humiFog - UA

Pressure Atomizing Multi-Point Zone Control Panel

ENG User manual

READ AND SAVE THESE INSTRUCTIONS

Integrated Control Solutions & Energy Savings

We wish to save you time and money!
We can assure you that the thorough reading of this manual will guarantee correct installation and safe use of the product described

WARNINGS

BEFORE INSTALLING OR HANDLING THE HUMIDIFIER PLEASE CAREFULLY READ AND FOLLOW THE INSTRUCTIONS AND SAFETY STANDARDS DESCRIBED IN THIS MANUAL AND ON THE LABELS ATTACHED TO THE *humiFog*.

CAUTION: ALWAYS DISCONNECT THE MAIN POWER BEFORE OPENING OR SERVICING THE HUMIDIFIER!

This appliance has been designed exclusively to directly humidify in ducts and AHUs through the atomizing rack.

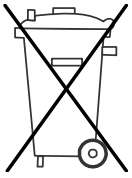
The quality of the water used affects the operation of this unit, so the ***humiFog*** must be supplied with treated water (Reverse Osmosis or Deionized). The installation, use, and maintenance operations must be carried out according to the instructions contained in this manual and on the labels applied internally and externally.

IMPORTANT: BEFORE beginning installation:

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

The conditions of the environment and the power supply voltage must comply with the specified values listed on the data label in the humidifier.
All other uses and modifications made to the humidifier that are not authorized by the manufacturer are considered incorrect, and the manufacturer assumes no liability for the consequences of any such unauthorized use.
Please note that the humidifier contains powered electrical devices and high pressure components.
All service and/or maintenance operations must be performed by qualified personnel who are aware of the necessary precautions and are capable of performing the operations correctly.
Disconnect the humidifier from the main power supply before accessing any internal parts.
The humidifier must be installed in accordance with all local and national standards.

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.



***Disposal of the parts 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.**

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

TABLE OF CONTENTS

1. HOW THE humiFog WORKS

The humiFog humidification system is a high pressure atomizing system designed to produce a fine mist that readily evaporates to raise the relative humidity. The atomizing humidifier is an efficient humidification system that is especially suitable for larger installations, where high flow-rates of water are required without the necessity of excessive energy expenditure. When the humidity value in the environment is less then the desired value, as measured by a probe or external controller, the controller starts the volumetric piston pump, which sends the "treated" water to the nozzles.

The treated water; using a reverse osmosis or deionizer system, is pumped at a pressure of 1000psi (75bar) and sent via the connection pipes to the atomizing nozzles. The nozzles then reduce the jet of water into a multitude of very fine water droplets (10-20 microns). Because of the fine droplet size, the water can then easily change its state and vaporize. The energy required for this transformation is supplied by the ambient air; at a rate of 690 W per liter/hour. Consequently, there is a decrease in temperature in the environment being humidified, and this process may be useful in many applications (adiabatic transformation).

The humiFog unit must be supplied with treated water, for the following reasons:

- **To reduce the introduction into the environment of dust due to the mineral salts found in the untreated water.**
- **To minimize the clogging of the nozzles.**

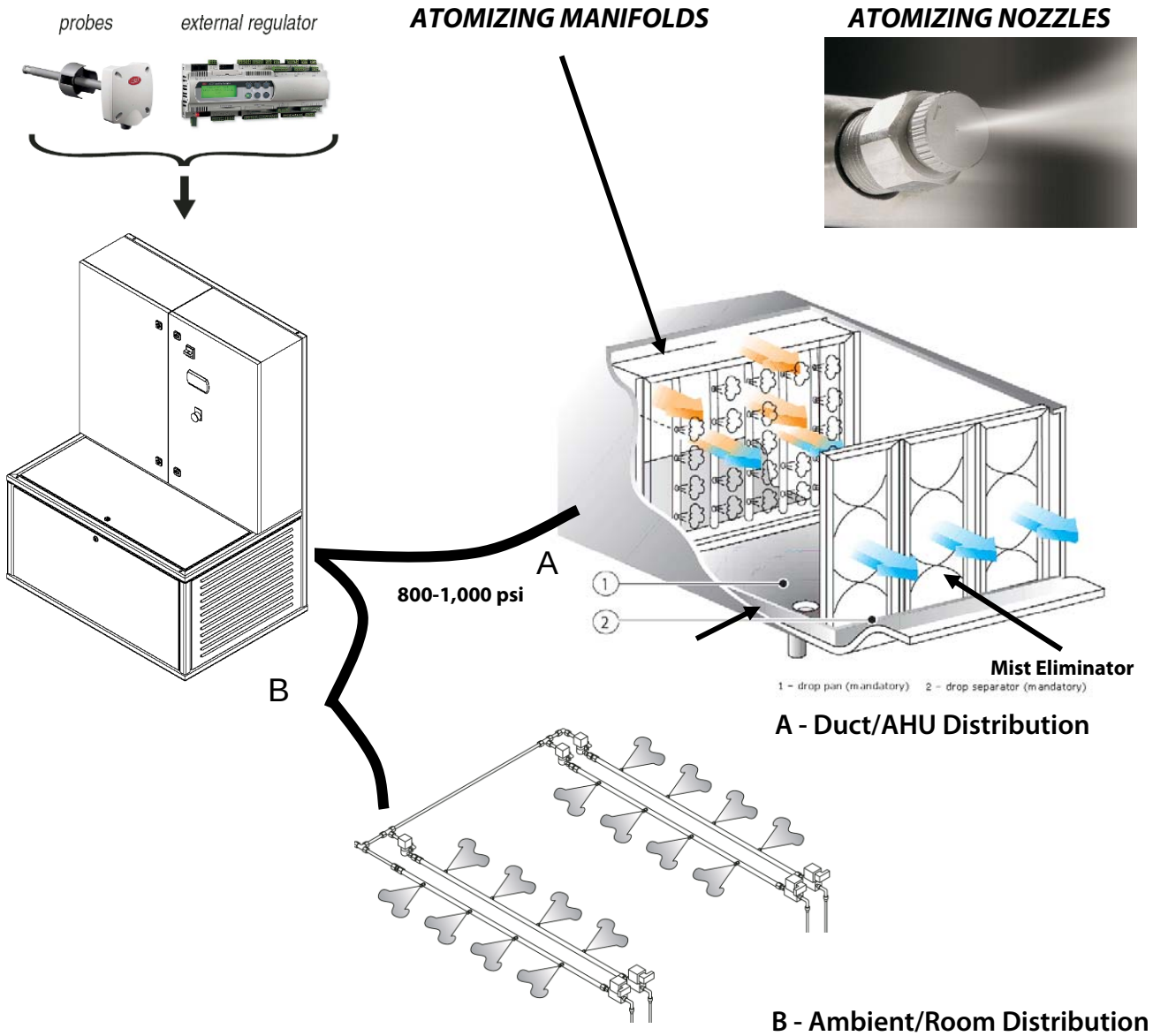


Fig. 1.a

2. COMPONENTS

A humiFog system is made up of the following components:

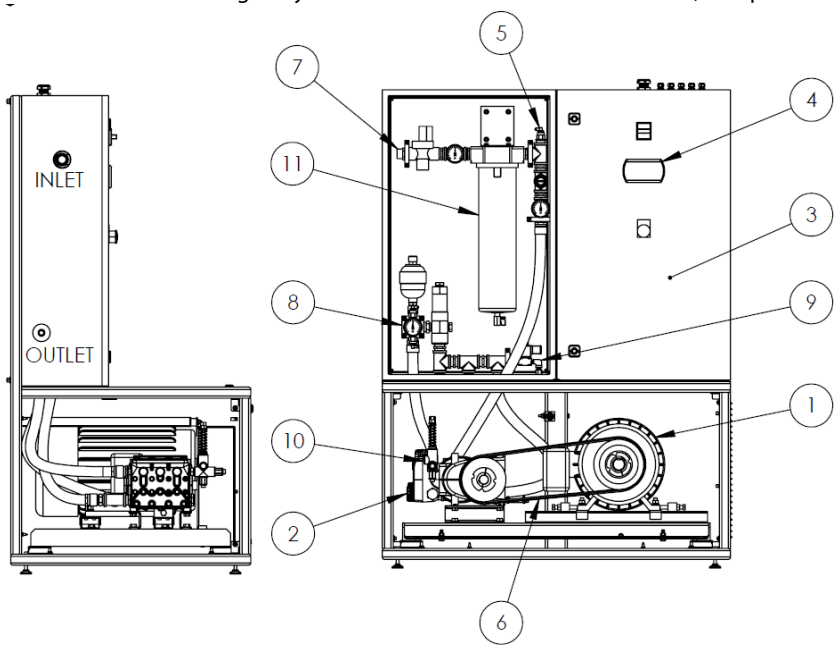
- Pumping station, containing the electrical panel and the volumetric piston pump.
- Microprocessor control system.
- Distribution system with the atomizing nozzles; for ducts/AHUs or rooms.
- Zone control panels for controlling the distribution staging in each zone or AHU.

2.1 MAIN PUMPING STATION

The main pumping station features an energy efficient combination of an advanced Inverter Duty Motor and a Variable Frequency Drive. This combination allows for the precise control of the volume of outlet water from the positive displacement pump. The positive displacement pump is a reliable component that is designed for long life and minimal maintenance. By adjusting the speed of the pump, the pressure and the flow rate of the nozzles are precisely modulated according to the requirements of the application. The station also incorporates a user friendly display, allowing the user to visually change set points, and other user-modified fields.

The main pumping station controls the water output using "Constant Pressure" principles. This type of control allows a single pumping station to supply humidification to multiple ducts/AHUs or rooms. In this setup, the humiFog controller manages the speed of the pump according to the "Constant Pressure" set point, increasing the speed if the pressure decreases (opening more zones/branches of the circuit) and decreasing the speed if the pressure increases (closing one or more branches of the circuit).

With this configuration, the humiFog controller can manage the humidity control and distribution directly (one zone/AHU); or the distribution control is managed by an additional external zone controller (multiple zones/AHUs).



No.	Description
1	Electric motor
2	Piston pump
3	Electrical cabinet
4	Controller-display
5	Low pressure hydraulics
6	Motor/pump drive assembly
7	Low pressure water inlet
8	High pressure water outlet
9	Drain water outlet-thermal valve
10	Drain water outlet-relief valve
11	Water filter

Tab.2.a

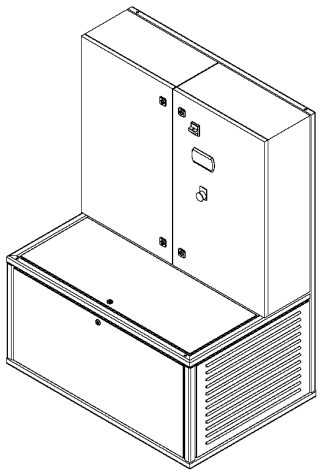


Fig. 2.b

2.2 MICROPROCESSOR CONTROL SYSTEM

The humiFog control system is based on the latest, state of the art, CAREL pCO programmable controller. This controller operates a Variable Frequency Drive to modulate water pressure and water flow according to requirements. Control can be stand-alone using humidity and temperature sensors, or the system can be controlled by a DDC signal. Modbus, BACnet, Echelon and TCP/IP protocol interface is available. A LAN (Local Area Network) connection allows up to 32 systems to be connected to share sensor information, or even operate redundantly.

2.3 ATOMIZING NOZZLES


Atomizing nozzles

The humiFog atomizing nozzles are constructed of stainless steel and are available in three capacities: 3.3, 6.2 & 8.8 lbs/hr (1.5, 2.8 & 4.0 kg/hr). Working on the centrifugal/whirljet principle, they have no targets to drip or require adjustment. An internal 60 micron filter is used to prevent jamming of the nozzle, and a special internal valve closes the orifice to avoid dripping and prevent any ambient contamination when the nozzle is off. The nozzles are mounted uniformly in the distribution manifolds.

2.4 DISTRIBUTION

The following diagrams illustrate the typical applications in ducts (Fig. 2.c) or directly in the rooms (Fig. 2.d).

