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NH Series™ Outdoor

ELECTRODE STEAM HUMIDIFIER

Outdoor Model Installation Manual

2531550-B

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INTRODUCTION

1. PRE-INSTALLATION

A. ABOUT THIS GUIDE

(1) This guide is intended as a supplement for the NH Series Installation Guide. The NH Series Installation guide is included with all NH Series humidifiers and contains information on installation, operation, and maintenance that applies to both indoor and outdoor models. This guide contains supplementary information that pertains specifically to the NH Series Outdoor humidifiers.

(2) For information on the installation of controls, interior piping, interior wiring, distribution systems please refer to the NH Series Installation Guide.

(3) The operation and control of the NH Outdoor Series is identical to the indoor series. Please refer to the NH Series Installation guide for information on operating your humidifier.

(4) The maintenance items described in this guide are specific to the outdoor model and must be performed IN ADDITION to the regular maintenance that an indoor model would require. Please refer to the NH Series Installation guide for other regular maintenance items.

B. RECEIVING & UNPACKING EQUIPMENT

(1) Check packing slip to ensure ALL material has been delivered.

(2) All material shortages are to be reported to NORTEC within 48 hours from receipt of goods. NORTEC assumes no responsibility for any material shortages beyond this period.

(3) Inspect shipping boxes for damage and note damages on shipping waybill accordingly.

(4) After unpacking, inspect equipment for damage and if damage is found, notify the shipper promptly.

(5) All NORTEC products are shipped on an FOB factory basis. Any and all damage, breakage or loss claims are to be made directly to the shipping company.

2. PACKAGING

A. GENERAL

(1) The equipment packaging is standardized in that each box in the shipment will always have the same contents. The following paragraphs identify the contents of each box.

B. HUMIDIFIER SKID

(1) Typically the NH Series Outdoor Humidifier ships on a skid (shown in Figure 1). Controls and accessories are shipped separately in a box. The contents of the box will be listed on the outside of the box.

C. DISTRIBUTOR BOX

(1) Depending on the equipment ordered any of the following distributor box configurations may be received:

(a) For equipment received if an ASD, BSD, CSD distributor(s) is ordered refer to Figure 2.

(b) For equipment received if a SAM-e distributor is ordered refer to Figure 3.

(c) For equipment received if a RMBP is ordered refer to Figure 4.

D. ACCESSORIES BOX

(1) Additional accessories such as drain water coolers and filters are shipped in a separate box. Smaller accessories that would fit in the humidifier box are put in the humidifier box and the box is identified as containing such.

Figure 1. Humidifier

Figure 2. Distributor Box Contents

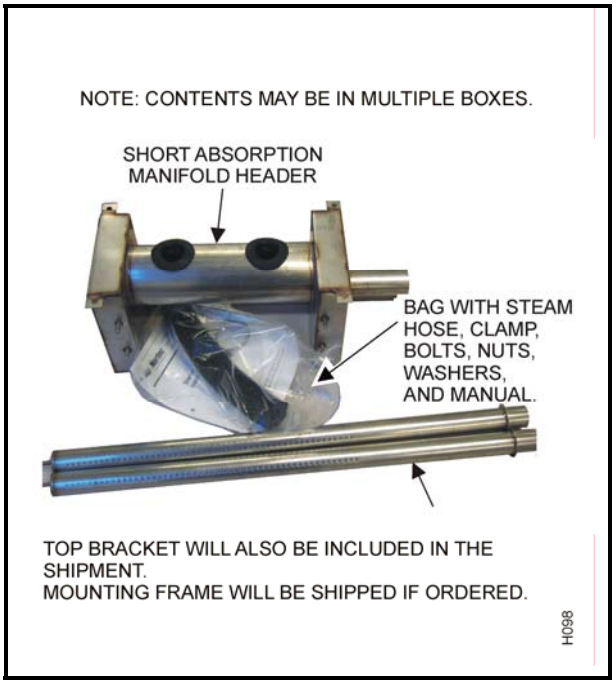

Figure 3. SAM-e Distributor Box

Figure 4. Blower Pack Box Contents

3. PRE-INSTALLATION

A. EQUIPMENT VERIFICATION

(1) Ensure that available voltage and phase corresponds with humidifier voltage and phase as indicated on humidifier's specification label.

(2) Ensure that the dedicated external fuse disconnect is of sufficient size to handle the rated amps as indicated on the specification label. Refer to local codes.

(3) Report any discrepancy immediately to the site engineer.

(4) Location and mounting is described in Chapter 10-10.

(5) Typical installation is described in Chapter 10-10.

B. MOVING AND HANDLING THE HUMIDIFIER

(1) The NH Outdoor Series humidifier is bolted to a shipping skid for easy transportation. While still attached the skid, the humidifier can be lifted to a rooftop or other location using a forklift or crane. The unit can also be positioned for wall mounting using a forklift as long as the skid is attached, although it may be easier to manually lift the unit onto its wall brackets. Installation on a curb requires guide lifting of the unit. Observe the following precautions when moving and positioning the humidifier:

(a) When lifting by crane, ensure that the unit is protected from physical damage by the tethers and lifting equipment.

(b) When lifting by forklift, ensure that unit is properly balanced and secured to prevent tipping.

(c) Use proper lifting techniques when manually lifting. Often several people will be required to lift the unit.

(d) Remove the cabinet doors before manually lifting the unit.

(e) Ensure that the humidifier is the proper model, capacity, and voltage for the specific location.

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INSTALLATION PROCEDURES

1. HUMIDIFIER INSTALLATION

A. LOCATION AND MOUNTING

(1) NH Outdoor Series humidifiers are UL listed for outdoor installation and come complete with internal cooling for the electronics. An internal heater is standard and ensures the enclosure remains at proper operating temperatures. Additionally, a freeze protection system is available for use in cold climates.

(2) The NH Outdoor Series humidifiers can be mounted on an air handler, on an appropriately sized curb, or on a wall or vertical surface. The clearance dimensions shown in this guide are for reference only and are the minimum required for maintenance of the humidifier. Local and National Codes should be consulted prior to final location and installation of the humidifier. NORTEC cannot accept responsibility for installation code violations. The minimum required maintenance clearances are shown in Figure 1.

(3) Humidifiers typically operate in the cold winter months. As a result they should be located where it is safe and convenient for maintenance personnel to service the unit. This is essential as it may be less desirable to service the unit during inclement weather. The warranty does NOT cover damage resulting to humidifier as a result of neglect or freezing. NH Outdoor series should NOT be installed on a rooftop in severe climates or where temperatures reach below 14°F (-10°C). Please refer to Table 1: Weather Design Data in this document.

(4) It is also important to consider the length and location of the humidifier steam line that will result from the installation. Consult section 10-10 in the NH Series Indoor Installation guide for further information on steam lines.

B. AIR HANDLER MOUNTING

(1) The NH outdoor series features provisions for hanging on brackets (supplied). This allows the unit to be mounted directly to a vertical wall on an air handler unit. This installation is advantageous since the steam piping is shorter, and hence the condensate losses and backpressure are minimized. Typical air handler installations are shown in Figure 2. Additionally, observe the following precautions when installing the humidifier:

(a) Ensure that the surface selected to mount the humidifier is structurally sound and capable of supporting the entire weight of the humidifier when in operation.

(b) For minimum required maintenance clearances see Figure 1.

(c) Wall mounting bracket provided should be securely attached horizontally with open edge upwards, using field-supplied fasteners.

(d) Using proper lifting techniques, lift the humidifier onto the brackets to mount it. Several people may be required to lift the unit.

(e) Ensure that both the bracket and humidifier are mounted level.

(f) Do not store or use gasoline or other flammable vapors and liquids in the vicinity of the humidifier.

C. CURB MOUNTING

(1) The integral base of the NH Outdoor models is designed to mount on a curb. The curb must be built to structurally support the entire weight of the humidifier when in operation. Required curb dimensions are given in Figure 1. Typical curb mounting installations are shown in Figure 3. Additionally, observe the following precautions when installing the humidifier:

(a) The NH Outdoor unit is shipped on a skid to allow for lifting by a forklift. When lifting by this method, ensure that the forks extend across the entire skid to prevent tipping or damage to the unit.

(b) Ensure that the humidifier is mounted level.

(c) The pan in the bottom of all outdoor models has a pipe chase for routing of services into the humidifier from below.

(d) If the humidifier will be roof mounted, it is not necessary to make the hole in the roof the same size as the curb, the curb drawing shows the size and location of the pipe chase required. The pipe chase should be sealed when installation is complete to ensure positive or negative pressure from the building.

(e) When mounting the unit in cold climates, ensure the lowest point of the air louvers is 12” above any surface when snow or ice could accumulate. Remove excessive ice and snow as necessary.

(f) Final installation of the humidifier is accomplished by manually lifting the unit into position on the curb. Ensure that proper lifting techniques are used. Several people may be required to lift the unit.

(g) The base of the humidifier is predrilled to allow the unit to the screwed to a curb. Ensure that the unit is securely fastened to the curb in this manner.

(h) Do not store or use gasoline or other flammable vapors and liquids in the vicinity of the humidifier.

(i) If possible, DO NOT locate humidifier any further than absolutely necessary from steam distributor location as net output will be reduced as a result of heat loss through steam line.

D. WALL MOUNTING

(1) A third option for installation involves mounting the humidifier on an exterior wall or other vertical surface. This method requires holes to be drilled into the wall to accommodate the steam lines, which exit from the rear of the humidifier. Typical wall mounting installations are shown in Figure 4. If this method is selected, utilize the provided brackets in a similar manner as if the installation was on an air handler. Additionally, observe the following precautions:

(a) Ensure that the surface selected to mount the humidifier is structurally sound and capable of supporting the entire weight of the humidifier when in operation.

