

All Information is per Unit

Quantity: 1 Model S3E-8518-05L-2 COOLING TOWER

Certified Capacity: 1350.00 USGPM of water from 95.00°F to 85.00°F at 80.00°F entering air wet bulb.

Fan Motor(s): Two (2) 15 HP fan motor(s): Totally Enclosed, Air Over (TEAO),
 1 Speed/1 Winding - Premium Efficiency (Inverter Duty), suitable for 460 volt, 3 phase,
 60 hertz electrical service. Drives are based on 0 inches ESP.

NOTE: Inverter Duty fan motors, furnished in accordance with NEMA Standard Mg.1 -- Part 31, are required for applications using variable frequency drives for fan motor control.

Submittal Information	Equipment Summary
BAC Terms and Conditions of Sale Mechanical Specifications Certificate of Wind and Seismic Load Capacity Submittal Drawings/Diagrams UP-Q14027904503 Unit Print SS-Q14027904503 Unit Support CG-Q14027904503 Center of Gravity BA-Q14027904503 Basin Accessories HW-Q14027904503 Heater Wiring ML-Q14027904503 Motor Location VL-Q14027904503 VCOS Location VW-Q14027904503 VCOS Wiring IA-Q14027904503 Internal Access	Induced Draft, Crossflow Cooling Tower Quality Assurance - ISO 9001 Certified Unit Energy Efficiency per ASHRAE Standard 90.1-2010 CTI Certified Thermal Performance Steel Panels and Structural Elements are Constructed of Heavy Gauge Galvanized Steel Standard Fan Driven by BALTIDRIVE® Power Train Galvanized Steel Fan Guard Fiberglass Reinforced Polyester (FRP) Casing Panels FRP Air Inlet Louvers PVC Fill & Drift Eliminators Structure Designed in accordance with the 2009 IBC End Inlet EASY CONNECT® Piping Arrangement End Outlet Pump Suction Connection Positive Closure Plate Mechanical Float Valves for Independent Cell Operation Electric Immersion Heater(s) Sized to Maintain +40°F water at a 0°F Ambient with Electrical Requirements Matching Fan Motor(s) Copper Heater Elements Electric Immersion Heater Controls for Independent Cell Operation Mechanical Vibration Cutout Switch Galvanized Steel Air Intake Screens Internal Walkway

THANK YOU FOR YOUR BUSINESS!

Rigging and Installation Instructions, as well as Operating and Maintenance Instructions are available at www.baltimoreaircoil.com



**BALTIMORE
AIRCOIL COMPANY**

Mechanical Specifications

10-2-2013

BAC Order # Q14027904503

All Information is per Unit

Quantity: 1 Model S3E-8518-05L-2 COOLING TOWER

Unit Type:

Factory fabricated, induced draft, crossflow cooling tower with vertical discharge.

Quality Assurance:

Each unit is manufactured under closely-controlled conditions using standardized parts to ensure each unit is built precisely to the same high-quality design and construction standards. The design, manufacture, and business processes of Baltimore Aircoil Company are ISO 9001:2000 certified.

Unit Efficiency:

The unit(s) complies with the energy efficiency requirements established by ASHRAE Standard 90.1-2010.

CTI Certification:

The thermal performance is certified by the Cooling Technology Institute in accordance with CTI Certification Standard STD-201.

Materials of Construction:

All structural steel components are constructed from G-235 (Z700 metric) hot-dip galvanized steel. The edges of the hot-dip galvanized steel components are given a protective coat of zinc-rich compound. Cold water basin includes a depressed section with drain/clean-out connection and the area under the fill sections is sloped toward the depressed section for easy cleaning.

Hot water distribution basins are gravity type constructed of heavy gauge, G-235 (Z700 metric) hot-dip galvanized steel. Polypropylene metering orifices are provided to assure even distribution of water over the wet deck surface. Heavy gauge, G-235 (Z700 metric) hot-dip galvanized steel covers are furnished to prevent the accumulation of debris and algae in the hot water distribution basins.

Fan & Drive System:

Fan(s) are driven by a one-piece multi-groove, neoprene/polyester belt designed specifically for evaporative cooling equipment service. Motor is mounted on an adjustable motor base. Fan and motor sheaves are non-corrosive cast aluminum. The BALTDRIIVE® Power Train fan drive system, including fan motors, is warranted against defects in materials and workmanship for five (5) years from date of shipment.

Fan(s) and steel fan shaft(s) are supported by heavy-duty, self-aligning, grease-packed, relubricatable ball bearings with special seals for protection against dust and moisture. All bearings are designed for minimum L10 life of 80,000 hours (280,000 hours average life).

Fan Guard(s):

A heavy gauge, G-235 (Z700 metric) hot-dip galvanized steel wire fan guard is provided over each fan cylinder. The fan guard is shipped loose for field installation.

Casing Panels:

Casing panels are constructed of fiberglass-reinforced polyester (FRP) panels. Hinged access doors are provided on both side walls of the tower for access to eliminators and fan plenum section for all cells. The doors are made of a steel frame, matching the unit construction, with an exterior overlay of FRP.

Inlet Louvers:

Air inlet louvers are wave-formed, fiberglass-reinforced polyester (FRP), spaced to minimize air resistance and prevent water splash-out.

Fill:

The BACross® Fill and integral drift eliminators are formed from self-extinguishing (per ASTM D-568) polyvinyl chloride (PVC), having a flame spread rating of 5 per ASTM Standard E84-77a, and are impervious to rot, decay, and fungus or biological attack. The fill is elevated above the cold water basin floor to facilitate cleaning. This fill is suitable for a maximum entering water temperature of 130°F (54.44°C). The eliminators are designed to effectively strip entrained moisture from the leaving airstream with a minimum of air resistance.

