification of parameters that do not have a specific button on the remote control

Follow the operations described in “Enabling the control when there is no identification code (single unit)”. Press the ▲ or ▼ buttons until the display shows the parameter you want to modify. Press the SEL button to display the actual value of the parameter; then press again ▲ or ▼ to increase or decrease it. Press SEL to confirm the new value. To modify other parameters, repeat the same procedure.

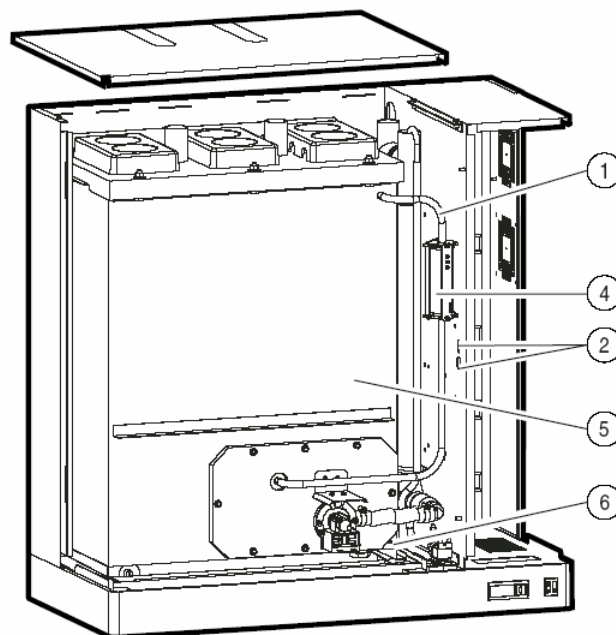
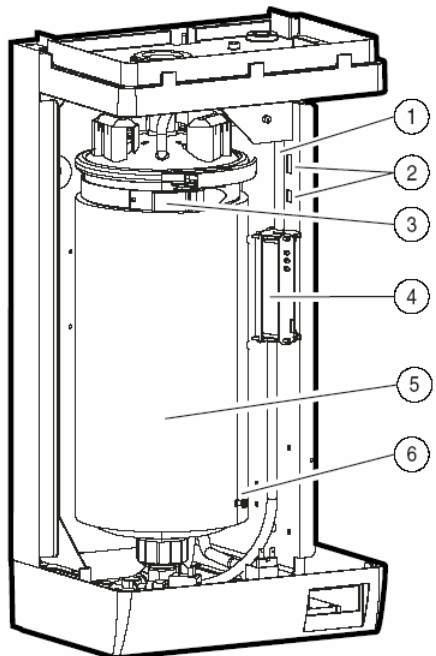
To exit the programming mode

To exit the programming mode and save the parameter modifications, press the PRG button; press CANCEL to exit without saving the modifications.

4 Maintaining Your heaterSteam Steam Humidifier

Although your heaterSteam humidifier is designed to take care of its normal operation, and even to provide you with diagnostic capability, good operation always means good maintenance. Periodic cleaning of the steam generating cylinder, and fill and drain valves is required as indicated by the controller. In H Type controllers, cleaning is indicated when the display shows "CL".

Also, at the end of each humidification season, it is good practice to shut off the humidifier and manually drain the cylinder of water to reduce corrosion of the heating elements during the nonuse season. When shutting off the humidifier it is advisable not to empty the boiler before it is cooled. This prevents any mineral deposits from becoming hard to remove.



The UR002 to UR010 units have a round cylinder as per the sketch above left. The UR020 to UR060 units have a rectangular canister as per the sketch above right.

4.1 UR002 to UR010: Remove And Clean The Steam Cylinder

- Turn off the humidifier with the On/Off switch located on the side of the cabinet;
- Manually drain the humidifier using the manual drain switch on the side of the unit or per instructions in section 10.6.
- Turn off the external fused disconnect or circuit breaker to the unit;
- Remove the steam hose from the top of the steam cylinder;
- Remove the float assembly equalizer tubing from the top of the cylinder (1);
- Disconnect the sensor wire plug from the cylinder compartment wall (2);
- Remove the white plastic caps on top of the cylinder and disconnect the power wires from the top of the cylinder;
- Disconnect the cylinder ground wire (6);
- Unlatch the cylinder holding strap (3);
- Remove the cylinder by twisting and lifting up until the cylinder pulls out of the o-ring fitting of the drain manifold;
- Take the cylinder to an appropriate bench or sink and open it by removing the top cylinder lid clamp (3);
- Lift the lid and elements out of the steam cylinder (there is no need to disassemble the elements from the lid)
- Clean the heating elements by immersing them in a bucket of 5% phosphoric acid solution, or a 50% solution of Lime-A-Way or CLR; (DO NOT immerse the entire lid) (photo 4)
- After about 30 minutes, rinse the elements with clean water and gently wipe off any excess mineral using a damp, soft cloth. DO NOT use hard tools that can



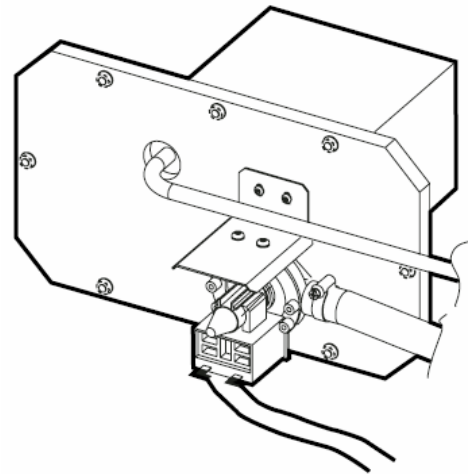
damage the Teflon coating.

- Remove the plastic liner from inside the steam cylinder, empty it of any mineral and wipe it off with a damp, soft cloth;
- Wipe out the inside of the steam cylinder with a damp, soft cloth;
- Remove and clean the cylinder bottom strainer;
- Remove and clean the fill and drain valves in the same cleaning solution;
WARNING: When cleaning fill valve, do NOT poke or probe flow regulator with any object which may enlarge the orifice. The flow regulator must meter water flow precisely or shortened cylinder life may result.
- Remove and clean the fill valve inlet strainer (photo bottom left);
- Remove the float assembly and carefully disassemble it. Clean the inside of the float tube, the float tubing and the float itself using the cleaning solution;
- Reassemble the unit in reverse order and restart.



4.2 UR027 to UR060: Clean Steam Canister

- Turn off the humidifier with the On/Off switch located on the side of the cabinet;
- Manually drain the humidifier using the manual drain switch on the side of the unit or per instructions in section 10.6.
- Turn off the external fused disconnect or circuit breaker to the unit;
- Remove the steam hose (s) from the top of the steam canister;
- Remove the float assembly equalizer tubing from the top and bottom of the canister (1);
- Disconnect the sensor wire plug from the canister compartment wall (2);
- Remove the black plastic covers on top of the canister and disconnect the power wires from the top of the canister;
- Disconnect the canister ground wire (6);
- Remove the drain pump assembly (sketch at right);
- Remove the canister by sliding it out on the guide rails;
- Alternatively, the steam canister can be cleaned out through the drain pump hole rather than removing it;
- Take the canister to an appropriate bench or sink and open it by removing the top canister lid;
- Lift the lid and elements out of the steam canister (there is no need to disassemble the elements from the lid)
- Clean the heating elements by immersing them in a bucket of 5% phosphoric acid solution, or a 50% solution of Lime-A-Way or CLR; (DO NOT immerse the entire lid) (photo 4)
- After about 30 minutes, rinse the elements with clean water and gently wipe off any excess mineral using a damp, soft cloth. DO NOT use hard tools that can damage the Teflon coating.
- Wipe out the inside of the steam canister with a damp, soft cloth;
- Clean the drain pump assembly and strainer;
- Remove and clean the fill valve in the same cleaning solution; **WARNING: When cleaning fill valve, do NOT poke or probe flow regulator with any object which may enlarge the orifice. The flow regulator must meter water flow precisely or shortened cylinder life may result.**
- Remove and clean the fill valve inlet strainer;
- Remove the float assembly and carefully disassemble it. Clean the inside of the float tube, the float tubing and the float itself using the cleaning solution;
- Reassemble the unit in reverse order and restart.



4.3 Reset The Run Time Hour Counter

- press and hold the PRG button for 5 seconds until "P0" is displayed;
- press UP or DOWN to reach parameter d4;
- press the SEL button to display the value;
- press the UP and DOWN button simultaneously for 5 seconds until the value resets to 0;
- press the SEL button to leave the parameter;
- PRG button to leave programming mode

5 Alarms and Trouble-Shooting

When an alarm condition occurs:

- If not in the programming mode, a message is displayed identifying the type of alarm (see alarm codes table following). The message alternates with the normally displayed value.
- Depending on the type of alarm, the humidifier may shut down;
- Activation of the alarm relay depends on the type of alarm.

When the alarm condition clears, humidifier operation and the alarm relay may automatically or manually be reset, depending on the type of alarm. The alarm message must be manually cleared (except for alarms “Ec” and “CL”) by pressing the PRG/reset button. Some alarms may cause a total shut-down of the humidifier, in which case the power supply must be disconnected. If the humidifier is not powered, the alarm relay will be open, even if the alarm condition still exists. In case of the CL alarm (maintenance requested), the alarm can be reset only by setting the hour counter to zero, see “Resetting the run time hour counter”.