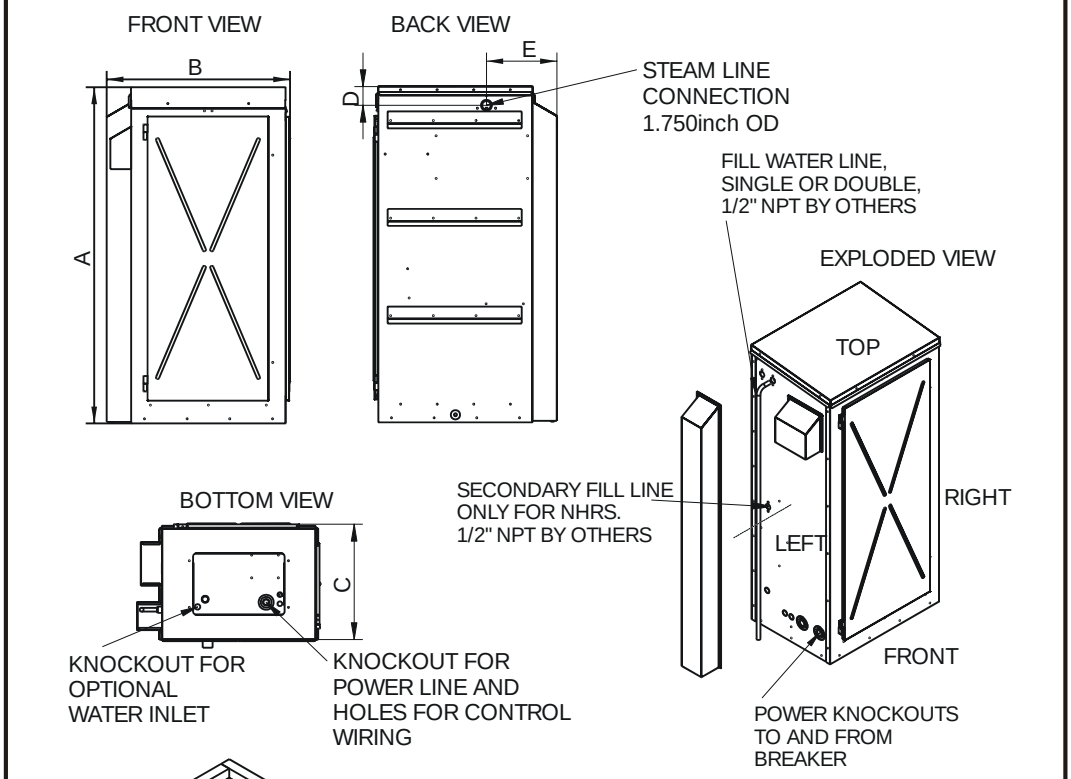
(b) For minimum required maintenance clearances see Figure 4.

(c) Wall mounting bracket provided should be securely attached horizontally with open edge upwards, using 5/16” x 3” (minimum) flat head screws. (See Figure 4).

(d) Using proper lifting techniques, lift the humidifier onto the brackets to mount it. Several people may be required to lift the unit.

(e) Ensure that both the bracket and humidifier are mounted level.

(f) Do not store or use gasoline or other flammable vapors and liquids in the vicinity of the humidifier.



Model	Weight (lbs)
0-50 lbs	99 lbs (45 kg)
50-100lbs	137 lbs (62 kg)
100-200lbs	206 lbs (93 kg)

	Roof Curb Height		
Model	Dimension F	Dimension G	Curb Height
** 0-50lbs	20.1" (51.1cm)	13.3" (33.8cm)	15"(38.1cm) Min.
50-100lbs	25.1" (63.8cm)	18.1" (46.0cm)	15"(38.1cm) Min.
100-200lbs	41.1" (104.4cm)	18.1" (46.0cm)	15"(38.1cm) Min.

	Minimum Required Clearance			
Model	Front	Left	Right	Back(Curb Mount)
** 0-50lbs	24" (60.96cm)	0	20" (50.80cm)	6" (15.25cm)
50-100lbs	24" (60.96cm)	0	20" (50.80cm)	6" (15.25cm)
100-200lbs	38" (96.52cm)	0	20" (50.80cm)	6" (15.25cm)

	Major Dimensions				
Model	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E
** 0-50lbs	34.7" (88.1cm)	25.0" (63.5cm)	15.5" (39.4cm)	3.4" (8.6cm)	7.9" (20.1cm)
50-100lbs	55.1" (140.0cm)	30.0" (76.2cm)	20.4" (51.8cm)	3.1" (7.8cm)	12.75" (32.4cm)
100-200lbs	55.1" (140.0cm)	46.0" (116.8cm)	20.4" (51.8cm)	3.1" (7.8cm)	12.75"/28.75" (32.4cm/73.1cm)

NHRS humidifiers under 50lbs/hour require a medium Outdoor Enclosure

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NH Outdoor Enclosure Physical Data Sheet
Small/Medium/Large models
May 21 2008