Equipment Structure:

The structure of this equipment has been designed, tested and independently certified in accordance with the wind and seismic load requirements of the 2009 International Building Code (IBC) and ASCE/SEI 7-05. Seismic qualification is based on tri-axial shake-table testing conducted at an independent test laboratory in accordance with the ICC-ES Acceptance Criteria AC 156, "Acceptance Criteria for Seismic Qualification By Shake-Table Testing of Nonstructural Components and Systems." For more information and specific wind and seismic load capacity ratings, please see the Certificate of Wind and Seismic Load Capacity.

Water Inlet(s):

Inlet water enters the EASY CONNECT® Piping Arrangement located on the end of the cell(s). Please see the submittal package for the connection type, size and location. The EASY CONNECT® Piping Arrangement balances the flow to each side of the tower and includes a plugged blow-down connection to permit purging of dirt and debris. Polyvinyl chloride (PVC) piping connects EASY CONNECT® Piping Arrangement Chamber to the hot water distribution basins.

Water Outlet(s):

A pipe stub connection(s) of a metal compatible with the cold water basin material and appropriately sized for design flow is provided. Please see the submittal package for the connection type, size and location. Also included is a large area, lift out strainer which matches the cold water basin material of construction and has perforated openings sized smaller than the water distribution nozzle orifices. Strainer includes anti-vortexing baffle to prevent air entrainment.

Flume Box Options:

The positive closure plate is included to allow cell isolation for maintenance or independent cell operation of flumed multi-cell units.

Basin Water Level Control:

Each cell is provided with one make-up valve with unsinkable polystyrene filled plastic float arranged for easy adjustment. The make-up valve is suitable for water supply pressures between 15 psig (103 kPa) and 50 psig (345 kPa).

Basin Heater(s):

A minimum number of high-watt-density electric immersion heater elements, sized to maintain +40°F (+4°C) basin water at 0°F (-18°C) ambient with a 10 mph (16 km/h) wind speed, is provided. Electrical requirements match fan motor. Wiring is not included.

Heater Element Material of Construction:

The unit is supplied with copper heater elements.

Basin Heater Control:

An electric immersion heater control package, including thermostat(s) and low water cutout switch(es) or probe(s), is provided for each cell. Disconnect switch, contactor, and wiring are not included.

Vibration Cutout Switch:

Fan system is provided with an appropriate number of vibration cutout switches to limit collateral damage to the unit in the event of a catastrophic fan failure. The vibration switch(es) is mechanically tripped with a frequency range of 0 to 3,600 RPM and trip point of 0.2 to 2.0 g's. No input power is required. Switch rating is 10 amperes at a maximum 480 VAC, and 1/4 ampere at 250 Vdc.

Air Intake Option:

Galvanized steel air intake screens are constructed of 1" X 1" (25 mm X 25mm) wire mesh. They protect the air intake face and prevent airborne debris from entering the unit(s).

Internal Access Option:

A G-235 (Z700 metric) galvanized steel walkway complying with OSHA standards and regulations provides access to the plenum to facilitate servicing the unit. Walkway mounting supports match the cold water basin material of construction.



BALTIMORE
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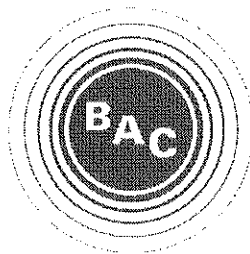
Certificate of Wind and Seismic Load Capacity

2006 and 2009 International Building Codes (IBC)

10-2-2013

BAC Order #

Q14027904503



Product Line:
Model Number: S3E-8518-05L-2

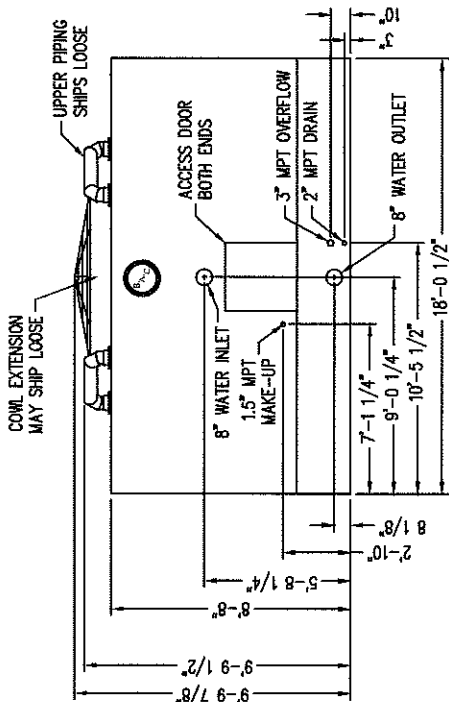
Wind and seismic load capacities for the referenced unit are provided below. It is the responsibility of the purchaser to determine the suitability of this unit for the specific application and to design the anchorage and support system for the project wind and seismic loads. Field modifications to the unit may void this certificate.