The ambient humidity is measured by a probe (1), or receives a command signal from an external controller, and is read by the controller contained in the humiFog pumping station (6). The controller then compares the humidity measured in the room against the humidity set point, starting, when necessary, the production of the pump. The demineralized water produced by the water treatment system (7) is brought to high pressure by the humiFog pump (6), sent to the manifolds for distribution into the duct or directly into the room (5), and then atomized by the nozzles (4). The percentage of water fog evaporated depends on the temperature and speed of the air, as well as on the relative humidity reached. In duct applications, any non-evaporated droplets are separated by a mist eliminator filter or cooling coil (2), collected in the bottom tank (3) and immediately discharged. The control system built into the pumping station controls the banks of nozzles supplied with solenoid "zone" valves.

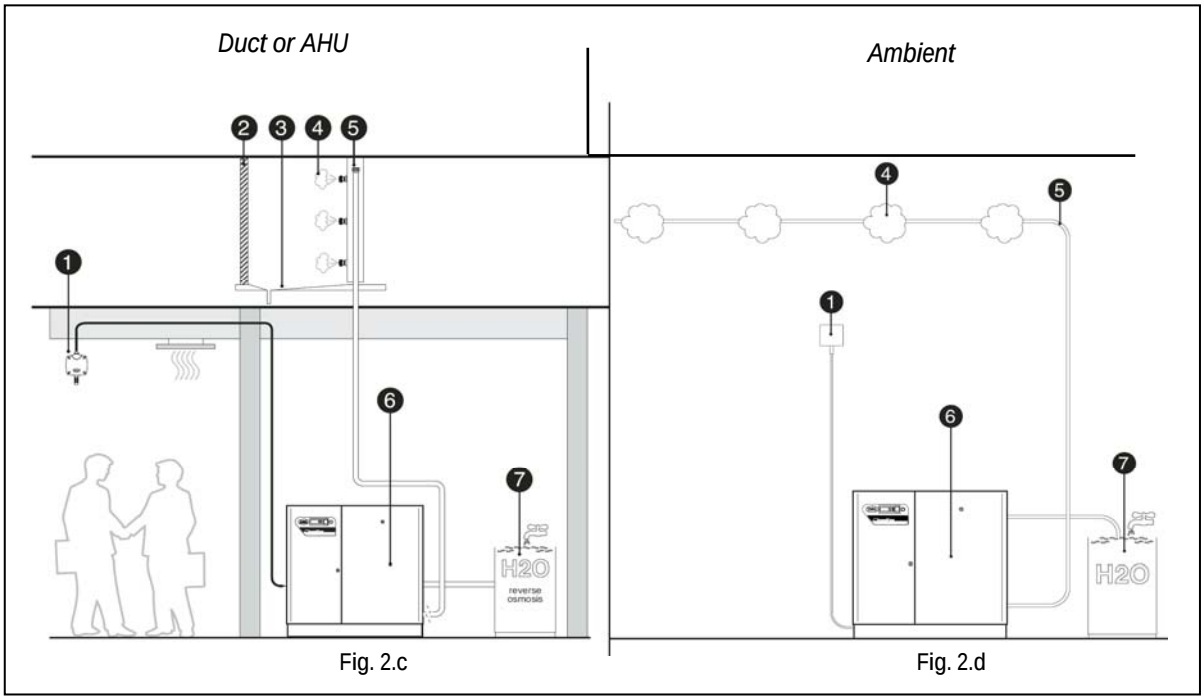


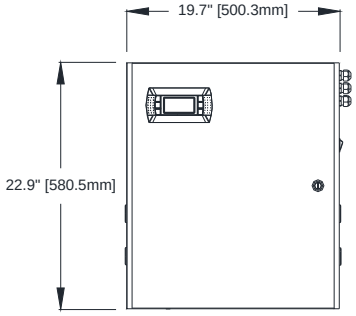
Fig. 2.c Fig. 2.d

2.5 ZONE CONTROL PANELS

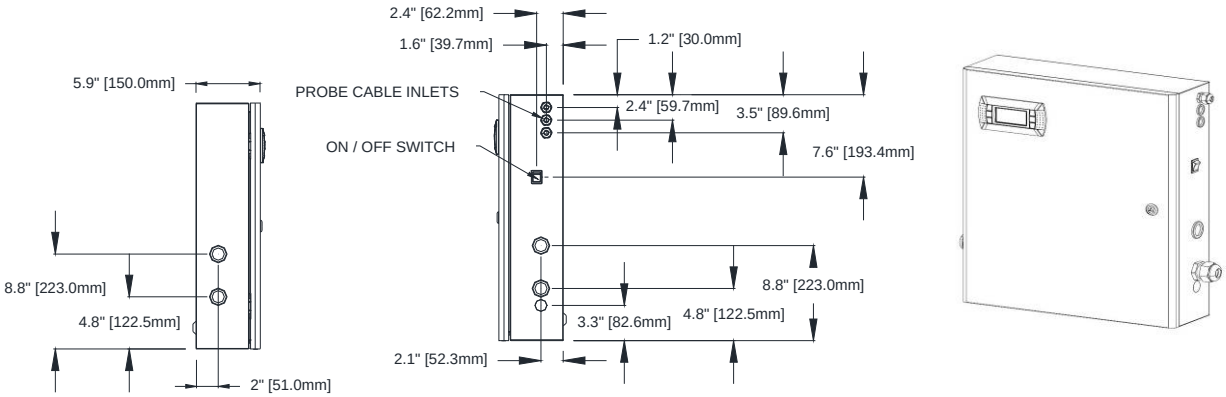
The humiFog Zone Control Panels utilize the latest state-of-the-art CAREL pCO programmable controller. This controller operates the distribution system, by interfacing with the selected control system, and then controlling the water solenoid valves for appropriate modulation. Control can be stand-alone using humidity and temperature sensors, or the system can be controlled by a DDC signal. Modbus, BACnet, Echelon and TCP/IP protocol interface is available. A LAN (Local Area Network) connection allows up to 32 Controller devices to be connected to share sensor information, or even operate redundantly. The zone control cabinets are also used to control each zone, in a multi-point humiFog system. In this type of system, all of the zone control panels communicate to each other, and to the pumping station panel, by a pLAN network.

Multi zone setup configuration may involve multiple zones within the same air handler. There are two primary methods of how to distribute water through a multi zone setup, **parallel** or **staged** control. With **parallel** control, each zone connected to the pumping station will be activated simultaneously and operate at the same output level. **Staged** control will run one zone to its maximum capacity before activating the next zone. This choice will affect the zone demand display of the zone control cabinets, as described in the section **7.1** of this manual.

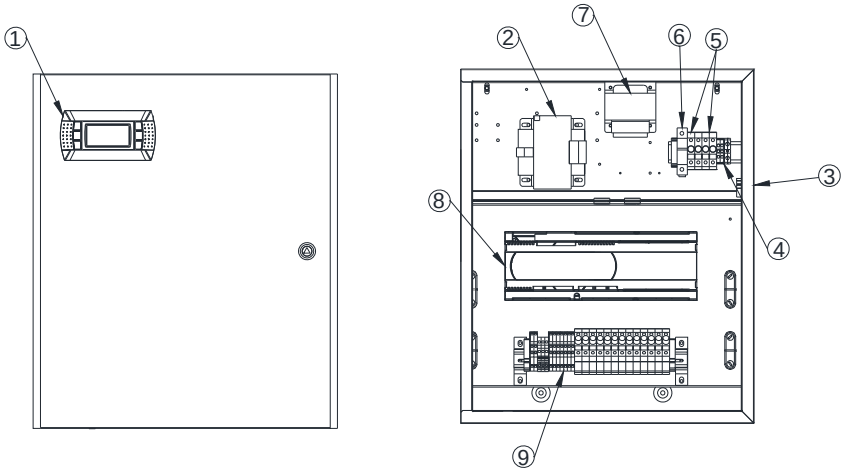
2.6 ZONE CONTROL PANEL DIMENSIONS AND WEIGHTS



Weight Table, UAZN******	
weight installed lbs / kg	53 / 24
weight packaged lbs / kg	66 / 30



2.7 ZONE CONTROL CABINET COMPONENTS



Key	
1	terminal rear view
2	transformer B
3	main switch G
4	power supply terminal block
5	transformer primary fuse carrier (TRA:F1,F2;TRB:F3,F4)
6	transformer B secondary fuse carrier (F8)
7	transformer A
8	electronic controller
9	control terminal block with fuses

3. MODELS

3.1 ZONE CONTROL PANEL CODING GUIDE

Zone Control Panels				
UA	**ZN**	**0**	**YYYY**	**U**
humiFog	**Zone Control Cabinet**	**Type of Cabinet** 0=Duct A=Ambient	**Available – Sequencing Number**	**Custom** U= USA

4. ZONE CONTROL CABINET POSITIONING AND MOUNTING

4.1 ZONE CONTROL POSITIONING AND MOUNTING NOTES

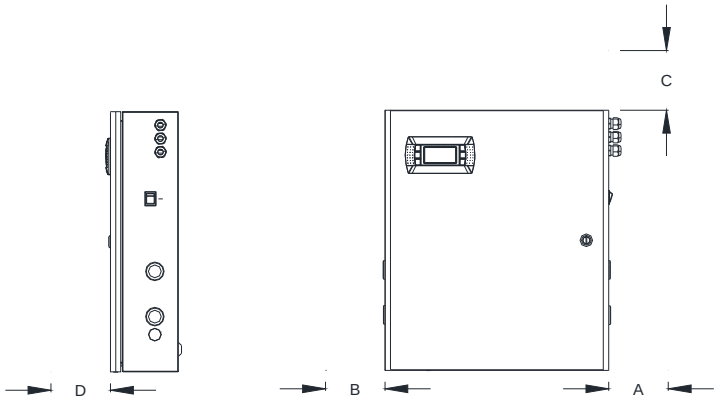
The humiFog zone control cabinets are designed to be wall mounted. There are appropriate holes in the back of the cabinet, for mounting to the wall. Use appropriate fasteners for supporting the weight of the cabinet and its components. Maintain clearances around the cabinet as noted below. This allows for proper ventilation, maintenance and user operation of the cabinet. The cabinet should be placed locally centered to the pumping station, and distribution zone points. For ducted systems, the zone control cabinet should be close to the duct/AHU. For ambient systems, the zone control cabinet should be mounted centrally to the zone areas.

***IMPORTANT NOTE*: The maximum distance between the zone control cabinet and the rack/distribution is 50ft (15meters). It is recommended that the unit be fixed in position so that the electrical connections do not become damaged. All connecting wiring is done by installer. Certain clearances must be maintained around the unit for safety and maintenance.**

The cabinet can be placed wherever the following conditions are met:

Cabinet protection index: IP20 / Nema Type 1 (unless specified otherwise)
Operating conditions: 20-80% RH non condensing, 34-104ºF (1-40ºC)
Storage conditions: 10-90% RH non condensing, 34-122ºF (1-50ºC)

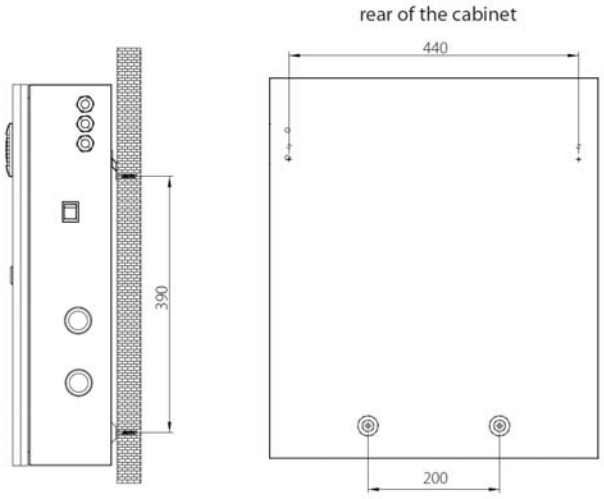
4.2 ZONE CONTROL PANEL CLEARANCES



UNIT CLEARANCES		
FACE OF UNIT	DIM (IN)	DIM (MM)
FRONT (D)	24	610
LEFT SIDE (B)	4	102
RIGHT SIDE (A)	4	102
TOP (C)	12	305