Figure 1. Recommended Clearances and Curb Dimensions

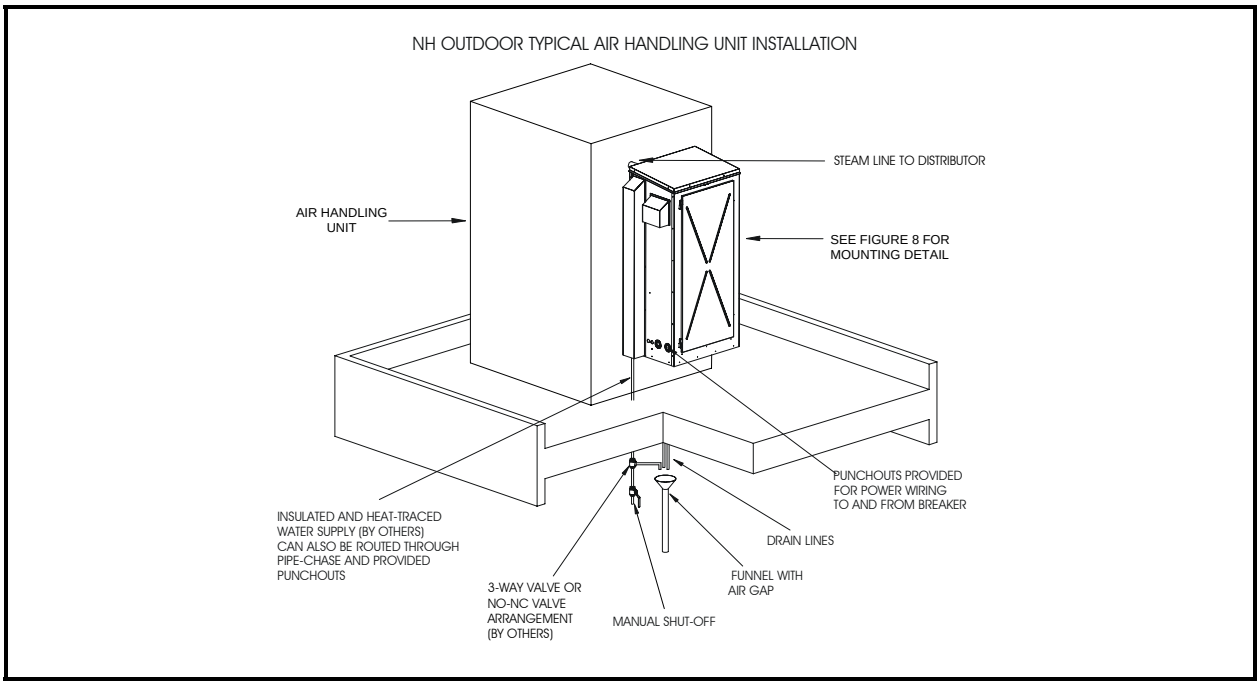


Figure 2. Typical Air Handling Unit Installation

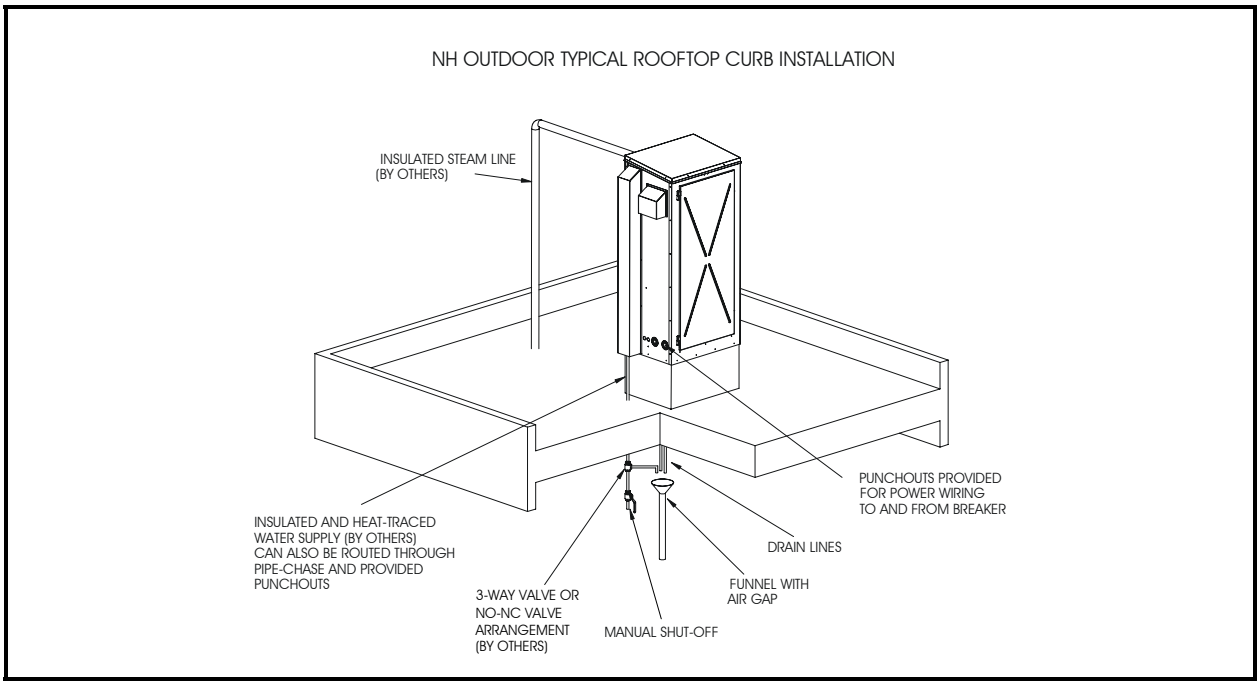
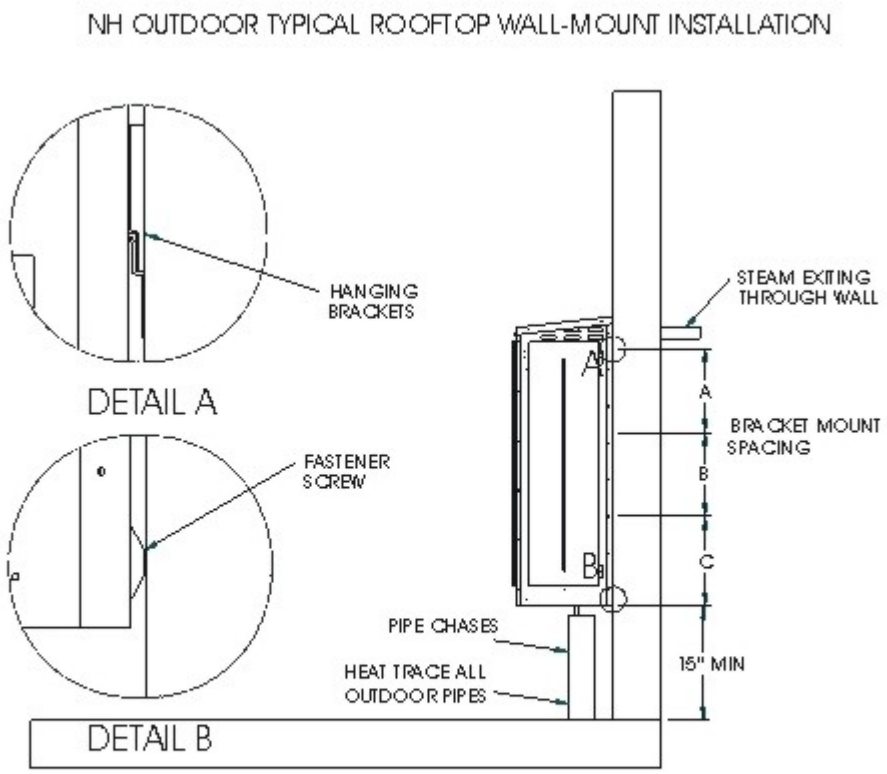


Figure 3. Typical Rooftop Curb Installation



	WALL MOUNT DIMENSIONS		
Model	Dimension A	Dimension B	Dimension C
**0-50lbs	N/A	18" (45.7cm)	10"(25.4cm)
50-100lbs	16" (40.6cm)	16" (40.6cm)	15"(38.1cm)
100-200lbs	16" (40.6cm)	16" (40.6cm)	15"(38.1cm)

Figure 4. Typical Wall Mount Installation

E. ELECTRICAL INSTALLATION

(1) Only qualified personnel should install electrical wiring. All wiring must be in accordance with national and local codes.

(2) Power and control wiring is to be routed into the humidifier through the pipe chase in the base of the unit.

(3) A field supplied NEMA rated weatherproof disconnect switch must be mounted external to the NH Outdoor unit to allow for power interruption during servicing and/or maintenance. A mounting plate, located on the side of each outdoor model, is available for mounting of the disconnect switch. Two electrical cutouts are provided for routing the primary wiring from the disconnect switch to the main power terminal strip inside the unit.

(4) Installation details for primary and low voltage control wiring are the same as for indoor units.

F. WATER SUPPLY LINE

(1) The water supply line is critical to the proper operation of the humidifier. Humidifiers primarily operate in the cold winter months when freezing is a serious issue. To prevent freezing of the humidifier, a water supply line freeze protection system should be ordered and used in conjunction with a normally open / normally closed valve arrangement described below. NORTEC's limited warranty does NOT cover damage resulting from freezing.

(2) There are two alternative configurations for the supply line plumbing. The first method involves using a normally open / normally close valve arrangement (see Figure 5). The valves should be installed inside of the building to prevent freezing. The water should flow from the supply through a normally closed valve. This valve should always be closed unless energized by the humidifier. This prevents water from flowing to the humidifier when there is no demand, or in the event of a power failure. After the first valve the water should flow to a tee. The central branch of the tee is to be plumbed to the humidifier. The remaining branch of the tee should is to be connected to a normally open valve. This valve remains open to allow water to drain back from the outdoor lines when there is no demand from the humidifier or in the event of a power failure. When energized by the humidifier, this valve will close and allow water to flow to the humidifier. With this configuration the outdoor line will be empty unless the humidifier requests water. This effectively eliminates the chance of water freezing in the outdoor portion of the line.

(3) The second method operates on the same principle as the first, however it replaces the two-valve configuration with a single safety three-way water valve. This valve is to be installed inside of the building. When the humidifier begins to operate, it will energize this valve and send water to the humidifier. When the humidifier is not in use, the valve will close the supply, and allow water in the outdoor lines to flow to drain. See Figure 6 for details.

(4) The valves described above should operate on either a 24V or 110V signal and should be wired to the appropriate terminals inside of the humidifier.

(5) Additionally the following points should be considered:

(a) Each unit is supplied with a ½" NPT male connection to the fill valve. Refer to the NH series indoor installation guide for allowable pressures and fill rates.

(b) **ALL OUTDOOR LINES MUST BE PROPERLY HEAT TRACED AND INSULATED TO PREVENT FREEZING**

(c) It is recommended to install and additional guide shut off valve within the building to allow isolation of the water to the unit for easy servicing. The guide shut off valve must be accessible to service personnel.