Wind Load Rating

Design Wind Pressure:	p = 60.00	psf
Installation Requirements:	None	

Seismic Load Rating

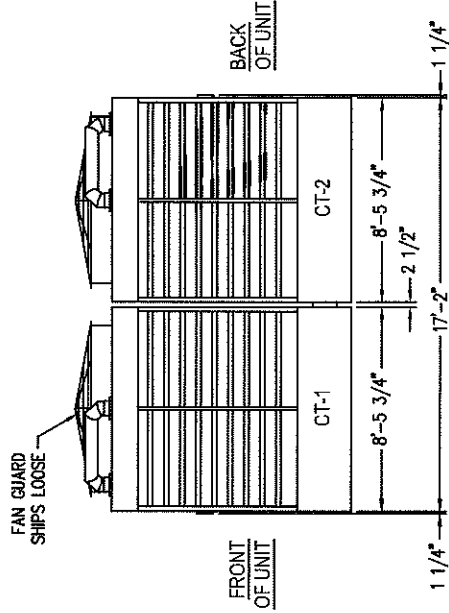
Design Spectral Acceleration:	S _{DS} = 1.40	on grade
	S _{DS} = 0.88	on rooftop
Component Importance Factor:	I _p = 1.5	
Installation Restrictions:	Outdoor	



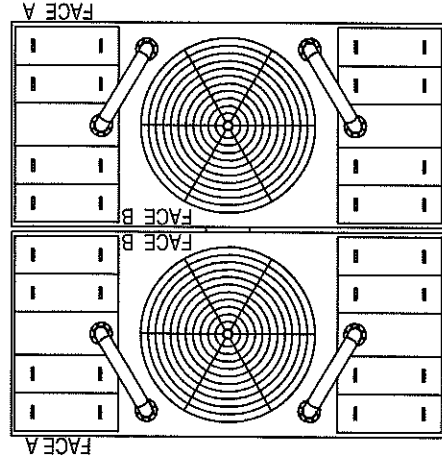
END ELEVATION (FACE A)
(CONNECTIONS SAME BOTH ENDS)

Notes

- 1) Drawings are not to scale. All dimensions are in feet and inches. Weights are in pounds and include options and accessories.
- 2) Unless otherwise indicated, connections 3" and smaller are MPT. Connections 4" and larger are grooved to suit a mechanical coupling and beveled for welding.
- 3) Field piping should be fabricated at time of installation. Pre-fabrication of pipe work is not recommended.
- 4) Do not support piping from unit connections. All necessary piping supports to be supplied by others.
- 5) For weight loadings and support requirements, refer to the suggested unit support drawing.
- 6) The area above the fan discharge must be unobstructed.
- 7) Due to height limitations on truck shipments, some items shown may ship loose for field installation.
- 8) Outlet connections are sized for pump suction application at the design flow rate. They are based on the maximum flow rate through the strainer with basin water at standard operating level.



SIDE ELEVATION



PLAN VIEW

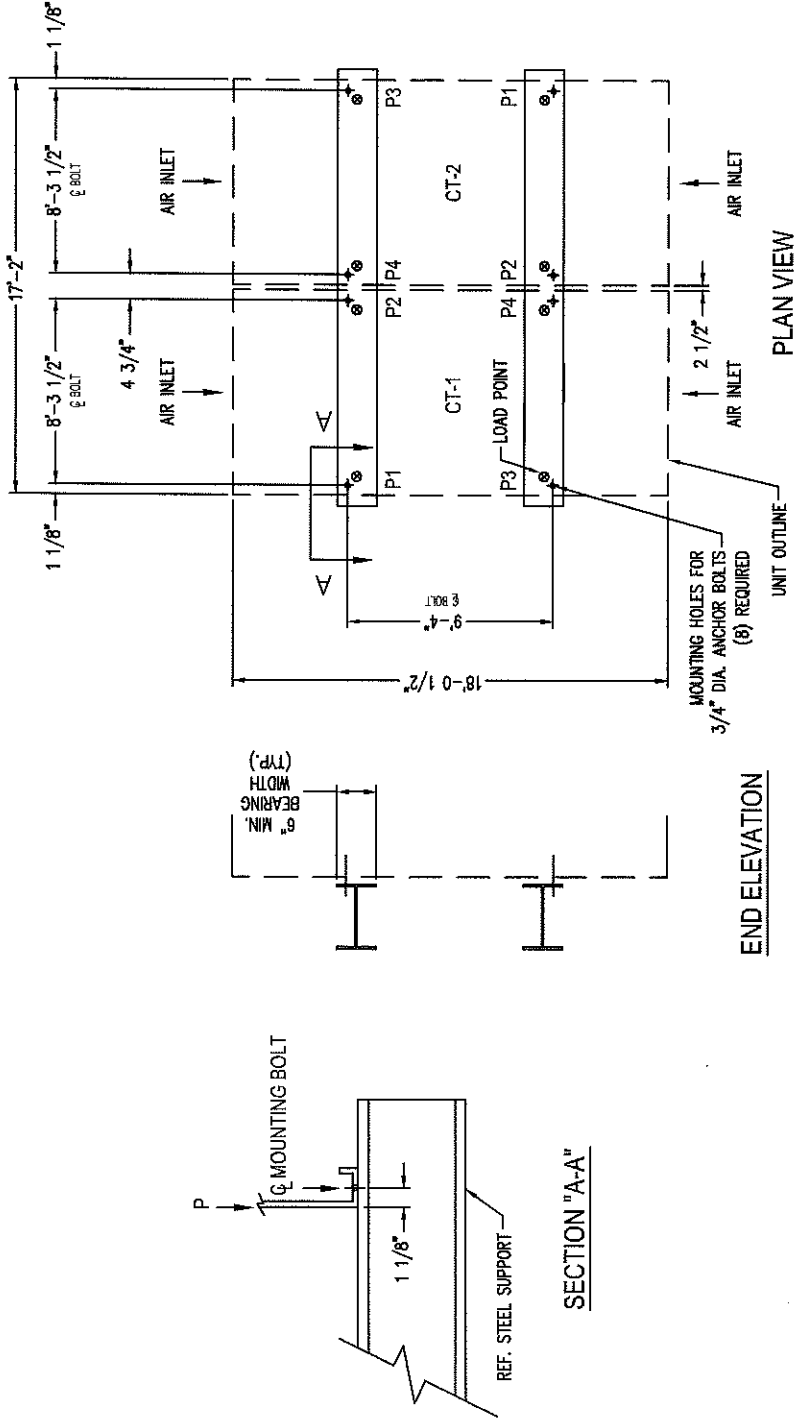
Model Number	Shipping Weight	Operating Weight	Heaviest Section
S3E-8518-05L-2	16320	30600	8160