Tab. 4.b

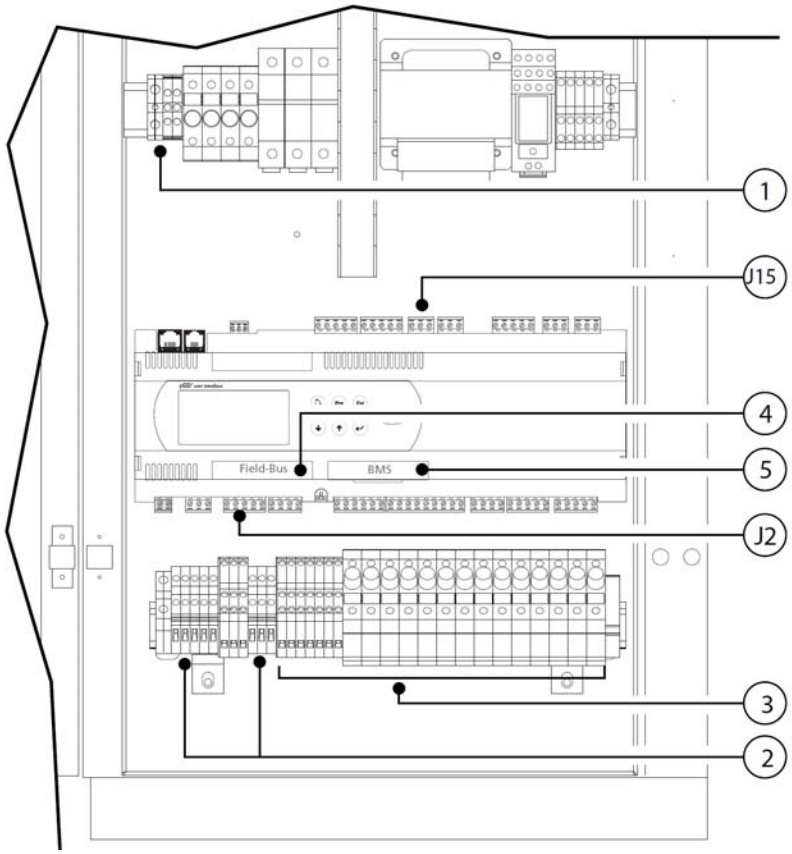
4.3 ZONE CONTROL DRILLING TEMPLATE



Drilling Hole Conversion Table		
Dimension	**mm**	**in**
Upper Horizontal	440	17.32
Lower Horizontal	200	7.87
Vertical Space Between Horiz.	390	15.35

5. ELECTRICAL WIRING

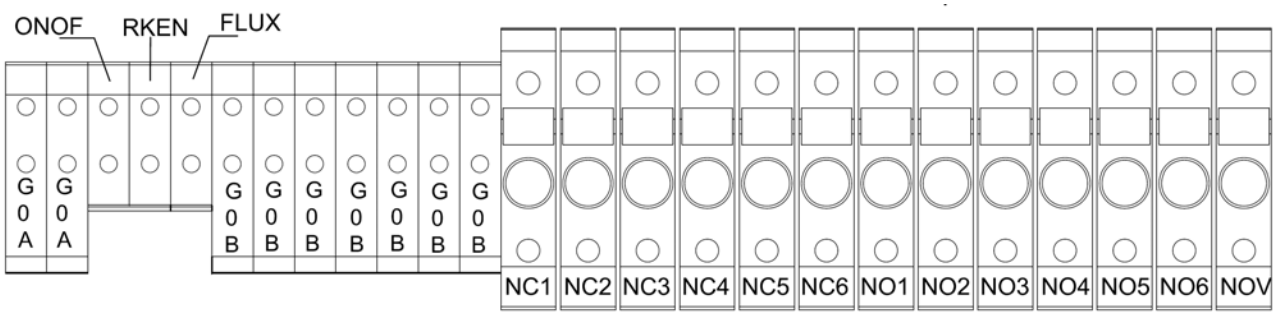
5.1 POWER WIRING CONNECTION LAYOUTS



Key:

1	L/N/GR	Power supply Important • make sure that the cable glands are fitted • do not run the control and signal cables through this cable gland.
J2	B1	Main humidity/temperature probe
	B2	Limit humidity/temperature probe
	B3	AUX probe (temperature display only)
J15	NO8	Cumulative alarm relay
2	PEN/G0A	Pumping unit remote enabling signal
	ROAL/G0A	Water treatment system alarm signal
	BKUP/G0A	Backup cabinet signal
	ROEN/COM	Water treatment system control
	ON-OFF/G0A	Control signals from external voltage-free contact, i.e. ON/OFF humidistat
	RKEN/G0A	Enable RACK production
	FLUX/G0A	Air flow switch
3	NC1÷NC6/GOB	Capacity-control solenoid valves, step
	NO1÷NO6/GOB	Drain solenoid valves, step
	NOL	Line drain solenoid valve
	NOV	Vent solenoid valve (rack)
4	Field card	Field card input for Master Slave connection
5	Serial Card	Serial card input for BMS (Building Management Systems)

5.2 DETAILS OF (2) AND (3) TERMINAL BLOCKS



5.3 ELECTRICAL POWER

Check that the power supply voltage to be connected matches the value indicated on the rating plate inside the electrical panel.

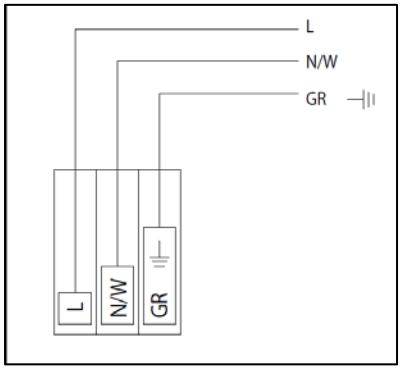
An external, fused disconnect should be provided according to local and/or national electrical codes.

NOTE: To avoid unwanted interference, the power cables should be kept separate from any control wiring.

All wiring must be in accordance with local, state and country electric codes.

NOTE: Tolerance allowed on main voltage = -15% to +10%

Power is connected to the main switch inside the control panel at the bottom right. Connect wires to the top of the switch/terminal labeled L, and N. There is also a ground bar/lug labeled GR



CONNECTIONS

Master - slave cabinet	Power cable
L	L/F (phase)
N	N/W (neutral)
GR	GR/PE (earth)

Power Table, UAZN****

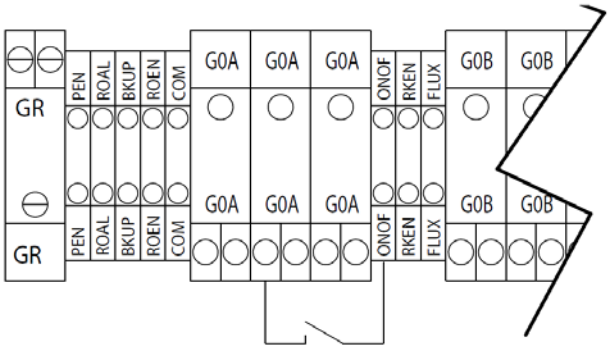
Model	Voltage	Current	External Disconnect Size, provided by Installer
UAZN00106U	115 V~	5.0 FLA	at least 6 Amps
UAZN00108U	115 V~	4.1 FLA	at least 5 Amps

5.4 CONTROL SIGNALS FROM EXTERNAL VOLTAGE-FREE CONTACT (HUMIDISTAT)

***IMPORTANT NOTE*:** **When grouping cabinets in a staged (cascaded) or parallel system, control signals, sensors, & switches ONLY need to be connected to the master zone control cabinet of each group, addressed at location "1".**

a) ON/OFF (C control)

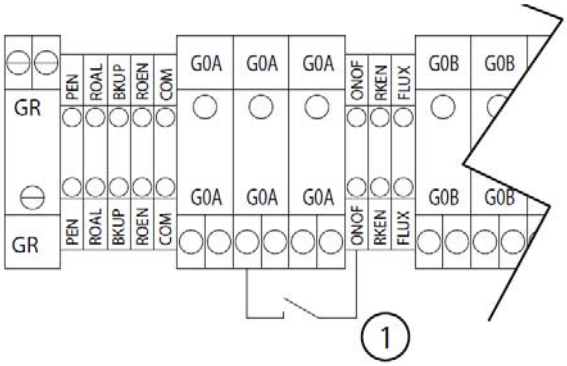
Cables	• up to 30 m: two-wire cables cross-section 0.5 mm² (AWG20) • greater than 30 m: shielded cables cross-section 1.5 mm² (AWG15)
electrical specifications of the contact	voltage-free contact



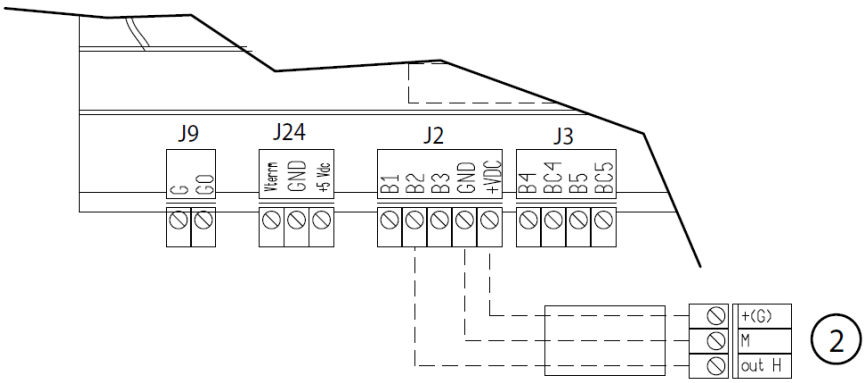
Contact open: humiFog deactivated
Contact closed: humiFog activated

humiFog Master cabinet	ON/OFF humidistat thermostat
ON/OFF	NC/NO
G0A	COM

b) ON/OFF and limit probe (CH/CT control)



Key:
1. ON/OFF humidistat thermostat
2. limit humidity/temperature probe



5.5 MODULATING CONTROL SIGNAL

***IMPORTANT NOTE*: When grouping cabinets in a staged (cascaded) or parallel system, control signals, sensors, & switches ONLY need to be connected to the master zone control cabinet of each group, addressed at location "1".**

The control signal input connections depend on the control algorithm activated

Cables	Up to 30 m : two-wire cables cross-section 0.5mm2 (AWG20)
The signal may come from:	-Modulating control with external controller -Modulating control with ambient humidity probe -External controller and limit humidity probe

To set the type of operation, control and signal: "installer menu > type of control (see chap. 9.11 Installer menu)

-N.B. Shielded cables should be used. The cables must not run near the 120 V power cables nor near the conductor cables; this avoids measurement errors due to electromagnetic disturbance.

a. Modulating control with external controller (P control)
0 to 1 V; 0 to 10 V; 2 to 10 V; 0 to 20 mA; 4 to 20 mA.

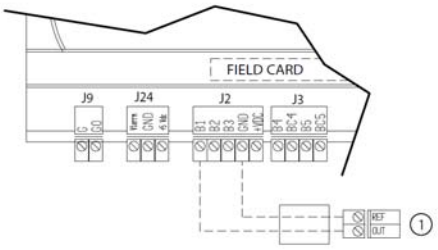


Fig. 3.g

Key:
1. external controller

Connections:

	humiFog cabinet	External controller
J2	B1	OUT
	GND	Reference, shield

b. Modulating control with ambient humidity probe (H control)
0 to 1 V; 0 to 10 V; 2 to 10 V; 0 to 20 mA; 4 to 20 mA

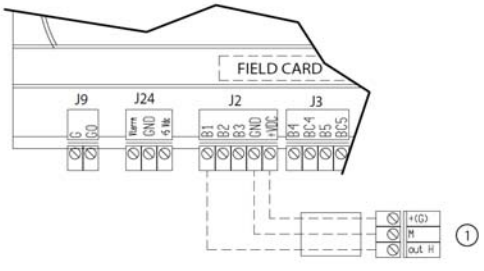


Fig. 3.h

Key:
1. humidity sensor

Connections:

	humiFog cabinet	Ambient humidity probe
J2	B1	OUT H
	+Vdc	+(G)
	GND	M

d. Modulating control with ambient humidity probe and limit humidity and temperature probe (HH/HT control)
0 to 1 V; 0 to 10 V; 2 to 10 V; 0 to 20 mA; 4 to 20 mA

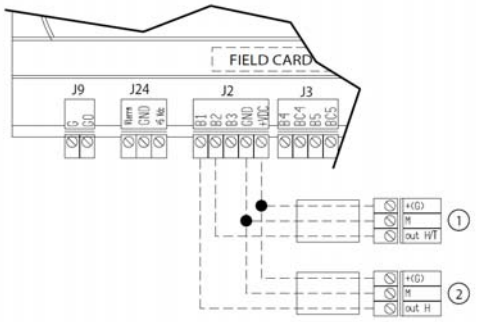


Fig. 3.j

Key:
1. limit humidity/temperature probe;
2. ambient humidity probe.