The alarm “E1” may occur in two distinct situations:

1. Malfunction during the reading of the parameter memory (usually on start-up)

The default parameters are temporarily recalled without being stored in the parameter memory (the parameters can be accessed and restored to their correct values).

The recall of the default parameters is recommended.

2. Malfunction during writing to the parameter memory (usually on pressing the PRG button)

Any modifications entered are cancelled; the parameters can be accessed, the values modified again and the storing operation repeated.

DISPLAYED CODE		CAUSE	SOLUTION	ACTION	RESET	ALARM RELAY
H and T control	graphic terminal					
Et	E201	Safety thermostat shut-down	- Clean the cylinder and the water level switches, checking the state of the components. - Check the electrical and hydraulic connections and that the unit is supplied correctly - Replace the PTC sensors	Total shut down	Not available	active
Er	E203	Element overheating The probes in the heating plates have signalled excess heating.	- Turn the unit off and clean the cylinder.	Total shut down	Not available	active
EL	E204	low level of water	- Check that the unit is supplied with water. - Turn the unit off and clean the cylinder and the water level control. - Check that the fill valve screen is not clogged.	Total shut down	Not available	active
EC	E205	High supply water conductivity	- Turn off the unit and clean the cylinder, as per the instructions. - If the problem persists, add a suitable water filtering or treatment system. DO NOT USE SOFTENED WATER	total shut down	automatic	active
EE	E211	Self-test failed There may be problems with the water supply, the water level control or the valves.	- Check that the unit is supplied with water. - Turn the unit off and clean the water level control switches as indicated in the maintenance section.	Humidifier disabled	manual	active
EP	E213	Power not available With the unit activated, no steam production or water pre-heating is registered.	- With the unit off, check that there are no bad connections or defective or broken electrical components.	Humidifier disabled	manual	active
EF	E214	no water	- Check that the water supply line is open and that there is sufficient supply pressure. - Check that that cylinder or the steam outlet pipe is not obstructed (bends or crimps). - Check that there is not excessive back-pressure in the steam pipe. - Check the fill valve and screen for obstructions and electric power.	Signal only	automatic	active

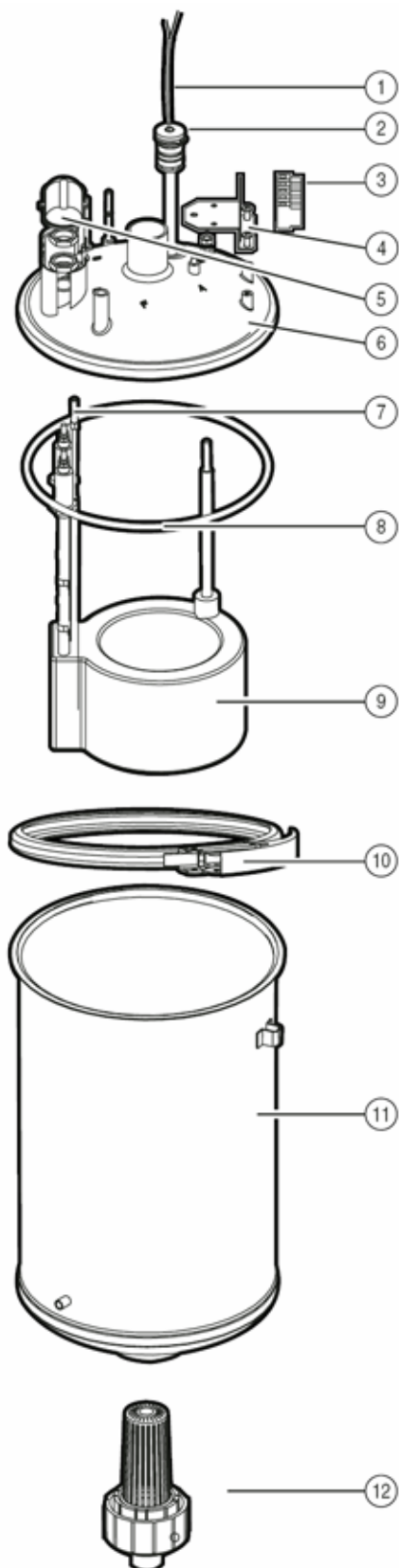
DISPLAYED CODE		CAUSE	SOLUTION	ACTION	RESET	ALARM RELAY
H and T control	graphic terminal					
EA	E215	excessive foam	- Clean the cylinder and check that the steam supply pipe is not crimped along its path and that there are no obstructions or pockets of condensed water.	Signal only	Automatic	active
EU		Full cylinder, no demand	- Leaking fill valve - Dirty high level / foam sensor	Signal only	Automatic	Active
Ed		Faulty drain	- Check/clean drain valve/pump	Signal only	Automatic	Active
E ⁻	E221	High humidity	- Check the operation of the sensor and the limit set by parameter P2.	Signal only	Automatic	active
E ₋	E222	Low humidity	- Check the operation of the sensor and the limit set by parameter P3.			
E =	E224	High humidity in supply air	- Check the operation of the sensor no. 2			
E0	E201	CAREL parameter error	- Contact Carel's service department.	De-energized humidifier	CAREL Re-programming	active
E1	E212	User parameter error	- Re-enter the set parameters or recall the default parameters - Check for bad wiring connections		Parameter Re-programming	
E2	E230	Hour counter error	- Reset hour counter See pg. 30, item 4.3	Deactivation of the memory of the counter	Hour-counter manual reset	idle
E3	E220	Control sensor not connected	- Check the connection of the sensor or the setting of parameter A0 for configuration in ON - OFF	De-energised humidifier	Automatic	active
E4	E223	High limit sensor not connected	- Check the connection of the sensor or the setting of parameter A0.			
E5	E225	Pre -heating NTC probe not connected	- Check the effective pre-heating functioning and b1, b2 and b3 parameter set. - Check the 5 pole terminal connections on the cylinder cover.	Pre-heating de-energized		
CL	E232	Maintenance warning	- Stop the unit and clean the steam cylinder, filter and water level switches.	signal only	Hour-counter reset	idle

5.1 Troubleshooting

PROBLEM	CAUSE	SOLUTION
The control does not switch on	1) No power present 2) Humidifier external switch open, position 0 3) Connectors not inserted properly 4) Blown fuses 5) The transformer is broken	1) Check the external fuses or breakers. 2) Close the switch on the panel (position I) 3) Check that the wires are properly inserted in the terminal block 4) Check the fuses F1/F2 6) Check that the transformer voltage is 24 Vac at the secondary
The humidifier does not produce steam	1) On/Off local/remote contact open (lever on relay board/terminals 7I - 8I) 2) The regulator/humidity controller or external sensor are not connected properly 3) Broken sensor/humidistat 4) The configuration parameters have not been set correctly	1) Check that the contacts On/Off are closed (lever on relay board/terminals 7I - 8I) 2) Check the external connection 3) Check the external connection signal 4) Reset the parameters correctly (par. 11.2.11, page 34)
The humidifier fills and drains continuously without producing steam	1) Back-pressure during steam outlet 2) Broken water supply valve flow regulator (possible leaks in the hydraulic circuit) 3) Defective water level control 4) Cylinder inlet filter blocked 5) Limestone scales in the fill tank 6) Broken drain valve	1) Check that the steam outlet valve is not crimped or bent 2) Replace the drain valve 3) Clean or replace the water level control if necessary 4) Clean the filter 5) Clean the fill tank 6a) Check the presence of 24 Vac on drain valve 6b) Replace the drain valve
The electrical circuit differential switch is activated	1) There is a leakage of current to ground from the water drain 2) There is a leakage of current to ground from the steam outlet	1) Check the seals and electrical connections of the humidifier 2) Check that the outlet/drain tubes are not metallic or made from conducting rubber 3) Check possible heater waste
The mains overload switch is activated	The mains overload safety switch is rated too low	Check that the mains overload switch is rated for at least one-and-a-half times the rated current of the humidifier
The humidifier duct is wet	1) The distributor is not installed correctly 2) The system is over-sized 3) Humidification is on when the duct fan is off	1) Check that the steam distributor has been installed correctly. (see par. 9.3, page 21) 2) Decrease the steam production on the humidifier control 3) Connect a trigger from the fan to terminals 7I - 8I of the On-Off remote (e.g. differential pressure switch or flow switch contact)
The floor below the humidifier is wet	1) The humidifier drain is blocked 2) The hydraulic circuit is over-full or has leaks 3) The condensation drain pipe does not feed into the filler tank 4) The steam outlet pipe is not properly attached to the cylinder	1) Clean the drain outlet in the bottom tank 2) Check the entire hydraulic circuit 3) Check the correct placement of the condensation drain pipe in the fill tank. 4) Check the tightening of the pipe clamp on the steam outlet