ORDER NO: **Q14027904503**

DATE: **10/2/2013**



3000E Unit Print
One Piece Units
DRAWING NUMBER:
UP-Q14027904503



Notes

- 1) Drawings are not to scale. All dimensions are in feet and inches. Weights are in pounds and include options and accessories.
- 2) Operating weight and weight loading are for units with water level in basin at overflow.
- 3) Unit support beams and anchor bolts to be designed and furnished by others.
- 4) Support beams must be flush and level at top.
- 5) Steel frame members perpendicular to the support beams and under the air inlet edges of unit must be at least 2" below the top of the support beams.
- 6) For non-standard support beam spacing, mounting holes in the unit are to be drilled by others.

Model Number	Shipping Weight	Operating Weight	Point "1"	Point "2"	Point "3"	Point "4"	Point "5"	Point "6"	Point "7"	Point "8"	Point "9"	Point "10"
S3E-8518-05L-2	16320	30600	3826	3826	3826	3826	0	0	0	0	0	0

ORDER NO:	Q14027904503	 BALTIMORE AIRCOIL COMPANY	3000E Unit Support Standard Basins		
DATE:	10/2/2013		DRAWING NUMBER: SS-Q14027904503		

UNIT CENTER OF GRAVITY

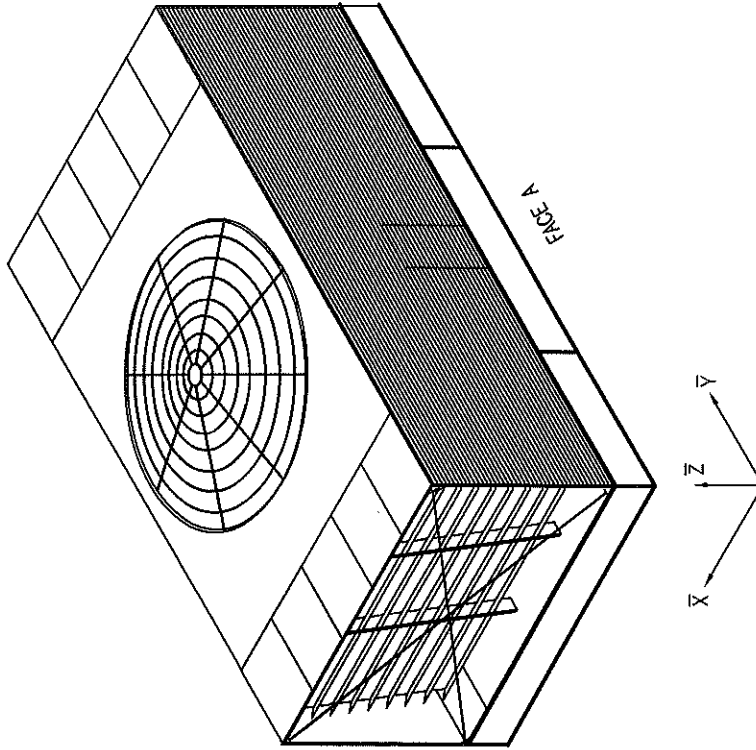
	$\bar{X}$		$\bar{Y}$		$\bar{Z}$	
	DRY	OPERATING	DRY	OPERATING	DRY	OPERATING
4'-6 3/4"		4'-4 3/4"	9'-1 1/2"	9'-0 1/2"	4'-3"	3'-6"

WEIGHT BREAKDOWN FOR FIELD INSTALLED ACCESSORIES

VELOCITY RECOVERY STACK (EACH): N/A
 INTAKE ATTENUATION (EACH): N/A
 DISCHARGE ATTENUATION (PER CELL): N/A
 FAN COWL EXTENSIONS (EACH): N/A
 LOUVER FACE PLATFORMS (EACH): N/A
 ACCESS DOOR PLATFORMS (EACH): N/A
 EXTERNAL MOTOR PLATFORMS (EACH): N/A
 FAN DECK EXTENSION (EACH): N/A
 FAN DECK HANDRAILS (TOTAL): N/A

Notes

- 1) Drawings are not to scale.
- 2) Accessory weights shown above are included in the total unit Operating, Shipping and Heaviest Section values located on the Unit Print and Unit Support drawings. Ladder and cage weights are not shown above but are included in the totals.
- 3) These accessories ship loose for field assembly and installation.