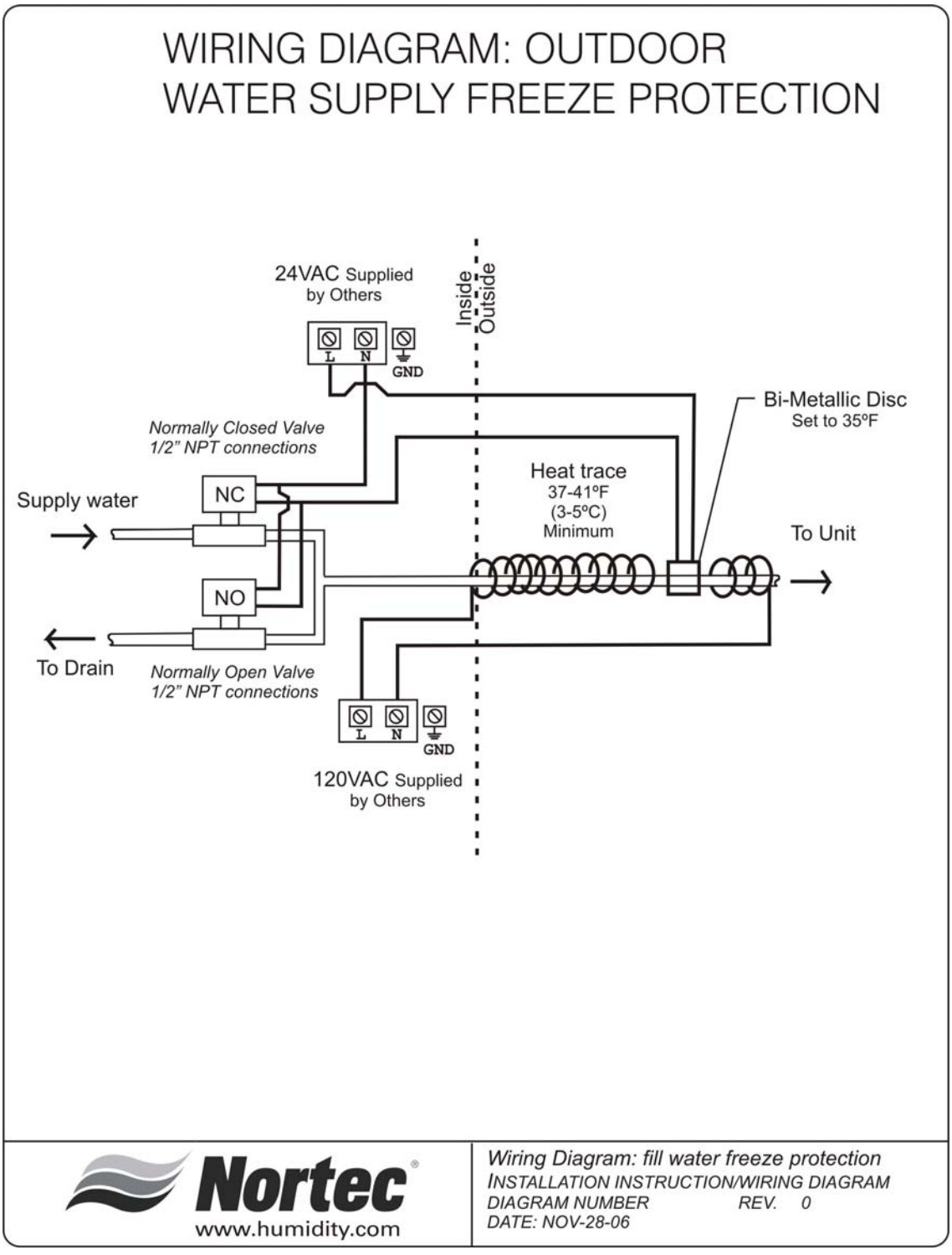


Figure 5. Normally Open / Normally Closed Valve Arrangement

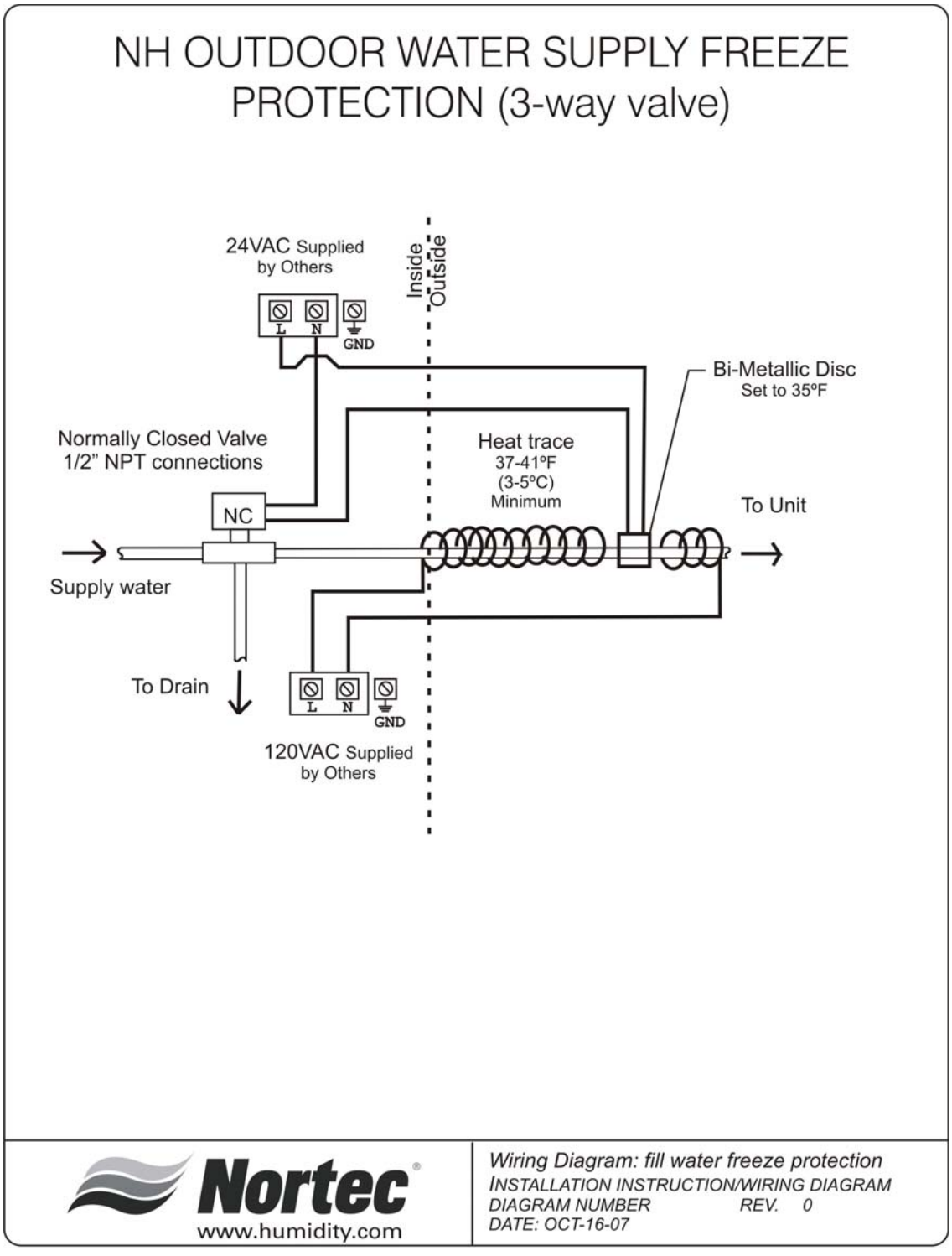


Figure 6. 3-Way Valve Arrangement

G. DRAIN LINE

(1) NH Series Outdoor units require and external drain line to provide for draining from the unit.

(2) **ALL OUTDOOR PIPING SHOULD BE PROPERLY INSULATED AND HEAT TRACED TO PREVENT FREEZING.**

(3) Route the drain hose to a drain funnel inside the building to provide an air gap before entering the main building drain/sewage system.

(4) Some units have a drain pump. Refer to the NH Indoor Installation Guide for flow rates and pressures.

(5) Drain line should be capable of withstanding 200°F (93°C) temperatures.

(6) Internal drain water tempering will ensure a maximum of 140°F (60°C) during normal operation.

(7) Optional low temperature drain water cooler is available to cool drain water to 120°F (49°C).

H. AUXILIARY DRAINS

(1) Auxiliary draining is part of the freeze protection system that is discussed in section 2C of this chapter.

(2) A second hose, 5/8” in diameter, extends from the bottom of the unit. This is the auxiliary drain hose.

(3) This hose must be drained into an open funnel. It can share a funnel with the primary drain line if necessary.

(4) **ENSURE ALL AUXILIARY DRAIN HOSE IS PROPERLY HEAT TRACED AND INSULATED TO PROTECT FROM FREEZING.**

(5) Auxiliary drain water temperature will be 50°F (10°C)

(6) Additionally, the NHSC has an additional port to allow for guide draining of the scale tank. It is recommended that this drain port be plumbed to a funnel in the same manner as the other drains. This drain can share a funnel with the other primary and auxiliary drains if desired.

I. STEAM LINES

(1) The steam outlet connection is located at the back of the NH Outdoor unit. Steam hose(s) and clamps are supplied with the unit and are intended to provide a flexible coupling outside of the unit to the building steam lines.

(2) NH Outdoor models can develop steam pressures up to 12” w.c. to overcome duct and steam line pressures. Duct and line pressures about 12” w.c. will cause steam to exit through the drain line.

(3) Steam lines can be routed to an air handler on a roof or pipe chased (external to the unit) through an exterior wall or roof to enter the building.

(4) All steam lines must be insulated to reduce losses.

(5) For steam line installation guidelines, consult the distribution system installation

guide (Steam Distributor Installation Guide Form #XX-231 and SAM-e Short Absorption Manifold Form #XX-249).

2. IMPORTANT INFORMATION

A. GENERAL

CAUTION

YOUR HUMIDIFIER OPERATES ON HIGH VOLTAGE AND CURRENTS, WHICH CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE THAT THE POWER TO THE UNIT IS OFF BEFORE PERFORMING ANY SERVICE WORK ON THE HUMIDIFIER. ONLY QUALIFIED PERSONNEL SHOULD PERFORM MAINTENANCE OR REPAIRS ON THE HUMIDIFIER. DO NOT SERVICE THE HUMIDIFIER WHILE STANDING ON WET OR ICY SURFACES, OR IN WET WEATHER.

CAUTION

IF THE HUMIDIFIER HAS BEEN IN OPERATION, INTERNAL COMPONENTS CAN BE HOT ENOUGH TO CAUSE SERIOUS INJURY. FULLY DRAIN THE UNIT AND ALLOW SUFFICIENT TIME FOR THE UNIT TO COOL BEFORE PERFORMING ANY SERVICE WORK.

B. HEATER AND FAN SYSTEM

(1) The NH Outdoor humidifiers feature an internal heating and cooling system to maintain appropriate operating temperatures and protect the electronics during adverse conditions.

(2) During the winter months when the temperatures are cooler, a 200 W heater and fan system will automatically activate to keep the internals of the case at an appropriate operating temperature. This heater is automatically controlled by an internal thermostat, and cannot be manually activated.

(3) During the warm summer months, a weather shielded case fan will circulate air throughout the case, cooling the electronics and maintaining operating temperatures. This fan is automatically controlled by a thermostat, and cannot be manually activated.

WARNING

IT IS ESSENTIAL THAT THE FANS AND HEATERS BE INSPECTED PERIODICALLY TO ENSURE THAT THEY CAN SPIN FREELY AND HAVE NOT BECOME CLOGGED WITH DIRT, POLLEN, OR BY ANIMALS. THIS IS ESPECIALLY TRUE OF THE EXTERNAL CASE FAN AND FAN SHROUD.

WARNING

IN COLD CLIMATES THE FREEZE PROTECTION SYSTEMS MUST BE CORRECTLY INSTALLED AND FULLY FUNCTIONAL AT ALL TIMES. HUMIDIFIER WARRANTY DOES NOT COVER DAMAGE RESULTING FROM FREEZING OF THE HUMIDIFIER, SUPPLY LINES, DRAIN LINES, OR STEAM DISTRIBUTION SYSTEM.

C. FREEZE PROTECTION SYSTEM (STANDARD)

(1) Freeze protection is Standard for NH Outdoor units. This system prevents internal water freeze-up, which may damage the humidifier.