6 Spare Parts

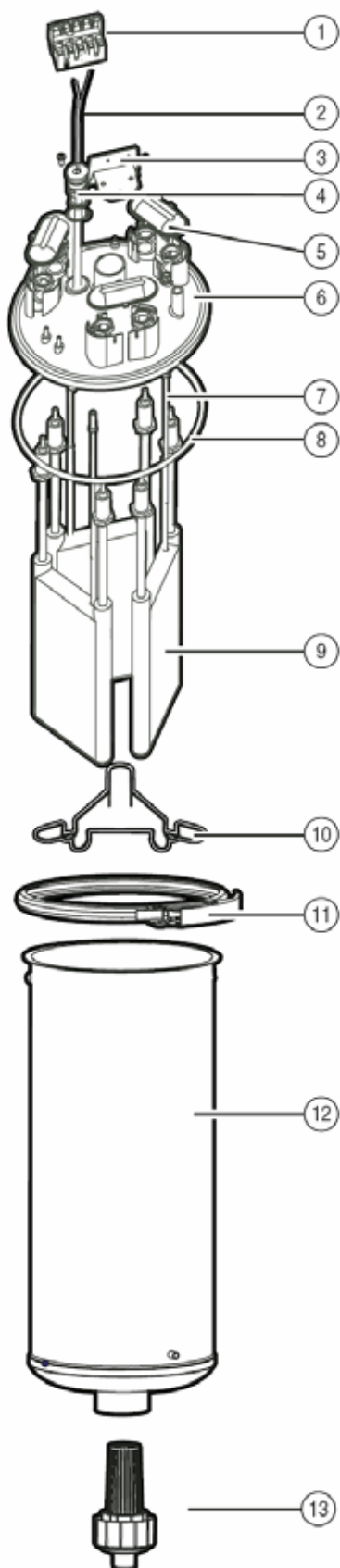
UR 002, UR 004 Exploded Steam Cylinder / Parts



No.	Description	Spare Parts Codes	
		UR002	UR004
1	NTC probe	61C479A070	61C479A070
2	NTC well	13C453A121	13C453A121
3	PTC probe wire terminals	2218010AXX	2218010AXX
4	Terminal fastening bracket	14C453A012	14C453A012
5	Power connection protection cover	18C453A043	18C453A043
6	Cylinder cover	URKCOPC00S	URKCOPC00S
7	PTC probe wire terminals	61C479A031	61C479A031
8	Cylinder gasket	18C453A019	18C453A019
9	Heating element w/Teflon		
	208V	57C453A348	57C453A349
	230V	57C453A348	57C453A349
10	Cylinder cover locking clamp	14C453A020	14C453A020
11	cylinder	14C453A089	14C453A089
12	filter, ring nut and pipe union	UEKF000000	UEKF000000
-	Gasket kit	URKG00000M	URKG00000M

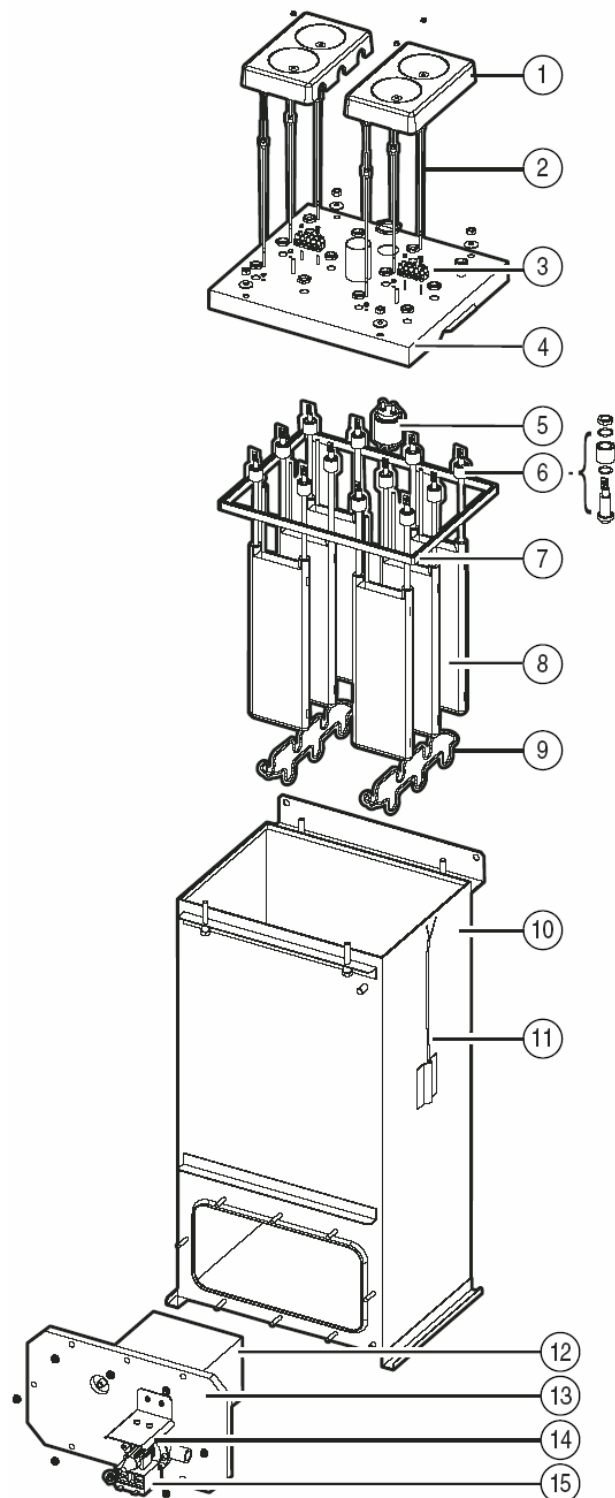
Installation, Operation & Maintenance Manual

UR 006, UR 010 Exploded Steam Cylinder / Parts



No.	Description	Spare Parts Codes		
		UR006 - 1Ph.	UR006 - 3Ph.	UR010 - 3Ph.
1	PTC probe wire terminals	2218010AXX	2218010AXX	2218010AXX
2	NTC Probe	61C479A070	61C479A070	61C479A070
3	Wire terminal bracket	14C453A012	14C453A012	14C453A012
4	NTC well	13C453A122	13C453A122	13C453A122
5	Power connection cover	18C453A043	18C453A043	18C453A043
6	Cylinder cover	URKCOPC00M	URKCOPC00M	URKCOPC00M
7	PTC probe	61C453A031	61C453A031	61C453A031
8	Cylinder gasket	18C453A019	18C453A019	18C453A019
9	Heating elements w/Teflon:			
	208V	57C453A347	57C453A347	57C453A346
	230V	57C453A320	57C453A320	57C453A322
	400V		57C453A320	57C453A322
	460V		57C453A344	57C453A347
	575V		57C453A341	57C453A342
10	Heating element spring	13C453A048	13C453A048	13C453A048
11	Cylinder cover locking clamp	14C453A020	14C453A020	14C453A020
12	Cylinder	14C453A014	14C453A914	14C453A0134
13	Filter, ring nut and pipe union	UEKF000000	UEKF000000	UEKF000000
-	Gasket kit	URKG00000M	URKG00000M	URKG00000M

UR 020, UR 027, UR 040, UR 060 Exploded Steam Cylinder / Parts

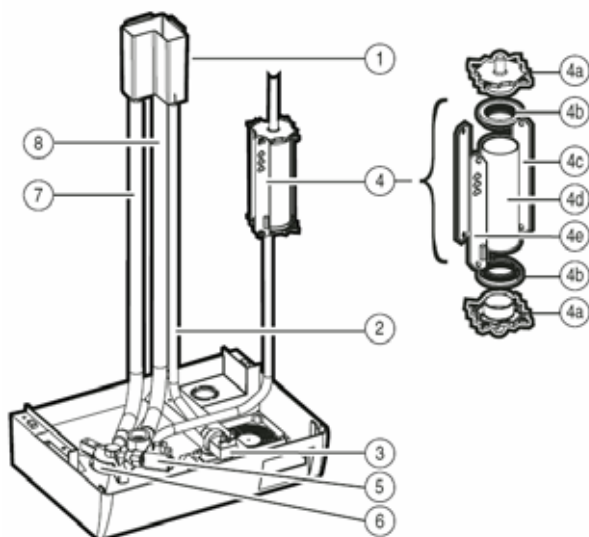


		Spare Parts Codes	
No.	Description	UR020	UR027
1	Heating element protection	14C479A160	14C479A160
2	PTC probe	61C479A162	61C479A162
3	PTC probe wire terminals	2218008AXX	2218008AXX
4	Cylinder cover	14C528A152	14C479A152
5	Anti-foaming system	13C483A004	13C481A004
6	Heating element assembly	--	--
7	Cylinder gasket	13C479A153	13C479A153
8	Heating element w/Teflon	6x	6x
208V		57C528A382	57C528A382
230V		57C528A381	57C528A382
400V		57C528A381	57C528A382
460V		57C528A386	57C528A381
575V		57C528A385	57C528A380
9	Heating element spring	13C579A170	13C479A170
10	Cylinder	14C479A150	14C479A150
11	NTC probe	61C479A070	61C479A070
12	Use filter	URKF0000XL	URKF0000XL
13	Use flange	13C479A154	13C479A154
14	Pump fastening bracket	14C479A155	14C479A155
15	Drain pump	KITPS0000	KITPS0000
-	Gasket kit	URKG0000XL	URKG0000XL