ORDER NO: **Q14027904503**

DATE: **10/2/2013**



3000E Center of Gravity

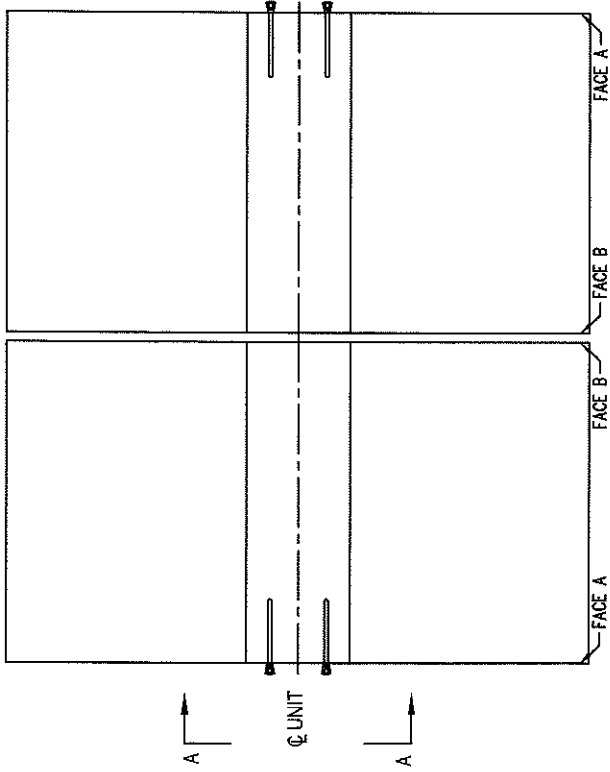
DRAWING NUMBER:
CG-Q14027904503

ELECTRIC IMMERSION HEATERS

AMBIENT TEMPERATURE: 0°F
HEATER QTY (TOTAL): 4
POWER (EACH): 6 KW
VOLTAGE: 460 V
PHASE: 3
FREQUENCY: 60 HZ

Notes

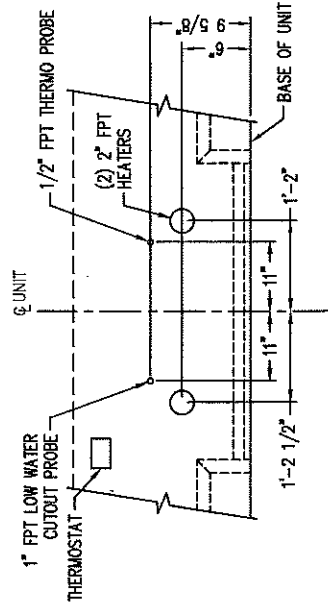
- 1) Heater elements and controls ship loose for field installation (by others).
- 2) Refer to the appropriate wiring diagram for heater wiring details.



CT-2

CT-1

PLAN VIEW



END ELEVATION VIEW A-A

CONTROLS IN ALL CELLS



3000E Basin Accessories

ORDER NO: **Q14027904503**

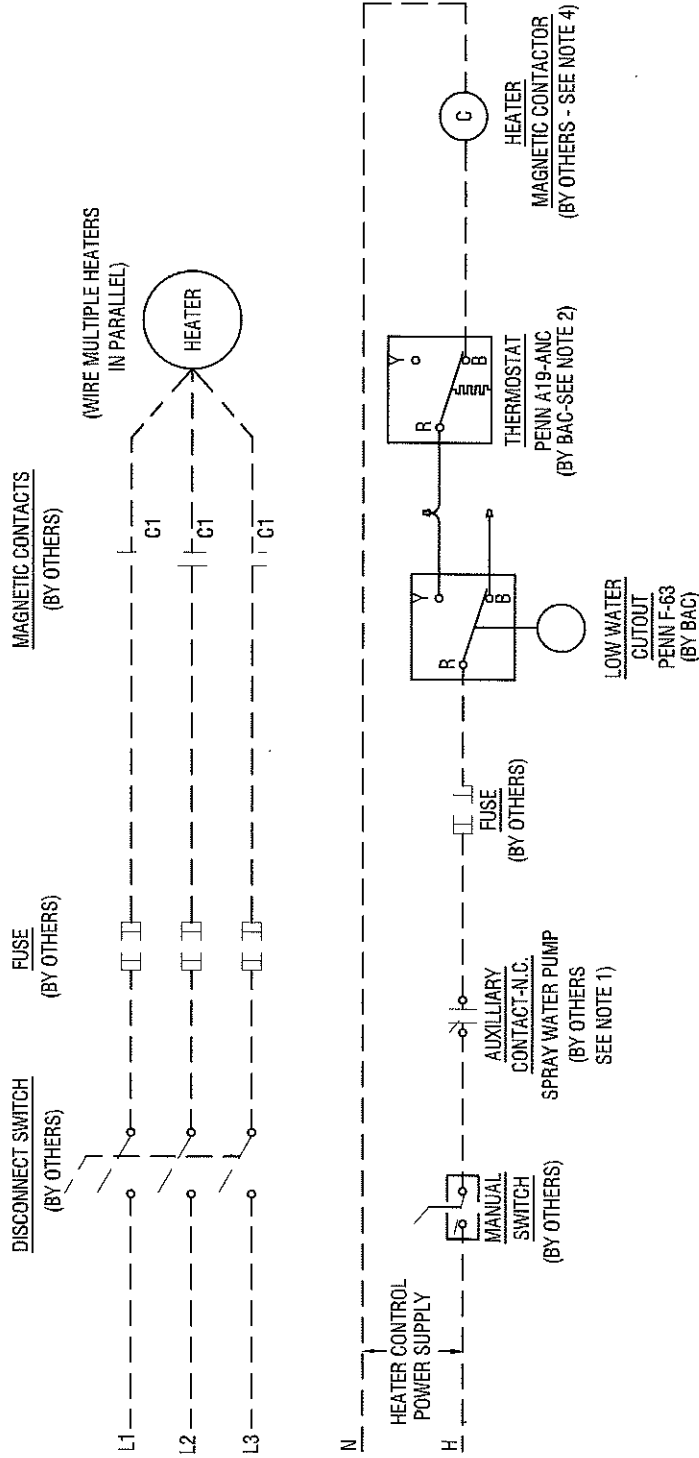
DATE: **10/2/2013**

DRAWING NUMBER:

BA-Q14027904503

NOTES:

1. INTERLOCK IMMERSION HEATERS WITH CIRCULATING PUMP TO DE-ENERGIZE HEATERS WHEN PUMP IS RUNNING.
2. CONTROL THERMOSTAT IS TO BE SET FOR 40° F. DO NOT SET THERMOSTAT LOWER THAN 40° F.
3. BROKEN LINES INDICATE COMPONENTS AND WIRING TO BE SUPPLIED BY OTHERS.
4. CONTACTOR, FUSE PROTECTION AND POWER SUPPLY WIRING ARE TO BE SIZED TO MATCH HEATER REQUIREMENTS. WIRING MUST COMPLY TO APPLICABLE CODES AND ORDINANCES.