(2) The system consists of an additional normally closed mechanical drain valve. This valve is activated by a bi-metallic strip thermostat, which allows for it to operate in the event of a power failure. When the thermostat detects that the water inside the humidifier has cooled to 43°F (6°C), the valve opens allowing water to drain. The freeze protection system drains water from steam cylinders, reservoirs, hoses, and internal lines. Emptying the humidifier protects the hoses, fittings, valves, cylinders, and fill cups from ice damage and prevents unit freeze up.

WARNING

ENSURE THAT THE FREEZE PROTECTION SYSTEM DRAIN HOSE IS FREE OF KINKS OR BLOCKAGES THAT MAY PREVENT IT FROM OPERATING.

WARNING

IN COLD CLIMATES THE FREEZE PROTECTION SYSTEMS MUST BE CORRECTLY INSTALLED AND FULLY FUNCTIONAL AT ALL TIMES. HUMIDIFIER WARRANTY DOES NOT COVER DAMAGE RESULTING FROM FREEZING OF THE HUMIDIFIER.

D. SERVICING ELECTRODE STEAM CYLINDER

(1) The cylinders inside of the NH electrode stream models have a finite life and must be replaced periodically. The life span of the cylinder varies based on incoming water conditions. The unit will indicate that it is time to change the cylinder by way of a message displayed on the screen. The humidifier should be frequently monitored ensure that the cylinder is changed when required to eliminate downtime. An optional Remote Fault Indication Package (P/N: 2522170) is

available to signal remotely that he humidifier requires service. If the NORTEC OnLine option was ordered, cylinder change notices will be delivered via email.

(2) Please refer to the NH Series Indoor Installation guide for further details on replacing cylinders.

E. SERVICING NHRS WITH SCALE MANAGEMENT SYSTEM

(1) As with the indoor units, the scale collector tanks on the NHRS must be emptied periodically based on supply water conditions. At a minimum NORTEC recommends the tanks be emptied twice every year/season. Also, every third time the tanks are cleaned, the cylinder and heating elements should be disassembled and cleaned as well. This will ensure long and reliable operation of your NORTEC humidifier.

(2) The procedure for changing the cylinder is similar to that of the indoor units with two minor differences:

(a) The guide drain control is located on the back of the scale collector tank as opposed to the side.

(b) When the tank has finished draining the hose clamps that secure the freeze protection/ drain hoses to the tank need to be loosened and the hoses removed. With the hoses disconnected the scale collector tank can be removed and emptied. Ensure that the hoses are reconnected and secure before restarting the humidifier.

(c) For further details please refer to the NHSC Installation Guide.

F. CLEANING DUST AND POLLEN DEPOSITS

(1) Dust, pollen, and animal nests must be periodically removed from the humidifier. This is best accomplished with a vacuum or with compressed air. When cleaning the humidifier focus on the following areas:

(a) Exhaust and heater fans

(b) Heater coil

(c) Case louvers

(d) Heat sinks (if applicable)

(e) Electronics

(f) Case floor

G. RESTARTING AFTER FREEZING

(1) In the unlikely event that the humidifier must be restarted after freezing, the following procedure should be followed:

(a) Inspect all hoses, fittings, valves, and seals for cracking or damage. Since water expands when it freezes, connections may have come loose, or fittings may have cracked. If any parts are damaged contact your NORTEC representative for replacement parts.

(b) Power the humidifier on. The heater and fan circuit will automatically power on and begin to warm the case.

(c) Once the unit has reached an appropriate temperature it will resume normal operation.

3. OPERATION AND ADDITIONAL MAINTENANCE

A. OPERATION

(1) NH Outdoor series humidifiers are operated in the same manner as their indoor counterparts. Please refer to the NH Series Installation guide for more details.

B. ADDITIONAL MAINTENANCE

(1) In addition to the maintenance items listed in this guide, the NH Series Installation Guide lists other maintenance items that apply the entire NH Series (indoor and outdoor). Refer to the NH Series Installation Guide for further details and procedures.

4. WEATHER DESIGN DATA

A. WEATHER DATA

(1) The following weather design data is provided to assist in determining suitable locations for rooftop mounting of the NH Series Outdoor models. Climates that see very cold winter conditions are not good candidates for rooftop NH units. **It is NOT recommended to install the humidifier in areas that reach below 14°F (-10°C) during January, or above 122°F (50°C) during July (see table below).** These harsh climates can cause required maintenance to be difficult to perform and increase the risk of the humidifier freezing or overheating.

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Table 1. Weather Design Data

		JANUARY Temperature		JANUARY Relative Humidity (% RH)			JULY Temperature		JULY Relative Humidity (% RH)		
State/Province	City	Dry Bulb °F	Dry Bulb °C	7:30 A.M.	1:30 P.M.	7:30 P.M.	Dry Bulb °F	Dry Bulb °C	7:30 A.M.	1:30 P.M.	7:30 P.M.
Alabama	Birmingham	10	-12	81	61	66	95	35	84	56	68
	Mobile	10	-12	--	--	--	95	35	90	64	78
Arizona	Flagstaff	-10	-23	83	58	--	90	32	77	36	--
	Phoenix	25	-4	75	47	39	105	41	53	31	23
	Yuma	30	-1	56	37	27	110	44	51	31	23
Arkansas	Little Rock	5	-15	80	67	68	95	35	85	55	59
California	Eureka	30	-1	87	--	77	90	32	92	--	80
	Fresno	25	-4	93	80	66	105	41	61	36	20
	Los Angeles	35	2	63	46	51	90	32	85	50	54
	Sacramento	30	-1	90	82	70	100	38	76	46	28
	San Diego	35	2	76	58	60	85	29	86	68	65
	San Francisco	35	2	84	68	70	85	29	92	75	78
Colorado	Denver	-10	-23	54	37	41	95	35	55	27	30
	Grand Junction	-15	-26	77	64	64	95	35	48	27	22
	Pueblo	-20	-29	67	44	48	95	35	73	34	35
Connecticut	New Haven	0	-18	75	65	69	95	35	77	64	74
Delaware	Wilmington	0	-18	77	62	70	95	35	80	52	69
District of Columbia	Washington	0	-18	73	56	64	95	35	78	52	64
Florida	Jacksonville	25	-4	89	56	75	95	35	85	57	76
	Miami	35	2	87	59	75	91	33	83	64	76
Georgia	Atlanta	10	-12	80	64	69	95	35	83	57	68
	Augusta	10	-12	84	59	69	98	37	83	55	69
	Savannah	20	-7	83	58	72	95	35	85	61	80
Idaho	Boise	-10	-23	82	75	74	95	35	54	34	23
	Lewiston	-5	-20	79	73	71	95	35	64	37	25
Illinois	Cairo	0	-18	81	69	--	98	37	83	57	--
	Chicago	-10	-23	81	70	75	95	35	78	51	55
	Peoria	-10	-23	83	72	77	96	35	81	53	58
Indiana	Fort Wayne	-10	-23	84	75	81	95	35	84	53	58
	Indianapolis	-10	-23	83	72	78	95	35	84	54	60
	Terre Haute	0	-18	82	70	76	95	35	77	50	56
Iowa	Davenport	-15	-26	--	--	--	95	35	--	--	--
	Sioux City	-20	-29	78	67	72	95	35	86	55	54
Kansas	Dodge City	-10	-23	78	57	61	95	35	77	45	52
	Topeka	-10	-23	78	64	67	100	38	85	54	54
Kentucky	Louisville	0	-18	78	68	69	95	35	77	52	57
Louisiana	New Orleans	20	-7	85	67	73	95	35	84	64	72
	Shreveport	20	-7	83	67	66	100	38	86	56	62
Maine	Portland	-5	-21	81	65	74	90	32	78	58	76
Maryland	Baltimore	0	-18	72	68	56	95	35	71	52	65
Massachusetts	Boston	0	-18	72	59	67	92	33	72	55	70
Michigan	Detroit	-10	-23	82	71	77	95	35	74	50	56
	Grande Rapids	-10	-23	85	78	80	95	35	76	51	54
Minnesota	Duluth	-25	-32	78	74	74	93	33	87	61	66
	Minneapolis	-20	-29	82	72	75	95	35	82	54	54
Mississippi	Vicksburg	10	-12	82	65	67	95	35	87	61	70