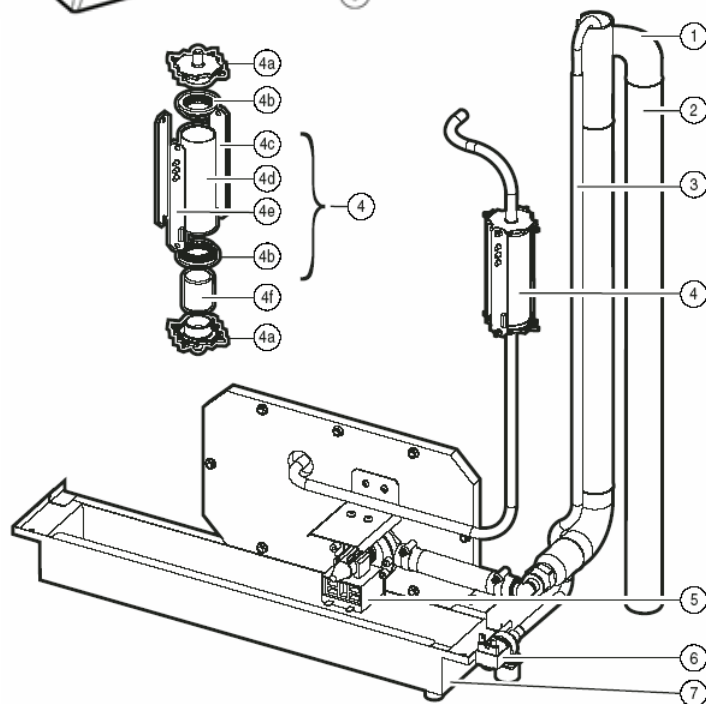
		Spare Parts Codes	
No.	Description	UR040	UR060
1	Heating element protection	14C479A160	14C479A160
2	PTC probe	61C479A162	61C479A162
3	PTC probe wire terminals	2218008AXX	2218008AXX
4	Cylinder cover	14C479A152	14C528A002
5	Anti-foaming system	13C483A004	13C483A004
6	Heating element assembly	--	--
7	Cylinder gasket	13C479A153	13C528A007
8	Heating element w/Teflon	6x	9x
208V			
230V			
400V		57C528A387	57C528A387
460V		57C528A390	57C528A390
575V		57C528A389	57C528A389
9	Heating element spring	13C479A170	13C479A170
10	Cylinder	14C479A151	14C528A001
11	NTC probe	61C479A070	61C479A070
12	Use filter	URKF0000XL	URKF0000XL
13	Use flange	13C479A154	13C479A154
14	Pump fastening bracket	14C479A155	14C479A155
15	Drain pump	KITPS0000	KITPS0000
-	Gasket kit	URKG0000XL	URKG000XXL

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Other Plumbing Components



No.	Description	Spare Parts Codes	
		UR002 to UR004	UR006 to UR010
1	Tank	18C453A008	18C453A008
2	Supply pipe	URKT00000S	URKT00000M
3	Fill electrovalve	KITVC00006	KITVC00006
4	Level control:	URKSL000002	URKSL00002
4a	Sensor cap		
4b	O-ring		
4c	Sensor spacer		
4d	Sensor pipe		
4e	Control board		
5	Drain electrovalve	13C453A124	13C453A124
6	A/D manifold (fill - drain)		
7	Drain pipe	URKT00000S	URKT00000M
8	Overflow pipe		



No.	Description	Spare parts codes			
		UR020	UR027	UR040	UR060
1	Overflow pipe	--	13C479A168	13C479A168	13C479A168
2	Drain column				
3	Supply pipe	--	URKT0000XL	URKT0000XL	URKT0000XL
4	Level control:	--	URKSL00001	URKSL00001	URKSL00001
4a	Sensor cap				
4b	o-ring				
4c	sensor spacer				
4d	sensor pipe				
4e	control board				
4f	sensor floating				
5	Drain pump	--	KITPS00000	KITPS00000	KITPS00000
6	Fill electrovalve	KITVC00040	KITVC00040	KITVC00040	KITVC00100
7	Drain tank	--	--	--	--

	HeaterSteam Model								
Models	UR002	UR004	UR006-1Ph.	UR006-3Ph.	UR010	UR020	UR027	UR040	UR060
Plumbing Parts:									
humidifier gasket kit	URKG00000M	URKG00000M	URKG00000M	URKG00000M	URKG00000M	URKG00000XL	URKG00000XL	URKG00000XL	URKG00000XL
cylinder cover kit	URKCOPC00S	URKCOPC00S	URKCOPC00M	URKCOPC00M	URKCOPC00M	-	-	-	-
cylinder cover fast. bracket	14C453A020	14C453A020	14C453A020	14C453A020	14C453A020	-	-	-	-
cylinder filter kit	UEKF000000	UEKF000000	UEKF000000	UEKF000000	UEKF000000	URKF00000XL	URKF00000XL	URKF00000XL	URKF00000XL
heater elements w/Teflon:									
208 V	57C453A348	57C453A349	57C453A347	57C453A347	57C453A346	57C528A382	57C528A383	-	-
230 V	57C453A348	57C453A349	57C453A320	57C453A320	57C453A322	57C528A381	57C528A382	-	-
460 V				57C453A344	57C453A347	57C528A386	57C528A381	57C528A390	57C528A390
575 V				57C453A341	57C453A342	57C528A385	57C528A380	57C528A389	57C528A389
cylinder fastening strap	14C453A107	14C453A107	14C453A107	14C453A107	14C453A107	-	-	-	-
stainless steel cylinder	14C453A089	14C453A089	14C453A014	14C453A014	14C453A014	14C479A150	14C479A150	14C479A151	14C528A001
fill cup	18C453A008	18C453A008	18C453A008	18C453A008	18C453A008	-	-	-	-
drain valve kit	13C453A124	13C453A124	13C453A124	13C453A124	13C453A124	-	-	-	-
drain pump kit						KITPS00000	KITPS00000	KITPS00000	KITPS00000
drain pipe kit						URKT00000XL	URKT00000XL	URKT00000XL	URKT00000XL
fill valve kit	KITVC00006	KITVC00006	KITVC00012	KITVC00012	KITVC00012	KITVC00040	KITVC00040	KITVC00040	KITVC00100
internal pipe kit	URKT00000S	URKT00000S	URKT00000M	URKT00000M	URKT00000M	URKT00000XL	URKT00000XL	URKT00000XL	URKT00000XL
level control with sensor	URKSL00002	URKSL00002	URKSL00002	URKSL00002	URKSL00002	URKSL00001	URKSL00001	URKSL00001	URKSL00001
internal cylinder liner	13C453A085	13C453A085	13C453A035	13C453A035	13C453A035	-	-	-	-
external insulation blanket	16C453A054	16C453A054	16C453A024	16C453A024	16C453A024	16C479A158	16C479A158	16C479A159	16C528A008
Electrical parts:									
contactor:									
208-230V	0203000AXX	0203000AXX	0203000AXX	0203000AXX	0203000AXX	0203008AXX	0203008AXX		
400 V				0203000AXX	0203000AXX	0203001AXX	0203001AXX	0203001AXX	0203007AXX
460 V				0203000AXX	0203000AXX	0203000AXX	0203001AXX	0203001AXX	0203008AXX
575 V				0203000AXX	0203000AXX	0203000AXX	0203001AXX	0203001AXX	0203007AXX
power supply transformer:									
230-400 V	09C476A029	09C476A029	09C476A029	09C476A029	09C476A029	09C479A063	09C479A063	09C479A063	09C479A063
200-208-460-575 V	09C476A030	09C476A030	09C476A030	09C476A030	09C476A030				
200-208-460-575V						09C479A062	09C479A062	09C479A062	09C479A062
fuse holder	0606192AXX	0606192AXX	0606192AXX	0606192AXX	0606192AXX	0606193AXX	0606193AXX	0606193AXX	0606193AXX
460 V									0606209AXX
208-230 V							0606209AXX		
fan	1312543AXX	1312543AXX	1312543AXX	1312543AXX	1312543AXX	1312541AXX	1312541AXX	1312541AXX	1312541AXX
Motor protector	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000	THP00A0000
socket for pre-heater probe	13C453A121	13C453A121	13C453A122	13C453A122	13C453A122	13C479A056			