Data Version 1.00
DWG Version 1.10

Electric Immersion Heater Wiring
Standard Controls

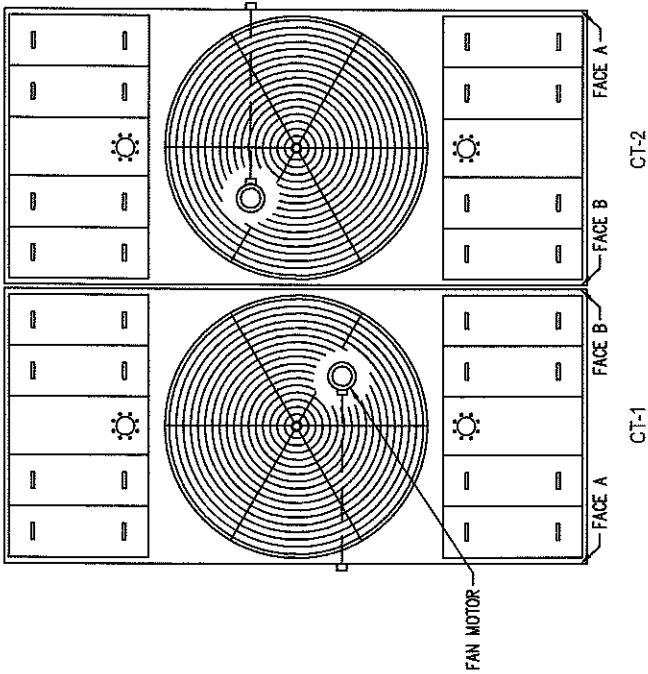
DRAWING NUMBER:

HW-Q14027904503



ORDER NO: Q14027904503

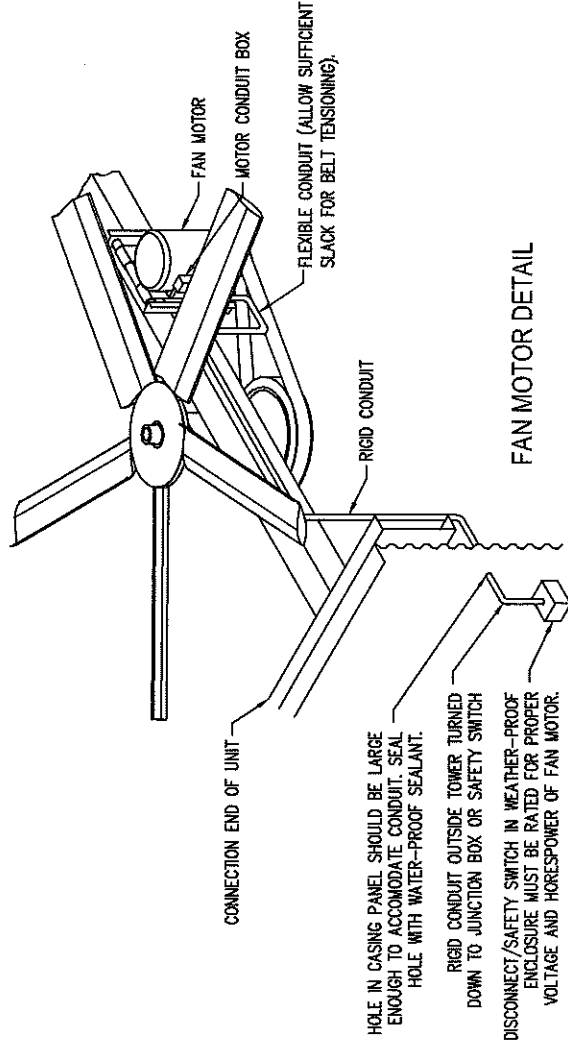
DATE: 10/2/2013



PLAN VIEW

Notes

- 1) Drawings are not to scale.
- 2) Conduit must be water tight and pitched downward to allow condensation to drain away from fan motor conduit box. Therefore, do not run the conduit through fan deck.
- 3) All wiring must conform to local and national electrical codes. Junction box/safety switch and all conduit from fan motor conduit box to be sized, provided, and installed by others.
- 4) Rigid conduit outside casing panel must turn down to junction box.
- 5) For proper motor orientation see plan view.



3000E Motor Location

ORDER NO: Q14027904503

DATE: 10/2/2013

DRAWING NUMBER:

ML-Q14027904503

OPERATING INSTRUCTIONS

Follow the installation drawings and wiring diagram to ensure the proper operation of the vibration switch. Direct any questions to your local BAC Representative.

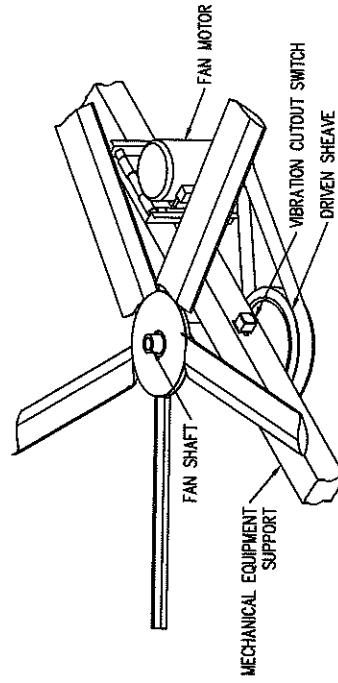
NOTE

Moisture inside the switch can lead to switch failure. Care must be taken when replacing the cover on the vibration switch to ensure that the proper watertight seal is obtained.

CAUTION

Before performing any maintenance, adjustment or inspection of the switch, make certain that all power has been disconnected and locked in the off position.

SWITCH LOCATION
Belt Drive Units



**BALTIMORE
AIRCOIL COMPANY**

3000E VCOS Location

ORDER NO: **Q14027904503**

DATE: **10/2/2013**

DRAWING NUMBER:

VL-Q14027904503

NOTES:

1. LOCAL PUSH BUTTON RESET.
2. TO MAINTAIN HAZARDOUS DUTY RATINGS, THE FACTORY INSTALLED WATER TIGHT CONDUIT/CABLE CONNECTION FITTINGS MUST BE REMOVED AND THE FOUR CONDUCTOR CABLE MUST BE ROUTED INSIDE OF A SUITABLE EXPLOSION PROOF CONDUIT. NOTE: THE CONNECTORS CAN EASILY BE REMOVED WITHOUT HAVING TO UN-WIRE THE CONDUCTORS FROM INSIDE THE CUTOUT SWITCH.
3. THE MECHANICAL VIBRATION CUTOUT SWITCH COMES WITH TWO WATER TIGHT CONDUIT/CABLE CONNECTORS. ONE CONNECTOR IS USED TO PROVIDE A WATER TIGHT CONNECTION TO THE VIBRATION CUTOUT SWITCH AND THE OTHER IS PROVIDED FOR THE ELECTRICIAN TO CONNECT THE WIRE CABLE TO A JUNCTION BOX LOCATED IN THE VICINITY OF THE VIBRATION CUTOUT SWITCH.
4. THE SWITCH IN THE NORMALLY CLOSED CIRCUIT (BLACK WIRE) WILL OPEN WHEN THE DEVICE EXPERIENCES VIBRATION LEVELS ABOVE THE SETPOINT VALUE. IF REVERSE CONTROL LOGIC IS DESIRED, CUT OFF THE BUTT END CONNECTOR ON THE WHITE WIRE AND INSTALL A WIRE NUT OR BUTT CONNECTOR ON THE NORMALLY CLOSED WIRE (BLACK).
5. THIS MECHANICAL VIBRATION CUTOUT SWITCH COMES WITH ONE SINGLE POLE DOUBLE THROW SWITCH. THE SWITCH CONTACTS ARE "DRY CONTACTS" WHICH CAN BE SUCCESSFULLY USED DIRECTLY IN THE FAN STARTER CONTROL (TYPICALLY A/C VOLTAGE) CIRCUIT OR DIRECTLY IN A BUILDING MANAGEMENT SYSTEM (TYPICALLY D/C VOLTAGE).
CONTACT RATINGS: 3 AMPS@ 125 OR 480 VAC, 1/2 AMP@ 125 VDC, 1/4 AMP@ 250 VDC.
6. CAUTION: MOISTURE INSIDE THE SWITCH CAN LEAD TO SWITCH FAILURE. CARE MUST BE TAKEN WHEN REPLACING THE COVER ON THE VIBRATION SWITCH TO ENSURE THAT THE PROPER WATERTIGHT SEAL IS OBTAINED.

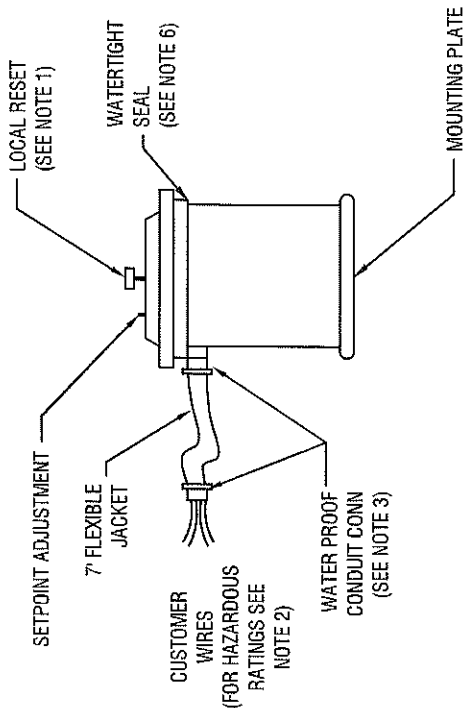
ADJUSTMENTS OF BAC MECHANICAL VIBRATION CUTOUT SWITCH

BAC RECOMMENDS THAT EACH VIBRATION CUTOFF SWITCH BE FIELD ADJUSTED AT START-UP TO OPTIMIZE THE TRIP POINT RELATIVE TO THE FINAL MOUNTING POSITION AND VIBRATIONAL CHARACTERISTICS OF THE INSTALLED EQUIPMENT.

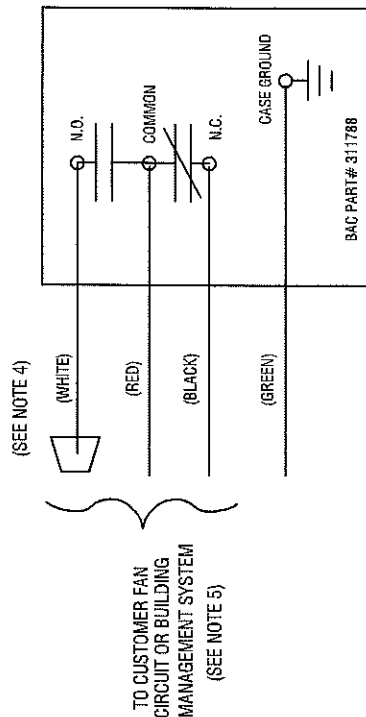
NOTE: INSTALLATION AND ADJUSTMENT MUST BE PERFORMED BY A QUALIFIED, COMPETENT TECHNICIAN

1. FOR SAFETY SAKE, TURN OFF, THEN LOCK & TAG-OUT THE ELECTRICAL SUPPLY TO THE FAN MOTOR(S).
2. TURN ADJUSTMENT SCREW COUNTERCLOCKWISE (CCW) 1/8 TURN AT A TIME UNTIL YOU HEAR THE CONTROL TRIP.
3. ONCE TRIPPED, ROTATE ADJUSTMENT SCREW 1/4 TURN CLOCKWISE (CW) AND THEN PUSH IN MANUAL RESET BUTTON.
4. START UP FAN(S) TO DETERMINE IF THE START-UP WILL CAUSE THE CUTO-OUT SWITCH TO TRIP.
5. IF THE VIBRATION CUTOUT SWITCH DOES NOT TRIP, THEN START AND STOP THE FAN TWO MORE TIMES AND IF THE CUTOUT SWITCH STILL DOES NOT TRIP, THEN CALIBRATION IS COMPLETE. IF THE VIBRATION CUTOUT SWITCH DID TRIP, THEN TURN OFF, THEN LOCK & TAG-OUT THE ELECTRICAL SUPPLY TO THE FAN MOTOR(S). ADJUST THE SET POINT SCREW AN ADDITIONAL 1/4 TURN CW AND THEN DEPRESS THE RESET BUTTON. RE-START THE FAN(S) TO DETERMINE IF THE START-UP WILL CAUSE THE SWITCH TO TRIP. REPEAT THIS ADJUSTMENT PROCESS UNTIL THE CONTROL DOES NOT TRIP. ONCE THE FINAL ADJUSTMENT HAS BEEN MADE, START AND STOP THE FAN TWO MORE TIMES AND IF THE CUTOUT SWITCH STILL DOES NOT TRIP, THEN CALIBRATION IS COMPLETE.

MECHANICAL VIBRATION CUT-OUT SWITCH
(ONE-SINGLE POLE DOUBLE THROW SWITCH)



WIRING DIAGRAM
(ONE-SINGLE POLE DOUBLE THROW SWITCH - SEE NOTE 5)



BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR INSPECTION OF THE SWITCH, MAKE CERTAIN THAT ALL POWER HAS BEEN DISCONNECTED AND LOCKED IN THE OFF POSITION.

Data Version 1.00
DWG Version 1.00



BALTIMORE
AIRCOIL COMPANY

Mechanical VCOS Wiring
Shut Off with Local Reset

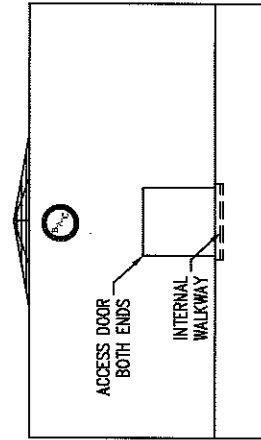
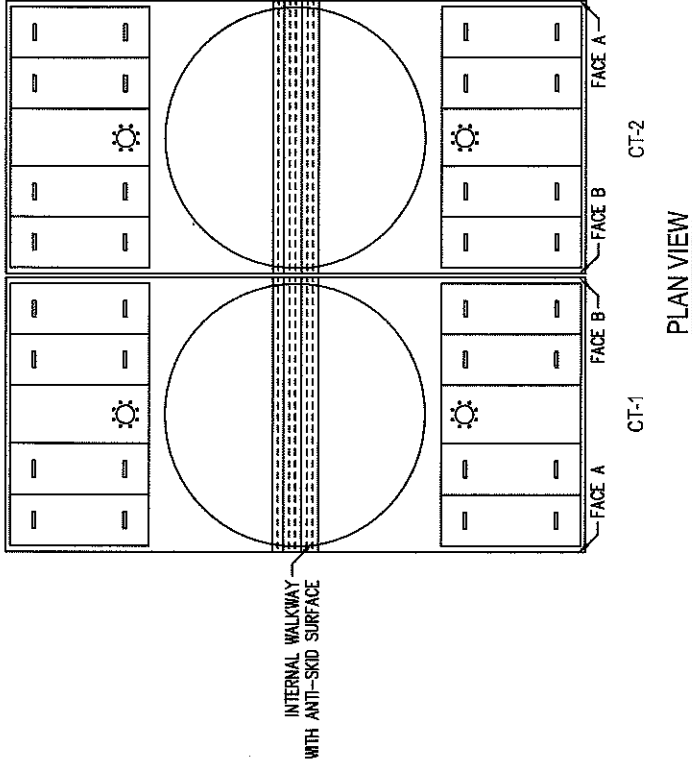
DRAWING NUMBER:

VW-Q14027904503

ORDER NO: Q14027904503

DATE: 10/2/2013

- Notes
- 1) Drawings are not to scale.
 - 2) Field piping must be kept clear and supported independently of all unit access accessories.



3000C Internal Access



ORDER NO: Q14027904503

DATE: 10/2/2013

DRAWING NUMBER:
IA-Q14027904503