Connections:

	humiFog cabinet	External controller	limit humidity probe
J2	B1	OUT H	
	B2		OUT H/T
	+Vdc	+(G)	+(G)
	GND	M	M

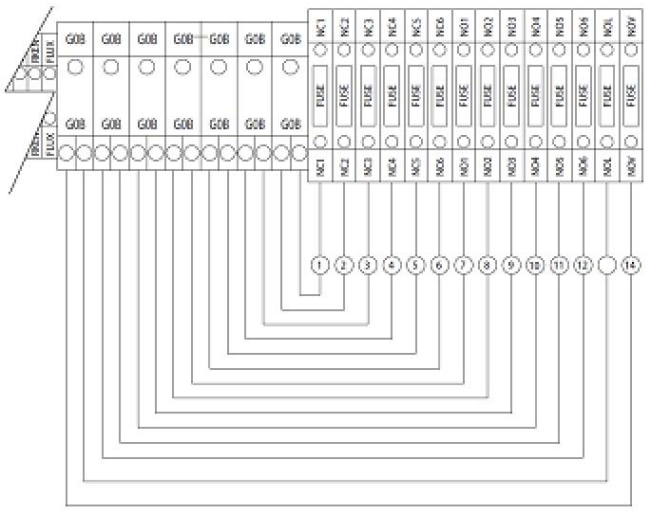
5.6 SOLENOID VALVE CONNECTION FOR DISTRIBUTION SYSTEM

For the management of the distribution system, the cabinet controls four

types of solenoid valves:

- normally closed “NC” for capacity-control of the manifolds.
- normally open “NO” for draining the manifolds.
- normally open vent valves.

Recommended connection cables: two-wire plus earth AWG 18-20 (0.5-1.0 mm^2), maximum length 100 m.



NOTES: (Diagram above for other models)

REF.	CABINET TERMINAL BLOCK	SOLENOID VALVE CONNECTOR	DESCRIPTION	MAX. NO. OF SOLENOID VALVES PER STEP
1	NC1 - GOB	1 - 2	Capacity-control sol. Valves 1st step	3
2	NC2 - GOB	1 - 2	Capacity-control sol. Valves 2nd step	3
3	NC3 - GOB	1 - 2	Capacity-control sol. Valves 3rd step	3
4	NC4 - GOB	1 - 2	Capacity-control sol. Valves 4th step	1
5	NC5 - GOB	1 - 2	Capacity-control sol. Valves 5th step	1
6	NC6 - GOB	1 - 2	Capacity-control sol. Valves 6th step	1
7	N01 - GOB	1 - 2	Drain solenoid Valves 1st step	3
8	N02 - GOB	1 - 2	Drain solenoid Valves 2nd step	3
9	N03 - GOB	1 - 2	Drain solenoid Valves 3rd step	3
10	N04 - GOB	1 - 2	Drain solenoid Valves 4th step	1
11	N05 - GOB	1 - 2	Drain solenoid Valves 5th step	1
12	NO6 - GOB	1 - 2	Drain solenoid Valves 6th step	1
14	NOV - GOB	1 - 2	Vent drain solenoid valves	1

5.7 CUMULATIVE ALARM RELAY (J15)

Activated when one or more alarms is detected via a contact/output that can be transferred to a supervisory system.

Cable	two-wire AWG 15/20	
Electrical specifications of the relay	power 500 VA; voltage 250 V; current 2 A resistive/ inductive	
Status and operation of the relay:	contact open	no alarm active
	contact closed	active alarm/alarms

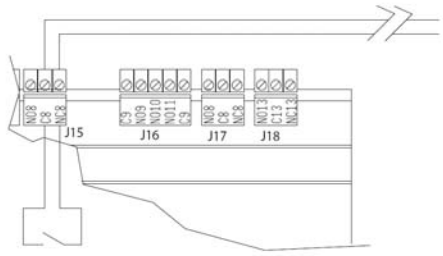


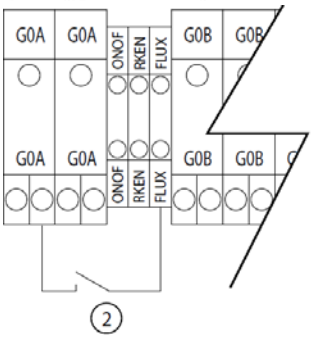
Fig. 3.q

Connections

humiFog cabinet	terminal	
J15	NO8	normally open
	C8	COM

5.8 INPUTS FROM EXTERNAL DEVICES

Cable	two-wire AWG 15/20	
Electrical specifications of the relay	voltage-free contact	
Status and operation of the relay:	contact open	no alarm active
	contact closed	active alarm/alarms



Key:

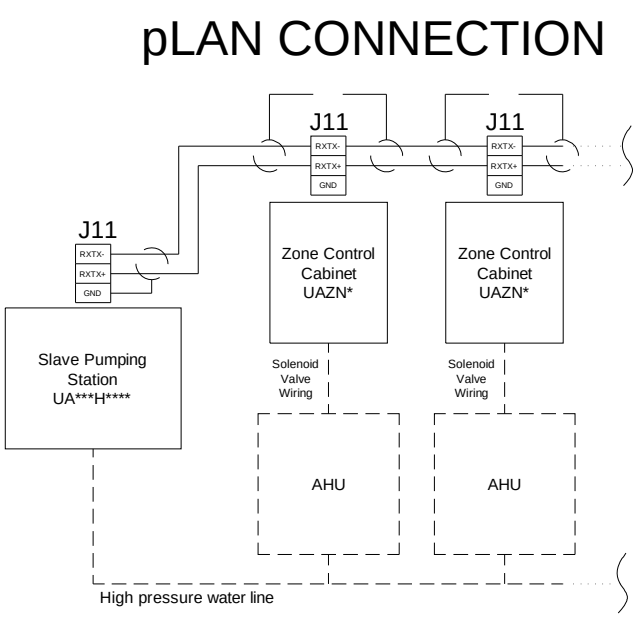
2. alarm input from AHU pressure sensor (flow switch).

5.9 SUPERVISOR NETWORK

Supervisor network is through the pumping station unit. Please see the pumping station manual.

5.10 PUMPING STATION TO MULTI ZONES

Pumping stations are wired to the multi-zone control panels by pLAN connections. Please see diagram below, as well as the CAREL pCO platform manual for specific instructions.



WIRING FROM PUMPING STATION, TO ZONE CONTROL CABINET(S)

NOTES:

1. Use a twisted pair shielded cable to zone control cabinets.

2. Connect to terminal block J11 of PCO3 in each zone cabinet.

3. Connect the shield to the GND at pumping station end only.

5.11 DUPLEX CONTROL WIRING / MULTIPLE ZONES PER AIR HANDLER

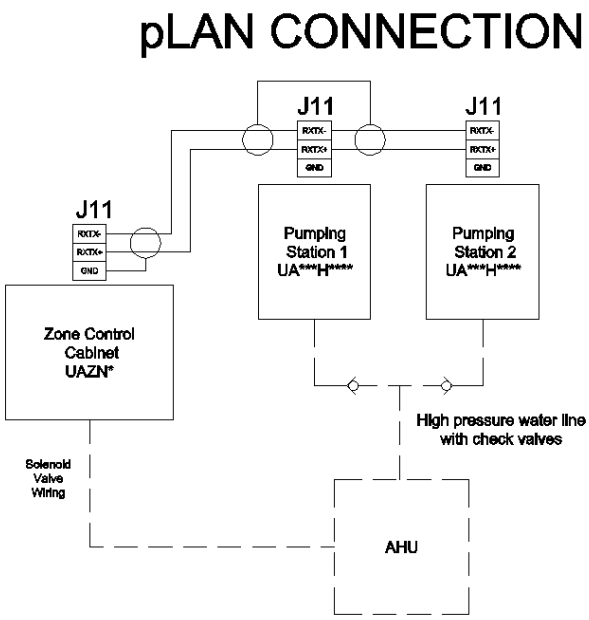
WIRING FROM ZONE CONTROL CABINET TO DUPLEX PUMPING STATIONS

NOTES:
1. Use a twisted pair shielded cable to pumping stations.

2. Connect to terminal block J11 of PCO3 in each pumping station.

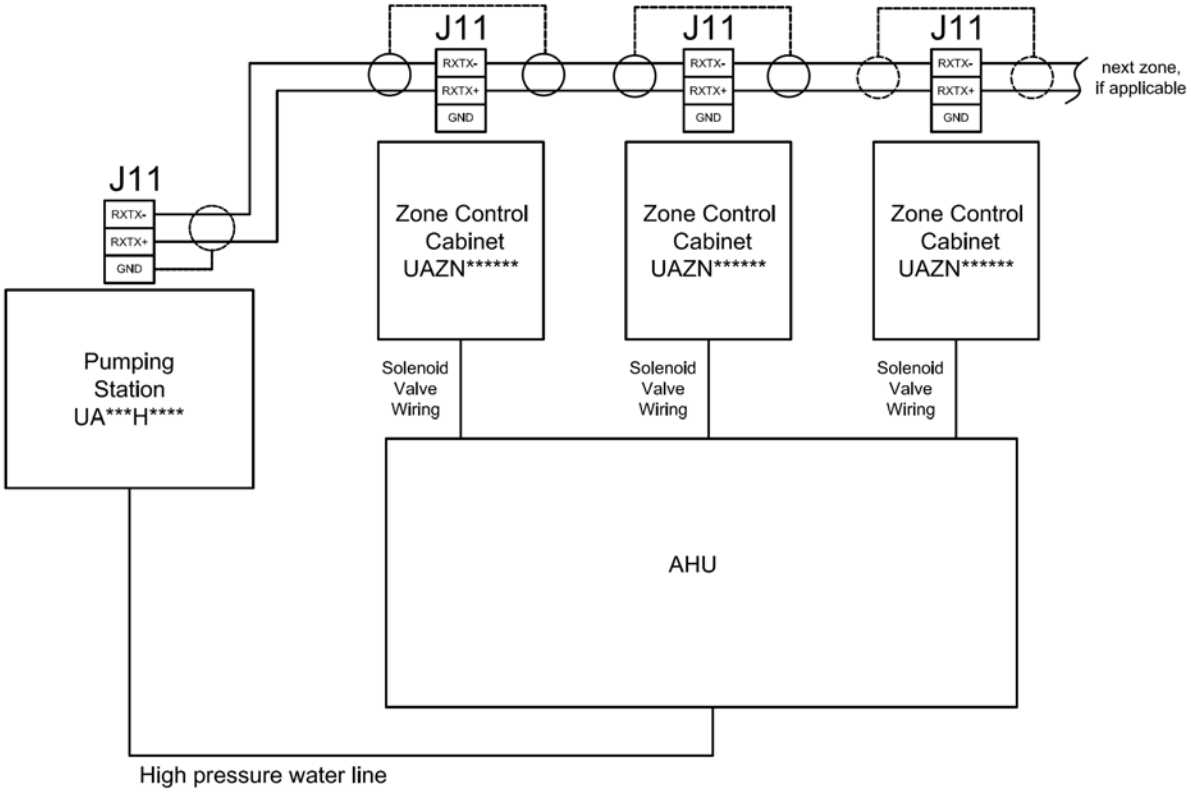
3. Connect the shield to the GND at zone control end.

Rx/Tx+ must match on all PCO controllers. Rx/Tx- must also match on all PCO controllers.



For a duplex system, both pumping stations are wired to one or more zone control panels by pLAN connections. Please see diagram 6.d, as well as the CAREL pCO platform manual for specific instructions.

Fig. 6.d **For multiple zones in the same air handler, the same wiring rules apply for the pLAN connections. For multiple zones each with multiple zone control cabinets, the *number of cabinets per each zone must be the same*. Contact the factory for additional details regarding this.**



6. START-UP

IMPORTANT INSTRUCTIONS/WARNINGS:
Before connecting the water to the pumping station, flush the supply pipe for 10 minutes by piping water directly into the drain.
Before starting the pumping station, verify that the humidifier is in full operational condition. The hydraulic and electrical equipment should not be locked out. There should not be any water leaks and the electrical components must be dry.
If a hazard does seem to exist, the system should be locked out immediately and the problems corrected before continuing.