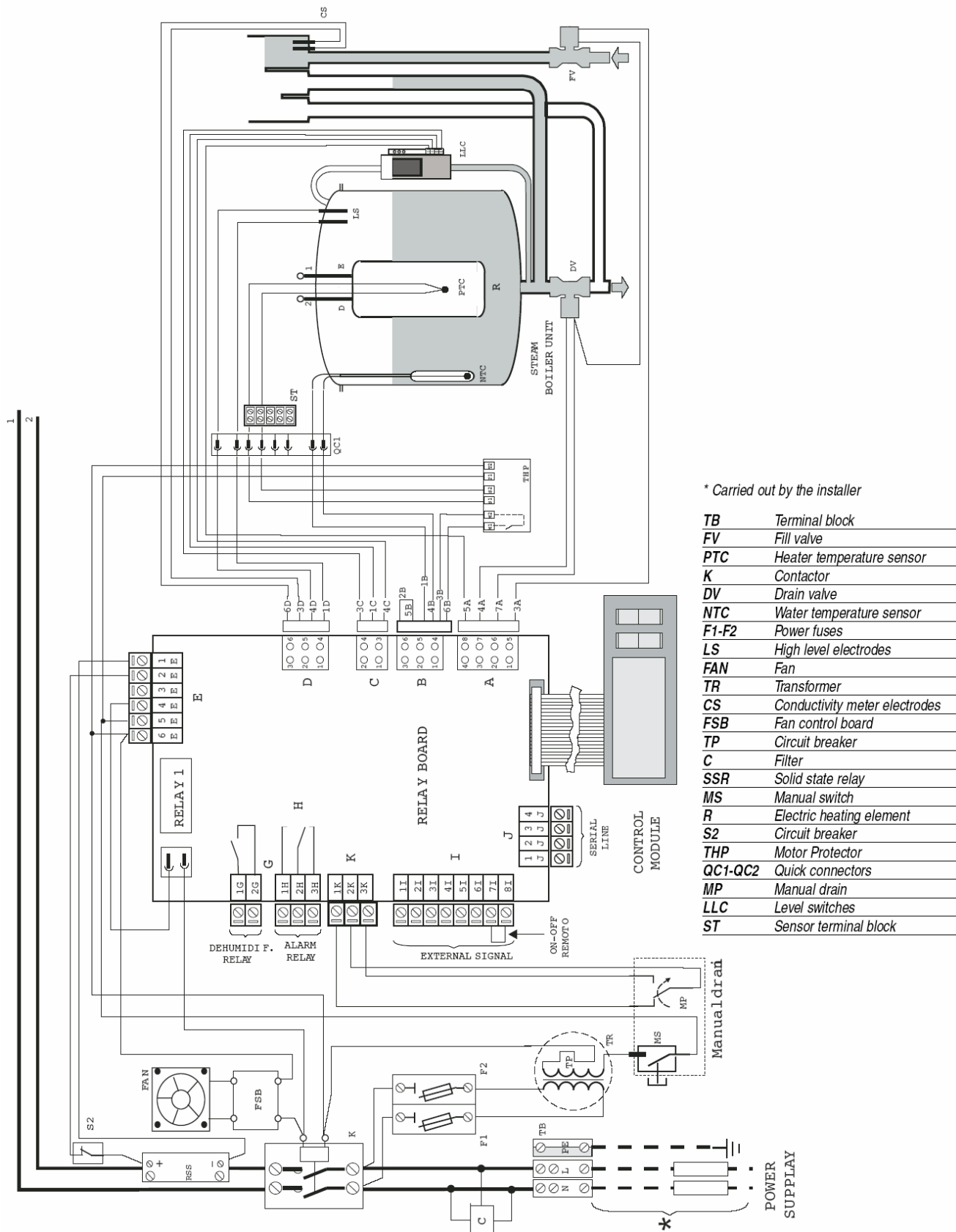
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HeaterSteam Model									
Models	UR002	UR004	UR006-1Ph.	UR006-3Ph.	UR010	UR020	UR027	UR040	UR060
Electronic Parts:									
version H control module	URH0000000	URH0000000	URH0000000	URH0000000	URH0000000	URH0000000	URH0000000	URH0000000	URH0000000
version T control module	URS0000000	URS0000000	URS0000000	URS0000000	URS0000000	URS0000000	URS0000000	URS0000000	URS0000000
main control board	URI0000000	URI0000000	URI0000000	URI0000000	URI0000000	URI0000000	URI0000000	URI0000000	URI0000000
flat connection cable	59C460A003	59C460A003	59C460A003	59C460A003	59C460A003	59C486A003	59C486A003	59C486A003	59C486A003
fan circuit breaker	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX	6132702AXX
fan control board	98C453CP68	98C453CP68	98C453CP68	98C453CP68	98C453CP68				
solid state relay:									
208 V	0101002AXX	0101002AXX	0101003AXX	0101002AXX	0101002AXX	0101005AXX	0101005AXX		
230 V	0101002AXX	0101002AXX	0101003AXX	0101002AXX	0101002AXX	0101005AXX	0101005AXX		
400 V	0101002AXX	0101002AXX		0101002AXX	0101002AXX	0101005AXX	0101005AXX	0101005AXX	0101005AXX
460 V	0101002AXX	0101002AXX		0101002AXX	0101002AXX	0101005AXX	0101005AXX	0101005AXX	0101005AXX
575 V				0101003AXX	0101002AXX	0101005AXX	0101005AXX	0101005AXX	0101005AXX
PTC probe	61C453A031	61C453A031	61C453A031	61C453A031	61C453A031	61C479A162	61C479A162	61C479A162	61C479A162
NTC probe	61C479A070	61C479A070	61C479A070	61C479A070	61C479A070	61C479A070	61C479A070	61C479A070	61C479A070