Missouri	Kansas City	-10	-23	78	64	66	100	38	76	48	47
	St. Louis	0	-10	77	65	68	95	35	73	50	55
Montana	Billings	-25	-32	67	73	60	90	32	65	40	33
	Butte	-20	-29	76	70	71	95	35	82	36	33
Nebraska	North Platte	-20	-29	80	62	66	85	29	84	50	46
	Omaha	-10	-23	82	68	73	95	35	80	51	51
Nevada	Reno	-5	-21	82	67	54	95	35	72	25	20
New Hampshire	Concord	-15	-26	78	60	69	90	32	80	49	69
New Jersey	Atlantic City	5	-15	79	68	74	95	35	81	72	82
	Newark	0	-18	72	79	65	95	35	75	51	65
	Trenton	0	-18	73	62	68	95	35	77	55	68
New Mexico	Albuquerque	0	-18	68	51	46	95	35	59	33	28
New York	Albany	-10	-23	75	63	71	93	34	79	52	64
	Buffalo	-5	-21	79	72	78	93	34	78	53	63
	New York	0	-18	72	61	66	95	35	75	58	68
	Rochester	-5	-21	81	73	79	95	35	80	50	60
North Carolina	Asheville	0	-18	82	59	69	93	34	88	56	73
	Raleigh	10	-12	82	57	69	95	35	86	55	72
North Dakota	Bismarck	-30	-34	77	71	75	95	35	85	52	49
Ohio	Cincinnati	0	-18	82	70	74	95	35	84	52	60
	Cleveland	0	-18	81	72	79	95	35	79	52	58
	Columbus	-10	-23	83	71	76	95	35	78	52	60
	Toledo	-10	-23	79	72	75	95	35	76	52	59
Oklahoma	Oklahoma City	0	-18	79	62	65	101	38	80	49	51
Oregon	Baker	-5	-21	83	81	78	90	32	69	68	36
	Portland	10	12	87	82	78	90	32	86	63	48
Pennsylvania	Harrisburg	0	-18	72	49	65	95	35	78	51	62
	Philadelphia	0	-18	74	65	68	95	35	78	52	64
	Pittsburg	0	-18	77	67	63	95	35	80	52	63
	Scranton	-5	-21	80	67	--	95	35	77	50	--
Rhode Island	Providence	0	-18	73	60	67	93	34	79	57	73
South Carolina	Charleston	15	-9	87	55	76	95	35	88	64	82
	Columbia	10	-12	81	57	65	95	35	83	56	68
South Dakota	Huron	-20	-29	79	72	76	95	35	86	52	49
	Rapid City	-20	-29	71	69	67	95	35	71	42	40
Tennessee	Knoxville	0	-18	83	65	69	95	35	83	55	66
	Memphis	0	-18	82	67	73	95	35	85	55	59
Texas	Amarillo	-10	-23	71	51	52	100	38	77	43	42
	Corpus Christi	20	-7	88	66	75	95	35	93	58	68
	Dallas	10	-12	81	62	62	100	38	79	50	47
	El Paso	10	-12	63	45	39	100	38	60	37	30
	Houston	20	-7	85	66	73	95	35	90	58	66
	San Antonio	20	-7	82	60	59	100	38	88	49	45
Utah	Salt Lake City	-10	-23	80	71	72	95	35	56	27	23
Vermont	Burlington	-10	-23	81	69	78	90	32	76	54	67
Virginia	Richmond	15	-9	84	60	68	95	35	81	57	72
Washington	Seattle	15	-9	86	80	74	85	29	86	63	47
	Walla Walla	-5	-21	80	74	78	95	35	50	33	22
West Virginia	Charleston	0	-18	79	64	70	95	35	88	53	67
	Parkersburg	-10	-23	82	66	74	95	35	80	52	65
Wisconsin	Green Bay	-15	-26	75	68	73	95	35	85	58	64
	Milwaukee	-15	-26	76	70	73	95	35	81	58	64

Wyoming	Cheyenne	-15	-26	59	48	55	95	35	73	36	40
Alberta	Calgary	-29	-34		71		87	31		34	
	Edmonton	-29	-34		75		86	30		42	
	Grande Prairie	-43	-42		80		84	29		38	
	Lethbridge	-32	-36		66		91	33		30	
	Medicine Hat	-30	-34		73		96	36		31	
British Columbia	Estevan Point	17	-8		84		87	31		32	
	Fort Nelson	-40	-40		79		94	34		32	
	Penticton	0	-18		81		85	29		44	
	Prince George	-37	-38		82		73	23		53	
	Prince Rupert	11	-12		87		80	27		54	
	Vancouver	15	-9		87		80	27		41	
Manitoba	Brandon	-29	-34		73		90	32		50	
	Churchill	-40	-40		76		79	26		57	
	The Pas	-35	-37		77		85	29		54	
	Winnipeg	-29	-34		78		90	32		50	
New Brunswick	Campbellton	-18	-28		77		87	31		54	
	Fredericton	-16	-27		72		89	32		47	
	Moncton	-12	-24		82		88	31		52	
	Saint John's	-12	-24		82		81	27		62	
Newfoundland	Corner Brook	-10	-23		84		84	29		47	
	Gander	-5	-21		76		85	29		45	
	Goose Bay	-26	-32		85		86	30		42	
	St. John's	1	-17				79	26		60	
N.W.T.	Frobisher	-45	-43		77		63	17		67	
	Resolute	-49	-45		71		54	12		81	
	Yellowknife	-49	-45		82		78	26		50	
Nova Scotia	Halifax	0	-18		83		83	28		50	
	Sydney	1	-17		84		84	29		56	
	Yarmouth	5	-15		83		76	24		70	
Ontario	Thunder Bay	-27	-33		80		86	30		52	
	Hamilton	0	-18		75		91	33		52	
	Kaspuskasing	-30	-34		79		87	31		52	
	Kingston	-11	-24				85	29		69	
	Kitchener	-3	-19		84		88	31		58	
	London	0	-18		80		90	32		53	
	North Bay	-20	-29		77		87	31		46	
	Ottawa	-17	-27				90	32		50	
	Peterborough	-13	-25		77		90	32		53	
	Sioux Lookout	-33	-36		78		65	18		69	
	Sudbury	-20	-29		81		89	32		44	
	Timmins	-33	-36		79		90	32		45	
	Toronto	-3	-19		82		90	32		56	
	Windsor	-3	-16				92	31		51	
	Sault Ste. Marie	-20	-29				88	29		48	
P.E.I.	Charlottetown	-6	-21		86		84	29		57	
Quebec	Knob Lake	-40	-40		79		55	13		70	
	Mont Joli	-11	-24		75		62	17		71	
	Montreal	-16	-27				88	31		58	
	Port Harrison	-39	-39		76						
	Quebec City	-19	-28		81		86	30		60	
	Sept-Iles	-27	-33				80	27		47	

	Sherbrooke	-18	-28		87	31	58
	Trois Rivieres	-18	-28		88	31	58
Saskatchewan	Prince Albert	-41	-41	77	88	31	
	Regina	-34	-37	81	92	33	
	Saskatoon	-34	-37	76	90	32	
	Swift Current	-29	-34	79	93	34	
Yukon Territory	Dawson	-56	-49	76	57	14	60
	Whitehorse	-45	-43	82	78	26	40

Table Source: *ASHRAE*

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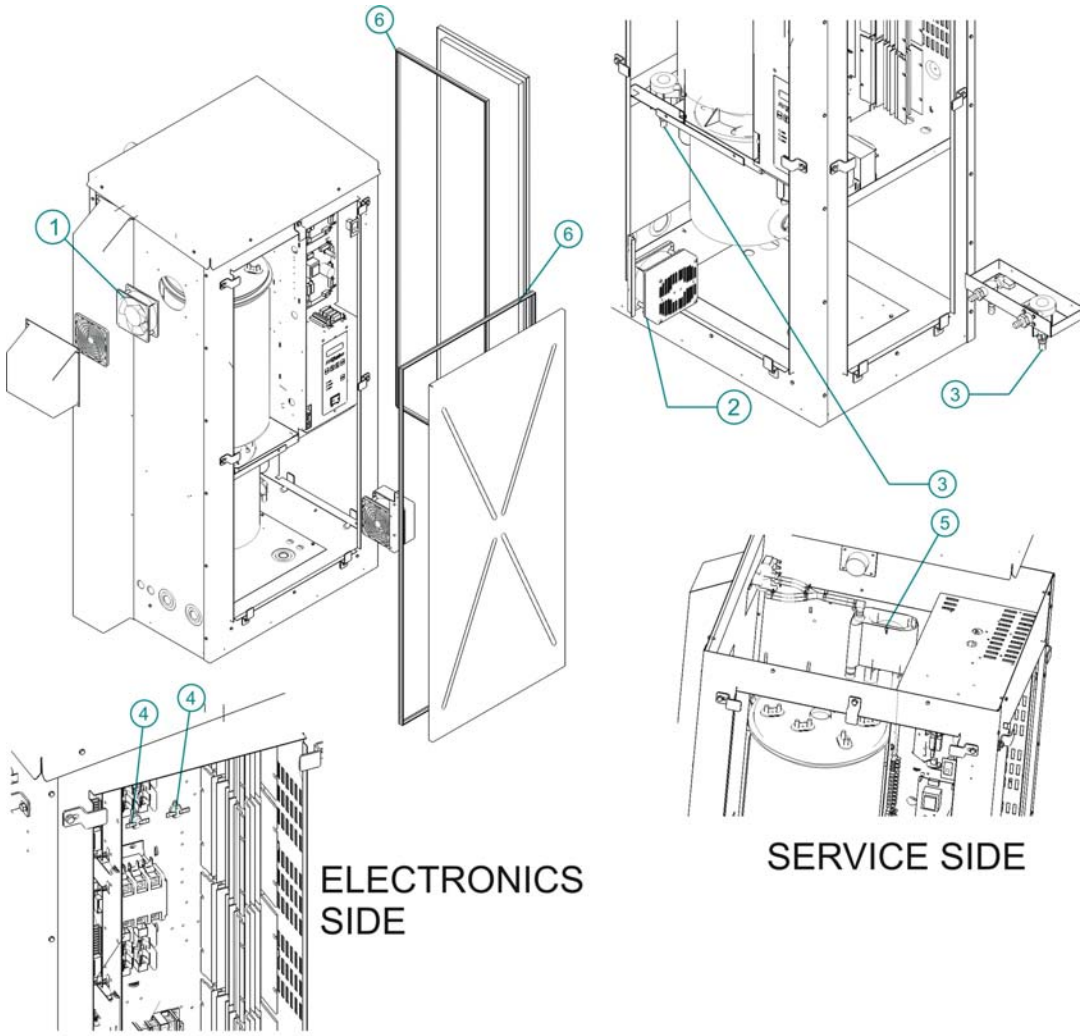
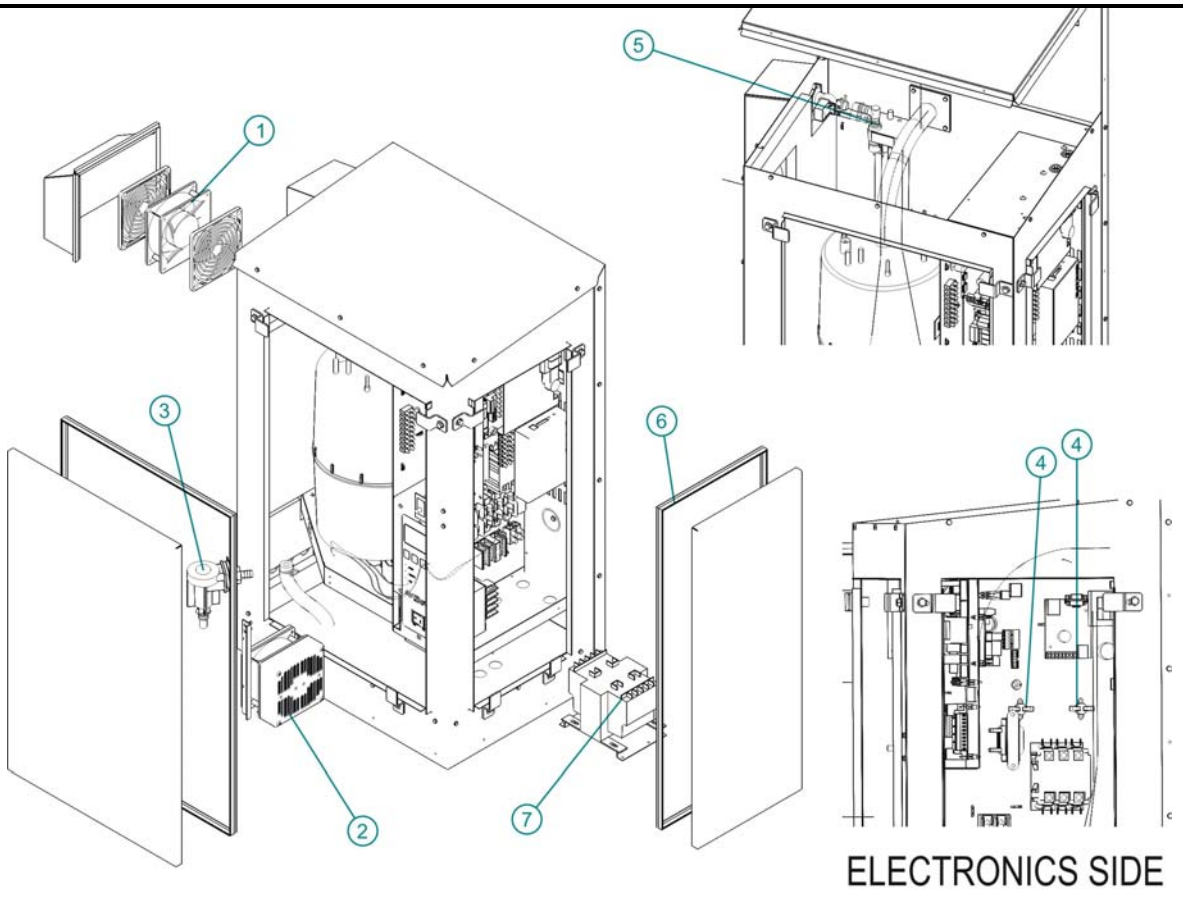
10-20
TECHNICAL