6.1 STARTUP CHECKLIST

Before starting the humidifier, the following should be checked:

☐ **Water is connected, the line has been flushed, and external valves are open.**
☐ **Drain is connected and run to an open drain.**
☐ **Electricity is connected in accordance with instructions, local codes and data labels in the unit.**
☐ **The external power fuses/disconnect are installed and intact.**
☐ **All control wiring is done and tested.**
☐ **Airflow switch is wired to open on air flow loss.**
☐ **Hi-limit humidistat is wired to open on humidity rise above set point.**
☐ **Unit wires have been checked to make sure they and all connectors are tight from shipping.**
☐ **The high pressure water outlet piping is run correctly to the distribution system.**
☐ **The proper capacities for each stage of the manifold system are installed in the zone control cabinet.**
☐ **For a multi-zone system, the addresses of the zone controls cabinets are changed.**
☐ **For a duplex system, the addresses of the pumping stations are changed.**

6.2 RE-ADDRESSING THE CONTROLLERS AND DISPLAYS FOR MULTI-ZONE OR DUPLEX SYSTEMS

The default addresses for a zone control cabinet are "1" for the PCO3 controller and "30" for the PGD display. The default addresses for the pumping station cabinet are "16" for the PCO3 controller and "32" for the PGD display. For multi-zone or duplex systems, the additional cabinets on the pLAN must have their addresses changed before they can operate correctly.

When changing addresses, the pLAN connections between each of the PCO3 controllers must be removed. The connections are restored once the readdressing is completed.

- **For multi-zone system,**
  - **the PCO3 controllers in the additional cabinets can be assigned addresses sequentially upward.**
  - **the PGD displays in the additional cabinets can be assigned addresses sequentially downward.**
- **For a duplex system,**
  - **the PCO3 controller in the additional pumping station cabinet must be changed to "17."**
  - **the PGD display in the additional pumping station cabinet must be changed to "31."**

	pLAN ADDRESS TABLE					
	PCO3 Controller			PGD Display		
	Default	Multi-zone	Duplex	Default	Multi-zone	Duplex
Pumping Station	16	N/C	17	32	N/C	31
Zone Control	1	2, 3, …, 15	N/A	30	29, 28, …, 18	N/A

Tab. 7.a

6.3 RE-ADDRESSING PCO3 CONTROLLER

To change the address of the PCO3 controller, the address of the PGD display must be set to "0" first. (The procedure for setting the address of the PGD back to the proper address is described in 6.2.2.)

1. **Unplug J11 connector from PCO3 controller.**
2. **Press the up, down, and enter keys (3 keys on the right hand side of remote display) for approximately 3 seconds.**
3. **The screen should show "Display address setting."**
4. **Press the enter key and change value to "0."**
5. **Press enter.**
6. **Shut down power to the PCO3 controller, wait 3 sec, and then turn power back on to the PCO3 controller.**
7. **As unit is powering on, press and hold the up and alarm buttons (top left and top right buttons on PGD remote display) until "pLAN address" is displayed.**
8. **Change to desired address.**
9. **Press enter.**
10. **The PCO3 is now address to the value you last entered.**

6.4 RE-ADDRESSING PGD DISPLAY

1. **Unplug J11 connector from PCO3 controller.**
2. **Press the up, down, and enter keys (3 keys on the right hand side of remote display) for approximately 3 seconds.**
3. **The screen should show "Display address setting."**
4. **Press the enter key and change this value to 18-32. This address must be different from the address of the PCO3 controller.**
5. **Press enter.**
6. **Press the up, down, and enter keys (3 keys on the right hand side of remote display) for approximately 3 seconds.**
7. **You will be taken to the same screen as before, but this time you will see "I/O Board Address" displayed underneath "Display address setting."**
8. **Press the enter button 2 times so the text box is blinking beside "I/O Board address."**
9. **Change this to the same address that you assigned to the PCO3 controller.**
10. **Then, press enter.**
11. **The next screen displayed will show "Terminal config" press enter to continue.**
12. **The following screen will show P:(address of PCO3 controller) in upper left corner.**
13. **Trm1 None will be blinking. Change "none" to the addressed you entered in step 4 (address of PGD display.)**
14. **Press enter 1 time and change the next field to Pr.**
15. **Press enter 5 times and change ok? From no to yes.**
16. **Press enter.**
17. **The PGD remote display is now addressed to your PCO3 controller.**

7. THE humiFog CONTROLLER

The humiFog controller features a comprehensive information display that shows the operation of the system at a glance:

	Alarm	**Turns off the buzzer and displays the first alarm screen in the alarm-loop.** **A red LED located under the Alarm button will be energized when there are alarms present. If the red LED is blinking, that means an alarm has occurred, but the condition has been corrected and the alarm can now be reset.**
Prg	**Program**	**Shortcut to the Technician's Menu, where all application settings can be reached. If protected, a password will need to be entered.**
Esc	**Escape**	**Escapes to previous screen-loop. When already in the Technician's Menu, pressing ESC takes you to the main status screen.** **If ESC's green LED is blinking, part of the system is under "Manual Control."**
	Up	**Cycles upward through the screens, when cursor is in top left corner. When cursor is in a field, the value of the field is increased. The longer the button is held, the faster the value increases.**
	Enter	**Cycles through fields in a screen. When in a field, pressing ENTER confirms the current value into the field and goes to the next field.**
	Down	**Cycles downward through the screens, when cursor is in top left corner. When cursor is in a field, the value of the field is decreased.** **The longer the button is held, the faster the value decreases.**
+	**Up + Down**	**Shortcut to quickly see the Software Application's Version Number and Date.** **It is in this screen from which you can restore the Factory Settings,** **by pressing , then , then , and finally one last time.**
Esc + Prg	**Escape + Program**	**Shortcut to quickly see the System Type and Number of Humidification Stages.** **When in the Alarm History Screen, pressing ESC+PRG will erase the history.**
Esc +	**Escape + Alarm**	**Keyboard shortcut to reset all Manually controlled points to Automatic control.** **When in the System Run Hours screens, pressing these keys will reset the currently selected Stage's Run Hours.**

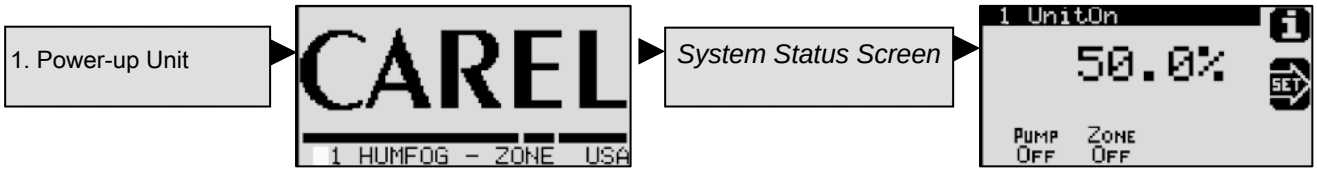
NOTE: The standard humiFog display will have fields that can display values or fields that can accept values. If pressing the ENTER key places the cursor next to the display field, the UP and DOWN keys can be used to change that value.

7.1 MULTI-ZONE IN SINGLE AHU SETUP OVERVIEW

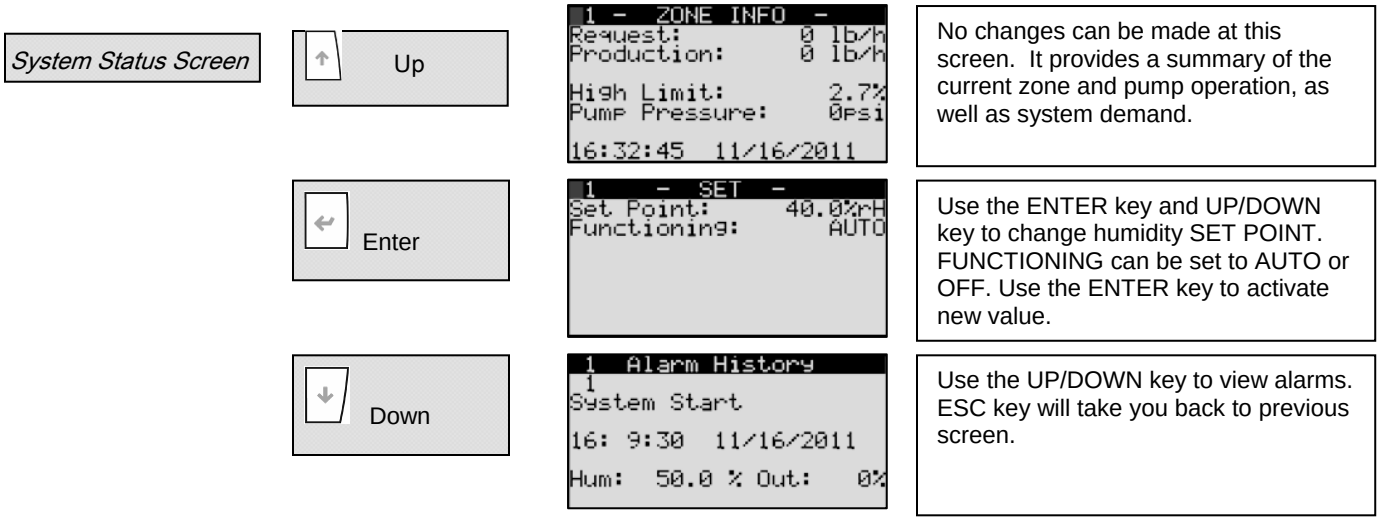
Depending on the system setup variables, there can be significant differences in the user interface options. Some options may have more selections to choose from, and some menu selections may be absent altogether.

7.2 SYSTEM STATUS

On initial power-up, the controller will go through a series of self-tests and then activate the program, bringing up the following screens. The visibility of some screens is dependent on the configuration of the system.



During power-up, the controller performs an alarm test. The alarm key will be red, and must be pushed twice to clear the alarms. To check the "Alarm History", use DOWN key from System Status Screen. The 1st alarm is a "System Start Alarm", and the 2nd alarm is a "No Air Flow Alarm". Note: The "No Air Flow Alarm" occurs whether the AF digital input is open (low voltage) or closed (high voltage) at power-up. Actions that can be performed from the System Status Screen:



***IMPORTANT NOTE*: The *System Status Screen* can vary depending on the setup options in section 7.4 , MANUFACTURER SUBMENU. See section 5.11 for a review of multiple zone setup options. If the setup involves multiple zones in the same air handler, choosing parallel or staged setup will change the *System Status Screen* as follows:**

Parallel Zone Control: Each zone cabinet will display the same demand percentage because each cabinet is operating simultaneously at the same level of output. The output level displayed is that of the entire zone & pumping system.

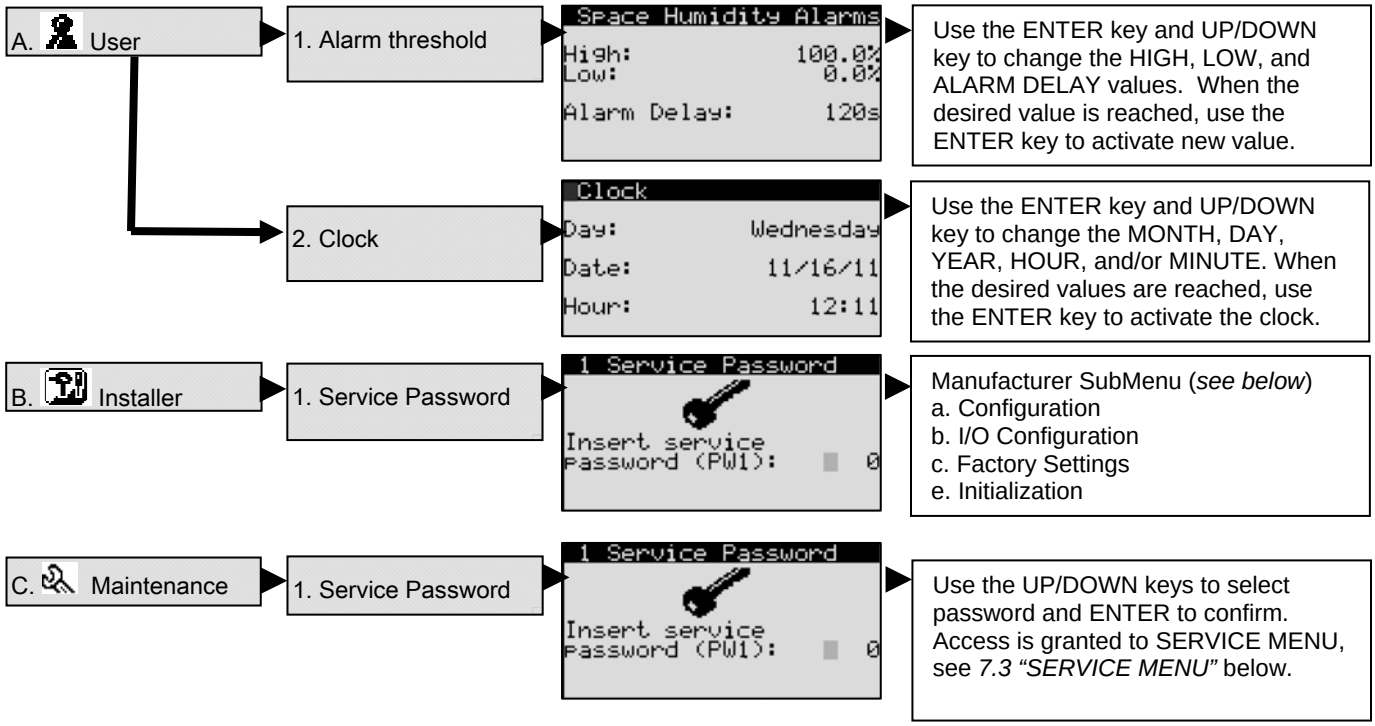
Staged (Cascaded) Zone Control: Zone control cabinets operate in a linear sequence, with zone activation occurring only after the previous one has reached 100%. Due to the variation in demand among cabinets, the master cabinet (address 1) will display the demand value of entire system capacity. The remaining cabinet(s) will only display its own output relative to its capacity. For example, the zone at address 1 may read 50%, indicating that the system capacity is 50% while the zone demand at address 1 is actually 100%. For the subsequent zones, however, the demand displayed is the actual output of that zone.

7.3 MAIN MENU

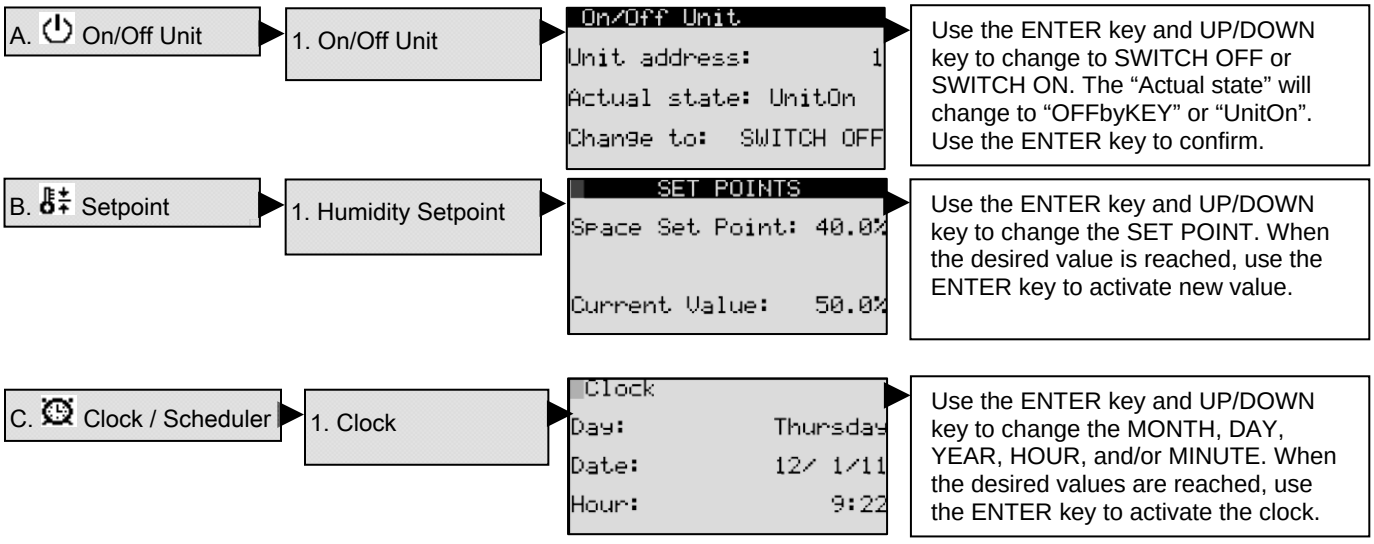
To access the "MAIN MENU", press PRG from the "System Status Screen" shown above.

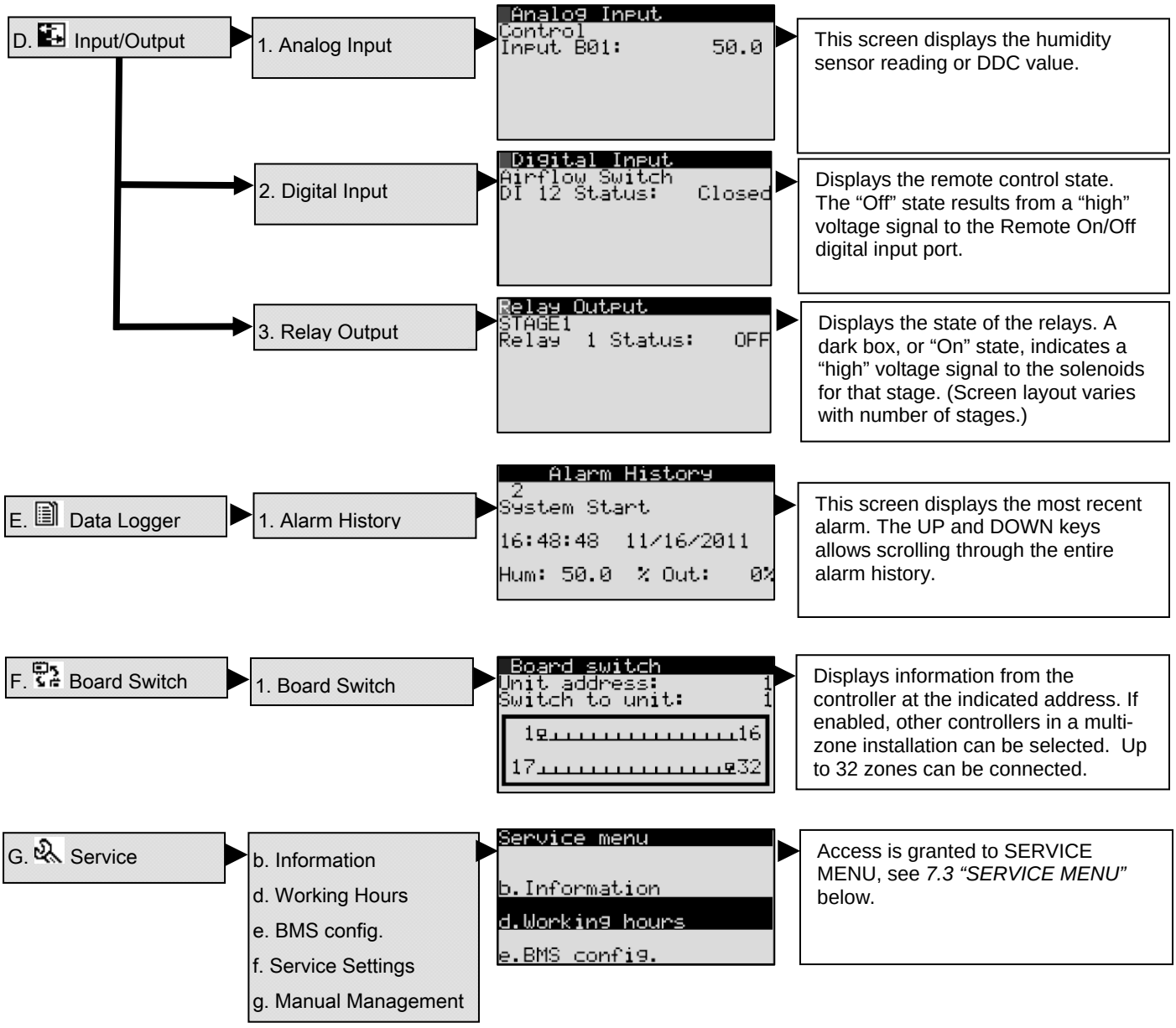
List of Main Menu selections: (Use the UP/DOWN arrows to scroll through this list)

1. **User**
2. **Installer**
3. **Maintenance**



To access the "Main Menu", press PRG twice from the System Status Screen.



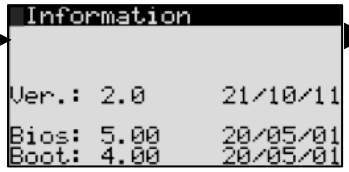

D. Input/Output
1. Analog Input
Analog Input
Control
Input B01: 50.0
This screen displays the humidity sensor reading or DDC value.
2. Digital Input
Digital Input
Airflow Switch
DI 12 Status: Closed
Displays the remote control state. The “Off” state results from a “high” voltage signal to the Remote On/Off digital input port.
3. Relay Output
Relay Output
STAGE1
Relay 1 Status: OFF
Displays the state of the relays. A dark box, or “On” state, indicates a “high” voltage signal to the solenoids for that stage. (Screen layout varies with number of stages.)
E. Data Logger
1. Alarm History
Alarm History
2
System Start
16:48:48 11/16/2011
Hum: 50.0 % Out: 0%
This screen displays the most recent alarm. The UP and DOWN keys allows scrolling through the entire alarm history.
F. Board Switch
1. Board Switch
Board switch
Unit address: 1
Switch to unit: 1
1 16
17 32
Displays information from the controller at the indicated address. If enabled, other controllers in a multi-zone installation can be selected. Up to 32 zones can be connected.
G. Service
b. Information
d. Working Hours
e. BMS config.
f. Service Settings
g. Manual Management
Service menu
b. Information
d. Working hours
e. BMS config.
Access is granted to SERVICE MENU, see 7.3 “SERVICE MENU” below.

7.4 SERVICE MENU

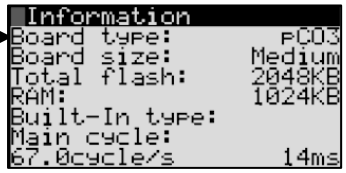
To access the "Service menu", scroll to "3. Maintenance" from "Main Menu", and press ENTER when highlighted. The factory default password is 22.
List of "Service Submenu" selections: (Use the UP/DOWN arrows to scroll through this list. Selections "a" and "c" are not available.)

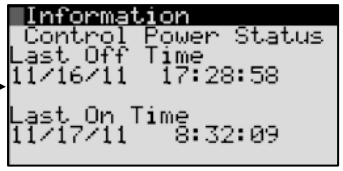
- **b. Information**
- **d. Working Hours**
- **e. BMS config.**
- **f. Service Settings**
- **g. Manual Management**

b. Information



Displays information on controller software, hardware, and power. Use the UP/DOWN keys to alternate screens.

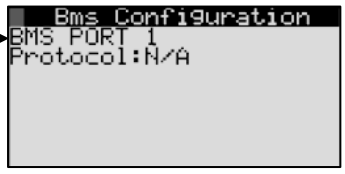




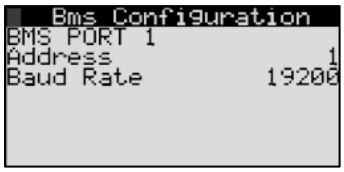
d. Working Hours

Displays cumulative run-time for each stage. (Screen layout varies with number of stages.)

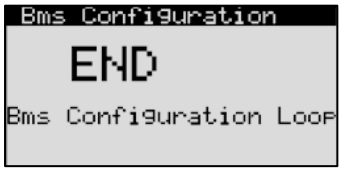
e. BMS config.

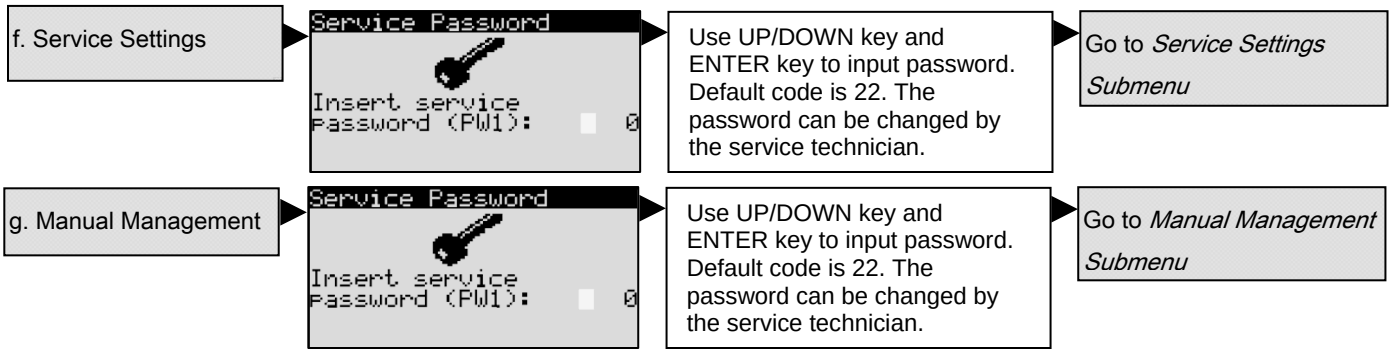


Use ENTER to select Protocol and UP/DOWN key to select Protocol type. ENTER again to confirm selection.



Use ENTER to select Address or Baud rate and UP/DOWN key to change. ENTER again to confirm selection.





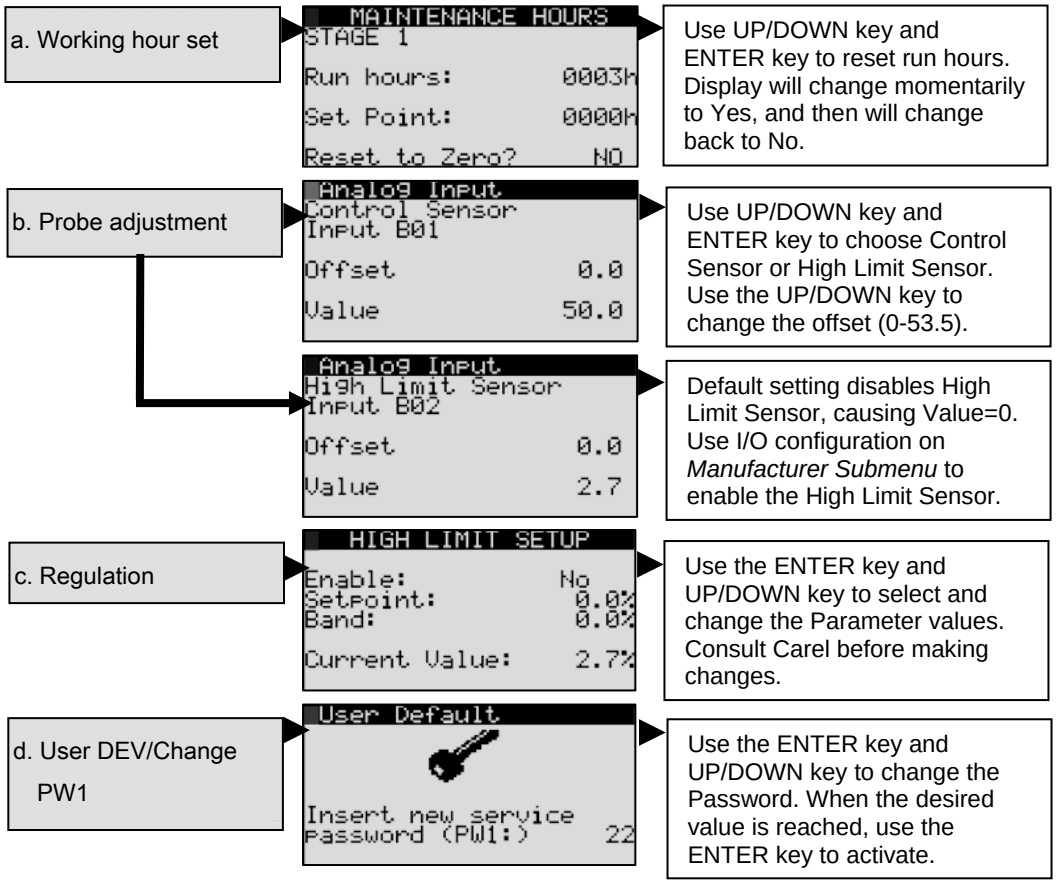
7.4.1 Service Settings Submenu

To access the "Service Settings Submenu,"

- **Scroll through the "G. Service" submenu to "F. Service Settings"**
- **Press ENTER when "Service Settings Submenu" is highlighted.**
- **Input the password.**

List of Service Settings Submenu selections: (Use the UP/DOWN arrows to scroll through this list.)

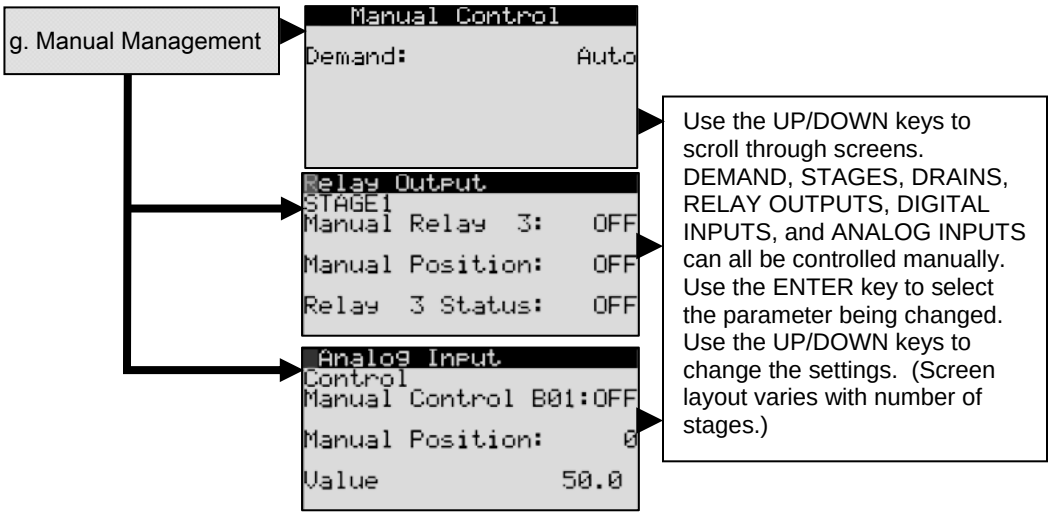
a. Working hour set
b. Probe adjustment
c. Regulation
d. User DEV/Change PW1



7.4.2 Manual Management Submenu

To access the "Manual Management Submenu,"

- **Scroll through main menu to "G. Service" and then "g. Manual Management". Press ENTER and input the password.**

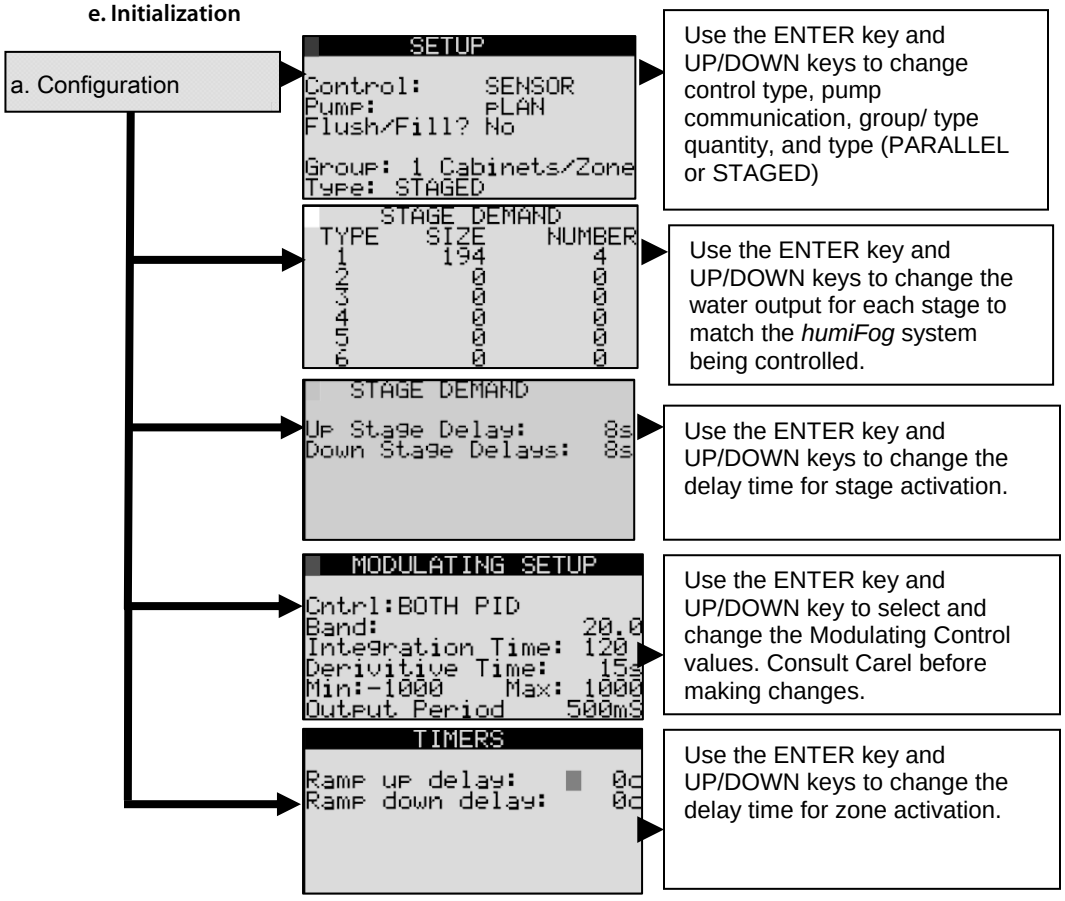


7.5 MANUFACTURER SUBMENU

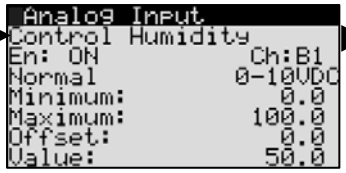
To access the "Manufacturer Submenu," scroll through the "Main Menu" and select "B. Installer". The settings in the "Manufacturer Submenu" are password-protected. Unauthorized users should contact their Carel representative before accessing the "Manufacturer Submenu."

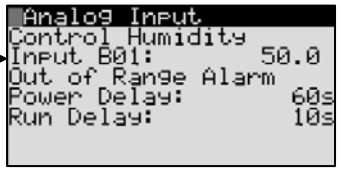
List of Manufacturer Submenu selections: (Use the UP/DOWN arrows to scroll through this list. Selection "d" is not available.)

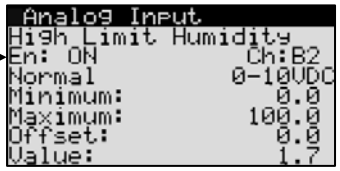
a. Configuration
b. I/O Configuration
c. Factory Settings
e. Initialization

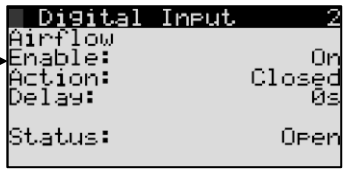


b. I/O Configuration









Use the UP/DOWN keys to scroll through screens. Use the ENTER and UP/DOWN keys to

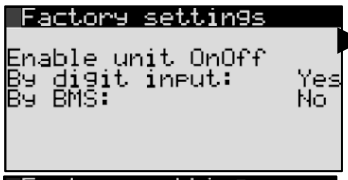
- Disable/enable inputs
- Change RH signal type
  - o 0-1,5,10 VDC
  - o 4-20 mA
  - o NTC, -50T90, 10T170, nu10, PT1000, SPKP
  - o On/Off (Note: other choices not used for RH)
- Change max/min values

Use the UP/DOWN keys to scroll through screens. Use the ENTER key and UP/DOWN keys to

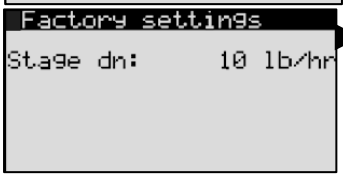
- Disable/enable inputs
- Change the action (A closed condition results in a "high" voltage signal to the digital input port.
- Change time delay (up to 999 s)

Enabling the Remote On/Off by a supervisor requires a change to the *Factory Settings*.

c. Factory Settings



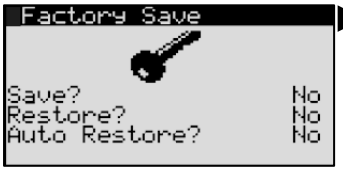
Use the ENTER key and UP/DOWN key to select and change the Parameter values. Consult Carel before making changes.



Use the ENTER key and UP/DOWN key to select and change capacity setting. Consult Carel before making changes.

e. Initialization

Use the ENTER key and UP/DOWN key to reset all values to global settings. To complete initialization, turn unit off and on.



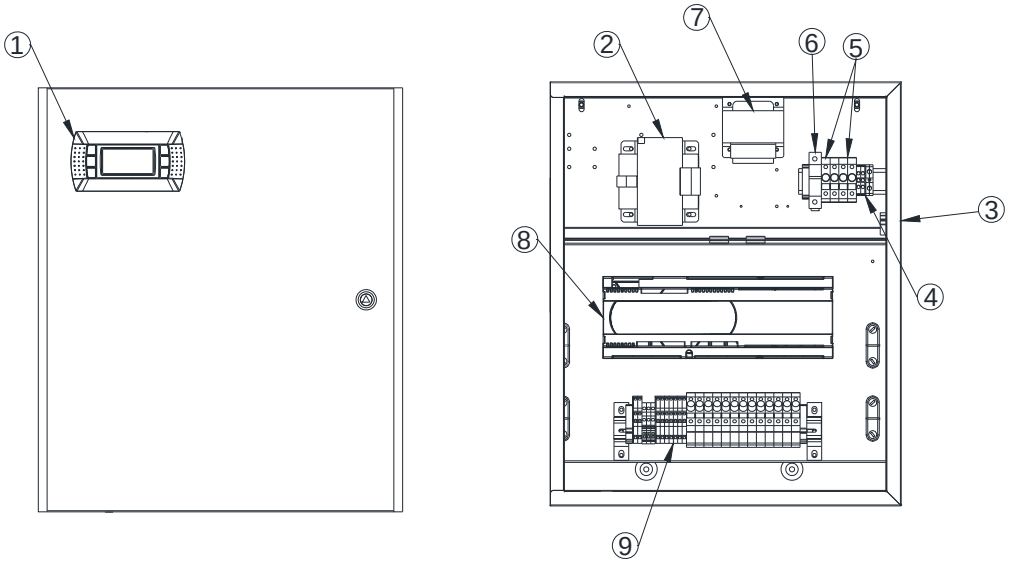
Use the ENTER key and UP/DOWN key to select SAVE options. There is an identical screen for USER SAVE custom options. ENTER will confirm the choice.

Use the ENTER key and UP/DOWN key to YES or NO. Exercise caution when accessing this screen since it can erase everything.

Use the ENTER key and UP/DOWN key to change access passwords. ENTER will confirm the selected digit.

8. REPLACEMENT PARTS

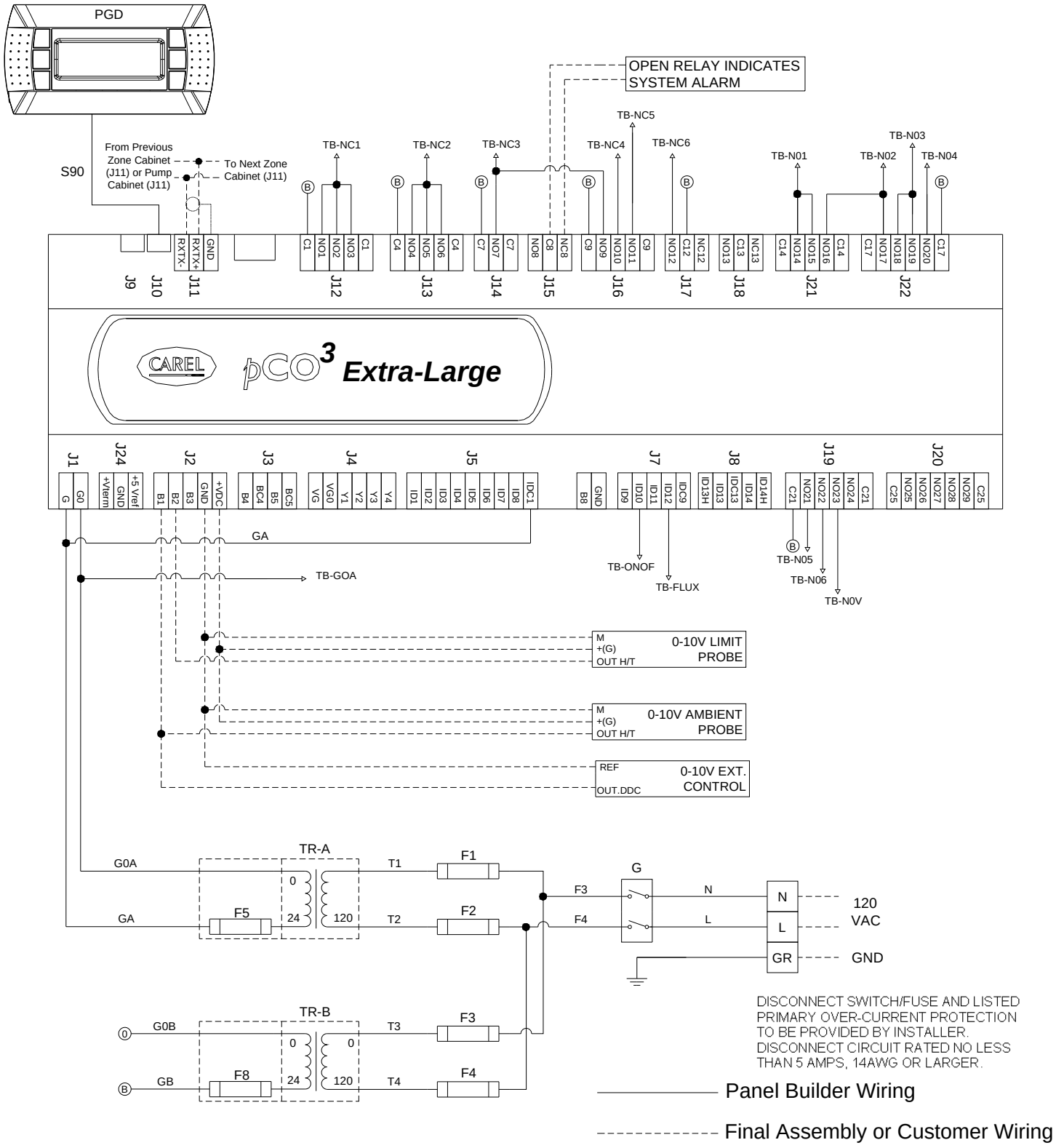
8.1 SEE SPECIFIC MATERIAL LIST(S) PROVIDED WITH UNIT.



Tab. 8.1
Typical Zone Control Cabinet

Item	Description	Part Number
8	CAREL PCO3 MEDIUM CONTROLLER	CONTACT CAREL
7	ISOLATION TRANSFORMER	CONTACT CAREL
3	MAIN SWITCH G	CONTACT CAREL
4	POWER SUPPLY TERMINAL BLOCK	CONTACT CAREL
2	MAIN CONTROL TRANSFORMER	CONTACT CAREL
6	TRANSFORMER B SECONDARY FUSE CARRIER	CONTACT CAREL
5	TRANSFORMER PRIMARY FUSE CARRIER	CONTACT CAREL
1	CAREL PGD DISPLAY	PGD1000FW0
9	CONTROL TERMINAL BLOCK PLUS FUSES	CONTACT CAREL

9. WIRING DIAGRAM



PCO	PCO3000AS0
PGD	PGD1000FW0
G	MAIN DISCONNECT SWITCH
TR-A	TRANSFORMER (PCO)
TR-B	TRANSFORMER (RELAYS)
F1, 2	FUSE: 5X20 1A 250V FAST
F3, 4	FUSE: 5X20 4A 250V SLOW
F5	FUSE: 6.3X32 3.15A 250V SLOW
F8	FUSE: 10.3X38 20A 600V FAST
F-NC* NO* NOV	FUSE: 5X20 6.3A 250V FAST
NC*	NC FILL VALVES (STAGE #)
NO*	NO DRAIN VALVES (STAGE #)
NOV	NO VENT VALVE
S90	PCO-PGD CABLE

NOTES:

1. CABINET AND WIRING MUST BE UL508A ASSEMBLED.
2. CABINET SHALL BE CONTRUCTED WITH FINGERSAFE COMPONENTS.
3. CABINET SHALL BE CONTRUCTED AS TYPE 12.
4. WIRE COLORS SHALL BE AS FOLLOWS:

Black - All ungrounded conductors operating at supply voltage (wire numbers 1-4)

Red - Ungrounded AC control conductors at below supply voltage (all wires unless marked otherwise)

Orange (or) - All ungrounded conductors that remain energized when the main disconnect switch is "off"

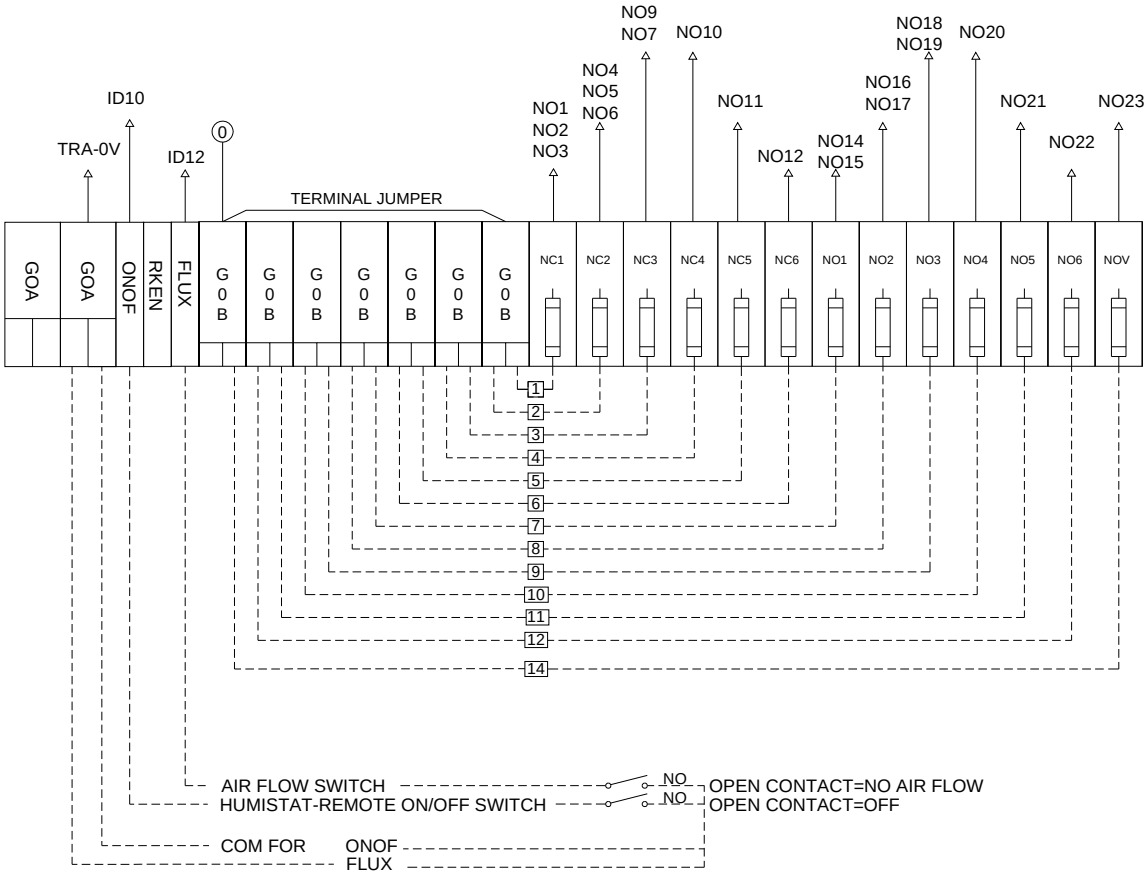
Blue (blu) - Ungrounded DC control conductors at below supply voltage

White - All grounded AC current-carrying conductors, regardless of voltage

White w/ orange stripe - All grounded AC current-carrying conductors that remain energized when the main disconnect switch is "off"

White w/ blue stripe - All grounded DC current-carrying conductors,regardless of voltage

Green(w/ or w/o yellow stripe) - Earth grounding.



10.WARRANTY

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 filters, nozzles, pump parts, 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.

NOTES

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