7 Wiring Diagrams

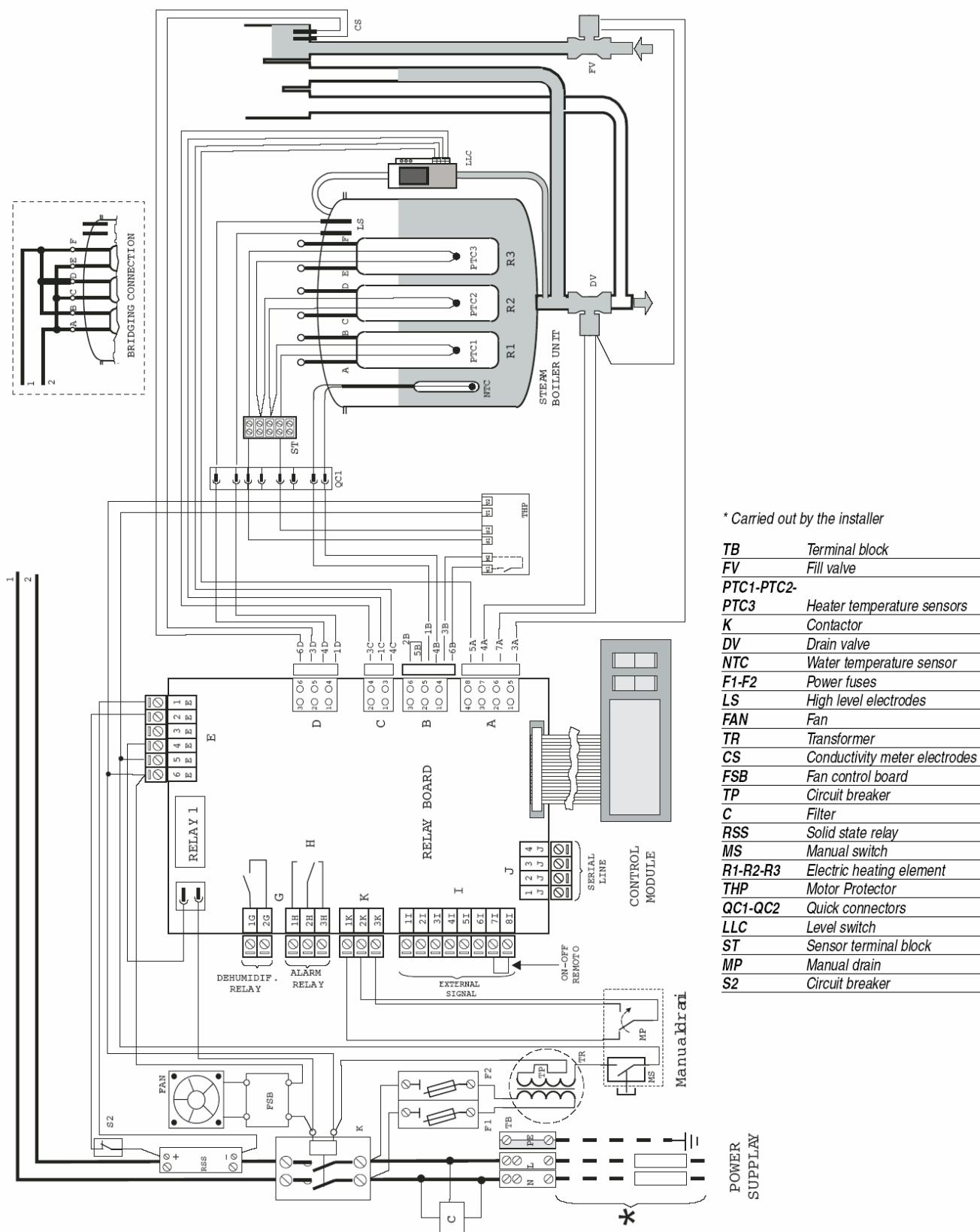
7.1 Unit Wiring Diagrams

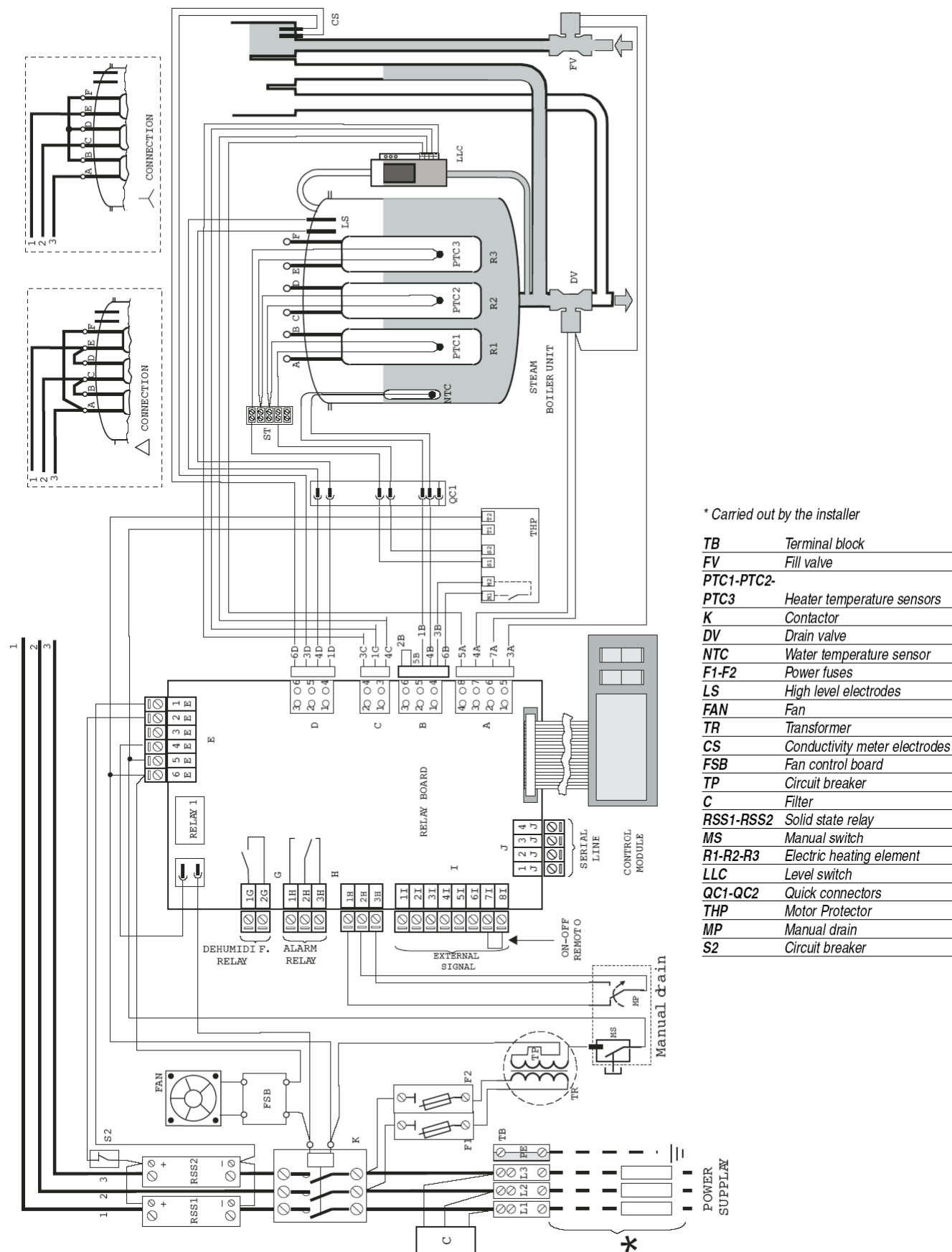
UR 002, 004 Single Phase H Type Control



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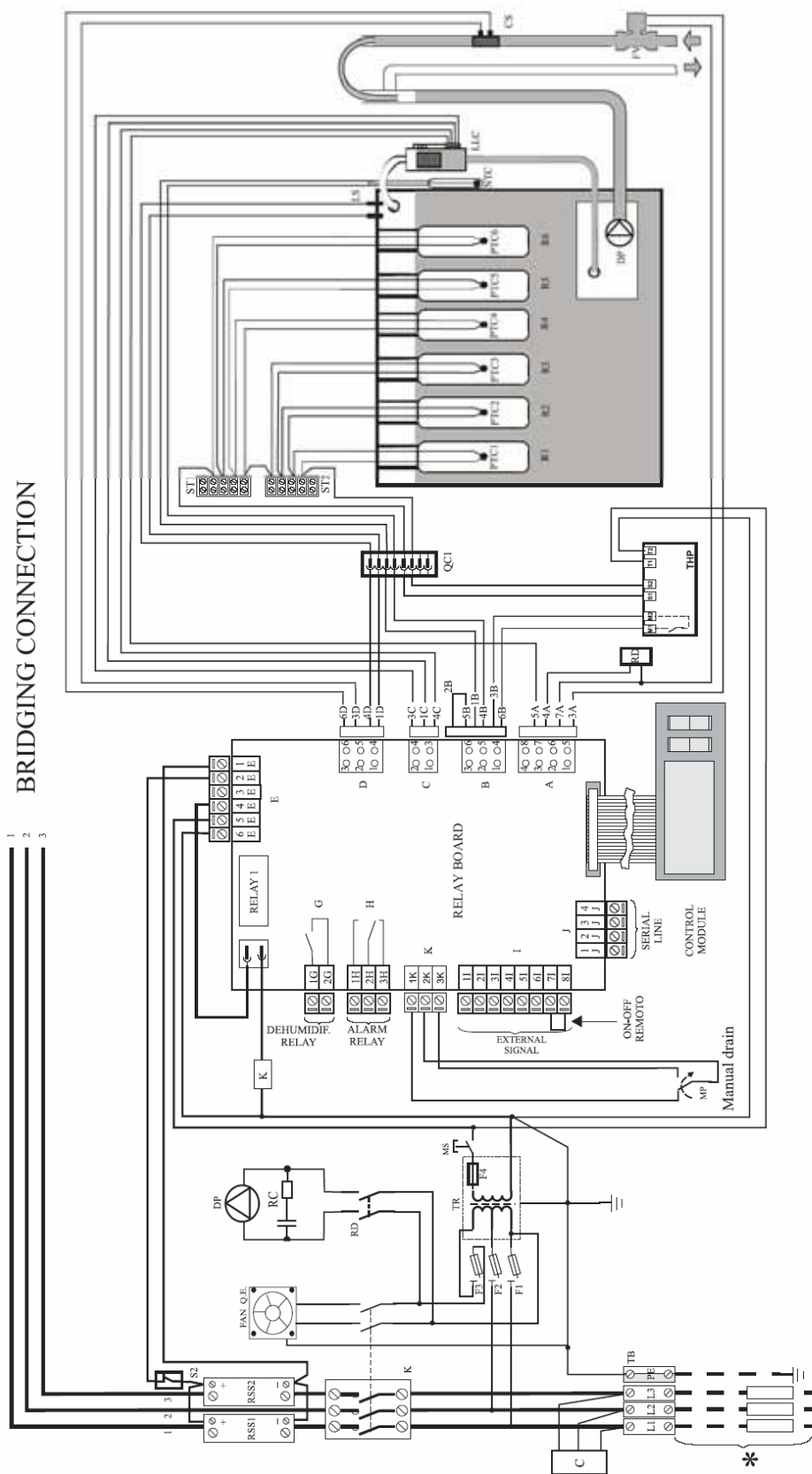
UR 006 Single Phase H Type Control





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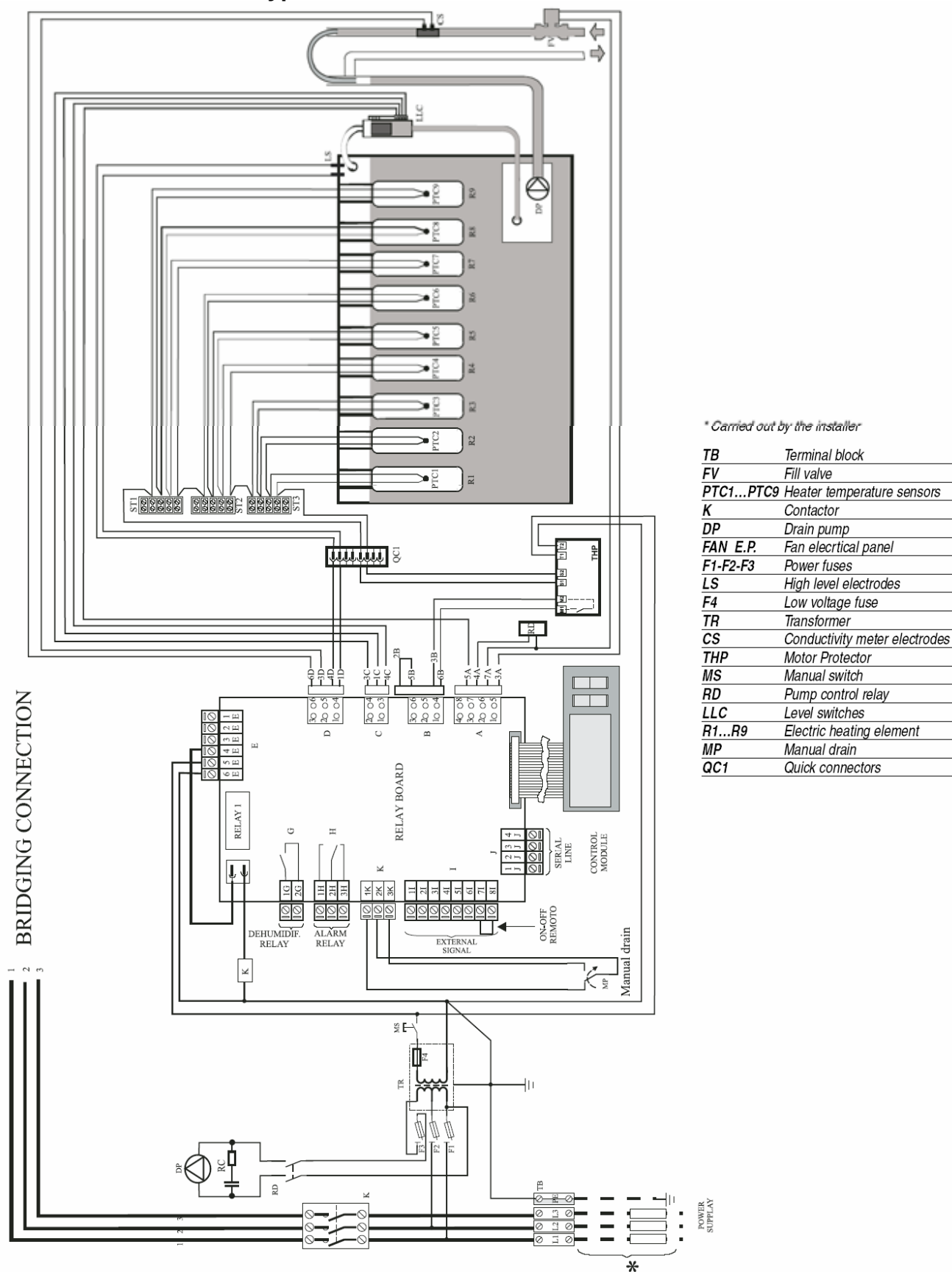
UR 020, 027, 040 Three Phase H Type Control



* Carried out by the installer

TB	Terminal block
FV	Fill valve
PTC1...PTC6	Heater temperature sensors
K	Contactor
DP	Drain pump
FAN E.P.	Fan electrical panel
F1-F2-F3	Power fuses
LS	High level electrodes
F4	Low voltage fuse
TR	Transformer
CS	Conductivity meter electrodes
THP	Motor Protector
MS	Manual switch
RD	Pump control relay
NTC	Water temperature sensor
LLC	Level switches
R1...R6	Electric heating element
RSS1-RSS2	Solid state relay
MP	Manual drain
QC1	Quick connectors
C	Filter

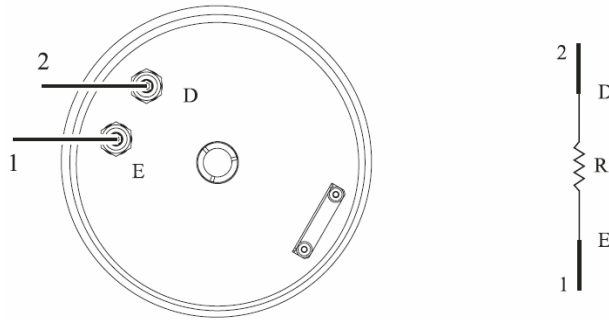
UR 060 Three Phase H Type Control



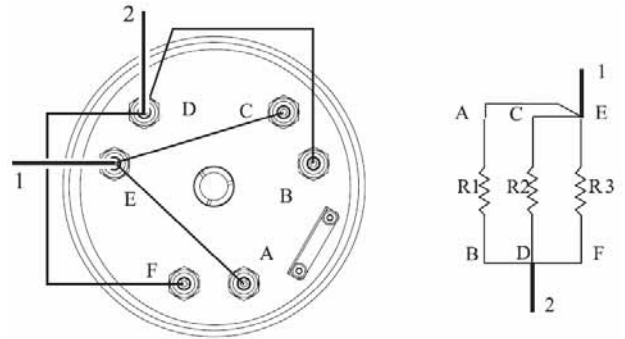
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7.2 Heater Wiring Diagrams

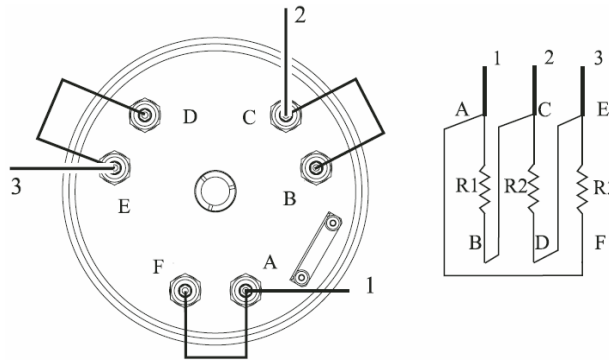
1 Ph. Connections (UR002, UR004)



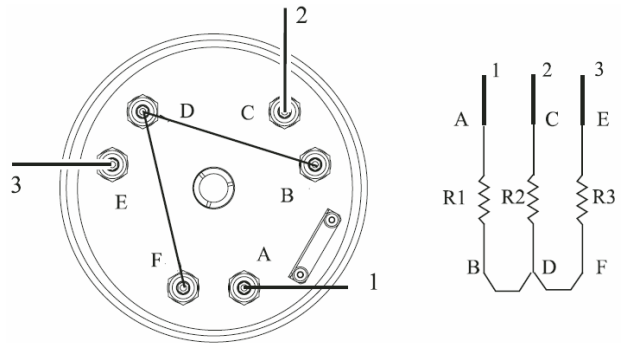
1 Ph. Parallel Connections (UR006)



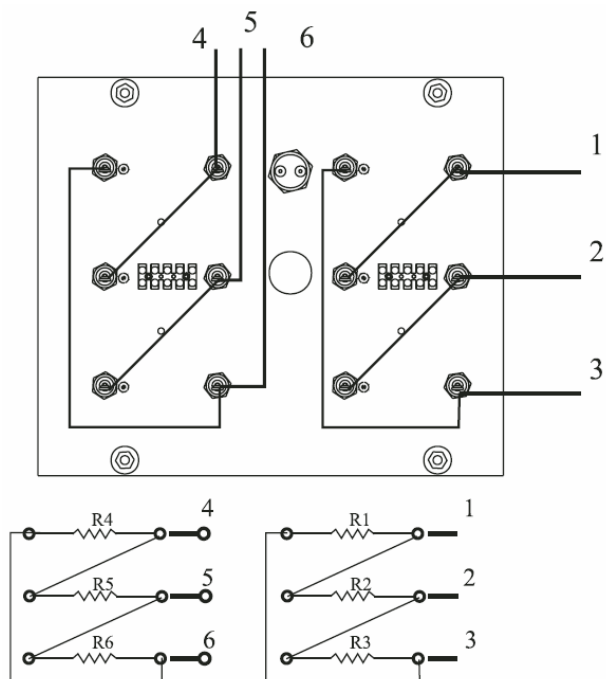
Delta 3 Ph. Connections (UR 006, 010)



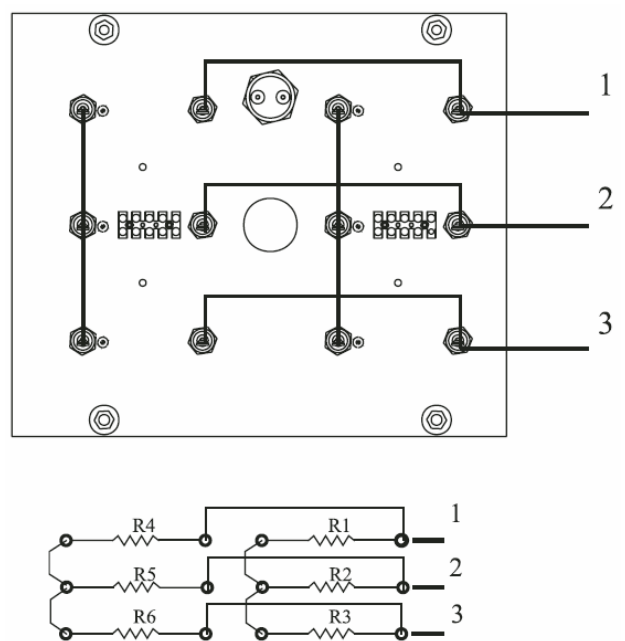
Star 3 Ph. Connections (UR 006, 010)



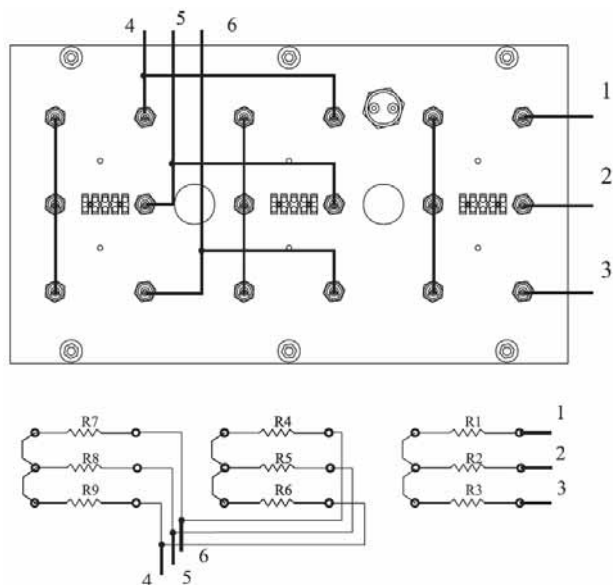
Delta 3 Ph. Connections (UR 020, 027 / 208-230V)



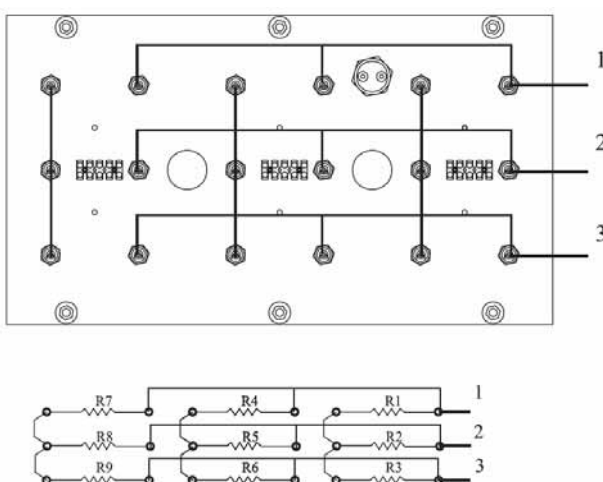
Star 3 Ph. Conn. (UR 020, 027, 040 / 400-575V)



Star 3 Ph. Connections (UR 060 / 460V)



Star 3 Ph. Connections (UR 060 / 575V)



UNIT MODEL NUMBER, CYLINDER WIRING CONNECTIONS								
V / Ph.	UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
208/1	1 Ph.	1 Ph.	1 Ph. Par.					
230/1	1 Ph.	1 Ph.	1 Ph. Par.					
208/3			Δ	Δ	2 Δ	2 Δ	Y	Y
230/3			Δ	Δ	2 Δ	2 Δ	Y	Y
460/3			Y	Y	Y	Y	Y	Y
575/3			Y	Y	Y	Y	Y	Y

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8 Technical Specifications

8.1 Models

Model Selection								
UR	003	H	U	1	01	U	0	0
UR HeaterSteam	Model in kg/h from chart above	H Control On/off or Modulating or DDC	Power U=208/1 D=230/1 W=208/3 K=230/3 M=460/3 N=575/3	Type 1=Deluxe	Version 01=all 0S=UR020	USA	Reserved	Options 0=standard B=direct mount blower

8.2 Electrical Specifications

V Ph.	FACTOR	UNIT MODEL NUMBER, CAPACITY, AMPERAGE, WATTAGE							
		UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
208 1	Lbs/hr	4.4	7.3	13.6					
	Kg/hr	2.0	3.3	6.22					
	Amps	7.0	11.8	22.2					
	Watts	1500	2500	4600					
230 1	Lbs/hr	5.3	8.8	13.2					
	Kg/hr	2.4	4	6					
	Amps	7.8	13	19.6					
	Watts	1800	3000	4500					
208 3	Lbs/hr			13.6	22	47.5	63.4		
	Kg/hr			6.2	10	21.6	28.8		
	Amps			12.8	20.8	45.1	60.0		
	Watts			4600	7500	16200	21600		
230 3	Lbs/hr			13.2	22	43.3	58.1		
	Kg/hr			6.0	10	19.7	26.4		
	Amps			11.3	18.8	37.1	49.8		
	Watts			4500	7500	14700	19800		
460 3	Lbs/hr			13.2	22	46.2	57.9	88.9	133.3
	Kg/hr			6	10	21	26.3	40.4	60.6
	Amps			5.7	9.4	19.7	24.7	38.1	57.1
	Watts			4500	7500	15700	19700	30300	45500
575 3	Lbs/hr			13.2	22	43.1	57.2	88.2	132.2
	Kg/hr			6	10	19.6	26	40.1	60.1
	Amps			4.5	7.5	14.8	19.4	30.2	45.3
	Watts			4500	7500	14600	19500	30000	45100

8.3 Mechanical Specifications

	UNIT MODEL NUMBER							
	UR002	UR004	UR006	UR010	UR020	UR027	UR040	UR060
Width – in.	14.4	14.4	14.4	14.4	27.2	27.2	27.2	34.5
Depth – in.	10.8	10.8	10.8	10.8	17.2	17.2	17.2	17.2
Height – in.	24.4	24.4	28	28	34.9	34.9	34.9	34.9
Ship Wt. – Lbs.	57	57	68	68	161	161	169	216
Oper. Wt. – Lbs.	59	59	77	77	213	213	251	341
No. Elements	1	1	3	3	6	6	6	9
Steam Outlets	1-1/4" (30mm)				1-5/8" (40mm)			1-5/8" (40mm) x 2
Control Voltage	24 VAC 50/60 Hz							
Ambient	34 – 104 °F, 10 – 80 %RH non-condensing, up to 6" W.C. duct static pressure							
Feed Water	15 – 150 psi, <= 24 grains (418 ppm) hardness							
Instant Maximum Feed Water Flow	0.20 gpm		0.30 gpm		1.1 gpm			2.6 gpm
Feed Water Attachment	¼" O.D. Comp.				3/8" O.D. Comp.			
Instant Maximum Drain Water Flow	1.3 gpm				6 gpm			
Drain Water Attachment	1 -1/2" (40mm)							
Room Distribution Units	VSDUOA 34 WATTS 50 dBa 103 CFM				VRDXL 35 Watts 40 dBA 380 CFM			

8.4 Electronic Specifications

Item	Specification
Control Power	24Vac /50-60Hz, 30VA
Sensor Input Impedence	60 kOhm for 0-1Vdc, 0-10Vdc, 2-10 Vdc 50 Ohm for 0-20mAdc, 4-20mAdc
Power For Active Sensors	24 Vdc (24 Vac rectified), I _{max} =250mA 12 Vdc 5%, I _{max} =50mA
Alarm and Dehumidify Relays	250 V, 8 Amp
Remote On/Off Input	Use dry contact, max. resistance=50 Ohm Humidifier puts out 24 Vdc, I _{max} =5mA
Serial Communications	2-wire RS485

8.5 Additional Technical Information

8.5.1 Electronic Float Assembly

The new electronic level floats have 3 LEDs (red, yellow, green). When the water level is below working level, the red LED is on. When the unit is filling during operation, the yellow LED is on. When the unit is full and operating, the green LED is on.

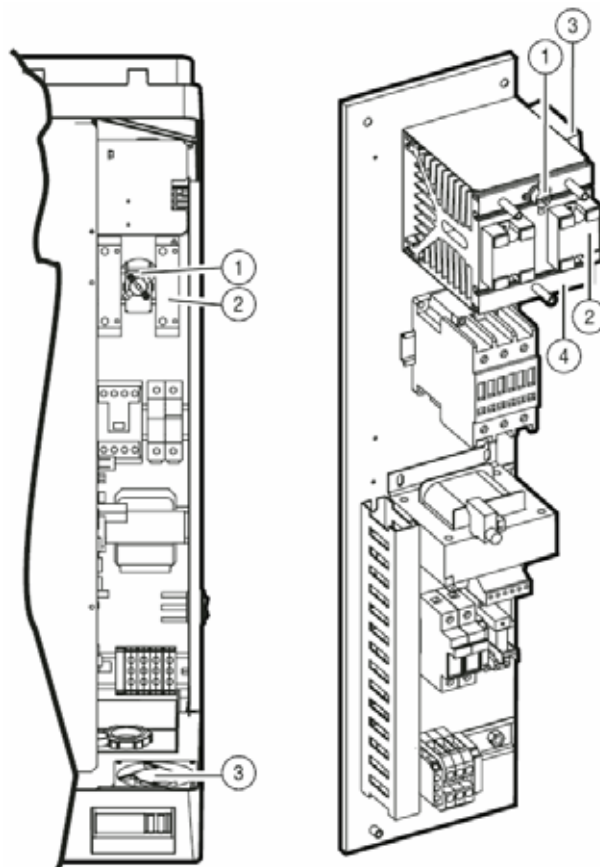
8.5.2: Steam Baths

A special "T" version of the HumiControl is available which reads the input as a temperature sensor to control steam to a steam bath. With the T type control, all references to the control sensor refer instead to a temperature sensor and display.

8.5.3 Electronic Compartment

Parts are identified as:

1. Klaxon temperature sensor
2. Solid State Relay
3. Cooling fan
4. Heat sink



NOTES:

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NOTES:

NOTES:**Limited Warranty**

All products manufactured by Carel USA, LLC are warranted to the original purchaser to be free from defects in materials and workmanship in the course of normal and reasonable use for a period of 2 years and 1 month from the date of shipment (The OEM controls warranty is 2 years from date of manufacture), humidifier replacement parts warranty is 90 days from date of Invoice. Warranty replacement parts are warranted for remainder of original unit warranty or 90 days, whichever is longer, so long as the product has been installed and operated in accordance with all appropriate manuals and wiring diagrams, and started up by a qualified Carel USA technician. Any product or part that is found to be defective will, at the option of Carel USA, LLC be replaced or repaired. Carel USA, LLC reserves the right to inspect any part or installation before replacing or repairing defective parts. After startup of the product, labor for repairs or replacement of parts is not covered by this warranty. Products not included in this warranty are NTC and PTC probes, transformers (TRA series), and routinely replaceable parts such as steam cylinders and gaskets. Carel USA, LLC assumes no liability for consequential or inconsequential damage, or damage due to negligence or improper use. Under the terms of this warranty, the original purchaser may have certain legal rights and other rights, which may vary from state to state. The Warranty will not be considered valid if a product is damaged due to negligence, mishandling or misapplication, or if the product label is missing. Carel USA will attempt to repair or replace the products within two (2) months of the receipt of the returned goods.

CAREL

CAREL USA, LLC
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Manheim, PA 17545