ITEM	DESCRIPTION	PART NO.	NOTES
1	COOLING FAN KIT, NH OUTDOOR	2535015	120 VAC, DIRECTION ARROW ON SIDE TO POINT OUT OF UNIT
2	HEATING FAN KIT, NH OUTDOOR	2535016	120VAC, COMES WITH ALL HARDWARE AND MOUNTING BRACKET
3	FREEZE PROTECTION KIT, NH OUTD0OR	2535017	COMPLETE AS SHOWN, NOT ALL PARTS MAY BE NEEDED. CONSULT FACTORY
4	FAN AND HEATER THERMOSTAT KIT, NH OUTDOOR	2535018	Place STC-100 thermostat (for cooling fan), Place STC-60 thermostat (for heater on left)
5	FILL CUP KIT, NHRS OUTDOOR	2531071	COMES WITH ALL HOSES AND CLAMPS
6	GASKET KIT, NH OUTDOOR	2535020	KIT CONTAINS ALL GASKETS FOR OUTDOOR PORTION ONLY
NOT SHOWN	WIRE HARNESS	----------	CONTACT FACTORY, SPECIFIC TO EACH MODEL
NOT SHOWN	TRANSFORMER, PRIMARY VOLTAGE TO 120VAC	----------	CONTACT FACTORY, SPECIFIC TO EACH MODEL. (INITIALY SOLD AS OPTION)

ALL OTHER SPARE PARTS ARE LISTED IN THE MAIN MANUAL FOR THE NHRS. PLEASE CONSULT FACTORY

Figure 1. NHRS Outdoor Exploded View



ITEM	DESCRIPTION	PART NO.	NOTES
1	COOLING FAN KIT, NH OUTDOOR	2535015	120 VAC, DIRECTION ARROW ON SIDE TO POINT OUT OF UNIT
2	HEATING FAN KIT, NH OUTDOOR	2535016	120VAC, COMES WITH ALL HARDWARE AND MOUNTING BRACKET
3	FREEZE PROTECTION KIT, NH OUTD0OR	2535017	COMPLETE AS SHOWN, NOT ALL PARTS MAY BE NEEDED. CONSULT FACTORY
4	FAN AND HEATER THERMOSTAT KIT, NH OUTDOOR	2535018	Place STC-100 thermostat (for cooling fan), Place STC-60 thermostat (for heater on left)
5 5	FILL CUP KIT, NHTC 005 -100 OUTDOOR FILL CUP KIT, NHTC 100 -200 OUTDOOR	2531030 2531065	COMES WITH ALL HOSES AND CLAMPS
6 6	GASKET KIT, NHTC 005 -050 OUTDOOR GASKET KIT, NHTC 100 -200 OUTDOOR	2535150 2535020	KIT CONTAINS ALL GASKETS FOR OUTDOOR PORTION ONLY
NOT SHOWN	WIRE HARNESS	----------	CONTACT FACTORY, SPECIFIC TO EACH MODEL
7	TRANSFORMER, PRIMARY VOLTAGE TO 120VAC	----------	CONTACT FACTORY, SPECIFIC TO EACH MODEL. (INITIALY SOLD AS OPTION)

ALL OTHER SPARE PARTS ARE LISTED IN THE MAIN MANUAL FOR THE NHTC. PLEASE CONSULT FACTORY

Figure 2. NHTC Outdoor Exploded View

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10-30
WIRING DIAGRAMS

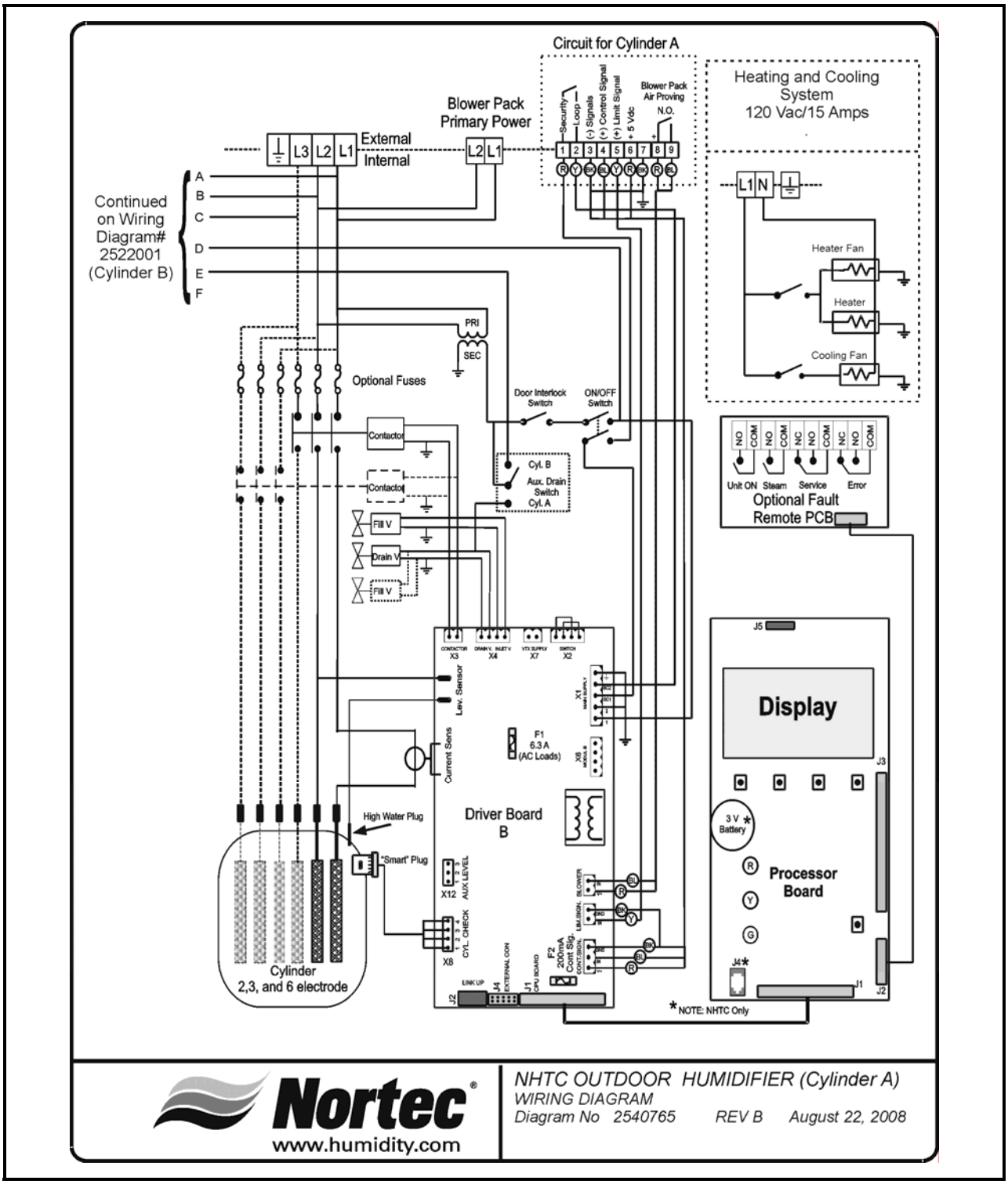

Figure 1. Wiring Diagram NHTC Outdoor

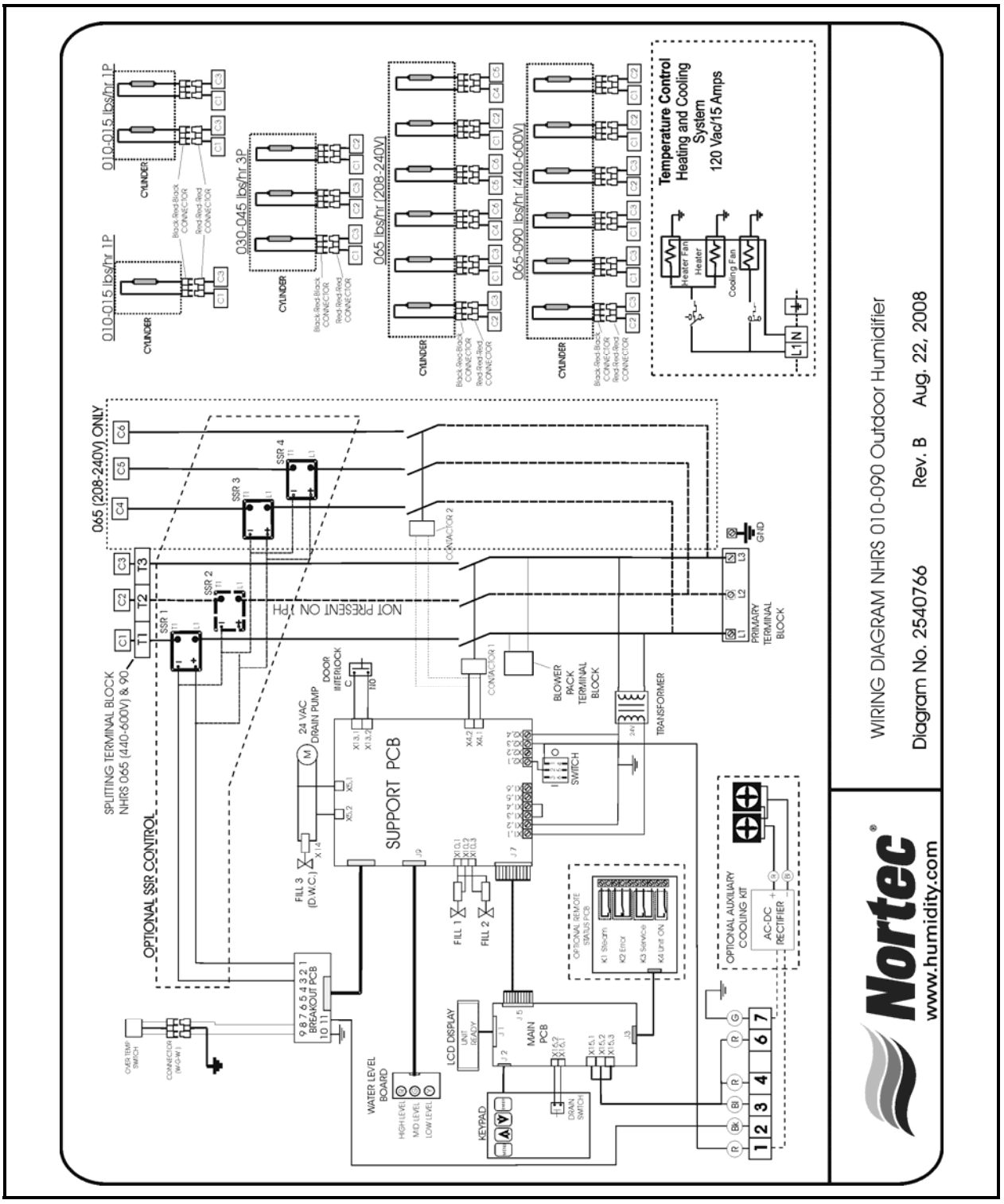

Figure 2. Wiring Diagram NHRS Outdoor (Single)

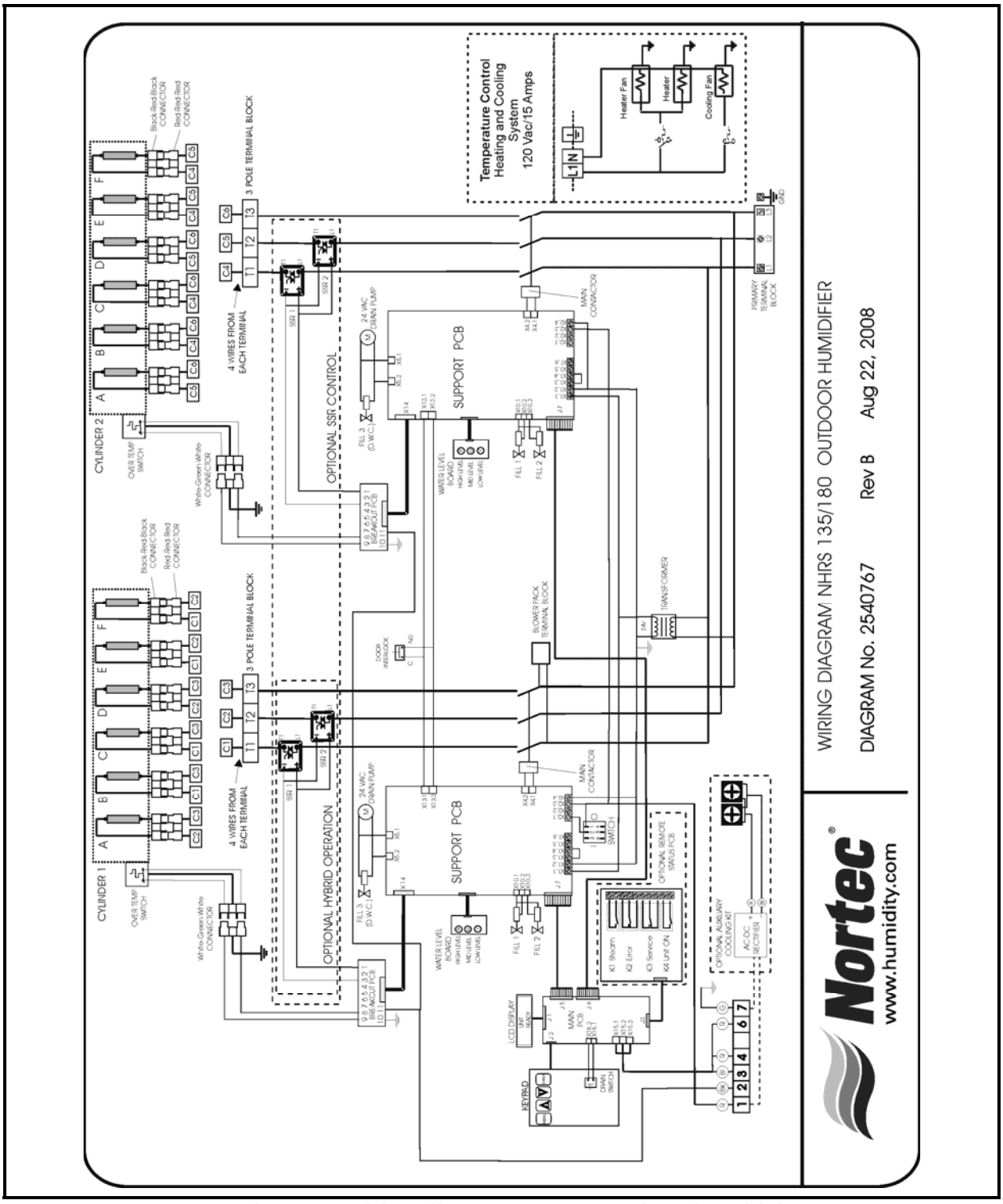

Figure 3. Wiring diagram NHRS Outdoor (Double)

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WARRANTY

(1) Walter Meier Inc. and/or Walter Meier Ltd. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted (with the exception of the cylinder), are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

(2) THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

(3) The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of THE COMPANY.

(4) THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

(5) THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

(6) THE COMPANY makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing or lack of proper maintenance of the equipment.

(7) THE COMPANY makes no warranty and assumes no liability whatsoever for damage resulting from freezing of the humidifier, supply lines, drain lines, or steam distribution systems.

(8) THE COMPANY makes no warranty and assumes no liability whatsoever for equipment that has failed due to ambient conditions when installed in locations having climates below 14°F (-10°C) during January or above 104°F (40°C) during July. (See Table 1: Weather Design Data above).

(9) THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.

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INSTALLATION DATE (MM/DD/YYYY)

MODEL #
SERIAL #
CYLINDER #

Cylinder Replacement Date (MM/DD/YYYY)

walter meier

c UL US LISTED

ISO 9001:2000
QMI REGISTERED
Certificate No. 002419

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Ogdensburg, NY 13669
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Authorized Agent: