

ADDENDUM #1

New Will County Morgue/Coroner Facility
BID PACKAGE #5
DATE: 1/18/2023

This addendum will be included in all future sets of drawings distributed and on Building Connected. www.buildingconnected.com.

Division 1 – General Instructions

1.0 Bid Instructions

A. Bid Submission

- **Bid due date is extended to 1/26/2023**

1.1 Bid Documents

A. Schedule of Bid Documents

The following documents are included as part of this bid addendum:

DATE	DESCRIPTION	By
1/6/2023	Cooler & Freezer Shop Drawings/Product Data	Leopardo Companies
1/18/2023	Cold Room Installation Scope	Leopardo Companies

SECTION 00220.404
WORK SCOPE COLD ROOMS INSTALL

The Scope of Work includes all labor, material, tools, equipment, scaffolding, hoisting, supervision and engineering as required to complete the COLD ROOMS INSTALL Scope of Work in accordance with the Contract Documents and enumerated below:

Subcontractor understands the Contract Documents are scope documents that indicate the general scope of the project which may not indicate or describe all the work required for the full performance and completion of their work. Subcontractor includes all items reasonably inferable to complete their scope of work whether or not indicated on the Contract Documents.

TRADE SPECIFIC-COLD ROOMS INSTALL

1. See "General Work Scope" for General Requirement, applicable to all bid packages.
2. GENERAL
 - a. Reference all drawings, and lab equipment schedule for total count and location of equipment.
 - b. All required scaffolds, ladders and other equipment necessary to access the work.
 - c. Traffic control and barricades as required for your work.
 - d. Union installation for all items furnished under this scope of work is also included.
 - e. Receive, unload, set in place, level and scribe all new Morgue & Autopsy Equipment & Cooler Freezer Equipment.
 - f. Field verify existing conditions prior to fabrication.
 - g. Caulking to adjacent surfaces.
 - h. Furnish trim fabricated to dimensions, profiles, and details indicated.
 - i. Clean-up all debris to LCI dumpsters
 - j. Onsite representative for startups, commissioning and owner training.
 - k. Compliance with LCI's Mechanical Project Delivery Plan.
 - l. Include all supports for in wall and above ceiling.
3. COLD ROOMS
 - a. Receive, Unload & Set in place a complete cold room and freezer assembly.
 - b. Install a complete cold room and freezer assembly per the specifications and Lab Drawings with no exceptions or exclusions.
 - c. Receive, Unload & Set in place all associated equipment, switches, evaporators, valves, defrost equipment, receptacles, lights, conduits, wire, piping, materials, components, systems etc. and other appurtenances and assemblies as required for a complete operating system.
 - d. Type ACR copper pipe and proper insulation to be supplied by this contractor, insulation thickness must meet all local codes and specifications provided.
 - e. Furnish and install roof curbs for condensers.
 - f. Line sets must be jacketed i.e. PVC or aluminum per local codes.
 - g. Point of connections to all equipment is required by the installer.
 - h. Provide 250 PSI 24 hour nitrogen test on systems before start up and notify inspector on project site at time of testing for proper approval to proceed with Start up.
 - i. Provide complete start up and balancing of systems to meet temperature requirements as specified.
 - j. Meet testing requirements in specifications for each walk-in room chamber. Provide a complete start up report.
 - k. Install condensate drain line to building drain from all refrigerated systems in cooler and freezer walk in chamber rooms. Type L copper is to be supplied and installed. Freezer piping supplied with heat trace and proper insulation to meet local codes and/or specifications.
 - l. This contractor to provide all miscellaneous hardware/screws/bolts/piping for walk in coolers and condensers.
 - m. Furnish and install all mounting and anchoring hardware.

- n. Install all associated equipment, switches, evaporators, valves, defrost equipment, receptacles, lights, conduits, wire, piping, materials, components, systems etc. and other appurtenances and assemblies as required for a complete operating system.
- o. Mortech will provide supervision during the Commissioning Process but this contractor should be responsible for the labor during commissioning as required by commissioning agent.
- p. Include installation of wire mesh partition and gate.
- q. Install all sliding door, hardware, frames, as required
- r. Install 3x3 steel angles, galvanized, painted safety yellow, wheel stop bolted to floor to prevent gurneys from accidentally rolling into the slide path of any sliding door.
- s. It will be the installers responsibility to check all panels & Components for damage and report any damages to Mortech within 48 hours of receipt, after which time the installer will be responsible and liable for any damages found. Upon delivery of cold rooms any immediate apparent damage must be noted on the BOL when signing before driver leaves. Pictures of damages will be required.
- t. This job required ASHPD inspection and verification with local inspector at the time of assembly, installer is required to follow all specifications provided by Mortech MFg, and local governing codes.
- u. Install walk in chamber cooler/freezer cold rooms including all accessories to complete walk-in chamber assembly as turnkey chambers and meet project specifications that pertain to installation.
- v. Installer is required to coordinate and make any penetrations required for other trades when needed or required along their own. Any and/or all penetrations will be the installer's responsibility to seal from any type of condensation leaks within the cold room chambers.
- w. Install a complete spec section 132126.

4. MISCELLANEOUS

- a. Subcontractor to provide all protection after installation of work to prevent other trades from damaging installed work.

END OF SECTION 00220.501

dbHMS engineering
SUBMITTAL REVIEW

SUBMITTAL # NA

SUBMITTAL NAME Cooler 124A (ME6)/Freezer 124B (ME7) Combo

DATE 01/16/2023

BY: AJ, GP

RESUBMITTAL NOT REQUIRED	RESUBMITTAL REQUIRED
<input type="checkbox"/> REVIEWED	<input type="checkbox"/> PARTIAL RESUBMITTAL REQUIRED
<input checked="" type="checkbox"/> REVIEWED AS NOTED	<input type="checkbox"/> FULL RESUBMITTAL REQUIRED
<input type="checkbox"/> RECEIVED FOR RECORD	<input type="checkbox"/> REJECTED - NOT APPLICABLE


THIS REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS NOR FOR COORDINATION OF ALL TRADES, SPECIAL COMPATIBILITY, OR MEANS AND METHODS OF CONSTRUCTION REGARDLESS OF THE COMMENTS INDICATED

REVIEW IS ONLY FOR CONFORMANCE WITH THE INFORMATION GIVEN AND THE DESIGN CONCEPT OF THE PROJECT AS EXPRESSED IN THE CONTRACT DOCUMENTS. REVIEW OF SUBMITTALS ARE NOT CONDUCTED FOR THE PURPOSE OF DETERMINING THE ACCURACY AND COMPLETENESS OF OTHER DETAILS, SUCH AS DIMENSIONS AND QUANTITIES, OR FOR SUBSTANTIATING INSTRUCTIONS FOR THE INSTALLATION OR PERFORMANCE OF EQUIPMENT OR SYSTEMS, ALL OF WHICH REMAIN THE RESPONSIBILITY OF THE CONTRACTOR AS REQUIRED BY THE CONTRACT DOCUMENTS. THE ARCHITECT'S REVIEW OF THE CONTRACTOR'S SUBMITTALS SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION CONTAINED IN THE CONTRACT DOCUMENTS. THE ARCHITECT'S REVIEW SHALL NOT CONSTITUTE APPROVAL OF ANY CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR ANY SAFETY PRECAUTIONS OR PROCEDURES. THE ARCHITECT'S REVIEW OF A SPECIFIC ITEM SHALL NOT INDICATE APPROVAL OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT.

NO EXCEPTIONS
 EXCEPTIONS AS NOTED
 REVISE & RESUBMIT
 REJECTED
 NOT REVIEWED
 OTHER: _____

BY: B. BREWER

DATE: 1/18/23



PROJECT 200216	SUBMITTAL 13 21 26	FILE C 5.
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1) Refer sheet M.100B for dehumidifier insulation requirements.

2) Refer comments inside body of submittal .

3) Refer detail 7 on sheet M.601 for pipe penetration through roof and roof curb detail for the condensing unit refrigerant piping.



PROJECT
SUBMITTAL

**WILL COUNTY
New Coroner Facility**

Cooler 124A (ME6)/ Freezer 124B (ME7) Combo

Vice President of Operations
Paul Joseph
411 North Aerojet Avenue Azusa, Ca. 91702
Office: 626 334-1471 Ext. 104
Fax: 626 334 1704

Prepared for:
Tyler Nassar
Leopardo Companies (IL)
Phone: (224) 2887903

Locate cooler controls in gyp.

ELECTRICAL, STRUCTURAL AND MECHANICAL ENGINEERS TO REVIEW.

Date: January 6, 2023
Submittal No. 1

1. Mortech to coordinate location of condensate recessed drain box with plumbing contractor.
2. Mortech to coordinate location of cooler floor drain with plumbing contractor.
3. Mortech to coordinate location of dehumidification unit with HVAC contractor.
4. Mortech to coordinate location of supply and return registers with HVAC contractor.

SHOP DRAWING REVIEW

REVIEW IS FOR GENERAL COMPLIANCE WITH CONTRACT DOCUMENTS. NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS OF DIMENSIONS OR DETAILS.

NO EXCEPTIONS TAKEN	
MAKE CORRECTIONS NOTED	X
REVISE & RESUBMIT	
REJECTED-SEE REMARKS	

MWL McLaren Wilson & Lawrie, Inc.

DATE: 1.11.23 BY: MWL

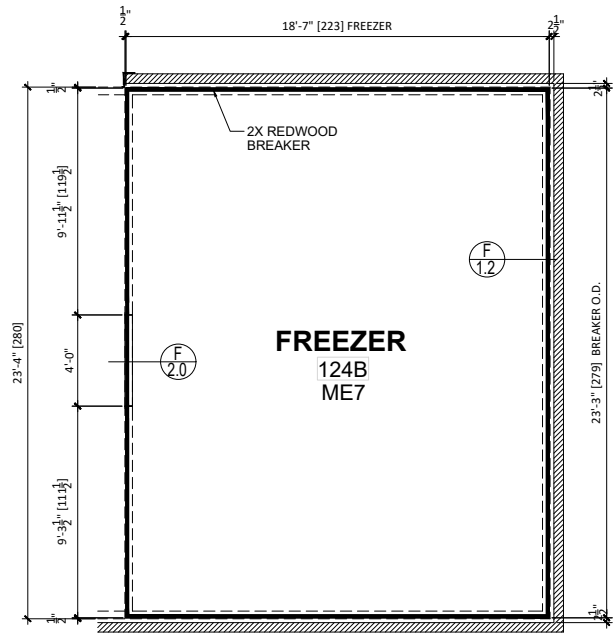
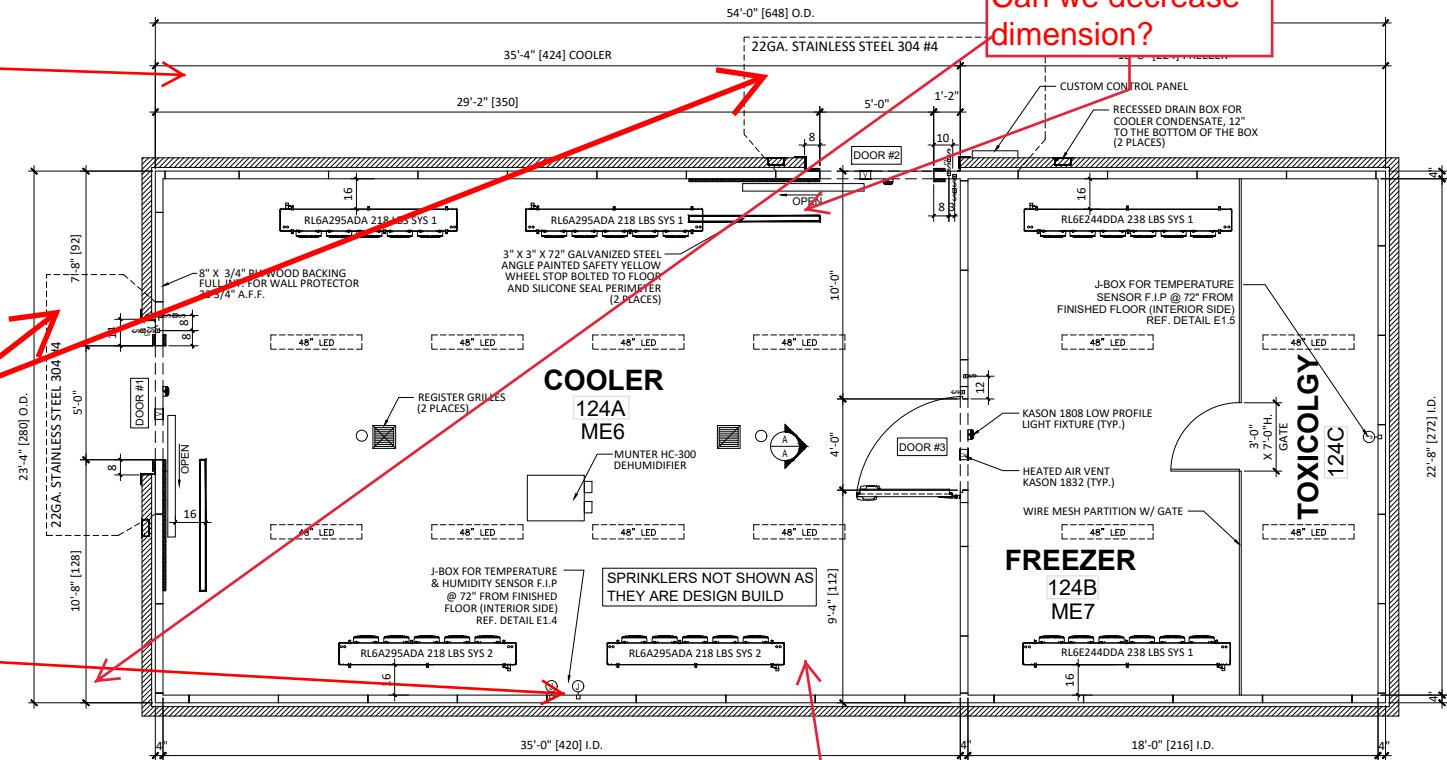
Note to GC. Please make sure the mechanical contractor installs dehumidifier ductwork and insulation per page 52 of this submittal. All items highlighted in blue are mechanical contractor responsibility.

GC TO CONFIRM ACTUAL FIELD DIMENSIONS PRIOR TO COOLER INSTALLATION.

CONTRACTOR TO CONFIRM WHAT DASH LINES REPRESENT. RAMP?

VERIFY THESE ARE NOT BEHIND AN EVAPORATOR OR IN DIRECT AIR FLOW WHICH WILL CONFUSE THE SENSORS

Can we decrease dimension?



PLAN VIEW

PLAN VIEW (FREEZER BREAKER LAYOUT)

SPECIFICATIONS

- WALK-IN TYPE: INDOOR COOLER/ FREEZER COMBO
23'-4" X 54'-0" X 10'-5" (W X D X H)
- CONSTRUCTION:** WALLS: 4" THICK, DOW RF400, HIGH DENSITY FOAM RAILS BASF, AUTOFROTH 100-B-1103 RESIN/9300A ISOCYANATE, HIGH DENSITY FOAM
- CEILING: 5" THICK, DOW RF400, HIGH DENSITY FOAM RAILS BASF, AUTOFROTH 100-B-1103 RESIN/9300A ISOCYANATE, HIGH DENSITY FOAM
- FLOOR: INSULATED FLOOR AND CONCRETE BY OTHERS
- FINISH:** WALLS: 22GA. STAINLESS STEEL 304 #4 (EXPOSED EXTERIOR)
26GA. STUCCO WHITE EMBOSSED GALVANIZED STEEL (INTERIOR)
26GA. STUCCO EMBOSSED GALVANIZED STEEL (UNEXPOSED EXTERIOR)
- CEILING: 26GA. STUCCO WHITE EMBOSSED GALVANIZED STEEL (INTERIOR)
26GA. STUCCO EMBOSSED GALVANIZED STEEL (EXTERIOR)
- DOORS:** SLIDING: (2) 60" X 84" HORIZONTAL SINGLE SLIDING COOLER DOOR, 4" THICK, ELECTRIC, INTERIOR MOUNT (SLIDE LEFT)
RM124A ME6
EFD- HORIZONTAL SLIDE (POWER)
SINGLE PANEL HORIZONTAL ELECTRIC SLIDE
COOLER (4" THICK DOOR PANEL) :: AMB INTF W/S :: 37F T/S
MOUNTED INSIDE COOLER
UL EPH / NSF SANITATION CERTIFICATION
304 STAINLESS STEEL (20 GA) FINISH IN/OUT
SS CHAINLOCK W/INSIDE RELEASE
48" HIGH STAINLESS STEEL(14GA) KICKPLATE IN/OUT
GLASS 14 X 14 VIEW WINDOW (HEATED)
12" TALL 304 SS (24 GA) CLAD HEADER W/304 SS (24 GA) CLAD ALUM DROPTAC
304 SS (24 GA) CLAD EXTRUDED ALUMINUM CASINGS
PANEL MOUNTED GASKETS
CASING MOUNTED LEADING EDGE CLOSURE HOOK
STAINLESS TRAILING EDGE WALL GUIDE SYSTEM
TRAILING EDGE BUMP STOP
PULL HANDLE IN/OUT
EFD DOOR CONTROLLER - INDOOR APPLICATION
UL LISTED
CHAIN DISCONNECT
REVERSING EDGE
JAMB MOUNTED PHOTO EYE
MOTOR COVER (STAINLESS)
WAVE SENSORS (2)
PADLOCKABLE LOCKOUT SWITCH
NEMA 4X BOX
STAINLESS STEEL HARDWARE PACKAGE
120V HEATER IN FRAME

GC and Architect to confirm sprinkler requirements

CM TO PROVIDE FIRE PROTECTION SHOP DRAWINGS & DETAILS

- INFIT:** (1) 48" X 84" FLUSH, INFIT, FREEZER DOOR WITH: HEATED FRAME (3-SIDES) AND HEATED THRESHOLD
RM124B ME7
FINISH: 26GA. STUCCO WHITE EMBOSSED GALVANIZED STEEL (EXT.)
26GA. STUCCO WHITE EMBOSSED GALVANIZED STEEL (INT.)
- (1) KASON LATCH #10058CL5020 W/STRIKE #10058005002 AND INSIDE SAFETY RELEASE #10481SC0400
(2) KASON CAM-RISE HINGE #11245000028
(1) KASON CAM-RISE HINGE SPRING ASSISTED #11248000004
(1) KASON DOOR CLOSER #11095000013 W/ HOOK #11094000027
(1) 14" X 14" NORFAB TRIPLE GLAZED VIEW WINDOW W/ HEATED FRAME: VIEWING AREA 12 3/4" X 12 3/4" SH OPENING 16 7/8" X 16 7/8" #55083-4
FINISH: 16GA. STAINLESS STEEL KICKPLATES & JAMBS (INT. & EXT.)
- (1) 3-WAY ROCKER SWITCH #1908000604 (DOOR #1,2)
(1) 3-WAY ROCKER SWITCH #1908000604 (DOOR #3)
(1) 48" VAPOR PROOF LED LIGHT FIXTURE #11810LCT400
(1) CONTACT VAPOR PROOF LED LIGHT FIXTURE KASON 1808 #11808000000
(1) JUNCTION BOX (FOAMED IN PLACE) - REF. DETAIL E1.8
(2) JUNCTION BOX FOR TEMPERATURE & HUMIDITY SENSORS (FOAMED IN PLACE) -
(1) JUNCTION BOX FOR EMERGENCY CUT-OFF SWITCH (FOAMED IN PLACE) -
(2) REGISTER GRILLES - LOCATION TBD
(1) MUNTERS DEHUMIDIFIER MODEL HC-300
(1 LOT) STAINLESS STEEL WALL GUARD #2182 (34" FROM F.F.) - INTERIOR
SILICONE, CAULKING, SCREWS, HEX WENCH AND TRIM
6" NSF 26GA. STUCCO WHITE EMBOSSED GALV. (INT./EXPOSED EXT)
(3) KASON 11832000004 HEATED AIR VENT (DOOR 1,2,3)
(2) 3" X 3" X 6" FLOOR ANGLE PAINTED YELLOW FOR SLIDING DOOR PROTECTION
(4) 6" X 6" X 60" CORNER GUARDS 16GA. STAINLESS STEEL
(4) 1" X 4" X 125" VERTICAL CLOSURE 22GA. STAINLESS STEEL 304 #4
(3) "C" CHANNEL CEILING SUPPORT ASSEMBLY
(36) 16GA. HANGER BRACKET
(1) CUSTOM CONTROL PANEL
(1) WIRE MESH PARTITION W/ GATE
- REFRIGERATION:** REFER TO SHEET 7 OF 8 OF THESE SHOP DRAWINGS (REQUEST MANUFACTURER'S LITERATURE IF MORE INFORMATION IS REQUIRED)
- NOTES:** CAM LOCK CEILING
ENGINEERING CALCULATIONS

FEDERAL LAW MINIMUM R VALUE REQUIREMENTS						
	MIN. R VALUE FOR COMMERCIAL SECTIONS				MEAN TEMP (°F)	FEDERAL LAW MIN. R=
	3.5"	4"	5"	5.5"		
COOLER	26.6	30.4	38	41.8	55	R=25
FREEZER	26.6	34.0	42.5	46.7	20	R=32
FLOOR	29.7	34.0	42.5	46.7	20	R=28

SEC. 340 OF THE ENERGY POLICY AND CONSERVATION ACT (42 U.S.C. 6311)
ASTM METHOD C-518

PROJECT TITLE:
**WILL COUNTY
NEW CORONER FACILITY**

PROJECT ADDRESS:
302 N. CHICAGO ST.
JOLIET, IL 60433

APPROVAL:
SIGNATURE: _____ DATE: _____

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FINISH: -

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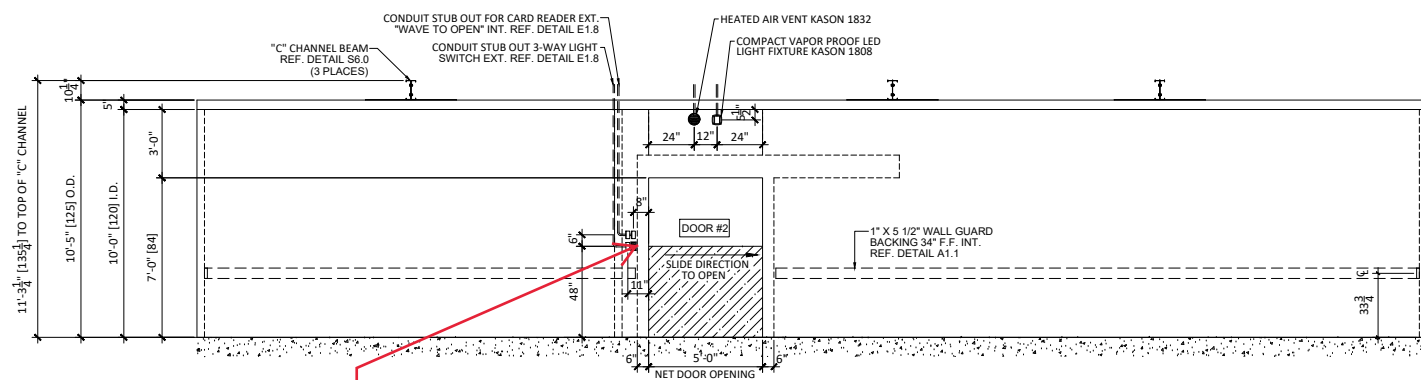
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Azusa, CA 91702
TEL: (800) 410-0100 (626) 334-1471
FAX: (626) 334-1704
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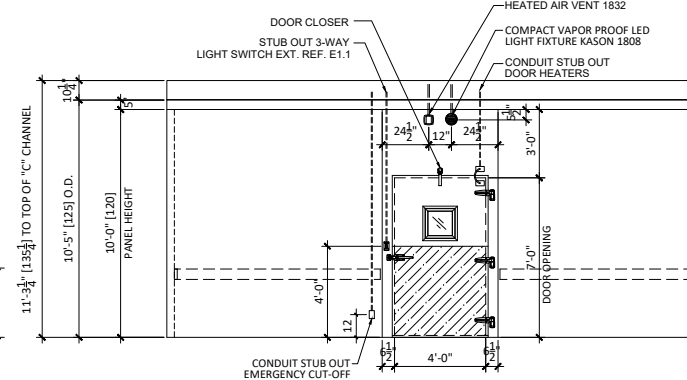
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APPROVALS: DRAWN BY: RENE DATE: 05/11/2022
CHECKED BY: VICTOR
APPROVED BY: _____

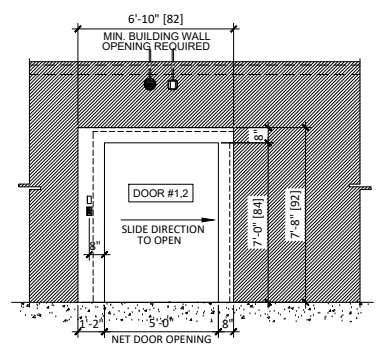
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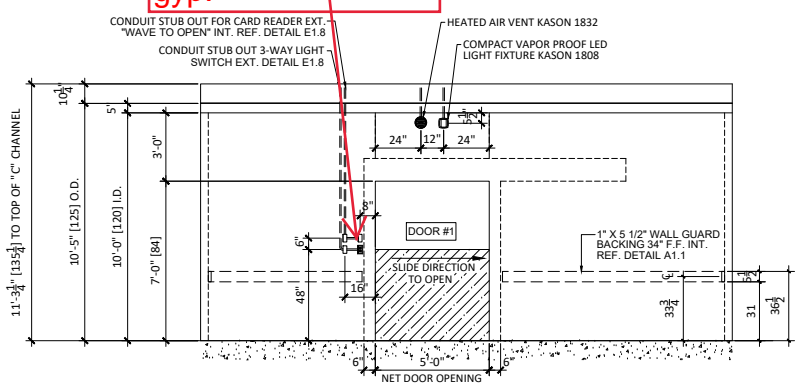
BACK ELEVATION - EXTERIOR



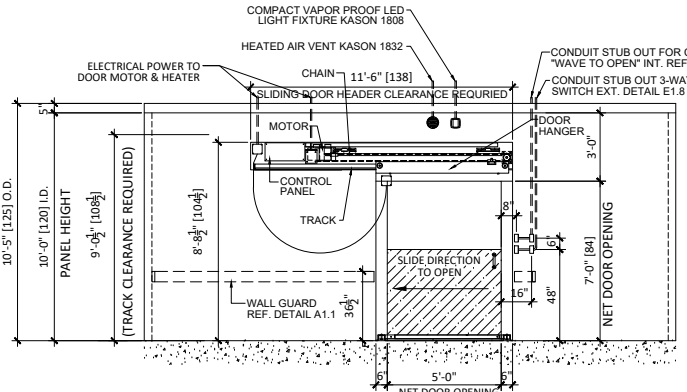
INTERIOR ELEVATION SECTION A-A



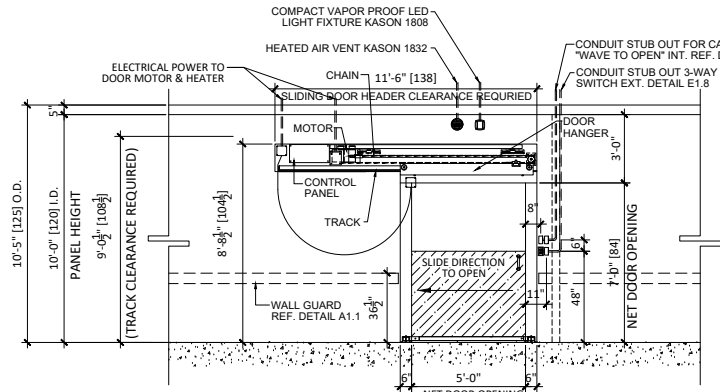
ELECTRIC SLIDING DOOR BUILDING WALL REQUIREMENTS



LEFT ELEVATION - EXTERIOR



(INTERIOR) DOOR #1



(INTERIOR) DOOR #2

FEDERAL LAW MINIMUM R VALUE REQUIREMENTS						
	MIN. R VALUE FOR COMMERCIAL SECTIONS				MEAN TEMP. (°F)	FEDERAL LAW MIN. R=
	3.5"	4"	5"	5.5"		
COOLER	26.6	30.4	38	41.8	55	R=25
FREEZER	29.7	34.0	42.5	46.7	20	R=32
FLOOR	29.7	34.0	42.5	46.7	20	R=28

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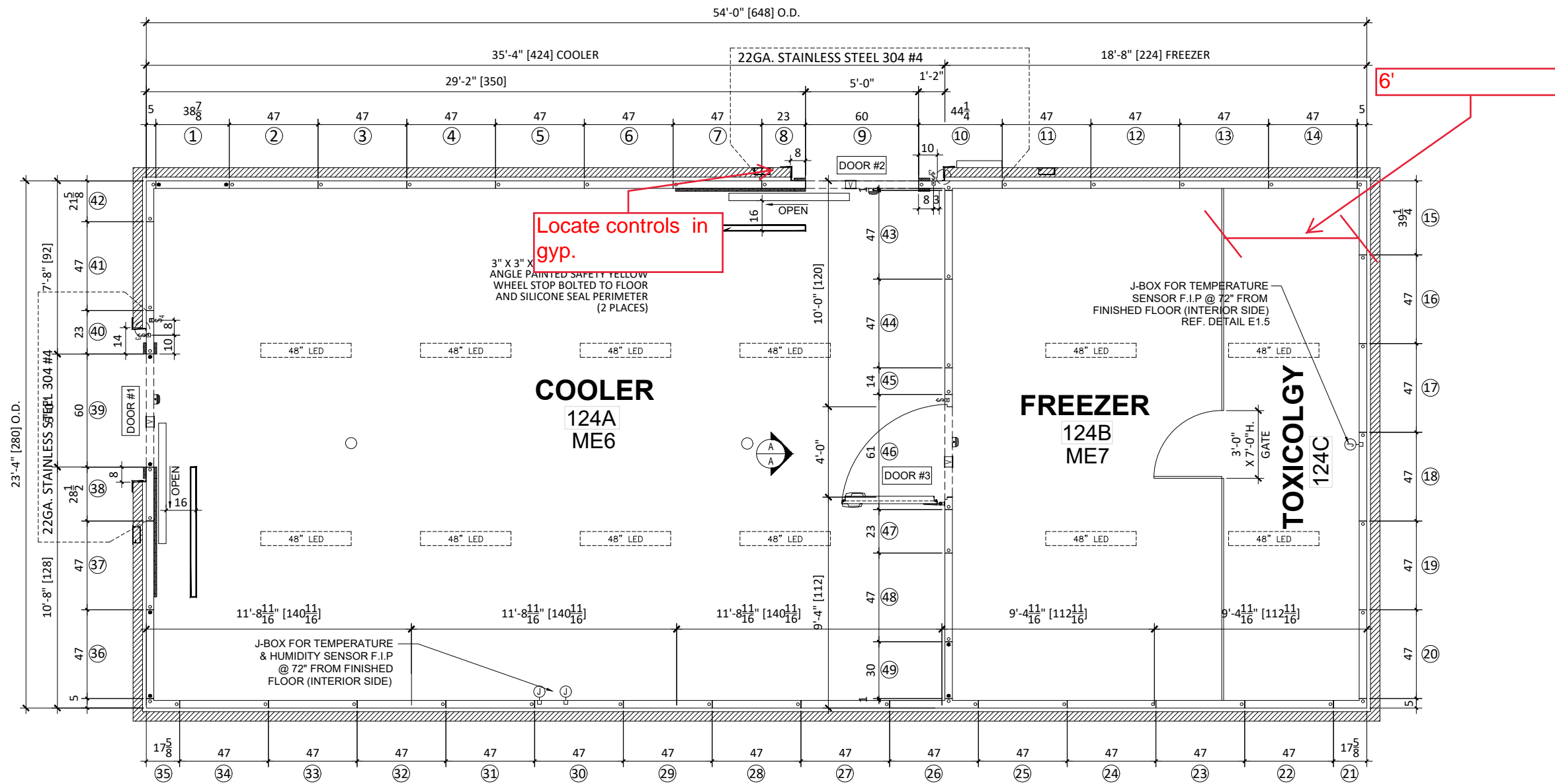
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SIZE: D DWG NO. **WILL COUNTY** REV. **X01**

SCALE: 1/4" = 1'-0"

REVISIONS				
REV.	DCN#	DESCRIPTION	DATE	CHANGED/APPROVED
-	-	-	-	-
X01	-	PRELIMINARY RELEASE	12/27/2022	RA

NOTE: 2" MIN. AIR SPACE REQUIRED BETWEEN WALK-IN BOX AND EXISTING BUILDING WALLS



PLAN VIEW WALL PANEL LAYOUT

FEDERAL LAW MINIMUM R VALUE REQUIREMENTS						
	MIN. R VALUE FOR COMMERCIAL SECTIONS				MEAN TEMP (°F)	FEDERAL LAW MIN. R=
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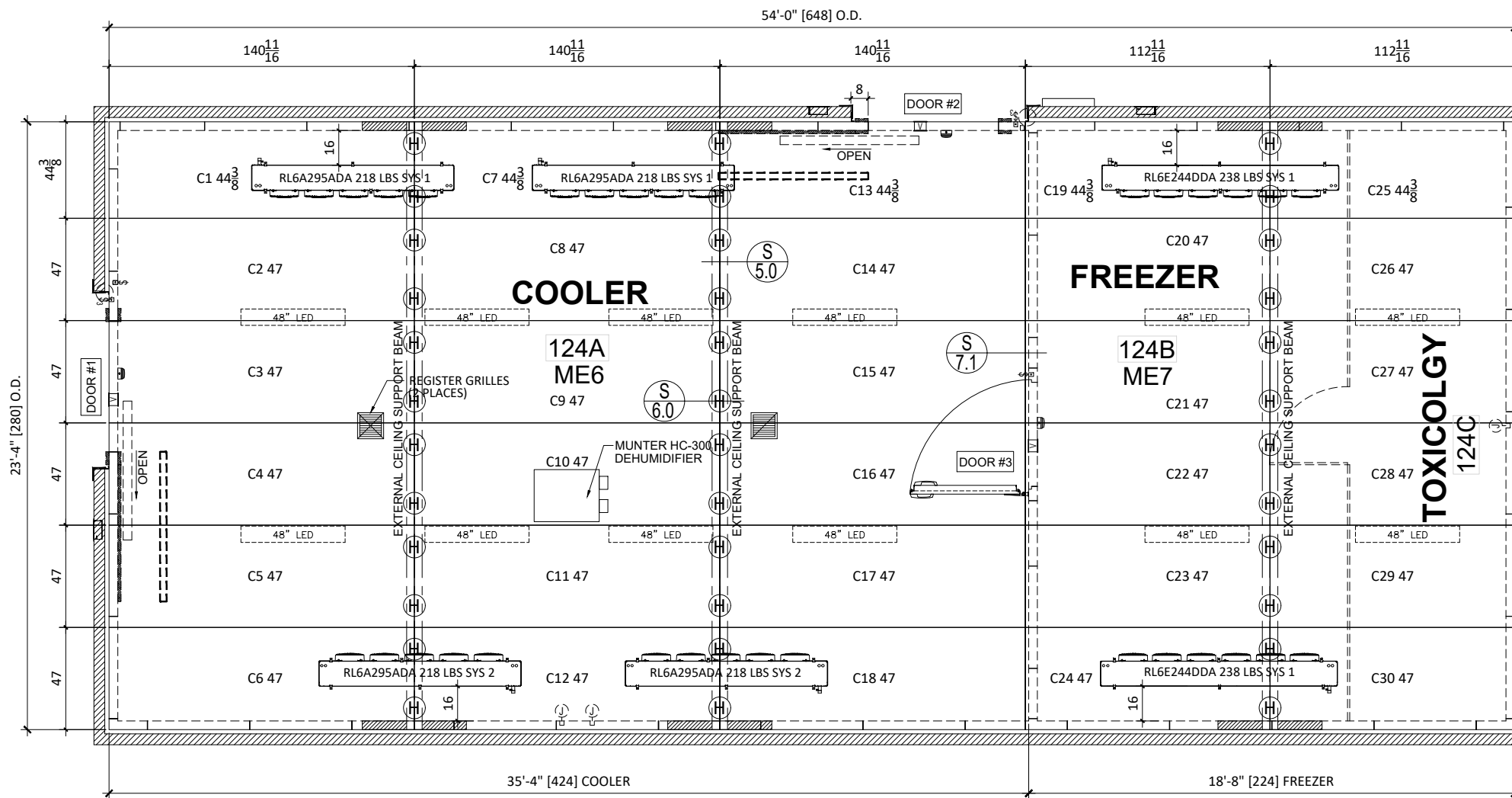
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SCALE: **3/8" = 1'-0"**

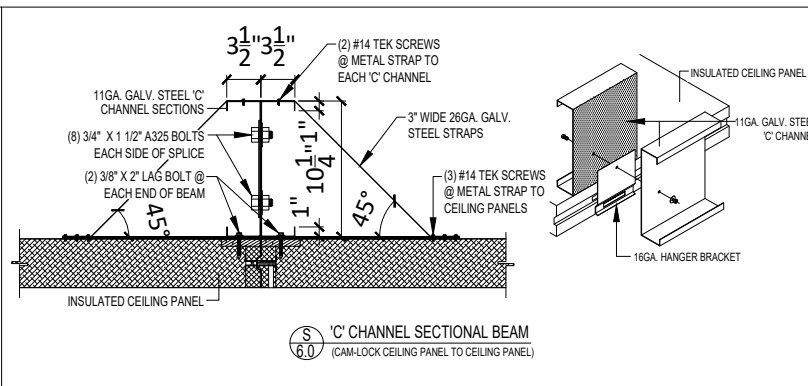
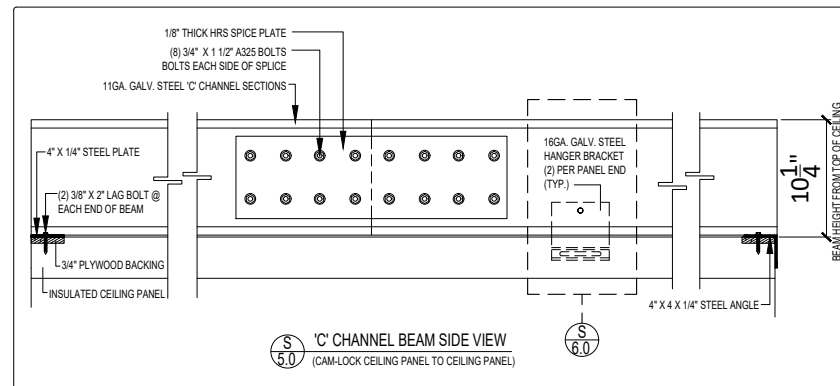
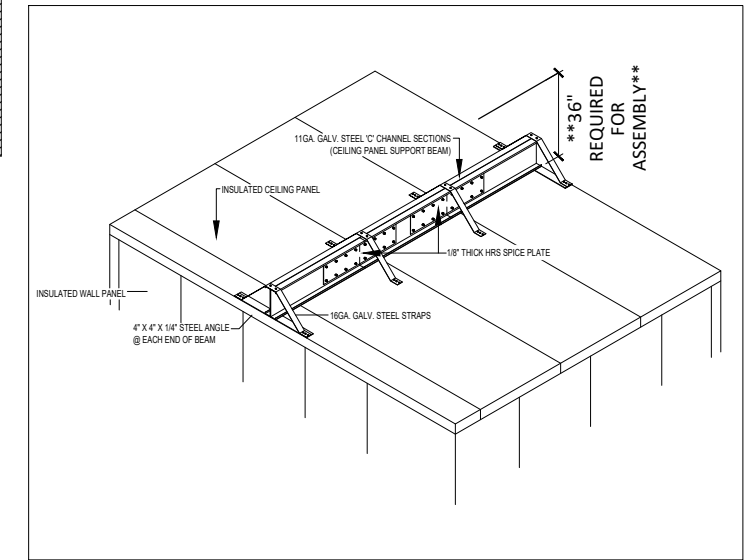
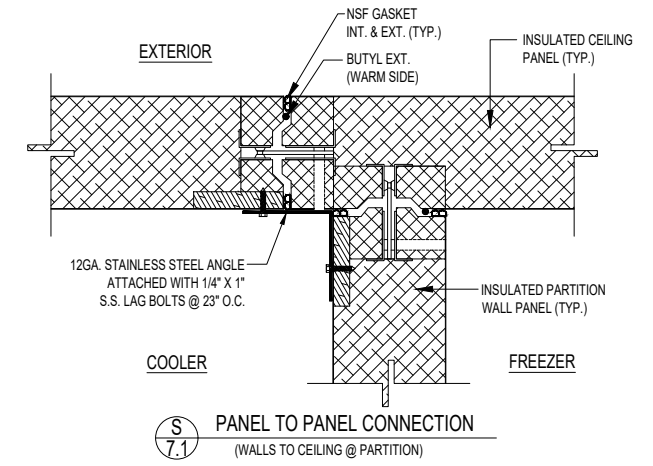
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SHEET **3** OF **8**

NOTE: 2" MIN. AIR SPACE REQUIRED BETWEEN WALK-IN BOX AND EXISTING BUILDING WALLS



PLAN VIEW



REVISIONS				
REV.	DCN#	DESCRIPTION	DATE	CHANGED/APPROVED
-	-	-	-	-
X01	-	PRELIMINARY RELEASE	12/27/2022	RA

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APPROVAL:

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DRAWN BY: RENE DATE: 05/11/2022

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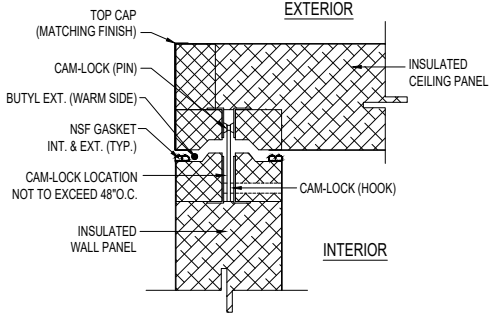
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SCALE: **3/8" = 1'-0"**

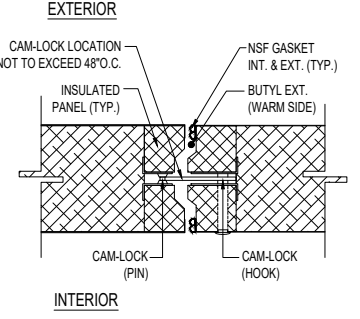
SHEET: **4** OF **8**

REV. **X01**

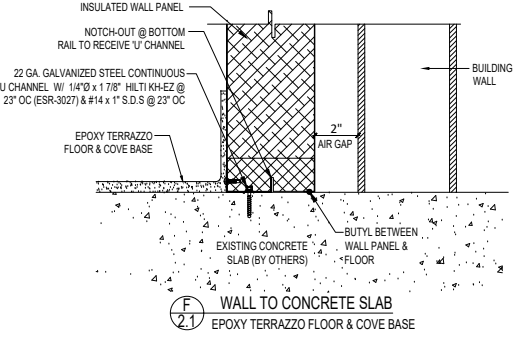
REVISE PER CONTRACT DOCUMENTS



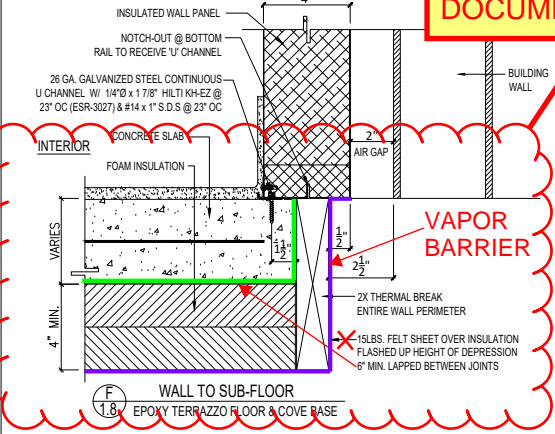
C.1.1 CEILING TO WALL CONNECTION
(CAM-LOCK CEILING TO WALLS)



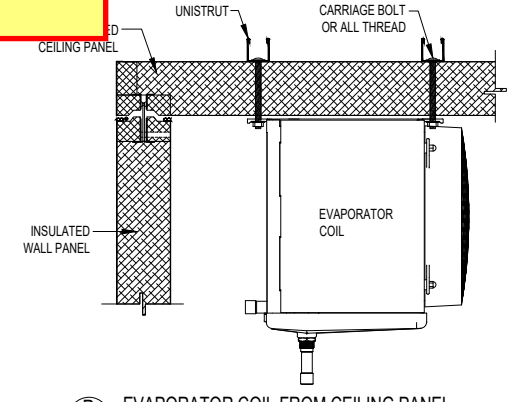
C.1.3 PANEL TO PANEL CONNECTION
(CAM-LOCK PANEL TO PANEL)



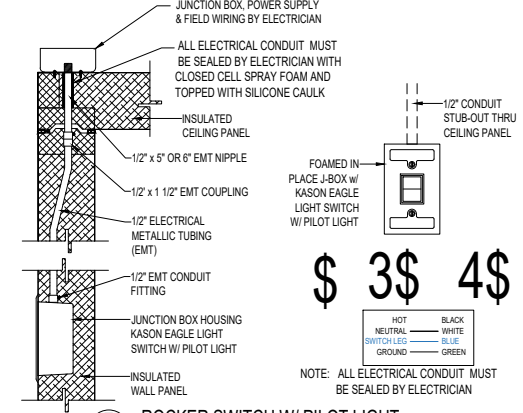
F.2.1 WALL TO CONCRETE SLAB
EPOXY TERRAZZO FLOOR & COVE BASE



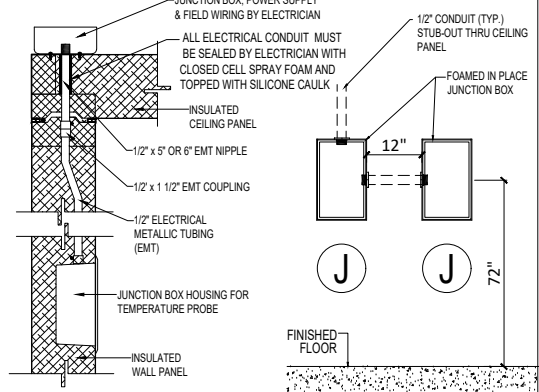
F.1.8 WALL TO SUB-FLOOR
EPOXY TERRAZZO FLOOR & COVE BASE



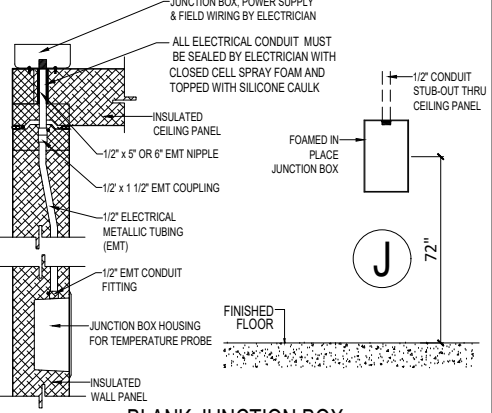
R.1.1 EVAPORATOR COIL FROM CEILING PANEL



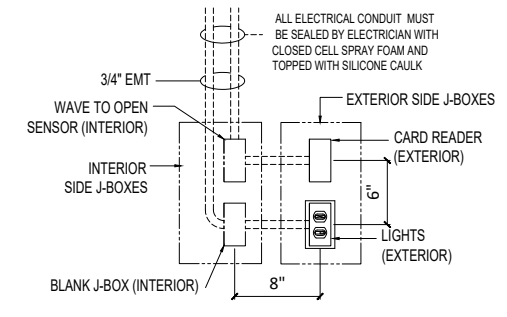
E.1.1 ROCKER SWITCH W/ PILOT LIGHT
(FOAMED IN PLACE)



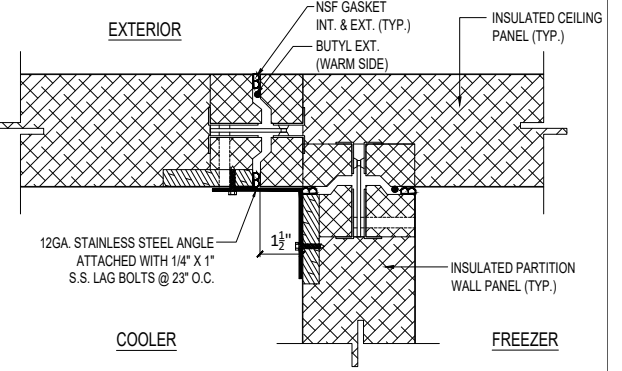
E.1.4 BLANK JUNCTION BOX
(TEMPERATURE & HUMIDIFIER SENSOR)



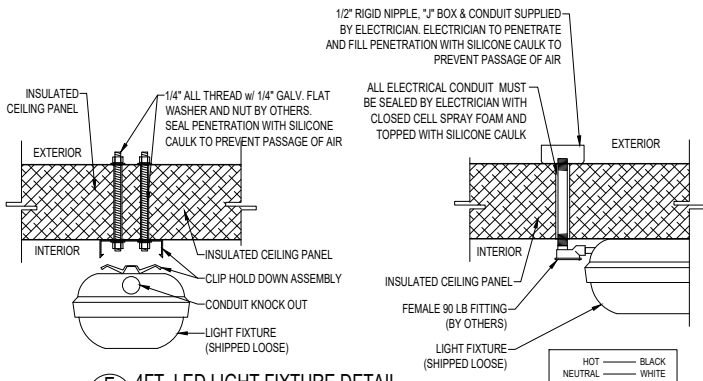
E.1.5 BLANK JUNCTION BOX
(TEMPERATURE PROBE - FREEZER)



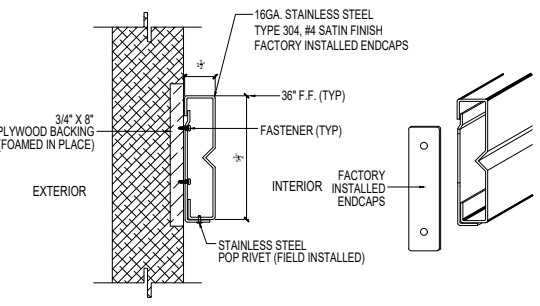
E.1.8 BLANK JUNCTION BOXES & DOOR #1 / #2



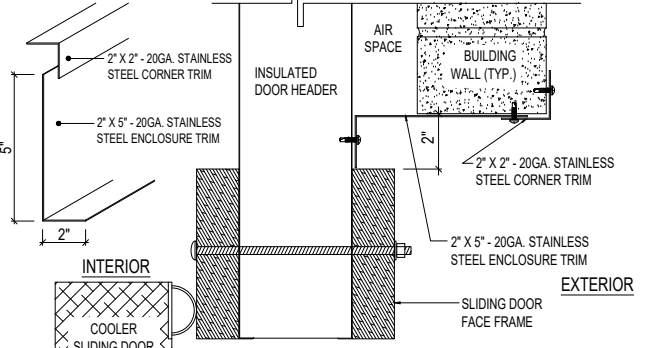
S.7.1 PANEL TO PANEL CONNECTION
(WALLS TO CEILING @ PARTITION)



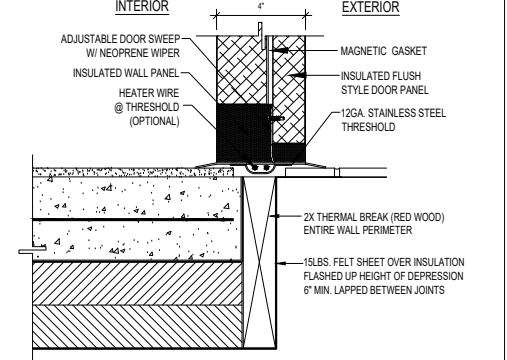
E.1.5 4FT. LED LIGHT FIXTURE DETAIL



A.1.1 WALL PROTECTOR
PROTECTOR SERIES 2182 WITH V GROOVE

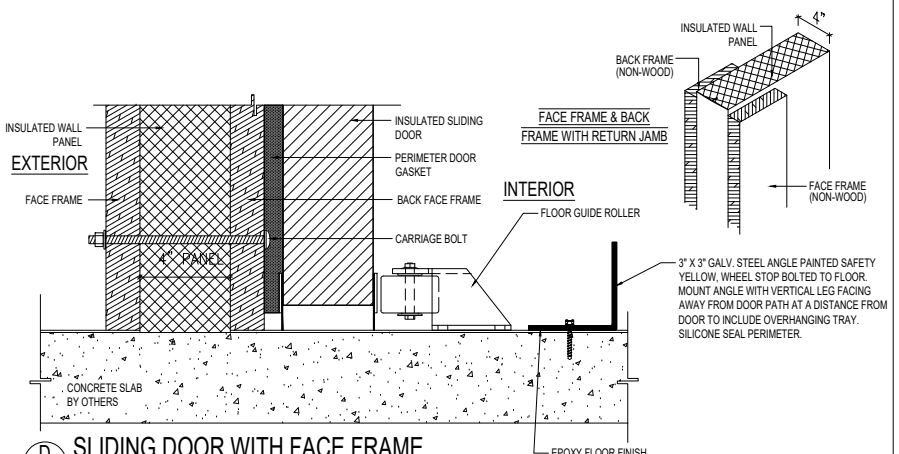


T.1.6 HEADER ENCLOSURE TRIM
PERIMETER OF DOOR OPENING

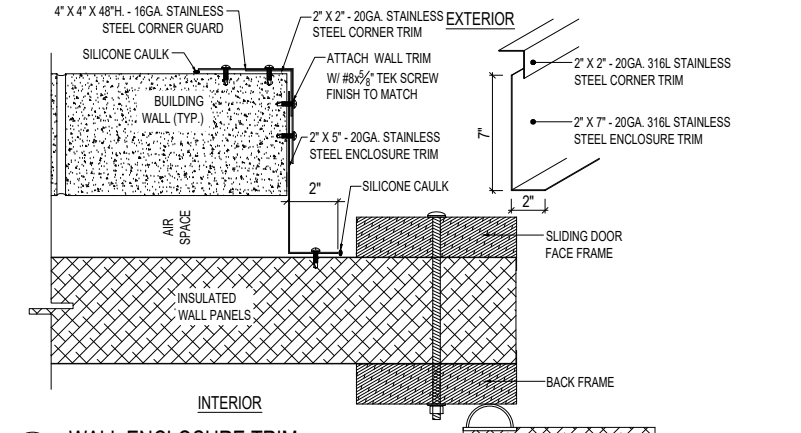


F.2.0 WALL TO SUB-FLOOR
EPOXY TERRAZZO FLOOR @ DOOR N.T.S.

**Missing detail.-
Confirm that
threshold at sliding
doors are
seamless. No
Threshold.**



D.1.8 SLIDING DOOR WITH FACE FRAME
(INTERIOR MOUNT SLIDING DOOR - EPOXY FLOOR FINISH)



T.1.5 WALL ENCLOSURE TRIM
PERIMETER OF DOOR OPENING

REVISIONS				
REV.	DCN#	DESCRIPTION	DATE	CHANGED/APPROVED
-	-	-	-	-
X01	-	PRELIMINARY RELEASE	12/27/2022	RA

PROJECT TITLE:
**WILL COUNTY
NEW CORONER FACILITY**
PROJECT ADDRESS:
**302 N. CHICAGO ST.
JOLIET, IL 60433**

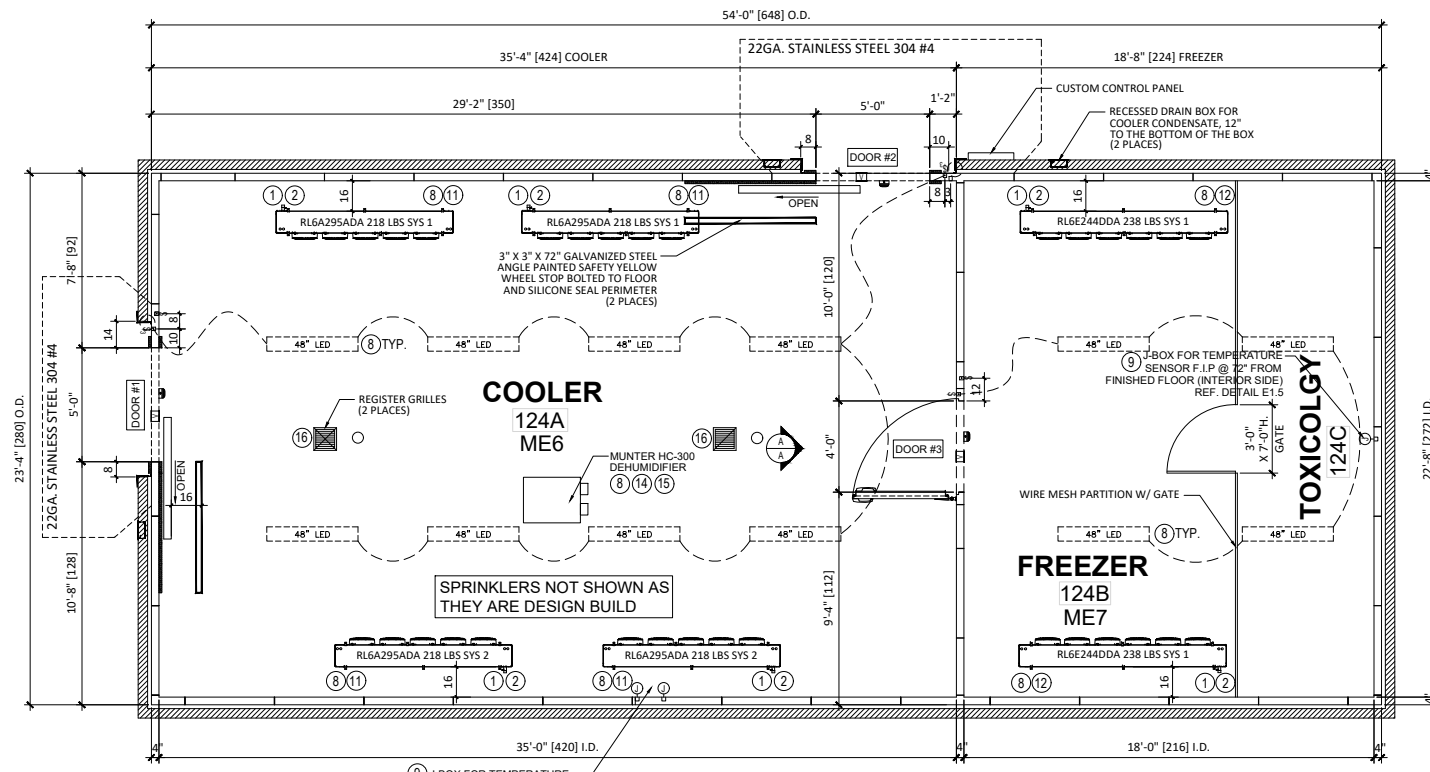
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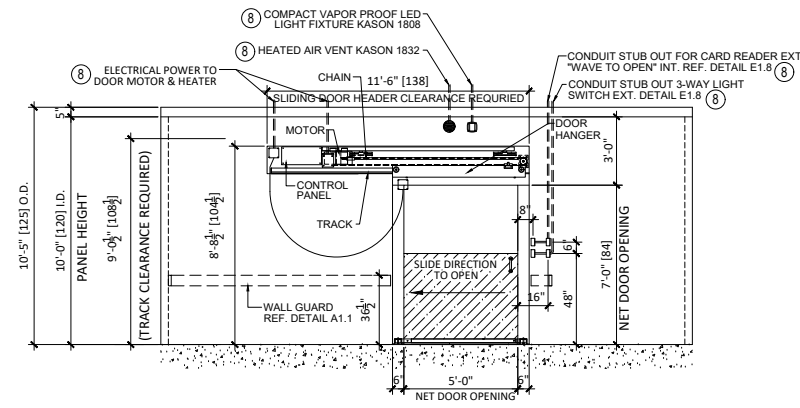
APPROVALS DATE
DRAWN BY: RENE 05/11/2022
CHECKED BY: VICTOR
APPROVED BY: APPROVED BY

DETAILS
WILL COUNTY
SCALE: 3/8" = 1'-0"
SHEET 5 OF 8

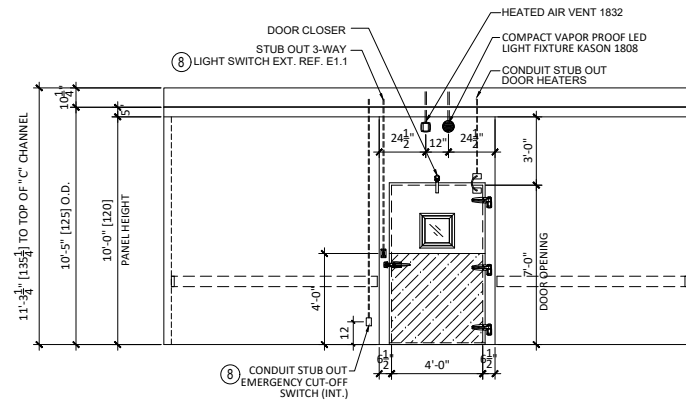
NOTE: 2" MIN. AIR SPACE REQUIRED BETWEEN WALK-IN BOX AND EXISTING BUILDING WALLS



PLAN VIEW



(INTERIOR) DOOR #1



INTERIOR ELEVATION SECTION A-A

LEGEND
REFRIGERATION AND KEY NOTE INFORMATION (X) = KEY NOTE NUMBER

NOTE: LOCATION OF EQUIPMENT TO BE FIELD COORDINATED.

1. MORTECH INSTALLER TO FURNISH AND INSTALL REFRIGERATION PIPE SET FROM CONDENSING UNITS TO EVAPORATOR COILS.
2. MORTECH INSTALLER TO COORDINATE WITH GENERAL CONTRACTOR ON APPROVED REFRIGERATION PIPE ROUTE FROM CONDENSING UNITS TO EVAPORATOR COILS ON COLD ROOMS BEFORE PIPING INSTALLATION CAN BE PERFORMED.
3. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL SOURCE OF POWER (BUILDING PANEL CIRCUIT) WITH FUSED DISCONNECT AT COOLER CONDENSING UNIT SYSTEM 1.
4. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL SOURCE OF POWER (BUILDING PANEL CIRCUIT) WITH FUSED DISCONNECT AT COOLER CONDENSING UNIT SYSTEM 2.
5. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL SOURCE OF POWER (BUILDING PANEL CIRCUIT) WITH FUSED DISCONNECT AT FREEZER CONDENSING UNIT SYSTEM 1.
6. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL SOURCE OF POWER (BUILDING PANEL CIRCUIT) WITH FUSED DISCONNECT AT FREEZER CONDENSING UNIT SYSTEM 2.
7. ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL SOURCE OF POWER (1) 120-230V/WYE/3PH/120A CIRCUIT TO COMBO COOLER-FREEZER CONTROL PANEL. (REFER TO CONTROL PANEL SUBMITTAL FOR ADDITIONAL ELECTRIC REQUIREMENTS). (FOUR WIRES PLUS GROUND ARE REQUIRED THREE HOT, ONE NEUTRAL, AND ONE GROUND)
8. MORTECH INSTALLER TO FURNISH AND INSTALL SOURCE OF POWER FROM COMBO COOLER-FREEZER CONTROL PANEL TO EVAPORATOR FANS, ILLS, LIGHTS, DEFROST TIME CLOCK (FREEZER), DOOR, VENT, AND DRAIN HEATERS, DEHUMIDIFIER SYSTEM (COOLER), AND OTHER RELATED ACCESSORIES LISTED IN CONTROL PANEL DRAWINGS SUBMITTED.
9. MORTECH INSTALLER TO INSTALL LOW VOLTAGE WIRING TO TEMPERATURE SENSORS AT THIS LOCATION.
10. PLUMBING CONTRACTOR TO FURNISH AND INSTALL CONDENSATE DRAINS FOR BOTH COOLER AND FREEZER. REFER TO PLAN DRAWING P.200 FOR CONDENSATE DRAIN BOX LOCATIONS
11. MORTECH INSTALLER TO FURNISH AND INSTALL LARGE COOLER/ DECOMP COOLER CONDENSATE DRAIN PIPE WITH CLEAN OUT TO FLOOR DRAIN OF BUILDING.
12. MORTECH INSTALLER TO FURNISH AND INSTALL DECOMP FREEZER CONDENSATE DRAIN PIPE, 3/4 INCH INSULATION, WITH CLEAN, AND HEAT TRACE DRAIN LINE WIRE TO FLOOR DRAIN OF BUILDING.
13. MORTECH INSTALLER TO COORDINATE WITH GENERAL CONTRACTOR ON APPROVED CONDENSATE PIPE ROUTE FROM EVAPORATOR COILS TO BUILDING DRAIN ON DECOMP COOLER AND FREEZER COLD ROOMS BEFORE PIPING INSTALLATION CAN BE PERFORMED.
14. MORTECH INSTALLER TO INSTALL DEHUMIDIFIER SYSTEM AND PERFORM START-UP ON COOLER 558 (RFI/CLARIFICATION NOT INDICATED ON MECHANICAL HVAC DUCT FIRST FLOOR PLANS)
15. MORTECH INSTALLER TO COORDINATE WITH MECHANICAL CONTRACTOR ON DEHUMIDIFIER SYSTEM MECHANICAL CONNECTIONS. MECHANICAL HOOK-UPS AND FINAL CONNECTIONS BY OTHERS. REFER TO MORTECH DEHUMIDIFIER SUBMITTAL AND (RFI/CLARIFICATION NOT INDICATED ON MECHANICAL HVAC DUCT FIRST FLOOR PLANS)
16. MORTECH INSTALLER TO FIELD INSTALL SUPPLY AND RETURN GRILLES IN COLD ROOM CEILING. FINAL DUCTING CONNECTIONS BY MECHANICAL CONTRACTOR. REFER TO MORTECH DEHUMIDIFIER SUBMITTALS (RFI/CLARIFICATION NOT INDICATED ON MECHANICAL HVAC DUCT FIRST FLOOR PLANS)
17. HOUSEKEEPING PADS, RACKS, AND PLATFORM ROOF CURBS FOR CONDENSING UNITS SUPPLIED AND INSTALLED BY OTHERS
18. COOLER AND FREEZER CONDENSING UNITS REFER TO ARCHITECTURAL PLAN M1.02 FOR LOCATIONS.
19. ALL CONDENSING UNITS REQUIRE A MINIMUM OF 3 FEET OF PERIMETER SPACE FROM ANY OBSTRUCTION.

LCI Note: All Notes that say "Mortech Installer" are by Bid Package #5 Cold Room Installer

FEDERAL LAW MINIMUM R VALUE REQUIREMENTS						
	MIN. R VALUE FOR COMMERCIAL SECTIONS				MEAN TEMP (°F)	FEDERAL LAW MIN. R=
	3.5"	4"	5"	5.5"		
COOLER	26.6	30.4	38	41.8	55	R=25
FREEZER	26.6	34.0	42.5	46.7	20	R=32
FLOOR	29.7	34.0	42.5	46.7	20	R=28

SEC. 340 OF THE ENERGY POLICY AND CONSERVATION ACT (42 U.S.C. 6311)
ASTM METHOD C-518

PROJECT TITLE:
**WILL COUNTY
NEW CORONER FACILITY**

PROJECT ADDRESS:
**302 N. CHICAGO ST.
JOLIET, IL 60433**

APPROVAL:

SIGNATURE: _____ DATE: _____

TOLERANCE BLOCK:
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SEE FINISHES

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APPROVALS

DRAWN BY: RENE DATE: 05/11/2022

CHECKED BY: VICTOR

APPROVED BY: _____

REVISIONS

REV.	DCN#	DESCRIPTION	DATE	CHANGED/APPROVED
-	-	-	-	-
X01	-	PRELIMINARY RELEASE	12/27/2022	RA

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Azusa, CA 91702
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KEYNOTES

WILL COUNTY

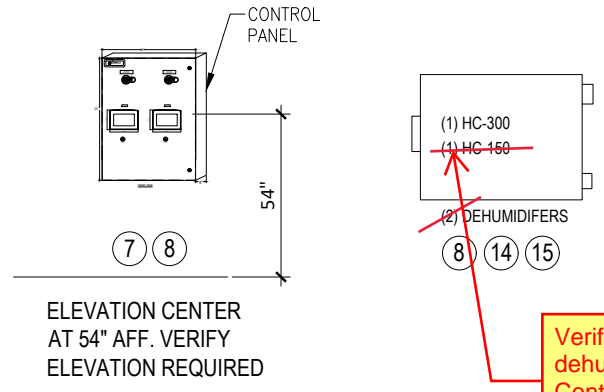
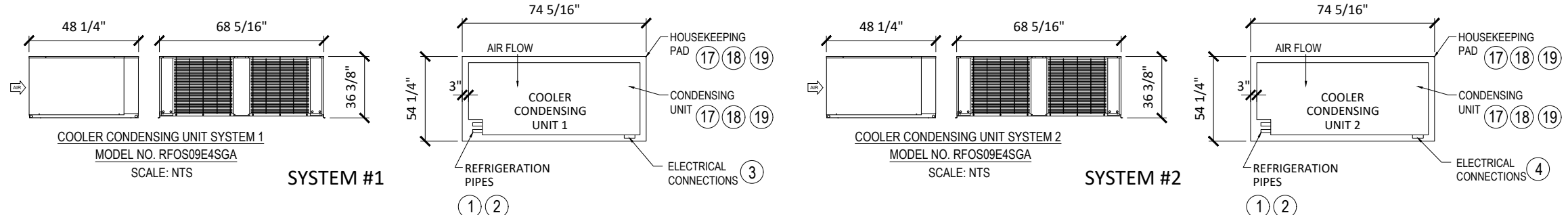
SCALE: 1/4" = 1'-0"

SHEET 6 OF 8

dbHMS: E.C. to provide (2) 35A-3P circuit breakers in panel H-SB-1 to feed ME6 equipment. Refer to sheet E.110 & E.510.

COOLER 558		DISCUSS, SCROLL AND SEMI-HERMETIC, AND HERMETIC CONDENSING UNITS																											
DESCRIPTION	QTY.	MFG.	MODEL NO.	SUCTION TEMP.	AMBIENT TEMP.	CAPACITY	CONNECTIONS (ID)		RECEIVER LBS.	DIMENSIONS (IN.)			NET WT. LBS.	SOUND DATA dba	VOLTAGE			FANS			COMPRESSOR			CIRCUIT TOTAL				REFRIGERANT TYPE	HG CAPACITY CONTROL
							LIQUID	SUCTION		L	W	H			VOLTS	PH	HZ	QTY.	HP	FLA/FAN	RLA	LRA	TOTAL AMPS	WATTS	MCA	MOPD			
CONDENSING	1	RUSSELL	RFOS09E4SGA	23°F	100°F	71,658	7/8	1-5/8	42.3	48.25	68.3125	36.375	980	-	460	3	60	2	09	3.7	15.4	114	-	-	24	35	R448A	NONE	
CONDENSING	1	RUSSELL	RFOS09E4SGA	23°F	100°F	71,658	7/8	1-5/8	42.3	48.25	68.3125	36.375	980	-	460	3	60	2	09	3.7	15.4	114	-	-	24	35	R448A	NONE	

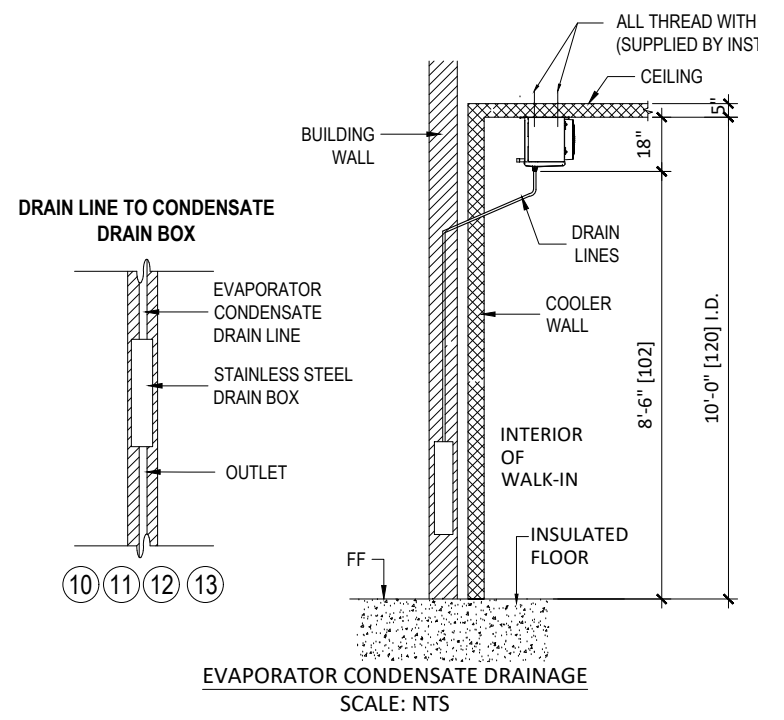
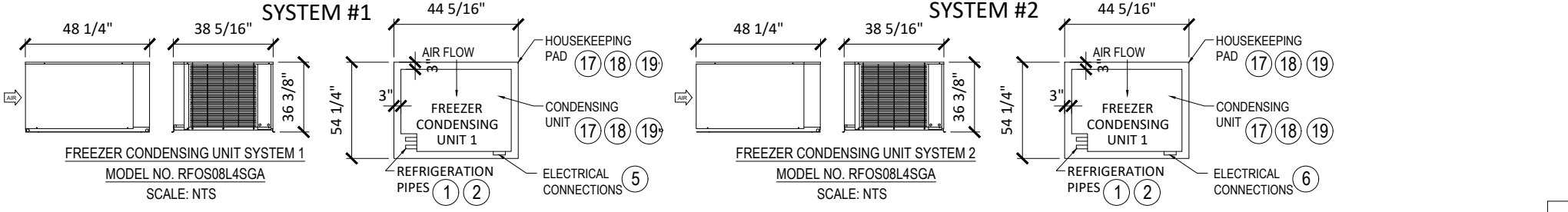
LOW PROFILE EVAPORATOR		DISCUSS, SCROLL AND SEMI-HERMETIC, AND HERMETIC CONDENSING UNITS																									
DESCRIPTION	QTY.	MFG.	MODEL NO.	AIR FLOW	EVAP. TEMP.	BOX TEMP.	CAPACITY	FAN(S)		VOLTAGE			DEFROST HEATERS			CIRCUIT TOTAL				CONNECTIONS (INCHES)			REFRIGERANT TYPE	NET WT. LBS.	DIMENSIONS (IN.)		
								QTY.	FLA	VOLTS	PH	HZ	TYPE	QTY.	AMPS	TOTAL AMPS	WATTS	MCA	MOP	INLET OD	SUCTION ID	DRAIN			L	W	H
EVAPORATOR	2	RUSSELL	RL6A295ADA	3,875	25°F	35°F	37,093	5	-	115	1	60	ELEC	1	NA	4	-	15	20	3/8	1 1/8	3/4	R448A	218	93.125	15.5	18.125
EVAPORATOR	2	RUSSELL	RL6A295ADA	3,875	25°F	35°F	37,093	5	-	115	1	60	ELEC	1	NA	4	-	15	20	3/8	1 1/8	3/4	R448A	218	93.125	15.5	18.125



Verify requirement on the dehumidifier quantity. Contract documents indicate one dehumidifier

FREEZER 559		DISCUSS, SCROLL AND SEMI-HERMETIC, AND HERMETIC CONDENSING UNITS																											
DESCRIPTION	QTY.	MFG.	MODEL NO.	SUCTION TEMP.	AMBIENT TEMP.	CAPACITY	CONNECTIONS (ID)		RECEIVER LBS.	DIMENSIONS (IN.)			NET WT. LBS.	SOUND DATA dba	VOLTAGE			FANS			COMPRESSOR			CIRCUIT TOTAL				REFRIGERANT TYPE	HG CAPACITY CONTROL
							LIQUID	SUCTION		L	W	H			VOLTS	PH	HZ	QTY.	HP	FLA/FAN	RLA	LRA	TOTAL AMPS	WATTS	MCA	MOPD			
CONDENSING	1	RUSSELL	RFOS08L4SEA	-12°F	95°F	25,698	1/2	1-5/8	19.9	48.25	38.3125	36.375	850	-	460	3	60	1	1/3	1.9	10.6	99	NA	-	16.2	25	R448A	NONE	
CONDENSING	1	RUSSELL	RFOS08L4SEA	-12°F	95°F	25,698	1/2	1-5/8	19.9	48.25	38.3125	36.375	850	-	460	3	60	1	1/3	1.9	10.6	99	NA	-	16.2	25	R448A	NONE	

LOW PROFILE EVAPORATOR		DISCUSS, SCROLL AND SEMI-HERMETIC, AND HERMETIC CONDENSING UNITS																									
DESCRIPTION	QTY.	MFG.	MODEL NO.	AIR FLOW	EVAP. TEMP.	BOX TEMP.	CAPACITY	FAN(S)		VOLTAGE			DEFROST HEATERS			CIRCUIT TOTAL				CONNECTIONS (INCHES)			REFRIGERANT TYPE	NET WT. LBS.	DIMENSIONS (IN.)		
								QTY.	FLA	VOLTS	PH	HZ	TYPE	QTY.	AMPS	TOTAL AMPS	WATTS	MCA	MOP	INLET OD	SUCTION ID	DRAIN			L	W	H
EVAPORATOR	1	RUSSELL	RL6E244DDA	4710	-10°F	0°F	27,284	6	-	208-230	1	60	ELEC	1	29	3	-	15	20	3/8	1 1/8	3/4	R448A	238	109.625	15.5	18.125
EVAPORATOR	1	RUSSELL	RL6E244DDA	4710	-10°F	0°F	27,284	6	-	208-230	1	60	ELEC	1	29	3	-	15	20	3/8	1 1/8	3/4	R448A	238	109.625	15.5	18.125



REVISIONS				
REV.	DCN#	DESCRIPTION	DATE	CHANGED/APPROVED
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X01	-	PRELIMINARY RELEASE	12/27/2022	RA

FEDERAL LAW MINIMUM R VALUE REQUIREMENTS						
	MIN. R VALUE FOR COMMERCIAL SECTIONS				MEAN TEMP (°F)	FEDERAL LAW MIN. R=
	3.5"	4"	5"	5.5"		
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FREEZER	26.6	34.0	42.5	46.7	20	R=32
FLOOR	29.7	34.0	42.5	46.7	20	R=28

SEC. 340 OF THE ENERGY POLICY AND CONSERVATION ACT (42 U.S.C. 6311)
ASTM METHOD C-518

PROJECT TITLE:
**WILL COUNTY
NEW CORONER FACILITY**

PROJECT ADDRESS:
**302 N. CHICAGO ST.
JOLIET, IL 60433**

APPROVAL:

TOLERANCE BLOCK:
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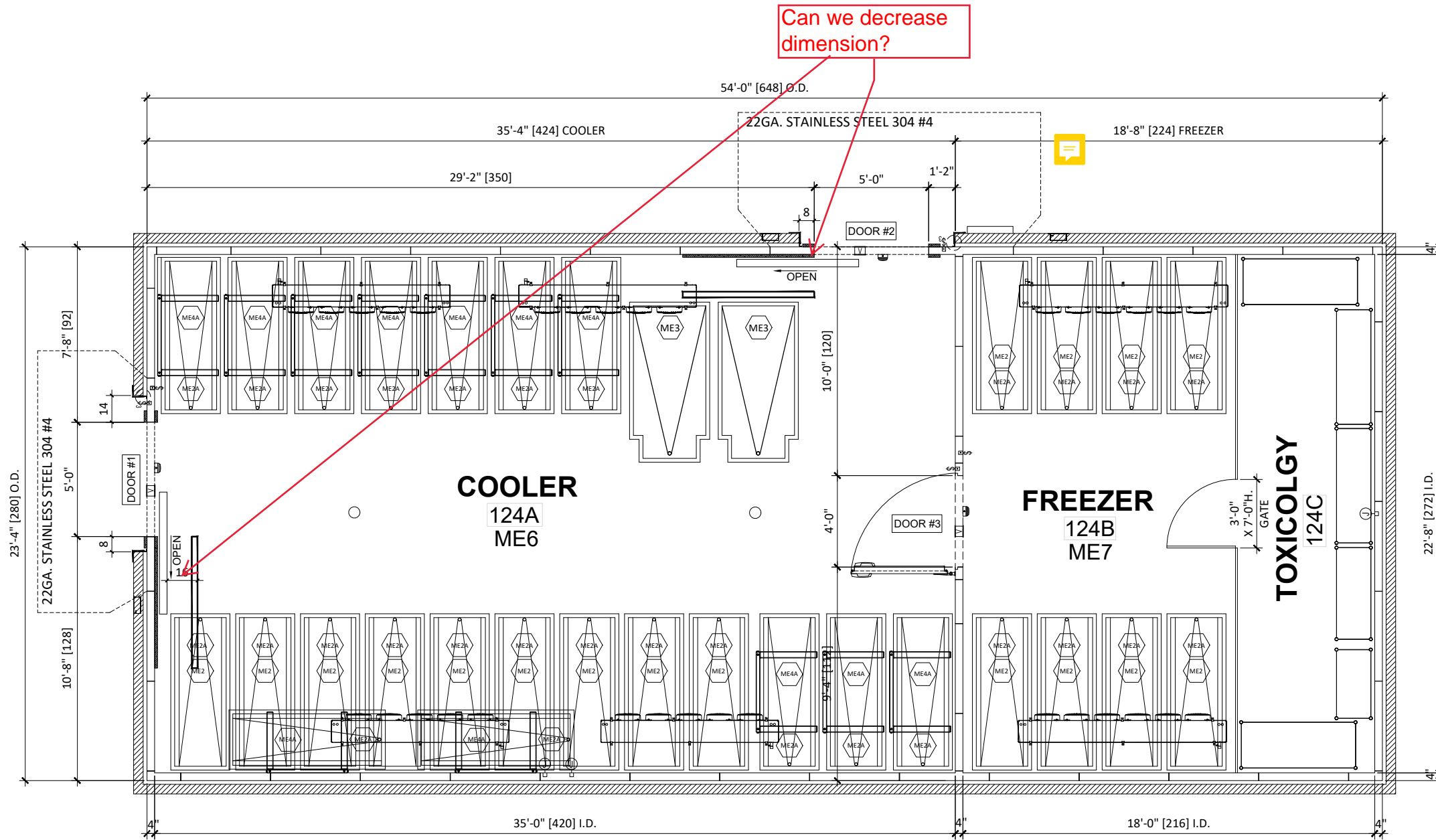
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FAX: (626) 334-1704
www.mortechmfg.com

TITLE: **REFRIGERATION**

APPROVALS: DRAWN BY: RENE DATE: 05/11/2022
CHECKED BY: VICTOR
APPROVED BY: _____

SIZE: **D** DWG NO.: **WILL COUNTY** REV: **X01**

SCALE: **N.T.S.** SHEET: **7** OF **8**



PLAN VIEW

FEDERAL LAW MINIMUM R VALUE REQUIREMENTS						
	MIN. R VALUE FOR COMMERCIAL SECTIONS				MEAN TEMP (°F)	FEDERAL LAW MIN. R=
	3.5"	4"	5"	5.5"		
COOLER	26.6	30.4	38	41.8	55	R=25
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APPROVALS

DRAWN BY: RENE DATE: 05/11/2022

CHECKED BY: VICTOR

APPROVED BY: _____

REVISIONS

REV.	DCN#	DESCRIPTION	DATE	CHANGED/APPROVED
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X01	-	PRELIMINARY RELEASE	12/27/2022	RA

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Azusa, CA 91702
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FAX: (626) 334-1704
www.mortechmfg.com

TITLE: **EQUIPMENT LAYOUT**

SCALE: **3/8" = 1'-0"**

SHEET: **8** OF **8**



REF. A

1908 WEATHERPROOF ROCKER SWITCH AND COVER PLATE

- Specification grade, weatherproof cover plate with 120 VAC pilot light.
- Easy to install.
- Pilot light built in for easy illumination- Eliminates the need for additional components.
- Built in indicator can be wired as "night light" or "lights on" to meet all of your needs.
- Spade wire terminal for easy and fast installation.
- Ideal solution for "wet locations", indoor and out.
- Cover plate included with switch.

1908-603 SINGLE AND THREE-WAY SWITCH WITH INDICATOR LIGHT

- Indicator: Neon
- Circuit: SPDT + Indicator
- Connection: 1/4" Spade Male Terminal

1908-604 FOUR-WAY SWITCH WITH INDICATOR LIGHT

- Indicator: Neon
- Circuit: DPDT + Indicator
- Connection: 1/4" Spade Male Terminal



REF. B



UTILITY BOX

- 3/4" (19 mm) knockouts.
- 1-7/8" (47 mm) deep.



REF. C



BWF SINGLE GANG BOX

- Weatherproof aluminum.
- 1/2" (13 mm) or 3/4" (19 mm) threaded outlets.



REF. D



BWF COVER PLATE

- Weatherproof aluminum.
- For single gang box, above.



REF. E



ROUND SPLICE BOX

- Weatherproof aluminum.
- 1/2" (13 mm) threaded outlets.



REF. F



7109 PEDESTAL BOXES

- Weatherproof aluminum.
- 1/2" (13 mm) threaded outlets.



REF. G

7110 RECESSED HOUSINGS

- #300 series stainless steel.
- Internal covered corners.
- Accepts standard J-box for tack welding.
- 4, No.10-24 mounting screws included.

Ref.	Model No.	Item
	1908000602	Waterproof Rocker Cover
A	1908000603	Waterproof Rocker Switch, Single or 3-way
	1908000604	Waterproof Rocker Switch, 4-way
B	3ELE0000050	Utility Box
C	3ELE0000500	Gang Box, 1/2" (13 mm) outlets
	3ELE0000750	Gang Box, 3/4" (19 mm) outlets
D	3ELE0001000	Cover Plate for Gang Boxes (B)
E	3ELE0000RB1	Round Splice Box
F	7109000002	Pedestal Box, Single Face
	7109000004	Pedestal Box, Double Face
G	7110000002	Recessed Housing with Cutout
	7110000004	Recessed Housing

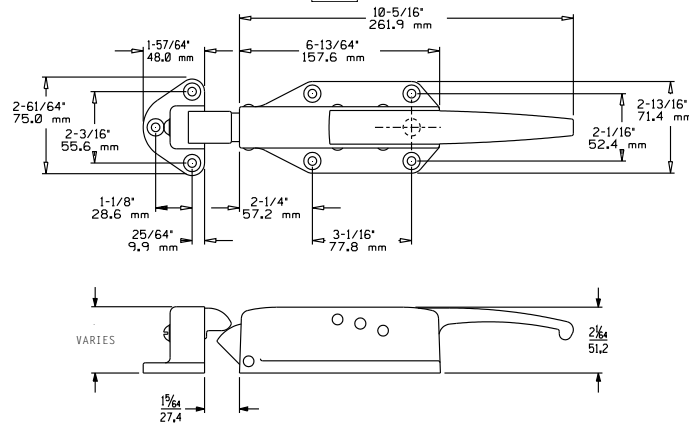
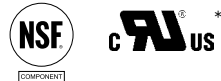


58 LATCH



U.S. Trademark 2,227,009

ITEM # 58



58 RADIAL LATCH

- For smooth, easy closure
- Works with foam doors
- Reliable, self-closing action provides positive tight closure with little effort
- Releases with minimum pressure or pull from outside or from inside with Kason inside release handle
- Works effectively with Kason door closers
- Economical, adjustable solid head strike
- Padlocking provision standard on all models



ITEM # 59 ROLLER STRIKE

59 ROLLER STRIKE

SPECIFICATIONS

MATERIAL:

High pressure die-cast zinc. Stainless black plate

FINISH:

Polished chrome models listed. Also available in brushed chrome, silver powder coat, or powder coated for severe environmental applications

MOUNTING HOLES:

Drilled and countersunk for 1/4" (6.0mm) screws

PACKAGING/WEIGHT:

6 body assemblies/approx. 16 lb. (7.3kg) per carton.
6 strike assemblies/approx. 7 lb. (3.2kg) per carton

INSIDE RELEASE:

Accepts "C" series inside release. Order separately. See pages B27 - 30 for selection.

LOCKING MECHANISM:

Accepts 5/16" (8mm) dia. shank Master #1LJ padlock (not included)

Strike Sold Separately.

Model No.	Item	Description
10058CH5020	Cylinder Locking Body	Heavy Spring
10058CL5020	Cylinder Locking Body	Light Spring
10058H05021	Body	Heavy Spring
10058L05021	Body	Light Spring
10058005001	Strike	-1/8" to 1/4" (-3.2 to 6.4 mm)
10058005002	Strike	3/4" to 1-5/8" (19.0 to 41.3 mm)
10058005003	Strike	1-3/4" to 2-1/2" (44.5 to 63.5 mm)
10059005001	Roller Strike	-1/8" to 1/4" (-3.2 to 6.4 mm)
10059005002	Roller Strike	3/4" to 1-5/8" (19.0 to 41.3 mm)
10059005003	Roller Strike	1-3/4" to 2-1/2" (44.5 to 63.5 mm)
90531CM000401	Replacement Cylinder Kit #1	
90531CM000402	Replacement Cylinder Kit #2	
90531CM000403	Replacement Cylinder Kit #3	
90531CM000404	Replacement Cylinder Kit #4	

**Light Spring Models with roller strike



1808 LED FIXTURE

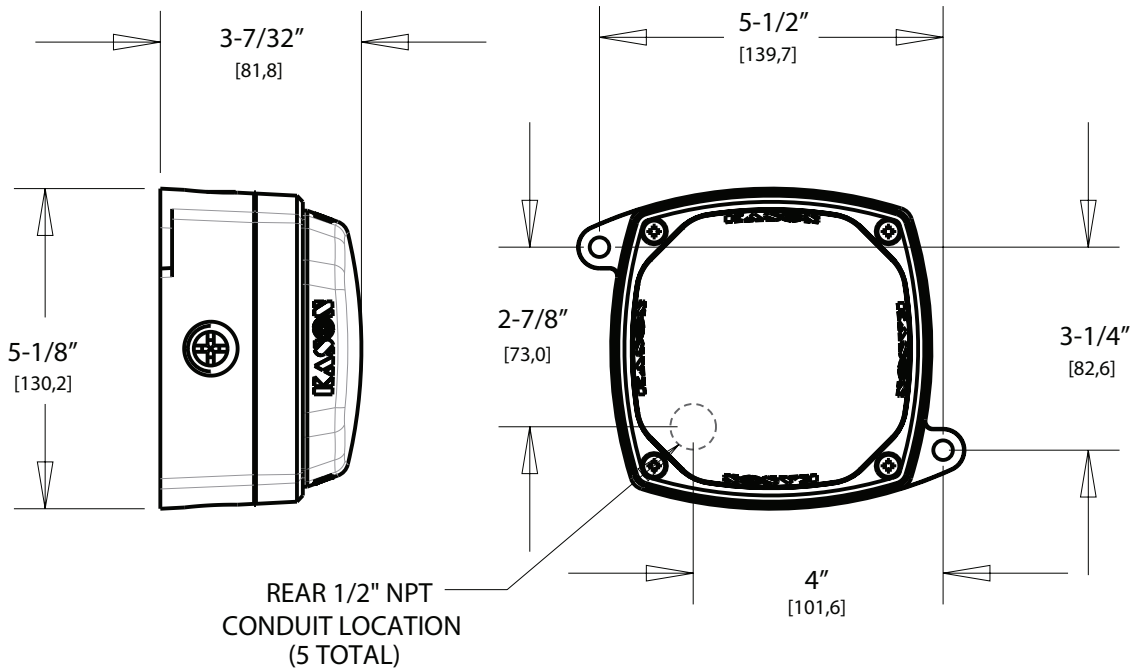
- Low profile high impact Lexan globe with anti-glare technology.
- Preferred fixture for replacing inefficient lighting.
- Designed to reduce electrical usage by 8.5%.
- Minimal heat generation will lower utility cost.
- Exceeds Federal Energy Act Requirements.
- Rated for 50,000+ hours of Life.
- 4000K color temperature.
- Designed for damp/ wet /cooler/ freezer environments.
- 5 year limited warranty on the light engine.
- LM-79 Tested.
- Prison Package:
 - Tamper resistant fastener kit option available.

SPECIFICATIONS

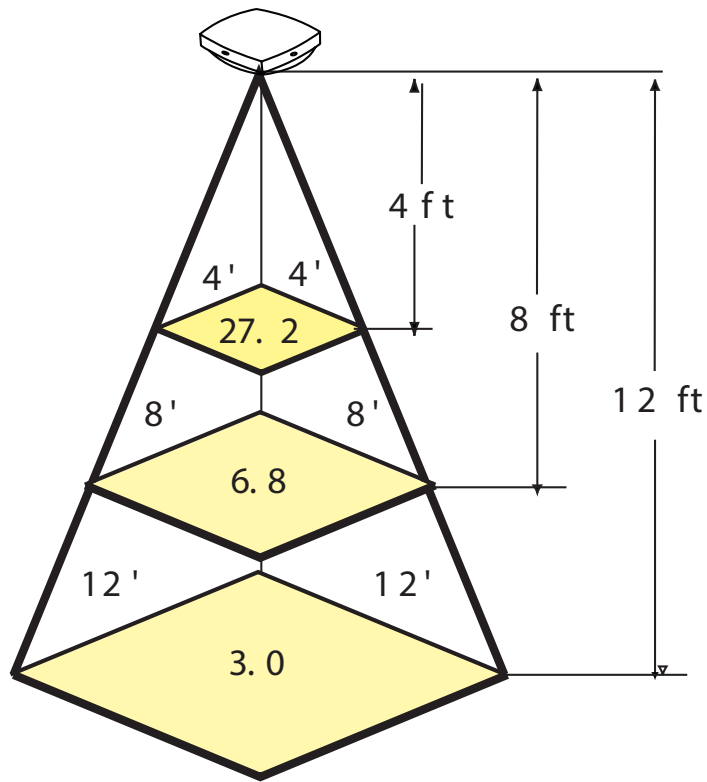
MATERIAL: Lexanlens Aluminum housing	MOUNTING: Surface mount
ELECTRICAL: 1160 Total Lumens 90-305 VAC, 50/60 Hz. 86 Lumens/Watt .12 Amps Watts: 14.0 W Powerfactor 0.9 CRI85	SAFETY STANDARDS: RoHS ULlisted US and Canada, File No. E333932 NSF Listed IP-65 Energy Star Certified Patent Applied

Temperature Ratings:
Operating Temperature:
-40°F [-40°C] to 104°F [40°C]

Model No.	Description	Weight
1180800000	14 Watt,VP, 90-305 V, LED Fixture	1.7 lbs./ unit
11808CE0000	14 Watt,VP, 90-305 V, LED Fixture	1.7 lbs./ unit

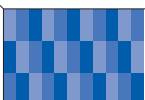


1808 LED LIGHT DISTRIBUTION



LIGHT DISTRIBUTION FOR 1808 LED

Height in Feet	Average FC for Single Fixture Over Indicated Area	
	8' x 8'	12' x 12'
5	9.3	5.1
8	6.8	4.0
9	-	3.7
12	-	3.0





ITEM # 1830



1830/1832 SERIES VENTILATOR PORTS

- Improved to increase air flow for easier opening and closing.
- Protects from structural damage because of temperature/pressure build up.
- Compensates for air expansion and contraction.
- Heated models available for freezer applications.

SPECIFICATIONS

Material:
Body - All metal parts are aluminum
Internal Sleeve - self-extinguishing Lexan

Length:
 Standard for 4" (101.6mm) wall thickness; other lengths available. Specify exact wall thickness; we will convert to our part number

UL LISTING:
 File No. E57306

Mounting:
 1830: May be mounted through wall or ceiling
 1832: Wall mount only. Drilled for No. 8 (4.0mm) screws

Diameter:
 See table

Electrical Requirements:
 See ordering information

1830 HEATED VENT

5-3/32" (129.4mm) diameter round aluminum cover plate.

1834 NON-HEATED VENT

Same as 1830, except without heating element.

Packaging: 10 per carton. **Weight:** 14 lb. (6.4 kg) per carton.

Model No.	Item
11830000004	Heated Vent, 23W, .2 amp @ 120 VAC
11830000008	Heated Vent, 23W, .1 amp @ 240 VAC
11834000004	Non-heated Vent
91830U04074800	Ins. Sleeve 3-1/2 OD x 48" Long

All 1830/1832 Series standard ventilators are for a 4" (101.6mm) thick wall. When other length is required, specify exact wall thickness. Kason will convert your individual requirement into our part number.



ITEM # 1832



1832 HI-FLOW HEATED VENT

- 6-1/4" (165.1mm) diameter round aluminum cover plate or square stainless steel or aluminum cover plate.

1836 HI-FLOW NON-HEATED VENT

- Same as 1832, except without heating element.

SPECIFICATIONS

Packaging: 10 per carton **Weight:** 13 lb. (5.9kg) per carton

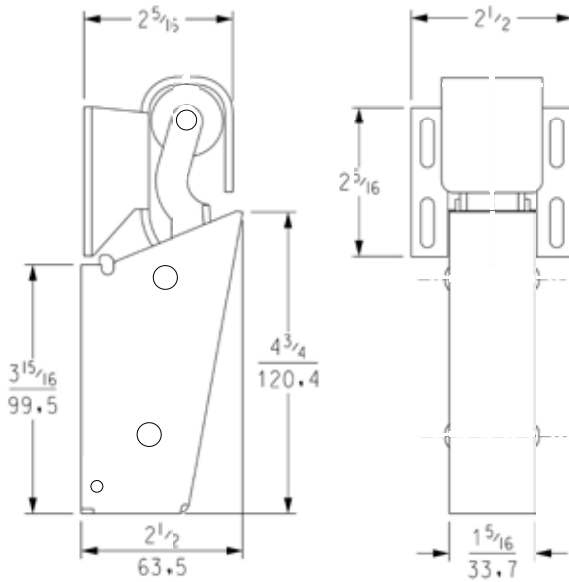
Model No.	Item
11832000004	Heated Vent, 23W, .2 amp @ 120 VAC
11832000008	Heated Vent, 23W, .1 amp @ 240 VAC
11832SA0004	Heated Vent with Sq. Aluminum Louver, 120 VAC
11832SS0004	Heated Vent with Sq. Stainless Steel Louver, 120 VAC
11832SA0001	Square Aluminum Louver
11832SS0001	Square Stainless Steel Louver
11836000004	Non-heated Vent
11836SA0001	Non-heated with Sq. Aluminum Louver
11836SS0001	Non-heated with Sq. Stainless Steel Louver
91832U04074800	Ins. Sleeve 4-41/64 OD x 48" Long



Square aluminum or stainless steel louvered cover plate, complete with gasket, available for models 1832 and 1836.

CONTINUED ON FOLLOWING PAGE

ITEM # 1095



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Hook sold separately.

1095 SPRING ACTION DOOR CLOSER

- Operates by direct force adding to natural swing momentum of closing door
- Designed to overcome slowing action of gaskets and air pressure
- Provides fast, full closure for heavy walk-in doors
- Easy installation; simply snaps onto concealed mounting plate.
- Simple spring mechanism gives long, trouble-free life.
- Steel housing and bend-resistant hook assure long wear in heavy use.
- Polymer roller ensures quiet operation.
- Ideal complement for Kason Walk-in door hardware to provide self-closing doors.

SPECIFICATIONS

MATERIAL:
Steel housing and mounting plate. Housing and hook also available in stainless steel

FINISH:
Bright chrome. Available in powder coat and stainless steel

MOUNTING HOLES:
Drilled for No. 10 (5.0mm) screws (included)

PACKAGING:
Closers and hooks packaged separately; 24 to carton

WEIGHT:
See order information

Model No.	Item	Wgt/Carton
11095000013	Steel Closer	30.0 lb (13.6 kg)
11094000026	Adjustable Wide-Hook, Flush	10 lb. (4.5kg)
11094000027	Adjustable Wide Hook, Offset	13 lb. (5.9kg)
11094000926	Adjustable Stainless Steel Wide-Hook, Flush to 3/4" (0.0-19.1 mm) Offset	10 lb. (4.5kg)
11094000927	Adjustable Stainless Steel Wide-Hook, 7/8"-1-5/8" (22.2-41.3 mm) Offset	13 lb. (5.9kg)
11095000093	Stainless Steel Closer	30.0 lb (13.6 kg)



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Walk-In
0094 Super Freezer Hinge
0998 Super Freezer Hinge
1037 Forged Brass Hinge
1055 Forged Brass Hinge
1073 Forged Brass Hinge
1074 Steel Strap Hinge
1075 Heavy Duty Steel Strap Hinge
1076 Extra Heavy Duty Steel Strap Hinge
1214 Heavy Duty Iron Strap Hinge
1240 Aluminum Hinge
1241 Heavy Duty Double Knuckle Hinge
1243 Reversible Oblique Hinge
1245 Reversible Cam-Rise Hinge
1246 Reversible Cam-Rise Hinge
1248 Spring Assisted Hinge
1249 Spring Assisted Hinge
1251 Heavy Duty Double Knuckled Hinge
1255 Pacesetter Hinge
1256 Pacesetter Hinge
1275 Heavy Duty Cam-Rise Hinge
1276 Enlarged Heavy Duty Cam-Rise Hinge
1277 Series Heavy Duty Hinges
1341 Stainless Steel Double Knuckle Hinge
1345 Performer Hinge
1377S Stainless Steel Self-Closing Hinge
1398 Heavy Duty Cam Rise Hinge
1409 Iron Strap Hinge
Latches & Locks
Lighting and Electrical

1245 REVERSIBLE CAM-RISE HINGE



- Industry standard self-closing cam-rise hinges.
- Door opens with minimum effort.
- Strong self-lubricating nylon cam delivers smooth, trouble-free door operation.
- Cam-rise action reduces gasket wear, even with irregular floors.
- Built-in dwell holds door open beyond 90°.
- Doors lift off without disassembly or removing hinges.
- Simple manual operation reverses hinges for use on right- or left-opening door.

Specifications

MATERIAL:

High pressure die-cast zinc with self-lubricating nylon cam.

FINISH:

See ordering information. Powder coated finishes available for severe environmental applications.

OFFSETS:

See ordering information.

MOUNTING:

Drilled and countersunk for 1/4" (6.0mm) flat head screws. **LOAD RATING:** See Hinge Selector Chart, Group D.

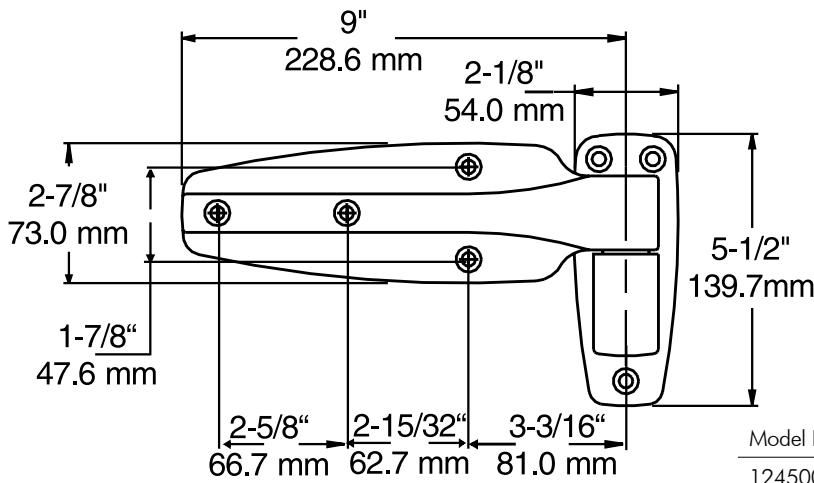
Additional Info

[1245 Hinge](#)

[Hinge Selector](#)



1245 REVERSIBLE CAM-RISE HINGE



Model No.	Item	Offset	Finish
1245000004	Hinge	Flush (0.0 mm)	Tuffkote
1245000016	Hinge	1-1/8" (28.6 mm)	Tuffkote
1245000020	Hinge	1-1/4" (31.8 mm)	Tuffkote
1245000024	Hinge	1-3/8" (34.9 mm)	Tuffkote
1245000052	Hinge	1-1/2" (38.1 mm)	Tuffkote
1245000056	Hinge	1-5/8" (41.3 mm)	Tuffkote
1245000060	Hinge	1-3/4" (44.5 mm)	Tuffkote
1245000064	Hinge	1-7/8" (47.6 mm)	Tuffkote
1245000028	Hinge	Flush (0.0 mm)	Polished Chrome
1245000040	Hinge	1-1/8" (28.6 mm)	Polished Chrome
1245000044	Hinge	1-1/4" (31.8 mm)	Polished Chrome
1245000048	Hinge	1-3/8" (34.9 mm)	Polished Chrome
1245000068	Hinge	1-1/2" (38.1 mm)	Polished Chrome
1245000072	Hinge	1-5/8" (41.3 mm)	Polished Chrome
1245000076	Hinge	1-3/4" (44.5 mm)	Polished Chrome
1245000080	Hinge	1-7/8" (47.6 mm)	Polished Chrome
1245000082	Hinge	2" (50.8 mm)	Polished Chrome
1245000088	Hinge	Flush (0.0 mm)	Brushed Chrome
1245000112	Hinge	1-1/8" (28.6 mm)	Brushed Chrome
1245000116	Hinge	1-1/4" (31.8 mm)	Brushed Chrome
1245000120	Hinge	1-3/8" (34.9 mm)	Brushed Chrome
1245000124	Hinge	1-1/2" (38.1 mm)	Brushed Chrome
1245000128	Hinge	1-5/8" (41.3 mm)	Brushed Chrome
1245000132	Hinge	1-3/4" (44.5 mm)	Brushed Chrome
1245000136	Hinge	1-7/8" (47.6 mm)	Brushed Chrome
1245000138	Hinge	2" (50.8 mm)	Brushed Chrome

PACKAGING: 3 pair per carton.

WEIGHT: Approx. 18 lb. (8.2 kg) per carton.



REVERSE HINGES IN MINUTES

1. Lift strap from flange and remove pin assembly.



2. Pop out cap. Turn strap 180°, reinsert pin assembly in strap.

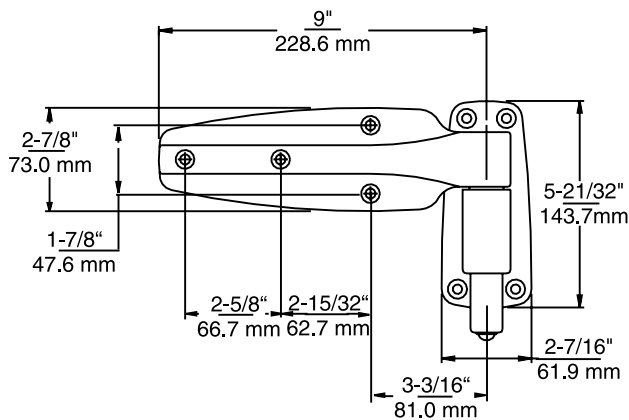


3. Reposition strap into flange and replace cap.

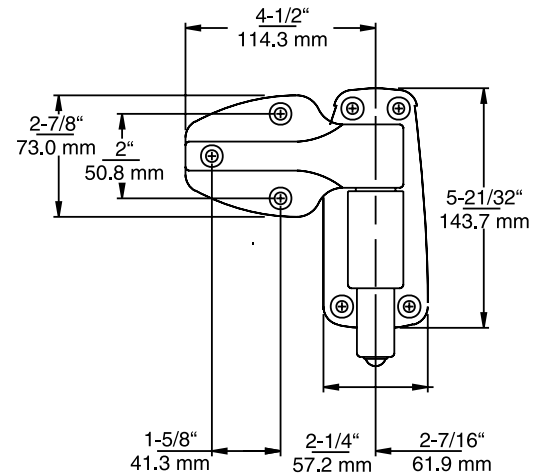
KASON REVERSIBLE CAM-RISE SPRING HINGES

CONTINUED FROM PREVIOUS PAGE

1248



1249



Model No.	Item	Offset	Finish	Non-Lift Off No.	Non-Spring No.
11248000004	Hinge	Flush (0.0 mm)	Polished Chrome	11248000006	11248000002
11248000016	Hinge	1-1/8" (28.6 mm)	Polished Chrome	n/a	n/a
11248000020	Hinge	1-1/4" (31.8 mm)	Polished Chrome	n/a	11248000019
11248000022	Hinge	1-1/2" (38.1 mm)	Polished Chrome	n/a	n/a
11248000024	Hinge	1-3/8" (34.9 mm)	Polished Chrome	n/a	11248000018
11248000025	Hinge	1-5/8" (41.3 mm)	Polished Chrome	n/a	n/a
11248000026	Hinge	1-3/4" (44.5 mm)	Polished Chrome	n/a	n/a
11248000027	Hinge	1-7/8" (47.6 mm)	Polished Chrome	n/a	11248000055
11248000028	Hinge	Flush (0.0 mm)	Brushed Chrome	11248000007	11248000029
11248000030	Hinge	2" (50.8 mm)	Polished Chrome	n/a	11248000080
11248000040	Hinge	1-1/8" (28.6 mm)	Brushed Chrome	n/a	n/a
11248000044	Hinge	1-1/4" (31.8 mm)	Brushed Chrome	n/a	n/a
11248000045	Hinge	1-1/2" (38.1 mm)	Brushed Chrome	n/a	11248000053
11248000048	Hinge	1-3/8" (34.9 mm)	Brushed Chrome	n/a	11248000039
11248000049	Hinge	1-5/8" (41.3 mm)	Brushed Chrome	n/a	11248000037
11248000050	Hinge	1-3/4" (44.5 mm)	Brushed Chrome	n/a	11248000054
11248000051	Hinge	1-7/8" (47.6 mm)	Brushed Chrome	n/a	n/a
11248000078	Hinge	2" (50.8 mm)	Brushed Chrome	n/a	n/a
11249000002	Hinge R.H.	Flush (0.0 mm)	Polished Chrome	n/a	n/a
11249000003	Hinge L.H.	Flush (0.0 mm)	Polished Chrome	n/a	n/a
11249000004	Hinge R.H.	Flush (0.0 mm)	Polished Chrome	11249000014	11249000024
11249000005	Hinge L.H.	Flush (0.0 mm)	Polished Chrome	11249000018	11249000025
11249000008	Hinge R.H.	1/8" (3.2 mm)	Polished Chrome	n/a	n/a
11249000012	Hinge R.H.	1/4" (6.4 mm)	Polished Chrome	n/a	n/a
11249000014	Hinge R.H.	Flush (0.0 mm)	Polished Chrome	n/a	n/a
11249000015	Hinge L.H.	Flush (0.0 mm)	Polished Chrome	n/a	n/a
11249000016	Hinge R.H.	Flush (0.0 mm)	Brushed Chrome	n/a	n/a
11249000017	Hinge L.H.	Flush (0.0 mm)	Brushed Chrome	n/a	n/a



VU-PORT INSULATED WINDOWS



WALK-IN COOLERS

WALK-IN FREEZERS

CLEAN ROOMS

ENVIRONMENTAL CHAMBERS



DEPENDABLE CLEAR VIEW ASSURES GREATER SAFETY

The Norfab Vu-Port glass is a 1" triple pane tempered insulated unit. Our aluminum frame has a thermal barrier built into it to diminish cold transfer. Choose from non-heated, heated frame only, or heated glass and frame for optimal performance.

14 x 14 STANDARD SIZE

Glass viewing area 12³/₄" x 12³/₄"

Rough opening 16⁷/₈" x 16⁷/₈"

Overall frame size 18¹/₄" x 18¹/₄"

DOOR/WALL THICKNESS	NON-HEATED	HEATED FRAME ONLY	HEATED FRAME AND GLASS
2"	55084-1	55083-1-A	55082-1-A
2"		55083-1-B	55082-1-B
3"	55084-2	55083-2-A	55082-2-A
3"		55083-2-B	55082-2-B
3 ¹ / ₂ "	55084-3	55083-3-A	55082-3-A
3 ¹ / ₂ "		55083-3-B	55082-3-B
4"	55084-4	55083-4-A	55082-4-A
4"		55083-4-B	55082-4-B
5"	55084-5	55083-5-A	55082-5-A
5"		55083-5-B	55082-5-B

TWO STANDARD FRAME SIZES

Choose from 2 standard sizes (14 x 14 or 14 x 24) or custom order to your specifications.

CHOICE OF THICKNESS 2", 3", 3¹/₂", 4", AND 5"

Inner frame adjustable to accommodate nominal variations in the door or wall thickness.

14 x 24 STANDARD SIZE

Glass viewing area 12³/₄" x 22³/₄"

Rough opening 16⁷/₈" x 26⁷/₈"

Overall frame size 18¹/₄" x 28¹/₄"

DOOR/WALL THICKNESS	NON-HEATED	HEATED FRAME ONLY	HEATED FRAME AND GLASS
2"	55084-6	55083-6-A	55082-6-A
2"		55083-6-B	55082-6-B
3"	55084-7	55083-7-A	55082-7-A
3"		55083-7-B	55082-7-B
3 ¹ / ₂ "	55084-8	55083-8-A	55082-8-A
3 ¹ / ₂ "		55083-8-B	55082-8-B
4"	55084-9	55083-9-A	55082-9-A
4"		55083-9-B	55082-9-B
5"	55084-10	55083-10-A	55082-10-A
5"		55083-10-B	55082-10-B



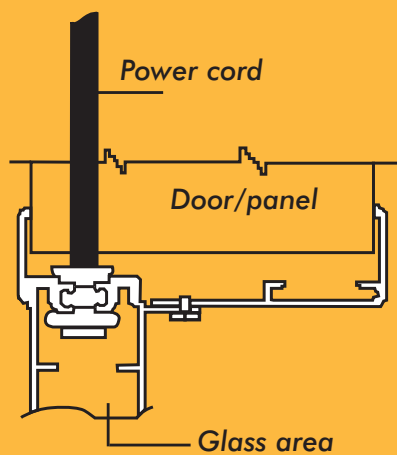
CUSTOM SIZES

- Custom sizes are available in heated and non-heated per customer specifications and are priced on an order-by-order basis.
- Maximum size is 24 square feet.
- Sizes larger than 9 square feet require going to a 2 pane insulated glass.
- When ordering please specify thickness of installation door or wall, Viewing Area or Rough Opening and Option A or B (refer to diagram at bottom of this page).

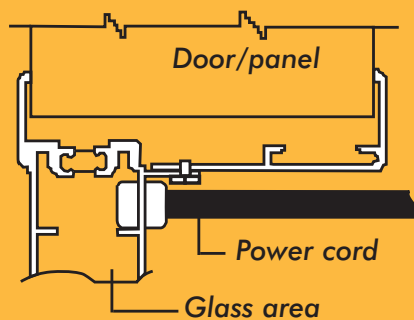


14 x 24 standard size

14 x 14 standard size



INTERNAL OPTION A



STANDARD OPTION B

FINISH OPTIONS

The Norfab Vu-Port comes standard in a clear satin anodized finish. Or get the look of stainless steel without the cost of stainless. Paint also available per customer specification. Custom finishes priced on an order-by-order basis.



Clear satin anodized
(Standard)

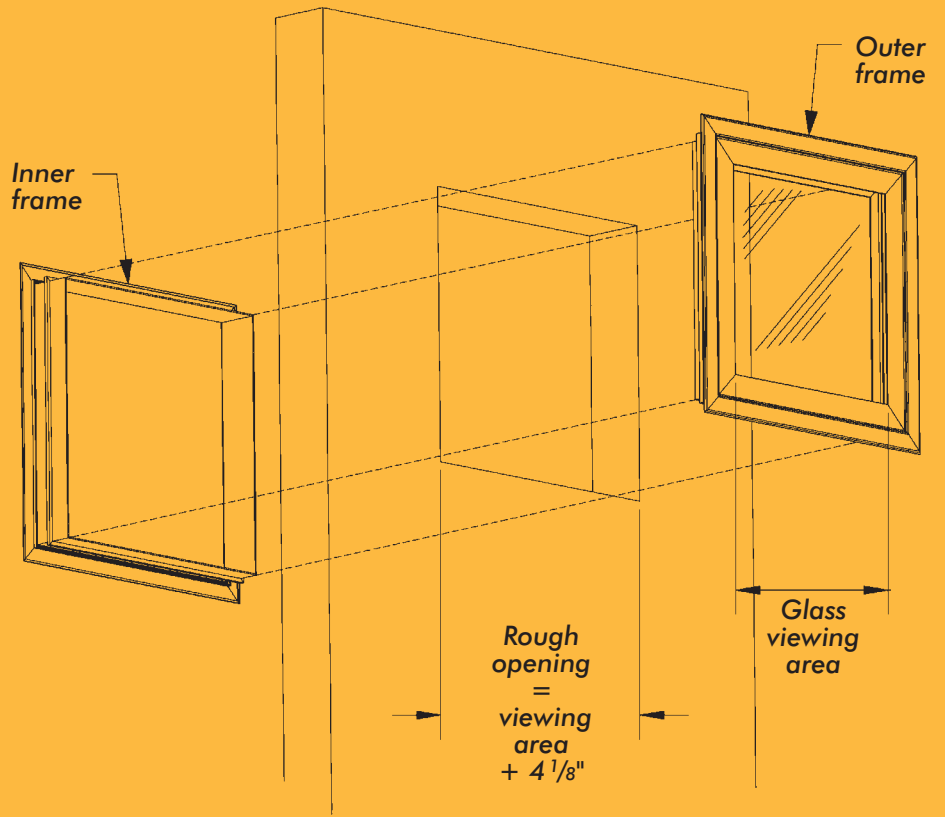


Brushed and anodized
to match stainless



Painted white
(Other colors available)

EASY INSTALLATION
Two section Vu-Port slides together easily into door or wall and is locked into place with self tapping screws.



SHIPPING OPTIONS

Your Vu-Port refrigeration door windows can be shipped in a wooden crate or in individual boxes and palletized. Either way you can be assured that your product will arrive undamaged and on time.



ALUMINUM EXTRUSION FABRICATORS

14830 - 27th Avenue North
Minneapolis, MN 55447
Ph: 763-559-2510
Fax: 763-559-7642
www.norfabinc.com



VU-PORT INSULATED WINDOW OPTIONS



NORFAB AIR FLOW VU-PORT WINDOW

For environmental chambers using Air Flow wall systems. The window allows air to flow between the glass. Hinged panel for easy cleaning access between the windows.



NORFAB FLUSH PANEL VU-PORT WINDOW

For clean rooms where ledges are not allowed. An added frame on the interior provides the same flush surface as the exterior.





NORFAB LOCKING SECURITY PANEL VU-PORT WINDOW

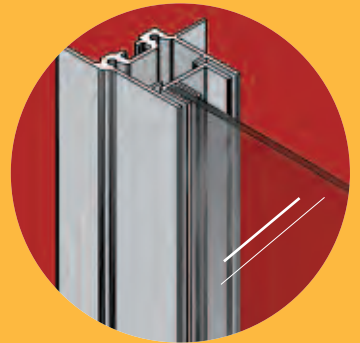
For chambers where darkness and security is needed. When viewing contents of chamber minimal light is exposed and zero contamination is allowed through an open door.



CANVAS SECURITY COVER

Our canvas cover provides added security by blocking the view of items to discourage theft and provide privacy when needed.

SINGLE PANE WINDOW FOR ENVIRONMENTAL/CLEAN ROOMS



ADDED DURABILITY AND SECURITY OPTIONS

For added durability and security choose our insulated window with one lite of 1/4" wire glass or a solid Polycarbonate panel (available in Non-Heated or Heated Frame only). Other options available upon request.

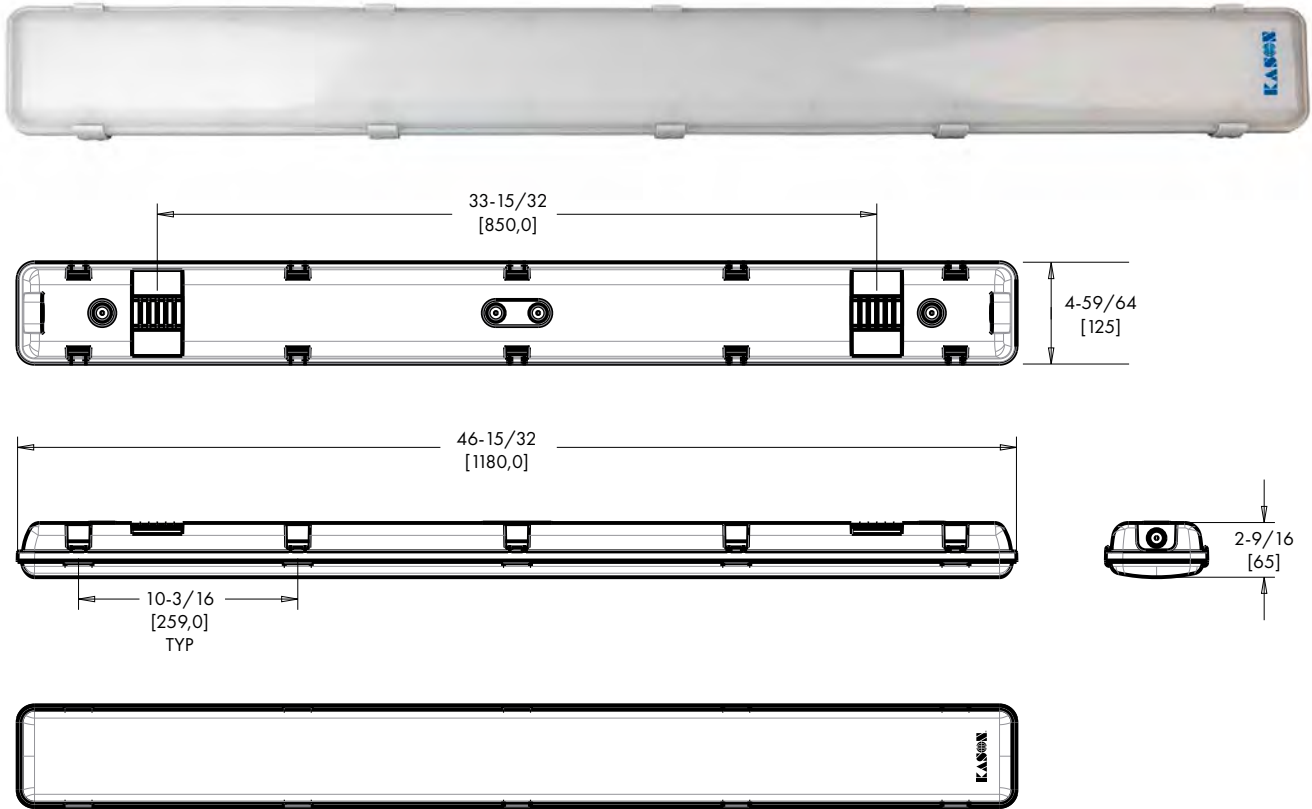


ALUMINUM EXTRUSION FABRICATORS

14830 - 27th Avenue North
Minneapolis, MN 55447
Ph: 763-559-2510
Fax: 763-559-7642
www.norfabinc.com

1810LCT400 LED Fixture

Part Number: 11810LCT400



FEATURES

- Dimmable energy-efficient lighting
- Surface mounting brackets
- Extremely durable polycarbonate housing and lens
- Designed for walk-in coolers and/or freezers
- Operating temp -40°F to 104°F (-40°C to 40°C)
- Rated 50,000+ hours of life
- **Certifications:** UL approved for wet location, NSF listed component, IP-65

MATERIALS

- **Diffuser:** frosted UL approved UL94-HB rated, PC
- **Housing:** gray UL approved UL94-5VA rated, PC
- **LED Tray:** white painted steel

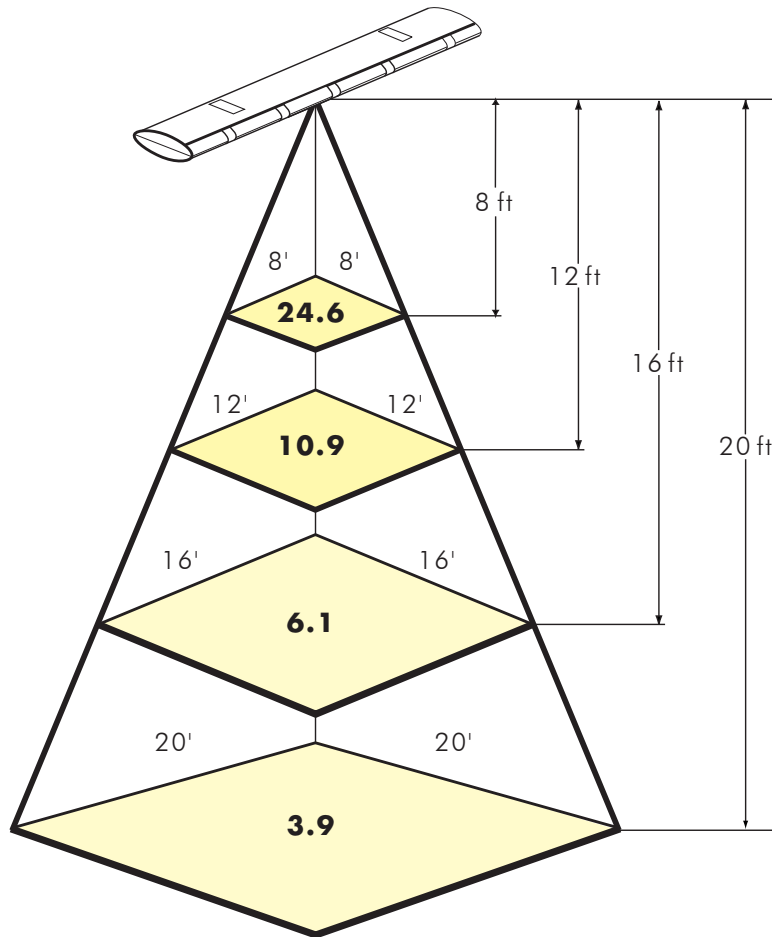
DESIGN CRITERIA

- **Power**
 - Watts: 40 W
 - Volts: 120-277 V
 - Amps: 0.4 A @120 V
 - PF: > 0.9
- **LED**
 - Output: 4550 lumens
 - Color Temperature: 4000k
 - 110 Lumens/Watt
- **Size**
 - Nominal Overall Dimensions:
46-15/32" L x 4-59/64" W x 2-9/16" H
(1180 x 125 x 65 mm)



1810LCT400 LED Fixture

Part Number: 11810LCT400



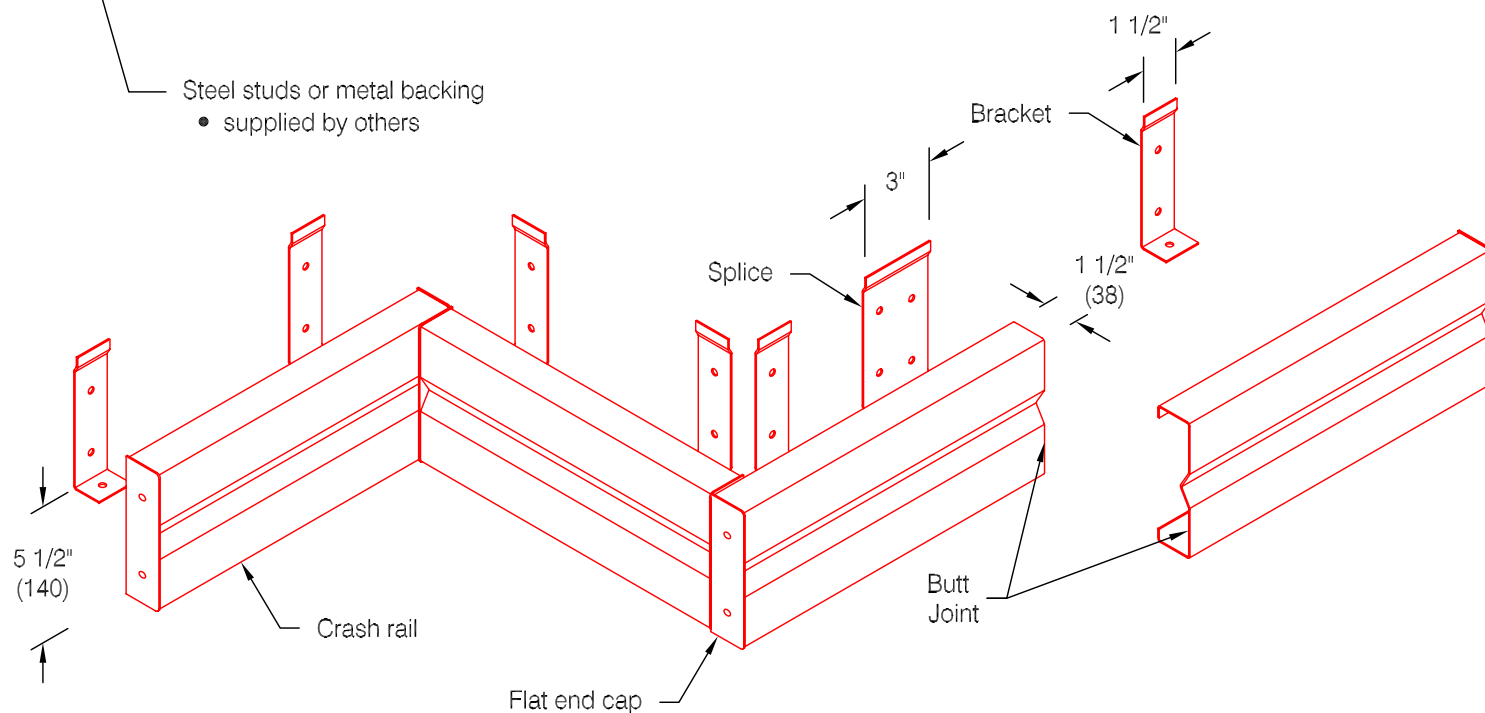
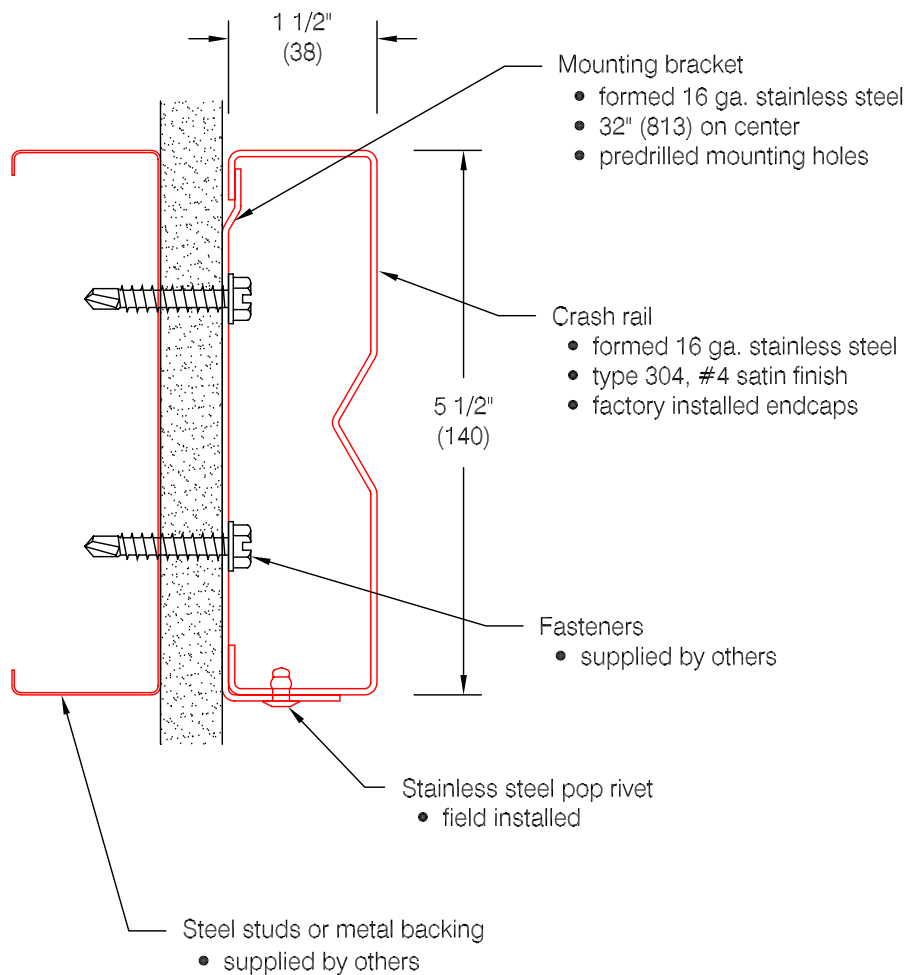
LIGHT DISTRIBUTION FOR 1810LCT400 LED

Height in Feet	Average FC for Single Fixture Over Indicated Area			
	8' x 8'	12' x 12'	16' x 16'	20' x 20'
5	33.7	18.6	11.8	8.2
8	24.6	14.4	9.6	6.8
9	-	13.4	9.0	6.5
12	-	10.9	7.5	5.5
13	-	-	7.1	5.3
16	-	-	6.1	4.6
17	-	-	-	4.4
20	-	-	-	3.9

Protector Series 2182

Features:

- Prefabricated to fit field measured conditions
- Factory installed end caps
- Available to 10'-0" without a splice
- Inside and outside corners are not available
all runs terminate with end caps at corners



WallGuard.Com reserves the right to discontinue a design or modify an existing design without prior notice

CLR System A - CDU-1 - Product Information

General Data

Model Line: NEXT-GEN II	Model Number: RFOS09E4SGA	Flooded: Yes
Refrigerant: R-448A	Voltage: 460/3/60	Compressor Type: SCROLL

Performance Data

Ambient Temp: 100 °F	Suction Temp: 23 °F	Capacity: 71,658 BTUH
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Electrical Data

Compressor RLA: 15.4	Compressor LRA: 114	Total Condenser Fan FLA: 3.7
MCA: 24	MOPD: 35	

Physical Data

Number of Compressors: 1	Compressor Model: ZB66K5E	Compressor HP: 09
Number of Condenser Fans: 2	Approx. Ship Weight: 980 lbs	Sound Data: 0 dBA
Liquid Line: 7/8 in.	Suction Line: 1-5/8 in.	
Pump Down Capacity (%): 80	Pump Down Capacity: 42.3 lbs	

Option Data

Mounted Option	PHASE LOSS MONITOR
Mounted Option	LIQUID LINE WITH COMPONENTS: SEALED FILTER & SIGHT GLASS
Mounted Option	SUCTION LINE COMPONENTS: SEALED FILTER
Mounted Option	SUCTION LINE ACCUMULATOR
Mounted Option	STANDARD RECEIVER
Mounted Option	HEATED AND INSULATED RECEIVER
Mounted Option	CRANKCASE PRESSURE REGULATION VALVE
Manual Option	FD-3 EC Fan motors and Hoffman controller
Warranty Option	EXTENDED COMPRESSOR WARRANTY (4 YEAR) - SCROLL

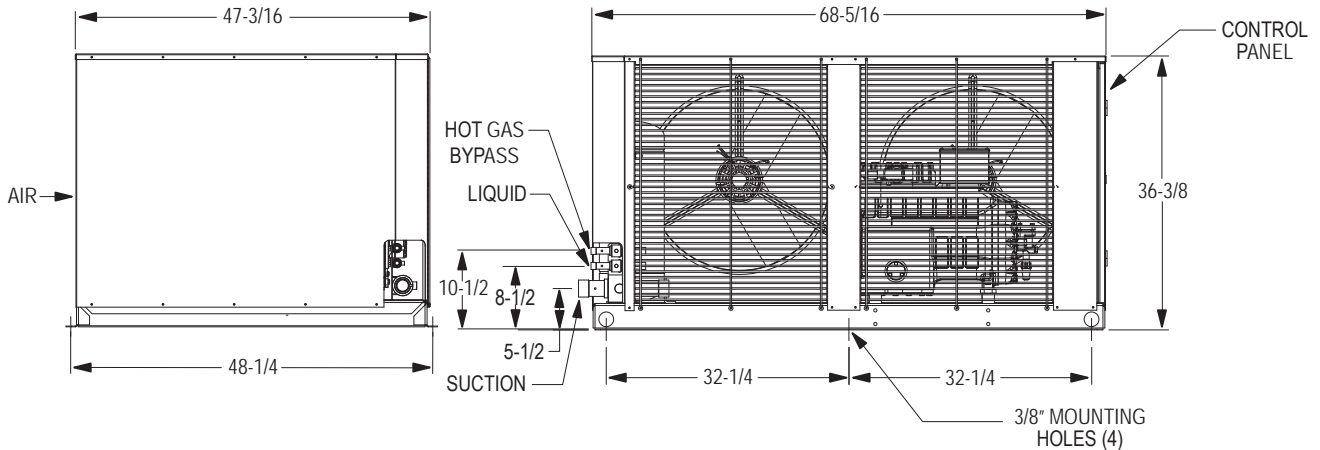
Compliance Data

AWEF: **7.60**

Notes

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Dimensional Drawing



Standard Features

- All-weather Galvanized steel painted housing
- Generously sized high efficiency condenser, enhanced copper tubes/aluminum fins
- Integral Liquid Subcooling Circuit provides subcooled liquid to the expansion device
- Crankcase heater
- Heavy duty three phase condenser fan motor(s)
- Dual pressure (auto reset) control with Reflex® flexible control lines
- Large electrical panel with hinged/removable door
- Removable top and side panels for ease of service
- Open view, flow-through equipment guard
- Color coded point-to-point wiring
- Quick access to shut off valves from exterior
- Flooded models include flooded head pressure control
- Non Flooded models include fan cycling
- UL/cUL certified for use with multiple refrigerants
- UL/cUL listed for outdoor use

Certifications



CLR System A - UC-1 - Product Information

General Data

Model Line: NEXT-GEN ALL-TEMP	Model Number: RL6A295ADA	Motors: DUAL SPEED EC MOTOR
Unit Voltage: 115/1/60	Defrost Type: AIR DEFROST	Refrigerant: R-448A
Fins Per Inch: 6	Number of Fans: 5	

Performance Data

Suction Temp: 25 °F	T.D: 10.3 °F	Capacity: 37,093.3 BTUH	CFM: 3875
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Electrical Data

Motor Voltage: 115/1/60	Total Unit Fan Motor Amps: 4	
Heater Voltage: 115/1/60	Heater Amps: 0	Heater Watts: 0
MCA: 15	MOPD: 20	

Physical Data

Liquid Line: 3/8 in.	Suction Line: 1-1/8 in.	Approx. Ship Weight: 218 lbs
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Option Data

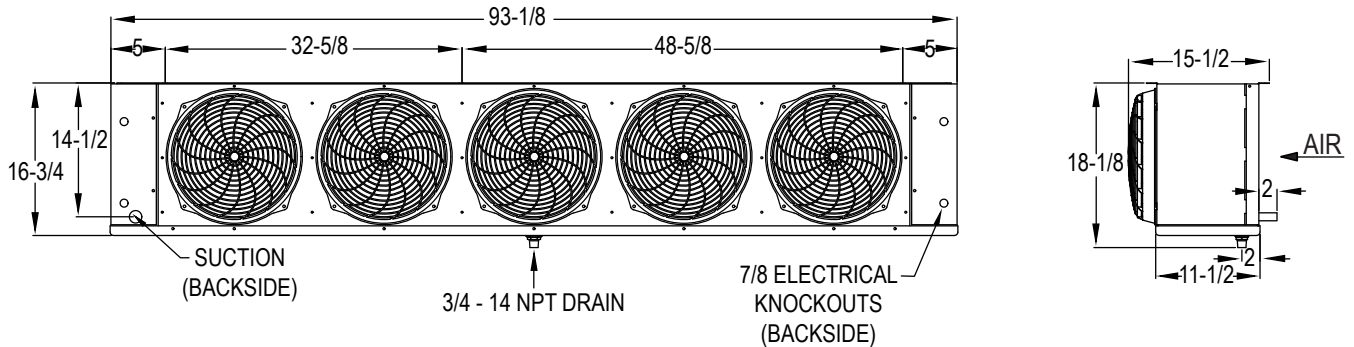
Mounted Option	Thermostatic Expansion Valve
Mounted Option	Liquid Line Solenoid Valve

Compliance Data

AWEF: **9.00**

Notes

Dimensional Drawing



Standard Features

- Embossed aluminum housing
- Enhanced copper tube and aluminum fin coil construction
- Sweat connections
- Thermal overload protection
- High efficiency fan guard design and deep draw venturi
- Heavy-duty fans are balanced for vibration-free operation
- Fan sections are baffled to prevent short cycling of air
- Slide out end panels
- Removable drain pan
- Mounts flush to the ceiling
- Top pan includes 1/2" wide slotted mounting points
- UL/cUL certified for use with multiple refrigerants
- NSF approved for use in food preparation areas

Certifications



CLR System B - System Design Summary

General Requirements

Room Temperature: **35 °F** Ambient Temperature: **100 °F** Design Run-time: **16 Hrs** Required Capacity: **75,126 BTUH**

Selected Equipment

Line Item	Quantity	Type	Tag	Description
2.0	1	System	CLR System B	R-448A - Refrigeration Equipment Match 2
2.1	1	Condensing Unit	CDU-2	RFOS09E4SGA
2.2	2	Unit Cooler	UC-2	RL6A295ADA

System Balance

Balanced Capacity: **74,186.6 BTUH** Evap. T.D.: **10.3 °F** Line Loss: **2 °F** Suction Temp: **22.7 °F** Calc. Run-Time: **16.2 Hrs**

CLR System B - CDU-2 - Product Information

General Data

Model Line: NEXT-GEN II	Model Number: RFOS09E4SGA	Flooded: Yes
Refrigerant: R-448A	Voltage: 460/3/60	Compressor Type: SCROLL

Performance Data

Ambient Temp: 100 °F	Suction Temp: 23 °F	Capacity: 71,658 BTUH
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Electrical Data

Compressor RLA: 15.4	Compressor LRA: 114	Total Condenser Fan FLA: 3.7
MCA: 24	MOPD: 35	

Physical Data

Number of Compressors: 1	Compressor Model: ZB66K5E	Compressor HP: 09
Number of Condenser Fans: 2	Approx. Ship Weight: 980 lbs	Sound Data: 0 dBA
Liquid Line: 7/8 in.	Suction Line: 1-5/8 in.	
Pump Down Capacity (%): 80	Pump Down Capacity: 42.3 lbs	

Option Data

Mounted Option	PHASE LOSS MONITOR
Mounted Option	LIQUID LINE WITH COMPONENTS: SEALED FILTER & SIGHT GLASS
Mounted Option	SUCTION LINE COMPONENTS: SEALED FILTER
Mounted Option	SUCTION LINE ACCUMULATOR
Mounted Option	STANDARD RECEIVER
Mounted Option	HEATED AND INSULATED RECEIVER
Mounted Option	CRANKCASE PRESSURE REGULATION VALVE
Manual Option	FD-3 EC Fan motors and Hoffman controller
Warranty Option	EXTENDED COMPRESSOR WARRANTY (4 YEAR) - SCROLL

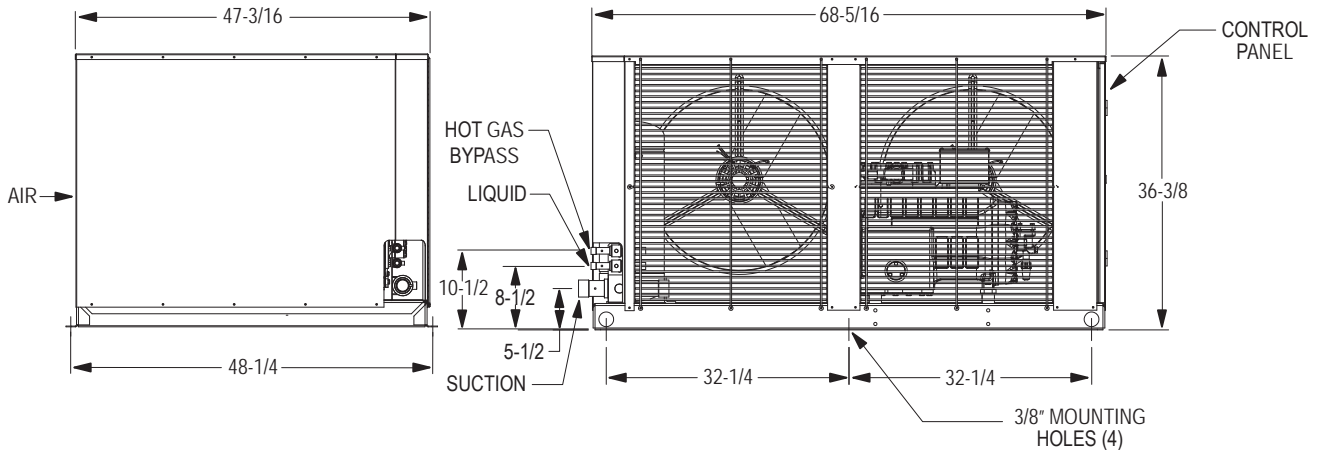
Compliance Data

AWEF: **7.60**

Notes

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Dimensional Drawing



Standard Features

- All-weather Galvanized steel painted housing
- Generously sized high efficiency condenser, enhanced copper tubes/aluminum fins
- Integral Liquid Subcooling Circuit provides subcooled liquid to the expansion device
- Crankcase heater
- Heavy duty three phase condenser fan motor(s)
- Dual pressure (auto reset) control with Reflex® flexible control lines
- Large electrical panel with hinged/removable door
- Removable top and side panels for ease of service
- Open view, flow-through equipment guard
- Color coded point-to-point wiring
- Quick access to shut off valves from exterior
- Flooded models include flooded head pressure control
- Non Flooded models include fan cycling
- UL/cUL certified for use with multiple refrigerants
- UL/cUL listed for outdoor use

Certifications



CLR System B - UC-2 - Product Information

General Data

Model Line: NEXT-GEN ALL-TEMP	Model Number: RL6A295ADA	Motors: DUAL SPEED EC MOTOR
Unit Voltage: 115/1/60	Defrost Type: AIR DEFROST	Refrigerant: R-448A
Fins Per Inch: 6	Number of Fans: 5	

Performance Data

Suction Temp: 25 °F	T.D: 10.3 °F	Capacity: 37,093.3 BTUH	CFM: 3875
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Electrical Data

Motor Voltage: 115/1/60	Total Unit Fan Motor Amps: 4	
Heater Voltage: 115/1/60	Heater Amps: 0	Heater Watts: 0
MCA: 15	MOPD: 20	

Physical Data

Liquid Line: 3/8 in.	Suction Line: 1-1/8 in.	Approx. Ship Weight: 218 lbs
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Option Data

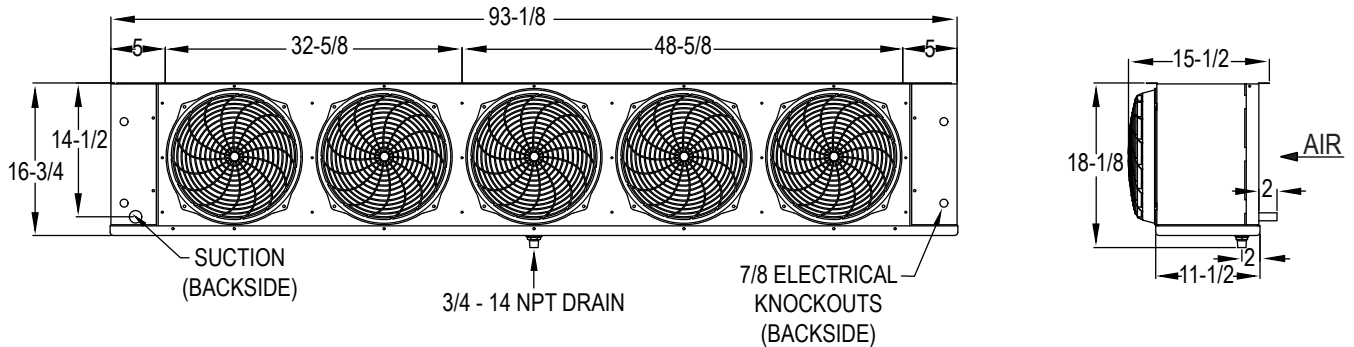
Mounted Option	Thermostatic Expansion Valve
Mounted Option	Liquid Line Solenoid Valve

Compliance Data

AWEF: **9.00**

Notes

Dimensional Drawing



Standard Features

- Embossed aluminum housing
- Enhanced copper tube and aluminum fin coil construction
- Sweat connections
- Thermal overload protection
- High efficiency fan guard design and deep draw venturi
- Heavy-duty fans are balanced for vibration-free operation
- Fan sections are baffled to prevent short cycling of air
- Slide out end panels
- Removable drain pan
- Mounts flush to the ceiling
- Top pan includes 1/2" wide slotted mounting points
- UL/cUL certified for use with multiple refrigerants
- NSF approved for use in food preparation areas

Certifications



Frzr System A - CDU-3 - Product Information

General Data

Model Line: NEXT-GEN II	Model Number: RFOS08L4SEA	Flooded: Yes
Refrigerant: R-448A	Voltage: 208-230/3/60	Compressor Type: SCROLL

Performance Data

Ambient Temp: 110 °F	Suction Temp: -12 °F	Capacity: 25,698 BTUH
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Electrical Data

Compressor RLA: 24	Compressor LRA: 224	Total Condenser Fan FLA: 3.8
MCA: 34.8	MOPD: 50	

Physical Data

Number of Compressors: 1	Compressor Model: ZF25K4E	Compressor HP: 08
Number of Condenser Fans: 1	Approx. Ship Weight: 850 lbs	Sound Data: 0 dBA
Liquid Line: 1/2 in.	Suction Line: 1-5/8 in.	
Pump Down Capacity (%): 80	Pump Down Capacity: 19.9 lbs	

Option Data

Mounted Option	LIQUID LINE WITH COMPONENTS: SEALED FILTER & SIGHT GLASS
Mounted Option	SUCTION LINE COMPONENTS: SEALED FILTER
Mounted Option	SUCTION LINE ACCUMULATOR
Mounted Option	STANDARD RECEIVER
Mounted Option	HEATED AND INSULATED RECEIVER
Mounted Option	CRANKCASE PRESSURE REGULATION VALVE
Mounted Option	LIQUID INJECTION
Manual Option	FD-3 EC Fan motors and Hoffman controller
Warranty Option	EXTENDED COMPRESSOR WARRANTY (4 YEAR) - SCROLL

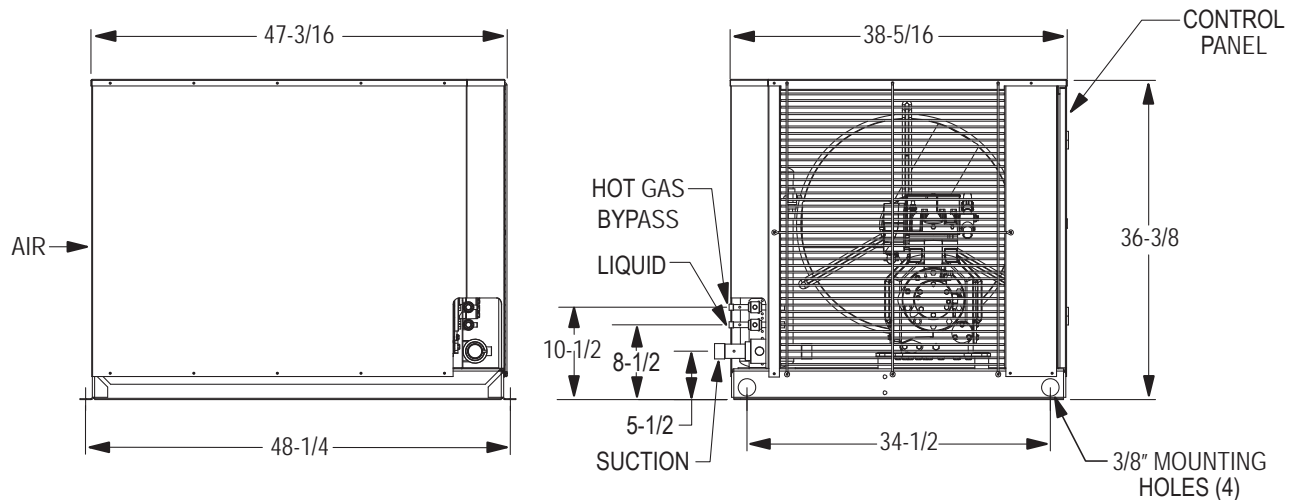
Compliance Data

AWEF: **3.15**

Notes

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Dimensional Drawing



Standard Features

- All-weather Galvanized steel painted housing
- Generously sized high efficiency condenser, enhanced copper tubes/aluminum fins
- Integral Liquid Subcooling Circuit provides subcooled liquid to the expansion device
- Crankcase heater
- Heavy duty three phase condenser fan motor(s)
- Dual pressure (auto reset) control with Reflex® flexible control lines
- Large electrical panel with hinged/removable door
- Removable top and side panels for ease of service
- Open view, flow-through equipment guard
- Color coded point-to-point wiring
- Quick access to shut off valves from exterior
- Flooded models include flooded head pressure control
- Non Flooded models include fan cycling
- UL/cUL certified for use with multiple refrigerants
- UL/cUL listed for outdoor use

Certifications



Frzr System A - UC-3 - Product Information

General Data

Model Line: NEXT-GEN ALL-TEMP	Model Number: RL6E244DDA	Motors: DUAL SPEED EC MOTOR
Unit Voltage: 208-230/1/60	Defrost Type: ELECTRIC DEFROST	Refrigerant: R-448A
Fins Per Inch: 6	Number of Fans: 6	

Performance Data

Suction Temp: -10 °F	T.D: 9.4 °F	Capacity: 27,284.4 BTUH	CFM: 4710
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Electrical Data

Motor Voltage: 208-230/1/60	Total Unit Fan Motor Amps: 3	
Heater Voltage: 208-230/1/60	Heater Amps: 29	Heater Watts: 6675
MCA: 15	MOPD: 20	

Physical Data

Liquid Line: 3/8 in.	Suction Line: 1-1/8 in.	Approx. Ship Weight: 238 lbs
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Option Data

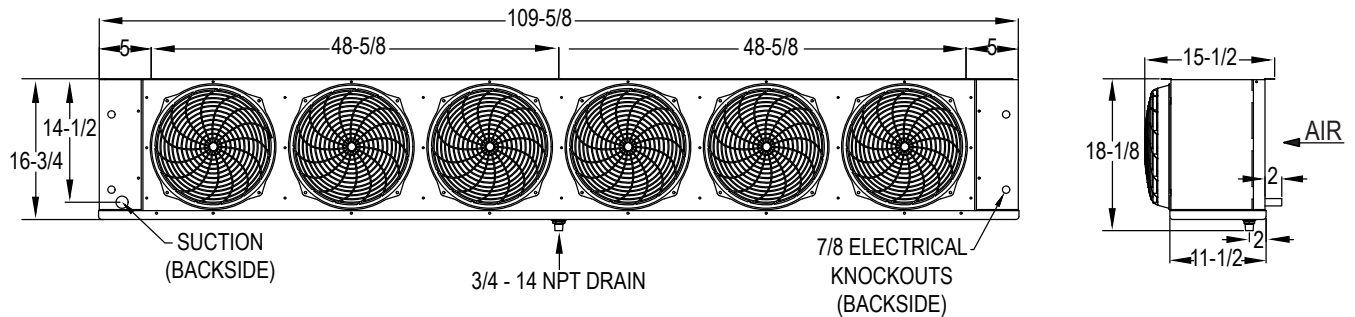
Mounted Option	Thermostatic Expansion Valve
Mounted Option	Liquid Line Solenoid Valve
Mounted Option	Fixed Defrost Control / Fan Delay Switch

Compliance Data

AWEF: **4.15**

Notes

Dimensional Drawing



Standard Features

- Embossed aluminum housing
- Enhanced copper tube and aluminum fin coil construction
- Sweat connections
- Thermal overload protection
- High efficiency fan guard design and deep draw venturi
- Heavy-duty fans are balanced for vibration-free operation
- Fan sections are baffled to prevent short cycling of air
- Slide out end panels
- Removable drain pan
- Mounts flush to the ceiling
- Top pan includes $\frac{1}{2}$ " wide slotted mounting points
- UL/cUL certified for use with multiple refrigerants
- NSF approved for use in food preparation areas

Certifications



Frzr System B - System Design Summary

General Requirements

Room Temperature: **0 °F** Ambient Temperature: **110 °F** Design Run-time: **18 Hrs** Required Capacity: **27,207** BTUH

Selected Equipment

Line Item	Quantity	Type	Tag	Description
4.0	1	System	Frzr System B	R-448A - Refrigeration Equipment Match 4
4.1	1	Condensing Unit	CDU-4	RFOS08L4SEA
4.2	1	Unit Cooler	UC-4	RL6E244DDA

System Balance

Balanced Capacity: **27,284.4** BTUH Evap. T.D.: **9.4 °F** Line Loss: **2 °F** Suction Temp: **-11.4 °F** Calc. Run-Time: **17.9** Hrs

Frzr System B - CDU-4 - Product Information

General Data

Model Line: NEXT-GEN II	Model Number: RFOS08L4SEA	Flooded: Yes
Refrigerant: R-448A	Voltage: 208-230/3/60	Compressor Type: SCROLL

Performance Data

Ambient Temp: 110 °F	Suction Temp: -12 °F	Capacity: 25,698 BTUH
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Electrical Data

Compressor RLA: 24	Compressor LRA: 224	Total Condenser Fan FLA: 3.8
MCA: 34.8	MOPD: 50	

Physical Data

Number of Compressors: 1	Compressor Model: ZF25K4E	Compressor HP: 08
Number of Condenser Fans: 1	Approx. Ship Weight: 850 lbs	Sound Data: 0 dBA
Liquid Line: 1/2 in.	Suction Line: 1-5/8 in.	
Pump Down Capacity (%): 80	Pump Down Capacity: 19.9 lbs	

Option Data

Mounted Option	LIQUID LINE WITH COMPONENTS: SEALED FILTER & SIGHT GLASS
Mounted Option	SUCTION LINE COMPONENTS: SEALED FILTER
Mounted Option	SUCTION LINE ACCUMULATOR
Mounted Option	STANDARD RECEIVER
Mounted Option	HEATED AND INSULATED RECEIVER
Mounted Option	CRANKCASE PRESSURE REGULATION VALVE
Mounted Option	LIQUID INJECTION
Manual Option	FD-3 EC Fan motors and Hoffman controller
Warranty Option	EXTENDED COMPRESSOR WARRANTY (4 YEAR) - SCROLL

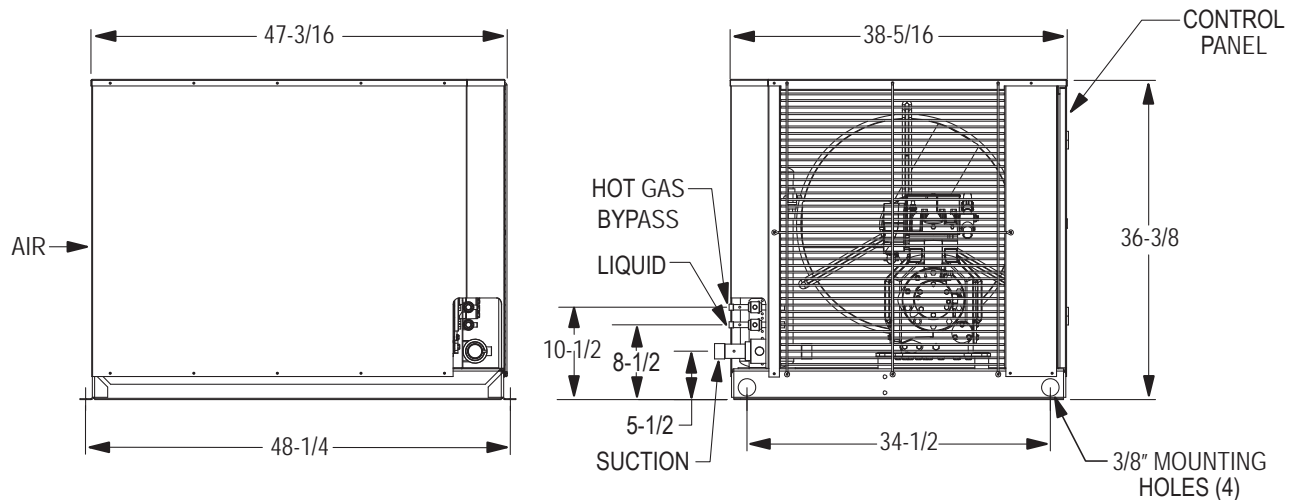
Compliance Data

AWEF: **3.15**

Notes

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Dimensional Drawing



Standard Features

- All-weather Galvanized steel painted housing
- Generously sized high efficiency condenser, enhanced copper tubes/aluminum fins
- Integral Liquid Subcooling Circuit provides subcooled liquid to the expansion device
- Crankcase heater
- Heavy duty three phase condenser fan motor(s)
- Dual pressure (auto reset) control with Reflex® flexible control lines
- Large electrical panel with hinged/removable door
- Removable top and side panels for ease of service
- Open view, flow-through equipment guard
- Color coded point-to-point wiring
- Quick access to shut off valves from exterior
- Flooded models include flooded head pressure control
- Non Flooded models include fan cycling
- UL/cUL certified for use with multiple refrigerants
- UL/cUL listed for outdoor use

Certifications



Frzr System B - UC-4 - Product Information

General Data

Model Line: NEXT-GEN ALL-TEMP	Model Number: RL6E244DDA	Motors: DUAL SPEED EC MOTOR
Unit Voltage: 208-230/1/60	Defrost Type: ELECTRIC DEFROST	Refrigerant: R-448A
Fins Per Inch: 6	Number of Fans: 6	

Performance Data

Suction Temp: -10 °F	T.D: 9.4 °F	Capacity: 27,284.4 BTUH	CFM: 4710
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Electrical Data

Motor Voltage: 208-230/1/60	Total Unit Fan Motor Amps: 3	
Heater Voltage: 208-230/1/60	Heater Amps: 29	Heater Watts: 6675
MCA: 15	MOPD: 20	

Physical Data

Liquid Line: 3/8 in.	Suction Line: 1-1/8 in.	Approx. Ship Weight: 238 lbs
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Option Data

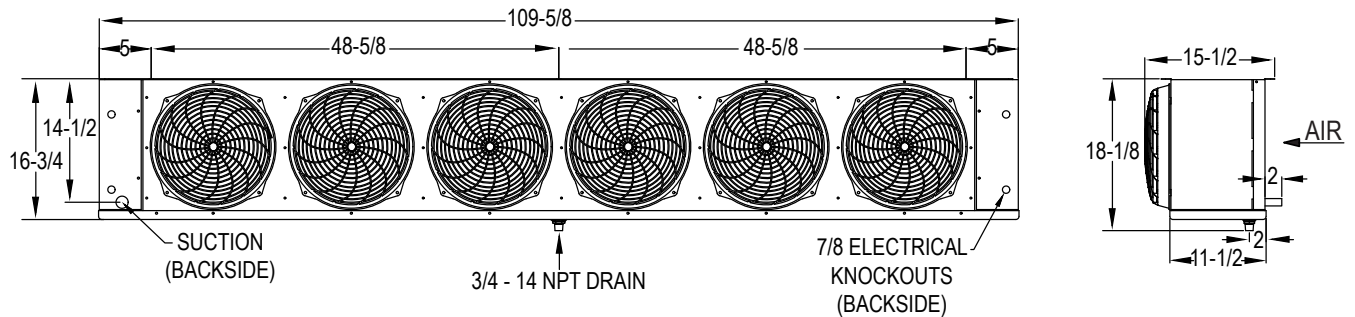
Mounted Option	Thermostatic Expansion Valve
Mounted Option	Liquid Line Solenoid Valve
Mounted Option	Fixed Defrost Control / Fan Delay Switch

Compliance Data

AWEF: **4.15**

Notes

Dimensional Drawing



Standard Features

- Embossed aluminum housing
- Enhanced copper tube and aluminum fin coil construction
- Sweat connections
- Thermal overload protection
- High efficiency fan guard design and deep draw venturi
- Heavy-duty fans are balanced for vibration-free operation
- Fan sections are baffled to prevent short cycling of air
- Slide out end panels
- Removable drain pan
- Mounts flush to the ceiling
- Top pan includes 1/2" wide slotted mounting points
- UL/cUL certified for use with multiple refrigerants
- NSF approved for use in food preparation areas

Certifications





PROJECT
SUBMITTAL

WILL COUNTY
New Coroner Facility
Dehumidifier

Vice President of Operations

Paul Joseph

411 North Aerojet Avenue Azusa, Ca. 91702

Office: 626 334-1471 Ext. 104

Fax: 626 334 1704

Prepared for:

Tyler Nassar

Leopardo Companies (IL)

Phone: (224) 2887903

Date: January 06, 2023

Submittal No. 1

HC Series

Desiccant Dehumidifier



Product Description

Munters off-the-shelf desiccant dehumidifiers combine state-of-the-art desiccant technology with dependability and long operating life for humidity control at virtually any temperature.

Process Air: Flow rates of 150-300 scfm. Nominal moisture removal: 7.9 lbs/hr at 75°F, 50% RH at 300 scfm. Capable of processing saturated, conditioned or outside air.

Contact Air Seals: Separate process and reactivation air streams.

Electrical Controls: Automatic restart after power failure. Contacts for remote run and fault status. Elapsed time meter. Simplified controls using relay logic. 24 VAC signal wiring allows for low voltage wiring of humidistat. Control system monitors and controls unit function.

Drive System: Simple drive belt arrangement, few moving parts.

Reactivation Utility: Energy modulation feature independently controls heater power to minimize energy consumption.

Dehumidifier Housing: Process and reactivation air flow insulation. Blower motors and controls isolated from air streams. Process and reactivation fan guards provided for safety. Volume control dampers for process and reactivation air streams. All welded aluminum cabinet. Compact size for minimum space requirements and easy installation.

PRODUCT INFORMATION

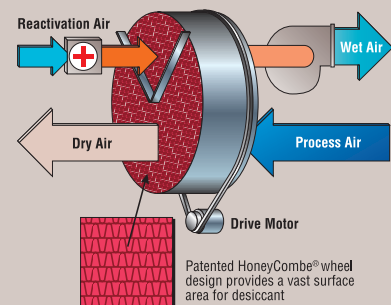
HC-300

OFF-THE-SHELF DEHUMIDIFIER

Advantages:

- Efficient humidity control for applications including product drying, mold and mildew control, corrosion protection, storage and condensation control
- Durable unitized body with welded aluminum construction
- Easy access panel for inspection and maintenance
- Simple ductwork connections
- Compact, low profile design

Desiccant Rotors

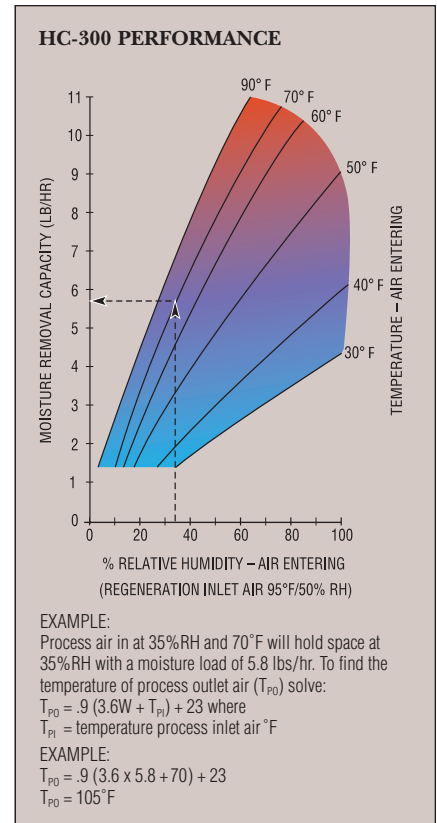
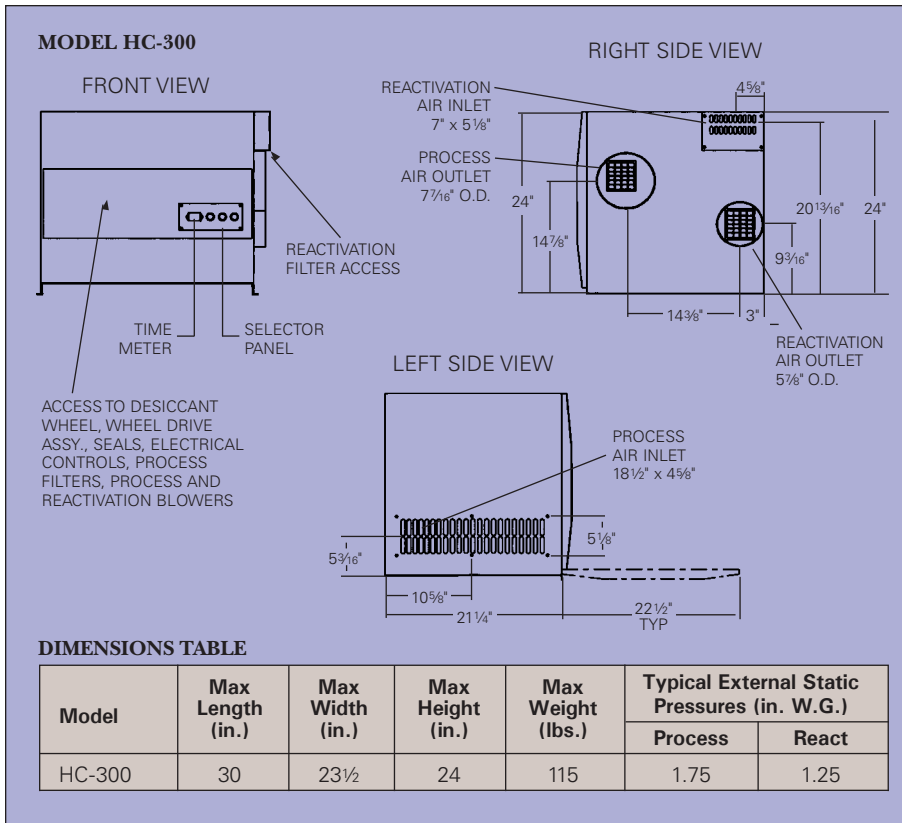


In the 1950's Munters invented modern industrial dehumidification when it introduced the self-regenerating desiccant rotor, the heart of the dehumidifier.

Today, Munters offers rotors with five desiccant formulations and is the acknowledged expert in the integration of rotors into dehumidification systems and air handlers.



The Humidity Expert



Suggested Specification Guide:

Dehumidifier shall be of a type proven in satisfactory operation for a minimum of ten years. Dehumidifier shall be of the non-cycling sorption type with a single desiccant rotary structure. The casing will be fabricated as a unitized body with welded aluminum construction for maximum strength and durability. Suitable access panel shall allow access for inspection or servicing without disconnecting ducting or electrical wiring. Airflow balancing dampers to be furnished.

The rotary structure shall be a monolithic fabricated extended surface consisting of inert silicates reinforced with uniform diameter glass fibers for maximum strength. The fabricated structure shall be smooth and continuous in the direction of airflow without interruptions or sandwich layers which restrict airflow or create a leakage path at joining surfaces. Desiccant shall not channel, cake or fracture due to repeated temperature and moisture cycling. The materials of construction shall be non-toxic and NFPA 255-ASTM E84 compliant.

Full face contact pressure seals shall be provided to separate the process and reactivation air streams and eliminate detrimental leakage of air or moisture with static pressure differentials of up to 3" of water gauge.

Dehumidifier shall be factory assembled, fully automatic, complete with HoneyCombe desiccant wheel, reactivation heaters, reactivation energy control system, roughing filters, industrial drive motor, fans, non-ratcheting desiccant drive unit, automatic controller and all components' auxiliaries. Reactivation energy modulation shall be stepless solid state proportioning type. Dehumidifier shall be functionally tested at the manufacturer's factory and shipped complete with all components necessary to maintain normal operation.

**Continual engineering and research for product improvement may result in design and specification changes. Consult factory for certified technical data.*

Munters Corporation
Dehumidification Division - Industrial
79 Monroe Street
Amesbury, MA 01913
Tel: (978) 241-1100 or (800) 843-5360
Fax: (978) 241-1214
www.munters.us

M162007 Rev.4 5/06
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Technical Specifications*

Utilities: 220/1/60, 220/3/60, 460/3/60 ±10%

Process Volume: 150-300 scfm

Max Reactivation Volume: 100 scfm

Max Reactivation Heater:
HC-300 = 6kW

Maximum FLA:
HC-300 = 33A @ 220V/1/60Hz
HC-300 = 19A @ 230V/3/60Hz
HC-300 = 9.7A @ 460V/3/60Hz

Process Air Blower: E.S.P. 1.75" W.G.
Reactivation Air Blower: E.S.P. 1.25" W.G.

Max dBA: 75 (3 feet from dehumidifier except in path of air flows)

Washable metal roughing filters

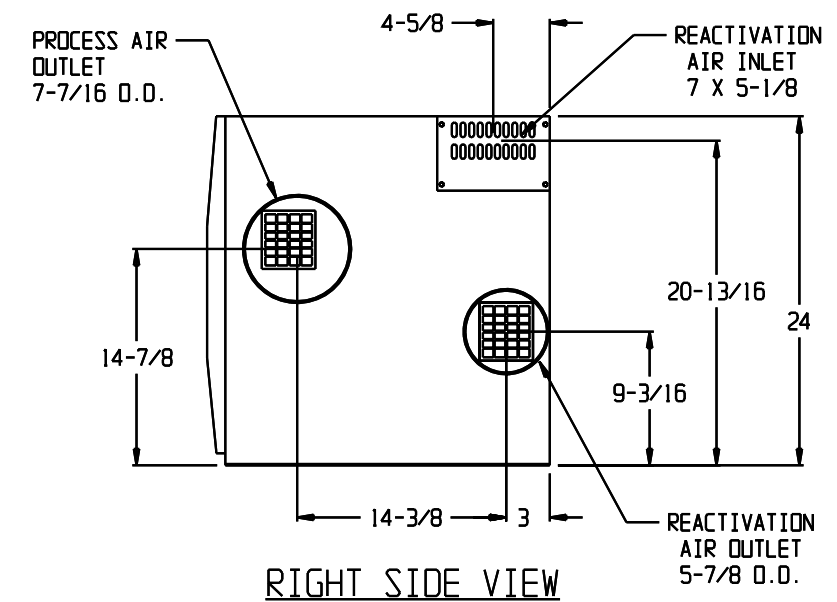
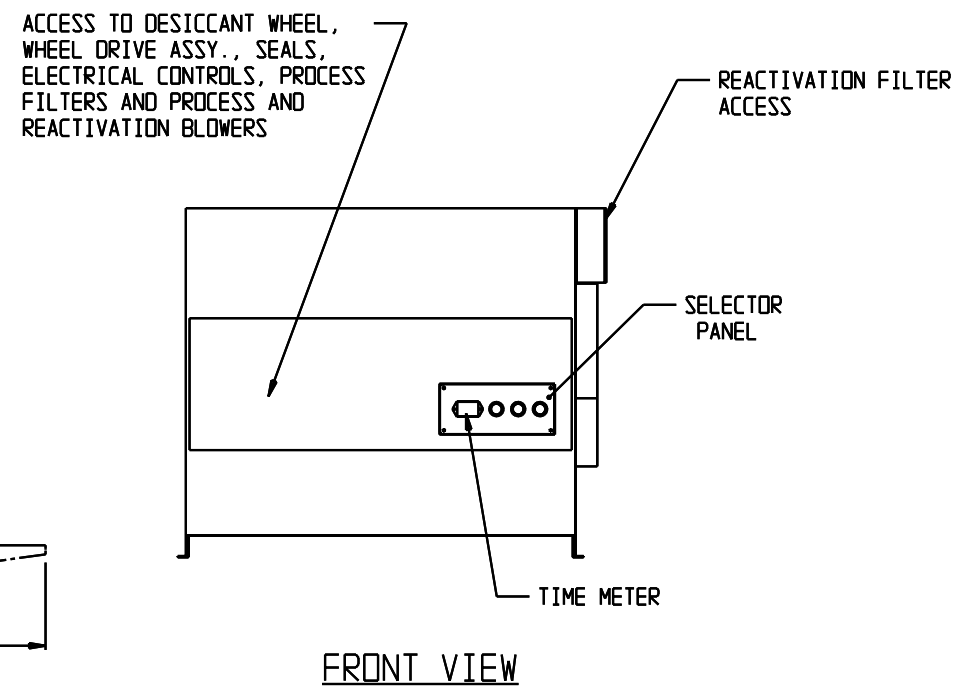
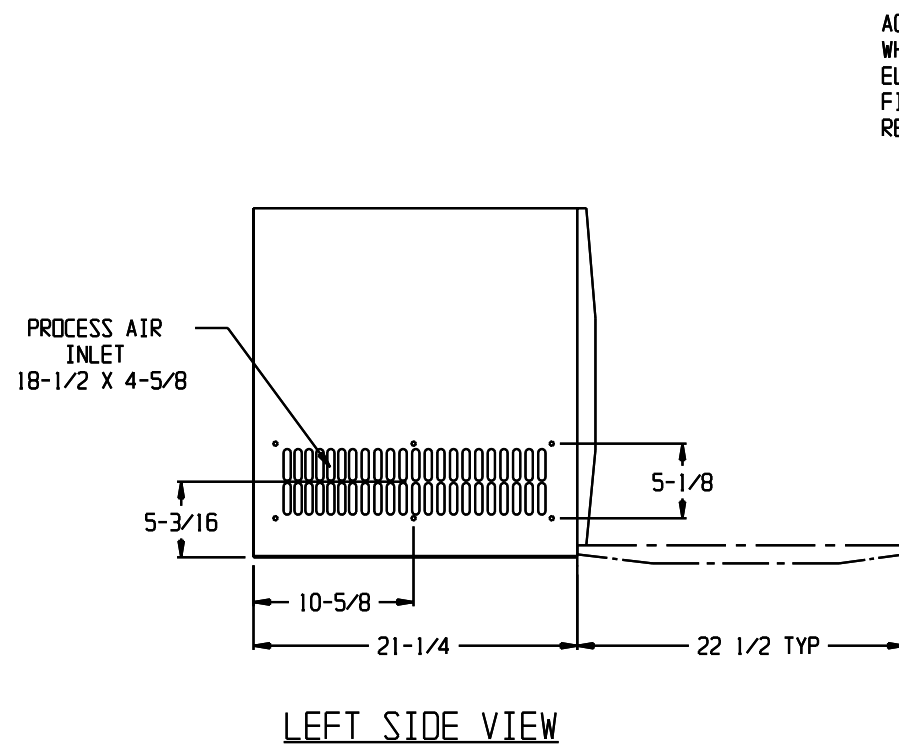
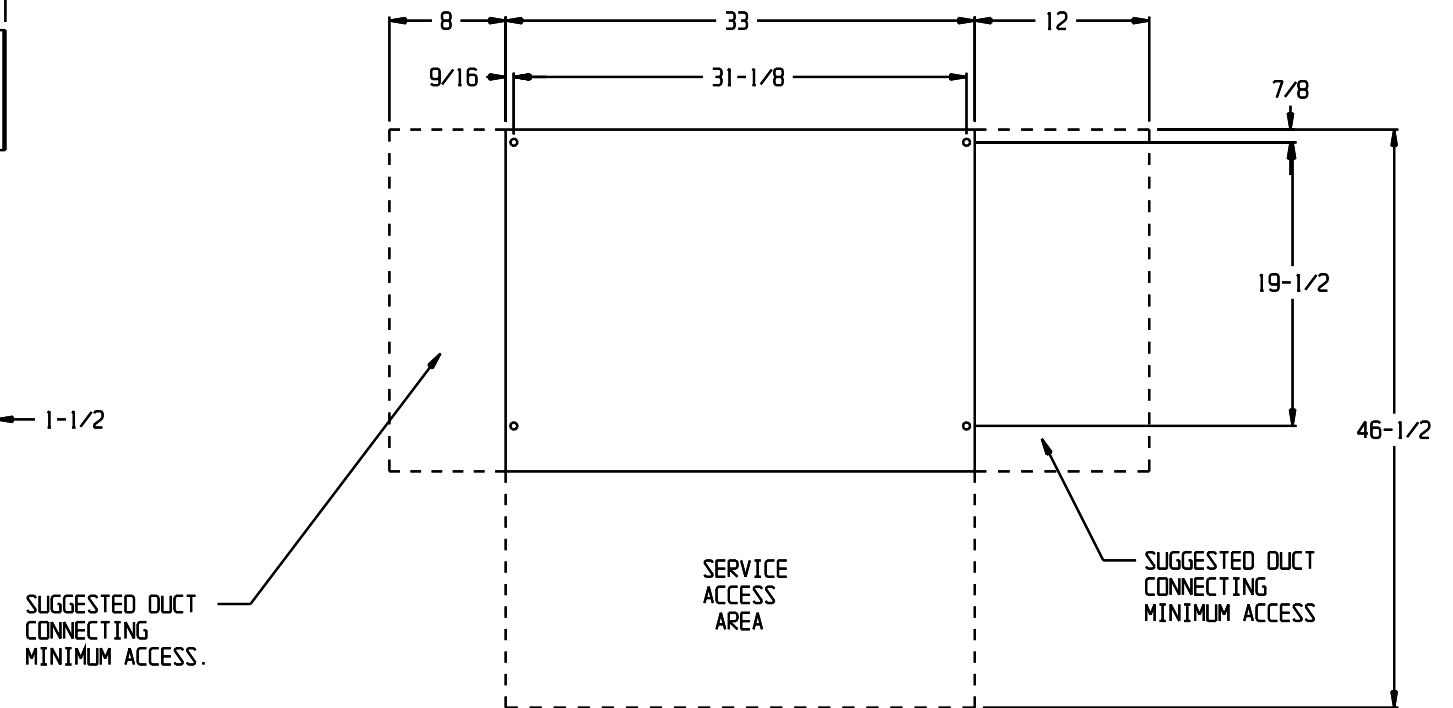
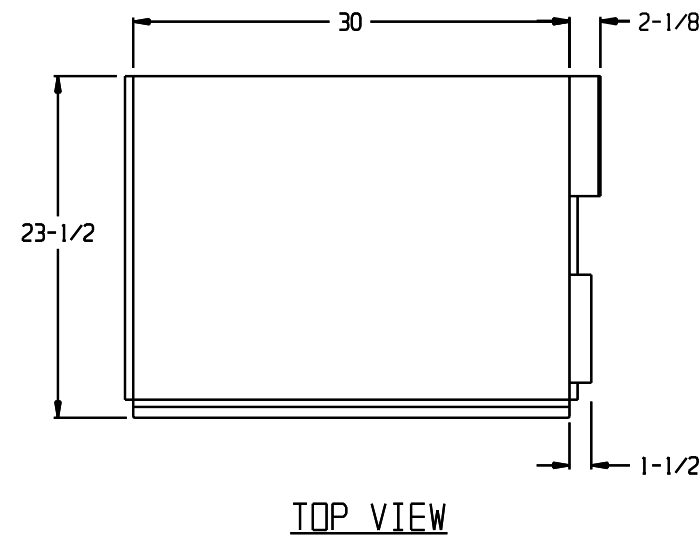
Options:

- Humidistat for on/off control
- Constant process blower
- Process inlet transitions for round duct




The Humidity Expert

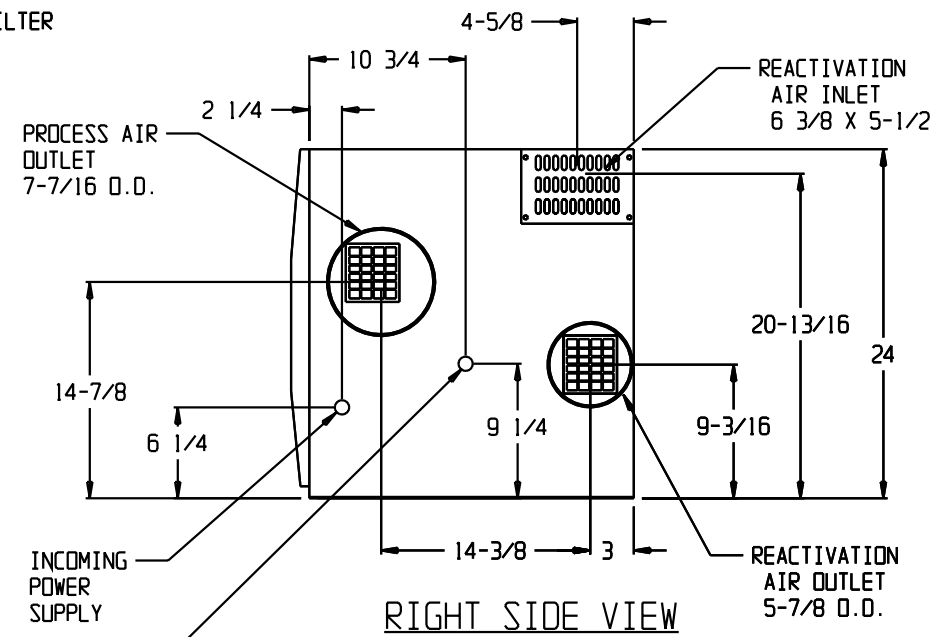
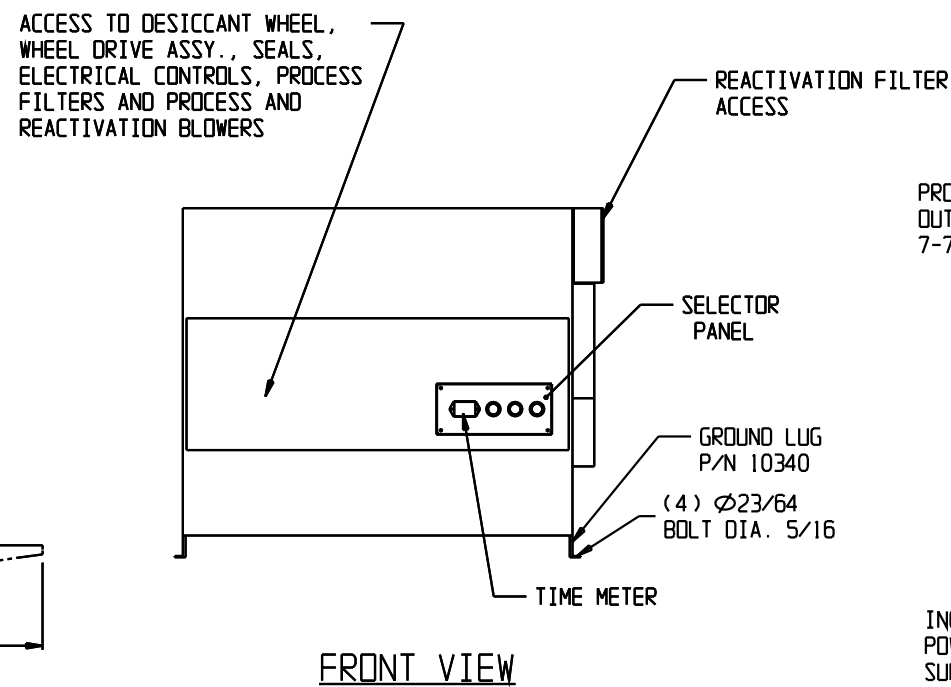
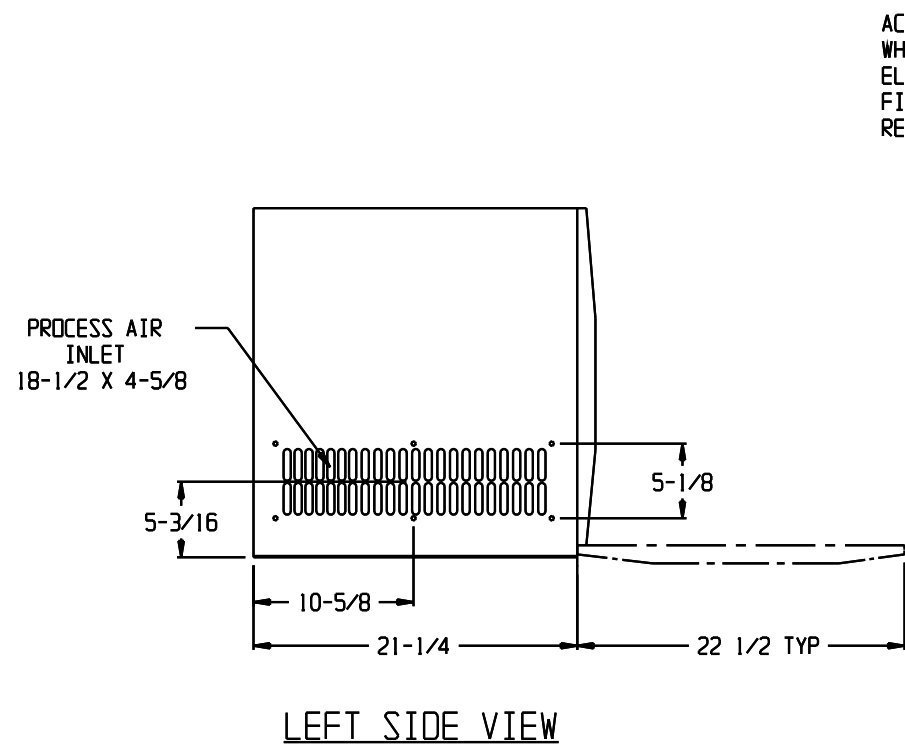
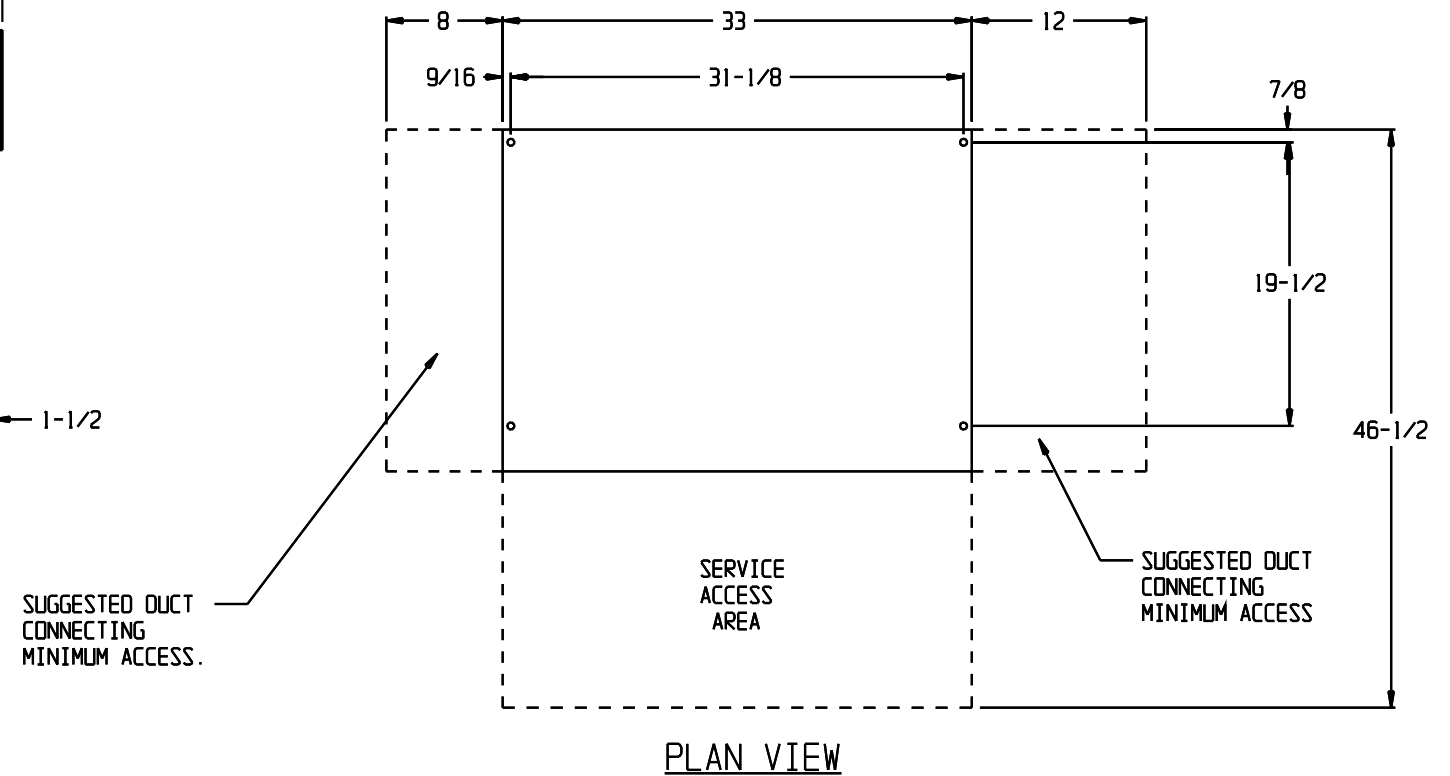
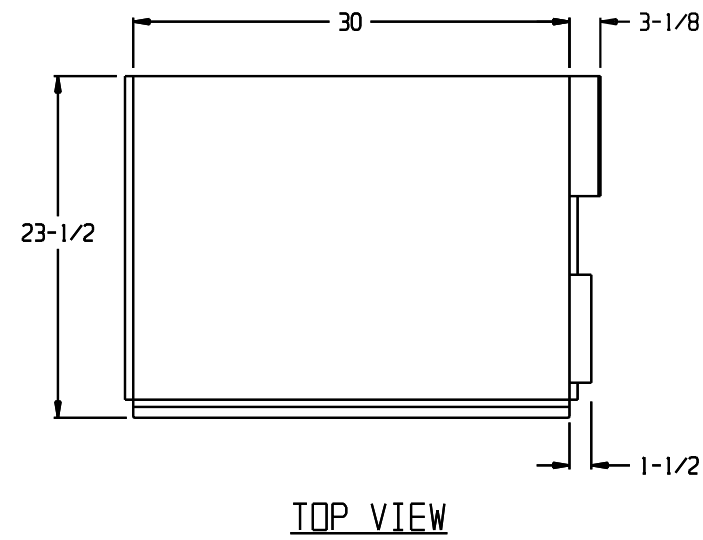
REVISIONS					
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1		REVISED TO SHOW NEW CONTROL PANEL	4/95	GG	E.J.L. E.J.L.
2		UPDATED TO NEW BORDER	12/9/98	TAB	
3		ADDED PAGE 2 W/GROUND LUG NOTE & 23/64 DIA. WEIGHT WAS 300 LBS.	04/6/05	RRO	E.J.L. E.J.L.
4		REVISED -02 PER AS BUILT	4/15/05	TJM	E.J.L. E.J.L.



ESTIMATED WEIGHT - 150 LBS.

PART NO. 74119-01

CONFIDENTIALITY STATEMENT THE TECHNICAL INFORMATION AND DESIGN DATA DISCLOSED HEREIN CONSTITUTE PROPRIETARY INFORMATION OF MUNTERS CORPORATION - CARGOCAIRE DIVISION AND ARE TO BE MAINTAINED IN STRICT CONFIDENCE. THIS INFORMATION IS FOR THE SOLE USE OF OUR CUSTOMERS AND END USERS OF OUR EQUIPMENT.	Job No. 30561	Date	 Munters Cargocaire 79 Monroe St. Amesbury, Ma 01913 TEL 978-241-1100 FAX 978-241-1214	
	Customer			GENERAL ASSEMBLY HC-300
	Dr. By: G.N.G.	11/22/93	SCALE	SHEET
	Ch. By: KHY	11/22/93	1:12	1 of 2
Apr. By: KHY	11/22/93	SIZE	B	
		REV	4	



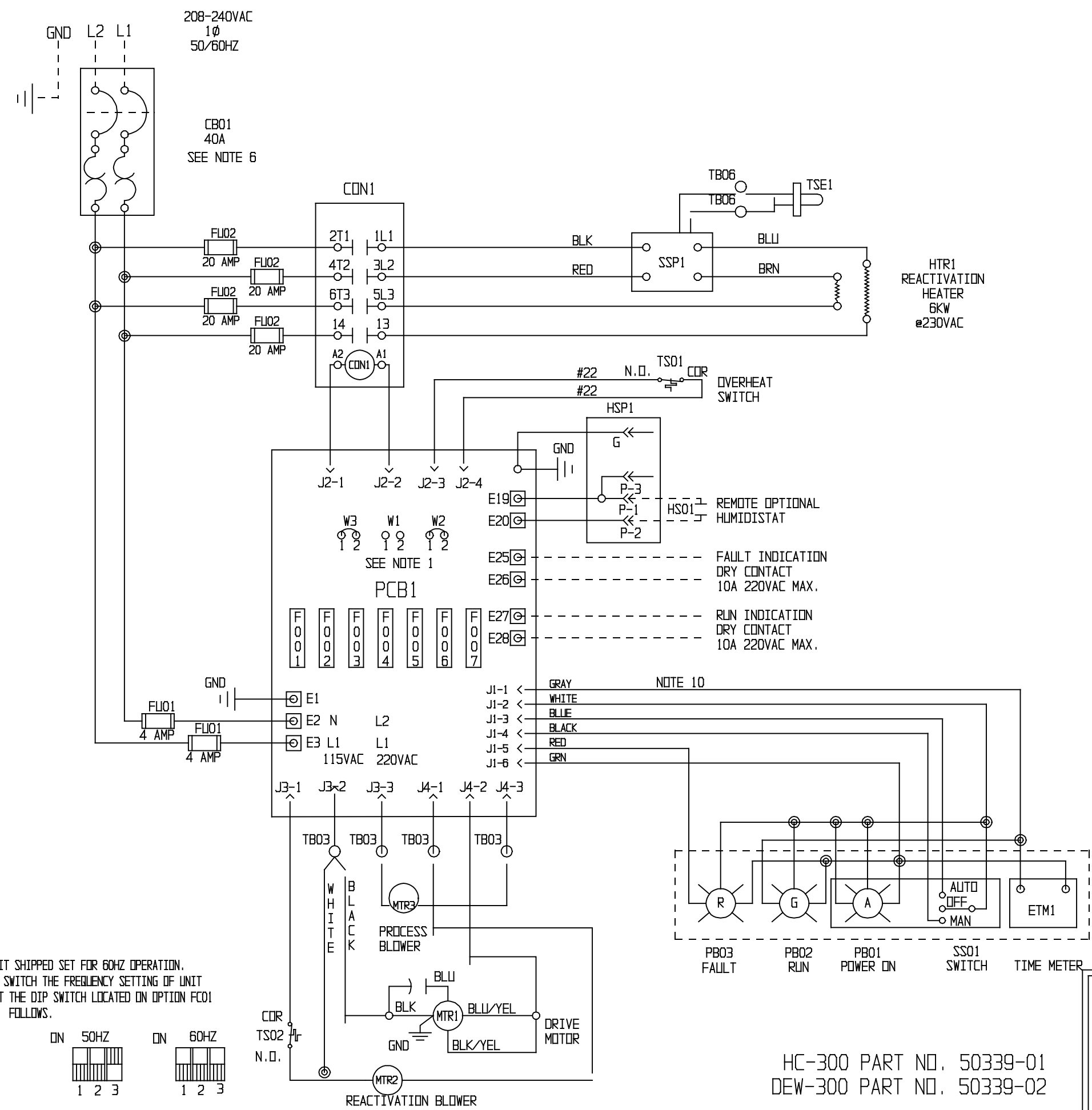
ESTIMATED WEIGHT - 150 LBS.

PART NO. 74119-02

TAG# LSC-M-016

<p>CONFIDENTIALITY STATEMENT</p> <p>THE TECHNICAL INFORMATION AND DESIGN DATA DISCLOSED HEREIN CONSTITUTE PROPRIETARY INFORMATION OF MUNTERS CORPORATION - CARGOCAIRE DIVISION AND ARE TO BE MAINTAINED IN STRICT CONFIDENCE. THIS INFORMATION IS FOR THE SOLE USE OF OUR CUSTOMERS AND END USERS OF OUR EQUIPMENT.</p>	Job No. 30561	Date	<p>Munters Cargocaire 79 Monroe St. Amesbury, Ma 01913 TEL 978-241-1100 FAX 978-241-1214</p>	
	Customer			GENERAL ASSEMBLY HC-300
	Dr. By. G.N.G.	11/22/93	SCALE	SHEET
	Ch. By. KHY	11/22/93	1:12	2 of 2
Apr. By. KHY	11/22/93	SIZE	B	
			74119	REV 4

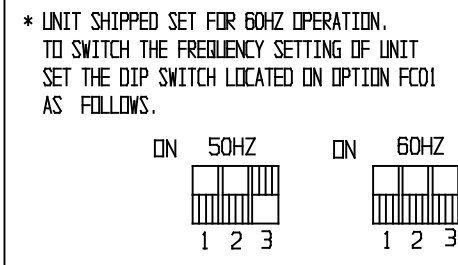
Revisions					
Rev	Description	Date	Dft	Chk	App
0	SAME 50191R2 W/O FAN SPEED CONTROL.	10/97	YL	EAC	EAC
1	UPDATED DRIVE MOTOR TO BODINE	01/09/01	CJT	EAC	EAC
2	ADDED TB03, TB06	01/02/02	EAC	KPW	EAC
3	CHANGED FU01 FROM 10 TO 4 AMPS	9/3/03	GJM	KPW	GJM
4	NOTE 10 WAS #22 AWG	6/12/07	TLB	KPW	TLB



- PRINTED CIRCUIT BOARD POWER.
FOR 115VAC JUMPER W3 1 TO 2 AND W2 1 TO 2.
FOR 220VAC JUMPER W1 1 TO 2 ONLY.
- COMPONENTS SHOWN DOTTED ARE AVAILABLE AS OPTIONS FROM C.E.C.
- ELECTRICAL COMPONENTS - REFER TO ELECTRICAL PARTS LIST.

SYM	DESCRIPTION	SYM	DESCRIPTION
A	AMBER, INDICATOR LIGHT, POWER ON	LS	ROTATION LIMIT SWITCH (OPTIONAL)
CB	CIRCUIT BREAKER, MAIN LINE	MTR	MOTOR
CON	CONTACTOR, ELECTRIC HEATER	PB	PUSHBUTTON
DPS	DIFFERENTIAL PRESSURE SWITCH	PCB	PRINTED CIRCUIT BOARD
E	TERMINAL, SPADE TYPE	R	RED, INDICATOR LIGHT, FAULT
ETM	ELAPSED TIME METER	SSP	SOLID STATE POWER CONTROLLER
F	FUSE (PCB)	TB	TERMINAL BLOCK
FU	FUSE	TS	THERMISTAT
G	GREEN, INDICATOR LIGHT, RUNNING	TSE	THERMISTER
HS	HUMIDISTAT	SS	SELECTOR SWITCH
HSP	HUMIDISTAT PLUG		
HTR	HEATER ELECTRIC, REACT. AIR		
J	JUMPER		

- FOR ELECTRICAL WIRE SIZING DATA.
A. STANDARD. A72001
B. CANADIAN. A72011
- PROTECTIVE DEVICES HAVE BEEN PRESET AND RECORDED AT FACTORY.
- EARTH GROUND IS TO BE INSTALLED (NOT BY C.E.C.) BEFORE ENERGIZING EQUIPMENT.
- BEFORE EQUIPMENT START-UP, REVIEW OPERATING AND MAINTENANCE MANUAL PROVIDED WITH UNIT.
- SEE ELECTRICAL PARTS LIST FOR COMPONENT SPECIFICATION.
- NC = NORMALLY CLOSED, NOF = OPEN ON FALL.
NO = NORMALLY OPEN, OOR = OPEN ON RISE.
- ALL WIRING FROM J1 TO DEVICES IS TO BE #18 AWG.



HC-300 PART NO. 50339-01
DEW-300 PART NO. 50339-02

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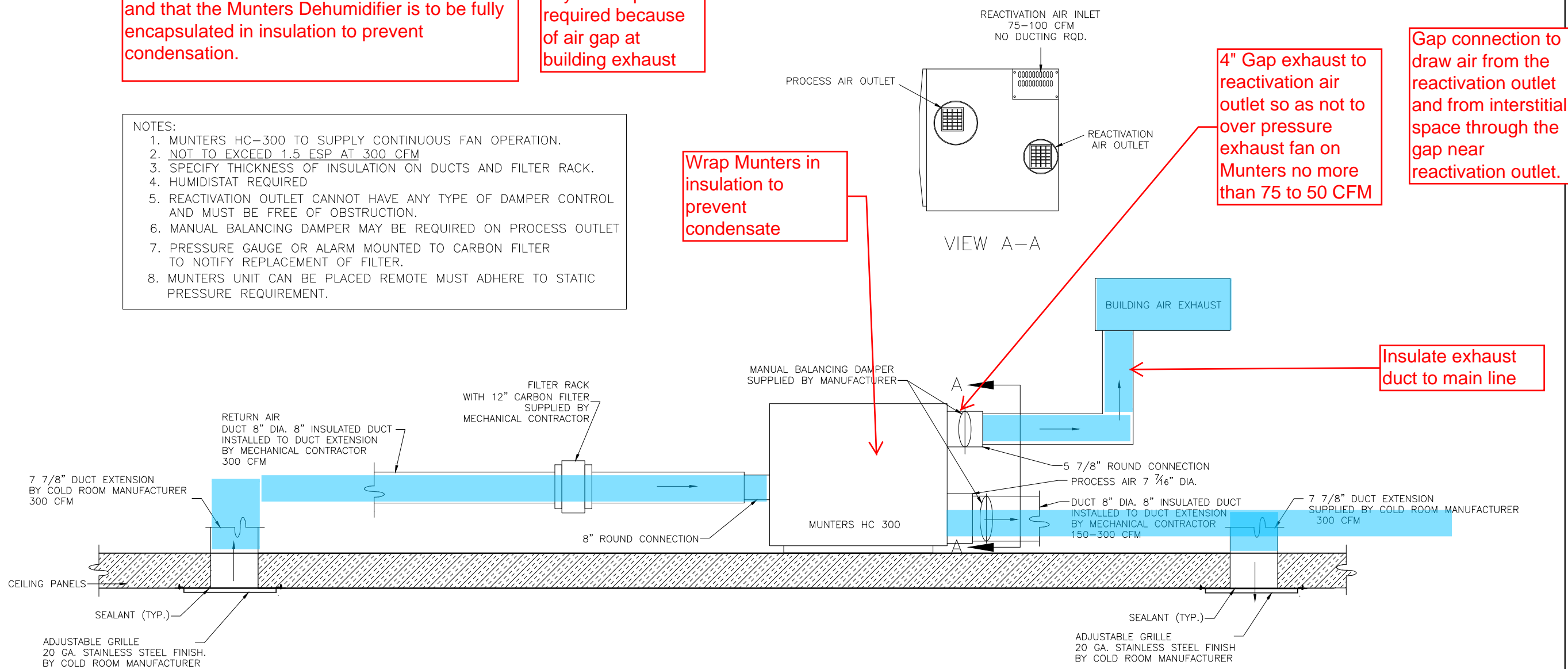
Job No.	STD	Date		Munters Cargocaire 79 Monroe St. Amesbury, Ma 01913 TEL 978-388-0600 FAX 978-388-0292			
Customer							
Dr. By.	Y.L.	10/97	WIRING DIAGRAM				
Ch. By.	BJK	10/97	DEW/HC-300				
Aprv. By.	BJK	10/97	208-240VAC 1Ø 50/60HZ				
SCALE	NTS	SHEET	1 of 1	SIZE	B	REV	4

REVISIONS				
REV.	DCN	DESCRIPTION	DATE	APPROVED
-	-	-----	11/16/11	PV/

Mechanical engineer to specify as provided by Div. 22 subcontractor the blue highlighted ducts, the carbon filter, insulation on all ducting and that the Munters Dehumidifier is to be fully encapsulated in insulation to prevent condensation.

Mechanical engineer to verify if any makeup air is required because of air gap at building exhaust

- NOTES:
1. MUNTERS HC-300 TO SUPPLY CONTINUOUS FAN OPERATION.
 2. NOT TO EXCEED 1.5 ESP AT 300 CFM
 3. SPECIFY THICKNESS OF INSULATION ON DUCTS AND FILTER RACK.
 4. HUMIDISTAT REQUIRED
 5. REACTIVATION OUTLET CANNOT HAVE ANY TYPE OF DAMPER CONTROL AND MUST BE FREE OF OBSTRUCTION.
 6. MANUAL BALANCING DAMPER MAY BE REQUIRED ON PROCESS OUTLET
 7. PRESSURE GAUGE OR ALARM MOUNTED TO CARBON FILTER TO NOTIFY REPLACEMENT OF FILTER.
 8. MUNTERS UNIT CAN BE PLACED REMOTE MUST ADHERE TO STATIC PRESSURE REQUIREMENT.



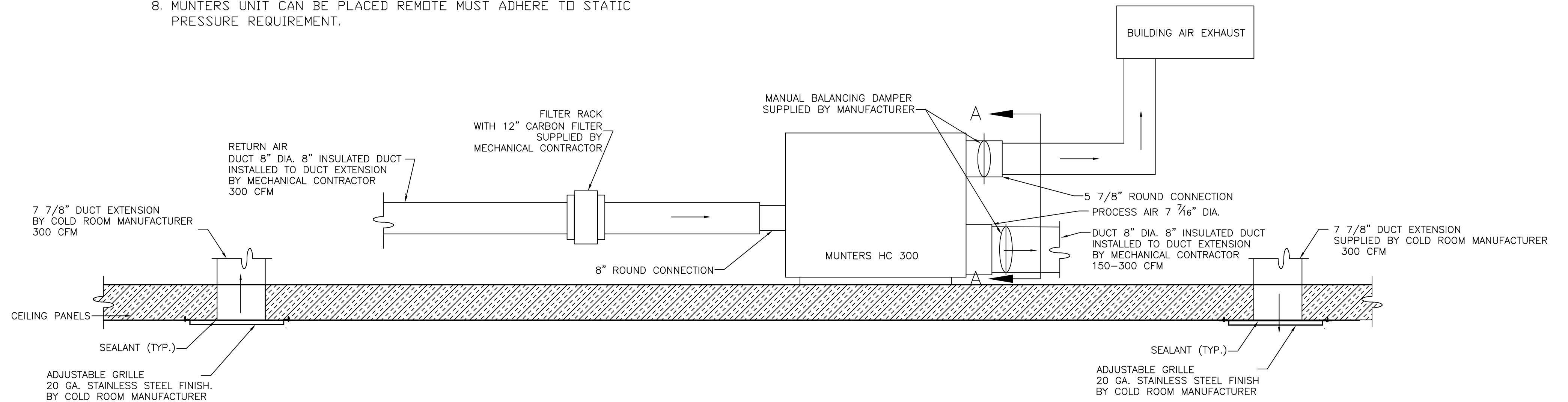
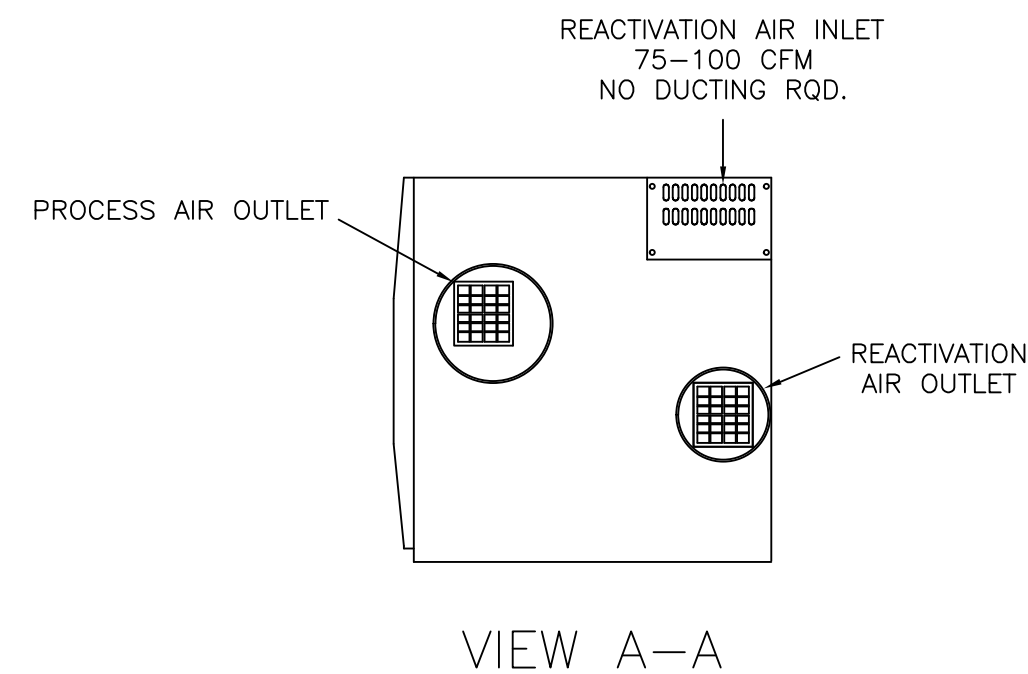
RETURN DRY AIR CONNECTION DETAIL

CUSTOMER:	APPROVAL	MATERIAL	<p>MORTECH, MFG. 411 North Aerojet Avenue Azusa, California 91702 (626) 334-1471 www.mortechmfg.com</p>
PROJECT:	SIGNATURE:	FINISH	
	DATE:	SCALE	
THE LIMITED RIGHT PROVISION		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES/TOLERANCES ARE:	
MATERIAL AND INFORMATION DISCLOSED HEREON WAS ORIGINATED WITH AND IS PROPRIETARY DATA OF MORTECH MANUFACTURING PROVIDED ON LOAN AND IN CONFIDENCE FOR REFERENCE PURPOSES OR TO FACILITATE ADDITIONAL ORDERS BUT NOT SUBJECT TO USE FOR PURPOSES OTHER THAN IN PLANT INFORMATION AND NO DISCLOSURE, USE, OR DUPLICATION THEREOF SHALL BE MADE FOR PROCUREMENT OR MANUFACTURING PURPOSES WITHOUT WRITTEN PERMISSION.		FOR SHEET METAL WHOLE NO. AND FRACTIONS = ±1/6 .XX = ±.125 ANGLE = ±0°30'	FOR MACHINE PARTS WHOLE NO. AND FRACTIONS = ±1/6 .XX = ±.01 .XXX = ±.005 ANGLE = ±0°30'
		SHEET	TITLE
		1 OF 1	MUNTERS HC 300 DEHUMIDIFIER CONNECTION DETAIL RETURN
		DATE	DATE
		PETE V.	11/16/11
SIZE	DWG. NO.	REV.	
B		-	

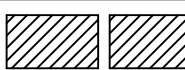
REVISIONS				
REV.	DCN	DESCRIPTION	DATE	APPROVED
-	-	-----	11/16/11	PV/

NOTES:

1. MUNTERS HC-300 TO SUPPLY CONTINUOUS FAN OPERATION.
2. NOT TO EXCEED 1.5 ESP AT 300 CFM
3. SPECIFY THICKNESS OF CLOSED CELL INSULATION ON DUCTS, FILTER RACK AND UNIT.
4. HUMIDISTAT REQUIRED
5. REACTIVATION OUTLET CANNOT HAVE ANY TYPE OF DAMPER CONTROL AND MUST BE FREE OF OBSTRUCTION. RECOMMENDED TO BE DUCTED OUT OF BUILDING.
6. MANUAL BALANCING DAMPER MAY BE REQUIRED ON PROCESS OUTLET
7. PRESSURE GAUGE OR ALARM MOUNTED TO CARBON FILTER TO NOTIFY REPLACEMENT OF FILTER.
8. MUNTERS UNIT CAN BE PLACED REMOTE MUST ADHERE TO STATIC PRESSURE REQUIREMENT.



RETURN DRY AIR CONNECTION DETAIL

CUSTOMER:	APPROVAL	MATERIAL	 MORTECH, MFG. 411 North Aerojet Avenue Azusa, California 91702 (626) 334-1471 www.mortechmfg.com
PROJECT:	SIGNATURE: _____ DATE: _____	FINISH	
		SCALE	
THE LIMITED RIGHT PROVISION MATERIAL AND INFORMATION DISCLOSED HEREON WAS ORIGINATED WITH AND IS PROPRIETARY DATA OF MORTECH MANUFACTURING PROVIDED ON LOAN AND IN CONFIDENCE FOR REFERENCE PURPOSES OR TO FACILITATE ADDITIONAL ORDERS BUT NOT SUBJECT TO USE FOR PURPOSES OTHER THAN IN PLANT INFORMATION AND NO DISCLOSURE, USE, OR DUPLICATION THEREOF SHALL BE MADE FOR PROCUREMENT OR MANUFACTURING PURPOSES WITHOUT WRITTEN PERMISSION.		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES/TOLERANCES ARE: FOR SHEET METAL WHOLE NO. AND FRACTIONS = $\pm \frac{1}{16}$.XX = $\pm .125$ ANGLE = $\pm 0^{\circ}30'$ FINISH PER ANSI B46.1 $\sqrt{125}$, THREADS PER FED-STD-H32	
		TITLE MUNTERS HC 300 DEHUMIDIFIER CONNECTION DETAIL RETURN	
		DRAWN PETE V. DATE 11/16/11	
		SHEET 1 OF 1	REV. —
		SIZE B	DWG. NO.



Munters

OPERATING AND MAINTENANCE MANUAL

MODEL: HC-300 / DEW-300

Section 1

- a) Operating and Maintenance Text

Section 2

- a) General Arrangement Drawing 74119
- b) Wiring Diagram 208-240 /1/ 50/60 50339
- c) Wiring Diagram 208-240 /3/ 50/60 50340
- d) Wiring Diagram 380-415 /3/ 50/60 50341
- e) Wiring Diagram 460 /3/ 50/60 50342
- f) Wiring Diagram 208-240 /3/ 50/60 50344

Section 3

- a) Replacing Fusible Links
- b) Humidistat Field Connections 26992
- c) Blastgate Installation Instructions 27110
- d) Recommended Spare Parts List 21239



OPERATING AND MAINTENANCE MANUAL MODEL HC-300 DEHUMIDIFIER

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1 - INTRODUCTION

Your HC-300 dehumidifier is durable, simple to operate, and needs very little maintenance. The HC-300 can give you years of trouble-free service if you follow the recommendations listed in this manual.

We strongly recommended that you read this whole manual. This should not take very long. In return, you will learn how your dehumidifier works, and how to get the best service from your unit.

If you do not understand something in this manual, or you have a question about your dehumidifier, please call Munters at (978) 241-1100 or send a fax to (978) 241-1217. Ask to speak with one of our Technical Support people.

1.1 DEHUMIDIFIER OPERATING PRINCIPLE

Figure 1-1 shows how the HC-300 removes moisture from the air. The heart of the system is the HoneyCombe® wheel. The detail in Fig. 1-1 shows the structure of the wheel. As you can see, the wheel has a series of air passages or channels. The passages inside the wheel are coated with a special substance called a “desiccant.” When this substance contacts damp air, it soaks up moisture. When the desiccant is heated, it releases the moisture again.

Let’s say that you want to dry the air in a storage room, using the HC-300. Damp “process” air is pulled into the unit from the storage room. The desiccant in the HoneyCombe® wheel picks up most of the moisture in the air. Once it has been “dried out,” the process air is vented back into the storage room. At this point, the moisture has been taken out of the process air, and “stored” in the HoneyCombe® wheel.

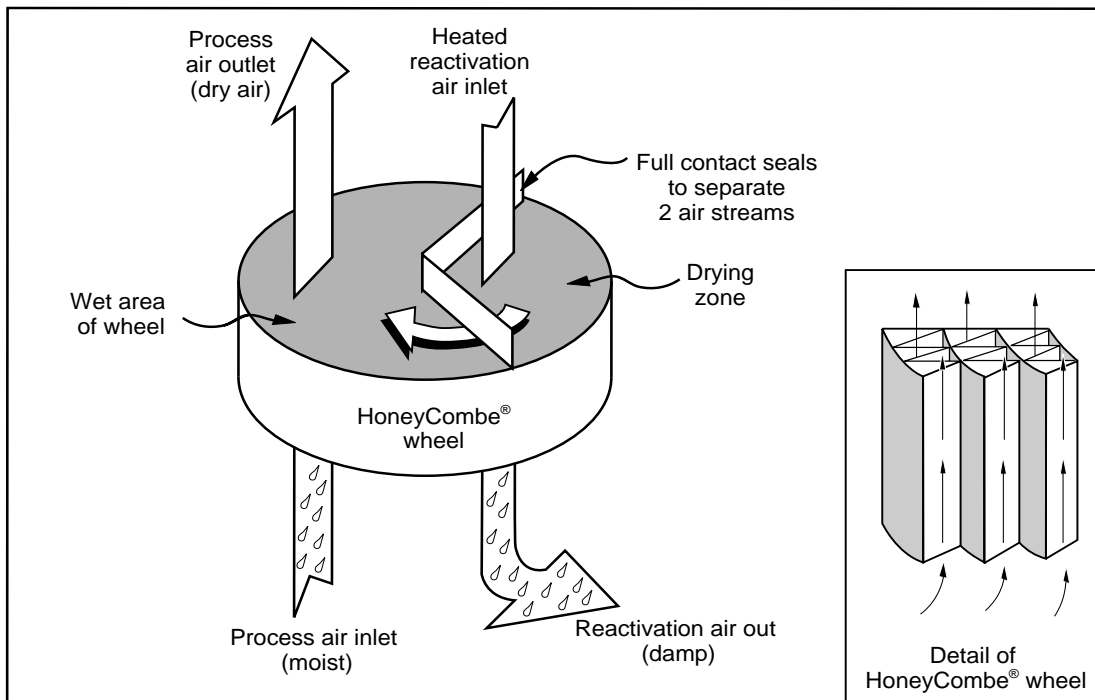


FIGURE 1-1
OPERATING PRINCIPLE

J140

The next job is to move this moisture out of the wheel. As we said, the desiccant will give up moisture when it is heated. When it is heated, and the moisture released, we say it is “reactivated.” In the HC-300, a stream of “reactivation” air is taken from outside the controlled space and heated using an electric heater. This heated air is forced through the channels in the HoneyCombe® wheel. The desiccant releases the moisture into the heated air stream. Finally, the damp reactivation air is vented outside. At this point, the moisture has been moved from the storage room to the wheel, then from the wheel into the outside air. The process is complete.

You may have noticed that, at one moment, we’re using the wheel to pick up moisture, and a moment later, we’re heating the wheel to drive off the moisture. In the HC-300, both actions are happening at the same time, on different sections of the wheel.

1.2 ABOUT THE HC-300

This is a simplified explanation of the operating principle. Figure 1-2 shows how we put this principle to work in the HC-300. You can still see the parts we discussed in the last Figure – the HoneyCombe® wheel, process air stream and reactivation air stream. We have also added a number of other parts:

- Two sets of seals to separate the two streams of air (damp process air and the heated reactivation air)
- Blower, damper and filter for the process air
- Blower and filter for the reactivation air
- Temperature sensors
- Electric heating elements for the reactivation air

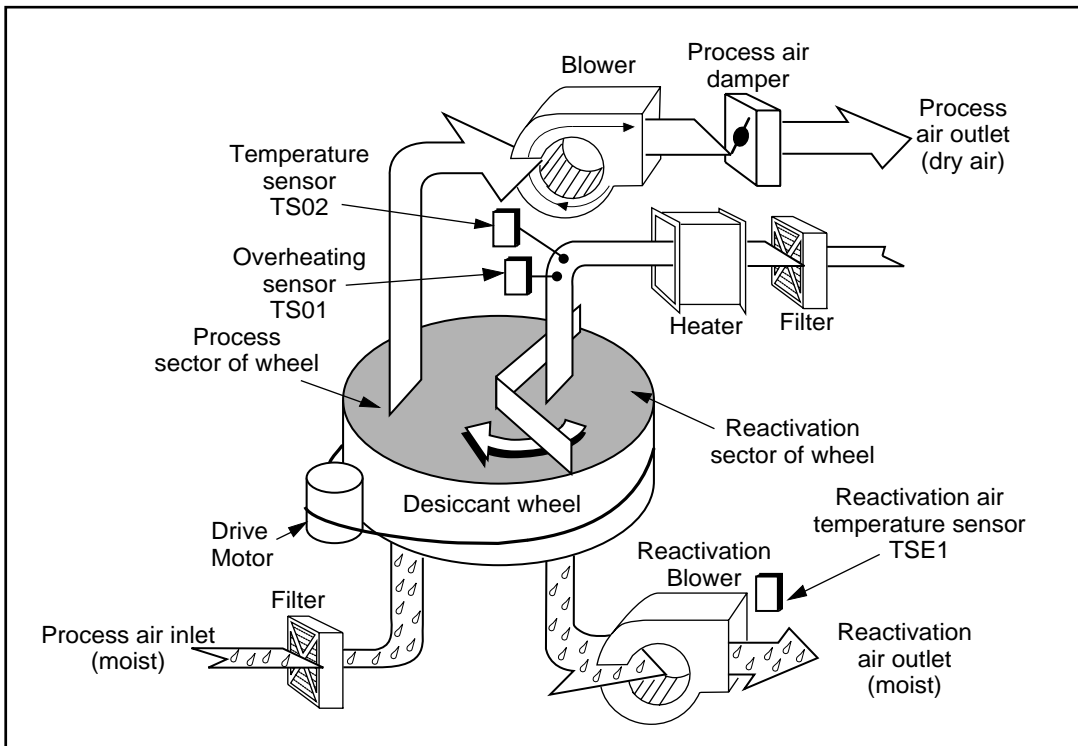


FIGURE 1-2
HC-300 IN OPERATION

04016

Figures 1-3 and 1-4 show some additional parts on the HC-300 unit. The HoneyCombe® wheel is turned by a small drive motor and a toothed belt. A spring-type tensioner automatically adjusts the belt tension.

1.3 CONTROLS AND INDICATORS

The unit has four indicators and controls on the control panel:

Auto/Off/Manual switch:

Auto position (amber) This indicator is on whenever the HC-300 is operating in the automatic mode. The unit is switched on and off by a remote humidistat.

Off position (amber) This indicator is on when the AC power to the unit is on, and it is not running (not set to Auto or Manual). (On shut-down, the heating elements will switch off. The reactivation blower will continue to run to cool down the unit. Once cooled down, the unit will become inactive.)

Manual position (amber) This indicator is on whenever the HC-300 is operating in the manual mode. The unit runs continuously until it is switched off.

Running light (green) This indicator is on whenever the unit is running (the Auto/Off/Manual switch is in the Manual position, or the switch is in the Auto position and the humidistat contacts are closed).

Fault light (red) This indicator is normally off. This light turns on when the unit overheats. See the section on “Troubleshooting.”

Time meter This indicator shows how many hours the unit has operated.

The control system uses a number of sensors and controllers to supervise the activity of the HC-300. A Solid State Power Controller (SSP1) turns the heating elements on and off. This controller responds to a signal from a temperature sensor (TSE1) which is

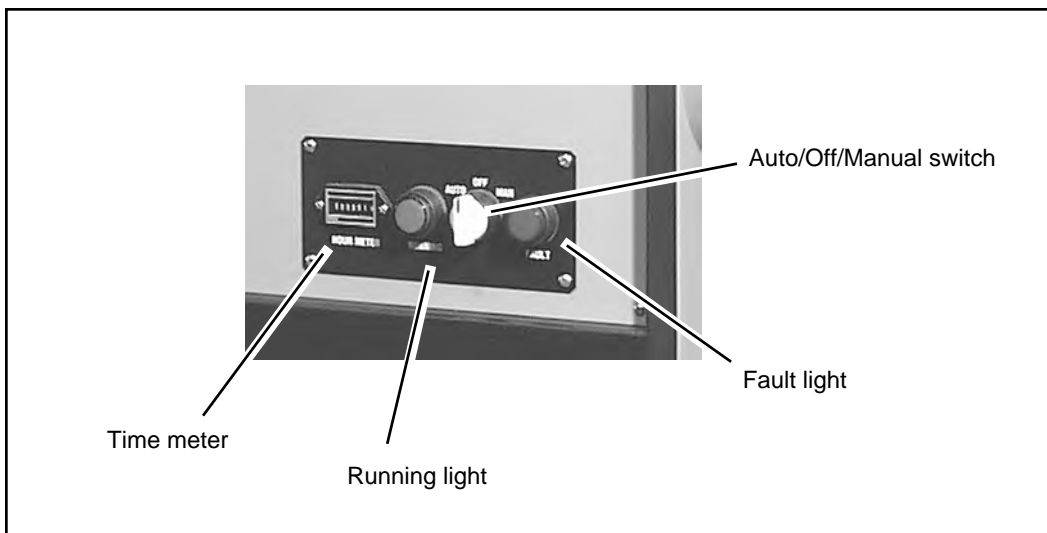


FIGURE 1-3
CONTROLS AND INDICATORS

located in the reactivation air stream after the wheel. This design allows reduced energy consumption at low load levels.

The unit continues to run for a few minutes after the Auto/Off/Manual switch is turned off. This “cool-down” cycle helps to protect the heating elements from overheating. During the cycle, the reactivation blower continues to operate. The “cool-down” period is controlled by a thermostat switch (TS02).

1.4 PROTECTIVE CIRCUITS

The HC-300 has several sensors and circuits which protect the machine and operator from possible problems. A temperature switch (TS01) is located just downstream of the heater. This sensor will tell the control circuits if the elements overheat (temperature above 320°F). If this happens, the Fault indicator will light and the machine will stop. To reset the machine, wait until the unit cools to normal temperature. Turn the Auto/Off/Manual switch off, then on again.

The wiring for each heating element includes a fusible link. This link will open if the element overheats. If this happens, the HC-300 will continue to operate, but will not dehumidify the process air. To correct this, find the cause of the overheat condition and replace the fusible link.

If a blower motor is jammed, it will start to draw a large amount of electrical current. If one of the motors detects this condition, that motor will shut itself down. The rest of the unit will continue to operate, unless an overheat fault is triggered. The affected motor will reset itself automatically.

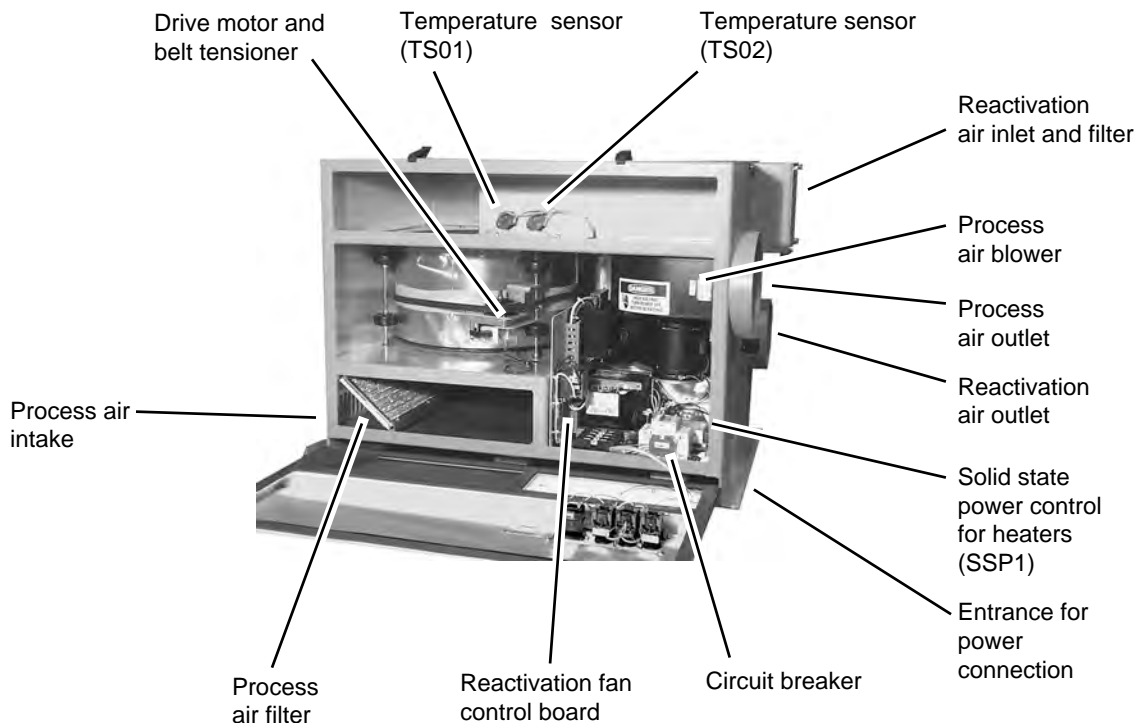


FIGURE 1-4
FRONT VIEW, COVER OPEN

2 - SAFETY NOTES

Munters is concerned about the safety of anyone who uses or services the HC-300 unit. Some of the parts inside the HC-300 can be dangerous if an untrained person tries to service the unit. Throughout this manual, we have pointed out some of the hazards which may occur in the use of the HC-300. We have also listed the precautions which you should take to avoid these problems.

In this manual, we will use three different kinds of messages to warn you of possible problems:



Immediate hazard which will result in severe personal injury or death.



Hazard or unsafe practice which may result in severe personal injury or death.



Hazard or unsafe practice which could result in minor personal injury or property damage.

Please keep these points in mind as you use or service the unit:



The HC-300 is wired for 208V to 480V AC. The unit can produce enough voltage and current to kill you, or cause severe burns. Do not work with the electrical parts unless you are a trained electrician. Always turn off the power before you work inside the unit. There should be a disconnect switch installed outside the unit. Turn off this switch before you do any work. For extra safety, also turn off the circuit breaker inside the unit.



Some HC-300 units are purchased with an optional humidistat. If wired incorrectly, the contacts inside the humidistat may carry a high voltage. This voltage and current can cause serious injury or death. Don't work on the parts inside the humidistat unless you are a trained electrician.

CAUTION

Don't place the HC-300 unit outdoors. The cabinet is not weather-proof. If the unit is mounted outdoors, water may drip into the electrical parts. This may cause an electrical shock hazard.

WARNING

The two blowers inside the HC-300 spin very quickly. Your hand may be hurt if you put it inside a blower while it is turning. Keep your hands away from the blowers while the unit is turned on. Do not run the HC-300 unless both the process and reactivation fans are protected by ductwork or finger guards.

WARNING

There are two conditions which could cause the unit to start without warning:

- When the Auto/Off/Manual switch is set to Auto, the unit may start if the humidistat contacts close.
- The motors on the blowers have internal over-current protection. If one of these blowers is overloaded, the affected motor will turn itself off. This over-current protection will reset automatically, so the blower may start without warning.

You can avoid either kind of problem if you turn off the power before working on the unit.

CAUTION

This type of wheel is washable. It is best to clean the wheel using clean water only. If you must use a detergent, choose a mild type (enzyme or dish-washing detergent). The wheel is sensitive to high pH (base condition). Choose a detergent with a neutral pH. Do not use any solvent to wash the wheel. This will permanently damage the wheel.

PLEASE READ ALL OF THIS MANUAL. PLEASE FOLLOW THE INSTRUCTIONS CAREFULLY AND COMPLETELY. PLEASE PAY PARTICULAR ATTENTION TO THE SAFETY INSTRUCTIONS AND PRECAUTIONS.

3 - INSTALLATION AND START-UP

3.1 INSPECTION

1. When the unit arrives, check immediately for signs of shipping damage. If you do notice any damage, report it to the trucking company right away.
2. Remove the cover on the front of the unit, as shown in Fig. 1-4. Check the following items:
 - Remove the packaging restraints.
 - Be sure the HoneyCombe® wheel is in position.
 - Check the position of the drive belt. The belt should be in good contact with the sheave.
 - Be sure the drive belt and rollers are free of grease.
 - Be sure the HoneyCombe® wheel can be turned by hand with some resistance with the belt removed.
 - Ensure that the process and reactivation air filters are in place.

3.2 POSITIONING THE UNIT

1. Figure 3-1 shows the dimensions of the HC-300 unit. You must allow three clearances around the unit:
 - a 24" space in front of the unit so you can remove and replace the HoneyCombe® wheel
 - a 12" space in front of the process air intake to allow smooth air flow (not necessary if ductwork is installed)
 - a 12" space in front of the reactivation air intake to allow smooth air flow (not necessary if ductwork is installed)

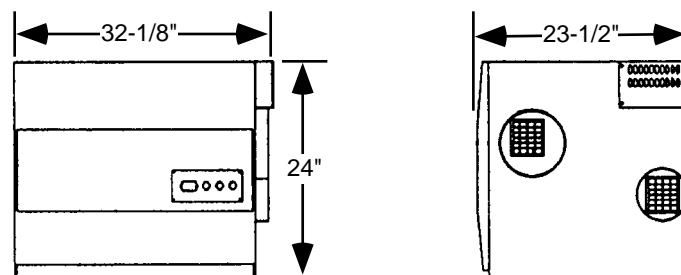


FIGURE 3-1
DIMENSIONS

2. Figures 3-2, 3-3 and 3-4 show three different ways of installing the HC-300.

3. There are some simple rules for arranging the ductwork for the HC-300:

Process air intake Taken from the storage space

Process air outlet Vented to the storage space

Reactivation air inlet Taken from a separate space (not from storage space – don't use dehumidified air)

Reactivation air outlet Vented outdoors (air is very damp - don't use for space heating)

(Note – The reactivation air can also be taken from and returned to an indoor space where the temperature and humidity levels are not important.)

4. Wherever the intake or outlet ducts open outdoors, protect them from the elements. Install weather hoods and bird screens.
5. Do not locate the intake and outlet for the process air too close together. If possible, allow a distance of at least 5 feet. Allow the same distance between the inlet and outlet for the reactivation air.
6. Figure 3-4 shows the set-up if you are installing the HC-300 in a system with an existing air-handling unit. Notice that both sides of the HC-300 are connected upstream of the air-handling unit.

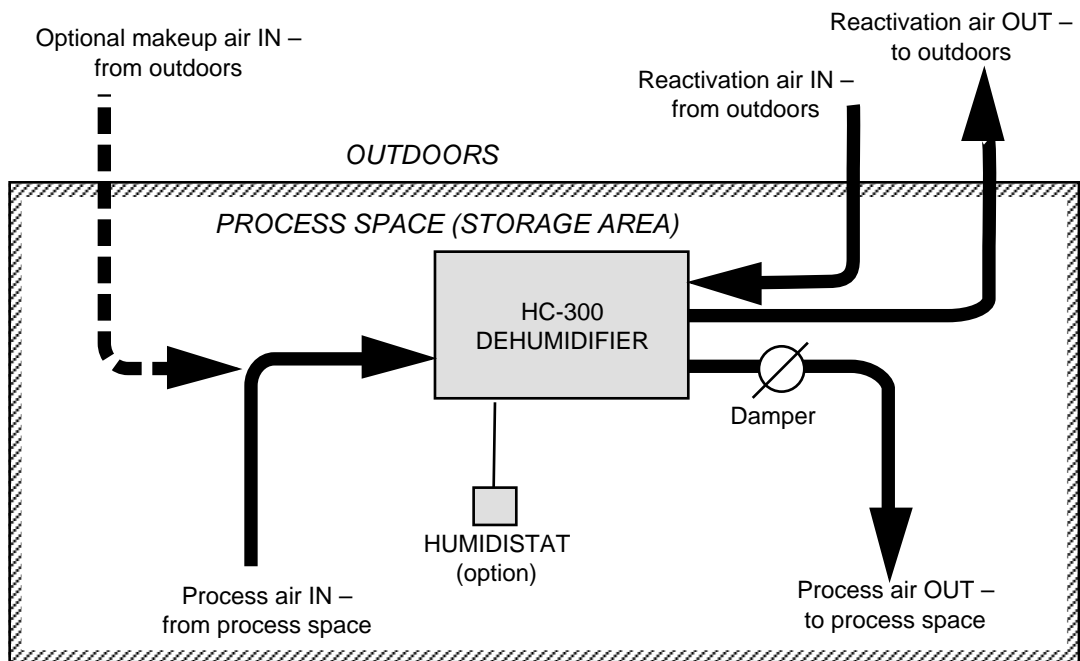


FIGURE 3-2
HC-300 INSTALLED IN PROCESS SPACE

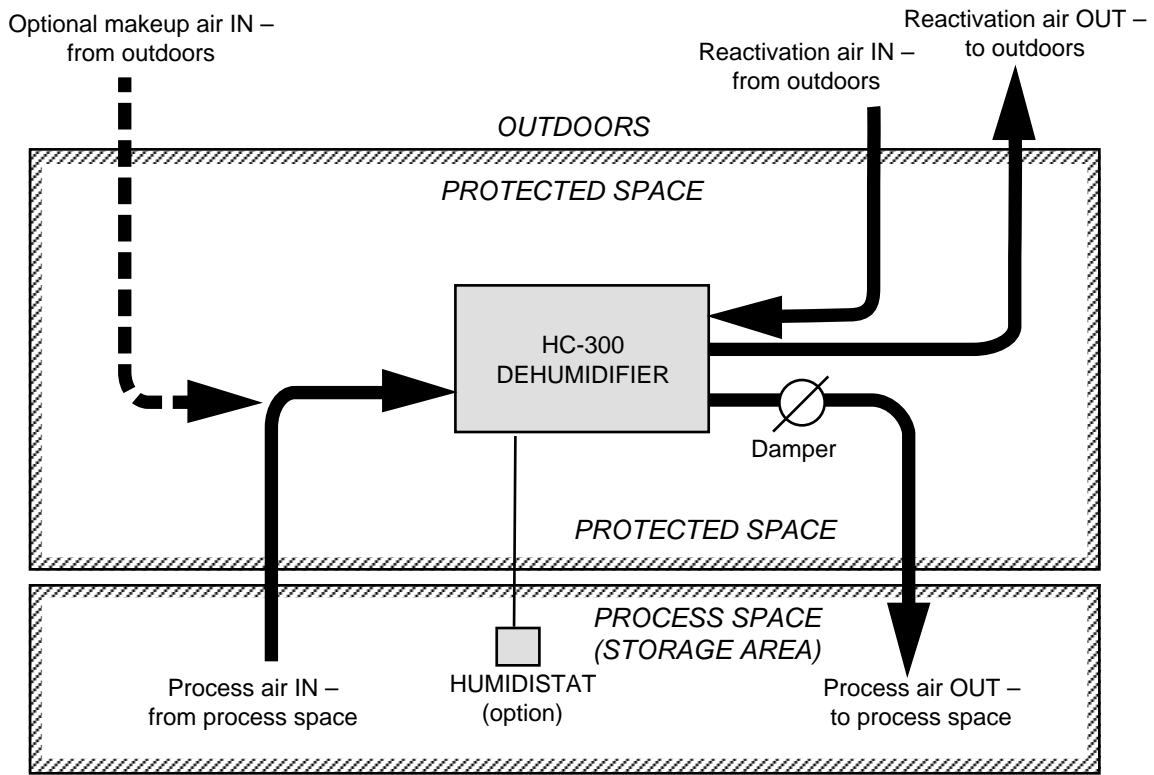


FIGURE 3-3
HC-300 INSTALLED OUTSIDE OF PROCESS SPACE

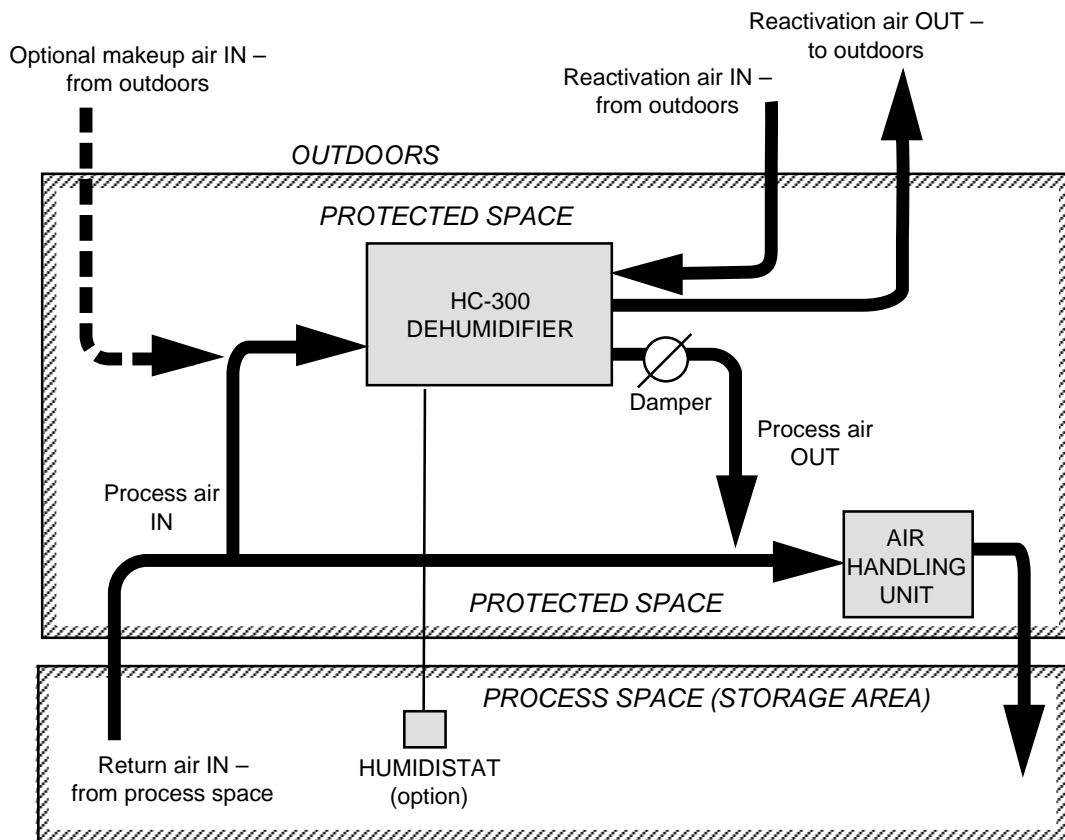
Do not connect the HC-300 so that it bypasses the air-handling unit. See Part A of Fig. 3-5. If you connect the ductwork this way, some of the air from the air-handling unit may be forced back through the HC-300, and the HC-300 will not be able to work correctly.

You may connect both sides of the HC-300 downstream of the air-handling unit, as shown in Part B of Fig. 3-5. The arrangement shown in Fig. 3-4 is better, however. This set-up allows the air-handling unit to heat or cool the processed air after it leaves the HC-300.

7. On some installations, “makeup” air is taken from outside the process space, and added to the process air stream. Unconditioned makeup air can add a moisture load to the HC-300, and this can overload the unit. For recommendations, consult the Service Operations Department at Munters.

3.3 CONNECTING THE DUCTWORK

1. Don't try to operate the unit without ductwork. The unit will not be damaged, but it will not operate correctly without the proper ductwork in place. Figures 3-2, 3-3 and 3-4 show some correct installations. Before you install the ductwork, remove the finger guards from the duct openings.



JS102

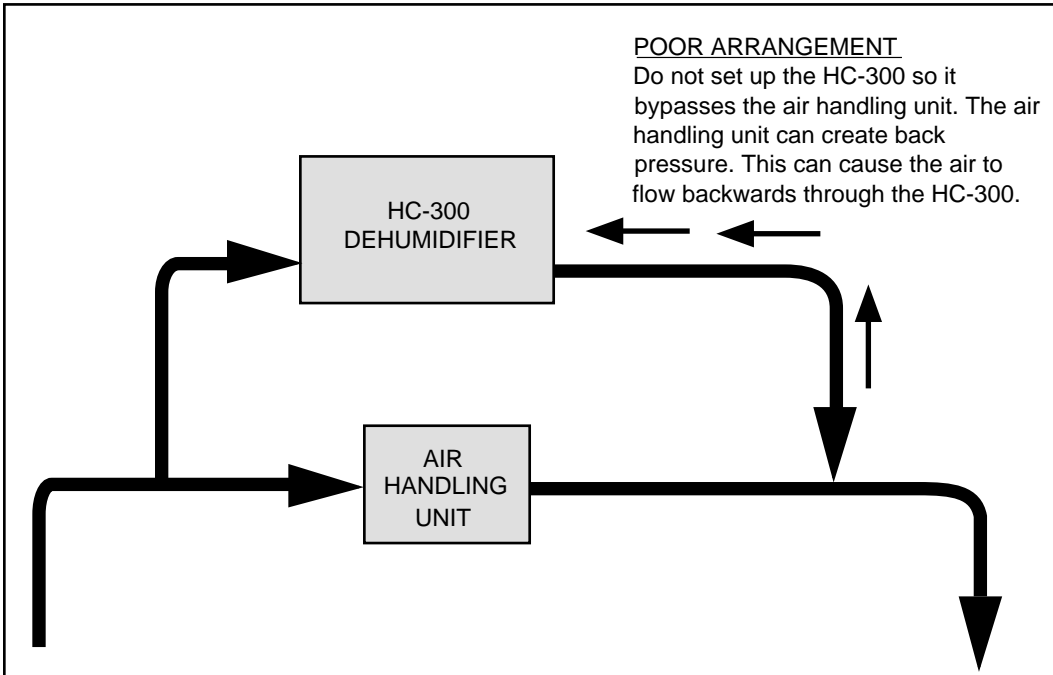
FIGURE 3-4
HC-300 INSTALLED WITH EXISTING AIR-HANDLING UNIT

2. Here are details on the duct connections:

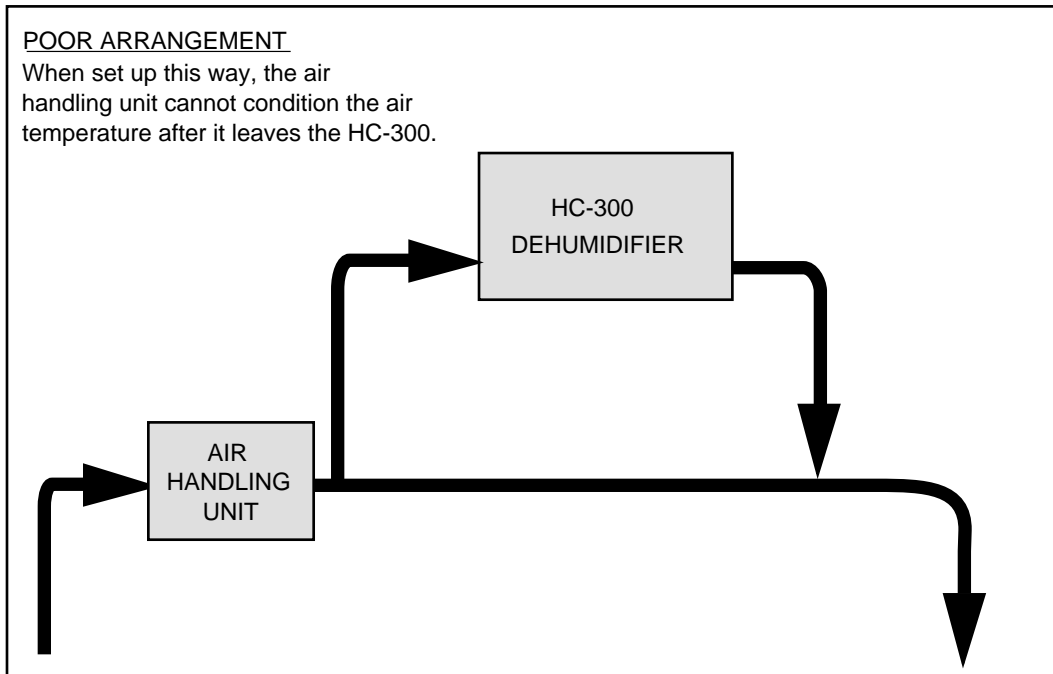
Process intake	if no ducting – allow 12" clearance optional fitting for 8" round ductwork is available
Process outlet	connection to 8" round ductwork add damper downstream of outlet
Reactivation intake	if no ducting – allow 12" clearance optional fitting for 6" round ductwork is available
Reactivation outlet	connection to 6" round ductwork

3. The ductwork for the reactivation air outlet should always be insulated. This will reduce condensation of the moisture in this air stream. Run the reactivation ductwork so that it slopes away from the dehumidifier. This way any condensed moisture will run away from the dehumidifier. On this type of installation, the unit should be installed at least 3 feet above the floor to allow for the slope in the ductwork.

If it is not possible to do this, include a vertical section in the ductwork, connected to the unit via a Tee fitting. Any moisture will collect in the part of the ductwork below the Tee connection. Install a "P" trap to allow a way of draining the moisture.



PART A



PART B

JS103

FIGURE 3-5
DO NOT INSTALL HC-300 THIS WAY

3.4 ELECTRICAL CONNECTIONS



Electrical connections should only be made by a licensed electrician.

1. The HC-300 is designed to operate on single-phase or three-phase AC at 208 to 480V. (Check the nameplate in the unit for the correct voltage and phase.) The customer must provide a disconnect switch on the AC line.
2. Open the front cover of the unit so you can make the wiring connections. Make the AC connections to the “line” side of the circuit breaker.
3. Be sure the chassis of the HC-300 is connected to a good earth ground.
4. Turn on the disconnect switch, and turn on the circuit breaker inside the machine. Open the damper for the process air. To start the unit, set the Auto/Off/Manual switch to the Manual position. Open the front cover and check the rotation of the HoneyCombe® wheel. The wheel should start turning clockwise (when seen from above the wheel).

3.5 CONNECTING THE REMOTE HUMIDISTAT



**Electrical connections should only be made by a licensed electrician.
Check all connections for tightness after 60 days of operation.**

1. In some installations, the HC-300 operates in the manual mode. In this type of installation, the HC-300 operates whenever the Auto/Off/Manual switch is set to Manual. Other units are set up for automatic cycling. In an installation of this type, the HC-300 is controlled by a device called a humidistat. The humidistat works much like the thermostat in a home heating system. When the humidity rises above a pre-set point, the humidistat turns on the HC-300.
2. The humidistat should be designed to operate at 24 V AC. Use a “close on rise” humidistat, with contacts which are normally open. (The contacts should be open when the humidity is below the pre-set limit, and closed when the humidity is too high.) The humidistat contacts should be rated at 1 Amp.
3. Mount the humidistat in the space you want to dehumidify. For best results, place the humidistat near the inlet duct for the process air. This will provide the most accurate sensing of the relative humidity in the process space. If possible, mount the humidistat away from the floor and ceiling, and do not mount it near any doors and windows. Do not mount the humidistat near the outlet vent for the process air from the HC-300.
4. Make the wiring connections between the humidistat and the HC-300 using 24 AWG wire. **Before you do this, turn off the power to the unit!** The humidistat should be wired to the plug connector on the side of the unit. See the wiring diagram for the i.d. numbers of the plug terminals.

3.6 ADJUSTING THE DAMPER

1. As shown in Fig. 3-2, 3-3 or 3-4, you should install a damper in the outlet duct for the process air stream.
2. Figure 1-4 shows the control knob on the power controller for the heaters (SSP1) This should be set for 120°F.
3. Turn on the unit by setting the Auto/Off/Manual switch to the Manual position. Allow the unit to warm up for 1/2 hour. Check the temperature at the reactivation outlet. It should be 120°F ±5°F.
4. Close the process damper completely. Wait ten minutes for the temperatures in the machine to stabilize, then check the temperature at the reactivation outlet. The temperature here should now be higher than 120°F.
5. Now open the damper a bit and wait ten minutes before checking the reactivation outlet temperature again. You should see that it has dropped a bit. Continue opening the damper by small amounts and checking the temperature. Eventually you will find a setting which causes the reactivation outlet temperature to drop to 120°F. This is the correct setting for the process damper.

4 - PREVENTIVE MAINTENANCE

The HC-300 unit requires very little regular maintenance. Check these points every 30 days:

4.1 CLEAN THE AIR FILTERS

1. The HC-300 unit includes two air filters. These are shown in Fig. 1-4. Each filter is made of expanded aluminum, mounted in a metal frame.
2. Switch the unit off and wait for the blowers to stop turning. Open the front access panel. The process filter is located in the lower left hand corner of the unit.
3. The reactivation filter is mounted on the right end of the unit. See Fig. 1-4. Undo the two thumbscrews on the bottom of the case. Using the tab, pull the bottom of the filter outward, then down.
4. If necessary, clean each filter in warm soapy water. Allow each filter to air-dry, or use compressed air. Once the filters are dry, re-install them by reversing Steps 2 and 3 above.

4.2 CHECK THE HONEYCOMBE® WHEEL

Check the HoneyCombe wheel to be sure it is rotating correctly. Look for signs of discoloration caused by dirt, dust, or other foreign materials. In order to clean the wheel and inspect the seal, you must remove the drive motor and wheel. See the instructions in Section 5.10, Checking the Drive Motor, Wheel and Seals.

4.3 CHECK THE UPPER AND LOWER AIR SEALS

The HoneyCombe® wheel rides on the lower air seal. Make a quick check of this seal. Be sure the outer surface of the seal is smooth. If the seal is very worn, the outer layer will wear through. If the seal must be replaced, please contact the factory.

4.4 CHECK THE REACTIVATION OUTLET TEMPERATURE

After the unit has been operating for 30 minutes, the temperature at the outlet of the reactivation air stream should be about 120°F. Check this outlet temperature with a thermometer. It should be within $\pm 5^\circ\text{F}$. If the outlet temperature falls outside this range, see the section on "Troubleshooting."

5 - TROUBLESHOOTING

The HC-300 has a state-of-the-art design, with a sophisticated control system using solid-state electronics. The technology used in this unit has proven to be very reliable in a wide variety of installations. When service problems do occur, they are often caused by the installation, rather than the HC-300 unit itself.

There are two parts to this section of the manual. In the first part, we will list some of the trouble symptoms you may find, and tell you how to correct them. In the second part, we will list some specific service routines – how to replace the HoneyCombe® wheel, how to check the heating elements, etc.

5.1 POSSIBLE TROUBLE CONDITIONS

In order to check most of these trouble conditions, the HC-300 must be turned on and operating, or trying to operate. Some units are wired with remote humidistats. With this type of set-up, it is sometimes not clear whether the humidistat is trying to turn on the HC-300. If you want to be sure the HC-300 is ready to operate, turn the Auto/Off/Manual switch to the Manual position.

5.2 AUTO/OFF/MANUAL SWITCH IS SET TO AUTO, RUNNING LIGHT DOES NOT COME ON



This service procedure involves an electrical hazard. Service work should only be done by an electrician who has been qualified by Munters.

1. Be sure the unit is receiving power. Check the circuit breaker or fuse which supplies the unit. The unit also has an internal circuit breaker behind the front cover.
2. There may be a problem with the humidistat. Set the Auto/Off/Manual switch to Manual. Does the wheel start to turn?
3. If the HC-300 starts to operate, check the humidistat. For some reason, the humidistat is not starting the HC-300. (The humidistat is bypassed when you set the switch to the Manual position.) Either the humidistat is not working, or the signal is not reaching the HC-300. See the section on "Checking the Humidistat."
4. Check the small fuses on the circuit boards inside the unit.

5.3 FAULT LIGHT IS ON, AND MACHINE SHOULD BE RUNNING

(Auto/Off/Manual switch is set to Auto or Manual)



This service procedure involves an electrical hazard. Service work should only be done by an electrician who has been qualified by Munters.

-
1. The Fault light is triggered when the heating elements overheat. There can be several possible causes. Begin by checking for a blockage in the reactivation air stream. Once the unit cools down, you may be able to reset it by turning the Auto/Off/Manual switch to Off, then back to Auto or Manual. You should still check the installation carefully for any possible problems.
 2. The heating elements may also overheat if the AC line voltage rises much above the specified AC voltage. The line voltage should be within $\pm 10\%$ of the specified voltage.
 3. If the reactivation blower is overloaded, it will stop automatically. This may cause the heater to overheat, and trip the Fault light. Once the motor has cooled, it should restart automatically.

During the overheat condition, the fusible links on the heating elements may open. When the unit restarts, you may find that there is no reactivation heat. See the section on "Checking the Heating Elements."

4. The thermistor for the solid-state power controller (TSE1) may be bad. See the section on "Checking the Thermistors."

5.4 REACTIVATION OUTLET TEMPERATURE IS TOO LOW

1. The air at the outlet for the reactivation air should be about 120°F , $\pm 5^{\circ}$. This measurement gives you a way of making a quick check of the overall operation of the HC-300.
2. The temperature may be too low if you try to operate the HC-300 without any ductwork. This can allow too much process air through the unit. See the material on "Adjusting the Damper" in the section on "Installation and Start-Up."
3. If the unit is overloaded, and is trying to remove too much moisture, the temperature at the outlet will drop below 120° . (You can think of the excess moisture as "cooling off" the stream of heated air.) Is there some reason why the air in the system has suddenly become much more humid? This change could be overloading the HC-300.
4. You can see a similar problem if the unit is trying to handle too much of the damp air at once. The volume of process air (the "process volume") may be too great. Change the volume of process air by adjusting the damper. Turn the HC-300 on and allow it to warm up. Check the **reactivation** outlet temperature – it should still be low. Close the process damper completely, then wait about 10 minutes for the temperatures and air volumes in the HC-300 to stabilize. Check the reactivation temperature again. It should be quite a bit higher than 120°F . Now open the damper a bit, wait another 10 minutes, and check the outlet temperature again. Keep doing this until you find the process damper setting which causes the reactivation outlet temperature to drop to 120°F . This is the correct setting for the process damper.
5. One of the heating elements may have stopped working. See the section on "Checking the Heating Elements."

-
6. A low outlet temperature can also be caused by a problem with the reactivation blower. Turn off the HC-300 and try to spin the blower by hand. It should turn freely.
 7. There may be a problem with the thermistor which controls the solid state power control (TSE1) See the section on "Checking the Thermistors." There may also be a problem with the power control itself (SSP1) Substitute a new part.

5.5 POOR DEHUMIDIFYING PERFORMANCE

1. Check the two intake filters, shown in Fig. 1-4. If these filters are dirty, clean them as described in the section on "Cleaning the Air Filters."
2. If you have installed bird screens on the intake and outlet for the reactivation air, check these.
3. Has something changed in the process space which could increase the moisture load on the unit? Check all openings into the process space to be sure all doors and windows are closed. Check for leaks in the ductwork.
4. The volume of process air may be too great. You can reduce the volume of process air by closing the process damper. (The control system will sense the changing conditions in the stream of process air, and make adjustments to the temperature and volume of the reactivation air.)
5. Check the air temperature at the outlet for the reactivation air. It should be 120°F, $\pm 5^\circ$. If it is not, see the section on "Reactivation Outlet Temperature is Too Low."
6. One or more of the heating elements may not be working. See the section on "Checking the Heating Elements."
7. If the process blower is overloaded, it will shut down automatically. This will prevent the unit from drying the process air. The motor will restart automatically, once it has cooled.
8. The HoneyCombe[®] wheel may be stopped. See the next section.

5.6 HONEYCOMBE[®] WHEEL IS STOPPED, RUNNING LIGHT IS ON

1. Check the wheel drive system. See Fig. 1-4. Pull back on the tensioner to loosen the belt. Remove the belt from the drive wheel on the motor. Set the Manual/Off/Auto switch to the Manual position to turn on the unit. The drive motor should turn slowly. See section 5.10, Checking the Drive Motor, Wheel and Seals.
2. After long use, the lower seal may wear. The HoneyCombe[®] wheel will then ride on the inner layer of the seal material. Since this is not as slippery as the outer layer, the wheel will not turn easily. Check the condition of the lower seal. The surface of the seal should be smooth. If the seal is very worn, you will be able to see some of the inner layer of seal material. If the seal must be replaced, please contact the factory for instructions.

SERVICE ROUTINES –

5.7 CHECKING THE HEATING ELEMENTS



This service procedure involves an electrical hazard. Service work should only be done by an electrician who has been qualified by Munters.

1. The heating elements are located near the intake for the reactivation air. See Fig. 1-4.
2. To check the elements, turn off the power to the unit! Remove the inlet grill for the reactivation air.
3. Check the resistance across each of the heating elements using an Ohmmeter. The resistance across each element should be 16Ω to 75Ω . Take your measurements at the incoming wire leads. If you find an infinite resistance, the element has developed an “open circuit,” and must be replaced. A faulty heating element assembly must be replaced as a unit.
4. Each of the power wires for the elements includes a fusible link. Once one of these links opens, it will cut off power to the element. Check across each fusible link with an Ohmmeter. A failed link will appear as an open circuit.
5. Check for a problem with the thermistor (TSE1) for the power controller (SSP1) If this thermistor open-circuits or shorts, the SSPC will not produce any output for the heating elements. Substitute a new part.

5.8 CHECKING THE THERMISTOR

1. A thermistor is a type of temperature sensor. This unit has one thermistor to sense the temperature of the heating elements (TSE1). The thermistor sends a signal to the solid-state power controller (SSP1), which controls the heaters. A thermistor may fail in either a shorted or an open-circuit condition. If the thermistor shorts **or** open-circuits, the power controller will shut off, and the heaters will not operate. Because of the way the thermistor operates, it is difficult to check it with a volt-ohmmeter. Often the easiest way to diagnose a problem is to substitute a new part.

5.9 CHECKING THE HUMIDISTAT

1. Start by adjusting the humidistat to the high end of the scale (close to 100% relative humidity). At this point, the humidistat should not be calling for drying. The contacts inside the humidistat should be open, and you should be able to measure 24 V AC across the contacts.
2. Next, adjust the humidistat to the low end of the scale (close to 10% or 20% relative humidity). Now the humidistat should be calling for drying, and the contacts inside the humidistat should be closed. You should see 0 Volts across the contacts.

-
3. You can also check the wiring between the humidistat and the HC-300. The humidistat is connected to terminals on the printed circuit board. When the humidistat is not calling for dehumidification, you should see 24 V AC across the contacts.

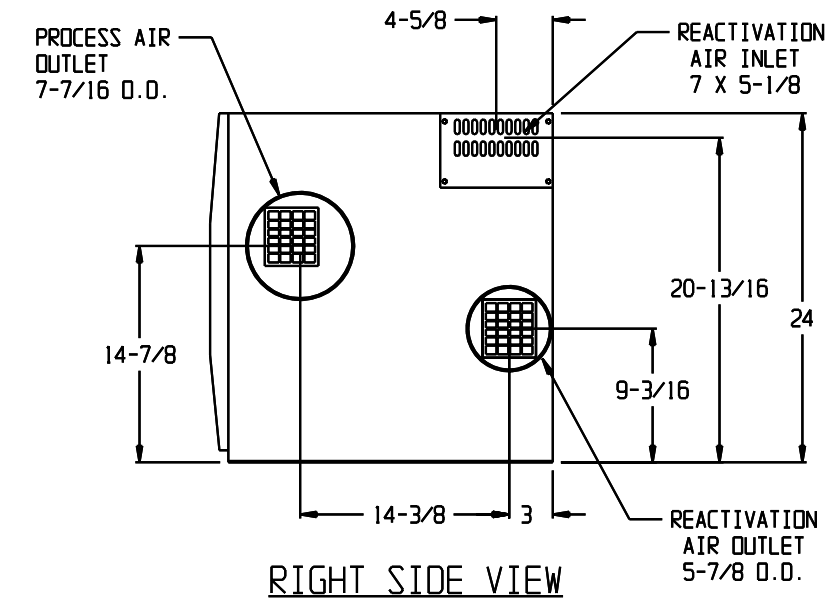
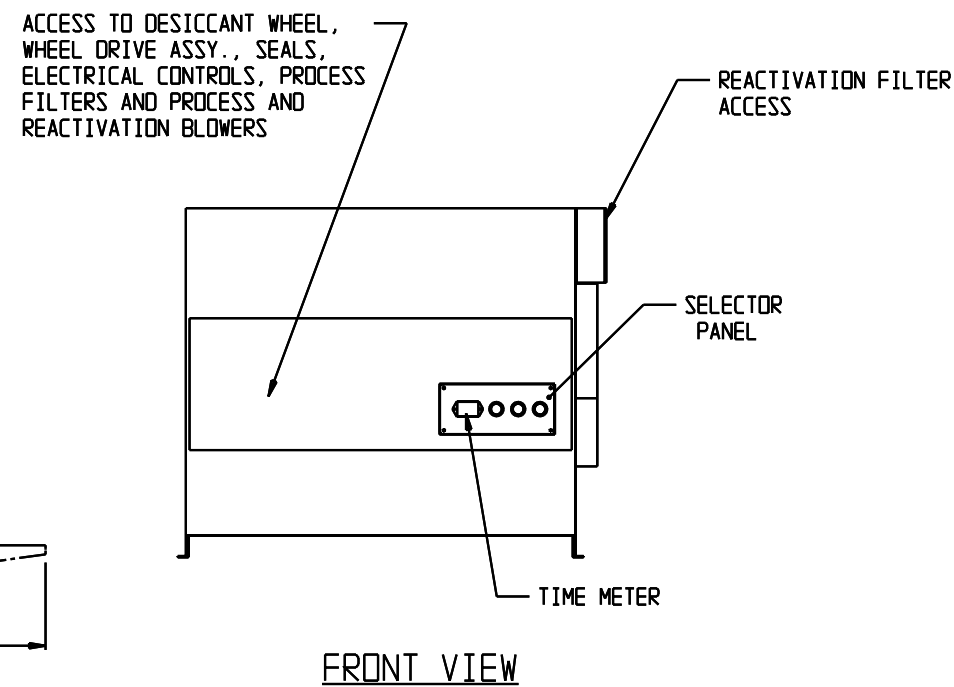
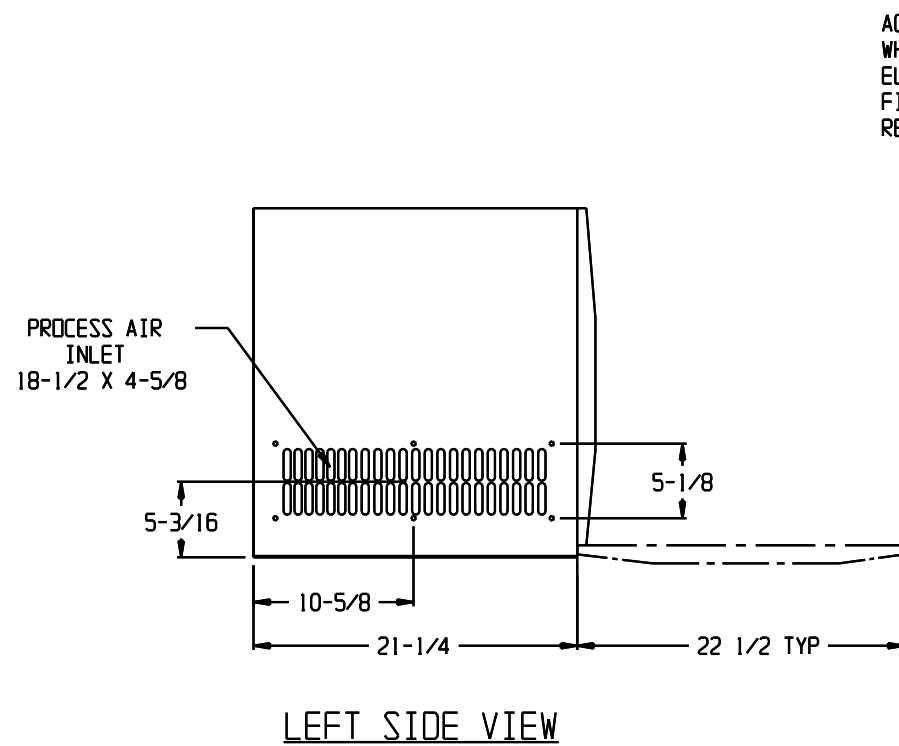
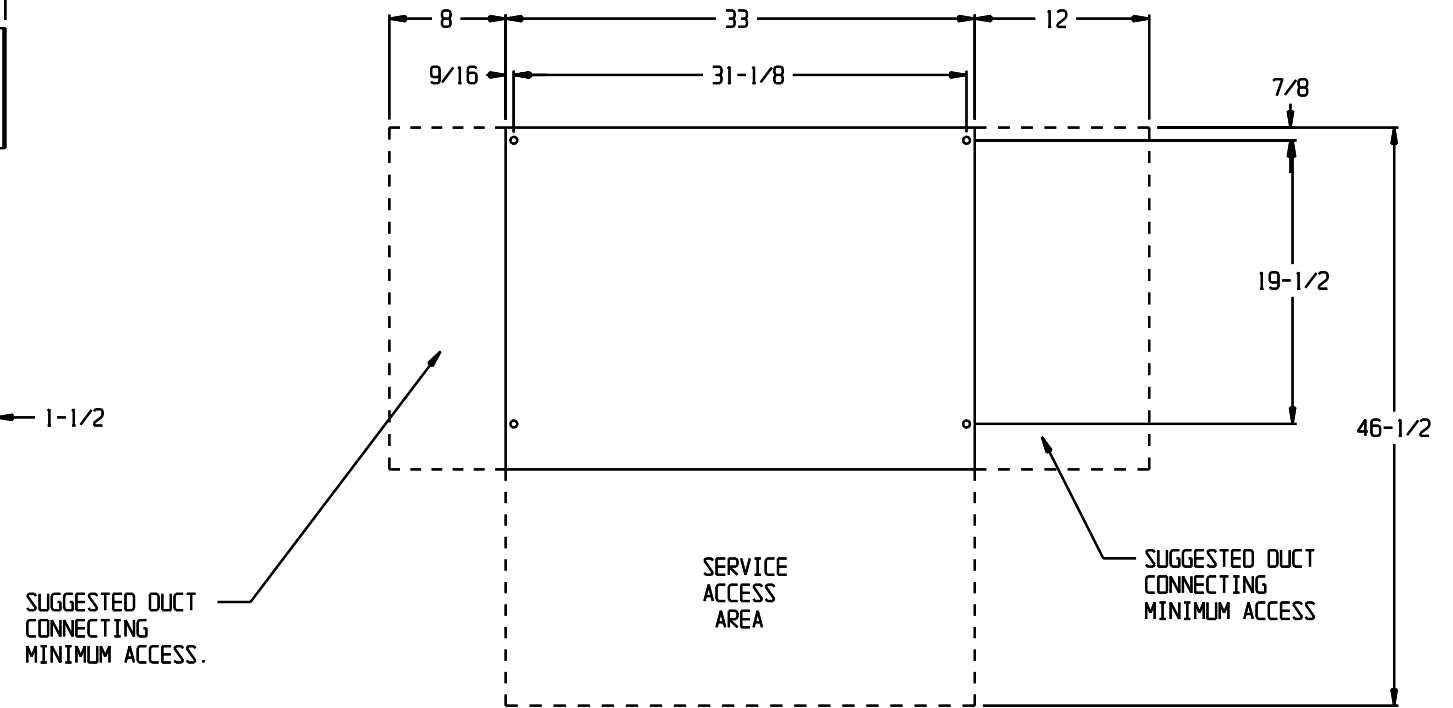
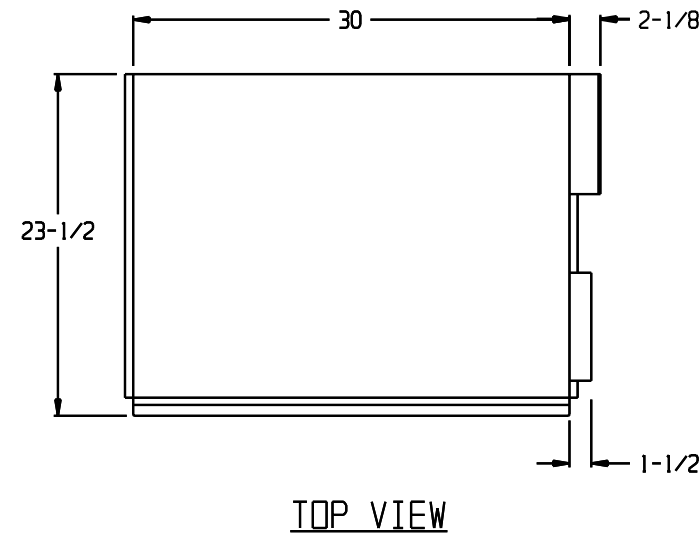
5.10 CHECKING THE DRIVE MOTOR, WHEEL AND SEALS

1. Before you can remove the wheel, you must remove the drive motor. Figure 1-4 shows the drive wheel and belt.
2. Pull back the tensioner to loosen the drive belt. Remove the belt from the drive sprocket on the motor.
3. Unplug the wiring connections to the drive motor. Be careful not to pull too hard on a connector. This could damage the wiring or the circuit board.
4. Remove the motor and drive assembly. This is mounted on the right-hand roller wheel assembly.
5. Remove the small roller wheels which are located on each side of the HoneyCombe® wheel. To remove a roller wheel, lift the wheel shaft up. Pull the bottom of the shaft toward you, then down.
6. Gently lift the wheel a bit and pull it forward. Be careful not to damage the lower seals.
7. The small passages in the HoneyCombe® wheel may be plugged by dust or dirt. To inspect the passages, hold the wheel upright. Hold a lamp with a 60 watt bulb behind the wheel. If the passages are clear, the light from the lamp should shine through the wheel. Because the passages are so small, you won't be able to see the light directly. Instead, you should see the glow from the light. If any part of the wheel is plugged, you will see a dark area.
8. If the wheel seems to be plugged, it may be possible to clean it. Use a wet/dry vacuum, and a dusting brush attachment with a soft bristle brush. Vacuum both surfaces of the wheel.
9. If you cannot clear the wheel using the vacuum, you may use compressed air to help the process. You must do this carefully, so that you do not damage the wheel. The compressed air should be dry and free of oil. Don't use a pressure higher than 30 PSIG. Use the compressed air on one side of the wheel, and the vacuum on the other. Don't hold the compressed air hose closer than 12" to the face of the wheel.
10. This type of wheel is washable. It is best to clean the wheel using clean water only. If you must use a detergent, choose a mild type (enzyme or dish-washing detergent). The wheel is sensitive to high pH (alkaline condition). Choose a detergent which with a neutral pH. Do not use typical laundry detergents. Do not use any solvent to wash the wheel. This will permanently damage the wheel.
11. If the wheel is still plugged, or if the honeycomb structure has softened, please call the Service Operations Department at Munters.
12. To replace the wheel, reverse Steps 2 through 6 above.

Munters Corporation
Dehumidification Division — Industrial
79 Monroe Street, P.O. Box 640
Amesbury, MA 01913-0640
TEL: (978) 241-1100 or (800) 843-5360
FAX: (978) 241-1217
WWW: <http://www.muntersamerica.com>
e-mail: dhinfo@munters.com




REVISIONS					
REV	ECR	DESCRIPTION	DATE	DFT	CHK APP
1		REVISED TO SHOW NEW CONTROL PANEL	4/95	GG	E.J.L. E.J.L.
2		UPDATED TO NEW BORDER	12/9/98	TAB	
3		ADDED PAGE 2 W/GROUND LUG NOTE & 23/64 DIA. WEIGHT WAS 300 LBS.	04/6/05	RRO	E.J.L. E.J.L.
4		REVISED -02 PER AS BUILT	4/15/05	TJM	E.J.L. E.J.L.
5		DELETED PAGE 2	2/29/08	RRO	E.J.L. E.J.L.

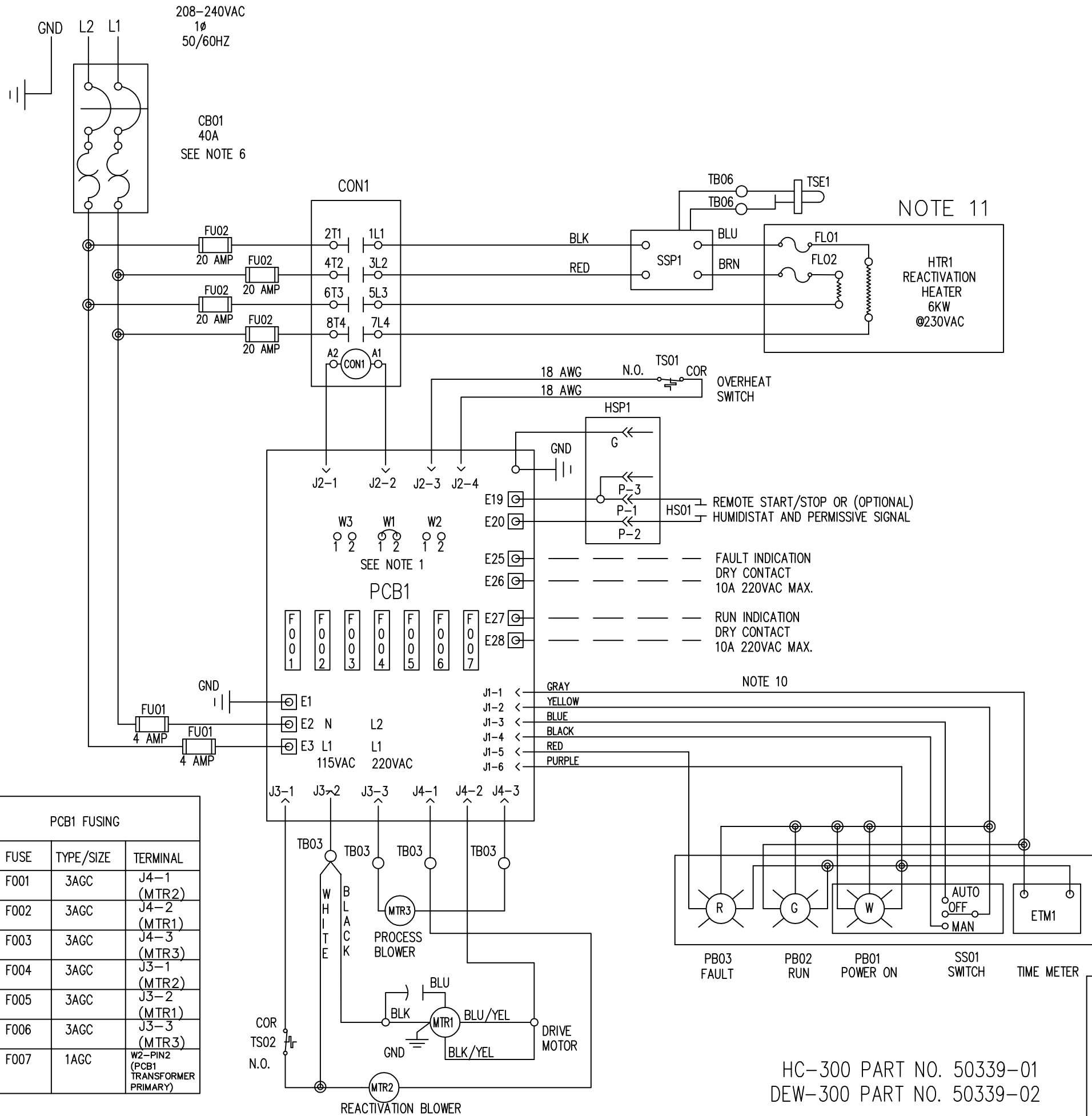


ESTIMATED WEIGHT - 150 LBS.

PART NO. 74119-01

CONFIDENTIALITY STATEMENT THE TECHNICAL INFORMATION AND DESIGN DATA DISCLOSED HEREIN CONSTITUTE PROPRIETARY INFORMATION OF MUNTERS CORPORATION - CARGOCAIRE DIVISION AND ARE TO BE MAINTAINED IN STRICT CONFIDENCE. THIS INFORMATION IS FOR THE SOLE USE OF OUR CUSTOMERS AND END USERS OF OUR EQUIPMENT.	Job No. 30561	Date	 Munters Cargocaire 79 Monroe St. Amesbury, Ma 01913 TEL 978-241-1100 FAX 978-241-1214
	Customer -----		
	Dr. By: G.N.G.	11/22/93	GENERAL ASSEMBLY
	Ch. By: KHY	11/22/93	HC-300
Apr. By: KHY	11/22/93	SCALE 1:12	SHEET 1 of 1
		SIZE B	74119
			REV 5

Revisions					
Rev	Description	Date	Dft	Chk	App
0	SAME 50191R2 W/O FAN SPEED CONTROL.	10/97	YL	EAC	EAC
1	UPDATED DRIVE MOTOR TO BODINE	01/09/01	CJT	EAC	EAC
2	ADDED TB03, TB06	01/02/02	EAC	KPW	EAC
3	CHANGED FU01 FROM 10 TO 4 AMPS	9/3/03	GJM	KPW	GJM
4	NOTE 10 WAS #22 AWG	6/12/07	TLB	KPW	TLB
5	ADDED FUSE LIST, FUSIBLE LINKS REMOVED FAN SPEED CONTROL SETTINGS AND CORRECTED NOTE 10	4/1/08	TLB	KPW	TLB
6	CON1 WAS A 3 POLE WITH AUX CONTACT	7/16/08	TLB	CAG	TLB
7	CHANGED HS01 CONTACT DESCRIPTION	7/1/09	MJL	RDS	RDS
8	UPDATED NOTE 4	7/17/13	DSL	RDS	RDS



PCB1 FUSING		
FUSE	TYPE/SIZE	TERMINAL
F001	3AGC	J4-1 (MTR2)
F002	3AGC	J4-2 (MTR1)
F003	3AGC	J4-3 (MTR3)
F004	3AGC	J3-1 (MTR2)
F005	3AGC	J3-2 (MTR1)
F006	3AGC	J3-3 (MTR3)
F007	1AGC	W2-PIN2 (PCB1 TRANSFORMER PRIMARY)

- PRINTED CIRCUIT BOARD POWER.
FOR 115VAC JUMPER W3 1 TO 2 AND W2 1 TO 2.
FOR 220VAC JUMPER W1 1 TO 2 ONLY.
- COMPONENTS SHOWN DOTTED ARE AVAILABLE AS OPTIONS FROM C.E.C.
- ELECTRICAL COMPONENTS - REFER TO ELECTRICAL PARTS LIST.

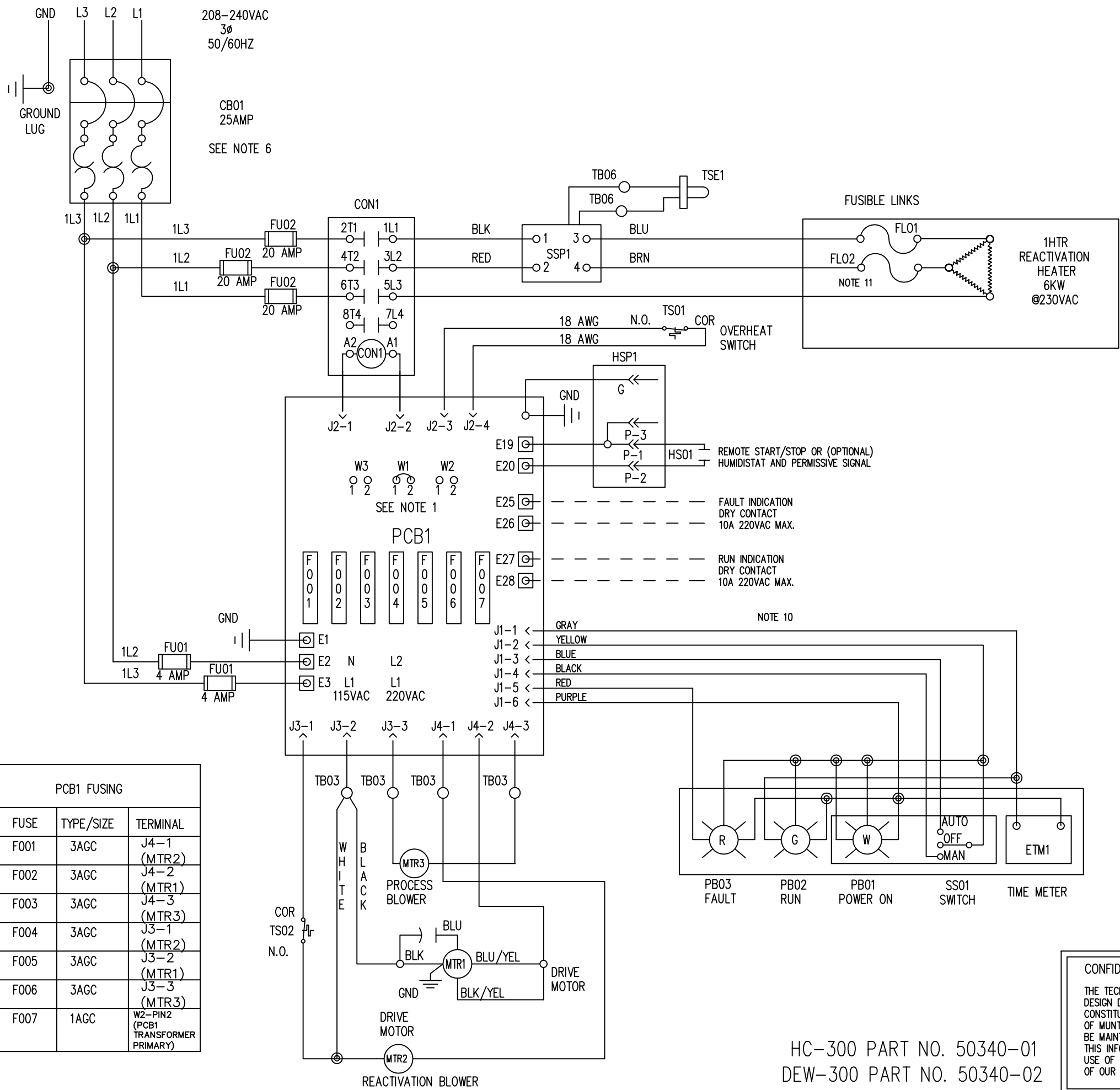
SYM	DESCRIPTION	SYM	DESCRIPTION
CB	CIRCUIT BREAKER, MAIN LINE	LS	ROTATION LIMIT SWITCH (OPTIONAL)
CON	CONTACTOR, ELECTRIC HEATER	MTR	MOTOR
DPS	DIFFERENTIAL PRESSURE SWITCH	PB	PUSHBUTTON
E	TERMINAL, SPADE TYPE	PCB	PRINTED CIRCUIT BOARD
ETM	ELAPSED TIME METER	R	RED, INDICATOR LIGHT, FAULT
F	FUSE (PCB)	SSP	SOLID STATE POWER CONTROLLER
FL	FUSIBLE LINK	TB	TERMINAL BLOCK
FU	FUSE	TS	THERMOSTAT
G	GREEN, INDICATOR LIGHT, RUNNING	TSE	THERMISTOR
HS	HUMIDISTAT	SS	SELECTOR SWITCH
HSP	HUMIDISTAT PLUG	W	WHITE, INDICATOR LIGHT, POWER ON
HTR	HEATER ELECTRIC, REACT. AIR		
J	JUMPER		

- FOR ELECTRICAL WIRE SIZING DATA.
A.STANDARD. AS75001
B.CANADIAN. A72011
- PROTECTIVE DEVICES HAVE BEEN PRESET AND RECORDED AT FACTORY.
- EARTH GROUND IS TO BE INSTALLED (NOT BY C.E.C.) BEFORE ENERGIZING EQUIPMENT.
- BEFORE EQUIPMENT START-UP, REVIEW OPERATING AND MAINTENANCE MANUAL PROVIDED WITH UNIT.
- SEE ELECTRICAL PARTS LIST FOR COMPONENT SPECIFICATION.
- NC = NORMALLY CLOSED, OOF = OPEN ON FALL.
NO = NORMALLY OPEN, OOR = OPEN ON RISE.
- ALL WIRING FROM J1 TO DEVICES IS TO BE #22 AWG.
- FUSIBLE LINK: PN#92329-01 (2) SPARES PROVIDED

HC-300 PART NO. 50339-01
DEW-300 PART NO. 50339-02

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Job No.	STD	Date	Munters Cargocaire 79 Monroe St. Amesbury, Ma 01913 TEL 978-388-0600 FAX 978-388-0292			
Customer			WIRING DIAGRAM DEW/HC-300 208-240VAC 1 ϕ 50/60HZ			
Dr.By	Y.L.	10/97	SCALE	SHEET	SIZE	REV
Chk.By	BJK	10/97	NTS	1 of 1	B	50339
Apr.By	BJK	10/97				8



PCB1 FUSING		
FUSE	TYPE/SIZE	TERMINAL
F001	3AGC	J4-1 (MTR2)
F002	3AGC	J4-2 (MTR1)
F003	3AGC	J4-3 (MTR3)
F004	3AGC	J3-1 (MTR2)
F005	3AGC	J3-2 (MTR1)
F006	3AGC	J3-3 (MTR3)
F007	1AGC	W2-PIN2 (PCB1 TRANSFORMER PRIMARY)

Revisions					
Rev	Description	Date	Dft	Chk	App
0	SAME AS 50192R2 W/O FAN SPEED CONTROL.	10/97	YL	EAC	EAC
1	UPDATED DRIVE MOTOR TO BODINE	01/09/01	CJT	EAC	EAC
2	ADDED TB03, TB06	01/02/02	EAC	KPW	EAC
3	CHANGED FU01 TO 4 AMPS	10/28/03	KPW	CAG	CAG
4	CHANGED PB01 TO WHITE	4/21/05	RSC	CAG	CAG
5	REMOVED OBSOLETE DIP SWITCH INFO AND ADDED PCB1 FUSE DETAILS	5/18/07	TLB	CAG	CAG
6	NOTE 10 WAS #22 AWG	6/12/07	TLB	CAG	TLB
7	ADDED NOTE 11, SYM FL & FIXED NOTE 10	4/1/08	TLB	CAG	TLB
8	CON1 WAS A 3 POLE WITH AUX CONTACT	7/16/08	TLB	CAG	TLB
9	CHANGED HS01 CONTACT DESCRIPTION	7/1/09	MJL	RDS	RDS
10	ADDED WIRE NUMBERS FROM CB01	1/28/10	MJL	RDS	RDS
11	UPDATED NOTE 4	7/17/13	DSL	RDS	RDS

- PRINTED CIRCUIT BOARD POWER.
FOR 115VAC JUMPER W3 1 TO 2 AND W2 1 TO 2.
FOR 220VAC JUMPER W1 1 TO 2 ONLY.
 - COMPONENTS SHOWN DOTTED ARE AVAILABLE AS OPTIONS FROM C.E.C.
 - ELECTRICAL COMPONENTS - REFER TO ELECTRICAL PARTS LIST.
- | | | | |
|-----|------------------------------|-----|----------------------------------|
| SYM | DESCRIPTION | SYM | DESCRIPTION |
| CB | CIRCUIT BREAKER, MAIN LINE | LS | ROTATION LIMIT SWITCH (OPTIONAL) |
| CON | CONTACTOR, ELECTRIC HEATER | MTR | MOTOR |
| DPS | DIFFERENTIAL PRESSURE SWITCH | PB | PUSHBUTTON |
| E | TERMINAL, SPADE TYPE | PCB | PRINTED CIRCUIT BOARD |
| ETM | ELAPSED TIME METER | R | RED, INDICATOR LIGHT, FAULT |
| F | FUSE (PCB) | SSP | SOLID STATE POWER CONTROLLER |
| FL | FUSIBLE LINK | TB | TERMINAL BLOCK |
| FU | FUSE | TS | THERMOSTAT |
| HS | HUMIDISTAT | TSE | THERMISTER |
| HSP | HUMIDISTAT PLUG | SS | SELECTOR SWITCH |
| HTR | HEATER ELECTRIC, REACT. AIR | W | WHITE, INDICATOR LIGHT, POWER ON |
| J | JUMPER | | |
- FOR ELECTRICAL WIRE SIZING DATA.
A. STANDARD. AS75001
B. CANADIAN. A72011
 - PROTECTIVE DEVICES HAVE BEEN PRESET AND RECORDED AT FACTORY.
 - EARTH GROUND IS TO BE INSTALLED (NOT BY C.E.C.) BEFORE ENERGIZING EQUIPMENT.
 - BEFORE EQUIPMENT START-UP, REVIEW OPERATING AND MAINTENANCE MANUAL PROVIDED WITH UNIT.
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NC = NORMALLY CLOSED, OOF = OPEN ON FALL.
 - ALL WIRING FROM J1 TO DEVICES IS TO BE #22 AWG
 - FUSIBLE LINK: PN#92329-01 (2) SPARES PROVIDED

HC-300 PART NO. 50340-01
DEW-300 PART NO. 50340-02

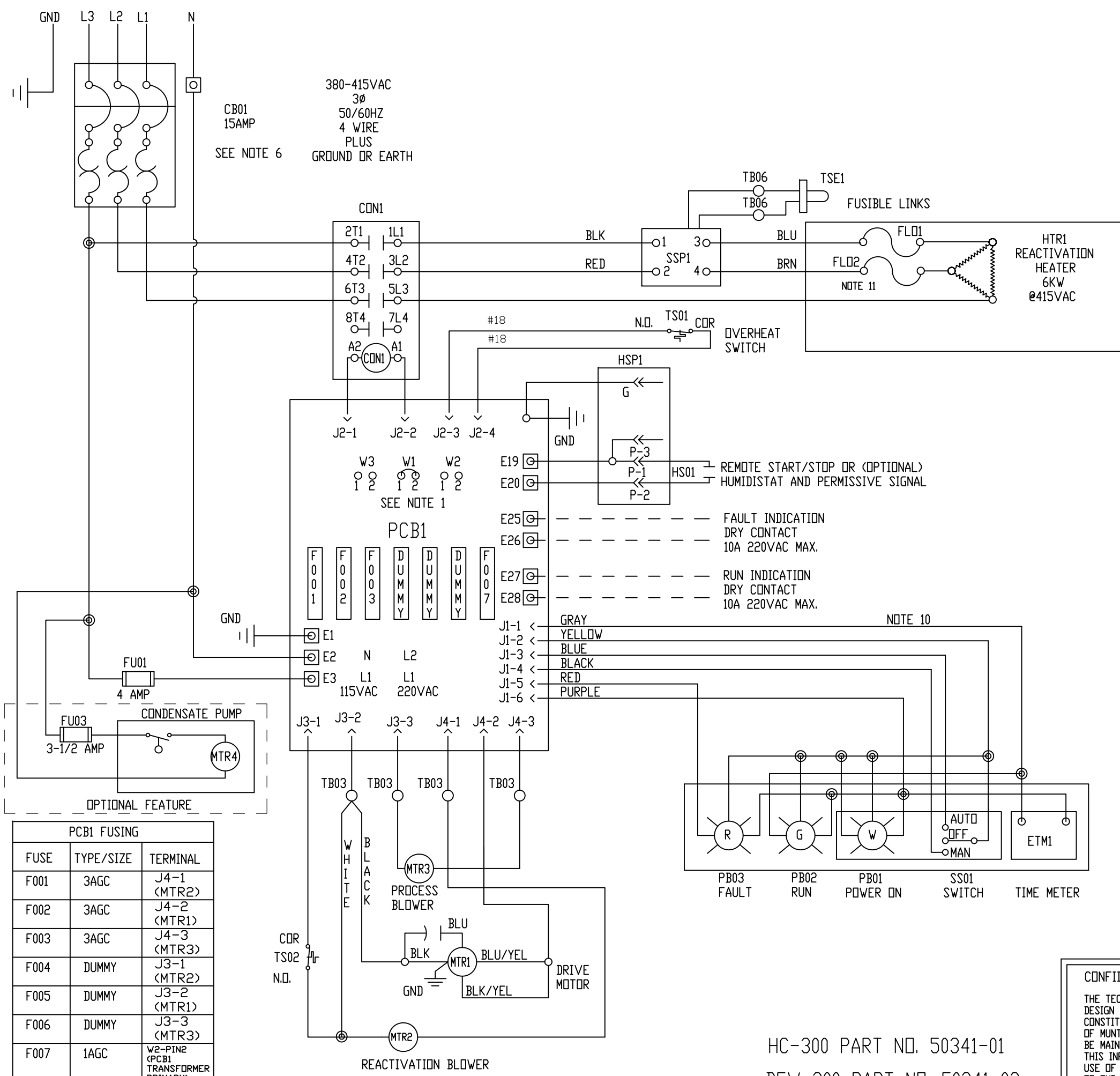
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Job No.	STD	Date	
Customer			
Dr. By.	Y.L.	10/97	
Chk. By.	BJK	10/97	
Appr. By.	BJK	10/97	

Munters Cargocaire
79 Monroe St. Amesbury, Ma 01913
TEL 978-388-0600 FAX 978-388-0292

WIRING DIAGRAM
DEW/HC-300
208-240VAC 3φ 50/60HZ

SCALE	SHEET	SIZE	REV
NTS	1 of 1	B	50340 11



Revisions				
Rev	Description	Date	Dft	Chk
0	SAME AS 50193R2 W/O FAN SPEED CONTROL	10/8/97	YL	BJK
1	UPDATED DRIVE MOTOR TO BODINE	01/09/01	CJT	EAC
2	ADDED TB03, TB06	01/02/02	EAC	KPW
3	CHANGED FU01 TO 4 AMPS	10/28/03	KPW	CAG
4	DELETED 50 / 60 HZ NOTE, #22, ECR 4582	6/2/04	KPW	CAG
5	NOTE 10 WAS #22 AWG	6/12/07	TLB	CAG
6	ADDED NOTE 11, PCB FUSING TABLE, FUSIBLE LINKS & NOTE 10 WAS CORRECTED	4/1/08	TLB	CAG
7	CON1 WAS A 3 POLE WITH AUX CONTACTS	7/16/08	TLB	CAG
8	ADDED FUSIBLE LINKS TO HEATER	7/24/08	TLB	CAG
9	CHANGED HS01 CONTACT DESCRIPTION	7/1/09	MJL	RDS
10	UPDATED NOTE 4	7/17/13	DSL	RDS
11	ADDED CONDENSATE PUMP AS OPTIONAL.	03/11/14	GDD	RDS
12	REMOVED FUSE ON NEUTRAL TO COND PUMP.	04/09/14	GDD	RDS

- PRINTED CIRCUIT BOARD POWER.
FOR 115VAC JUMPER W3 1 TO 2 AND W2 1 TO 2.
FOR 220VAC JUMPER W1 1 TO 2 ONLY.
- COMPONENTS SHOWN DOTTED ARE AVAILABLE AS OPTIONS FROM C.E.C.
- ELECTRICAL COMPONENTS - REFER TO ELECTRICAL PARTS LIST.

SYM	DESCRIPTION	SYM	DESCRIPTION
CB	CIRCUIT BREAKER, MAIN LINE	LS	ROTATION LIMIT SWITCH (OPTIONAL)
CON	CONTACTOR, ELECTRIC HEATER	MTR	MOTOR
DPS	DIFFERENTIAL PRESSURE SWITCH	PB	PUSHBUTTON
E	TERMINAL, SPADE TYPE	PCB	PRINTED CIRCUIT BOARD
ETM	ELAPSED TIME METER	R	RED, INDICATOR LIGHT, FAULT
F	FUSE (PCB)	SSP	SOLID STATE POWER CONTROLLER
FU	FUSE	TB	TERMINAL BLOCK
FL	FUSIBLE LINK	TS	THERMOSTAT
HS	HUMIDISTAT	TSE	THERMISTOR
HSP	HUMIDISTAT PLUG	SS	SELECTOR SWITCH
HTR	HEATER ELECTRIC, REACT. AIR	W	WHITE, INDICATOR LIGHT, POWER ON
J	JUMPER		

- FOR ELECTRICAL WIRE SIZING DATA.
A. STANDARD. AS75001
B. CANADIAN. A72011
- PROTECTIVE DEVICES HAVE BEEN PRESET AND RECORDED AT FACTORY.
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- ALL WIRING FROM J1 TO DEVICES IS TO BE #22 AWG
- FUSIBLE LINK: PN#92329-01 (2) SPARES PROVIDED

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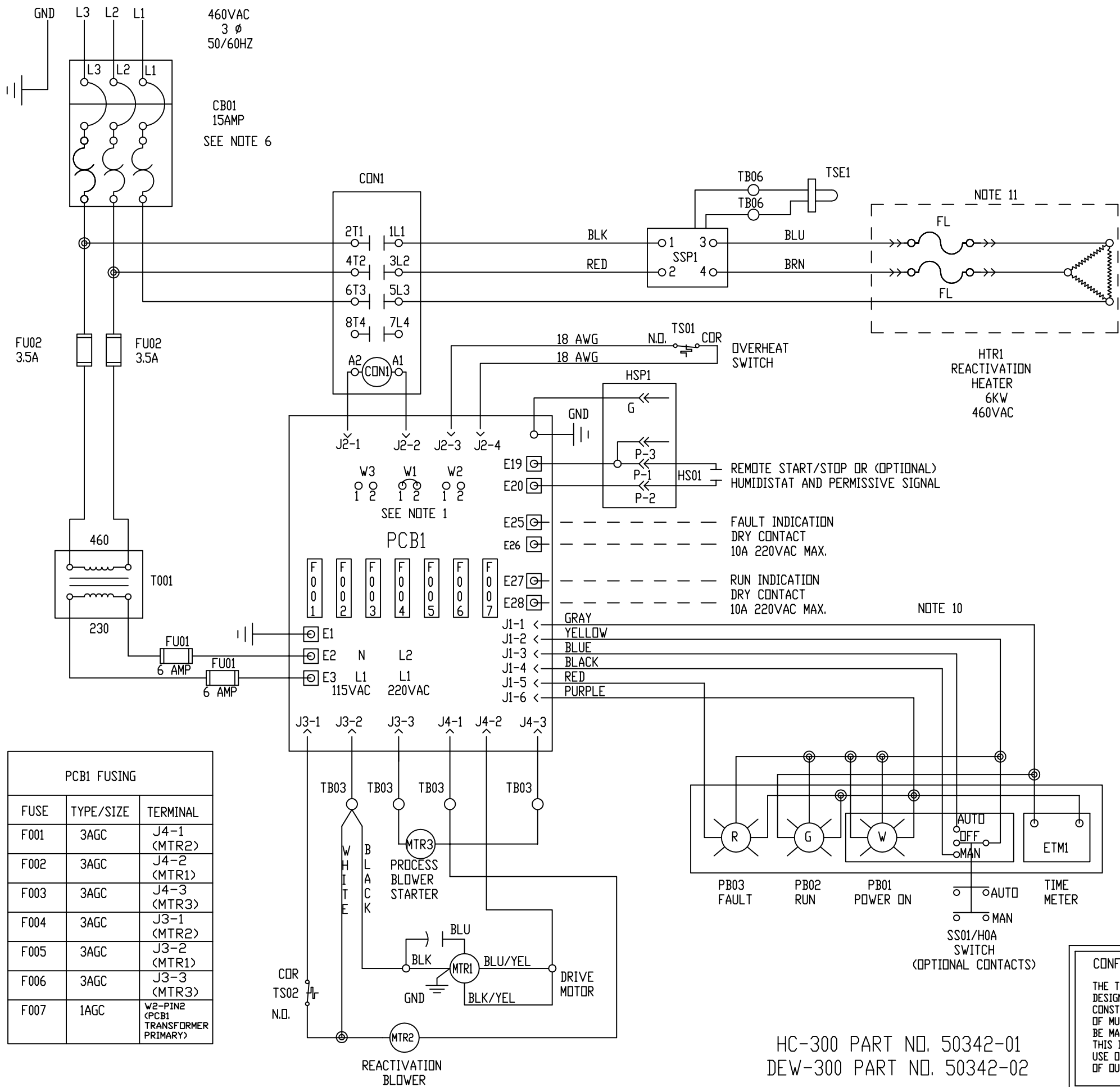
Job No.	STD	Date	
Customer	-----		
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Chk. By.	BJK	10/97	
Appr. By.	BJK	10/97	

Munters Cargocaire
79 Monroe St. Amesbury, Ma 01913
TEL 978-388-0600 FAX 978-388-0292

WIRING DIAGRAM
DEW/HC-300
380-415VAC 3Ø 50/60HZ

SCALE	SHEET	SIZE	REV
NTS	1 of 1	B	50341 12

Revisions					
Rev	Description	Date	Dft	Chk	App
1	SAME AS 50194R4 WITHOUT FAN CONTROL.	10/98	YL	BK	BK
2	FU02 WAS 3-1/2 AMP & FU01 WAS 10 AMP : DELETED DIP SWITCH SETTING FOR FAN SPEED CONTROLLER.	12/97	BK	BK	BK
3	UPDATED DRIVE MOTOR TO BODINE	01/09/01	CJT	EAC	EAC
4	ADDED TB03, TB06	01/02/02	EAC	KPW	EAC
5	FUSIBLE LINK SHOWN ON HEATER ASSEMBLY	10/31/02	WEM	KY	KY
6	CHANGED FU01 FROM 5A TO 10A	4/30/03	GJM	GR	GJM
7	CHANGED FU01 FROM 10A TO 6A	7/30/03	GJM	GR	GJM
8	CHANGED FU01 FROM 6A TO 4A	10/28/03	KPW	CAG	CAG
9	CHANGED TB03 TO TB06 ON TSE1.	02/26/04	CAG	KPW	CAG
10	CHANGED FU01 FROM 4A TO 6A	02/26/04	CAG	KPW	CAG
11	ADDED SS01/H0A SWITCH (OPTIONAL CONTACTS) AND NOTE 11	04/07/05	RSC	CAG	CAG
12	CHANGED COLOR OF POWER INDICATOR LIGHT FROM AMBER TO WHITE	04/15/05	RSC	CAG	CAG
13	FU02 WAS 2.8A IS NOW 3.5A	08/24/05	RSC	EJL	EJL
14	NOTE 10 WAS #22 AWG	6/12/07	TLB	CAG	TLB
15	ADDED PCB FUSING TABLE, CORRECTED W1,2,3 JUMPERS, CORRECTED NOTE 10	4/1/08	TLB	CAG	TLB
16	CHANGED TERMINAL #'S ON CON1 - DO NOT USE #'S 14 & 13	5/14/08	TLB	CAG	TLB
17	CON1 WAS A 3 POLE WITH AUX CONTACTS	7/16/08	TLB	CAG	TLB
18	MOVED JUMPER TO W1 ON PCB1	10/22/08	TLB	CAG	TLB
19	INPUT POWER WAS 3 ϕ ?	3/24/09	TLB	RS	TLB
20	CHANGED HS01 CONTACT DESCRIPTION ON HSP1	7/1/09	MJL	RDS	RDS
21	UPDATED NOTE 4	7/17/13	DSL	RDS	RDS



- PRINTED CIRCUIT BOARD POWER.
FOR 115VAC JUMPER W3 1 TO 2 AND W2 1 TO 2.
FOR 220VAC JUMPER W1 1 TO 2 ONLY.
- COMPONENTS SHOWN DOTTED ARE AVAILABLE AS OPTIONS FROM C.E.C.
- ELECTRICAL COMPONENTS - REFER TO ELECTRICAL PARTS LIST.

SYM	DESCRIPTION	SYM	DESCRIPTION
CB	CIRCUIT BREAKER, MAIN LINE	LS	ROTATION LIMIT SWITCH (OPTIONAL)
CON	CONTACTOR, ELECTRIC HEATER	MTR	MOTOR
DPS	DIFFERENTIAL PRESSURE SWITCH	PB	PUSHBUTTON
E	TERMINAL, SPADE TYPE	PCB	PRINTED CIRCUIT BOARD
ETM	ELAPSED TIME METER	R	RED, INDICATOR LIGHT, FAULT
F	FUSE (PCB)	SS	SELECTOR SWITCH
FL	FUSIBLE LINK	SSP	SOLID STATE POWER CONTROLLER
FU	FUSE	T	TRANSFORMER
G	GREEN, INDICATOR LIGHT, RUNNING	TB	TERMINAL BLOCK
HS	HUMIDISTAT	TS	THERMISTAT
HSP	HUMIDISTAT PLUG	TSE	THERMISTOR
HTR	HEATER ELECTRIC, REACT. AIR	W	WHITE, INDICATOR LIGHT, POWER ON
J	JUMPER		

- FOR ELECTRICAL WIRE SIZING DATA.
A. STANDARD. AS75001
B. CANADIAN. A72011
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NC = NORMALLY CLOSED, OOF = OPEN ON FALL.
- ALL WIRING FROM J1 TO DEVICES IS TO BE #22 AWG
- FUSIBLE LINK P/N 92329-01 (2) SPARES PROVIDED.

PCB1 FUSING		
FUSE	TYPE/SIZE	TERMINAL
F001	3AGC	J4-1 (MTR2)
F002	3AGC	J4-2 (MTR1)
F003	3AGC	J4-3 (MTR3)
F004	3AGC	J3-1 (MTR2)
F005	3AGC	J3-2 (MTR1)
F006	3AGC	J3-3 (MTR3)
F007	1AGC	W2-PIN2 (PCB1 TRANSFORMER PRIMARY)

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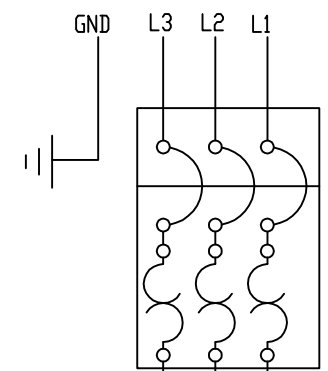
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Appr. By.	BJK	10/97	

Munters Cargocaire
79 Monroe St. Amesbury, Ma 01913
TEL 978-241-1100 FAX 978-241-1214

WIRING DIAGRAM
DEW/HC-300
460VAC 3 ϕ 50/60HZ

SCALE	SHEET	SIZE	REV
NTS	1 of 1	B	50342 21

HC-300 PART NO. 50342-01
DEW-300 PART NO. 50342-02

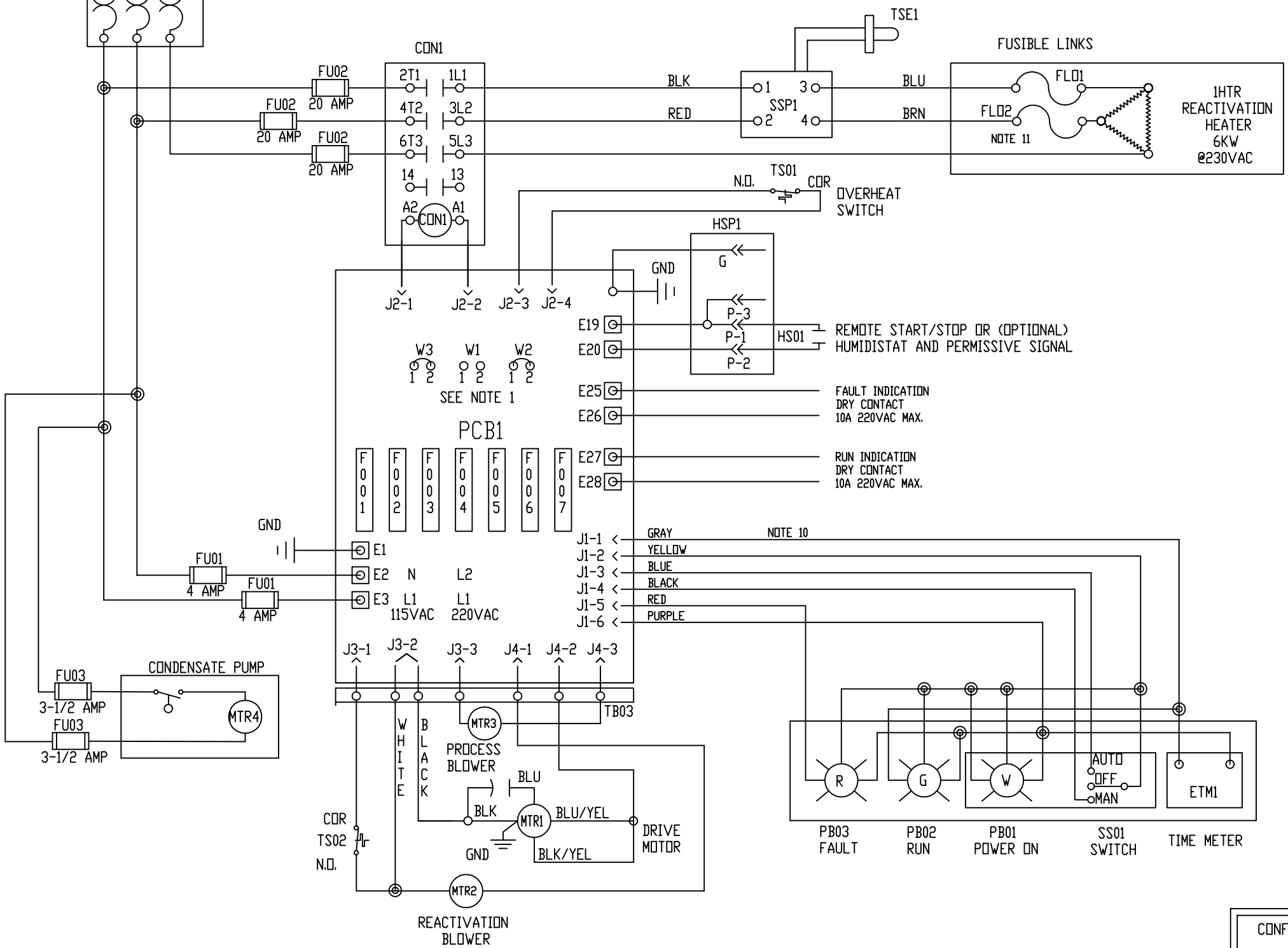


208-240VAC
3Ø
50/60HZ

CB01
25AMP

SEE NOTE 6

Revisions					
Rev	Description	Date	Dft	Chk	App
1	UPDATED DRIVE MOTOR TO BODINE	01/09/01	CJT	EAC	EAC
2	ADDED TB03, TB06. CHANGED FU01	-----	---	---	---
--	TO 4A. REMOVED DIP SWITCHES.	07/29/04	CAG	KPW	CAG
3	REMOVED WIRE GA #22-ECR#4749	08/12/04	RSC	TB	CAG
4	NOTE 10 WAS #22 AWG	6/12/07	TLB	CAG	TLB
5	ADDED NDT211, FUSE TABLE & LINKS	3/25/09	TLB	KPW	TLB
6	CHANGED HS01 CONTACT DESCRIPTION	7/1/09	MJL	RDS	RDS
7	UPDATED NOTE 4	7/17/13	DSL	RDS	RDS



- PRINTED CIRCUIT BOARD POWER.
FOR 115VAC JUMPER W3 1 TO 2 AND W2 1 TO 2.
FOR 220VAC JUMPER W1 1 TO 2 ONLY.
- COMPONENTS SHOWN DOTTED ARE AVAILABLE AS OPTIONS FROM C.E.C.
- ELECTRICAL COMPONENTS - REFER TO ELECTRICAL PARTS LIST.

SYM	DESCRIPTION	SYM	DESCRIPTION
CB	CIRCUIT BREAKER, MAIN LINE	LS	ROTATION LIMIT SWITCH (OPTIONAL)
CDN	CONTACTOR, ELECTRIC HEATER	MTR	MOTOR
DPS	DIFFERENTIAL PRESSURE SWITCH	PB	PUSHBUTTON
E	TERMINAL, SPADE TYPE	PCB	PRINTED CIRCUIT BOARD
ETM	ELAPSED TIME METER	R	RED, INDICATOR LIGHT, FAULT
FL	FUSIBLE LINKS	SSP	SOLID STATE POWER CONTROLLER
FU	FUSE (PCB)	TB	TERMINAL BLOCK
G	GREEN, INDICATOR LIGHT, RUNNING	TS	THERMOSTAT
HS	HUMIDISTAT	TSE	THERMISTER
HSP	HUMIDISTAT PLUG	SS	SELECTOR SWITCH
HTR	HEATER ELECTRIC, REACT. AIR	W	WHITE, INDICATOR LIGHT, POWER ON
J	JUMPER		

- FOR ELECTRICAL WIRE SIZING DATA.
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B. CANADIAN. A72011
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NC = NORMALLY CLOSED, OOF = OPEN ON FALL.
- ALL WIRING FROM J1 TO DEVICES IS TO BE #18 AWG
- FUSIBLE LINK: PN#92329-01 (2) SPARES PROVIDED

HC-300 PART NO. 50344-01
DEW-300 PART NO. 50344-02

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Aprv. By.	BJK	11/97	

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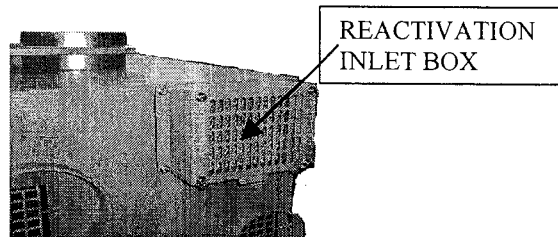
WIRING DIAGRAM
DEW/HC-300 W/PRECOOL
208-240VAC 3Ø 50/60HZ

SCALE	SHEET	SIZE	REV
NTS	1 of 1	B	7

HC 300 DEHUMIDIFIER REPLACING FUSIBLE LINKS

1. DANGER: HIGH VOLTAGE: TURN POWER OFF BEFORE SERVICING!!!

2. LOCATE REACTIVATION INLET BOX



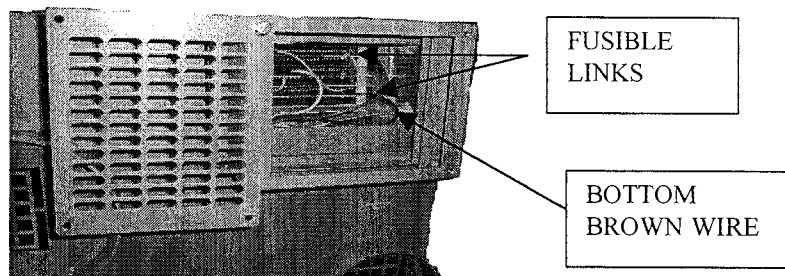
3. REMOVE (3) 1/4-20 BOLTS FROM THE INLET GRILL

4. LOOSEN THE 4TH SCREW & ROTATE 90° TO EXPOSE THE INLET METAL MESH FILTER AND RETIGHTEN THE 4TH SCREW TO HOLD THE GRILL IN PLACE.

5. REMOVE THE BOTTOM FILTER PANEL BY HAND LOOSENING THE (2) CAPTIVE SCREWS ON THE BOTTOM FILTER PANEL. ***CAUTION: METAL MESH FILTER MAY DROP OUT AS THE BOTTOM PANEL IS REMOVED.***

6. REMOVE METAL MESH FILTER.

7. THE OPENED REACTIVATION INLET SHOULD LOOK LIKE THIS.



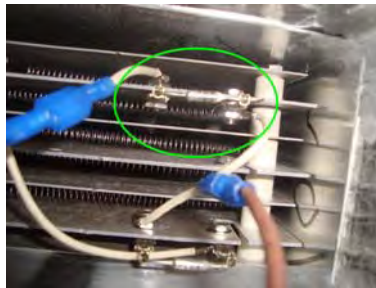
8. REMOVE THE BOTTOM BROWN WIRE (FEMALE SPADE) FROM THE MALE SPADE ON THE BOTTOM OF THE HEATING ELEMENT. CAUTION: DO ONLY ONE WIRE AT A TIME.

9. REMOVE INSULATED MALE SPADE TERMINAL FROM THE INSULATED FEMALE SPADE ATTACHED TO THE BROWN WIRE.

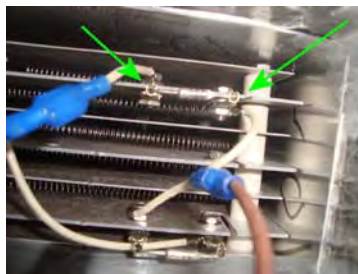
10. ASSEMBLE NEW FUSE SUB ASSEMBLY. CRIMP THE NON INSULATED FEMALE TERMINALS TO BOTH SIDES OF THE FUSE.



11. REMOVE FUSE ASSEMBLY FROM HEATER BY PULLING STRAIGHT OUT ON THE UNINSULATED FEMALE TERMINALS.



12. REPLACE FUSABLE LINK WITH NEW FUSE SUB ASSEMBLY BY REINSTALLING FEMALE TERMINALS TO SYSTEM TABS.

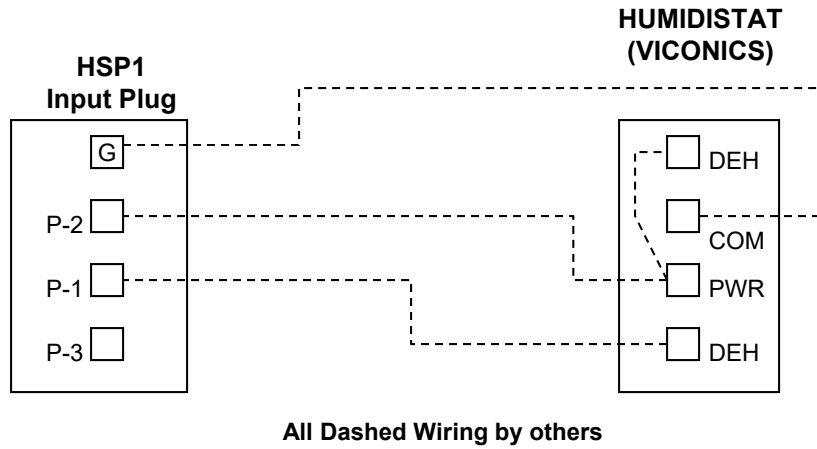


13. REPEAT STEPS 8 THROUGH 12 FOR THE SECOND REPLACEABLE FUSE.

14. BOTH FUSE ASSEMBLIES MUST BE INSIDE THE INNER REACTIVATION CHAMBER BEFORE REINSTALLING THE METAL MESH FILTER.

15. REASSEMBLY: REVERSE STEPS 1 THRU 6.

HC-150 and HC-300 Humidistat Field Connections

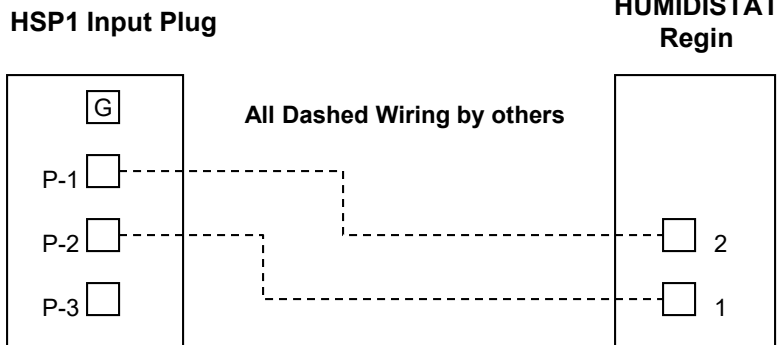


HC-150 / 300

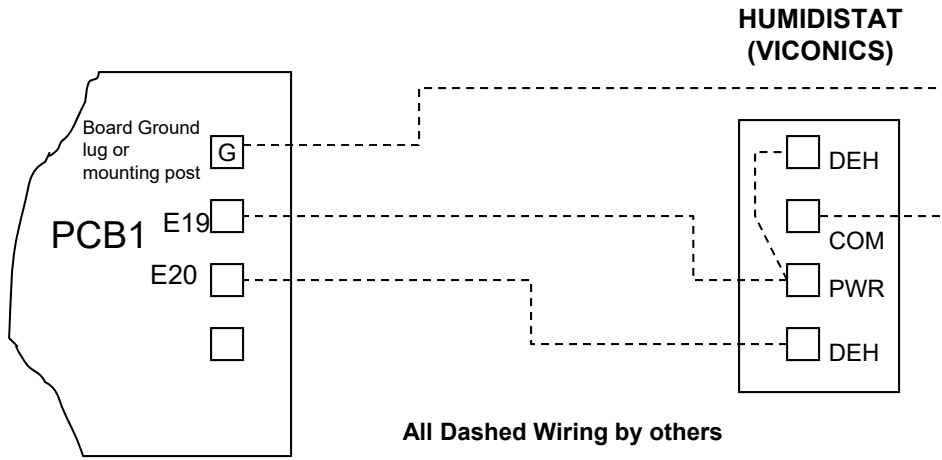


HSP1 Input Plug

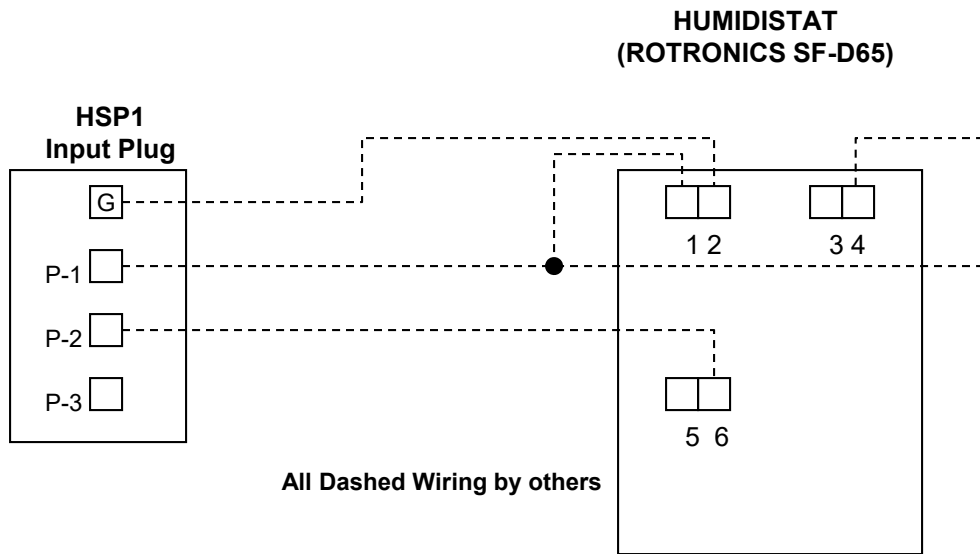
Regin Humidistat p/n 90485-xx



H200 Direct Connect to HC-150/300 Circuit Board



Main Unit Circuit Board



BLASTGATE INSTALLATION INSTRUCTIONS FOR

HC-150 & DEW-150

USING A 5" BLASTGATE DRILL (3) 3/16 DIAMETER HOLES EQUALLY SPACED ON CONNECTION RING OF THE BLASTGATE ON THE SIDE OPPOSITE THE DAMPER BLADE LOCKING SCREW.

APPLY THE ADHESIVE BACKED GASKET SUPPLIED, TO THE INSIDE DIAMETER OF THE BLASTGATE. INSTALL THE BLASTGATE TO THE PROCESS OUTLET CONNECTION RING. WHEN INSTALLING THE BLASTGATE BE CERTAIN THAT IT IS INSTALLED IN SUCH A MANNER TO ALLOW THE BLASTGATE TO OPEN COMPLETELY ALLOWING FULL MODULATION. ALSO CHECK TO MAKE CERTAIN THERE IS NO INTERFERENCE FROM ANY DUCTWORK, WALLS, FILTER BOXES, ETC. USING THE BLASTGATE AS A GUIDE DRILL (3) 5/32 DIAMETER HOLES THROUGH THE CONNECTION RING OF THE DEHUMIDIFIER. INSTALL (3) 10-32 SELF TAPPING SCREWS THROUGH THE BLASTGATE. REPEAT PROCEDURE FOR THE 4" BLASTGATE FOR REACTIVATION OUTLET.

HC-300 & DEW-300

USING 8" BLASTGATE DRILL (3) 3/16 DIAMETER HOLES EQUALLY SPACED ON CONNECTION RING OF THE BLASTGATE ON THE SIDE OPPOSITE THE DAMPER BLADE LOCKING SCREW.

INSTALL THE BLASTGATE TO THE PROCESS OUTLET CONNECTION RING. WHEN INSTALLING THE BLASTGATE BE CERTAIN THAT IT IS INSTALLED IN SUCH A MANNER TO ALLOW THE BLASTGATE TO OPEN COMPLETELY ALLOWING FULL MODULATION. ALSO CHECK TO MAKE CERTAIN THERE IS NO INTERFERENCE FROM ANY DUCTWORK, WALLS, FILTER BOXES, ETC. USING BLASTGATE AS GUIDE DRILL (3) 5/32 DIAMETER HOLES THROUGH THE CONNECTION RING OF THE DEHUMIDIFIER. INSTALL (3) SELF TAPPING SCREWS THROUGH BLASTGATE.

BLASTGATE INSTALLATION INSTRUCTION FOR CONNECTION TO DUCTWORK HC-150, DEW-150, HC-300 & DEW-300

USE FLEXIBLE CONNECTION AT THE DEHUMIDIFIER. LOCATE THE DAMPER IN A STRAIGHT RUN OF THE DUCTWORK OF PROCESS OUTLET IN AN EASILY ACCESSIBLE AREA TO FACILITATE ADJUSTMENTS. INSTALL BLASTGATE INTO DUCTWORK. DRILL 5/32 DIAMETER HOLES THROUGH DUCTWORK AND CONNECTION RING OF BLASTGATE. INSTALL 10-32 SELF TAPPING SCREWS. REPEAT PROCEDURE FOR HC-150 OR DEW-150 FOR REACTIVATION OUTLETS.

REVISION 1 - ADDED COMMENT ON BLASTGATE MOUNTING 10/27/92 EJL *EJL*

Munters Cargocaire Amesbury, Massachusetts 01913	DFT PAH	DATE 6/92	DWG NO.	
	CHK EJL	6/92	A27110	
BLASTGATE INSTALLATION INSTRUCTIONS	APP EJL	6/92		
	CODE IDENT. #82974		1 OF 1	REV 1

21239

Recommended Spare Parts List

HC-300

MODEL: HC-300

DESCRIPTION	P/N	QTY REQ
-------------	-----	---------

WHEELS (REPLACEMENT KITS)

SIGEL (Titanium Enhanced Silica Gel)	30146-12	(1)
--------------------------------------	----------	-----

SEALS

SEAL KIT, UPPER & LOWER	43552-02	(1)
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MOTORS

DRIVE MOTOR (S/N J92>)	92483-01 220V	(1)
------------------------	---------------	-----

BELTS

DRIVE BELT	91626-03	(1)
------------	----------	-----

FILTERS

PROCESS IN	95007-29	(1)
REACT IN	95007-40	(1)

ROLLERS

DESICCANT SUPPORT	15985	(2)
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HEATERS

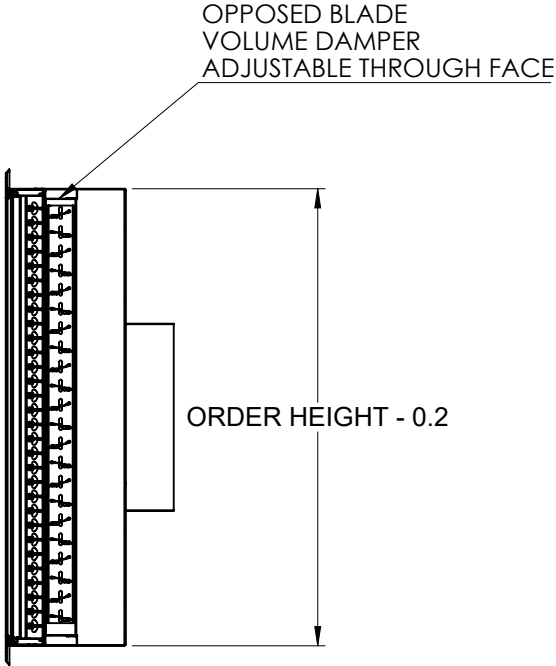
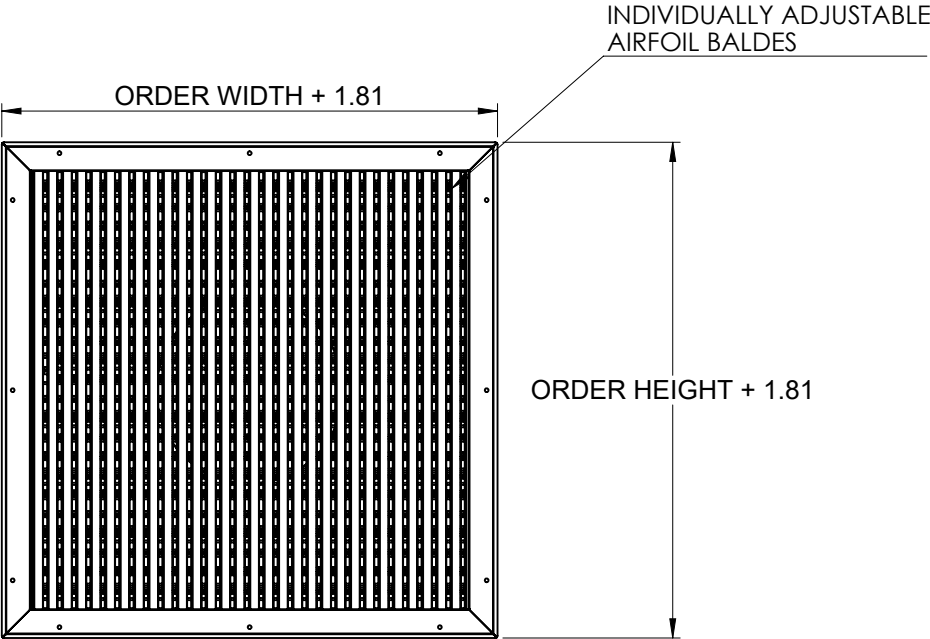
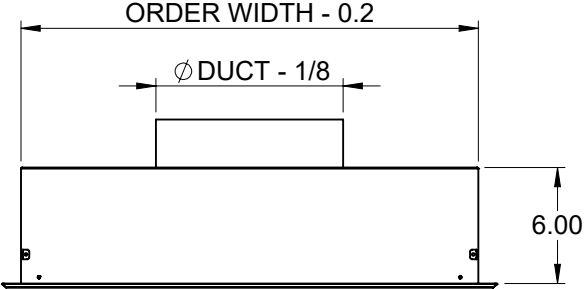
460V 3PH	91761-09	(1)
208-230V 3PH	91761-01	(1)
208V-230V 1PH	91761-02	(1)

-03	CHANGED 30146-11 TO 30146-12 PER ECR 12-00129MA	TJM	05/15/13	TJM
-02	DRIVE MOTOR WAS 92054-02, HEATERS WERE 91719 SERIES.	SAH	02/03/04	SAH
-01	CHANGED REACT. FILTER P/N FROM -30 TO -40	EJL	12/01/98	EJL
REV	DESCRIPTION	DFT	DATE	APP
REVISIONS				

Munters Corporation 79 Monroe Street Amesbury, MA 01913	DFT	GR	DATE	2/97	REF SPEC #	DWG NO.	21239
	CHK	GR	DATE	2/97	CUST NAME: STANDARD		
	APP	SB	DATE	2/97	PAGE 1 OF 1	CODE IDENT # 82974	REV 3

250V STAINLESS STEEL

DOUBLE DEFLECTION SUPPLY GRILLE



SECTION A-A



DRAWING NAME
Q#113017-111

DIMENSIONS ARE IN INCHES/LBS UNLESS OTHERWISE SPECIFIED.
DIMENSIONS IN PARENTHESES ARE FOR REFERENCE ONLY.
TOLERANCES: ANGULAR, MACH ± .1° BEND ± .1° TWO DECIMALS ± .03;
THREE DECIMAL ± .010; THREE DECIMALS FOR LASER ± .005.
REMOVE ALL SHARP EDGES AND BURRS.

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DRAWN
HT

CHKD
RH

APRVD

MATERIAL
304L SS

FINISH
#4 SATIN

SIZE

JOB NAME

ENGINEER

CONTRACTOR

TAG

QTY

REV #

SHT 1/1

SCL 1:10

DO NOT SCALE



PROJECT
SUBMITTAL

WILL COUNTY
New Coroner Facility
Control Panel

Vice President of Operations

Paul Joseph

411 North Aerojet Avenue Azusa, Ca. 91702

Office: 626 334-1471 Ext. 104

Fax: 626 334 1704

Prepared for:

Tyler Nassar

Leopardo Companies (IL)

Phone: (224) 2887903

Date: January 06, 2023

Submittal No. 1

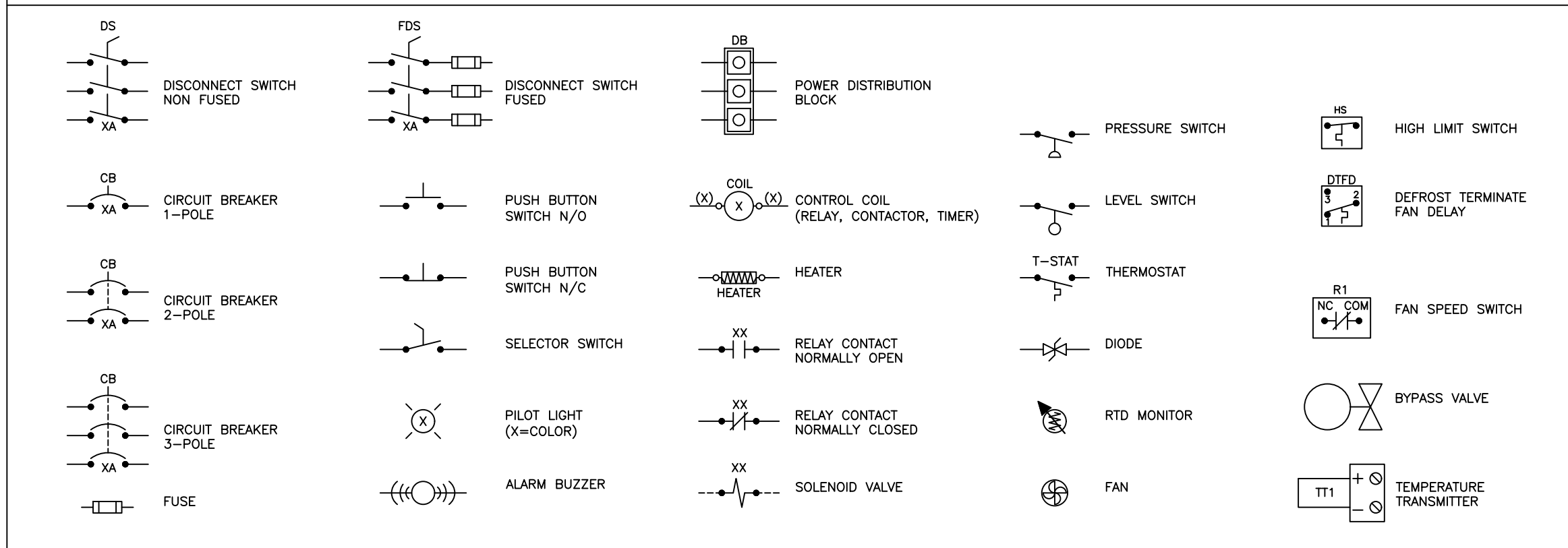
WILL COUNTY - LEAD LAG PANEL

COOLER RM. 124A / FREEZER RM. 124B / SYSTEMS 1 & 2

DRAWING INDEX

DRAWING NUMBER	SHEET NUMBER	DRAWING DESCRIPTION
2090796-00	1 OF 1	DRAWING INDEX
2090796-01	1 OF 1	ROOM SCHEDULE
2090796-02	1 OF 1	CONDUIT
2090796-03	1 OF 1	PANEL LAYOUT
2090796-04	1 OF 1	COOLER SYSTEM 1/DEHUMIDIFIER - RM 124A
2090796-05	1 OF 1	EVAP COOLER SYSTEMS 1 & 2 - RM 124A
2090796-06	1 OF 1	EVAP FREEZER SYSTEMS 1 & 2 - RM 124B
2090796-07	1 OF 1	24VDC POWER SUPPLY/PLC/CPU/ETHERNET
2090796-08	1 OF 1	DIGITAL INPUTS SLOT 1
2090796-09	1 OF 1	DIGITAL OUTPUTS SLOTS 2 & 3
2090796-10	1 OF 1	ANALOG OUTPUTS SLOT 4
2090796-11	1 OF 1	FIELD CONNECTIONS

COMPONENT LEGEND



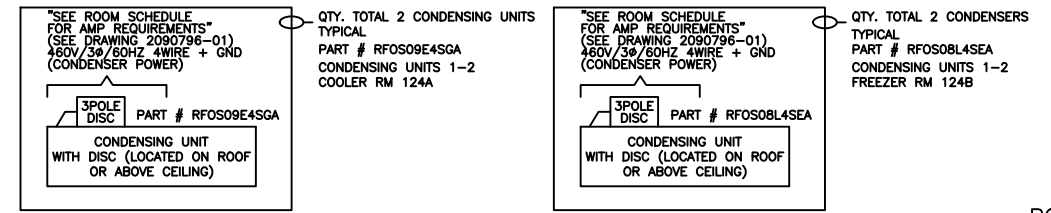
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0	12/13/22	LB	FOR APPROVAL											WILL COUNTY	NONE	12/13/22	411 North Aerojet Avenue Azusa, CA 91702		COVER SHEET
																	Tel: (800) 410-0100 - (626) 334-1471 Fax: (626) 334-704 www.mortechmfg.com		REV. 0
																	JOB NO. 2090796	DWG NO. 2090796-00	SHR. 1 OF 1

PROPRIETARY
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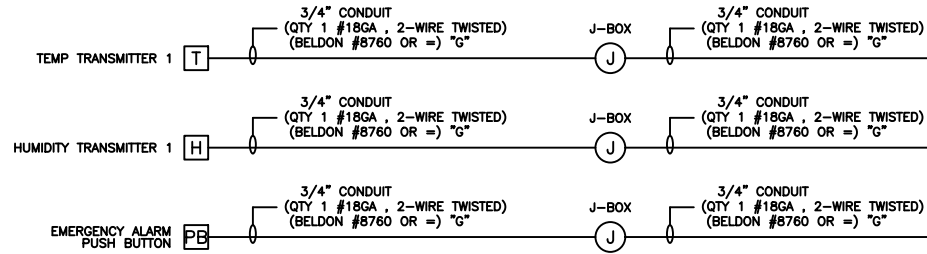
CONDUIT SCHEDULE

CONDENSING UNITS

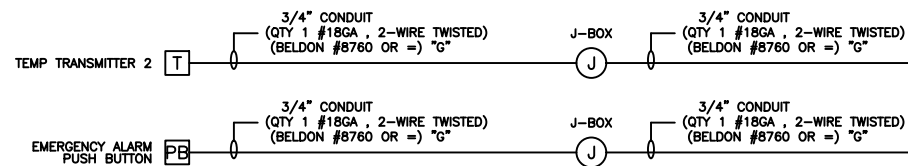
- GENERAL NOTES:
- ANY LOW VOLTAGE (CLASS-2) SIGNAL WIRE RUN WITH POWER WIRE MUST BE RATED AT 600V PLENUM-RATED CABLE.
 - LOW VOLTAGE (CLASS 2) SIGNAL WIRE NOT RUN IN CONDUIT SHALL BE INSTALLED IN A CLEAN WORKMAN LIKE MANNER AND SHALL FOLLOW PATHWAYS CREATED BY DUCTWORK.
 - BOTH HIGH AND LOW VOLTAGE CIRCUITS SHALL BE PERMITTED TO OCCUPY THE SAME EQUIPMENT WIRING ENCLOSURE, CABLE OR RACEWAY. ALL CONDUCTORS SHALL HAVE AN INSULATION RATING EQUAL TO AT LEAST 600V - THE MAXIMUM VOLTAGE APPLIED TO ANY CONDUCTOR WITHIN ENCLOSURE, CABLE OR RACEWAY.
 - ALL FIELD WIRING, CONDUIT, DISCONNECTS & WIRE SIZE MUST FOLLOW N.E.C. AND LOCAL ELECTRIC CODES, NO EXCEPTIONS.
 - USE COPPER CONDUCTORS ONLY!



COOLER SYSTEM RM 124A LOW VOLTAGE



FREEZER SYSTEM RM 124B LOW VOLTAGE



ALARM DRY CONTACTS FOR CUSTOMER MONITORING AND USE - 1-1/2" CONDUIT (QTY 11 #18GA, 3-WIRE TWISTED) (BELDON #8770 OR =) "H"

TEMP AND HUMIDITY RETRANSMIT FOR CUSTOMER MONITORING AND USE - 3/4" CONDUIT (QTY 3 #18GA, 2-WIRE TWISTED) (BELDON #8760 OR =) "G"

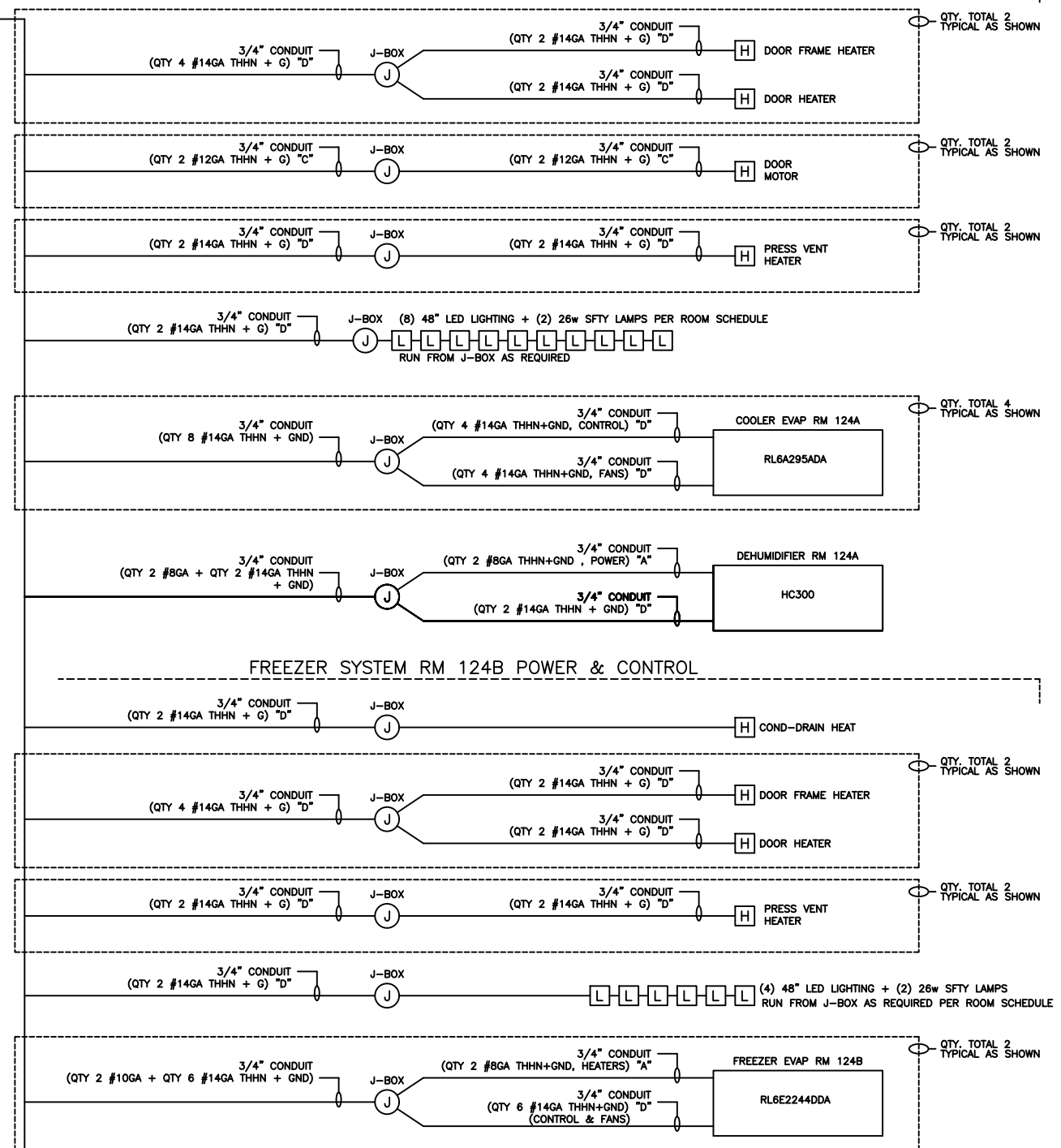
WIRE SPECIFICATIONS		
NUMBER	VOLTAGE	DESCRIPTION
A	600V	8GA (THHN OR =)
B	600V	10GA (THHN OR =)
C	600V	12GA (THHN OR =)
D	600V	14GA (THHN OR =)
E	600V	16GA (THHN OR =)
F	600V	18GA (THHN OR =)
G	300V	BLK, GRN, SHLD -18GA, 2 WIRE TWISTED SHELDED (BELDON #8760 OR =)
H	300V	BLK, RED, GRN -18GA, 3 WIRE TWISTED SHELDED (BELDON #8770 OR =)
J	600V	BLK, WHI, RED, GRN -14GA, 4 WIRE SHELDED (BELDON #8627 OR =)
K	-	CAT-5E or BETTER PLENUM CABLE

LOW VOLTAGE JUNCTION BOX

CONTROL PANEL

POWER JUNCTION BOX

COOLER SYSTEM RM 124A POWER & CONTROL



NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO	CUSTOMER	SCALE:	DATE	MORTECH MANUFACTURING	411 North Aerojet Avenue Azusa, CA 91702 Tel: (800) 410-0100 - (626) 334-1471 Fax: (626) 334-704 www.mortechmfg.com	COOLER 124A/SYSTEMS 1&2 FREEZER 124B/SYSTEMS 1&2			
FOR APPROVAL												WILL COUNTY			CONDUIT	REV.			JOB NO.	DWG NO.	SHT.	
0	12/13/22	LB													NONE	12/13/22			0	2090796	2090796-02	1 OF 1

1

2

3

4

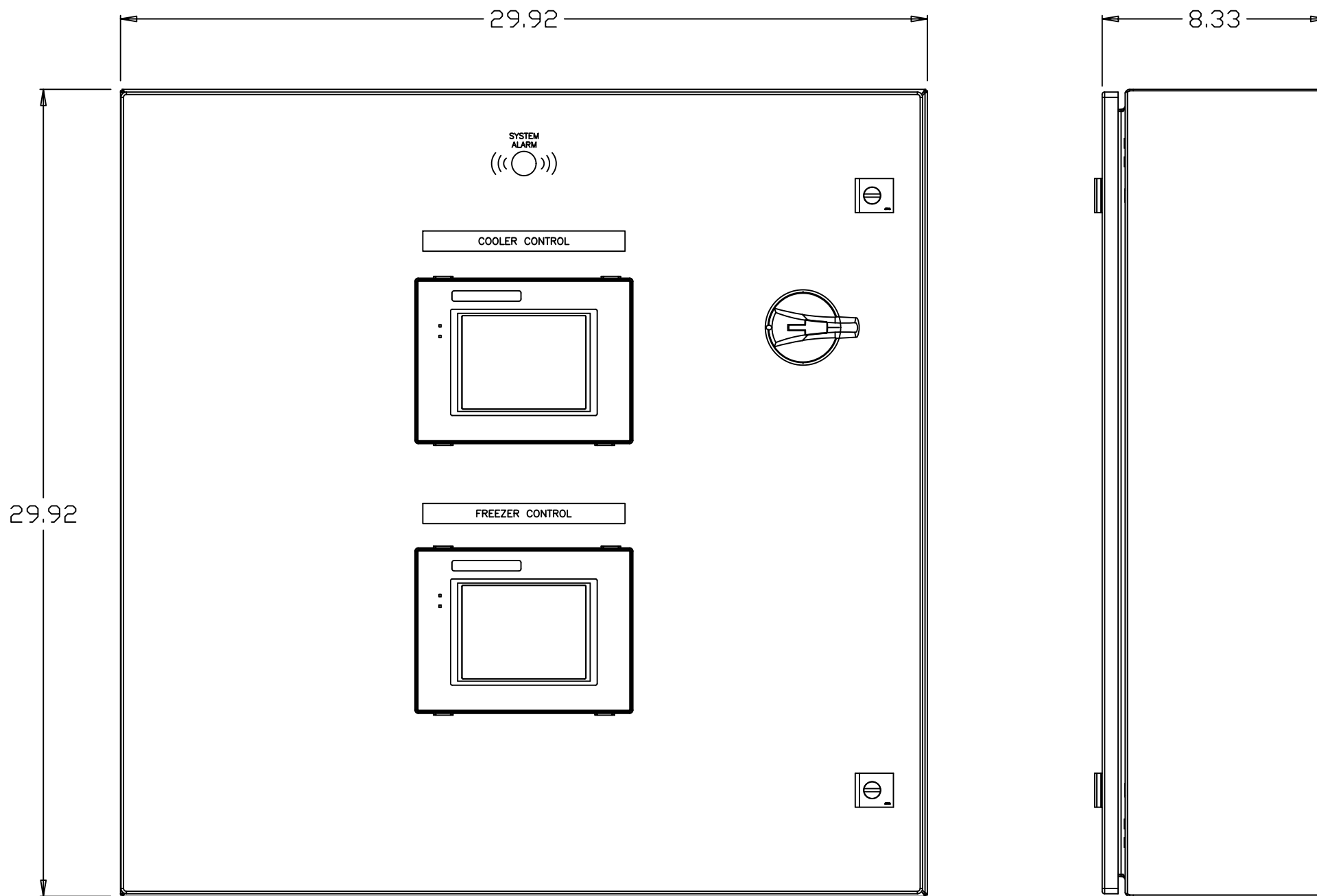
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6

7

8

COOLER/FREEZER SYSTEM PANEL LAYOUT



NO.	DATE	BY	REVISIONS
0	12/13/22	LB	FOR APPROVAL

NO.	DATE	BY	REVISIONS

DATE	REV.	ISSUED TO
		SHOP FIELD PURCH CUST. CUST.

CUSTOMER
WILL COUNTY

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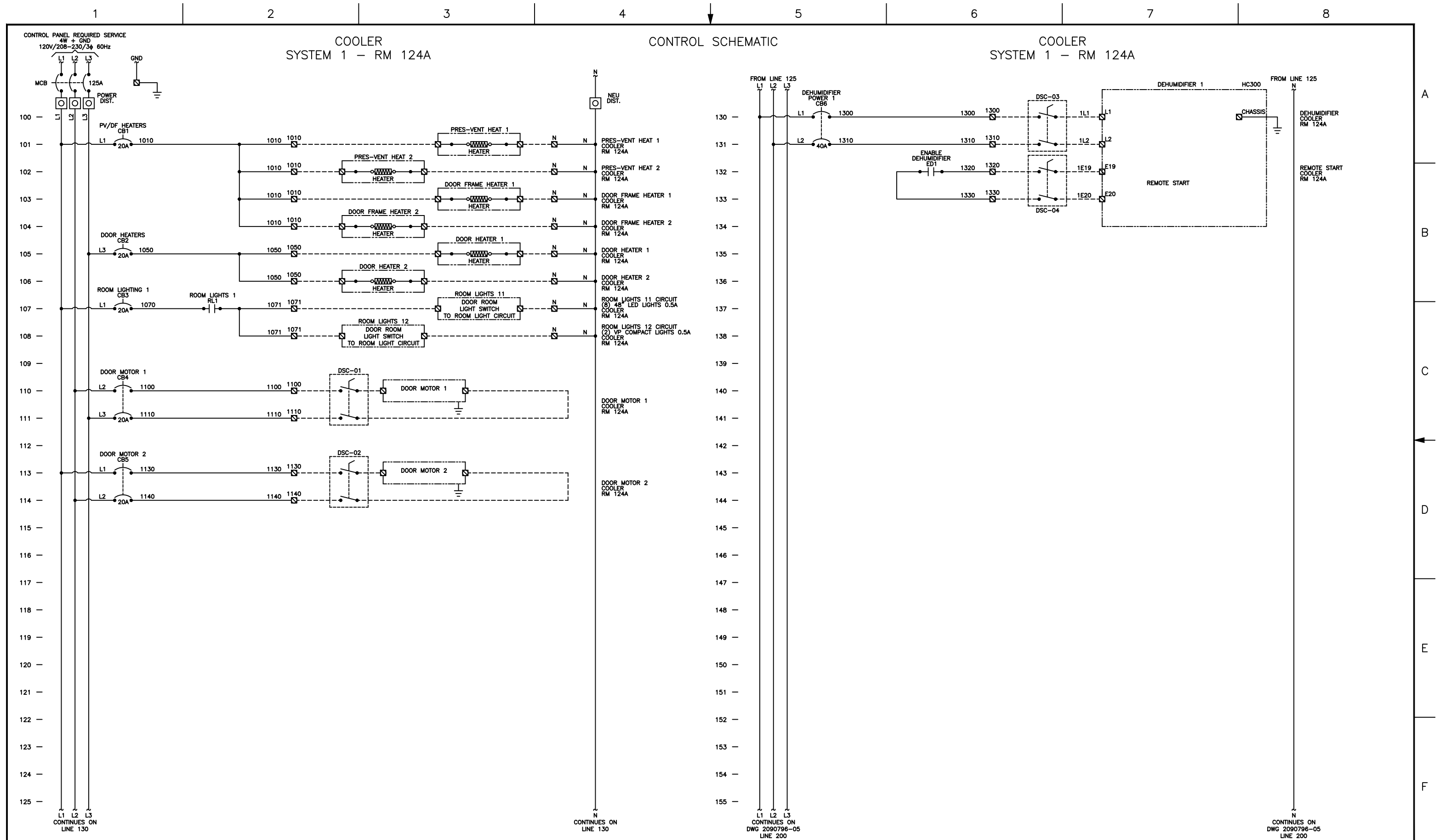
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DRWN	ILS	12/13/22
CHK'D	-	-
ENG'R	-	-
APP'D	-	-

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www.mortechmfg.com

COOLER/RM 124A/SYSTEMS 1&2		REV.	0
FREEZER/RM 124B/SYSTEMS 1&2			
PANEL LAYOUT			
JOB NO.	2090796	DWG NO.	2090796-03
		SHT.	1 OF 1



NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO	CUSTOMER	SCALE:	NONE	DATE	COOLER / RM 124A SYSTEM 1	
0	12/13/22	LB	FOR APPROVAL							SHOP			FIELD	WILL COUNTY	DRWN	ILS	12/13/22	CONTROL SCHEMATIC	
										PURCH			CUST.	ENG'R				REV. 0	
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																		DWG NO. 2090796-04	
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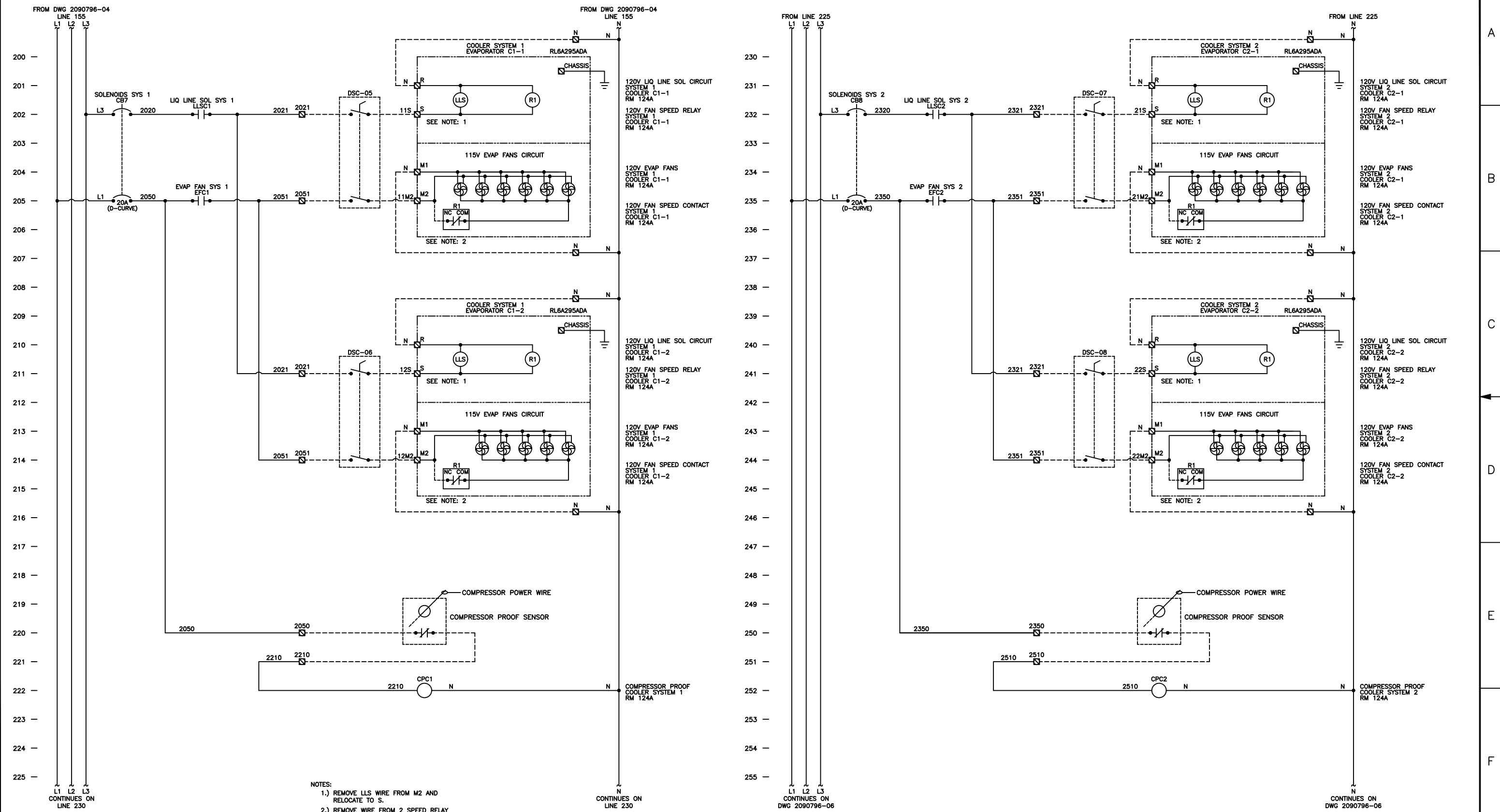


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COOLER SYSTEM 1 - RM 124A

CONTROL SCHEMATIC

COOLER SYSTEM 2 - RM 124A



- NOTES:
 1.) REMOVE LLS WIRE FROM M2 AND RELOCATE TO S.
 2.) REMOVE WIRE FROM 2 SPEED RELAY BETWEEN NC TERMINAL AND M2

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO
0	12/13/22	LB	FOR APPROVAL							SHOP			FIELD
										PURCH			CUST.
										CUST.			

CUSTOMER
WILL COUNTY

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ENG'R:	-		
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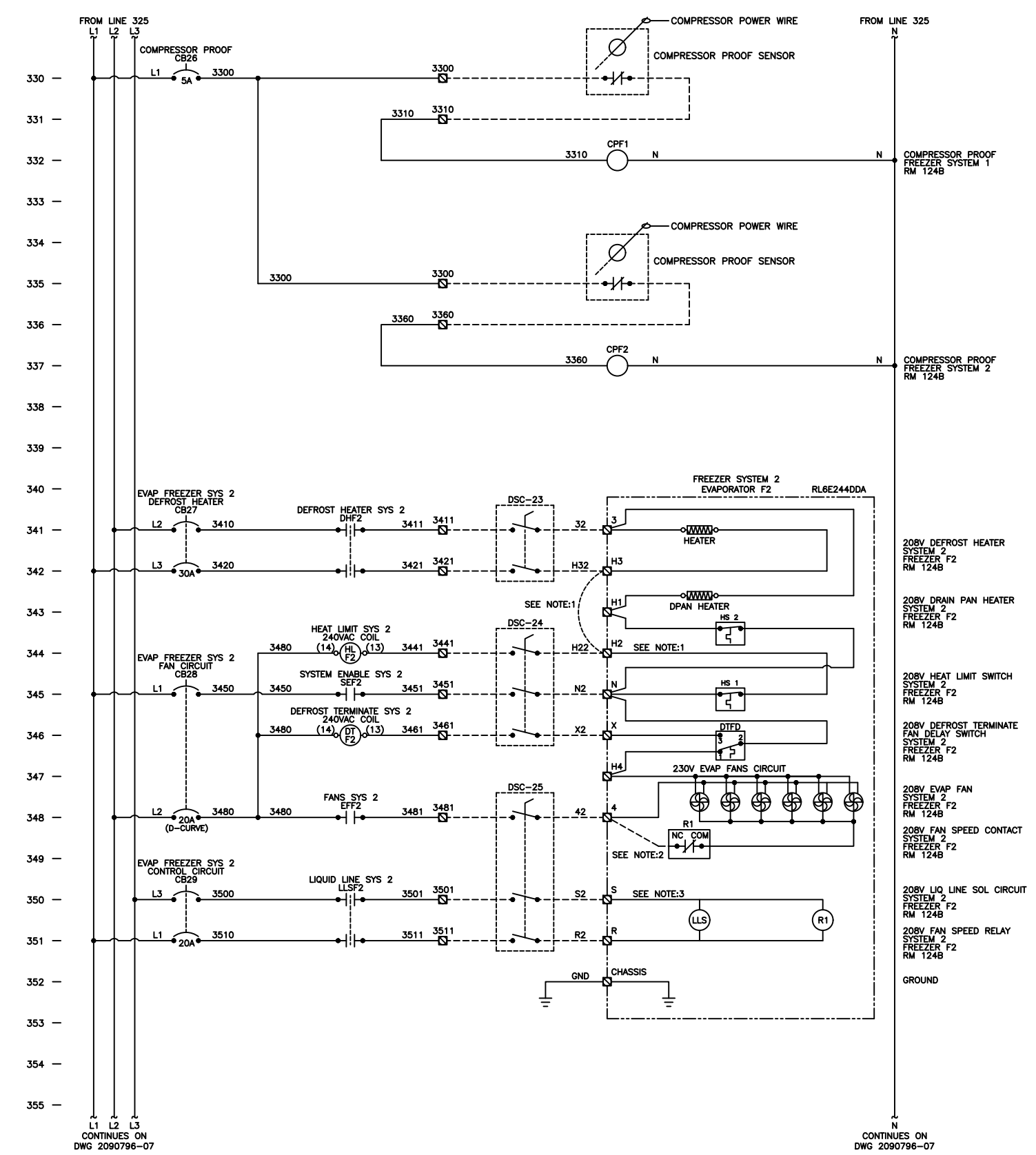
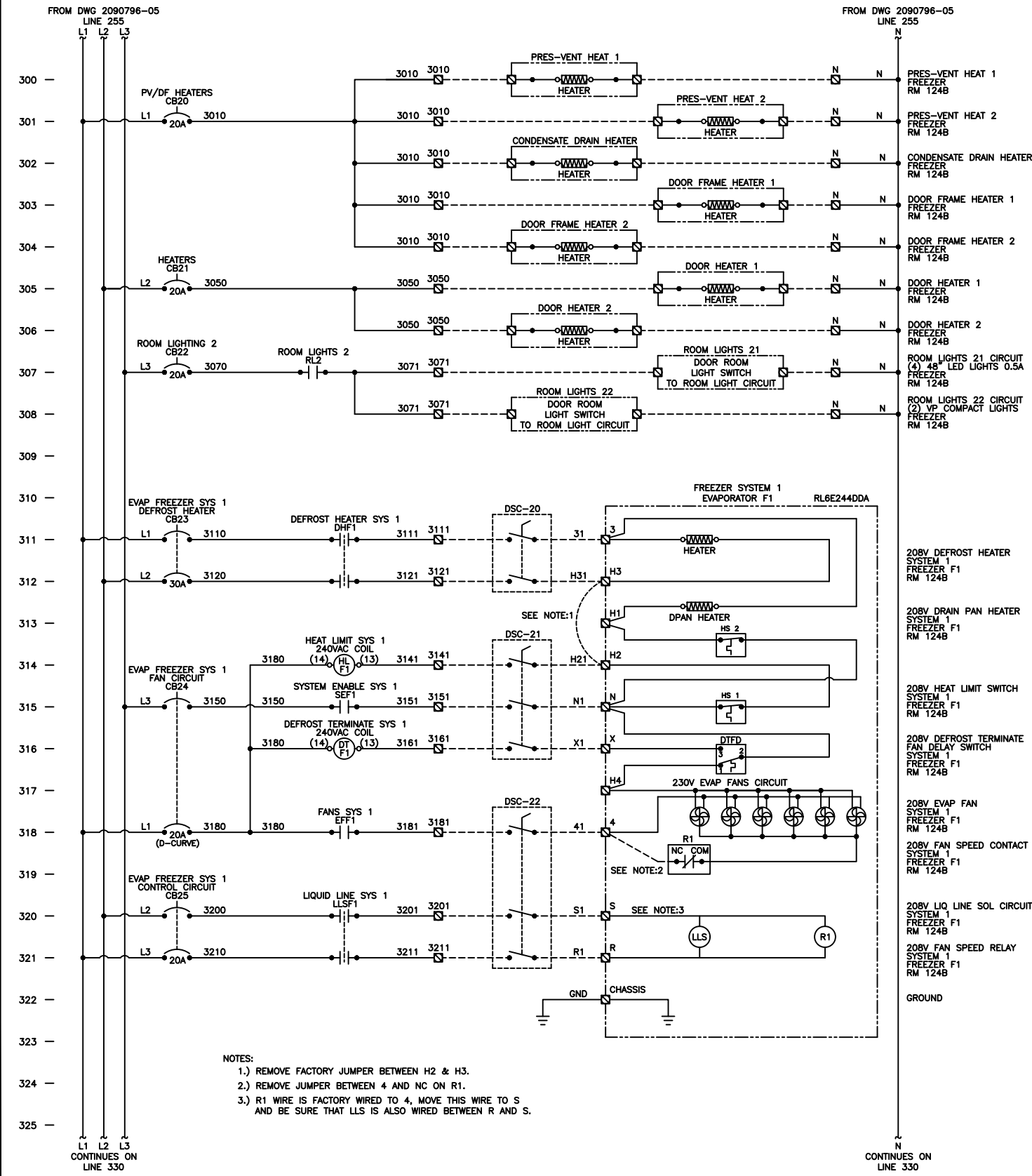
COOLER / RM 124A SYSTEM 2		REV.	0
CONTROL SCHEMATIC		REV.	0
JOB NO.	2090796	DWG NO.	2090796-05
		SHT.	1 OF 1



FREEZER SYSTEM 1 - RM 124B

CONTROL SCHEMATIC

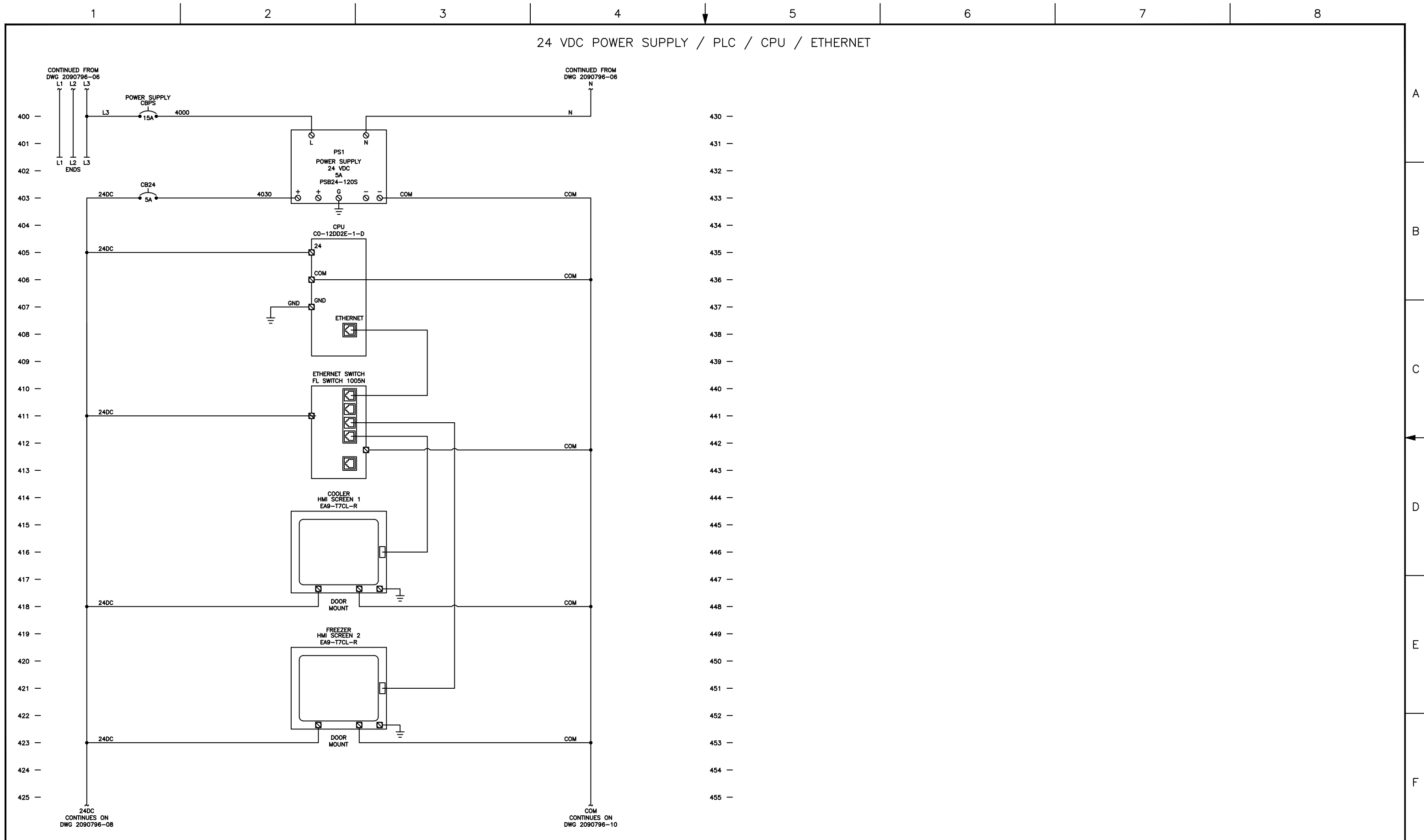
FREEZER SYSTEM 2 - RM 124B



- NOTES:
- 1.) REMOVE FACTORY JUMPER BETWEEN H2 & H3.
 - 2.) REMOVE JUMPER BETWEEN 4 AND NC ON R1.
 - 3.) R1 WIRE IS FACTORY WIRED TO 4, MOVE THIS WIRE TO S AND BE SURE THAT LLS IS ALSO WIRED BETWEEN R AND S.

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO	CUSTOMER	SCALE:	DATE	<p>411 North Aerojet Avenue Azusa, CA 91702 Tel: (800) 410-0100 - (626) 334-1471 Fax: (626) 334-704 www.mortechmfg.com</p>	<p>FREEZER / RM 124B SYSTEMS 1 & 2</p> <p>CONTROL SCHEMATIC</p> <p>REV. 0</p>				
0	12/13/22	LB	FOR APPROVAL											WILL COUNTY	NONE	12/13/22						
<p>PROPRIETARY</p> <p>THIS DOCUMENT AND THE DATE DISCLOSED HEREIN AND HEREWITH IS NOT TO BE REPRODUCED, USED, OR OTHERWISE DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT WRITTEN AUTHORIZATION FROM MORTECH MFG.</p>																						
														JOB NO.	2090796	DWG NO.	2090796-06	SHT.	1 OF 1			

24 VDC POWER SUPPLY / PLC / CPU / ETHERNET



NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO	
0	12/13/22	LB	FOR APPROVAL							SHOP	FIELD	PURCH	CUST. I	CUST. II

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DRWN ILS 12/13/22
CHK'D - -
ENG'R - -
APP'D - -

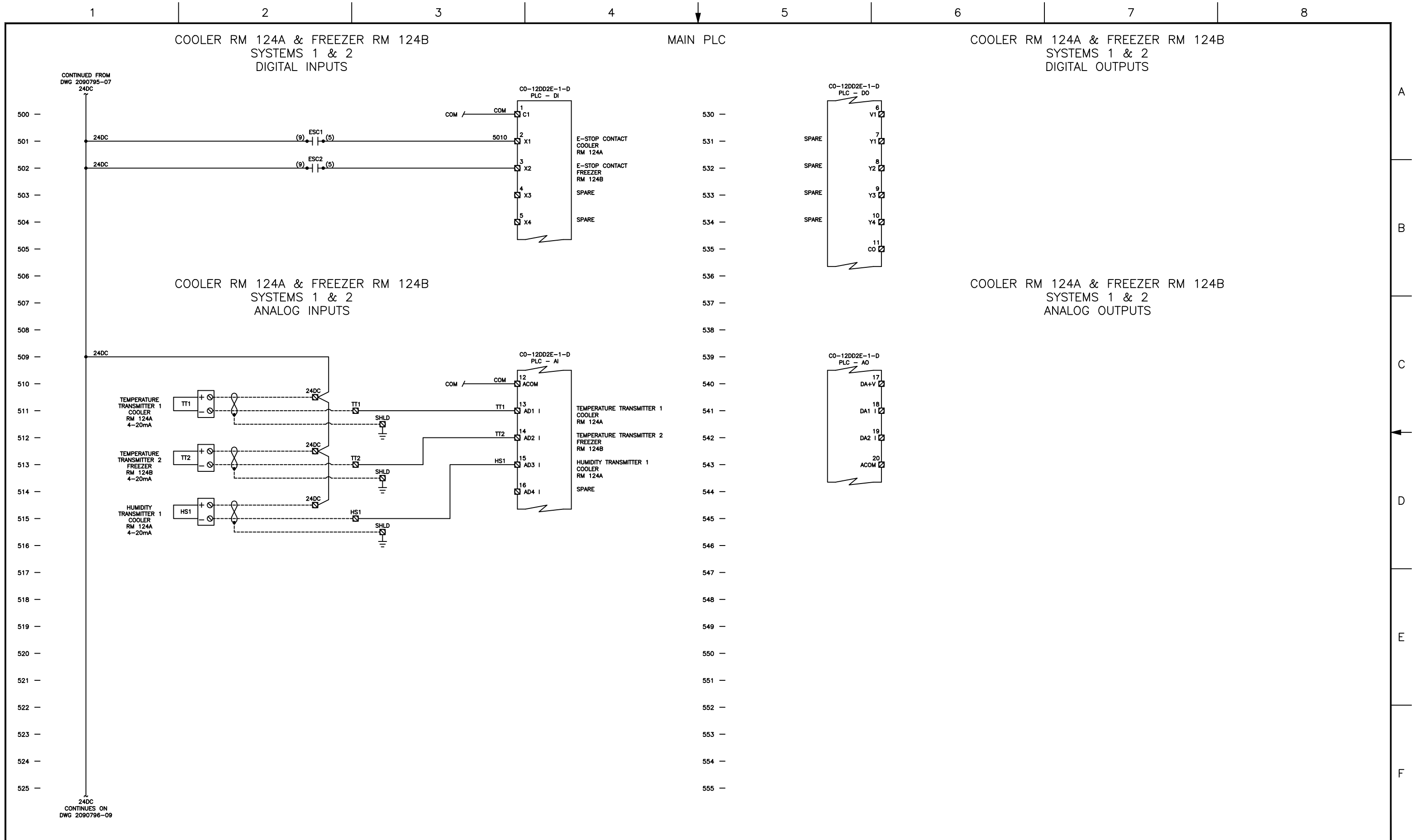
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COOLER/RM 124A/SYSTEMS 1&2
FREEZER/RM 124B/SYSTEMS 1&2

24 VDC POWER SUPPLY
PLC / CPU / ETHERNET

REV. 0

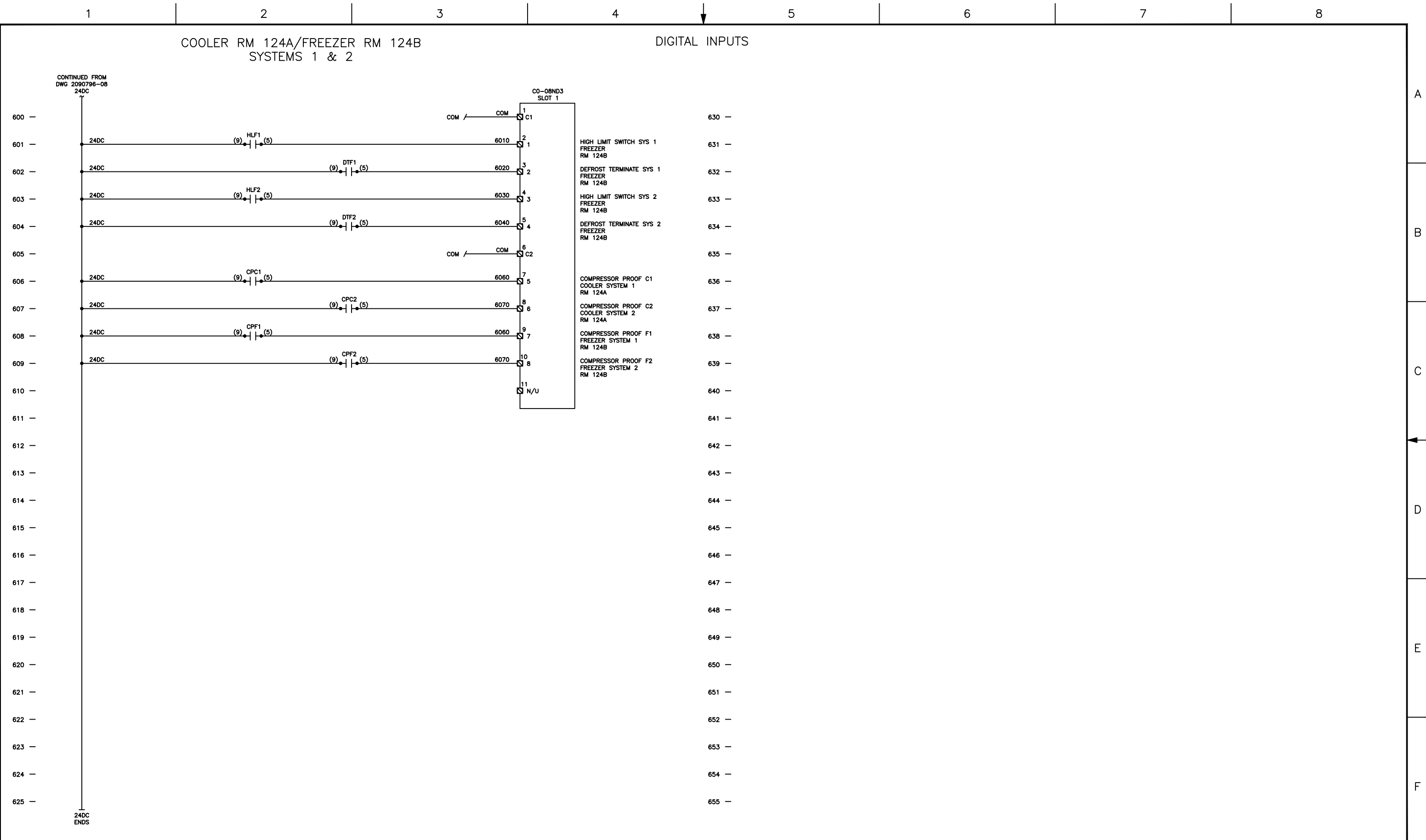
JOB NO. 2090796 DWG NO. 2090796-07 SH. 1 OF 1



NO.		DATE		BY		REVISIONS		DATE		REV.		ISSUED TO		DATE		REV.		ISSUED TO		CUSTOMER		SCALE: NONE		DATE	
0	12/13/22	LB										SHOP	FIELD	PURCH	CUST.	CUST.					WILL COUNTY	DRWN	ILS	12/13/22	
																						MORTECH MANUFACTURING		REV. 0	
																						411 North Aerojet Avenue Azusa, CA 91702		Tel: (800) 410-0100 - (626) 334-1471 Fax: (626) 334-704 www.mortechmfg.com	
JOB NO.		2090796		DWG NO.		2090796-08		SHT.		1 OF 1															

COOLER RM 124A/FREEZER RM 124B
SYSTEMS 1 & 2

DIGITAL INPUTS



CONTINUED FROM
DWG 2090796-08
24DC

CO-08ND3
SLOT 1

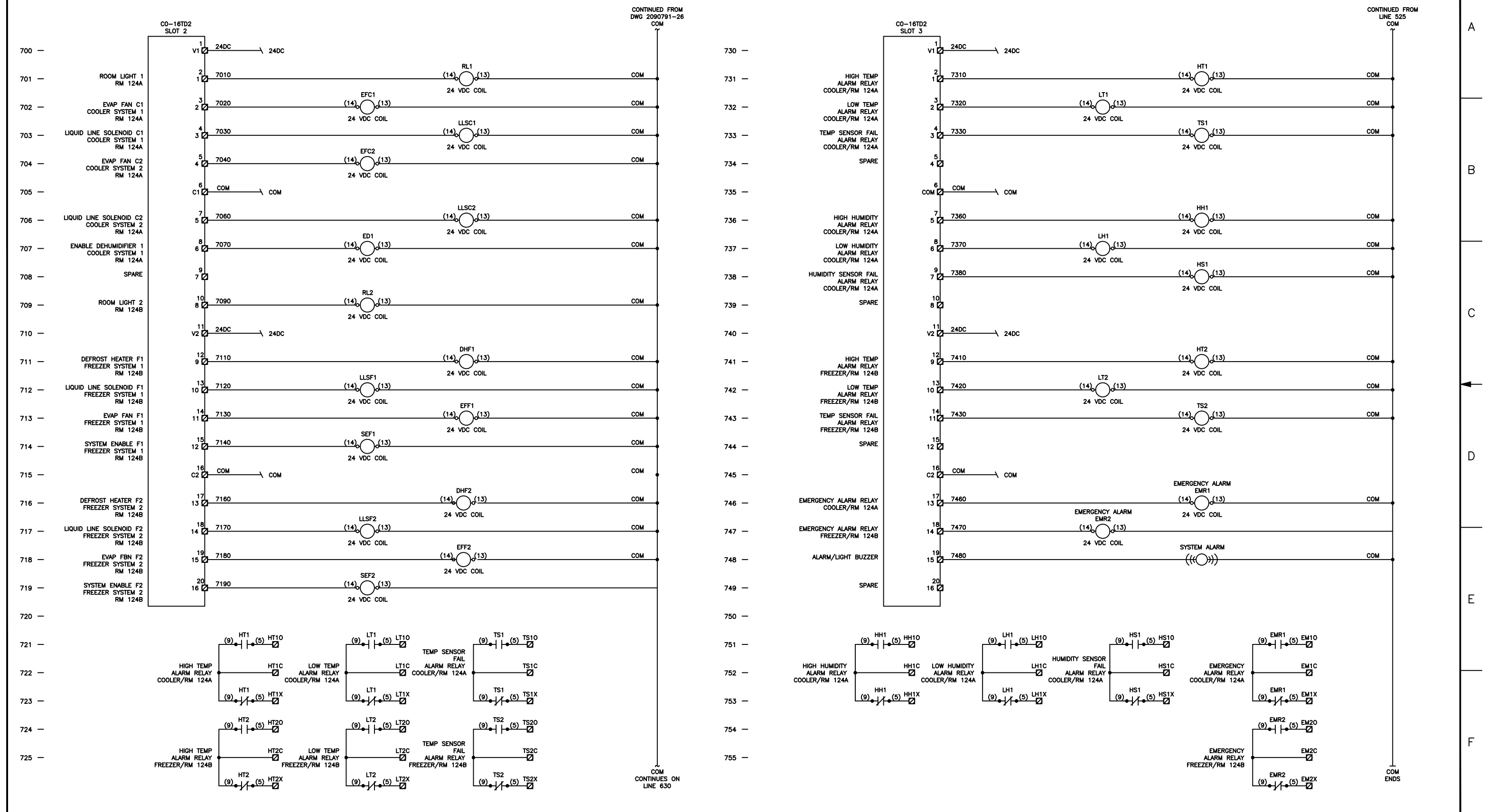
24DC
ENDS

NO.	DATE	BY	REVISIONS				NO.	DATE	BY	REVISIONS				DATE	REV.	ISSUED TO				DATE	REV.	ISSUED TO				CUSTOMER	SCALE:	NONE	DATE	JOB NO.	DWG NO.	SHT.	REV.		
			NO.	DATE	BY	REVISIONS				NO.	DATE	BY	REVISIONS			SHOP	FIELD	PURCH	CUST.			CUST.	SHOP	FIELD	PURCH									CUST.	CUST.
0	12/13/22	LB	FOR APPROVAL																																
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<p style="text-align: center;">MORTECH MANUFACTURING</p> <p>411 North Aerojet Avenue Azusa, CA 91702</p> <p>Tel: (800) 410-0100 - (626) 334-1471 Fax: (626) 334-704 www.mortechmfg.com</p>																																			
<p style="text-align: center;">COOLER/RM 124A/SYSTEMS 1&2 FREEZER/RM 124B/SYSTEMS 1&2</p> <p style="text-align: center;">DIGITAL INPUTS</p>																																			

COOLER RM 124A/FREEZER RM 124B SYSTEMS 1 & 2

DIGITAL OUTPUTS

COOLER RM 124A/FREEZER RM 124B SYSTEMS 1 & 2



NO.	DATE	BY	REVISIONS
0	12/13/22	LB	FOR APPROVAL

NO.	DATE	BY	REVISIONS

DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO

CUSTOMER		SCALE: NONE	DATE
WILL COUNTY		DRWN ILS	12/13/22
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		ENG'R	
		APP'D	

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Azusa, CA 91702

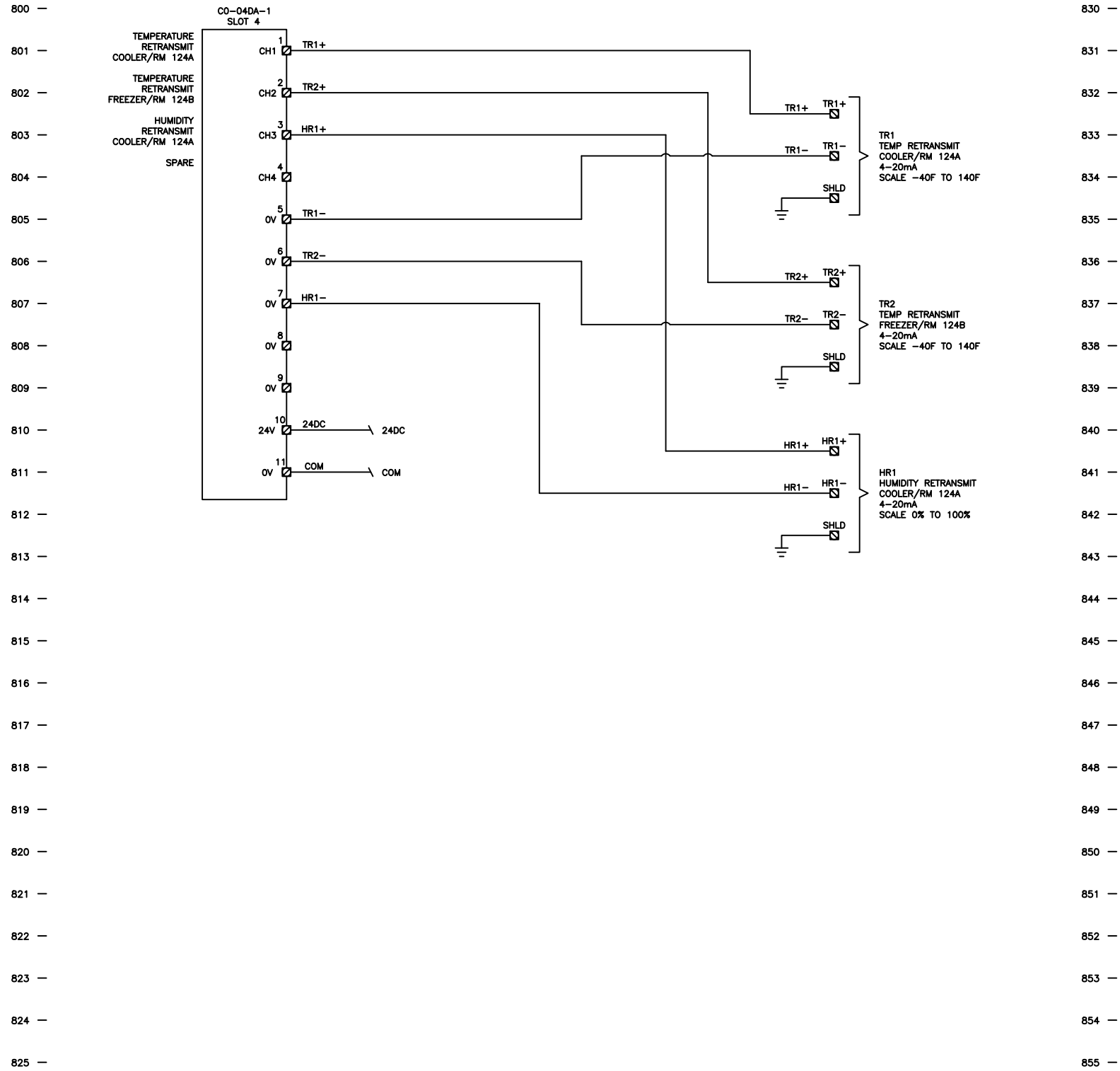
Tel: (800) 410-0100 - (626) 334-1471
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COOLER/RM 124A/SYSTEMS 1&2		REV.	0
FREEZER/RM 124B/SYSTEMS 1&2			
DIGITAL OUTPUTS			
JOB NO. 2090796	DWG NO. 2090796-10		

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COOLER RM 124A/FREEZER RM 124B
SYSTEMS 1 & 2

ANALOG OUTPUTS



NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO
0	12/13/22	LB	FOR APPROVAL							SHOP	FIELD	PURCH	CUST.

CUSTOMER
WILL COUNTY

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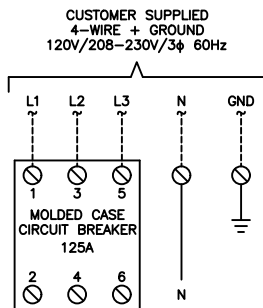
MORTECH
MANUFACTURING

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Azusa, CA 91702

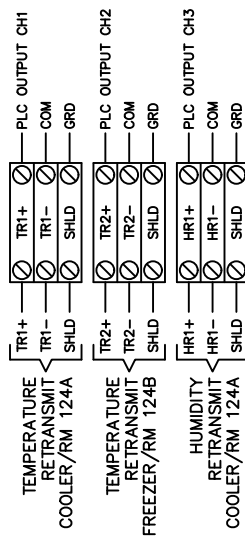
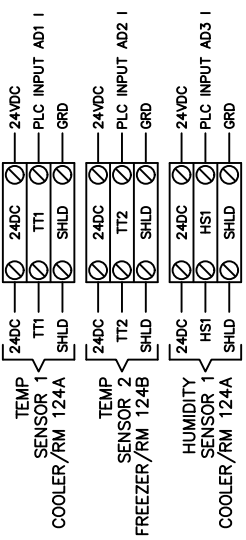
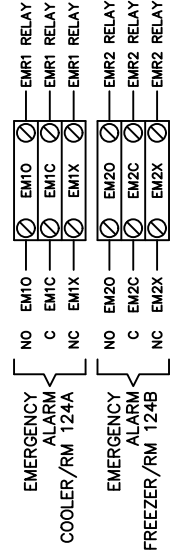
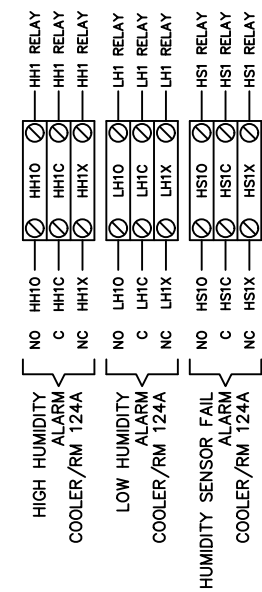
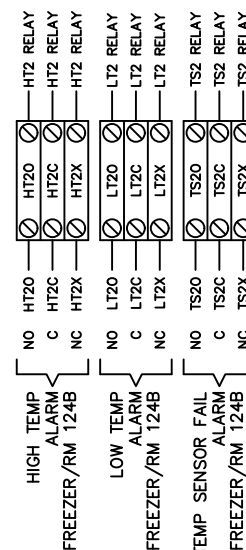
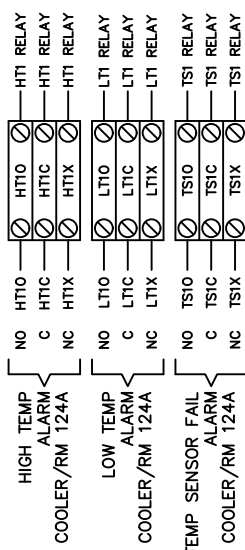
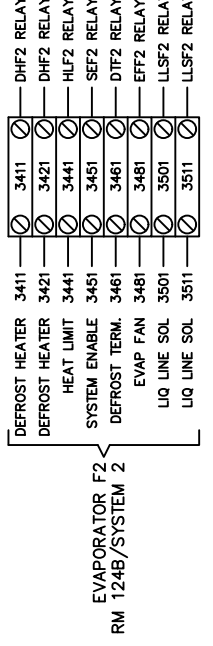
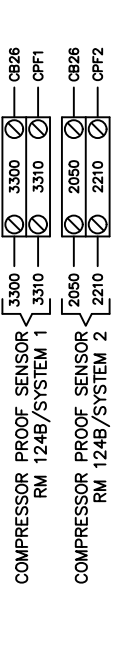
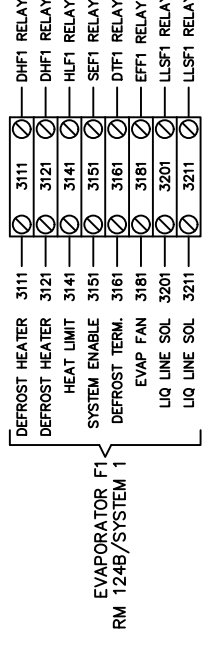
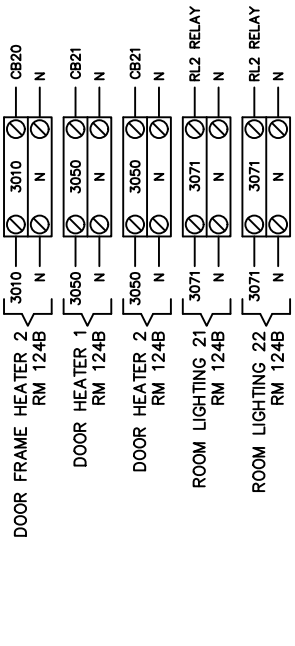
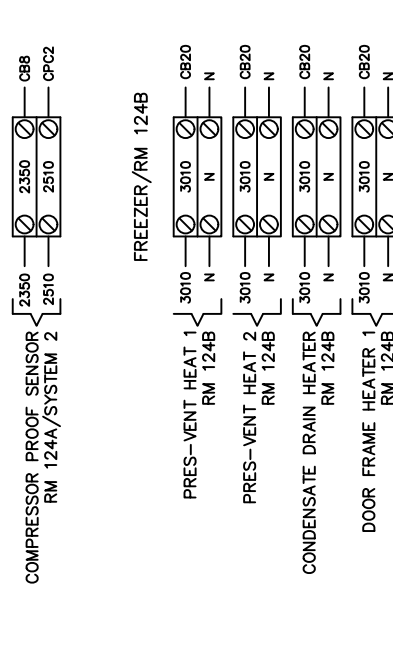
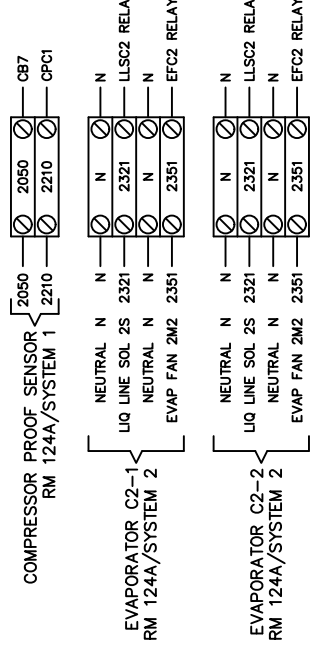
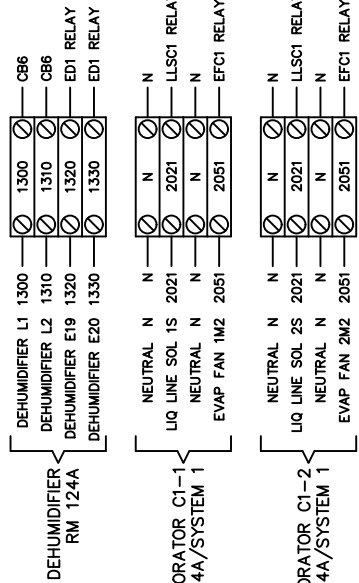
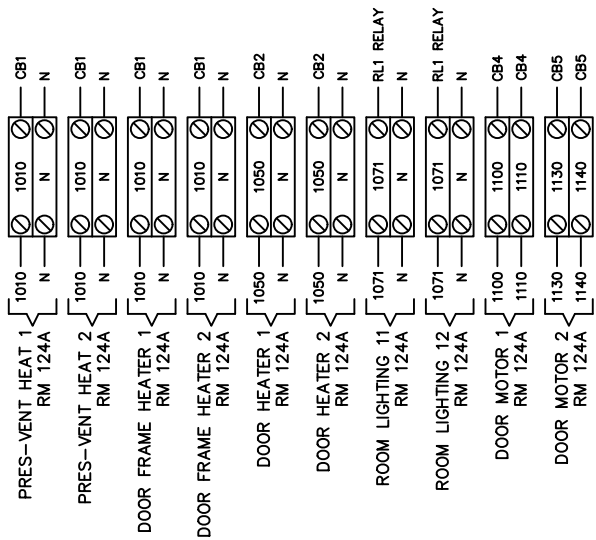
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COOLER/RM 124A/SYSTEMS 1&2 FREEZER/RM 124B/SYSTEMS 1&2		REV.
ANALOG OUTPUTS		0
JOB NO. 2090796	DWG NO. 2090796-11	SHR. 1 OF 1

FIELD CONNECTIONS
 COOLER SYSTEM - RM. 124A
 FREEZER SYSTEM - RM. 124B



COOLER/RM 124A



NO.	DATE	BY	REVISIONS
0	12/13/22	LB	FOR APPROVAL

NO.	DATE	BY	REVISIONS

DATE	REV.	ISSUED TO	DATE	REV.	ISSUED TO
		SHOP			SHOP
		FIELD			FIELD
		PURCH			PURCH
		CUST.			CUST.
		CUST.			CUST.

CUSTOMER	WILL COUNTY
SCALE:	NONE
DATE	12/13/22
DRWN	ILS
CHK'D	
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APP'D	

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COOLER/RM 124A/SYSTEMS 1&2		FREEZER/RM 124B/SYSTEMS 1&2	
FIELD CONNECTIONS		REV.	0
JOB NO.	2090796	DWG NO.	2090796-12
		SHT.	1 OF 1

Bill of Material

ITEM	QTY.	CATALOG NUMBER	MFG.	DESCRIPTION
		Enclosure		
1	1	WM303008NC	RITTAL	ENCLOSURE 30 x 30 x 08
		INCLUDED	RITTAL	SUB-PANEL 27.8 x 27.7
5	2	SA104SL	AUTOMATION DIRECT	PUSH BUTTON ENCLOSURE, 1-HOLE, 22mm, 70x70x74mm (HxWxD), GRAY BODY WITH YELLOW SCREW COVER
		PLC		
21	2	EA9-T7CL-R	C-MORE	HMI TOUCH SCREEN, 7" TFT LCD
90	1	CO-12DD2E-1-D	AUTOMATION DIRECT	ETHERNET ANALOG PLC, DI: 8 POINT, AI: 4-CHANNEL CURRENT, DO: 4-POINT, SOURCING, AO: 2-CHANNEL CURRENT
91	1	CO-08ND3	AUTOMATION DIRECT	DISCRETE INPUT MODULE, 8 POINT, 12-24 VDC, SINKING/SOURCING
92	2	CO-16TD2	AUTOMATION DIRECT	DISCRETE OUTPUT MODULE, 16 POINT, 12-24 VDC, SOURCING
93	1	CO-04DA-1	AUTOMATION DIRECT	ANALOG OUTPUT MODULE, 4-CHANNEL, CURRENT, 4-20mA
		Circuit Protection		
101	1	GCB150S-3FF125LL	GLADIATOR	MOLDED CASE CIRCUIT BREAKER, 100A FRAME, 3-POLE, 125A
102	1	GCBX2-EHR-N3R4-BK	GLADIATOR	ROTARY HANDLE, PISTOL, 2-POSITION, BLACK
103	1	GCBX4-SFT-12	GLADIATOR	SHAFT FOR ROTARY HANDLE
130	4	GMCBU-2D-20	GLADIATOR	CIRCUIT BREAKER, 2-POLE, D CURVE, 20A
131	1	GMCBU-2C-40	GLADIATOR	CIRCUIT BREAKER, 2-POLE, C CURVE, 40A
132	2	GMCBU-2C-30	GLADIATOR	CIRCUIT BREAKER, 2-POLE, C CURVE, 30A
133	4	GMCBU-2C-20	GLADIATOR	CIRCUIT BREAKER, 2-POLE, C CURVE, 20A
134	6	GMCBU-1C-20	GLADIATOR	CIRCUIT BREAKER, 1-POLE, C CURVE, 20A
135	1	GMCBU-1C-15	GLADIATOR	CIRCUIT BREAKER, 1-POLE, C CURVE, 15A
136	2	GMCBU-1C-5	GLADIATOR	CIRCUIT BREAKER, 1-POLE, C CURVE, 5A
160	1	KA25UBAG1R	BURNDY	GROUND LUG
		Power Conversion		
170	1	PSB24-120S	RHINO	SWITCHING POWER SUPPLY 120W, 22-28VDC OUTPUT, 5A, 120/240 VAC OR 120-375 VDC INPUT, 1-PHASE
190	1	1085039	PHOENIX CONTACT	ETHERNET SWITCH, FL SWITCH 1005N, 5-PORT

Bill of Material

ITEM	QTY.	CATALOG NUMBER	MFG.	DESCRIPTION
		Relays & Contactors		
220	19	38.51.0.024.0060	FINDER	RELAY MODULE, TB STYLE, 6A, SPDT, 24V AC/DC COIL
221	4	38.51.0.125.0060	FINDER	RELAY MODULE, TB STYLE, 6A, SPDT, 110-125V AC/DC COIL
222	4	38.51.3.240.0060	FINDER	RELAY MODULE, TB STYLE, 6A, SPDT, 220-240V AC/DC COIL
230	4	62.32.9.024.0070	FINDER	PLUG IN RELAY, 16A, DPDT, 24V DC COIL WITH LED INDICATOR, DIODE & TEST BUTTON
231	4	92.03	FINDER	SOCKET FOR 62.32 RELAYS
232	4	092.71	FINDER	METAL RETAINING CLIP FOR 92.03 SOCKET
233	4	99.02.0.024.59	FINDER	SUPPRESSION MODULE, LED INDICATOR MODULE FOR 6-24V DC COIL
271	3	CWB40-11-30C03	WEG	IEC CONTACTOR, 40A, 3-N.O. CONTACTS, 24 VDC COIL VOLTAGE, 1-N.O./1-N.C. AUX CONTACT
272	3	DIB-C33	WEG	SURGE SUPPRESSOR, DIODE, 12-600 VDC, USE WITH CWB9 TO CWB80 CONTACTORS
		Operator Devices		
300	1	ECX2070-24	AUTOMATION DIRECT	AUDIBLE ALARM BUZZER, 24 VAC/VDC
320	2	AR22V0R-01R	FUJII ELECTRIC	22mm EMERGENCY PUSH BUTTON, 40mm HEAD, TWIST TO RELEASE, RED, 1-N.C. CONTACT
		Sensors		
500	2	BA/T1K[-40F TO 140F]-SP	BAPI	ROOM TEMPERATURE SENSOR
501	1	BA/H200-O-BB2	BAPI	HUMMIDITY SENSOR
		Terminal Blocks		
400	LOT	3209510	PHOENIX CONTACT	5mm TB
401	LOT	3209536	PHOENIX CONTACT	5mm GROUND TB
402	LOT	3030417	PHOENIX CONTACT	END COVER FOR 3209510 & 3209536
430	LOT	3022276	PHOENIX CONTACT	END BLOCK
450	4	EPDB104	EDISON	POWER DISTRIBUTION BLOCK, 175A, 1-LINE SIDE, 4-LOAD SIDE
	LOT		SHOP	DIN RAIL
	LOT		SHOP	PANDUIT

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▶ WM Wallmount Enclosures



Rittal WM enclosures set the standard for maximum use of space and ease of installation. WM compact enclosures can be used for virtually any application. NEMA protection ratings are ensured through a secure locking system, foamed-in-place gasket and knife-edge perimeter. Features include a body constructed of cold rolled steel, steel doors and zinc-plated mounting panels. WM enclosures are readily available in all of the most popular sizes, protection categories and configurations – including universal disconnect cutout.

For complete details on the entire line, go to www.rittal.us.

- One-piece welded cold-rolled steel body
- Available in carbon and stainless steel
- Zinc-plated mounting panel standard
- Available with universal disconnect cutout
- Foamed-in-place gasket
- Quick-release hidden 130° door hinges
- Electrophoresis dip-coat primer with powder-coat surface
- Flange-trough collar opening channels liquids and dust away from enclosure gasket and enclosure interior
- Left-hand hinged door (the single door configuration is reversible)
- Wall-mounting holes
- Single door enclosures less than 20" in height have one ¼ turn latch with screwdriver insert
- Single door enclosures 20 - 40" in height have two ¼-turn latches with screwdriver inserts
- Single door enclosures greater than or equal to 42" in height have a 3-point latching L-handle
- Double door and disconnect enclosures have a 2- or 3-point latching L-handle

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES



Carbon Steel, Single Door – UL/cUL Type 12, 3R, 4

Part No.	Catalog No.	H x W x D
8017528	WM121206NC	12x12x6
8017529	WM161206NC	16x12x6
8017530	WM161606NC	16x16x6
8017531	WM162006NC	16x20x6
8017532	WM201606NC	20x16x6
8017533	WM202006NC	20x20x6
8017534	WM241606NC	24x16x6
8017535	WM242006NC	24x20x6
8017536	WM242406NC	24x24x6
1034250	WM161208NC	16x12x8
1244250	WM161608NC	16x16x8
8017541	WM162008NC	16x20x8
1045250	WM201608NC	20x16x8
1050250	WM202008NC	20x20x8
8017544	WM202408NC	20x24x8
8017545	WM241608NC	24x16x8
8017546	WM242008NC	24x20x8
1060250	WM242408NC	24x24x8
8017549	WM243008NC	24x30x8
8017551	WM302008NC	30x20x8
1076250	WM302408NC	30x24x8
1077250	WM303008NC	30x30x8
8017554	WM362408NC	36x24x8
8017559	WM423608NC	42x36x8
8017560	WM483608NC	48x36x8
8018963	WM202010NC	20x20x10
9851538	WM241610NC	24x16x10
8017561	WM242010NC	24x20x10
8017555	WM363008NC	36x30x8
8017557	WM363608NC	36x36x8
8017558	WM423008NC	42x30x8
8017562	WM242410NC	24x24x10
8017563	WM302410NC	30x24x10
8018902	WM303010NC	30x30x10
8017566	WM362410NC	36x24x10
8017567	WM363010NC	36x30x10
8017569	WM423610NC	42x36x10
8017570	WM483610NC	48x36x10
8017571	WM603610NC	60x36x10
1350250	WM202012NC	20x20x12
8017574	WM242012NC	24x20x12
8017575	WM242412NC	24x24x12
8017576	WM302412NC	30x24x12
1073250	WM303012NC	30x30x12
8017578	WM362412NC	36x24x12
8017579	WM363012NC	36x30x12
8017581	WM363612NC	36x36x12
8017586	WM423612NC	42x36x12

Carbon Steel, Single Door – UL/cUL Type 12, 3R, 4 (continued)

Part No.	Catalog No.	H x W x D
8017588	WM483612NC	48x36x12
8017591	WM603612NC	60x36x12
8017594	WM363016NC	36x30x16
8017595	WM483616NC	48x36x16
8017597	WM603616NC	60x36x16
8017598	WM302420NC	30x24x20
8017599	WM483620NC	48x36x20

Carbon Steel, Double Door – UL/cUL Type 12

Part No.	Catalog No.	H x W x D
8017550	WM244208NC	24x42x8
8017564	WM304210NC	30x42x10
8017565	WM304810NC	30x48x10
8017582	WM364212NC	36x42x12
8017583	WM364812NC	36x48x12
8017584	WM366012NC	36x60x12
8017587	WM426012NC	42x60x12
8017590	WM484812NC	48x48x12

Carbon Steel, Single Door, Without Mounting Panel – UL/cUL Type 12, 3R, 4

Part No.	Catalog No.	H x W x D
9851533	WM242408NC L/MPL	24x24x8
9851534	WM302408NC L/MPL	30x24x8
9851535	WM303008NC L/MPL	30x30x8
9851536	WM363008NC L/MPL	36x30x8

Carbon Steel Disconnect – UL/cUL Type 12, 3R, 4

Part No.	Catalog No.	H x W x D
8018976	WM202208XC	20x22x8
8018977	WM242208XC	24x22x8
8017548	WM242608XC	24x26x8
9851539	WM242610XC	24x26x10
8018978	WM302608XC	30x26x8
8017556	WM363208XC	36x32x8
8017568	WM363210XC	36x32x10
8017572	WM603810XC	60x38x10
8018979	WM302612XC	30x26x12
8017580	WM363212XC	36x32x12
8017585	WM423212XC	42x32x12
8018980	WM423812XC	42x38x12
8017589	WM483812XC	48x38x12
8017592	WM603812XC	60x38x12
8017596	WM483816XC	48x38x16
8018981	WM603816XC	60x38x16

Note: measurements are approximate.

Rittal North America LLC

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Suite 400 • Schaumburg, Illinois 60173 • USA
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Plastic Enclosures for 22mm Pilot Devices

Switch enclosures

Switch Enclosures			
Specification Standard	Enclosure Material	Gasket Material	Degree of Protection
CEI EN 60947-5-1	Thermoplastic ABS, conforms to UL94/HB	Caoutchouc (rubber) foam	IP65 according to CEI EN 60529

Also check out our metal pushbutton enclosures in the Enclosures section.



SA107-40SL **SA105-40SL** **SA100SL**

Enclosures have molded knock-outs for 1/2" conduit fittings.

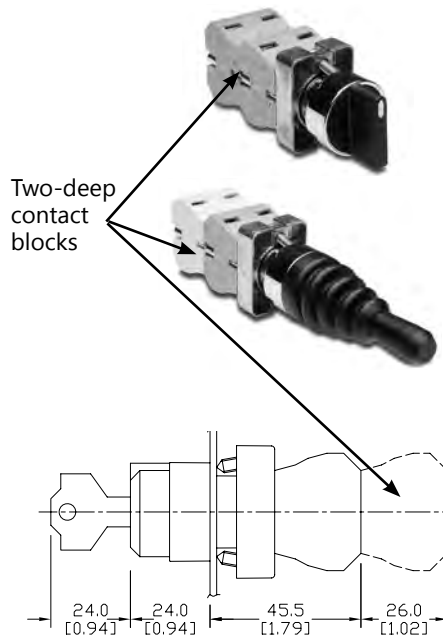
Important notes about enclosure depth and over-tightening

Switches with two-deep contact blocks require enclosures that are 74mm deep: 51mm-deep enclosures are too shallow and the switch contact block will not fit.

For switches with one-deep contact blocks, either 51mm-deep or 74mm-deep enclosures can be used.

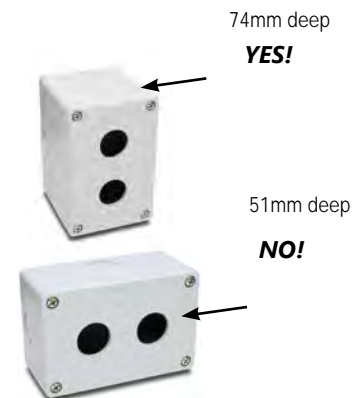
Also, do not over-tighten when securing switch in the enclosure body. Over-tightening will crack the plastic body of the enclosure.

When installing pushbutton, switches, and joysticks with securing screws, ensure that they have good purchase on area away from the perforated key-way slots made for other switch types. Securing screws should be tightened to 4.5 lb-in or less.



Dimensions: mm [inches]

For example: If using a switch having a two-deep contact block with a two-hole enclosure, order a 74mm-deep [SA104SL](#), not a 51mm-deep [SA105-40SL](#).



No-hole model

No Hole Model					
Part Number	Color		Drawing Link	Hole Size/Depth	Mounting Instructions
SA111-00	Gray		PDF	No Holes	Tighten 22mm devices only as needed to provide proper sealing. Over-tightening will crack plastic body.

Note: This enclosure works with most 22mm pushbuttons but may not work with Cutler-Hammer E22 series pushbuttons. Check your pushbutton dimensions before ordering.



74mm deep:
[SA111-00](#)

Plastic Enclosures for 22mm Pilot Devices

Single-hole models



51mm deep:
[SA100SL](#)
[SA101SL](#)



74mm deep:
[SA103SL](#)
[SA104SL](#)

Single-hole Models					
Part Number	Color		Drawing Link	Hole Size/Depth	Mounting Instructions
<u>SA100SL</u>	Gray		<u>PDF</u>	Hole size fits 22mm devices, 51mm depth accommodates single-deep contact block switches	Tighten 22mm devices only as needed to provide proper sealing. Over-tightening will crack plastic body.
<u>SA101SL</u>	Gray body/yellow top		<u>PDF</u>		
<u>SA103SL</u>	Gray		<u>PDF</u>	Hole size fits 22mm devices, 74mm depth accommodates two-deep contact block switches	
<u>SA104SL</u>	Gray body/yellow top		<u>PDF</u>		

Two-hole models



51mm deep:
[SA105-40SL](#)

Two-hole Models					
Part Number	Color		Drawing Link	Hole Size/Depth	Mounting Instructions
<u>SA105-40SL</u>	Gray		<u>PDF</u>	Hole size fits 22mm devices, 51mm depth accommodates single-deep contact block switches	Tighten 22mm devices only as needed to provide proper sealing. Over-tightening will crack plastic body.
<u>SA106-40SL</u>	Gray		<u>PDF</u>	Hole size fits 22mm devices, 74mm depth accommodates two-deep contact block switches	

Three-hole models



51mm deep:
[SA107-40SL](#)

Three-hole Models					
Part Number	Color		Drawing Link	Hole Size/Depth	Mounting Instructions
<u>SA107-40SL</u>	Gray		<u>PDF</u>	Hole size fits 22mm devices, 51mm depth accommodates single-deep contact block switches	Tighten 22mm devices only as needed to provide proper sealing. Over-tightening will crack plastic body.
<u>SA108-40SL</u>			<u>PDF</u>	Hole size fits 22mm devices, 74mm depth accommodates two-deep contact block switches	

GCX Series 22mm Plastic Pilot Devices Specifications

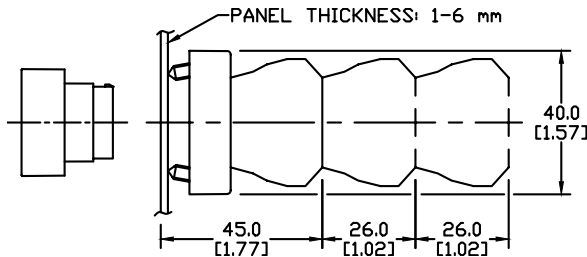
Assembly information

These pushbuttons and indicator lights are supplied with the appropriate contact blocks, unless otherwise indicated. Use these drawings as a guide to make sure there is adequate clearance behind the panel.

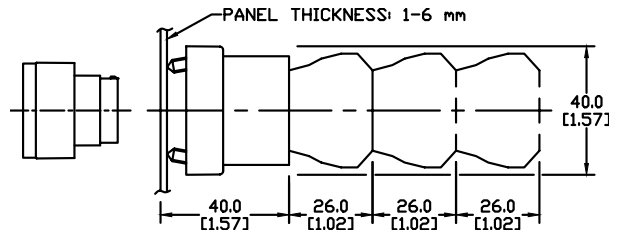
Dimensions

mm
[inches]

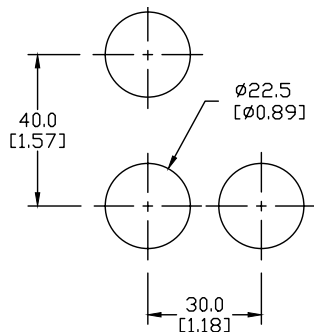
Pushbuttons and selector switches



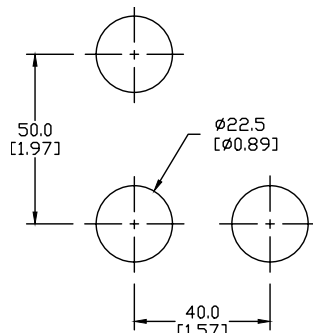
Illuminated pushbuttons and selector switches/ indicator lights



Mounting



This layout is suitable if all switches are 230V or less and the same polarity.

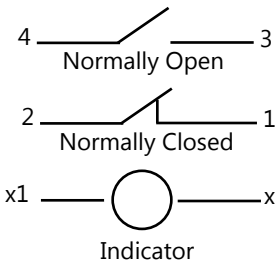


This layout is suitable if all switches are 400V or less and different polarity.

NOTE: Contact blocks can be arranged up to three deep by two wide.



Typical Wiring



Specifications

These specifications apply to all the GCX and ECX 22mm plastic pushbuttons and switches.

Physical Specifications		Electrical Specifications	
Standards Reference	CEI EN 60947-5-1, CSA C22-2 n.14	Rated Thermal Current (contact block)	A300, Q300 (Refer to E22 Series mounting/contact rating section for details)
Approvals	UL File E189258, IMQ (where specified)	Rated Insulation Voltage	Ui 660V according to CEI EN 60947-5-1, 300V according to CSA C22-2 n.14 and UL 508
Enclosure Material	Fiberglass reinforced thermoplastic	Dielectric Strength	3kV (1 second)
Contacts Material	Silver	Insulation Resistance	2MΩ min. (500VDC)
Protection Degree	IP40 for GCX3151-24, GCX3151-120, GCX3153-24 and GCX3153-120. IP65 for all others. (See Appendix of this catalog for explanation of IP ratings according to IEC 144 CEI 70-1.)	Initial Contact Resistance	≤ 25mΩ
Electric Shock Protection	IEC 536, Class II	Short-Circuit Protection*	Cartridge fuses gl 10 A-500V 10, 3x3811 100 KA
Temperature Ratings	Storage: -40 to 80°C (-40 to 176° F) Operating: -25° to +70°C (-13° to 158° F)	Terminal Markings	According to CENELEC EN 50013
Working Positions	All working positions are allowed	Connections	Single screw with non-loosening plate clamp, 14AWG max., Tighten to 0.8Nm max
Mechanical Life	Pushbuttons, selector switches, joy stick switches: 1,000,000 operations Emergency mushrooms and push-push pushbuttons: 300,000 operations	Contacts Operation	Self-cleaning types EN01 (N.C.) EN 10 (N.O.) slow-action, positive opening
Positive Opening Operation	(according to IEC 947-5-1) All functions incorporating an NC contact are positive opening operation	Operation Frequency	3600 operations per hour max.
		Utilization Category	AC15 (Control of AC electromagnetic loads) 24 volts AC at 10 amps 130 volts AC at 6.5 amps DC13 (Control of DC electromagnetic loads) 24 volts DC at 1.5 amps 110 volts DC at 0.5 amps

*Note: Recommended, not supplied

C-more Operator Panels Overview

Getting started

Installing the software and configuring the *C-more* panel is simple. You will need the following to successfully connect, configure and send a project to the panel:

- **C-more** HMI - 6in, 7in wide, 8in, 10in, 10in wide, 12in, 15in or [EA9-RHMI](#)
- **C-more** Programming Software, p/n [EA9-PGMSW](#)
- **C-more** programming cable, USB or Ethernet
- 12-24 VDC switching power supply or the optional **C-more** AC Power Adapter, p/n [EA-AC](#)
- Personal Computer - to run **C-more** programming software
- PLC communications cable (serial or Ethernet) to connect the **C-more** HMI to your controller

Part Number	Description	
EA9-T6CL-R	<i>C-more</i> EA9 series touch screen HMI, 6in color TFT LCD, analog resistive, 320 x 240 pixel, QVGA, LED backlight, (1) serial, (1) USB A and (1) USB B ports and (1) memory card slot.	
EA9-T6CL	<i>C-more</i> EA9 series touch screen HMI, 6in color TFT LCD, analog resistive, 320 x 240 pixel, QVGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	
EA9-T7CL-R	<i>C-more</i> EA9 series touch screen HMI, 7in color TFT LCD, analog resistive, widescreen, 800 x 480 pixel, WVGA, LED backlight, (1) serial, (1) Ethernet, (1) USB A and (1) USB B ports and (1) memory card slot.	
EA9-T7CL	<i>C-more</i> EA9 series touch screen HMI, 7in color TFT LCD, analog resistive, widescreen, 800 x 480 pixel, WVGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	
EA9-T8CL	<i>C-more</i> EA9 series touch screen HMI, 8in color TFT LCD, analog resistive, 800 x 600 pixel, SVGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	
EA9-T10CL	<i>C-more</i> EA9 series touch screen HMI, 10in color TFT LCD, analog resistive, 800 x 600 pixel, SVGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (1) memory card slot and (1) audio line out.	
EA9-T10WCL	<i>C-more</i> EA9 series touch screen HMI, 10in color TFT LCD, analog resistive, widescreen, 1024 x 600 pixel, WSVGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	
EA9-T12CL	<i>C-more</i> EA9 series touch screen HMI, 12in color TFT LCD, analog resistive, 800 x 600 pixel, SVGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	
EA9-T15CL-R	<i>C-more</i> EA9 series touch screen HMI, 15in color TFT LCD, analog resistive, 1024 x 768 pixel, XGA, LED backlight, (1) serial, (1) Ethernet, (1) USB A and (1) USB B ports and (1) memory card slot.	
EA9-T15CL	<i>C-more</i> EA9 series touch screen HMI, 15in color TFT LCD, analog resistive, 1024 x 768 pixel, XGA, LED backlight, (3) serial, (1) Ethernet, (1) USB A and (1) USB B ports, (2) memory card slots, (1) HDMI video out and (1) audio line out.	
EA9-RHMI	<i>C-more</i> EA9 series headless HMI, (2) serial, (1) Ethernet and (2) USB ports and (1) HDMI audio/video out and (1) memory card slot.	
EA9-PGMSW	<i>C-more</i> Windows programming software, CD or free download. For use with <i>C-more</i> EA9 series touch panels. Requires USB or Ethernet connection to touch panel.	
USB-CBL-AB3	AutomationDirect programming cable, USB A to USB B, 3ft cable length. For use with <i>C-more</i> HMIs, Do-more and Productivity series CPUs and most USB devices.	
USB-CBL-AB6	AutomationDirect programming cable, USB A to USB B, 6ft cable length. For use with <i>C-more</i> HMIs, Do-more and Productivity series CPUs and most USB devices.	
USB-CBL-AB10	AutomationDirect programming cable, USB A to USB B, 10ft cable length. For use with <i>C-more</i> HMIs, Do-more and Productivity series CPUs and most USB devices.	
USB-CBL-AB15	AutomationDirect programming cable, USB A to USB B, 15ft cable length. For use with <i>C-more</i> HMIs, Do-more and Productivity series CPUs and most USB devices.	

C-more Selection Guide & Specifications

Model	6" TFT color w/ base features	6" TFT color w/ full features	7" TFT color w/ base features	7" TFT color w/ full features
Specification				
Part Number	EA9-T6CL-R	EA9-T6CL	EA9-T7CL-R	EA9-T7CL
Display Actual Size and Type	5.7" TFT color		7.0" TFT color	
Display Viewing Area	4.54" x 3.40" [115.2 mm x 86.4 mm]		6.00" x 3.60" [152.4 mm x 91.4 mm]	
Weight	1.56 lb [710g]	1.59 lb [720g]	1.46 lb [660g]	1.48 lb [670g]
Screen Pixel	320 x 240 (QVGA)		800 x 480 (WVGA)	
Display Brightness	280 nits (typ)		350 nits (typ)	
LCD Panel Dot Pitch	0.18 mm x 0.18 mm		0.190 mm x 0.190 mm	
Color Scale	65,536 colors			
Backlight Average Lifetime*	50,000 hours @ 25°C			
Touch Panel Type**	Four-wire analog resistive, single touch			
Project Memory	26MB			
Number of Screens	Up to 999 screens – limited by project memory			
Realtime Clock	Realtime clock built into panel, backed up for 30 days at 25°C			
Calendar – Month / Day / Year	Yes - monthly deviation 60sec (Reference)			
Serial Port 1	15-pin D-sub female – RS232C, RS-422/485			
Serial Port 2	N/A	3-wire terminal block – RS-485	N/A	3-wire terminal block – RS-485
Serial Port 3	N/A	RJ-12 modular jack – RS-232C	N/A	RJ-12 modular jack – RS-232C
USB Port – Type B	USB 2.0 High speed (480 Mbps) Type B – Download/Program – Max. cable length 15-feet			
USB Port – Type A	USB 2.0 High speed (480 Mbps) Type A – for USB device options – Max. cable length 15-feet – Bus Power – Less than 200mA at 5VDC			
Ethernet Port	N/A	10/100 Base-T, auto MDI/MDI-X		
Ethernet Port - Expansion Module	N/A	EA-ECOM	N/A	EA-ECOM
Audio Line Out	N/A	3.5 mm mini jack – requires amplifier and speaker(s)	N/A	3.5 mm mini jack – requires amplifier and speaker(s)
Mic In (Future)	N/A	3.5 mm mini jack	N/A	3.5 mm mini jack
SD Card Slot	1 slot supports max 2GB (SD,) max 32GB (SDHC)			
HDMI Video Out	N/A			
HDMI Supported Resolution	N/A			
Supply Power	10.2-26.4 VDC Class 2 or SELV (Safety Extra-Low Voltage) Circuit or Limited Energy Circuit (LEC), or use the AC/DC Power Adapter, EA-AC , to power the touch panel from a 100-240 VAC, 50/60 Hz power source. Reverse Polarity Protected			
Power Consumption	16.0 W 1.30 A @ 12VDC 0.66 A @ 24VDC			
Internal Fuse (non-replaceable)	4.0 A			
Altitude	Up to 2000m (6562ft)			
Operating Temperature	0 to 50°C (32 to 122°F) Maximum surrounding air temperature rating: 50°C (122°F) IEC 60068-2-14 (Test Nb, Thermal Shock)			
Storage Temperature	-20 to +60°C (-4 to +140°F) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)			
Humidity	5-95% RH (non-condensing)			
Environment	For use in Pollution Degree 2 environment, no corrosive gases permitted			
Noise Immunity	(EN61131-2), EN61000-4-2 (ESD), EN61000-4-3 (RFI), EN61000-4-4 (FTB), EN61000-4-5 (Serge), EN61000-4-6 (Conducted) EN61000-4-8 (Power frequency magnetic field immunity) (Local Test) RFI, (145MHz, 440Mhz 10W @ 10cm), Impulse 1000V @ 1µs pulse			
Withstand Voltage	1000VAC, 1min. (FG to Power supply)			
Insulation Resistance	> 10M ohm @ 500VDC (FG to Power supply)			
Vibration	IEC60068-2-6 (Test Fc)			
Shock	IEC60068-2-27 (Test Ea)			
Emission	EN55011 Class A (Radiated RF emission)			
Enclosure	NEMA 250 type 4/4X indoor use only UL50 type 4X indoor use only IP-65 indoor use only (When mounted correctly)		NEMA 250 type 4/4X indoor use only UL50 type 4X indoor use only IP-65 (not tested by UL) (When mounted correctly)	
Agency Approvals	UL508, E157382, Class 1, Div 2, Groups A, B, C CE (EN61131-2), RoHS (2011/65/EU) CUL Canadian C22.2		UL61010, E157382 CE (EN61131-2), RoHS (2011/65/EU) CUL Canadian C22.2	
NOTES:	*The backlight average lifetime is defined as the average usage time it takes before the brightness becomes 50% of the initial brightness. The lifetime of the backlight depends on the ambient temperature. The lifetime will decrease under low or high temperature usage. **The touchscreen is designed to respond to a single touch. If it is touched at multiple points at the same time, an unexpected object may be activated.			

C-more 7" TFT Color Touch Panel - Full Model

EA9-T7CL

C-more EA9 series touch screen interface panel, 7-inch color TFT (7.0 inch viewable screen), 64K colors, 800 x 480 pixel WVGA screen resolution, 800MHz CPU, 12-24 VDC powered, NEMA 4/4X, IP65 (when mounted correctly; for indoor use only)(not tested by UL), non-replaceable LED backlight. Includes (3) serial ports, USB 2.0 Type A and B ports and Ethernet port; supports SD memory card. Compatible with [EA9-PGMSW](#) programming software version 6.3 or later.



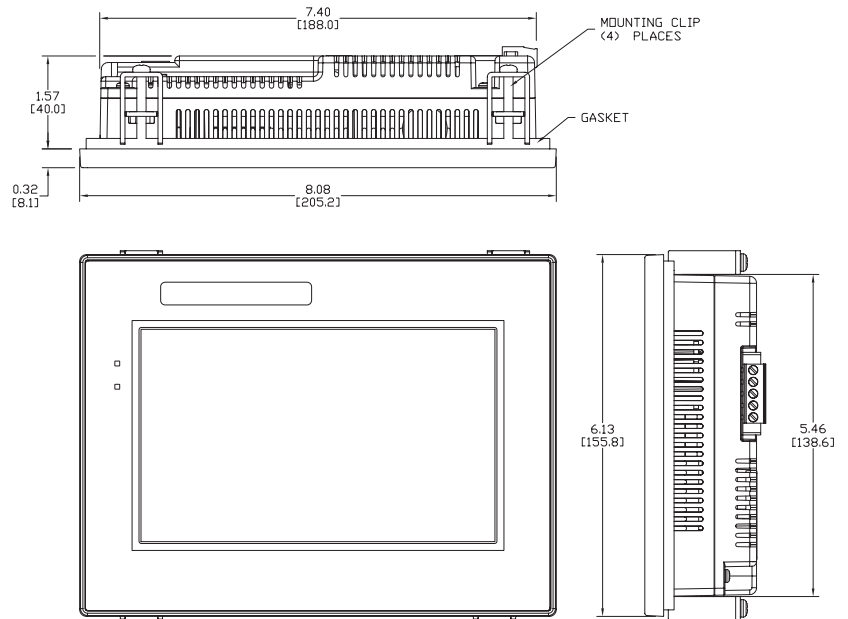
Features

- 7.0" diagonal color TFT (Thin Film Transistor) LCD display with 64K colors
- 800 x 480 pixel resolution
- 350 NITS display brightness
- 50,000 hour average backlight half-life
- Analog resistive (1024 X 1024) touch screen allowing unlimited touch areas
- USB port B (program/download) and USB port A (USB device options)
- Ethernet 10/100 Base-T port (program/download & PLC communication)
- Expansion Module Support
- Use [EA-ECOM](#) for second Ethernet Port
- Remote Internet access
- Serial PLC interface (RS-232/422/485)
- One built-in SD memory card slot
- 12-24 VDC powered, 110VAC power adapter (optional)
- Audio Line Out, stereo - requires amplifier and speaker(s)
- 26MB project memory
- Data logging
- 0 to 50°C [32 to 122°F] operating temperature range
- NEMA 4/4X, IP65(not tested by UL) when mounted correctly, indoor use only
- Slim design saves panel space
- UL, cUL & CE agency approvals
- 2-year warranty from date of purchase

Function	Available
Ethernet	Yes
USB	Yes
SD Card	Yes
Audio Out	Yes
HDMI Video Out	No
Expansion Module	Yes

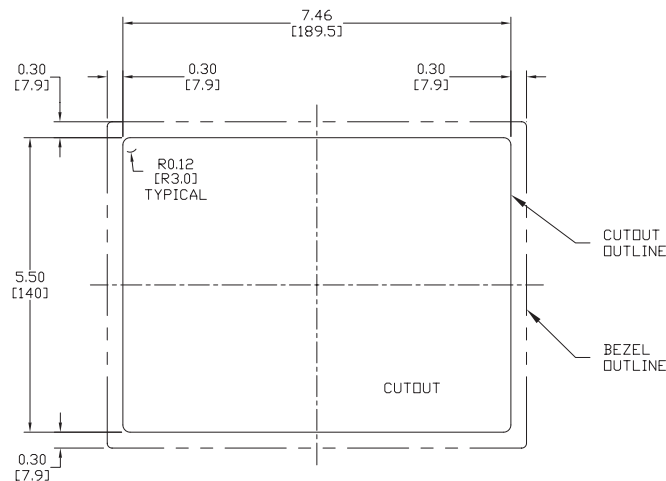
Dimensions

Units: inches [mm]

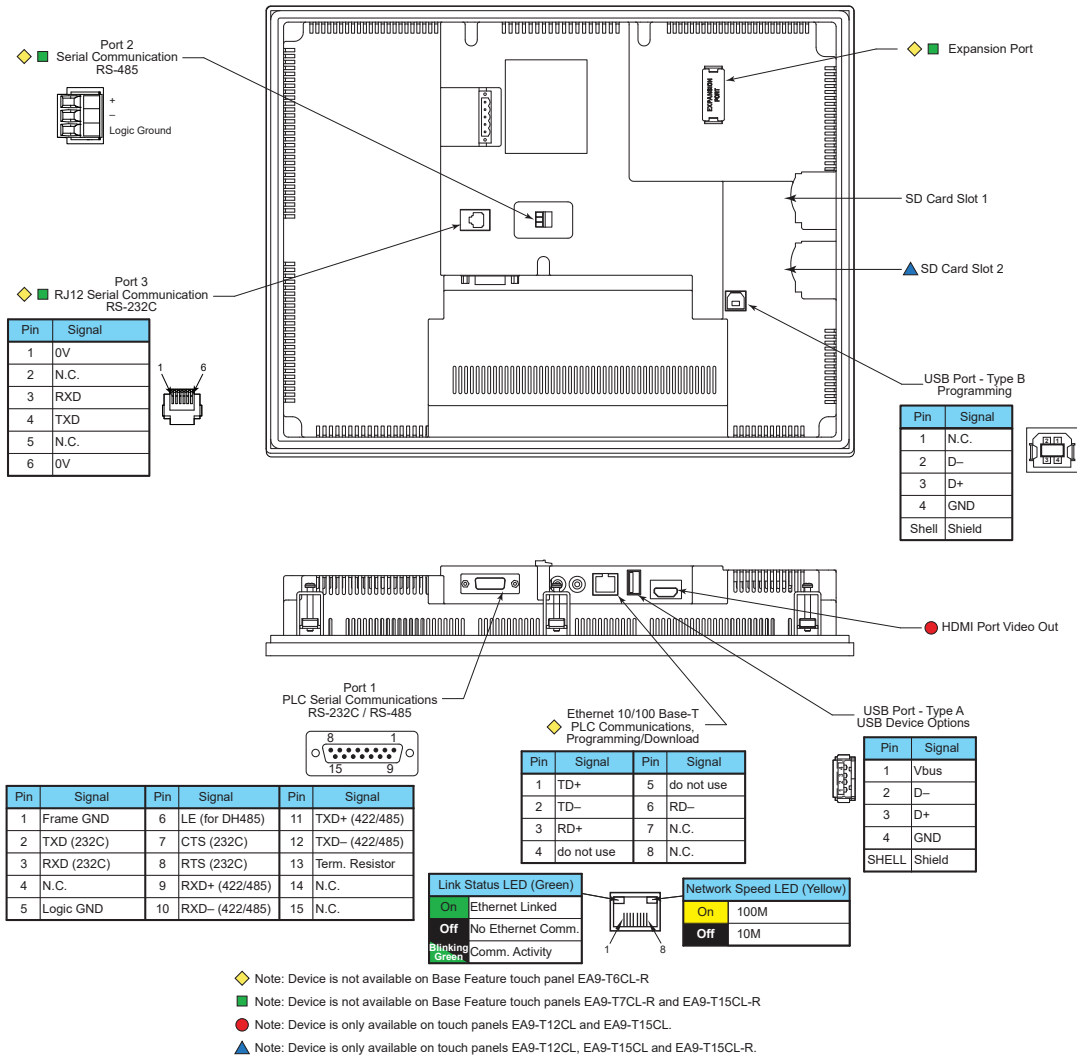


See our website www.AutomationDirect.com for complete engineering drawings.

Mounting Cutout



C-more Communication Ports



Ethernet Port

The Ethernet port has several uses:

- Download program to panel
- Communicate to PLCs/PCs
- Send e-mail
- Access FTP server
- Act as a Web server
- Remote Internet access

The Ethernet port has an RJ-45 8-wire modular connector with green and yellow LEDs.

- The yellow LED indicates network speed – off for a 10 Mbps connection and illuminated for a 100 Mbps connection.
- The green LED indicates link status and illuminates when a link is established.

Note: EA6-T6CL-R does not include an Ethernet port, and does not have these capabilities.

Expansion Port

The expansion port supports the EA-ECOM module to provide a second Ethernet Port for all full featured models.

USB Port B

Program C-more via the USB programming port. It's fast and easy, with no baud rate settings, parity, or stop bits to worry about. We stock standard USB cables for your convenience. USB Port B can be used to upload or download projects to and from a PC.

USB Port A

The Universal Serial Bus (USB) Port A is a standard feature on all models and can be used to connect various USB HID (Human Input Device) devices to the panel, such as the following:

- USB flash drives ([USB-FLASH](#))
- USB keyboards
- USB barcode scanners
- USB card scanners

C-more can log data to the USB flash drive as well as load projects to the panel from the pen drive. You can also back up project files and panel firmware.

Sound Interface (Audio Line Out)

When attached to an amplifier and speaker(s), C-more can play warning sounds or pre-recorded messages such as "conveyor is jammed". C-more supports WAV type files. The output is stereo.

Serial Port

Port 1 - Connect to your serial controller network via Port 1. Port 1 is a 15-pin port that supports RS-232 or RS-422/485.

Port 2 - Connect your RS-485 network via Port 2. Port 2 is provided with a 3-wire removable terminal block.

Port 3 - Connect to your RS-232C device via Port 3. Port 3 is an RJ12 connection.

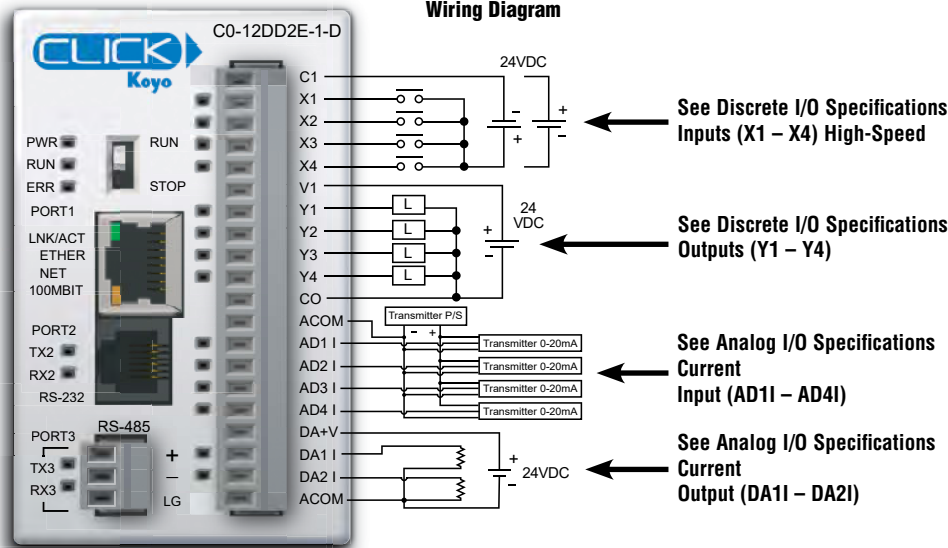
HDMI Video Out

EA9-T12CL and EA9-T15CL include an HDMI Type A port to provide video output to a projector or remote monitor.

Ethernet Analog PLC

C0-12DD2E-1-D

- 4 DC Input (Sink/Source)/ 4 Sourcing DC Output
- 4 Analog Current Input
- 2 Analog Current Output Micro PLC



NOTE: There are no ZIPLink pre-wired PLC connection cables and modules for the Analog PLCs (cannot mix discrete I/O and analog I/O signals in a ZIPLink cable).

NOTE: When using Ethernet Analog PLCs, you must use CLICK programming software version V2.20 or later.



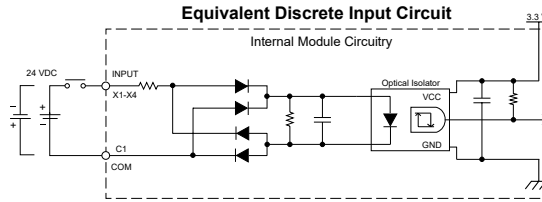
General Specifications	
Current Consumption at 24VDC	140mA
Terminal Block Replacement Part No.	C0-16TB
Weight	5.08 oz (144g)

Ethernet Analog PLC

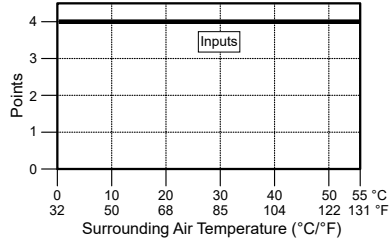
C0-12DD2E-1-D (cont'd)

X1 - X4 (High-Speed)

Discrete I/O Specifications - Inputs	
Inputs per Module	4 (Sink/Source)
Operating Voltage Range	24VDC
Input Voltage Range	21.6–26.4 VDC
Input Current	Typ 6.5 mA @ 24VDC
Maximum Input Current	7mA @ 26.4 VDC
Input Impedance	3.9 kΩ @ 24VDC
Maximum Input Frequency	X1-X4: 100kHz
ON Voltage Level	> 19VDC
OFF Voltage Level	< 2VDC
Minimum ON Current	4.5 mA
Maximum OFF Current	0.5 mA
OFF to ON Response	Typ 3μs, Max 5μs
ON to OFF Response	Typ 1μs, Max 3μs
Status Indicators	Logic Side (4 points, green LED)
Commons	1 (4 points/common)

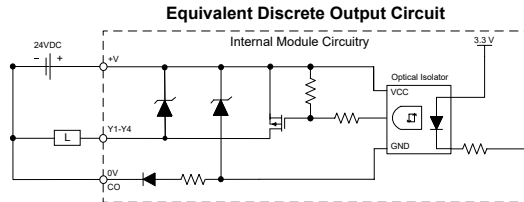


C0-12DD2E-1-D Temperature Derating Chart

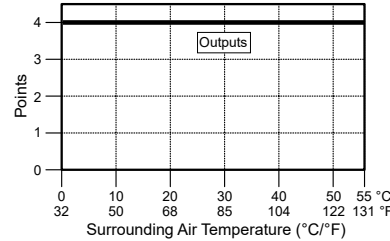


Y1 - Y4

Discrete I/O Specifications - Outputs	
Outputs per Module	4 (Source)
Output Voltage Range	19.2–30 VDC
Maximum Output Current	0.1 A/point, 0.4 A/common CO
Minimum Output Current	0.2 mA
Maximum Leakage Current	0.1 mA @ 30VDC
On Voltage Drop	0.5 VDC @ 0.1 A
Maximum Inrush Current	150mA for 10ms
OFF to ON Response	< 5μs
ON to OFF Response	< 5μs
Status Indicators	Logic Side (4 points, red LED)
Commons	1 (4 points/common)



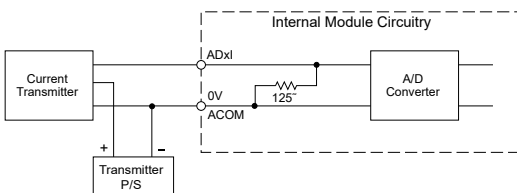
C0-12DD2E-1-D Temperature Derating Chart



AD1I - AD4I

Analog Specifications - Current Input	
Inputs per Module	4 (current)
Input Range	0–20 mA (sink)
Resolution	12-bit
Conversion Time	50ms
Input Impedance	125Ω
Input Stability	±2 LSB maximum
Full-Scale Calibration Error	±2% maximum
Offset Calibration Error	±0.1 mA maximum
Accuracy vs. Temperature Error	±100ppm / °C maximum

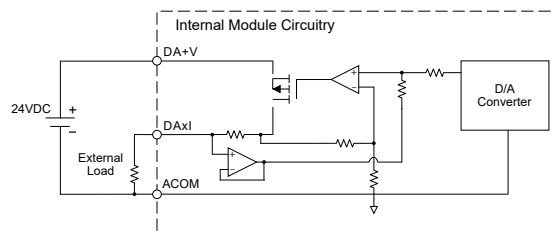
Analog Current Input Circuit



DA1I - DA2I

Analog Specifications - Current Output	
Outputs per Module	2 (current)
Output Range	4–20 mA (source)
Resolution	12-bit
Conversion Time	2.5 ms
Load Impedance	250Ω Typ (200Ω to 800Ω)
Loop Supply Voltage	24VDC Typ (21.6–26.4 VDC)
Full-Scale Calibration Error	±2% maximum
Offset Calibration Error	±25mA maximum
Accuracy vs. Temperature Error	±120ppm / °C maximum
External DC Power Required	21.6–26.4 VDC

Analog Current Output Circuit

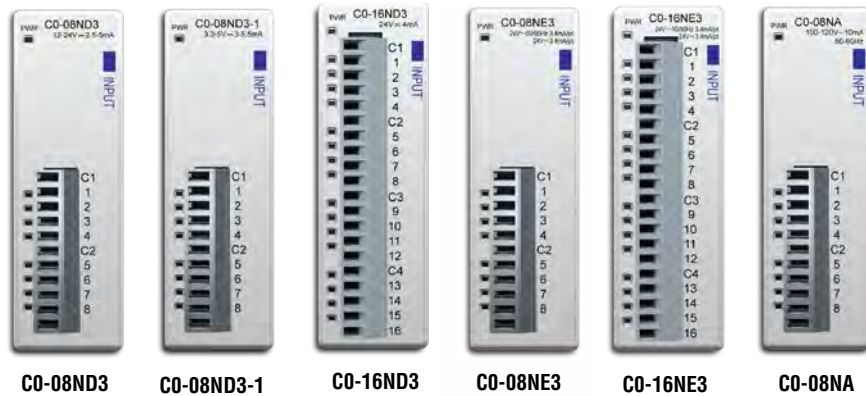


Choosing Expansion I/O Modules

I/O Modules

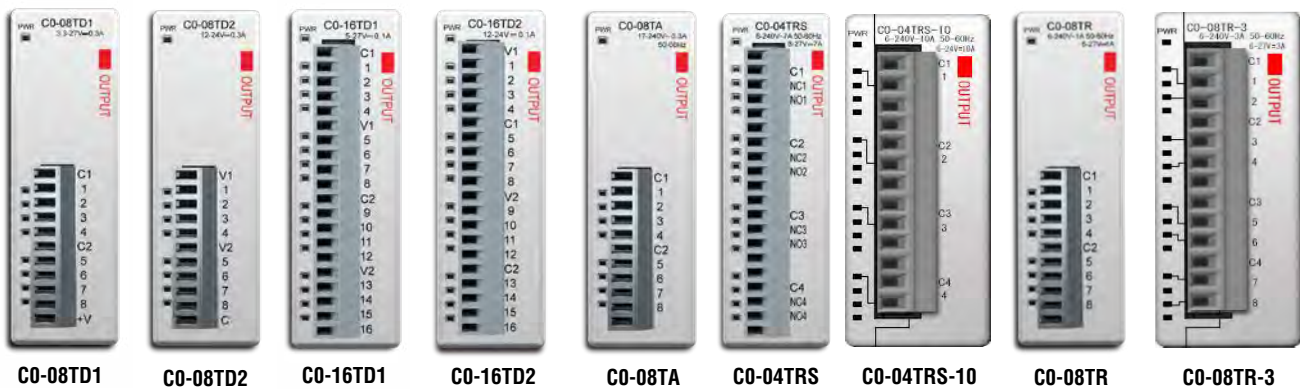
A variety of discrete, combo, and analog I/O modules are available for the CLICK PLC system. Up to eight I/O modules can be connected to a CLICK PLC unit to expand the system I/O count and meet the needs of a specific application. Complete I/O module specifications and wiring diagrams can be found later in this section.

Discrete Input Modules



Discrete Input Modules			
Part Number	I/O Type/ Number/Commons	Sink or Source	Voltage Ratings
CO-08ND3	DC / 8/2	Sink or Source	12–24 VDC
CO-08ND3-1	DC / 8/2	Sink or Source	3.3–5 VDC
CO-16ND3	DC / 16/4	Sink or Source	24VDC
CO-08NE3	AC/DC / 8/2	Sink or Source	24 VAC/VDC
CO-16NE3	AC/DC / 16/4	Sink or Source	24 VAC/VDC
CO-08NA	AC / 8/2	N/A	100–120 VAC

Discrete Output Modules

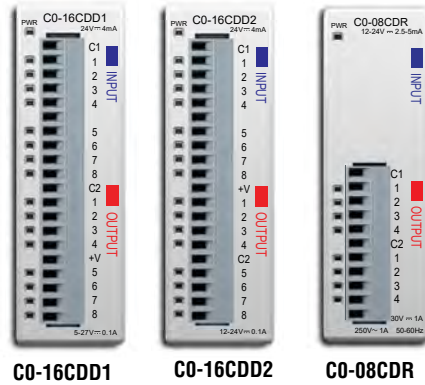


Discrete Output Modules			
Part Number	I/O Type/ Number/ Commons	Sink or Source	Voltage/Current Ratings
CO-08TD1	DC/8/2	Sink	3.3–27 VDC, 0.3 A
CO-08TD2	DC/8/1	Source	12–24 VDC, 0.3 A
CO-16TD1	DC/16/2	Sink	5–27 VDC, 0.1 A
CO-16TD2	DC/16/2	Source	12–24 VDC, 0.1 A
CO-08TA	AC/8/2	N/A	17–240 VAC, 0.3 A
CO-04TRS	Relay/4/4	N/A	6–27 VDC, 7A 6–240 VAC, 7A
CO-04TRS-10	Relay/4/4	N/A	6–24 VDC, 10A 6–240 VAC, 10A
CO-08TR	Relay/8/2	N/A	6–27 VDC, 1A 6–240 VAC, 1A
CO-08TR-3	Relay/8/4	N/A	6–27 VDC, 3A 6–240 VAC, 3A

Choosing Expansion I/O Modules

Discrete I/O Modules (continued)

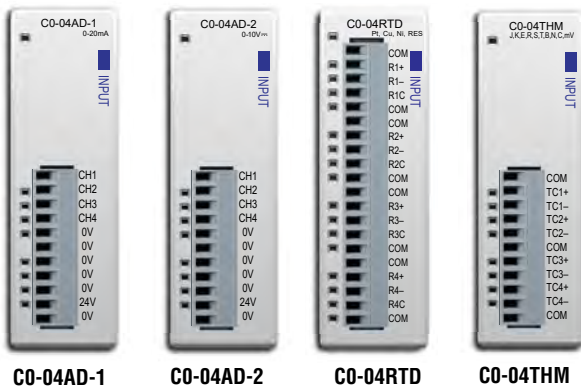
Discrete Combo I/O Modules



Discrete Combo I/O Modules				
Part Number	Input Type	Input Voltage	Output Type	Output Voltage / Current Ratings
CO-16CDD1	8 DC (source/sink)	24VDC	8 DC (sink)	5–27 VDC / 0.1 A
CO-16CDD2	8 DC (source/sink)	24VDC	8 DC (source)	12–24 VDC / 0.1 A
CO-08CDR	4 DC (source/sink)	12–24 VDC	4 (relay)	6.25–24 VDC, 1A 6–240 VAC, 1A

Analog I/O Modules

Analog Input Modules



Analog Output Modules



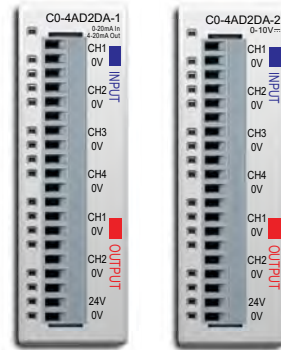
Analog Input Modules		
Part Number	Analog Input Types	External Power Required
CO-04AD-1	4 channel, current (0-20 mA), 13 bit	24VDC
CO-04AD-2	4 channel, voltage (0-10 V), 13 bit	24VDC
CO-04RTD	4 channel RTD input (0.1 degree °C/°F resolution), or resistive input (0 to 3125 ohms)	None
CO-04THM	4 channel thermocouple input (0.1 degree °C/°F resolution), or voltage input (-156.25 mV to 1.25 V), 16 bit	None

Analog Output Modules		
Part Number	Analog Output Types	External Power Required
CO-04DA-1	4 channel, current sourcing (4-20 mA), 12-bit	24VDC
CO-04DA-2	4 channel, voltage (0-10 V), 12-bit	24VDC

Choosing Expansion I/O Modules

Analog I/O Modules (continued)

Analog Combo I/O Modules



CO-4AD2DA-1 CO-4AD2DA-2

Analog Combo I/O Modules			
Part Number	Analog Input Type	Analog Output Type	External Power Required
CO-4AD2DA-1	4 channel, current (0-20 mA), 13-bit	2 channel, current sourcing (4-20 mA), 12-bit	24VDC
CO-4AD2DA-2	4 channel, voltage (0-10 V), 13-bit	4 channel, voltage (0-10 V), 12-bit	24VDC

Specialty Module



CO-08SIM

Specialty Module			
Part Number	I/O Type/ Number/Commons	Sink or Source	Voltage Ratings
CO-08SIM	Toggle Switch, 8	N/A	N/A

CLICK Specifications

General Specifications For All CLICK PLC Products

These general specifications apply to all CLICK PLCs, optional I/O modules, and optional power supply products. Please refer to the appropriate I/O temperature derating charts under both the PLC and I/O module specifications to determine best operating conditions based on the ambient temperature of your particular application.

General Specifications	
Operating Temperature	Analog, analog combo I/O modules only: 32°F to 140°F (0°C to 60°C); All other modules: 32°F to 131°F (0°C to 55°C), IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	-4°F to 158°F (-20°C to 70°C) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Ambient Humidity	30% to 95% relative humidity (non-condensing)
Environmental Air	No corrosive gases. Environmental pollution level is 2 (UL840)
Vibration	MIL STD 810C, Method 514.2, EC60068-2-27, Category [f], Procedure[VIII] JIS C60068-2-27 (Sine wave vibration test)
Shock	MIL STD 810C, Method 516.2, IEC60068-2-27, JIS C60068-2-27, Category [f], Procedure[VIII]
Noise Immunity	<EN61131-2> EN61000-4-2 (ESD) EN61000-4-3 (RFI) EN61000-4-4 (FTB) EN61000-4-5 (Surge) EN61000-4-6 (Conducted) EN61000-4-8 (Power frequency magnetic field immunity) <Local Test> Impulse noise 1µs, 1000V RFI: No interference measured at 150 and 450 MHz (5w/15cm)
Emissions	EN55011:1998 Class A; EN61000-6-4:2007+A1:2011
Agency Approvals	UL508, UL61010-2-201 (File No. E157382, E316037); CE (EN61131-2); CUL Canadian C22.2
Other	RoHS 2011/65/EU Amendment (EU)2015/863

CLICK Specifications

PLC Unit Specifications

Basic, Standard and Analog PLC Unit Specifications			
	Basic PLC	Standard PLC	Analog PLC
Control Method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method
I/O Numbering System	Fixed in Decimal	Fixed in Decimal	Fixed in Decimal
Ladder Memory (steps)	8000	8000	8000
Total Data Memory (words)	8000	8000	8000
Contact Execution (Boolean)	< 0.6 us	< 0.6 us	< 0.6 us
Typical Scan (1K Boolean)	1-2 ms	1-2 ms	1-2 ms
RLL Ladder Style Programming	Yes	Yes	Yes
Run Time Edits	No	No	No
Scan	Variable / fixed	Variable / fixed	Variable / fixed
CLICK Programming Software for Windows	Yes	Yes	Yes
Built-in Communication Ports	Yes (two RS-232 ports)	Yes (two RS-232 ports and one RS-485 port)	Yes (two RS-232 ports and one RS-485 port)
Protocols	Protocols: Modbus RTU (master/slave) and ASCII (in/out)		
FLASH Memory	Standard on PLC	Standard on PLC	Standard on PLC
Built-in Discrete I/O points	8 inputs, 6 outputs	8 inputs, 6 outputs	4 inputs, 4 outputs
Built-in Analog I/O Channels	No	No	2 inputs, 2 outputs
Number of Instructions Available	21	21	21
Control Relays	2000	2000	2000
System Control Relays	1000	1000	1000
Timers	500	500	500
Counters	250	250	250
Interrupts	Yes (external: 8 / timed: 4)	Yes (external: 8 / timed: 4)	Yes (external: 4 / timed: 4)
Subroutines	Yes	Yes	Yes
For/Next Loops	Yes	Yes	Yes
Math (Integer and Hex)	Yes	Yes	Yes
Drum Sequencer Instruction	Yes	Yes	Yes
Internal Diagnostics	Yes	Yes	Yes
Password Security	Yes	Yes	Yes
System Error Log	Yes	Yes	Yes
User Error Log	No	No	No
Memory Backup	Super Capacitor	Super Capacitor + Battery	Super Capacitor + Battery
Battery Backup	No	Yes (battery sold separately; part # D2-BAT-1)	Yes (battery sold separately; part # D2-BAT-1)
Calendar/Clock	No	Yes	Yes
I/O Terminal Block Replacement	AutomationDirect p/n C0-16TB	AutomationDirect p/n C0-16TB	AutomationDirect p/n C0-16TB
Communication Port & Terminal Block Replacement	N/A	AutomationDirect p/n C0-3TB	AutomationDirect p/n C0-3TB
24VDC Power Terminal Block Replacement	AutomationDirect p/n C0-4TB	AutomationDirect p/n C0-4TB	AutomationDirect p/n C0-4TB

CLICK Specifications

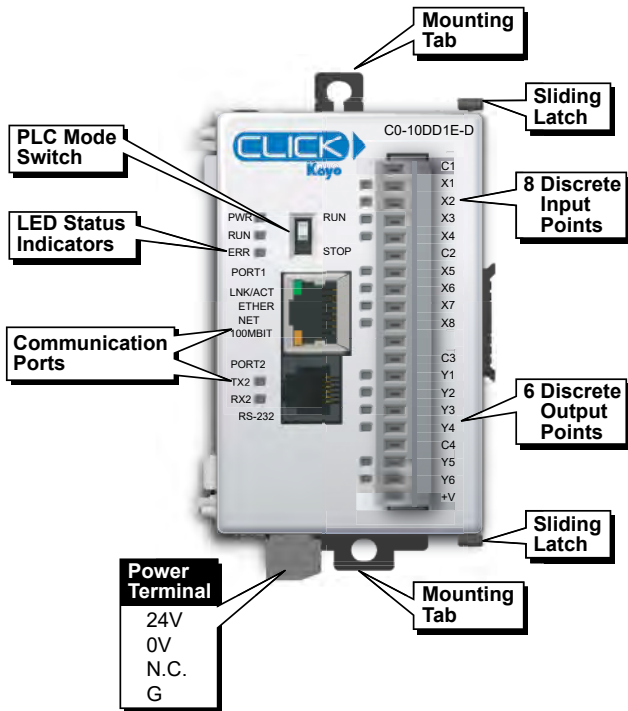
PLC Unit Specifications (continued)

Ethernet Basic, Standard and Analog PLC Unit Specifications			
	Ethernet Basic PLC	Ethernet Standard PLC	Ethernet Analog PLC
Control Method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method	Stored Program/Cyclic execution method
I/O Numbering System	Fixed in Decimal	Fixed in Decimal	Fixed in Decimal
Ladder Memory (steps)	8000	8000	8000
Total Data Memory (words)	8000	8000	8000
Contact Execution (Boolean)	< 0.2 µs	< 0.2 µs	< 0.2 µs
Typical Scan (1K Boolean)	< 1ms	< 1ms	< 1ms
RLL Ladder Style Programming	Yes	Yes	Yes
Run Time Edits	Yes	Yes	Yes
Scan	Variable / fixed	Variable / fixed	Variable / fixed
CLICK Programming Software for Windows	Yes	Yes	Yes
Built-in Communication Ports	Yes (one Ethernet port and one RS-232 port)	Yes (one Ethernet port, one RS-232 port and one RS-485 port)	Yes (one Ethernet port, one RS-232 port and one RS-485 port)
Protocols	Modbus RTU (master/slave) and ASCII (in/out), Modbus TCP (client/server), EtherNet/IP Implicit and Explicit (adapter server)		
FLASH Memory	Standard on PLC	Standard on PLC	Standard on PLC
Built-in Discrete I/O points	8 inputs, 6 outputs	8 inputs, 6 outputs	4 inputs, 4 outputs
Built-in Analog I/O Channels	No	No	2 or 4 inputs; 2 outputs
Number of High-Speed Input Points	4	8	4
Number of High-Speed Counters	4	6	4
PID Control Loops	8	8	8
Number of Instructions Available	21	21	21
Control Relays	2000	2000	2000
System Control Relays	1000	1000	1000
Timers	500	500	500
Counters	250	250	250
Interrupts	Yes (external: 8 / timed: 4)	Yes (external: 8 / timed: 4)	Yes (external: 4 / timed: 4)
Subroutines	Yes	Yes	Yes
For/Next Loops	Yes	Yes	Yes
Math (Integer and Hex)	Yes	Yes	Yes
Drum Sequencer Instruction	Yes	Yes	Yes
Internal Diagnostics	Yes	Yes	Yes
Password Security	Yes	Yes	Yes
System Error Log	Yes	Yes	Yes
User Error Log	No	No	No
Memory Backup	Super Capacitor + Battery	Super Capacitor + Battery	Super Capacitor + Battery
Battery Backup	Yes (battery part # D2-BAT-1)	Yes (battery part # D2-BAT-1)	Yes (battery part # D2-BAT-1)
Calendar/Clock	Yes	Yes	Yes
I/O Terminal Block Replacement	AutomationDirect p/n C0-16TB	AutomationDirect p/n C0-16TB	AutomationDirect p/n C0-16TB
Communication Port & Terminal Block Replacement	N/A	AutomationDirect p/n C0-3TB	AutomationDirect p/n C0-3TB
24VDC Power Terminal Block Replacement	AutomationDirect p/n C0-4TB	AutomationDirect p/n C0-4TB	AutomationDirect p/n C0-4TB

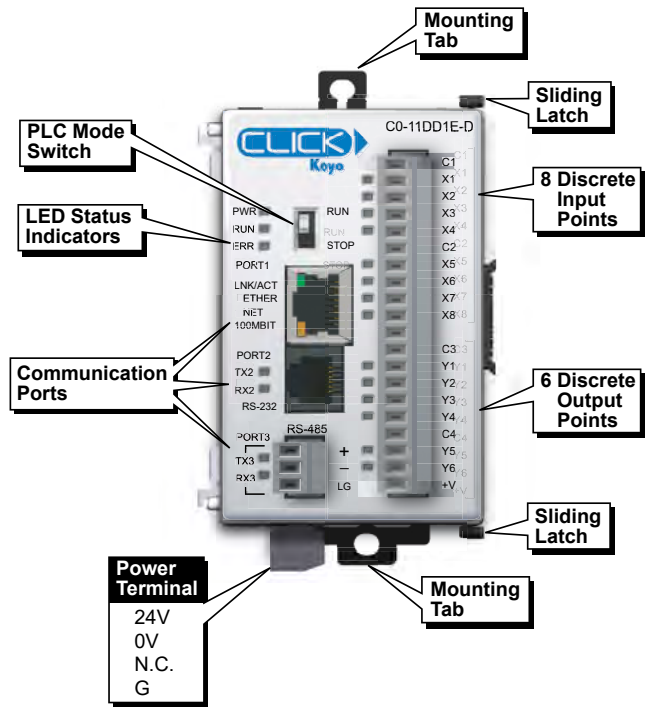
CLICK Specifications

PLC Features (continued)

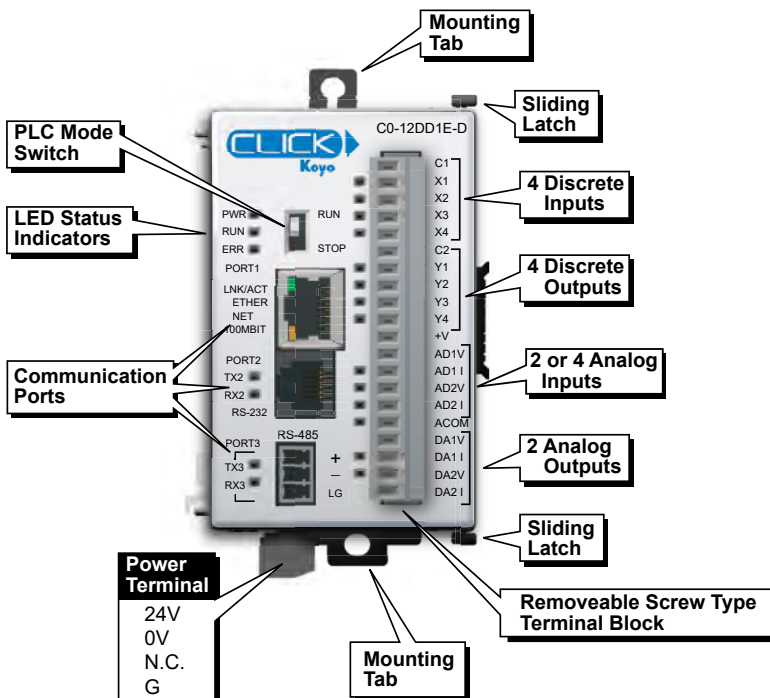
Ethernet Basic PLCs



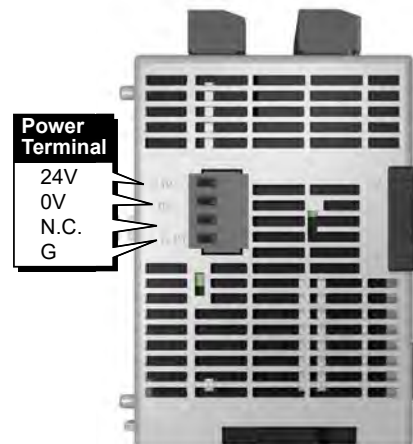
Ethernet Standard PLCs



Ethernet Analog PLCs



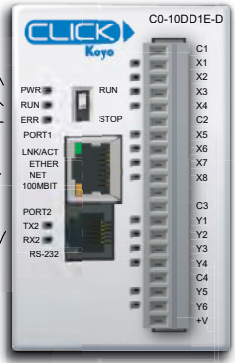
**Bottom of Ethernet PLC
(Same on all models)**



CLICK Specifications

PLC LED Status Indicators

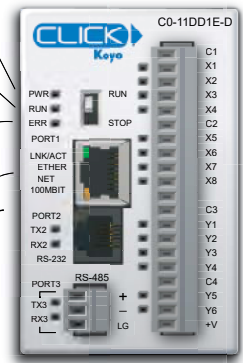
Ethernet Basic PLC



POWER LED (Green)	
On	Power Good
Off	Power Failure
RUN LED (Green)	
On	PLC Run Mode
Blink	Initializing System
Off	PLC Program Mode
ERROR LED (RED)	
On	Self Diagnostic Error
Blink	Self Diagnostic Warning
Off	No Error
LNK/ACT LED (Green)	
On	Connected to the network
Blink	Communicating
Off	Disconnected from the network
100MBIT LED (Orange)	
On	Communicating at 100Mbps
Off	Communicating at 10Mbps or disconnected from the network
TX & RX LED (Green)	
On	Comm Port Data Active
Off	No Communication

INPUT LEDs (Green)	
On	Input True
Off	Input False
OUTPUT LEDs (Red)	
On	Output True
Off	Output False

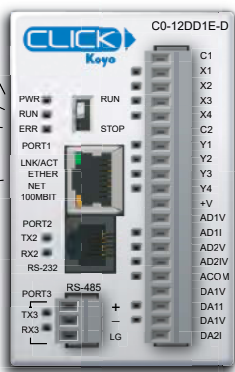
Ethernet Standard PLC



POWER LED (Green)	
On	Power Good
Off	Power Failure
RUN LED (Green)	
On	PLC Run Mode
Blink	Initializing System
Off	PLC Program Mode
ERROR LED (RED)	
On	Self Diagnostic Error
Blink	Self Diagnostic Warning
Off	No Error
LNK/ACT LED (Green)	
On	Connected to the network
Blink	Communicating
Off	Disconnected from the network
100MBIT LED (Orange)	
On	Communicating at 100Mbps
Off	Communicating at 10Mbps or disconnected from the network
TX & RX LED (Green)	
On	Com Port Data Active
Off	No Communication

INPUT LEDs (Green)	
On	Input True
Off	Input False
OUTPUT LEDs (Red)	
On	Output True
Off	Output False

Ethernet Analog PLC



POWER LED (Green)	
On	Power Good
Off	Power Failure
RUN LED (Green)	
On	PLC Run Mode
Blink	Initializing System
Off	PLC Program Mode
ERROR LED (RED)	
On	Self Diagnostic Error
Blink	Self Diagnostic Warning
Off	No Error
LNK/ACT LED (Green)	
On	Connected to the network
Blink	Communicating
Off	Disconnected from the network
100MBIT LED (Orange)	
On	Communicating at 100Mbps
Off	Communicating at 10Mbps or disconnected from the network
TX & RX LED (Green)	
On	Com Port Data Active
Off	No Communication

INPUT LEDs (Green)	
On	Input True
Off	Input False
OUTPUT LEDs (Red)	
On	Output True
Off	Output False

Gladiator MCCB (Molded Case Circuit Breakers)

Gladiator MCCBs thermal-magnetic circuit breakers are designed to protect low voltage electrical systems from damage caused by overloads and short circuits.

Wide Range of Applications

- Branch and feeder circuits
- Industrial control panels
- Industrial machines
- Power distribution



High Performance

- Ultimate breaking capacity (kA rms)
- Max 65kA@480VAC and 50kA@600V
- DC ratings
- Reverse feed capable
- HACR (Heating, Air Conditioning and Refrigeration) rated

Simplified Product Range

- Seven frame sizes
- Three trip unit types
- Ampere range: 15A to 1200A
- Poles: 2P, 3P

Wide Range of Accessories

- Electrical auxiliaries (AUX, ALX, ALM, UVT, SHT)
- Extended rotary handle
- Flange handle with flexible cable and linkage
- Locking devices
- LUG for CU/AL cable with UL486

Variety of Trip Units

- AA: Adjustable thermal & magnetic unit
- FF: Fixed thermal & magnetic unit
- ES: Electronic self-powered

STANDARDS

- World class with UL489
 - UL489
 - CSA C22.2 No. 5
- IEC60947-2
- Class 1E for Nuclear power plant
 - EQ : Environment Qualification
 - SQ : Seismic Qualification

Seven Frame Sizes Up To 1200A

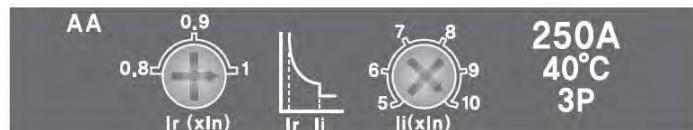
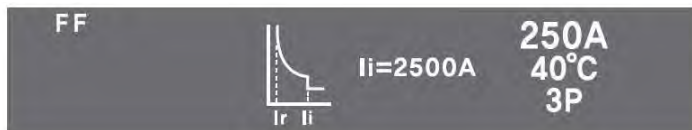
- GCB100 Series 15-100 A
- GCB150 Series 125-150 A
- GCB250 Series 175-250 A
- GCB400 Series 300-400 A
- GCB600 Series 500-600 A
- GCB800 Series 800 A
- GCB1200 Series 1200 A



UL file E503708 MCCB
UL file E509077 Accessories

FF
Fixed Thermal: 15A to 600A
Fixed Magnetic: 400A to 6000A

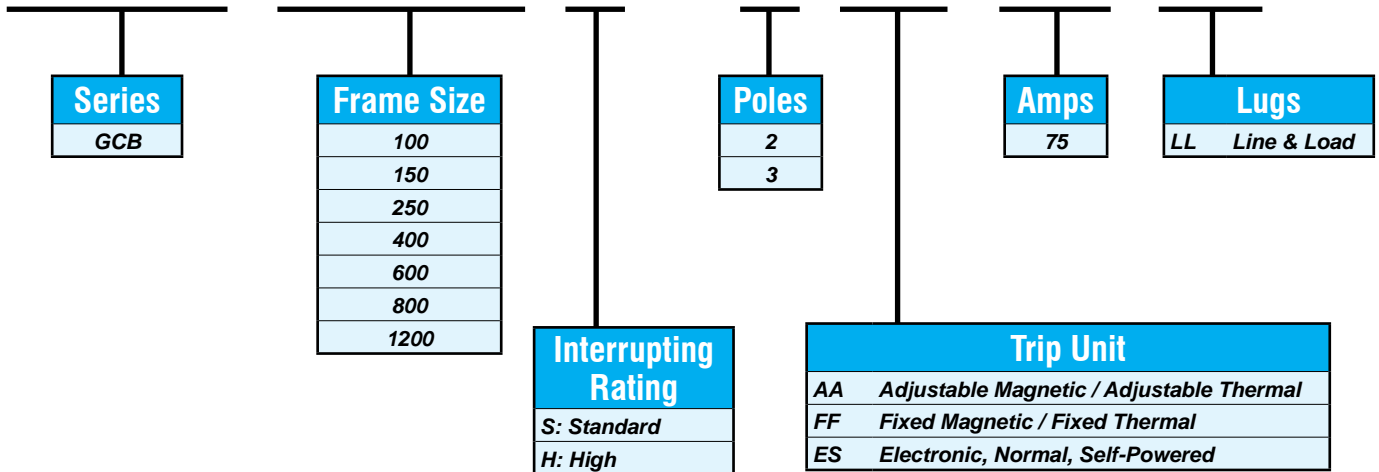
AA
Adjustable Thermal: 100A to 600A
Adjustable Magnetic: 500A to 6000A



Gladiator MCCB Part Number Nomenclature

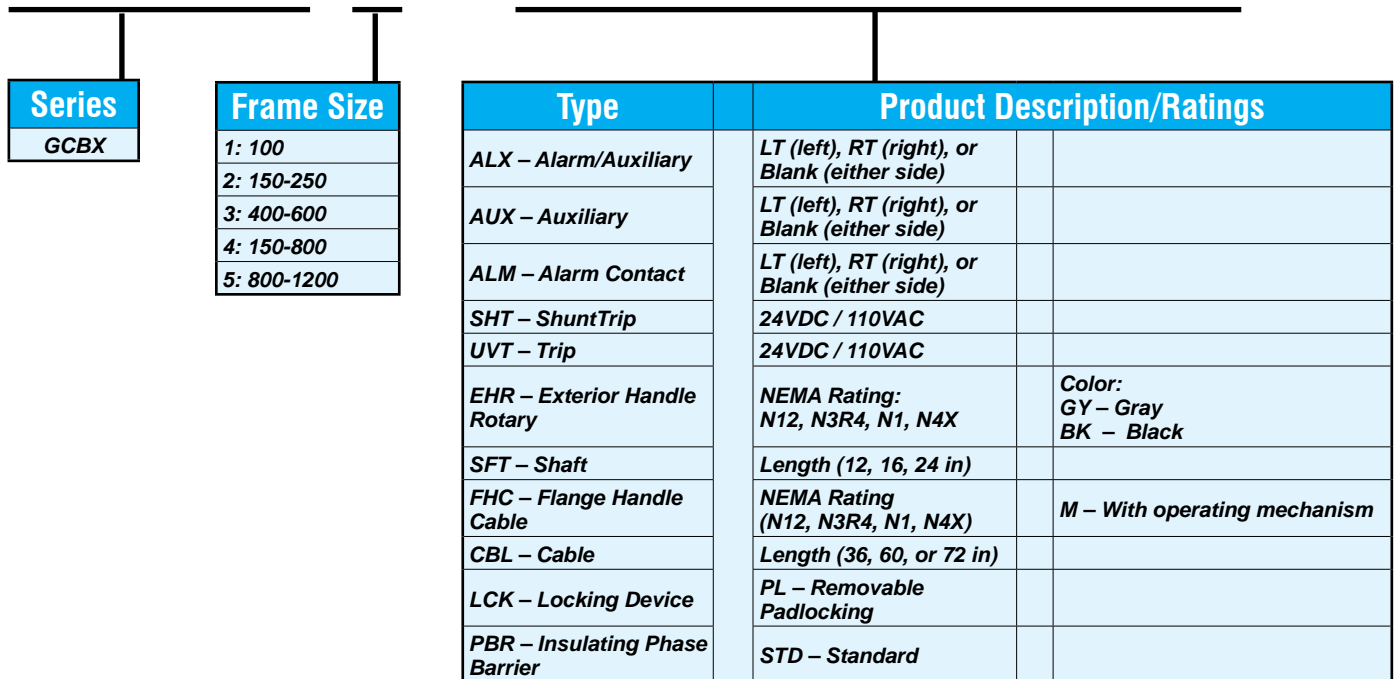
Gladiator MCCB

GCB 1200 S - 3 FF 75 LL



Gladiator MCCB Accessories

GCBX 1 - AUX - LT - BK



Gladiator MCCB GCB100 (15-100 A) 2-Pole or 3-Pole



GCB100S-2FF15LL

- HACR rated
- SWD (lighting circuits) switch duty rating (applied only to 15 and 20A / 347VAC or less)
- HID high intensity discharge lighting rating (15-50A / 480VAC or less)
- 40°C [104°F]
- Reverse feed capable
- Includes line and loadside lugs

Gladiator MCCB GCB100 2-Pole (15-100 A) Selection Guide

Part Number	Frequency	Ampere Rating	Voltage (AC)	Interrupt Capacity (kA)	Voltage (DC)	Interrupt Capacity (kA)	Dimensional Drawing
GCB100S-2FF15LL	50/60 Hz	15	120/240	65	250 (2P)	25	PDF
GCB100S-2FF20LL		20					PDF
GCB100S-2FF25LL		25					PDF
GCB100S-2FF30LL		30	240	PDF			
GCB100S-2FF40LL		40	480	PDF			
GCB100S-2FF50LL		50	600Y/347	PDF			
GCB100S-2FF60LL		60	PDF				
GCB100S-2FF70LL		70	PDF				
GCB100S-2FF80LL		80	PDF				
GCB100S-2FF90LL		90	PDF				
GCB100S-2FF100LL	100	PDF					

Gladiator MCCB GCB100 3-Pole (15-100 A) Selection Guide

Part Number	Frequency	Ampere Rating	Voltage (AC)	Interrupt Capacity (kA)	Voltage (DC)	Interrupt Capacity (kA)	Dimensional Drawing
GCB100S-3FF15LL	50/60 Hz	15	120/240	65	250 (2P)	25	PDF
GCB100S-3FF20LL		20					PDF
GCB100S-3FF25LL		25					PDF
GCB100S-3FF30LL		30	240	PDF			
GCB100S-3FF40LL		40	480	PDF			
GCB100S-3FF50LL		50	600Y/347	PDF			
GCB100S-3FF60LL		60	PDF				
GCB100S-3FF70LL		70	PDF				
GCB100S-3FF80LL		80	PDF				
GCB100S-3FF90LL		90	PDF				
GCB100S-3FF100LL	100	PDF					

Gladiator MCCB GCB100 (15-100 A)

2-Pole or 3-Pole

Gladiator MCCB GCB100 (15-100 A) Specifications			
Maximum Rated Current		100A	100A
Number of Poles		2	3
Breaker Type		S	S
UL489/CSA C22.2		GCB100	GCB100
Interrupting capacity (kA rms) AC (50/60HZ) UL, CSA	120/240 V	65	65
	240VAC	65	65
	480VAC	35	35
	600VAC	–	–
	600Y/347 VAC	18	18
UL489 DC		GCB100	GCB100
Interrupting Capacity (kA) DC UL, CSA	250V DC-2P	25	25
	500V DC-3P	–	35
	600V DC-3P	–	–
IEC 60947-2		GCB100	GCB100
Ultimate Breaking Capacity, (kA rms) AC 50/60Hz, Icu	220/240V	65	65
	380/415V	35	35
	480/500V	–	–
Service Breaking Capacity, Ics (%Icu)		100%	100%
Insulation Voltage, Ui		750VAC	750VAC
Impulse Withstand Voltage, Uimp		8KVAC	8KVAC
Rated Short-Time Withstand Current (Icw)		–	–
Utilization Category		A	A
TRIP UNITS F : Fixed A : Adjustable T : Thermal E : Electronics	Amperes	15-100 A	15-100 A
	ATU	–	–
	FTU	✓	✓
	ETS	–	–
Trip Unit Mounted		✓	✓
Mechanical Lugs		✓	✓
Terminal Shields		–	–
Interphase Barriers		✓	✓
Shunt Trip		✓	✓
Undervoltage Trip		✓	✓
Auxiliary Switch		✓	✓
Alarm Switch		✓	✓
Flange Cable Handle		✓	✓
NEMA-Door-Mounted Operating Mechanisms		✓	✓
Handle Padlock Attachment		✓	✓
Weight (lb [kg])		1.64 [0.74]	2.33 [1.06]

Gladiator MCCB GCB100 (15-100 A) 2-Pole or 3-Pole – Accessories

Gladiator MCCB GCB100 2-Pole (15-100 A) Accessories			
Part Number		Description	Dimensional Drawing
GCBX1-ALX-LT		Gladiator field installable alarm/auxiliary contact, left side mount, (2) SPDT contact(s), 3A @ 250VAC/0.2A @ 250VDC, 20in 24AWG lead wires, Auxiliary contact indicates if the MCCB is closed or open/tripped. Alarm contact indicates if the MCCB is tripped.	NA
GCBX1-ALX-RT		Gladiator field installable alarm/auxiliary contact, right side mount, (2) SPDT contact(s), 3A @ 250VAC/0.2A @ 250VDC, 20in 24AWG lead wires, Auxiliary contact indicates if the MCCB is closed or open/tripped. Alarm contact indicates if the MCCB is tripped.	NA
GCBX1-AUX-LT		Gladiator field installable auxiliary contact, left side mount, (1) SPDT contact(s), 3A @ 250VAC/0.2A @ 250VDC, 20in 24AWG lead wires, Auxiliary contact indicates if the MCCB is closed or open/tripped.	NA
GCBX1-AUX-RT		Gladiator field installable auxiliary contact, right side mount, (1) SPDT contact(s), 3A @ 250VAC/0.2A @ 250VDC, 20in 24AWG lead wires, Auxiliary contact indicates if the MCCB is closed or open/tripped.	NA
GCBX1-LCK-PL		Gladiator lockout attachment, 5-8mm (3/16-5/16in) diameter. For locking in the OFF position only. Accepts up to 3 locks.	PDF
GCBX1-SHT-110VAC		Gladiator field installable shunt trip, right side mount, 110-130 VAC/VDC coil voltage, screw terminals.	NA
GCBX1-SHT-24VDC		Gladiator field installable shunt trip, right side mount, 24 VAC/VDC coil voltage, screw terminals.	NA
GCBX1-UVT-110VAC		Gladiator field installable undervoltage trip, right side mount, 110-130 VAC/VDC sensing range, screw terminals.	NA
GCBX1-UVT-24VDC		Gladiator field installable undervoltage trip, right side mount, 24 VAC/VDC sensing range, screw terminals.	NA



Gladiator MCCB GCB100 2-Pole (15-100 A) Flange Handles and Cables			
Part Number		Description	Dimensional Drawing
GCBX1-FHC-N3R4-M		Gladiator flange handle, lever, gray/chrome, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 3/3R/4. Operating mechanism included.	PDF
GCBX1-FHC-N4X-M		Gladiator flange handle, lever, chrome, external front mount, 2-position, lockable in OFF only, defeatable, NEMA 3/4/4X. Operating mechanism included.	PDF
GCBX2-CBL-36		Gladiator cable assembly, 36in [0.91 m]	PDF
GCBX2-CBL-60		Gladiator cable assembly, 60in [1.52 m]	PDF



Gladiator MCCB GCB100 2-Pole (15-100 A) Rotary Handles and Shafts			
Part Number		Description	Dimensional Drawing
GCBX1-EHR-N12-GY		Gladiator rotary handle, pistol, gray, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 1/12. Operating mechanism included.	PDF
GCBX1-EHR-N3R4-BK		Gladiator rotary handle, pistol, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3/3R/4. Operating mechanism included.	PDF
GCBX1-EHR-N4X-BK		Gladiator rotary handle, pistol, black, external front mount, 2-position, lockable in ON-OFF, defeatable, NEMA 3/4/4X. Operating mechanism included.	PDF
GCBX1-SFT-12		Gladiator shaft, 12in [0.30 m] length.	PDF
GCBX1-SFT-16		Gladiator shaft, 16in [0.41 m] length.	PDF
GCBX1-SFT-24		Gladiator shaft, 24in [0.61 m] length.	PDF



Gladiator MCCB Derating Tables (80% Rating)

Item #'s 100-102

Circuit Diagrams For DC Applications

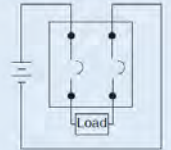
250VDC, 2P in Series

Suitable for use on ungrounded systems, or grounded systems that have one end of load(A) connected to grounded terminal, opposite poles in series connection.



A. Grounded System

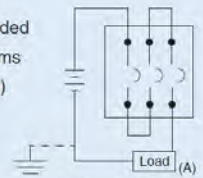
Suitable for use on ungrounded systems only



B. Ungrounded System

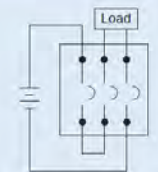
500VDC or 600VDC, 3P in Series

Suitable for use on ungrounded systems, or grounded systems that have one end of load(A) connected to grounded terminal, opposite poles in series connection.



A. Grounded System

Suitable for use on ungrounded systems only



B. Ungrounded System

NOTE: GCB800 and GCB1200 models have an electronic trip unit, so derating is not necessary.

Gladiator MCCB GCB100 (15-100 A)								
Temperature	50°F [10°C]	68°F [20°C]	77°F [25°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
Rating (A)	Modification of Current (A)							
15	13.1	12.7	12.5	12.4	12.0	11.2	10.3	9.5
20	17.4	17.0	16.7	16.5	16.0	14.9	13.8	12.6
25	21.8	21.2	20.9	20.6	20.0	18.6	17.2	15.8
30	26.2	25.4	25.1	24.7	24.0	22.3	20.6	19.0
35	30.5	29.7	29.3	28.8	28.0	26.0	24.1	22.1
40	34.9	33.9	33.4	33.0	32.0	29.8	27.5	25.3
45	39.2	38.2	37.6	37.1	36.0	33.5	31.0	28.4
50	43.6	42.4	41.8	41.2	40.0	37.2	34.4	31.6
60	52.3	50.9	50.2	49.4	48.0	44.6	41.3	37.9
70	61.0	59.4	58.5	57.7	56.0	52.1	48.2	44.2
80	69.8	67.8	66.9	65.9	64.0	59.5	55.0	50.6
90	78.5	76.3	75.2	74.2	72.0	67.0	61.9	56.9
100	87.2	84.8	83.6	82.4	80.0	74.4	68.8	63.2

Gladiator MCCB GCB150 (40-150 A)								
Temperature	50°F [10°C]	68°F [20°C]	77°F [25°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
Rating (A)	Modification of Current (A)							
40	36.8	35.2	34.4	33.6	32.0	30.1	28.2	26.2
50	46.0	44.0	43.0	42.0	40.0	37.6	35.2	32.8
60	55.2	52.8	51.6	50.4	48.0	45.1	42.2	39.4
70	64.4	61.6	60.2	58.8	56.0	52.6	49.3	45.9
80	73.6	70.4	68.8	67.2	64.0	60.2	56.3	52.5
90	82.8	79.2	77.4	75.6	72.0	67.7	63.4	59.0
100	92.0	88.0	86.0	84.0	80.0	75.2	70.4	65.6
110	101.2	96.8	94.6	92.4	88.0	82.7	77.4	72.2
125	115.0	110.0	107.5	105.0	100.0	94.0	88.0	82.0
150	138.0	132.0	129.0	126.0	120.0	112.8	105.6	98.4

Gladiator MCCB GCB250 (150-250 A)								
Temperature	50°F [10°C]	68°F [20°C]	77°F [25°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
Rating (A)	Modification of Current (A)							
150	138.0	132.0	129.0	126.0	120.0	106.8	93.6	80.4
160	147.2	140.8	137.6	134.4	128.0	113.9	99.8	85.8
175	161.0	154.0	150.5	147.0	140.0	124.6	109.2	93.8
200	184.0	176.0	172.0	168.0	160.0	142.4	124.8	107.2
225	207.0	198.0	193.5	189.0	180.0	160.2	140.4	120.6
250	230.0	220.0	215.0	210.0	200.0	178.0	156.0	134.0

Gladiator MCCB GCB400 (250-400 A)								
Temperature	50°F [10°C]	68°F [20°C]	77°F [25°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
Rating (A)	Modification of Current (A)							
250	218.0	212.0	209.0	206.0	200.0	172.0	144.0	116.0
300	261.6	254.4	250.8	247.2	240.0	206.4	172.8	139.2
350	305.2	296.8	292.6	288.4	280.0	240.8	201.6	162.4
400	348.8	339.2	334.4	329.6	320.0	275.2	230.4	185.6

Gladiator MCCB GCB600 (500-600 A)								
Temperature	50°F [10°C]	68°F [20°C]	77°F [25°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
Rating (A)	Modification of Current (A)							
500	436.0	424.0	418.0	412.0	400.0	344.0	288.0	232.0
600	523.2	508.8	501.6	494.4	480.0	412.8	345.6	278.4

Gladiator MCCB Door-Mounted Rotary Handles

NEMA Door-Mounted Rotary Handles

The extended rotary operating handle consists of the following:

- A mounting plate that provides a rotary actuator for a standard toggle circuit breaker
- Handle assemblies available for NEMA Type 1, 12, 3, 3R, 4, 4X
- Available in standard or long (12-24 in) handle assemblies

The door mounted operating handle makes it possible to operate circuit breakers installed in enclosure from the front.

- Indication of three positions: I (ON), Tripped and O (OFF): NEMA Type 1, 12
- Provides ON (I) and OFF (O) indication : NEMA Type 3, 3R, 4, 4X
- The circuit breaker may be locked in either the ON or OFF position

Models

- Standard with dark gray handle (NEMA Type 1, 12)
- Outdoor with black handle (NEMA Type 3, 3R, 4, 4X)
- Field-installable (secured by screws)

GCB100	GCB150/250	GCB400/600	GCB800/1200
GCBX1-EHR-N12-GY	GCBX2-EHR-N12-GY	GCBX3-EHR-N12-GY	GCBX5-EHR-N12-GY
GCBX1-EHR-N3R4-BK	GCBX2-EHR-N3R4-BK	GCBX3-EHR-N3R4-BK	GCBX5-EHR-N3R4-BK
GCBX1-EHR-N4X-BK	GCBX2-EHR-N4X-BK	GCBX3-EHR-N4X-BK	GCBX5-EHR-N4X-BK

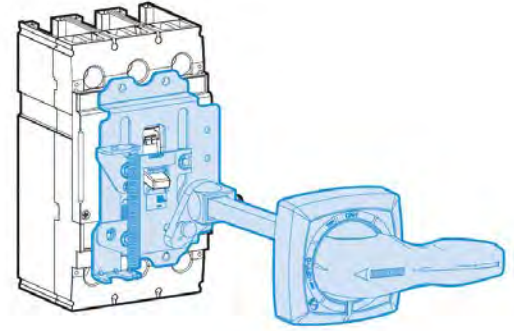
The shaft length is the distance between the back of the circuit breaker and door:

- Minimum mounting depth is 5.51 in [140mm] in GCB100
- Minimum shaft length is 12 in. [305mm] with long shaft
- Minimum shaft length is 24 in. [600mm] with long shaft
- Extended shaft length must be adjusted

Note: Rotary handles (EHR) include external operating handle and internal operating mechanism. Shafts (SFT) are sold separately.

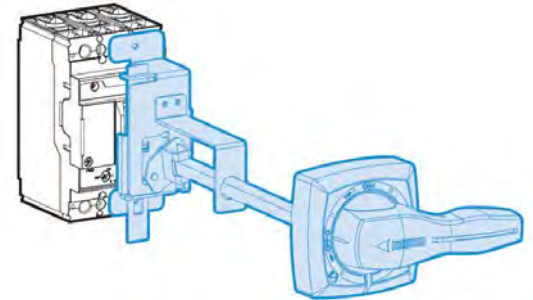
Standards

- The door-mounted rotary operating handle is UL Listed under file E509077
- Degree of protection NEMA Type 1, 12, 3, 3R, 4, 4X



Door-Mounted Rotary Operating Handle

- [GCBX2-EHR-N12-GY](#)
- [GCBX3-EHR-N12-GY](#)
- [GCBX5-EHR-N12-GY](#)
- [GCBX2-EHR-N3R4-BK](#)
- [GCBX3-EHR-N3R4-BK](#)
- [GCBX5-EHR-N3R4-BK](#)
- [GCBX2-EHR-N4X-BK](#)
- [GCBX3-EHR-N4X-BK](#)
- [GCBX5-EHR-N4X-BK](#)



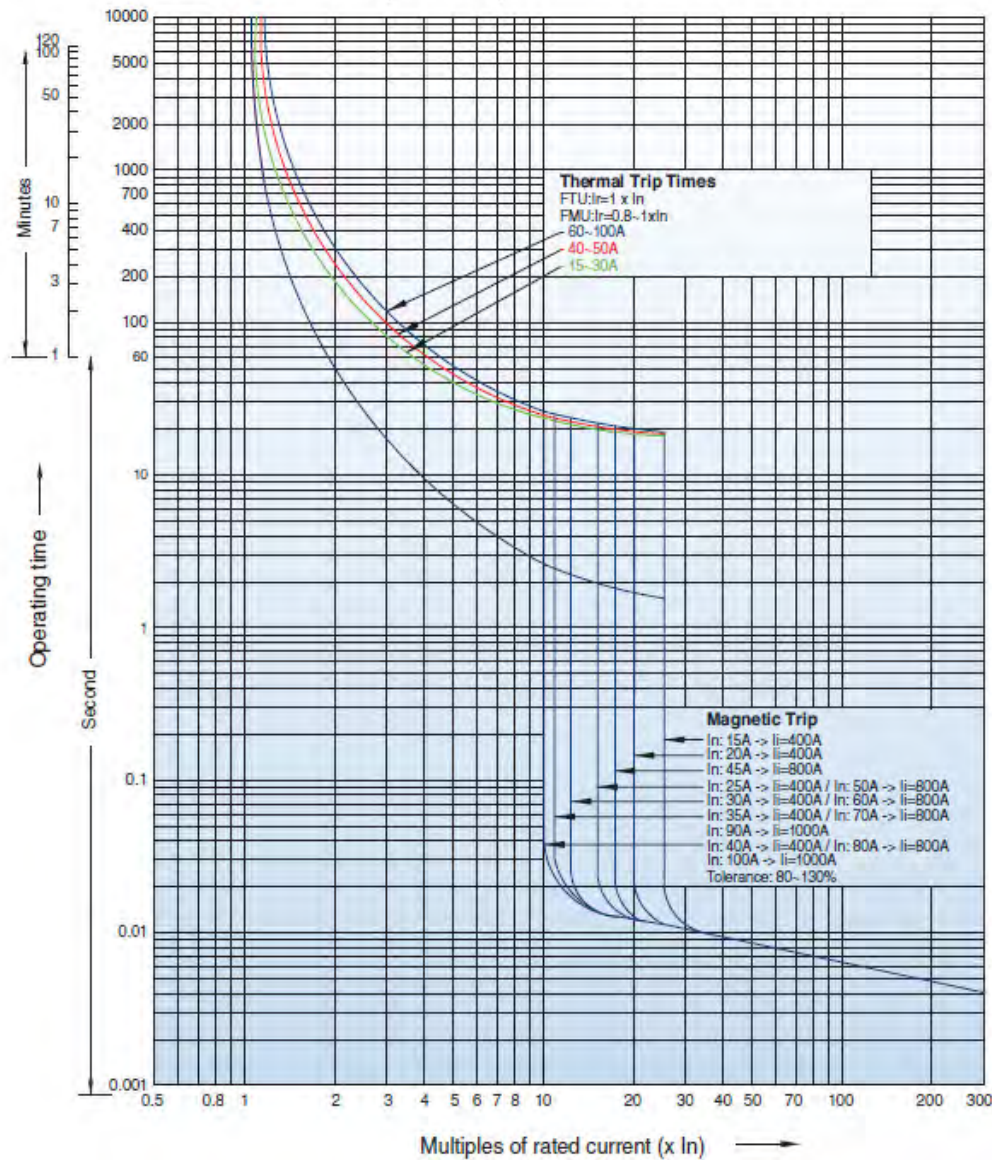
Door-Mounted Rotary Operating Handle

- [GCBX1-EHR-N12-GY](#)
- [GCBX1-EHR-N3R4-BK](#)
- [GCBX1-EHR-N4X-BK](#)

Gladiator MCCB Characteristic Curves

GCB100 (FTU – Fixed Trip Units)

All time/current characteristic curve data is based on 40°C ambient cold start.

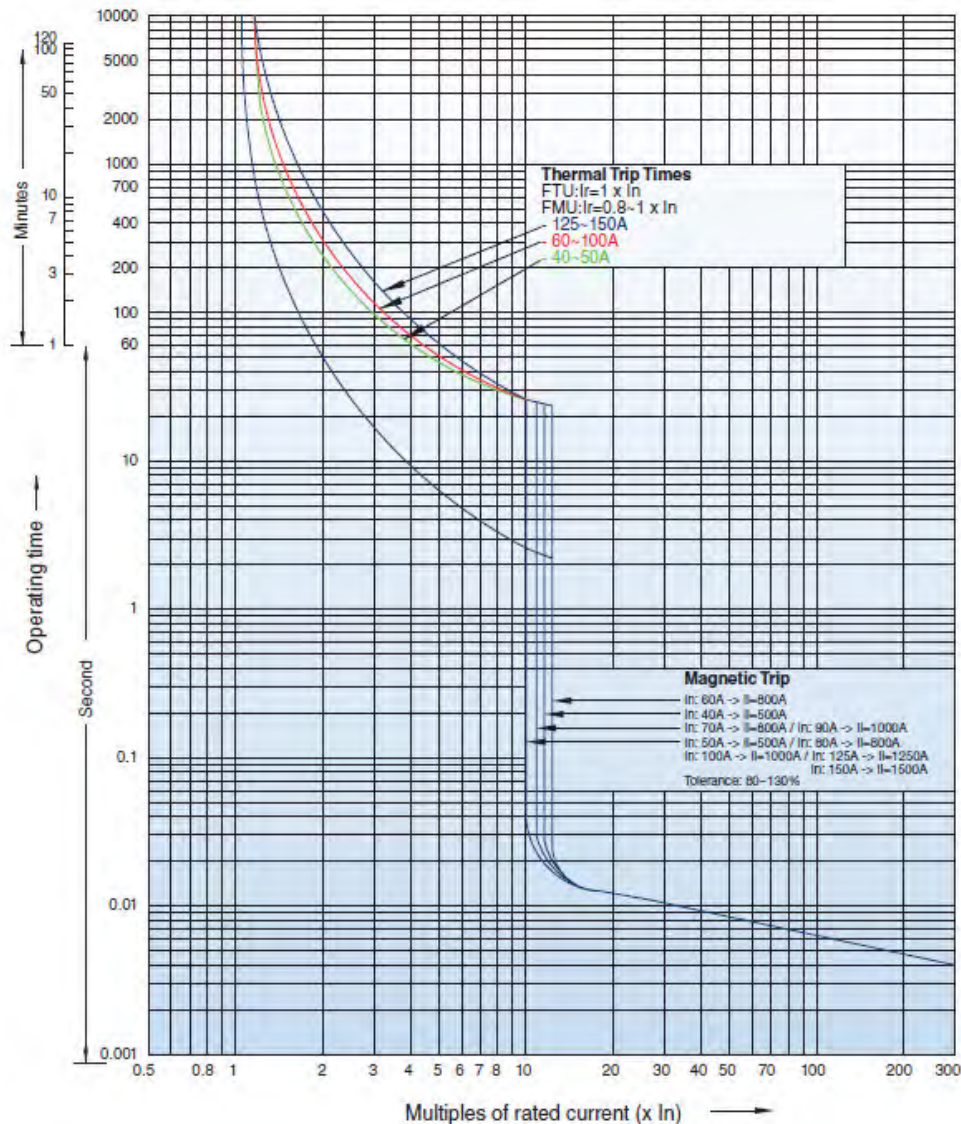


Rating	FTU	
	2P/3P	Mag Trip (80% - 130%) (A)
15	✓ / ✓	400
20	✓ / ✓	
25	✓ / ✓	
30	✓ / ✓	
35	✓ / ✓	
40	✓ / ✓	
45	✓ / ✓	800
50	✓ / ✓	
60	✓ / ✓	
70	✓ / ✓	
80	✓ / ✓	1000
90	✓ / ✓	
100	✓ / ✓	

Gladiator MCCB Characteristic Curves

GCB150 (FTU – Fixed Trip Units)

All time/current characteristic curve data is based on 40°C ambient cold start.



Rating	FTU	
	2P/3P	Mag Trip (80% - 130%) (A)
40	✓ / ✓	500
50	✓ / ✓	
60	✓ / ✓	800
70	✓ / ✓	
80	✓ / ✓	
90	✓ / ✓	1000
100	✓ / ✓	
125	✓ / ✓	1250
150	✓ / ✓	1500

UL 489 or UL 1077? What are your Circuit Protection Requirements?

An understanding of circuit types and circuit protection products is critical to ensure their proper application.
See NEC Sections 100, 430 and 409 for definitions.

The proper sizing of an overcurrent protection device is the responsibility of the customer and should be determined using the application standards of the NEC (National Electric Code), CEC (Canadian Electrical Code) or other applicable standards. Per fine print note of 2008 NEC Section 100 "A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Therefore, the rules for overcurrent protection are specific for particular situations."

UL 489

Branch Protection

UL 1077

Supplementary Protection



What You Need to Know and Look For In Specifications

Certifications – Standards – Acceptance

UL 489 Branch Protection

- UL 489 Listed or Recognized
- CSA C22.2 No. 5
- International ratings available depending on breaker type

UL 1077 Supplementary Protection

- UL Recognized under UL 1077
- CSA 22.2 No. 285
- IEC 60947-2 or IEC 898

Function

- Opens automatically on Overload and Short Circuit when properly applied within its ratings
- Protects wire and cable against Overload and Short Circuit

- Opens automatically on Overload and Short Circuit
- Provides additional equipment protection where branch circuit protection is already provided or not required
- Not suitable for the protection of branch circuit conductors

Applications

- Branch circuit protection in control panels, panelboards, switchboards and motor control centers
- Motor overload and motor short circuit protection (UL 489 Recognized motor circuit protectors) for control panels and motor control centers

- Used within appliances or other electrical equipment such as control circuits, control power transformers, relays, PLC I/O points and lighting circuits
- Ideal replacement for fuses that are applied as supplementary protection

Features

- Bolted down or DIN rail mounted
- External handle mechanisms available
- Field mounted accessories
- Stand alone branch circuit protection
- Various levels of protection (curve type)
- High voltage and interruption levels (up to 100 kAIC @ 480V)

- DIN rail mounted
- Field mounted accessories
- Various levels of protection (curve type)
- 10 kAIC @ 240 VAC
- 10 kAIC @ 277 VAC and 5 kAIC @ 480VAC
- 10 kAIC @ 48VDC

kAIC = thousands of Amps interrupt capacity

Summary

A Supplementary Protector can't be used for Branch Circuit Protection.
Understanding the difference between Branch Circuit Protection and Supplementary Protection helps to ensure their proper use.



Single-Pole



Two-Pole



Three-Pole

Overview

Gladiator miniature circuit breakers offer optimum and efficient protection for branch and control circuits up to 63 amps. The Gladiator series is available with B, C or D trip characteristics in accordance with UL 489. The Gladiator series units are DIN rail mountable and can be used in feeder and branch circuit applications.

Listings

- UL Listed under UL 489 Category DIVQ E503708
- Category DIHS E509077
- CE LVD 2014/35/EU
- IEC/EN 60947-2

Features and Benefits

- Dual rated for AC or DC applications
- Complete range of UL 489 listed DIN rail mounted miniature circuit breakers up to 63 amp current rating
- Single-pole, two-pole and three-pole models
- Suitable for reverse feed applications
- Suitable for branch circuit device protection
- Thermal-magnetic overcurrent protection – three levels of short circuit protection, categorized by B, C and D curves
- B-curve magnetic trip point: 3 to 5 times the rated current, typically used for resistive loads such as conductors or heaters.
- C-curve magnetic trip point: 5 to 10 times the rated current, typically used for small transformers, pilot devices, etc.
- D-curve magnetic trip point: 10 to 20 times the rated current, typically used for transformers or very high inductive loads.
- Trip-free design – breaker cannot be defeated by holding the handle in the "ON" position
- Captive screws cannot be lost
- Can also be used in applications for which UL 1077 or CSA C22.2 No.235 are also allowed
- Field installable shunt trip and auxiliary switches, side mountable
- Module width of only 18mm [0.71 in] (per pole)
- Contact position indicator (red / green)
- 35mm DIN rail mountable, utilizing spring clip

Full Line of Field Installable Accessories

- Auxiliary switch
- Alarm/auxiliary switch
- Shunt trip
- Padlock provision

Applications

- Feeder and Branch Circuit Protection
- PLC I/O points
- Motor control circuits
- Control instrumentation
- Power supplies
- Relays
- Convenience receptacle circuits (internal / external)
- Load circuits leaving the equipment (external)
- Computers
- UPS
- HACR Equipment (Heating Air Conditioning, Refrigeration)
- Power conditioners





Miniature Circuit Breakers

Tripping Characteristics

Gladiator miniature circuit breakers are available with "B" or "C" or "D" tripping characteristics.

Type B trip curve

(3 to 5 times I_n)

B-curve devices are suitable for resistive loads such as conductors or heaters.

Type C trip curve

(5 to 10 times I_n)

C-curve devices are suitable for applications where medium levels of inrush current are expected. Applications include small transformers, lighting, pilot devices, control circuits and coils. C-curve devices provide a medium magnetic trip point.

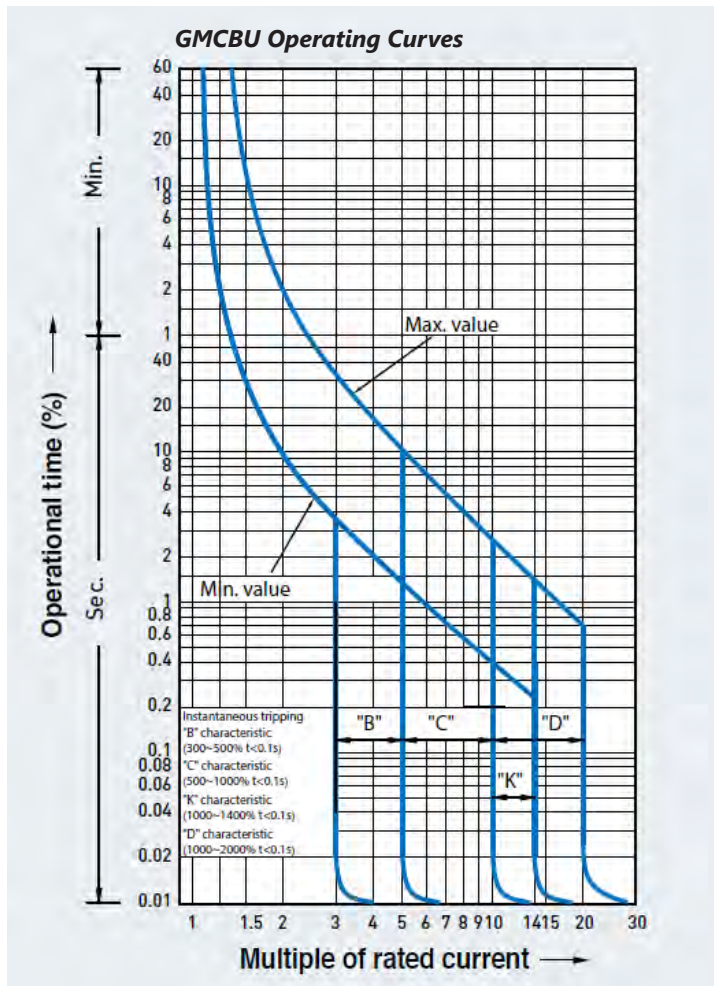
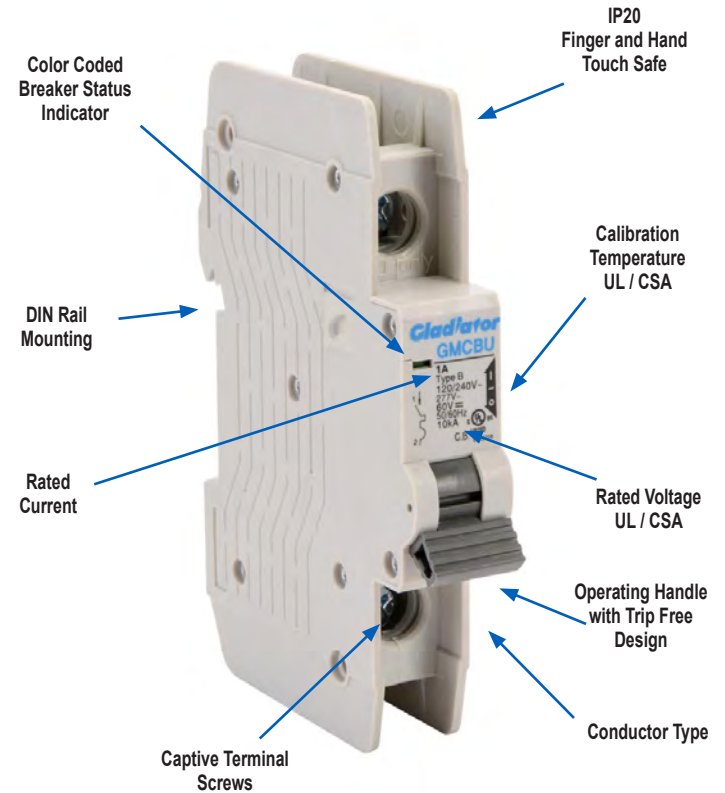
Type D trip curve

(10 to 20 times I_n)

D-curve devices are suitable for applications where high levels of inrush current are expected. The high magnetic trip point prevents nuisance tripping in high inductive applications such as motors, transformers and power supplies.

Labeling

The front of each Gladiator miniature circuit breaker is labeled for positive identification.



Miniature Circuit Breakers (UL 489)



Single-Pole

Gladiator UL 489 Single-Pole 277 VAC Selection Guide					
Ampere Rating	B-Curve Part Number		C-Curve Part Number		D-Curve Part Number
1	GMCBU-1B-1		GMCBU-1C-1		GMCBU-1D-1
2	GMCBU-1B-2		GMCBU-1C-2		GMCBU-1D-2
3	GMCBU-1B-3		GMCBU-1C-3		GMCBU-1D-3
4	GMCBU-1B-4		GMCBU-1C-4		GMCBU-1D-4
5	GMCBU-1B-5		GMCBU-1C-5		GMCBU-1D-5
6	GMCBU-1B-6		GMCBU-1C-6		GMCBU-1D-6
8	GMCBU-1B-8		GMCBU-1C-8		GMCBU-1D-8
10	GMCBU-1B-10		GMCBU-1C-10		GMCBU-1D-10
15	GMCBU-1B-15		GMCBU-1C-15		GMCBU-1D-15
16	GMCBU-1B-16		GMCBU-1C-16		GMCBU-1D-16
20	GMCBU-1B-20		GMCBU-1C-20		GMCBU-1D-20
25	GMCBU-1B-25		GMCBU-1C-25		GMCBU-1D-25

Gladiator UL 489 Single-Pole 120/240 VAC Selection Guide					
30	GMCBU-1B-30		GMCBU-1C-30		GMCBU-1D-30
32	GMCBU-1B-32		GMCBU-1C-32		GMCBU-1D-32
40	GMCBU-1B-40		GMCBU-1C-40		GMCBU-1D-40
50	GMCBU-1B-50		GMCBU-1C-50		GMCBU-1D-50
63	GMCBU-1B-63		GMCBU-1C-63		GMCBU-1D-63



Two-Pole

Gladiator UL 489 Two-Pole 480Y/277 VAC Selection Guide					
Ampere Rating	B-Curve Part Number		C-Curve Part Number		D-Curve Part Number
1	GMCBU-2B-1		GMCBU-2C-1		GMCBU-2D-1
2	GMCBU-2B-2		GMCBU-2C-2		GMCBU-2D-2
3	GMCBU-2B-3		GMCBU-2C-3		GMCBU-2D-3
4	GMCBU-2B-4		GMCBU-2C-4		GMCBU-2D-4
5	GMCBU-2B-5		GMCBU-2C-5		GMCBU-2D-5
6	GMCBU-2B-6		GMCBU-2C-6		GMCBU-2D-6
8	GMCBU-2B-8		GMCBU-2C-8		GMCBU-2D-8
10	GMCBU-2B-10		GMCBU-2C-10		GMCBU-2D-10
15	GMCBU-2B-15		GMCBU-2C-15		GMCBU-2D-15
16	GMCBU-2B-16		GMCBU-2C-16		GMCBU-2D-16
20	GMCBU-2B-20		GMCBU-2C-20		GMCBU-2D-20
25	GMCBU-2B-25		GMCBU-2C-25		GMCBU-2D-25

Gladiator UL 489 Two-Pole 240VAC Selection Guide					
30	GMCBU-2B-30		GMCBU-2C-30		GMCBU-2D-30
32	GMCBU-2B-32		GMCBU-2C-32		GMCBU-2D-32
40	GMCBU-2B-40		GMCBU-2C-40		GMCBU-2D-40
50	GMCBU-2B-50		GMCBU-2C-50		GMCBU-2D-50
63	GMCBU-2B-63		GMCBU-2C-63		GMCBU-2D-63

Miniature Circuit Breakers (UL 489)



Three-Pole

Gladiator UL 489 Three-Pole 480Y/277 VAC Selection Guide					
Ampere Rating	B-Curve Part Number		C-Curve Part Number		D-Curve Part Number
1	<u>GMCBU-3B-1</u>		<u>GMCBU-3C-1</u>		<u>GMCBU-3D-1</u>
2	<u>GMCBU-3B-2</u>		<u>GMCBU-3C-2</u>		<u>GMCBU-3D-2</u>
3	<u>GMCBU-3B-3</u>		<u>GMCBU-3C-3</u>		<u>GMCBU-3D-3</u>
4	<u>GMCBU-3B-4</u>		<u>GMCBU-3C-4</u>		<u>GMCBU-3D-4</u>
5	<u>GMCBU-3B-5</u>		<u>GMCBU-3C-5</u>		<u>GMCBU-3D-5</u>
6	<u>GMCBU-3B-6</u>		<u>GMCBU-3C-6</u>		<u>GMCBU-3D-6</u>
8	<u>GMCBU-3B-8</u>		<u>GMCBU-3C-8</u>		<u>GMCBU-3D-8</u>
10	<u>GMCBU-3B-10</u>		<u>GMCBU-3C-10</u>		<u>GMCBU-3D-10</u>
15	<u>GMCBU-3B-15</u>		<u>GMCBU-3C-15</u>		<u>GMCBU-3D-15</u>
16	<u>GMCBU-3B-16</u>		<u>GMCBU-3C-16</u>		<u>GMCBU-3D-16</u>
20	<u>GMCBU-3B-20</u>		<u>GMCBU-3C-20</u>		<u>GMCBU-3D-20</u>
25	<u>GMCBU-3B-25</u>		<u>GMCBU-3C-25</u>		<u>GMCBU-3D-25</u>
Gladiator UL 489 Three-Pole 240VAC Selection Guide					
30	<u>GMCBU-3B-30</u>		<u>GMCBU-3C-30</u>		<u>GMCBU-3D-30</u>
32	<u>GMCBU-3B-32</u>		<u>GMCBU-3C-32</u>		<u>GMCBU-3D-32</u>
40	<u>GMCBU-3B-40</u>		<u>GMCBU-3C-40</u>		<u>GMCBU-3D-40</u>
50	<u>GMCBU-3B-50</u>		<u>GMCBU-3C-50</u>		<u>GMCBU-3D-50</u>
63	<u>GMCBU-3B-63</u>		<u>GMCBU-3C-63</u>		<u>GMCBU-3D-63</u>

Miniature Circuit Breakers (UL 489)

Technical Specifications

Gladiator Miniature Circuit Breakers – UL 489				
		B-Curve	C-Curve	D-Curve
Short Circuit Trip Response		3-5 x In	5-10 x In	10-20 x In
Current Rating		1, 2, 3, 4, 5, 6, 8, 10, 15, 16, 20, 25, 30, 32, 40, 50, 63A		
Maximum Voltage Ratings UL / CSA	1-63 A, AC	1P: 120/240V 2P: 240V 3P: 240V		
	1-25 A, AC	1P: 277V 2P: 480Y/277V 3P: 480Y/277V		
	1-63 A, DC	1P: 60V 2P: 125V 3P: 125V		
Thermal Tripping Characteristics (Temperature)	Single-pole	104°F [40°C]		
	Multi-pole			
Interrupting Ratings (@ maximum voltage)	1-pole	AC: 10kA @ 120/240VAC, 10kA @ 277VAC (1~25A), 10kA @ 120/240VAC (30~63A) DC: 10kA @ 60VDC		
	2-pole	AC: 10kA @ 240VAC, 480Y/277 VAC(1~25A), 10kA@240VAC (30~63A) DC: 10kA @ 125VDC		
	3-pole			
Rated Frequency		50/60 Hz		
Agency Approvals		UL, CB		

Notes: Line voltage connection suitable for reverse feed

To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

Gladiator Miniature Circuit Breaker - IEC				
		B-Curve	C-Curve	D-Curve
Short Circuit Trip Response		3-5 x In	5-10 x In	10-20 x In
Current Rating		1, 2, 3, 4, 5, 6, 8, 10, 15, 16, 20, 25, 30, 32, 40, 50, 63A		
Maximum Voltage Ratings - IEC/EN 60947-2	1-pole	500VAC		
	2-pole / 3-pole			
	2 poles in series			
Thermal Tripping Characteristics (Temperature)	Single-pole	104°F [40°C]		
	Multi-pole			
Interrupt Ratings (At Max Voltage) Uimp		6kV		
Rated Frequency		50/60 Hz		

General Specifications		
Lifespan / Endurance	6,000 operations electrical	
Operating Temperature	23°F to 104°F [-5°C to 40°C]	
Housing Material	Engineering plastic	
Mounting Position	On 35mm DIN rail (vertical)	
Weight	1-pole	0.28 lb [130g]
	2-pole	0.58 lb [260g]
	3-pole	0.86 lb [390g]
Wire Size		
Conductor Size Copper Only, 149°F [65°C]	Lug type 14-4 AWG	
Tightening Torque		
Tightening Torque	35 lb•in [3.9 N•m]	



Series Technical Data (UL 489)

Temperature Derating (UL 489)

Temperature Derating for UL 489 Influence of Ambient Temperature T on Load Carrying Capacity (UL 489)												
Device Current Rating in Amps at 104°F [40°C]	I _n (A) at Higher Ambient Temperature											
	-40°F [-40°C]	-22°F [-30°C]	-4°F [-20°C]	14°F [-10°C]	32°F [0°C]	50°F [10°C]	68°F [20°C]	86°F [30°C]	104°F [40°C]	122°F [50°C]	140°F [60°C]	158°F [70°C]
1	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	0.9	0.8	0.8
2	3.0	2.8	2.7	2.6	2.4	2.3	2.2	2.1	2.0	1.8	1.7	1.5
3	4.4	4.2	4.0	3.8	3.6	3.5	3.3	3.2	3.0	2.8	2.5	2.3
4	5.9	5.6	5.4	5.1	4.9	4.6	4.4	4.2	4.0	3.7	3.4	3.1
5	7.4	7.0	6.7	6.4	6.1	5.8	5.5	5.3	5.0	4.6	4.2	3.9
6	8.9	8.4	8.0	7.7	7.3	6.9	6.6	6.3	6.0	5.5	5.0	4.6
8	11.8	11.3	10.7	10.2	9.7	9.3	8.8	8.4	8.0	7.3	6.7	6.2
10	14.8	14.1	13.4	12.8	12.2	11.6	11.0	10.5	10.0	9.2	8.4	7.7
15	22.2	21.1	20.1	19.1	18.2	17.4	16.5	15.8	15.0	13.8	12.6	11.6
16	23.6	22.5	21.4	20.4	19.4	18.5	17.6	16.8	16.0	14.7	13.5	12.3
20	29.5	28.1	26.8	25.5	24.3	23.2	22.1	21.0	20.0	18.3	16.8	15.4
25	36.9	35.2	33.5	31.9	30.4	28.9	27.6	26.3	25.0	22.9	21.0	19.3
30	44.3	42.2	40.2	38.3	36.5	34.7	33.1	31.5	30.0	27.5	25.2	23.1
32	47.3	45.0	42.9	40.8	38.9	37.0	35.3	33.6	32.0	29.3	26.9	24.7
40	59.1	56.3	53.6	51.1	48.6	46.3	44.1	42.0	40.0	36.7	33.6	30.8
50	73.9	70.4	67.0	63.8	60.8	57.9	55.1	52.5	50.0	45.9	42.0	38.6
63	93.1	88.6	84.4	80.4	76.6	72.9	69.5	66.2	63.0	57.8	53.0	48.6

Power Loss at I_n (UL 489)

Power Loss at I _n			
Characteristic B			
I _n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.2	1.5	3.2
2	1.4	3.2	3.5
3	1.2	2.9	3.9
4	1.3	3.1	4.3
5	1.6	3.2	3.5
6	1.3	2.6	3.9
8	1.5	3.1	4.3
10	1.6	3.7	5.3
15	1.9	4.4	5.2
16	1.9	4.3	6.1
20	2.5	5.3	8.6
25	3.2	6.1	9.3
30	3.6	6.5	9.6
32	3.5	7.0	10.5
40	4.2	8.2	12.4
50	5.5	10.2	15.5
63	6.3	12.6	19.1

Power Loss at I _n			
Characteristic C			
I _n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.1	1.8	3.2
2	1.3	2.2	4.2
3	1.1	2.1	3.7
4	1.2	2.8	4.0
5	1.5	3.0	3.7
6	1.2	2.3	3.5
8	1.4	3.1	4.2
10	1.5	2.8	4.3
15	1.8	3.3	4.8
16	1.8	3.6	5.4
20	2.7	4.8	8.2
25	3.1	5.9	9.1
30	3.3	6.4	9.5
32	3.7	7.1	10.7
40	4.0	7.9	12.3
50	4.8	9.7	15.1
63	6.1	12.1	18.5

Power Loss at I _n			
Characteristic D			
I _n [A]	1p P[W]	2p P[W]	3p P[W]
1	1.5	2.1	2.8
2	1.2	2.3	3.3
3	1.3	2.4	3.9
4	1.1	2.3	3.8
5	1.4	2.5	3.8
6	1.4	2.4	3.7
8	1.9	2.9	3.2
10	1.5	2.7	4.2
15	1.6	2.9	4.3
16	1.7	3.1	4.5
20	2.0	3.3	4.9
25	2.7	5.4	7.3
30	3.0	5.9	8.8
32	3.3	5.9	9.8
40	3.7	7.2	10.7
50	4.8	9.2	14.1
63	6.0	11.6	17.9



KA25U

by Burndy
 Catalog ID: KA25U

Prop 65 Notice

Aluminum Universal Terminal, 1 Hole, 14-1/0 AWG (Str), 1/4" Stud, 1 Screw, Al/Cu Rated, Tin Plated.

Features: These Dual-Rated One-Conductor Lugs Are Constructed From High Strength Aluminum Alloy And Electro Tin-Plated To Provide Low Contact Resistance, Stud/bolt Hole Size: 1/4 IN, Set Screw Type: Slot, Length: 1.5 IN, Installation Torque: 50 IN-LB, Width: 0.63 IN, Height: 0.8 IN, Dimension D: 0.81 IN, Dimension N: 0.44 IN, Dimension T: 0.19 IN

Product Details

General

Application	For Aluminum And Copper Conductors
Connector Type	Terminal
Installation Torque Recommended in-lb	50 LBS/in
Material	Aluminum
Material - Hardware	Aluminum
Physical Attribute - Number of Holes	1
Physical Attribute - Number of Screws	1
Physical Attribute - Screw Type	Slot
Plated	Y
Plating Type	Tin
Sub Brand	UNIVERSAL TERM
Temperature Rating	194
Type	Bolted Lugs & Terminals
UPC	781810370193

Dimensions

Dimension - Bolt Hole Size inch	0.25 in
Dimension - D inch	0.81 in
Dimension - Height fraction	23/25 in
Dimension - Height inch	0.92 in
Dimension - Hole Size inch	0.27 in
Dimension - Hole Size mm	7 mm
Dimension - L Length Overall mm	38 mm
Dimension - Length Overall inch	1.50 in
Dimension - N inch	0.44 in
Dimension - Pad Width inch	0.63 in
Dimension - Stud Size inch	1/4
Dimension - Width fraction	63/100 in
Dimension - Width inch	0.63 in

Dimension - Width mm	16 mm
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Item # 160

Electrical Ratings

Rating - Minimum Voltage	600
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Conductor Related

Conductor - AL Str Size	8 AWG;6 AWG;4 AWG;3 AWG;2 AWG;1 AWG;1/0 AWG
Conductor - AL Str Size Range	8 AWG-1/0 AWG
Conductor - Copper Solid Size	12 AWG;11 AWG;10 AWG;9 AWG;8 AWG;7 AWG;6 AWG;5 AWG;4 AWG;3 AWG;2 AWG;1 AWG;1/0 AWG
Conductor - Copper Solid Size Range	12 AWG-1/0 AWG
Conductor - Copper Str Size	14 AWG;12 AWG;10 AWG;9 AWG;8 AWG;7 AWG;6 AWG;5 AWG;4 AWG;3 AWG;2 AWG;1 AWG;1/0
Conductor - Copper Str Size Range	14 AWG-1/0
Conductor Type	<ul style="list-style-type: none"> • AL C Str-Size • CU C Str-Size • CU C Solid-Size
Number Of Conductors	1

Certifications and Compliance

Certification - CSA Approved	Yes
Certification - UL Listed Direct Burial	No
Industry Standard(s)	UL 486A-486B
Standards - Industry Standards Met	UL 486A-486B
Standards - RoHS Compliance Status	EX
UL Listed	Yes

Logistics

Carton Quantity	900 EA
Minimum Pack Quantity	50

For further technical assistance, please contact us

BURNDY Headquarters

47 East Industrial Park Drive
Manchester, New Hampshire 03109

Customer Service Hours:

8 AM - 8 PM Eastern Monday-Friday
Emergency Service 24-hours/365 Days
Phone: 1-800-346-4175
1-603-647-5299 (International)

RHINO PSB Series DIN Rail Power Supplies

Single-Phase Input

AutomationDirect's RHINO PSB series of DIN Rail power supplies is perfect for applications that require a basic DC voltage power supply. These low-cost power supplies offer high performance and reliability without all the additional features of higher-cost full-featured power supplies. The following models in the RHINO PSB series are available with universal single-phase input and with output voltages of 24VDC or 48VDC from 60 to 480 Watts. They feature removable terminal blocks, high efficiencies, conformal coated circuit boards, and approval for Class 1, Division 2 hazardous locations. The rugged plastic and aluminum housings easily install with integral 35mm DIN Rail mounting adapters. These high-quality power supplies include overload, overvoltage and thermal protection, and are UL 508 listed, UL 60950 recognized, CSA certified, CE marked and RoHS compliant.

[PSB48-480S](#) is perfect for Stepper Drives, like our [STP-DRV-6575](#), [STP-DRV-4850](#) or [STP-DRV-80100](#)

Features

- Universal input voltage, single-phase 120/240 VAC or 120–375 VDC
- 24VDC or 48VDC outputs, 60 to 480 Watts
- Adjustable output voltage
- Rugged plastic or aluminum housings with integral 35mm DIN Rail mounting adapters
- Output voltage status LED
- NEC Class2 (Model [PSB24-100-N](#) & [PSB24-060S-P](#) only)
- Removable terminal blocks (except [PSB24-060S-P](#), [PSB24-100-N](#), [PSB24-480S](#) and [PSB48-480S](#)) with IP20 protection
- Conformal coated circuit board for protection against demanding environments
- Overload, overvoltage and thermal protection
- UL 508 listed, UL 60950 recognized, CSA certified, approved for Class I (except [PSB24-100-N](#)), Division 2 hazardous locations CE marked and RoHS compliant
- Three year warranty



PSB Single-Phase Series Input Specifications

Part Number	Weight kg [lb]	Housing	Input Voltage	Input Frequency Range	Max. Input Current	Inrush Current Limitation I _{2t} @ 77°F (+25°C) typ.	Leakage Current	Recommended Circuit Breaker	Hold-Up Time at Nominal Load (Typ.) (Mains Buffering) (100% load, 25°C)	Turn-on Time
PSB24-060S-P	0.33 [0.73]	Plastic	85–264 VAC [DC input range 120–375 VDC] UL Approved for 100-240 VAC only	47–63 Hz [0Hz @ DC Input]	<1.5 A @ 100VAC	<40A @ 115VAC, <80A @ 230VAC	<0.5mA @ 240VAC	16A "B" Curve	>20ms @ 115VAC >125ms @ 230VAC	<3 sec.
PSB24-060S	0.37 [0.82]	Aluminum			<1.4 A @ 115VAC, <0.8 A @ 230VAC	<20A @ 115VAC, <35A @ 230VAC	<1mA @ 240VAC	8A "B" Curve	>20ms @ 115VAC >30ms @ 230VAC	<2 sec.
PSB24-100-N	0.60 [1.32]				<1.00A @ 115VAC, <0.53A @ 230 VAC	<30A @ 115VAC <60A @ 230 VAC	<0.5mA @ 24VAC	13A "B" Curve		
PSB24-120S	0.72 [1.59]				<2.2 A @ 115VAC, <1.2 A @ 230VAC	<35A @ 115VAC, <35A @ 230VAC	<1mA @ 240VAC	10A "B" Curve	>20ms @ 115VAC >115ms @ 230VAC	
PSB24-240S	1.10 [2.43]				<2.5 A @ 115VAC, <1.3 A @ 230VAC		8A "B" Curve	>20ms @ 115VAC & 230VAC		
PSB24-480S	1.37 [3.02]				<5A @ 115VAC, <3A @ 230VAC		6A "B" Curve	<1 sec.		
PSB48-120S	0.72 [1.59]				<2.2 A @ 115VAC, <1.1 A @ 230VAC	<35A @ 115VAC, <35A @ 230VAC	<1mA @ 240VAC	8A "B" Curve	>20ms @ 115VAC >50ms @ 230VAC	
PSB48-240S	0.97 [2.14]				<2.5 A @ 115VAC, <1.3 A @ 230VAC		8A "B" Curve	>20ms @ 115VAC & 230VAC		
PSB48-480S	1.37 [3.02]				<5A @ 115VAC, <3A @ 230VAC		10A "B" Curve	>20ms @ 115VAC & 230VAC	<1.5 sec.	

RHINO PSB Series DIN Rail Power Supplies

PSB Single-Phase Series Output Specifications									
Part Number	Output Voltage (Vnom) / Adjustment Range	Output Power	Output Current	Ripple and Noise [20 MHz]	Startup with Capacitive Loads Max	Derating	Max. Power Dissipation Idling/ Nominal Load Approx.	Efficiency [Typ @ 115VAC]	MTBF
PSB24-060S-P	24VDC $\pm 2\%$ /22–28 VDC [maximum power ≤ 60 W]	60W	2.5 A	< 240 mVpp @ 25°C	8,000 μ F	>50°C de-rate power by 2.5%/°C	8W	88%	>800,000 hrs.
PSB24-060S	24VDC $\pm 2\%$ /24–28 VDC [maximum power ≤ 60 W]					>70°C de-rate power by 4%/°C			
PSB24-100-N	24VDC $\pm 2\%$ /22–24 VDC [maximum power ≤ 91.2 W]	91.2 W	3.80A	< 150 mVpp @ 25°C	8,000 μ F	>50°C de-rate power by 2.5%/°C > 70°C de-rate power by 4%/°C	12.4 W	88%	>800,000 hrs.
PSB24-120S	24VDC $\pm 2\%$ /24–28 VDC [maximum power ≤ 120 W]	120W	5A			>50°C de-rate power by 2.5%/°C	14.8 W	89%	
PSB24-240S	24VDC $\pm 2\%$ /24–28 VDC [maximum power ≤ 240 W]	240W	10A	< 150 mVpp @ 25°C	10,000 μ F	>50°C de-rate power by 2.5%/°C	26.5 W	90%	>500,000 hrs.
PSB24-480S	24VDC $\pm 2\%$ /24–28 VDC [maximum power ≤ 480 W]	480W	20A			>50°C de-rate power by 2.5%/°C >70°C de-rate power by 5%/°C	47W	91%	
PSB48-120S	48VDC $\pm 1\%$ /48–56 VDC [maximum power ≤ 120 W]	120W	2.5 A	< 200 mVpp @ 25°C	6,500 μ F	>50°C de-rate power by 2.5%/°C	14.8 W	90%	>800,000 hrs.
PSB48-240S	48VDC $\pm 1\%$ /48–56 VDC [maximum power ≤ 240 W]	240W	5A	< 200 mVpp @ 85VAC to 265VAC	10,000 μ F	>50°C de-rate power by 2.5%/°C	25W	90%	>500,000 hrs.
PSB48-480S	48VDC $\pm 1\%$ /48–56 VDC [maximum power ≤ 480 W]	480W	10A	< 200 mVpp @ 85VAC to 264VAC		>50°C de-rate power by 2.5%/°C >70°C de-rate power by 5%/°C	46.5 W	91%	

PSB Single-Phase Series General Specifications	
Output Line Regulation	$< 0.5\%$ @ 85–264 VAC input, 100% load
Output Load Regulation	$< 1\%$ @ 85–264 VAC input, 0-100% load PSB24-100-N: $< 1\%$ at -25°C to +25°C $< 2\%$ at +25°C to +50°C $< 1\%$ typ. @ 85–264 VAC input, 0-100% load
Parallel Operation	PSB60-REM20S / PSB60-REM40S or with ORing Diode
Case Cover	Aluminium or Plastic [Polycarbonate] for P Series
Signals	Green LED DC OK
Humidity at 25°C [77°F], no condensation	$< 95\%$ RH [non-condensing]
Shock (Non-Operating)	IEC 60068-2-27, 30G [300m/S ²] for a duration of 18ms, 1 time per direction, 2 times in total
Vibration (Non-Operating)	IEC60068-2-6, 10Hz to 500Hz @ 30 m/S ² [3G peak]; 60 min per axis for all X, Y, Z direction
Environmental Air	No corrosive gases permitted (PSB24-100-N - Conformal coating on PCBA to protect against chemical and dust pollutants)
Pollution Degree	2
Climatic Class	3K3 according to EN 60721

PSB Single-Phase Series Certification and Standards	
Electrical Equipment of Machines	IEC60204-1 [over voltage category III]
Electronic equipment for use in electrical power installations	EN62477-1 / IEC62103
Safety Entry Low Voltage	PELV [EN60204], SELV [EN60950]
Industrial Control Equipment	UL/cUL listed to UL508 and CSA C22.2 No. 107.1-01 File no. E197592 CSA to CSA C22.2 No. 107.1-01
Hazardous Location	cCSAus to CSA C22.2 No. 213-M1987, ANSI / ISA 12.12.01:2007 Class I, Division 2, Group A,B,C,D T4, Ta = 25 to +80°C (PSB24-060S-P, PSB24-060S, PSB24-120S, PSB24-240S, PSB48-120S, PSB48-240S); 25 to +75°C (PSB24-480S, PSB48-480S) Vertical: $> +50^\circ\text{C}$ derating, File no. 249074
Class 2 Power Supply	UR/cUR Class 2 power supply recognized to UL1310 and CSA C22.2 No. 223 File no. E198298 (PSB24-060S-P and PSB24-100-N only)
CE	CE Marked

RHINO PSB Series DIN Rail Power Supplies

PSB Single-Phase Series Safety and Protection	
Transient surge voltage protection	Varistor
Overvoltage	<p>PSB24-060S-P, PSB24-060S, PSB24-100-N, PSB24-120S, PSB24-240S, PSB24-480S: <32V, SELV Output, hiccup mode, non-latching [auto-recovery]</p> <p>PSB48-120S, PSB48-240S, PSB48-480S: <57V, SELV Output, hiccup mode, non-latching [auto-recovery]</p>
Overload / Overcurrent	<p>PSB24-060S-P, PSB24-060S, PSB24-100-N, PSB24-120S, PSB24-240S, PSB24-480S: >150% of rated load current, hiccup mode, non-latching [auto-recovery].</p> <p>PSB24-060S-P: 110-150% of rated load current, hiccup mode, non-latching [auto-recovery].</p>
Isolation Voltage: Input/output (type test/routine test) Input/GND (type test/routine test) Output/GND (type test/routine test)	<p>4 kVAC / 3 kVAC 1.5 kVAC / 1.5 kVAC 1.5 kVAC / 500 VAC</p>
Protection Degree	IP20
Safety Class	Class I with GND connection

Additional Data						
Part Number	Wire Size / Torque*		Terminal Block Type	Ambient Operating Temperature**	Storage Temperature	Drawing Link
	Input	Output				
PSB24-060S-P	0.52–5.3 mm ² [AWG 20–10] / 0.45 Nm [3.96 lb-in]		Fixed screw terminals	-25 to 80°C [-13 to 176°F]	-25 to 80°C [-13 to 176°F]	PDF
PSB24-060S	0.52–3.3 mm ² [AWG 20–12] / 0.46 Nm [4.05 lb-in]		Removable screw terminals	-25 to 80°C [-13 to 176°F] Cold start at -40°C [-40°F]	-40 to 85°C [-40 to 185°F]	PDF
PSB24-100-N	0.82–3.3 mm ² [AWG 18–12] / 0.91 Nm [8.1 lb-in]	0.82–3.3 mm ² [AWG 18–12] / 0.61 Nm [5.4 lb in]	Fixed screw terminals			PDF
PSB24-120S	0.52–3.3 mm ² [AWG 20–12] / 0.46 Nm [4.05 lb-in]		Removable screw terminals			PDF
PSB24-240S	1.3–2.1 mm ² [AWG 16–14] / 0.46 Nm [4.05 lb-in]					PDF
PSB24-480S	0.82–5.3 mm ² [AWG 18–10] / 0.45 Nm [3.96 lb-in]	3.3–5.3 mm ² [AWG 12–10] / 0.45 Nm [3.96 lb-in]	Fixed screw terminals	-25 to 75°C [-13 to 176°F]		PDF
PSB48-120S	0.52–3.3 mm ² [AWG 20–12] / 0.46 Nm [4.05 lb-in]		Removable screw terminals	-25 to 80°C [-13 to 176°F]		PDF
PSB48-240S				PDF		
PSB48-480S	0.82–5.3 mm ² [AWG 18–10] / 0.45 Nm [3.96 lb-in]	1.3–5.3 mm ² [AWG 16–10] / 0.45 Nm [3.96 lb-in]	Fixed screw terminals	-25 to 75°C [-13 to 176°F]	PDF	

*Stripping length 7 mm [0.28 in]

** See output specifications for temperature derating

1085039

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Narrow Ethernet switch, five RJ45 ports with 10/100 Mbps on all ports, automatic data transmission speed detection, autocrossing function, and QoS

Your advantages

- RJ45 ports support a transmission speed of 10/100 Mbps
- QoS-prioritized (Quality of Service) messages
- Local diagnostic indicators with LEDs
- Enhanced traffic prioritization for automation protocols
- PROFINET PTCP filter for reliable communication on PROFINET networks
- Energy-efficient Ethernet in accord. with IEEE 802.3az
- PROFINET Conformance Class A for real-time data exchange
- Auto negotiation and autocrossing detection simplifies installation and setup

Technical Data

Dimensions

Width	22.5 mm
Height	117 mm
Depth	84 mm

Notes

Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area
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Material specifications

Housing material	Polycarbonate fiber reinforced
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Mounting

Mounting type	DIN rail mounting
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Interfaces

Ethernet (RJ45)

Number of interfaces	5
Connection method	RJ45
Note on the connection method	Auto negotiation and autocrossing
Transmission speed	10/100 Mbps
Transmission physics	Ethernet in RJ45 twisted pair
Transmission length	100 m (per segment)
Signal LEDs	Data receive, link status
No. of channels	5 (RJ45 ports)

Product properties

Product type	Switch
MTTF	167.2 Years (MIL-HDBK-217F standard, temperature 25°C, operating cycle 100%)
	1627 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)
	1526 Years (Telcordia standard, 25°C temperature, 21% operating cycle (5 days a week, 8 hours a day))

Switch functions

Basic functions	Unmanaged switch
	Autonegotiation
	Store and Forward switching mode
PROFINET conformance class	Conformance-Class A
MAC address table	2k

Status and diagnostic indicators	LEDs: U _S , link and activity per port
Additional functions	100 BASE-TX/100BASE-FX (IEEE 802.3u)
	Quality of Service (QoS) prioritization (IEEE 802.1p)
	Energy-efficient Ethernet (IEEE 802.3az)
	10Base-T (IEEE 802.3)

Security functions

Basic functions	Unmanaged switch
	Autonegotiation
	Store and Forward switching mode

Electrical properties

Transmission medium	Copper
---------------------	--------

Supply

Supply voltage	24 V DC
	24 V AC (50/60 Hz)
Supply voltage range	9 V DC ... 32 V DC
	18 V AC ... 30 V AC (50/60 Hz)
Power supply connection	Via COMBICON, max. conductor cross section 2.5 mm ²
Residual ripple	3.6 V _{PP} (within the permitted voltage range)
Max. current consumption	110 mA (at 9 V DC)
Typical current consumption	19 mA (at 24 V DC)

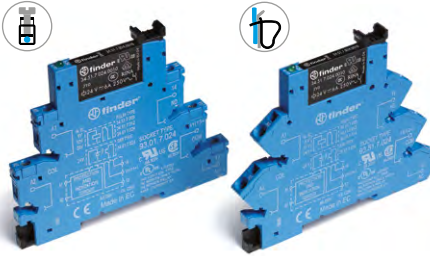


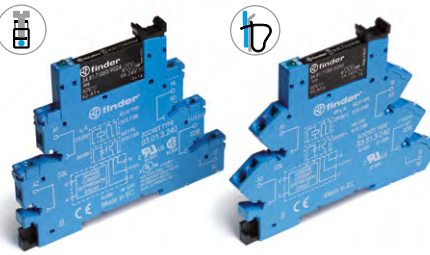


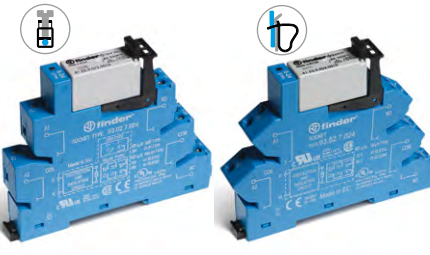
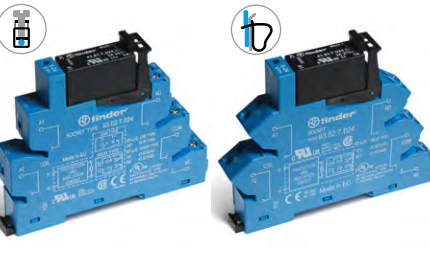
Connection data

Connection method	Push-in spring connection
Conductor cross section, rigid	0.2 mm ² ... 2.5 mm ²
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm ² ... 2.5 mm ²
Stripping length	10 mm

Ambient conditions

Degree of protection	IP30
Ambient temperature (operation)	-10 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	2000 m (maximum)
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)
Shock (operation)	30g (EN 60068-2-27)
Vibration (operation)	in acc. with IEC 60068-2-6: 5g, 150 Hz
Air pressure (operation)	79 kPa ... 108 kPa up to 2000 m above mean sea level (Without derating)
Air pressure (storage/transport)	79 kPa ... 108 kPa up to 2000 m above mean sea level (Without derating)

Standards and regulations

<p>Common features</p> <ul style="list-style-type: none"> • Instant ejection of relay by plastic retaining clip • Integral coil indication and protection circuit • 35 mm rail (EN 60715) mounting 	<p>EMR Electromechanical Relays</p>	<p>SSR Solid State Relays</p>
<p>6.2 mm wide</p> <ul style="list-style-type: none"> • EMR - DC, AC or AC/DC coil versions • SSR - DC or AC/DC input versions • Screw and Screwless terminal options 	<p>38.51/38.61</p>  <ul style="list-style-type: none"> • 1 CO - 6 A/250 V AC <p>Page 1</p>	<p>38.81/38.91</p>  <ul style="list-style-type: none"> • Single solid state output: Options 0.1 A/48 V DC, 6 A/24 V DC, 2 A/240 V AC • Silent, high speed switching • Long electrical life <p>Page 2</p>
<p>6.2 mm wide</p> <ul style="list-style-type: none"> • Special coil/input leakage current suppression types • EMR - AC or AC/DC coil versions • SSR - AC or AC/DC input versions • Screw and Screwless terminal options 	<p>38.51.3... - 38.61.3...</p>  <ul style="list-style-type: none"> • 1 CO - 6 A/250 V AC <p>Page 1</p>	<p>38.81.3... - 38.91.3...</p>  <ul style="list-style-type: none"> • Single solid state output: Options 0.1 A/48 V DC, 6 A/24 V DC, 2 A/240 V AC • Silent, high speed switching • Long electrical life <p>Page 2</p>
<p>6.2 mm wide</p> <ul style="list-style-type: none"> • Timed Interface module • 4 functions & 4 time scales 0.1 s...6 h • EMR - AC/DC (12 or 24 V) supply versions • SSR - AC/DC (24 V) supply • Screw terminals 	<p>38.21</p>  <ul style="list-style-type: none"> • 1 CO - 6 A/250 V AC <p>Page 3</p>	<p>38.21...9024-8240</p>  <ul style="list-style-type: none"> • Single solid state output: Options 6 A/24 V DC, 2 A/240 V AC • Silent, high speed switching • Long electrical life <p>Page 3</p>
<p>14 mm wide</p> <ul style="list-style-type: none"> • 2 pole 8 A or 1 pole 16 A • EMR - DC or AC/DC coil versions • SSR - DC input versions • Screw and Screwless terminal options 	<p>38.01/38.52/38.11/38.62</p>  <ul style="list-style-type: none"> • 1 CO - 16 A/250 V AC • 2 CO - 8 A/250 V AC <p>Page 4</p>	<p>38.31/38.41</p>  <ul style="list-style-type: none"> • Single solid state output: Options 5 A/24 V DC, 3 A/240 V AC • Silent, high speed switching • Long electrical life <p>Page 5</p>

B

1 Pole - 6 A electromechanical relay interface modules, 6.2 mm wide.

Ideal interface for PLC and electronic systems

- Sensitive DC coil or AC/DC coil versions
- Integral coil indication and protection circuit
- Instant ejection of relay using plastic retaining clip
- UL Listing (certain relay/socket combinations)
- 35 mm rail (EN 60715) mounting

38.51/38.51.3
Screw terminal

38.61/38.61.3
Screwless terminal



* Special version for max ambient temperature +70 °C.

** Maximum ambient temperature limitations apply in the case of adjacent mounting of modules, where the coil is energised with a duty cycle of $\geq 50\%$ or where the ON time exceeds 1 hour:
+55 °C: applies to groups limited to 2 adjacent modules and where each group is separated by an air gap ≥ 6.2 mm.
+30 °C: applies to a group of more than 2 adjacent modules.

For outline drawing see page 13

Contact specification

Contact configuration

1 CO (SPDT)

1 CO (SPDT)

Rated current/
Maximum peak current

A

6/10

6/10

Rated voltage/
Maximum switching voltage

V AC

250/400

250/400

Rated load AC1

VA

1500

1500

Rated load AC15 (230 V AC)

VA

300

300

Single phase motor rating (230 V AC)

kW

0.185

0.185

Breaking capacity DC1: 30/110/220 V

A

6/0.2/0.12

6/0.2/0.12

Minimum switching load

mW (V/mA)

500 (12/10)

500 (12/10)

Standard contact material

AgNi

AgNi

Coil specification

Nominal voltage (U_N)

V AC/DC

12 - 24 - 48 - 60 - (110...125) - (220...240)**

(110...125)

—

V AC

(230...240)*

—

(230...240)

V DC

6 - 12 - 24 - 48 - 60 (non polarized)

—

—

Rated power AC/DC

VA (50 Hz)/W

See page 9

1/1

0.5/—

Operating range

AC/DC

(0.8...1.1) U_N

(94...138)V

—

AC

(184...264)V

—

(184...264)V

DC

(0.8...1.2) U_N

—

—

Holding voltage

AC/DC

0.6 U_N / 0.6 U_N

0.6 U_N / 0.6 U_N

Must drop-out voltage

AC/DC

0.1 U_N / 0.05 U_N

44 V

72 V

Technical data

Mechanical life AC/DC

cycles

10 · 10⁶

10 · 10⁶

Electrical life at rated load AC1

cycles

60 · 10³

60 · 10³

Operate/release time

ms

5/6

5/6

Insulation between coil and contacts (1.2/50 μ s)

kV

6 (8 mm)

6 (8 mm)

Dielectric strength between open contacts

V AC

1000

1000

Ambient temperature range ($U_N \leq 60$ V / > 60 V)

°C

-40...+70/-40...+55

-/-40...+55

Protection category

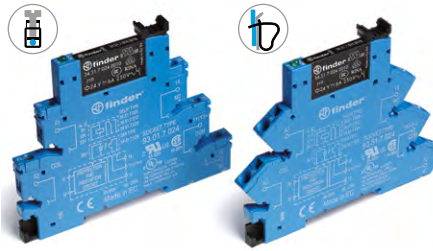
IP 20

IP 20

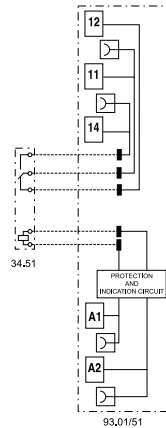
Approvals relay (according to type)



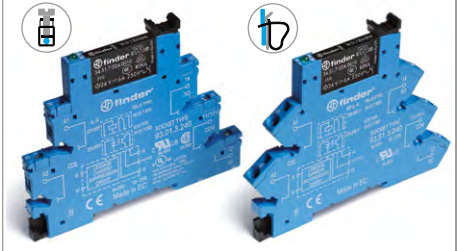
38.51/61



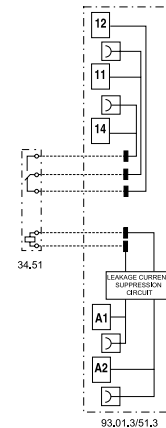
- 1 pole electromechanical relay
- Screw terminal and screwless terminal
- 35 mm rail (EN 60715) mounting



38.51.3/38.61.3



- Leakage current suppression
- 1 pole electromechanical relay
- Screw terminal and screwless terminal
- 35 mm rail (EN 60715) mounting

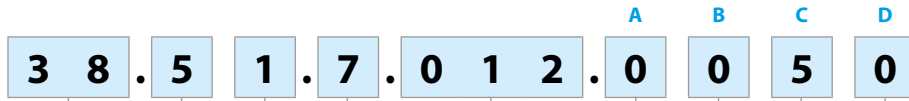


Ordering information

Electromechanical relay - 1 or 2 Pole

Example: 38 series screw terminal relay interface module, 1 CO (SPDT), sensitive 12 V DC coil.

B



Series

Type

- 0 = Electromechanical 16 A relay, with screw terminal
- 1 = Electromechanical 16 A relay, with screwless terminal
- 2 = Timer multifunction (AI, DI, GI, SW), with screw terminal
- 5 = Electromechanical relay, with screw terminal
- 6 = Electromechanical relay, with screwless terminal

No. of poles

- 1 = 1 pole, 6 or 16 A
- 2 = 2 pole, 8 A

Coil version

- 0 = AC (50/60 Hz)/DC
- 3 = Leakage current suppression for (110...125)V AC/DC - (230...240)V AC
- 7 = Sensitive DC, (6, 12, 24, 48, 60)V only
- 8 = AC (50/60 Hz)

Coil voltage

See coil specifications

D: Special versions

0 = Standard

C: Options

- 5 = Standard DC
- 6 = Standard AC or AC/DC

B: Contact circuit

0 = CO (nPDT)

A: Contact material

- 0 = AgNi Standard
- 4 = AgSnO₂
- 5 = AgNi + Au

Selecting features and options: only combinations in the same row are possible.

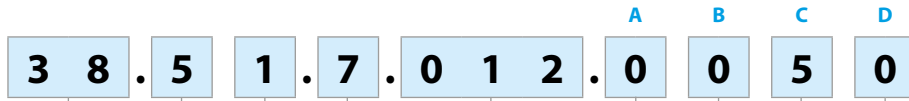
Type	Coil version	A	B	C	D
38.01/11	7	0 - 4	0	5	0
38.01/11	0 - 8	0 - 4	0	6	0
38.51/61	7	0 - 4 - 5	0	5	0
38.51/61	0 - 3 - 8	0 - 4 - 5	0	6	0
38.52/62	7	0 - 5	0	5	0
38.52/62	0 - 8	0 - 5	0	6	0
38.21	0	0	0	6	0

Ordering information

Electromechanical relay - 1 or 2 Pole

Example: 38 series screw terminal relay interface module, 1 CO (SPDT), sensitive 12 V DC coil.

B



Series

Type

- 0 = Electromechanical 16 A relay, with screw terminal
- 1 = Electromechanical 16 A relay, with screwless terminal
- 2 = Timer multifunction (AI, DI, GI, SW), with screw terminal
- 5 = Electromechanical relay, with screw terminal
- 6 = Electromechanical relay, with screwless terminal

No. of poles

- 1 = 1 pole, 6 or 16 A
- 2 = 2 pole, 8 A

Coil version

- 0 = AC (50/60 Hz)/DC
- 3 = Leakage current suppression for (110...125)V AC/DC - (230...240)V AC
- 7 = Sensitive DC, (6, 12, 24, 48, 60)V only
- 8 = AC (50/60 Hz)

Coil voltage

See coil specifications

D: Special versions

0 = Standard

C: Options

- 5 = Standard DC
- 6 = Standard AC or AC/DC

B: Contact circuit

0 = CO (nPDT)

A: Contact material

- 0 = AgNi Standard
- 4 = AgSnO₂
- 5 = AgNi + Au

Selecting features and options: only combinations in the same row are possible.

Type	Coil version	A	B	C	D
38.01/11	7	0 - 4	0	5	0
38.01/11	0 - 8	0 - 4	0	6	0
38.51/61	7	0 - 4 - 5	0	5	0
38.51/61	0 - 3 - 8	0 - 4 - 5	0	6	0
38.52/62	7	0 - 5	0	5	0
38.52/62	0 - 8	0 - 5	0	6	0
38.21	0	0	0	6	0

Technical data - 1 & 2 Pole Electromechanical Relays

Insulation

Insulation according to EN 61810-1	insulation rated voltage	V	250	400
	rated impulse withstand voltage	kV	4	4
	pollution degree		3	2
	overvoltage category		III	III
Insulation between coil and contacts (1.2/50 μs)		kV	6 (8 mm)	
Dielectric strength between open contacts		V AC	1000	



Insulation between coil terminals

Rated impulse voltage (surge) differential mode (according to EN 61000-4-5)	kV (1.2/50 μs)	2
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Other data

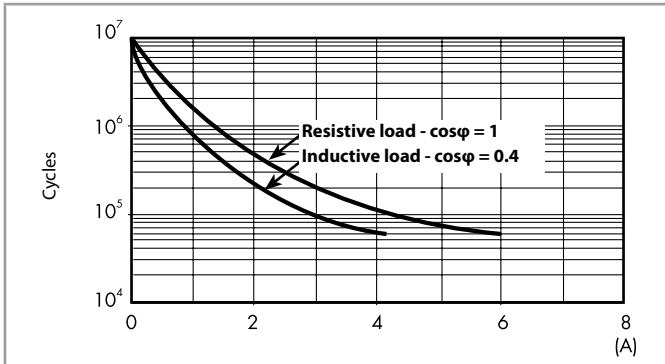
		1 Pole 6 A	1 Pole 16 A - 2 Pole 8 A
Bounce time: NO/NC	ms	1/6	2/5
Vibration resistance (10...55)Hz: NO/NC	g	10/5	15/2
Power lost to the environment	without contact current	W	0.2 (12 V) - 0.9 (240 V)
	with rated current	W	0.5 (12 V) - 1.5 (240 V)
		38.21 / 38.51	38.61

Terminals

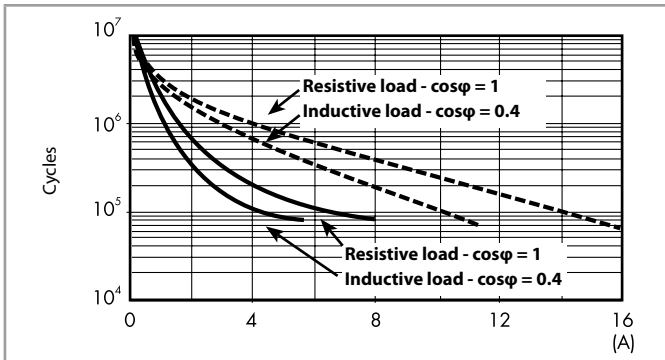
Wire strip length	mm	10	10		
 Screw torque	Nm	0.5	—		
Max. wire size		solid cable	stranded cable	solid cable	stranded cable
	mm ²	1 x 2.5 / 2 x 1.5	1 x 2.5 / 2 x 1.5	1 x 2.5	1 x 2.5
	AWG	1 x 14 / 2 x 16	1 x 14 / 2 x 16	1 x 14	1 x 14
		38.01 / 38.52	38.11 / 38.62		
Wire strip length	mm	10	10		
 Screw torque	Nm	0.5	—		
Max. wire size		solid cable	stranded cable	solid cable	stranded cable
	mm ²	1 x 2.5 / 2 x 1.5	1 x 2.5 / 2 x 1.5	1 x 2.5	1 x 2.5
	AWG	1 x 14 / 2 x 16	1 x 14 / 2 x 16	1 x 14	1 x 14

Contact specification - 1 & 2 Pole Electromagnetic Relays

F 38 - Electrical life (AC) v contact current, 1 Pole 6 A

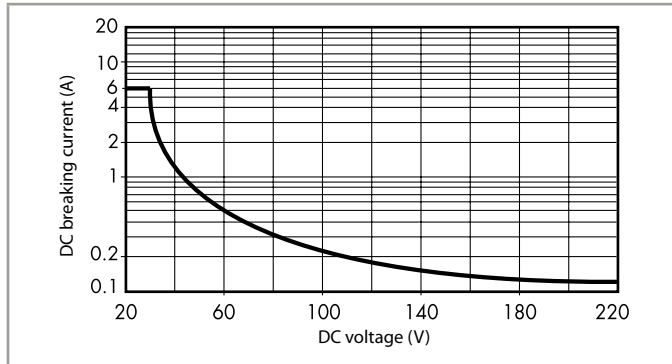


F 38 - Electrical life (AC) v contact current, 1 Pole 16 A and 2 Pole 8 A

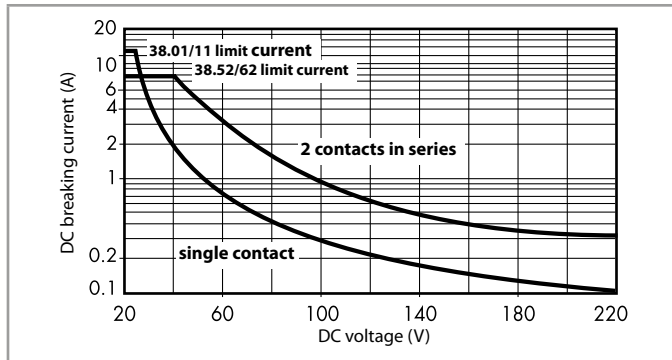


————— : 2 Pole 8 A
————— : 1 Pole 16 A

H 38 - Maximum DC1 breaking capacity, 1 Pole 6 A



H 38 - Maximum DC1 breaking capacity, 1 Pole 16 A and 2 Pole 8 A



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of $\geq 60 \cdot 10^3$ (1 Pole) or $\geq 80 \cdot 10^3$ (2 Pole) can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load. Note: the release time for the load will be increased.

Coil specifications - 1 Pole 6 A Electromechanical Relay

Coil data sensitive DC, 1 Pole

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	W
6	7.006	4.8	7.2	35	0.2
12	7.012	9.6	14.4	15.2	0.2
24	7.024	19.2	28.8	10.4	0.3
48	7.048	38.4	57.6	6.3	0.3
60	7.060	48	72	7	0.4

Coil data AC/DC, 1 Pole

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	VA/W
12	0.012	9.6	13.2	16	0.2/0.2
24	0.024	19.2	26.4	12	0.3/0.2
48	0.048	38.4	52.8	6.9	0.3/0.3
60	0.060	48	66	7	0.5/0.5
110...125	0.125	88	138	5(*)	0.6/0.6(*)
220...240	0.240	176	264	4(*)	1/0.9(*)

(*) Rated coil consumption and power consumption values relate to $U_N = 125$ and 240 V.

Coil data AC, 1 Pole (indicated for max ambient temperature +70 °C)

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	VA/W
(230...240) AC	8.240	184	264	3	0.7/0.3

Coil data, leakage current suppression types, 1 Pole

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	VA/W
(110...125) AC/DC	3.125	94	138	8(*)	1/1(*)
(230...240) AC	3.240	184	264	7(*)	1.7/0.5(*)

(*) Rated coil consumption and power consumption values relate to $U_N = 125$ and 240 V.

The 38 Series interface modules (supply version 3) have built-in leakage current suppression to address industry concerns of the contacts not dropping-out when there is residual current in the circuit; at (110...125)V AC and (230...240)V AC.

This problem can occur, for example, when connecting the interface modules to PLCs with triac outputs or when connecting via relatively long cables.

Coil specifications - 1 Pole 16 A and 2 Pole 8 A Electromechanical Relay

Coil data sensitive DC, 1 Pole 16 A and 2 Pole 8 A

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	W
12	7.012	9.6	14.4	41	0.5
24	7.024	19.2	28.8	19.5	0.5
60	7.060	48	72	8	0.5

Coil data AC/DC, 1 Pole 16 A and 2 Pole 8 A

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	W
24	0.024	19.2	26.4	20	0.5/0.5
60	0.060	48	66	7.1	0.5/0.5
110...125	0.125	88	138	4.6	0.6/0.6
220...240	0.240	184	264	3.8	0.9/0.9

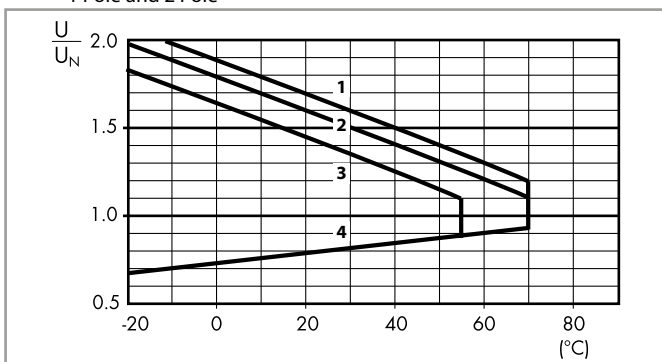
Coil data AC, 1 Pole 16 A and 2 Pole 8 A

Nominal voltage U_N	Coil code	Operating range		Rated coil consumption I at U_N	Power consumption P at U_N
		U_{min}	U_{max}		
V		V	V	mA	VA/W
230...240	8.230	184	264	5.3	1.2/0.6

Coil specification - 1 & 2 Pole Electromagnetic Relays

R 38 - DC coil operating range v ambient temperature

1 Pole and 2 Pole

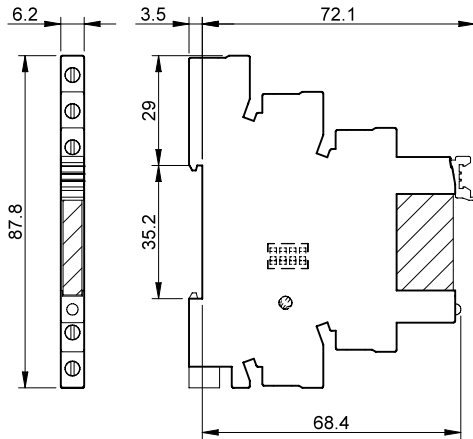


III-2020, www.findernet.com

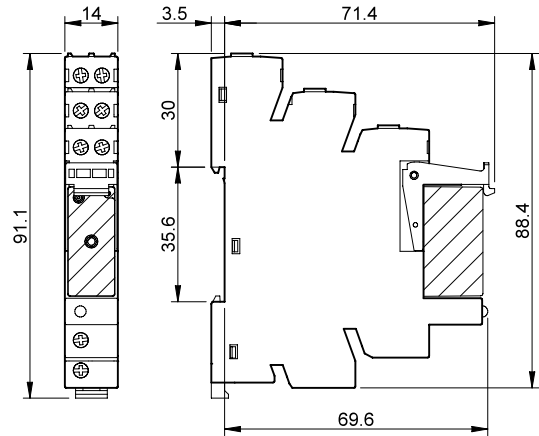
- 1 - Max. permitted coil voltage at nominal load (DC coil).
- 2 - Max. permitted coil voltage at nominal load (AC/DC coils $U \leq 60$ V).
- 3 - Max. permitted coil voltage at nominal load (AC/DC coils $U > 60$ V).
- 4 - Min pick-up voltage with coil at ambient temperature.

Outline drawings

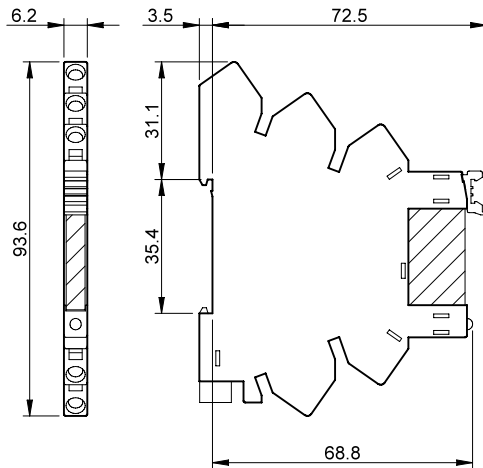
Types 38.21
38.51 / 38.51.3
38.81 / 38.81.3
Screw terminal



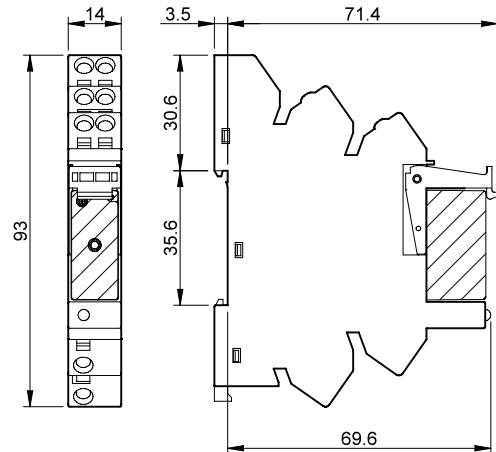
Types 38.01
38.31
38.52
Screw terminal



Types 38.61 / 38.61.3
38.91 / 38.91.3
Screwless terminal



Types 38.11
38.41
38.62
Screwless terminal

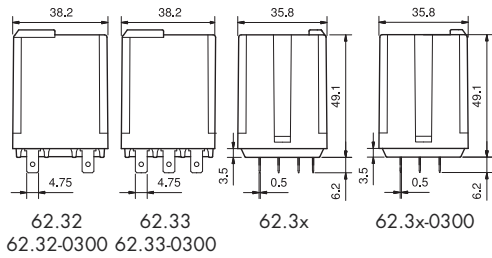


B

Features

**Plug-in mount/Faston 187
16 A Power relay**

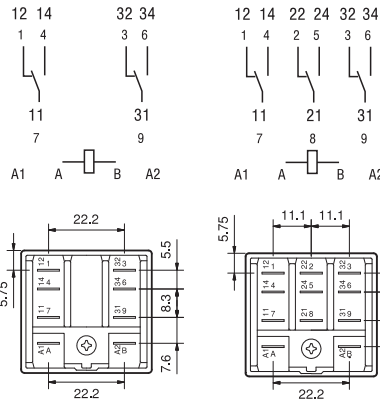
- Plug-in (92 series sockets) or Faston 187 (4.8x0.5 mm) with optional mounting adaptors
- 2 & 3 Pole changeover contacts or NO (≥ 3 mm contact gap)
- AC coils & DC coils
- UL Listing (certain relay/socket combinations)
- LED, mechanical indicator & test button options
- Reinforced insulation between coil and contacts according to EN 60335-1, with 6 mm clearance & 8 mm creepage distance
- SELV coil-contact separator option
- Cadmium Free contact material options
- Sockets and accessories
- European Patent



62.32 / 62.33



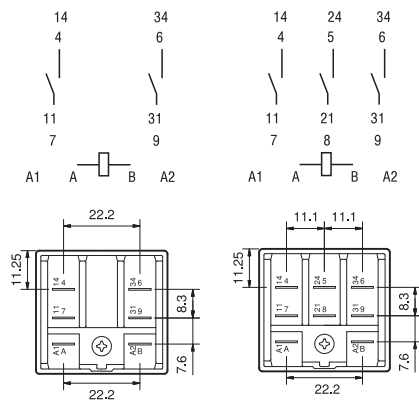
- 2 & 3 pole changeover contact
- Plug-in / Faston 187



62.32-0300 / 62.33-0300



- 2 & 3 pole normally open contact (≥ 3 mm contact gap)
- Plug-in / Faston 187



* Distance between contacts ≥ 3 mm (EN 60730-1).
** With the AgSnO₂ material the maximum peak current is 120 A - 5 ms (NO contact).

FOR UL RATINGS SEE:
"General technical information" page V

Contact specification

Contact configuration	2 CO (DPDT)	3 CO (3PDT)	2 NO (DPST-NO), ≥ 3 mm* 3 NO (3PST-NO), ≥ 3 mm*
Rated current/Maximum peak current	A	16/30**	16/30**
Rated voltage/Maximum switching voltage V AC		250/400	250/400
Rated load AC1	VA	4,000	4,000
Rated load AC15 (230 V AC)	VA	750	750
Motor rating (230/400 V AC)	kW	0.8/—	0.8/— 0.8/1.5
Breaking capacity DC1: 30/110/220 V	A	16/0.6/0.4	16/1.1/0.7
Minimum switching load	mW (V/mA)	1,000 (10/10)	1,000 (10/10)
Standard contact material		AgCdO	AgCdO

Coil specification

Nominal voltage (U _N)	V AC (50/60 Hz)	6 - 12 - 24 - 48 - 60 - 110 - 120 - 230 - 240 - 400
	V DC	6 - 12 - 24 - 48 - 60 - 110 - 125 - 220
Rated power AC/DC	VA (50 Hz)/W	2.2/1.3 3/3
Operating range	AC	(0.8...1.1)U _N
	DC	(0.8...1.1)U _N
Holding voltage	AC/DC	0.8 U _N /0.6 U _N
Must drop-out voltage	AC/DC	0.2 U _N /0.1 U _N

Technical data

Mechanical life AC/DC	cycles	10 · 10 ⁶ /30 · 10 ⁶	10 · 10 ⁶ /30 · 10 ⁶
Electrical life at rated load AC1	cycles	100 · 10 ³	100 · 10 ³
Operate/release time	ms	11/4	15/3
Insulation between coil and contacts (1.2/50 μs)	kV	6	6
Dielectric strength between open contacts	V AC	1,500	2,500
Ambient temperature range	°C	-40...+70	-40...+50
Environmental protection		RT I	RT I

Approvals (according to type)



Ordering information

Example: 62 series power relay + Faston 250 (6.3x0.8 mm), rear flange mount, 2 NO (DPST-NO), 12 V DC coil.

6	2	.	8	.	2	.	9	.	0	1	2	.	0	A	B	C	D	0
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

Series ———

Type
 2 = PCB
 3 = Plug-in
 8 = Faston 250 (6.3x0.8 mm) with rear flange mount

No. of poles
 2 = 2 pole
 3 = 3 pole

Coil version
 8 = AC (50/60 Hz)
 9 = DC

Coil voltage
 See coil specifications

A: Contact material
 0 = Standard AgCdO
 4 = AgSnO₂

B: Contact circuit
 0 = CO (nPDT)
 3 = NO (nPST), ≥ 3 mm contact gap
 5 = CO (nPDT) + additional physical separator between coil and contacts (for SELV applications)
 6 = NO (nPST), ≥ 3 mm contact gap + additional physical separator between coil and contacts (for SELV applications)

D: Special versions
 0 = Standard
 6 = Rear flange mount
 9 = Type 62.82/83 without rear flange mount

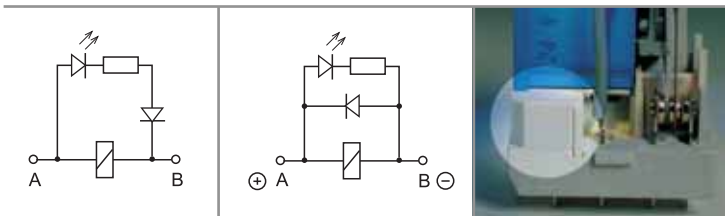
C: Options
 0 = None
 2 = Mechanical indicator
 3 = LED (AC)
 4 = Lockable test button + mechanical indicator
 5* = Lockable test button + LED (AC)
 54* = Lockable test button + LED (AC) + mechanical indicator
 6* = LED + diode (DC, polarity positive to pin A/A1)
 7* = Lockable test button + LED + diode (DC, polarity positive to pin A/A1)
 74* = Lockable test button + LED + diode (DC, polarity positive to pin A/A1) + mechanical indicator

Selecting features and options: only combinations in the same row are possible.
 Preferred selections for best availability are shown in **bold**.

Type	Coil version	A	B	C	D
62.22/23	AC-DC	0 - 4	0 - 3 - 5 - 6	0	0
62.32/33	AC-DC	0 - 4	0 - 3 - 5 - 6	0	0 - 6
	AC-DC	0 - 4	0 - 5	2 - 4	0 - 6
	AC	0 - 4	0	2 - 3 - 4 - 5	0 - 6
	AC	0 - 4	0 - 3	3	0 - 6
	AC	0 - 4	0	54	/
	DC	0 - 4	0	4 - 6 - 7	0 - 6
	DC	0 - 4	0 - 3	6	0 - 6
	DC	0 - 4	0	74	/
62.82/83	AC-DC	0 - 4	0 - 3 - 5 - 6	0	0 - 9
	AC-DC	0 - 4	0 - 5	2 - 4	0
	AC	0 - 4	0	2 - 3 - 4 - 5	0
	AC	0 - 4	0 - 3	3	0
	DC	0 - 4	0	4 - 6 - 7	0
	DC	0 - 4	0 - 3	6	0

* Options not available for 220 V DC and 400 V AC versions.

Descriptions: Options and Special versions



C: Option 3, 5, 54
LED (AC)

C: Option 6, 7, 74
LED + diode (DC, polarity positive to pin A/A1)

B: Contact circuit 5, 6
Additional physical separator between coil and contacts (for SELV applications)



Lockable test button and mechanical flag indicator (0040, 0050, 0054, 0070, 0074)

The dual-purpose Finder test button can be used in two ways:

Case 1) The plastic pip (located directly above the test button) remains intact. In this case, when the test button is pushed, the contacts operate. When the test button is released the contacts return to their former state.

Case 2) The plastic pip is broken-off (using an appropriate cutting tool). In this case, (in addition to the above function), when the test button is pushed and rotated, the contacts are latched in the operating state, and remain so until the test button is rotated back to its former position. In both cases ensure that the test button actuation is swift and decisive.

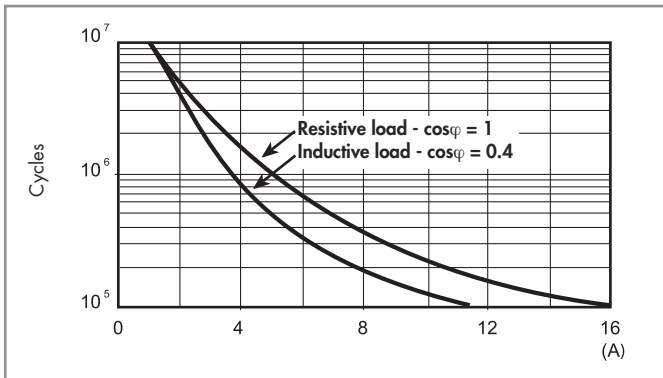


Technical data

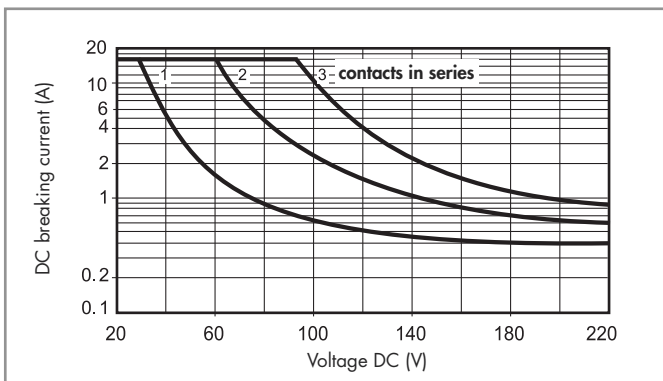
Insulation according to EN 61810-1						
		2 CO - 3 CO		2 NO - 3 NO		
Nominal voltage of supply system	V AC	230/400		230/400		
Rated insulation voltage	V AC	400		400		
Pollution degree		3		3		
Insulation between coil and contact set						
Type of insulation		Reinforced		Reinforced		
Overvoltage category		III		III		
Rated impulse voltage	kV (1.2/50 µs)	6		6		
Dielectric strength	V AC	4,000		4,000		
Insulation between adjacent contacts						
Type of insulation		Basic		Basic		
Overvoltage category		III		III		
Rated impulse voltage	kV (1.2/50 µs)	4		4		
Dielectric strength	V AC	2,500		2,500		
Insulation between open contacts						
Type of disconnection		Micro-disconnection		Full-disconnection		
Overvoltage category		—		III		
Rated impulse voltage	kV (1.2/50 µs)	—		4		
Dielectric strength	V AC/kV (1.2/50 µs)	1,500/2		2,500/4		
Conducted disturbance immunity						
Burst (5...50)ns, 5 kHz, on A1 - A2		EN 61000-4-4		level 4 (4 kV)		
Surge (1.2/50 µs) on A1 - A2 (differential mode)		EN 61000-4-5		level 4 (4 kV)		
Other data						
Bounce time: NO/NC	ms	1/5 (changeover)		3/— (normally open)		
Vibration resistance (10...150)Hz: NO/NC	g	20/8				
Shock resistance	g	15				
Power lost to the environment		2 pole (CO)	3 pole (CO)	2 pole (NO)	3 pole (NO)	
	without contact current	W	1.3	1.3	3	3
	with rated current	W	3.3	4.3	5	6
Recommended distance between relays mounted on PCB	mm	≥ 5				

Contact specification

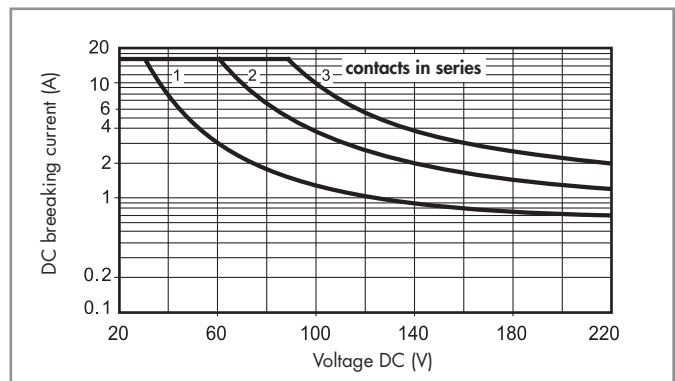
F 62 - Electrical life (AC) v contact current



H 62 - Maximum DC1 breaking capacity
Changeover contacts



H 62 - Maximum DC1 breaking capacity
Normally open contacts



- When switching a resistive load (DC1) having voltage and current values under the curve, an electrical life of $\geq 100 \cdot 10^3$ can be expected.
- In the case of DC13 loads, the connection of a diode in parallel with the load will permit a similar electrical life as for a DC1 load.
Note: the release time of the load will be increased.

Coil specifications

DC version data

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min} V	U_{max} V		
6	9.006	4.8	6.6	28	214
12	9.012	9.6	13.2	110	109
24	9.024	19.2	26.4	445	54
48	9.048	38.4	52.8	1,770	27
60	9.060	48	66	2,760	21.7
110	9.110	88	121	9,420	11.7
125	9.125	100	138	12,000	10.4
220	9.220	176	242	37,300	5.8

AC version data

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N (50Hz) mA
		U_{min} V	U_{max} V		
6	8.006	4.8	6.6	4.6	367
12	8.012	9.6	13.2	19	183
24	8.024	19.2	26.4	74	90
48	8.048	38.4	52.8	290	47
60	8.060	48	66	450	37
110	8.110	88	121	1,600	20
120	8.120	96	132	1,940	18.6
230	8.230	184	253	7,250	10.5
240	8.240	192	264	8,500	9.2
400	8.400	320	440	19,800	6

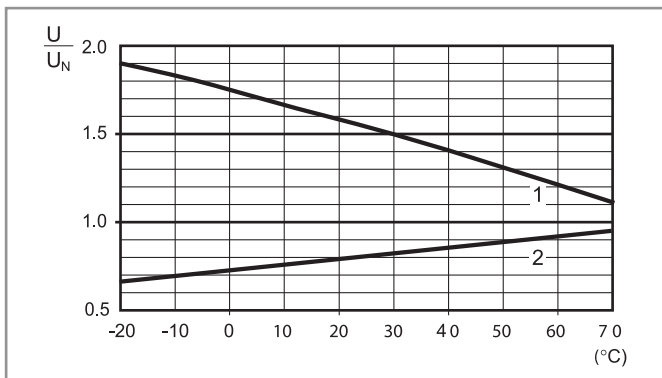
DC (NO/nPST-NO) version data - ≥ 3 mm

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N mA
		U_{min} V	U_{max} V		
6	9.006	5.1	6.6	12	500
12	9.012	10.2	13.2	48	250
24	9.024	20.4	26.4	192	125
48	9.048	40.8	52.8	770	63
60	9.060	51	66	1,200	50
110	9.110	93.5	121	4,200	26
125	9.125	106	138	5,200	24
220	9.220	187	242	17,600	12.5

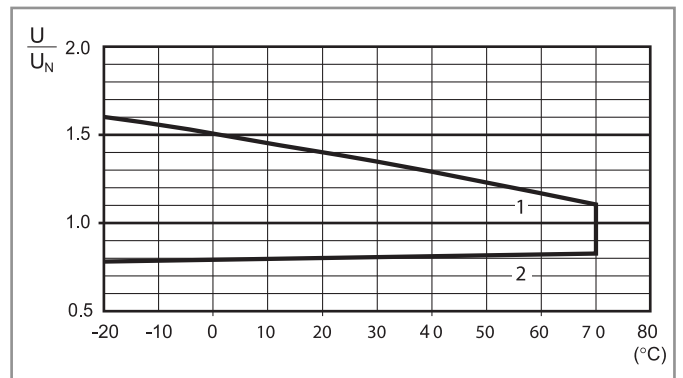
AC (NO/nPST-NO) version data - ≥ 3 mm

Nominal voltage U_N V	Coil code	Operating range		Resistance R Ω	Rated coil consumption I at U_N (50Hz) mA
		U_{min} V	U_{max} V		
6	8.006	5.1	6.6	4	540
12	8.012	10.2	13.2	14	275
24	8.024	20.4	26.4	62	130
48	8.048	40.8	52.8	220	70
60	8.060	51	66	348	55
110	8.110	93.5	121	1,200	30
120	8.120	106	137	1,350	24
230	8.230	196	253	5,000	14
240	8.240	204	264	6,300	12.5
400	8.400	340	440	14,700	7.8

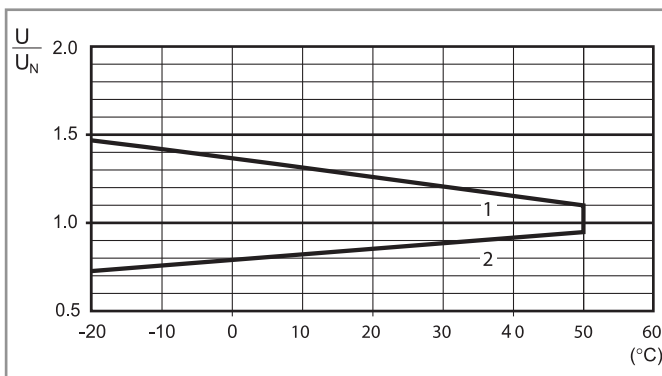
R 62 - DC coil operating range v ambient temperature
Changeover contacts



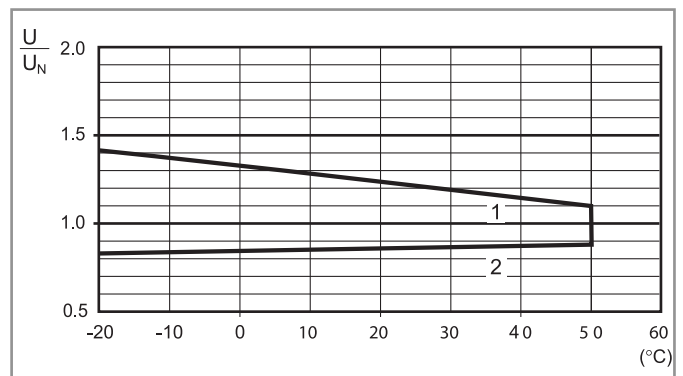
R 62 - AC coil operating range v ambient temperature
Changeover contacts



R 62 - DC coil operating range v ambient temperature
Normally open contacts



R 62 - AC coil operating range v ambient temperature
Normally open contacts

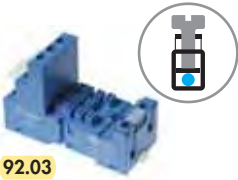


1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.

1 - Max. permitted coil voltage.
2 - Min. pick-up voltage with coil at ambient temperature.



92 Series - Sockets and accessories for 62 series relays



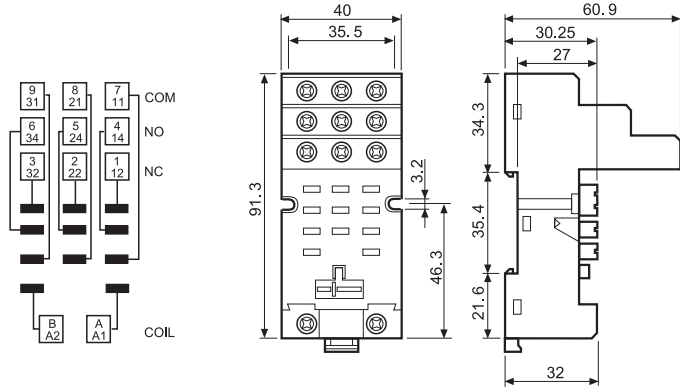
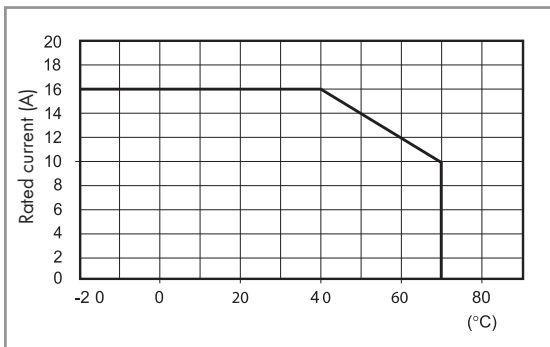
92.03

Approvals (according to type):



Screw terminal (Box clamp) socket panel or 35 mm rail (EN 60715) mount For relay type	92.03 Blue	92.03.0 Black	
Accessories			
Metal retaining clip (supplied with socket - packaging code SMA)		092.71	
Identification tag		092.00.2	
Modules (see table below)		99.02	
Timer modules (see table below)		86.00, 86.30	
Technical data			
Rated values	16 A - 250 V		
Dielectric strength	6 kV (1.2/50 µs) between coil and contacts		
Protection category	IP 20		
Ambient temperature	°C -40...+70 (see diagram L92)		
Screw torque	Nm	0.8	
Wire strip length	mm	10	
Max. wire size for 92.03 socket	solid wire	stranded wire	
	mm ²	1x10 / 2x4	1x6 / 2x4
	AWG	1x8 / 2x12	1x10 / 2x12

L 92 - Rated current vs ambient temperature



86.00



86.30

86 series timer modules		
Multi-voltage: (12...240)V AC/DC;		
Multi-functions: AI, DI, SW, BE, CE, DE, EE, FE; (0.05s...100h)		86.00.0.240.0000
(12...24)V AC/DC; Bi-function: AI, DI; (0.05s...100h)		86.30.0.024.0000
(110...125)V AC; Bi-function: AI, DI; (0.05s...100h)		86.30.8.120.0000
(230...240)V AC; Bi-function: AI, DI; (0.05s...100h)		86.30.8.240.0000

Approvals (according to type):



99.02

Approvals (according to type):



99.02 coil indication and EMC suppression modules for 92.03 socket		
Diode (+A1, standard polarity)	(6...220)V DC	99.02.3.000.00
LED	(6...24)V DC/AC	99.02.0.024.59
LED	(28...60)V DC/AC	99.02.0.060.59
LED	(110...240)V DC/AC	99.02.0.230.59
LED + Diode (+A1, standard polarity)	(6...24)V DC	99.02.9.024.99
LED + Diode (+A1, standard polarity)	(28...60)V DC	99.02.9.060.99
LED + Diode (+A1, standard polarity)	(110...220)V DC	99.02.9.220.99
LED + Varistor	(6...24)V DC/AC	99.02.0.024.98
LED + Varistor	(28...60)V DC/AC	99.02.0.060.98
LED + Varistor	(110...240)V DC/AC	99.02.0.230.98
RC circuit	(6...24)V DC/AC	99.02.0.024.09
RC circuit	(28...60)V DC/AC	99.02.0.060.09
RC circuit	(110...240)V DC/AC	99.02.0.230.09
Residual current by-pass	(110...240)V AC	99.02.8.230.07

DC Modules with non-standard polarity (+A2) on request.



CWB Series Contactors

Overview

Developed according to IEC 60947 and UL 508 international standards, the new WEG CWB line of contactors meets the requirements of a wide range of industrial applications. The CWBs are designed with the visual pattern and identity of WEG, a brand recognized worldwide for its quality.

Features

- "Zero-width" mechanical interlock
- Simple and compact mounting of surge suppressor blocks
- Available with AC or DC coils
- Simple and organized control circuits
- Additional contact blocks
- Easy access power and control terminals



[CWB9-11-30D15](#)



[CWB25-11-30D15](#)



[CWB80-11-30D15](#)



UL File No. E202315



[CWB9-11-30C03](#)



[CWB25-11-30C03](#)



[CWB80-11-30C03](#)

CWB Contactor Catalog Number Sequence

CWB	12	-	11	-	30	D15
Contactor Series <i>CWB-IEC</i>	Current Rating (IEC) 9: 9A 12: 12A 18: 18A 25: 25A 32: 32A 38: 38A 40: 40A 50: 50A 65: 65A 80: 80A		Auxiliary Contacts 11: 1NO+1NC		Power Poles 30: 3 NO Power Poles	Voltage Code AC Voltage: D15: 120V V24: 208-240V D39: 480V DC Voltage: C03: 24V

Table intended as reference only and not to create part numbers.



CWB Series Contactors

WEG CWB Series Three-Pole Contactors – AC Coil – Selection Guide

Part Number	Coil Voltage (VAC)	Ie Max (Ue ≤ 440V) AC-3 (A)	Maximum UL Horsepower							Built-In Auxiliary Contacts Per Contactor				Dimensional Drawing
			Single-Phase		Three-Phase					N.O.		N.C.		
			115V	230V	200V	230V	480V	575V						
CWB9-11-30D15	120	9	0.75	1.5	3	3	5	7.5	1	1			PDF	
CWB9-11-30V24	208-240												PDF	
CWB9-11-30D39	480												PDF	
CWB12-11-30D15	120	12	0.75	2	3	3	7.5	10	1	1			PDF	
CWB12-11-30V24	208-240												PDF	
CWB12-11-30D39	480												PDF	
CWB18-11-30D15	120	18	1	3	5	5	10	15	1	1			PDF	
CWB18-11-30V24	208-240												PDF	
CWB18-11-30D39	480												PDF	
CWB25-11-30D15	120	25	2	5	7.5	7.5	15	15	1	1			PDF	
CWB25-11-30V24	208-240												PDF	
CWB25-11-30D39	480												PDF	
CWB32-11-30D15	120	32	3	5	10	10	20	25	1	1			PDF	
CWB32-11-30V24	208-240												PDF	
CWB32-11-30D39	480												PDF	
CWB38-11-30D15	120	38	3	7.5	10	10	25	25	1	1			PDF	
CWB38-11-30V24	208-240												PDF	
CWB38-11-30D39	480												PDF	
CWB40-11-30D15	120	40	3	7.5	10	15	30	30	1	1			PDF	
CWB40-11-30V24	208-240												PDF	
CWB40-11-30D39	480												PDF	
CWB50-11-30D15	120	50	3	10	15	15	40	40	1	1			PDF	
CWB50-11-30V24	208-240												PDF	
CWB50-11-30D39	480												PDF	
CWB65-11-30D15	120	65	5	10	20	20	50	50	1	1			PDF	
CWB65-11-30V24	208-240												PDF	
CWB65-11-30D39	480												PDF	
CWB80-11-30D15	120	80	7.5	15	20	25	50	60	1	1			PDF	
CWB80-11-30V24	208-240												PDF	
CWB80-11-30D39	480												PDF	

WEG CWB Series Three-Pole Contactors – DC Coil – Selection Guide

Part Number	Coil Voltage (VDC)	Ie Max (Ue ≤ 440V) AC-3 (A)	Maximum UL Horsepower							Built-In Auxiliary Contacts Per Contactor				Dimensional Drawing
			Single-Phase		Three-Phase					N.O.		N.C.		
			115V	230V	200V	230V	480V	575V						
CWB9-11-30C03	24	9	0.75	1.5	3	3	5	7.5	1	1			PDF	
CWB12-11-30C03		12	0.75	2	3	3	7.5	10	1	1			PDF	
CWB18-11-30C03		18	1	3	5	5	10	15	1	1			PDF	
CWB25-11-30C03		25	2	5	7.5	7.5	15	15	1	1			PDF	
CWB32-11-30C03		32	3	5	10	10	20	25	1	1			PDF	
CWB38-11-30C03		38	3	7.5	10	10	25	25	1	1			PDF	
CWB40-11-30C03		40	3	7.5	10	15	30	30	1	1			PDF	
CWB50-11-30C03		50	3	10	15	15	40	40	1	1			PDF	
CWB65-11-30C03		65	5	10	20	20	50	50	1	1			PDF	
CWB80-11-30C03		80	7.5	15	20	25	50	60	1	1			PDF	



CWB Series Contactors Accessories



BFB-11



BLB-11



BFB-20



BFB-22



BFB-40



BFB-04

WEG CWB Series Contactors Accessories – Front Mounted Auxiliary Contact Blocks Selection Guide

Part Number	For Use With	Max. number of additional contacts/contactor	Auxiliary contacts		Weight g [oz]	Dimensional Drawing
			NO	NC		
BFB-11	CWB9 through CWB80	4	1	1	63 [2.22]	PDF
BFB-20			2	0	63 [2.22]	PDF
BFB-22			2	2	63 [2.22]	PDF
BFB-40			4	0	63 [2.22]	PDF
BFB-04			0	4	63 [2.22]	PDF

NOTES: The maximum number of auxiliary contacts assembled on the contactor is 4.

WEG CWB Series Contactors Accessories – Side Mounted Auxiliary Contact Blocks Selection Guide

Part Number	For Use With	Max. Number of Additional Contacts/Contactor	Auxiliary Contacts		Weight g [oz]	Dimensional Drawing
			NO	NC		
BLB-11	CWB9 through CWB80	4	1	1	34 [1.20]	PDF

NOTE: The maximum number of auxiliary contacts assembled on the contactor is 4.

WEG CWB Series Contactors Accessories – Plug-In Surge Suppressors Selection Guide

Part Number	For Use With	Voltage	Diagram	Weight g [oz]	Dimensional Drawing
VRB-E34	CWB9 through CWB80	50-127 VAC 50/60 Hz 60-180 VDC		8 [0.28]	PDF
VRB-E50		130-250 VAC 50/60 Hz 180-300 VDC		8 [0.28]	PDF
VRB-D73		400-510 VAC 50/60 Hz		8 [0.28]	PDF
DIB-C33		12-600 VDC		8 [0.28]	PDF



DIB-C33



VRB-E34



CWB Series Contactors

Terminal Markings According to IEC/EN 60947				
Diagram	Configuration	Auxiliary Contacts		Reference Code
		NO	NC	
3-Pole Contactors With Built-In Auxiliary Contacts				
	11	1	1	CWB9-11-30 CWB12-11-30 CWB18-11-30 CWB25-11-30 CWB32-11-30 CWB38-11-30 CWB40-11-30 CWB50-11-30 CWB65-11-30 CWB80-11-30
Front Mounted Auxiliary Contact Blocks				
	20	2	0	BFB-20
	11	1	1	BFB-11
	40	4	0	BFB-40
	22	2	2	BFB-22
	04	0	4	BFB-04
Side Mounted Auxiliary Contact Block				
	11	1	1	BLB-11



CWB Series Contactors

WEG CWB Series Contactors Specifications – General Specifications

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Compliance		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U (Pollution Degree 3)	IEC/EN 60947-4-1	690V						1000V			
	UL, CSA	600V									
Rated Impulse-Withstand Voltage U_{imp}	IEC/EN 60947-1	6kV									
Frequency Limits		25-400 Hz									
Mechanical Lifespan	AC Coil (million cycles)	10						6			
	DC Coil (million cycles)	10						6			
Electrical Lifespan	I_e AC-3 (million cycles)	2.0	2.0	1.8	1.6	1.6	1.2	1.6	1.6	1.6	1.2
Degree of protection (IEC/EN 60529)	Main Terminals	IP10 (front)									
	Coil and Auxiliary Contacts	IP20 (front)									
Mounting		With screws or DIN 35mm rail (EN 50022)									
Coil Connection Points	Contactors With AC Coil	2									
	Contactors With DC Coil	2									
Vibration resistance (IEC/EN 60068-2-6)	Open Contactor	4g									
	Closed Contactor	4g									
Resistance to mechanical shocks (½ sine wave=11ms - IEC/EN 60068-2-27)	Open Contactor	10g									
	Closed Contactor	15g									
Ambient Temperature	Operating	-25°C to +55°C [-13°F to +131°F]									
	Storage	-55°C to +80°C [-67°F to +176°F]									
Maximum Operation Altitude Without Modification of Rated Values¹		3000m [9843ft]									

¹ For altitudes of 3000-4000 m [9843-13123 ft] (0.90 x I_e and 0.80 x U_i) and 4000-5000 m [13123-16404 ft] (0.80 x I_e and 0.75 x U_i).

WEG CWB Series Contactors Specifications – Control Circuit (AC)

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Compliance		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U (Pollution Degree 3)	IEC/EN 60947-4-1	690V						1000V			
	UL, CSA	600V						600V			
Standard Voltages at 50/60 Hz		12 to 600 V						24 to 600 V			
Coil Operating Limits		0.8 to 1.1 μs						0.8 to 1.1 μs			
Coil 50/60 Hz	Pick Up	0.5 to 0.8 μs						0.5 to 0.8 μs			
	Drop Out	0.2 to 0.6 μs						0.2 to 0.6 μs			
Average Consumption (50Hz/60Hz)	Magnetic Circuit Closed	9 / 7.5 VA						27 / 17.2 VA			
	Power Factor Switching On (cos φ)	0.8 / 0.7						0.56 / 0.55			
	Power Factor Switched On (cos φ)	0.24 / 0.27						0.25 / 0.28			
	Thermal Power Dissipation	5-7 / 5-7 W						3.7-6.3 / 3.7-6.3 W			
	Closing the Magnetic Circuit	90 / 75 VA						202 / 185 VA			
Operation Average Time of NO Contacts (Closing/Opening)		15 to 25 ms / 8 to 12 ms						10 to 15 ms / 8 to 12 ms			

WEG CWB Series Contactors Specifications – Control Circuit (DC)

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Compliance		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 508									
Rated Insulation Voltage U (Pollution Degree 3)	IEC/EN 60947-4-1	690V						1000V			
	UL, CSA	600V						600V			
Standard Voltages		12 to 500 V						12 to 500 V			
Coil Operating Limits		0.8 to 1.1 μs						0.8 to 1.1 μs			
	Pick Up	0.5 to 0.8 μs						0.5 to 0.8 μs			
	Drop Out	0.1 to 0.4 μs						0.1 to 0.4 μs			
Average Consumption (50Hz/60Hz)		1.0x use the coil cold						1.0x use the coil cold			
	Magnetic Circuit Closed	5.8 W						14.5 W			
	Closing the Magnetic Circuit	5.8 W						105W			
Operation Average Time of NO Contacts (Closing/Opening)		35 to 45 ms / 8 to 12 ms						20 to 30 ms / 4 to 8 ms			
Thermal Power Dissipation		5 to 7 W						12 to 16 W			



CWB Series Contactors

WEG CWB Series Contactors Specifications – Main Contacts													
			CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80	
Rated operational current I_e	AC-3 ($U_e \leq 440$ V)	A	9	12	18	25	32	38	40	50	65	80	
	AC-4 ($U_e \leq 440$ V)	A	4.4	5.8	8.5	10.4	13.7	13.7	18.5	18.5	26	32	
	AC-1 ($\theta \leq 55$ °C, $U_e \leq 690$ V)	A	25	25	32	40	50	50	60	90	110	110	
Rated operational voltage U_e	IEC/EN 60947-4-1	V	690V						1000V				
	UL, CSA	V	600V										
Conventional thermal current I_{th} ($\theta \leq 55$ °C)		A	25	25	32	40	50	50	60	90	110	110	
Making capacity – IEC/EN 60947		A	250	250	300	450	550	550	550	1000	1000	1000	
Breaking capacity – IEC/EN 60947	$U_e \leq 400$ V)	A	250	250	300	450	550	550	550	1000	1000	1000	
	$U_e = 500$ V)	A	220	220	250	350	450	450	480	880	880	880	
	$U_e = 690$ V)	A	150	150	180	250	350	350	350	640	640	640	
Acceptable short-time current (no current flowing during recovery time of 15min and $\theta \leq 40$ °C)	1s	A	210	210	240	380	400	430	720	820	900	900	
	10s	A	105	105	145	240	260	310	320	400	520	640	
	1min	A	60	60	80	120	130	150	165	230	340	360	
	10min	A	30	30	40	50	60	60	85	110	130	130	
Short circuit protection of the main contacts Fuse (RK5)	@600 V - UL/CSA	kA	5										
	Coordination type 1	A	25	40	50	63	63	63	80	100	125	160	
	Coordination type 2	A	20	20	25	35	50	50	63	80	100	125	
Impedance per pole		mΩ	2.5	2.5	2.5	2	2	2	1.6	1.6	1.6	1.6	
Average power dissipation per pole	AC-1	W	1.5	1.5	2.5	3.2	5	5	6	13	19	19	
	AC-3	W	0.2	0.4	0.8	1.2	2	3	3	4	7	10	
Utilization category AC-3													
Rated operational current I_e ($\theta \leq 55$ °C)	$U_e \leq 440$ V	A	9	12	18	25	32	38	40	50	65	80	
	$U_e \leq 500$ V	A	9	12	15.8	23	28.5	28.5	35	45	55	75	
	$U_e \leq 690$ V	A	7	9	12.8	16.5	21	21	32	35	40	50	
Orientative rated operational power Three-phase induction motors (50/60 Hz) IV poles - 1,800 rpm	220/240 V	kW	2.2	3	4.5	6.5	7.5	9.2	11	15	18.5	22	
		hp	3	4	6	8.7	10	12.5	15	20	25	29	
	380/400 V	kW	4	5.5	7.5	12.5	15	18.5	18.5	22	30	37	
		hp	5.5	7.5	10	16.8	20	25	25	29	40	50	
	415/440 V	kW	4.5	6.5	9.2	12.5	15	18.5	22	30	37	45	
		hp	6	8.7	12.5	16.8	20	25	29	40	50	60	
	500V	kW	5.5	7.5	10	15	18.5	18.5	22	30	37	55	
		hp	7.5	10	13.4	20	25	25	29	40	50	74	
	660/690 V	kW	5.5	7.5	11	15	18.5	18.5	30	33	37	45	
		hp	7.5	10	15	20	25	25	40	44	50	60	
	Maximum percentage	600 ops/h	%	100	100	100	100	100	100	100	100	100	100
	Utilization category AC-4												
Rated operational current I_e	($U_e \leq 440$ V)	A	4.4	5.8	8.5	10.4	13.7	13.7	18.5	18.5	26	32	
	($U_e \leq 500$ V)	A	3.9	5.1	7.5	12	13.9	13.9	17.5	23.5	28.5	33	
	($U_e \leq 690$ V)	A	2.8	3.7	5.4	12	12.8	12.8	14	18	22	26	
Orientative rated operational power Three-phase induction motors (50/60 Hz) IV poles - 1,800 rpm (200,000 operations)	220/240 V	kW	1.5	1.5	2.2	3	4	4	4.5	5.5	7.5	11	
		hp	2.0	2.0	2.9	4.0	5.4	5.4	6.0	7.4	10.1	14.7	
	380/400 V	kW	2.2	3.7	4	5.5	7.5	7.5	9.2	11	15	18.5	
		hp	2.9	5.0	5.4	7.4	10.1	10.1	12.3	14.7	20.1	24.8	
	415/440 V	kW	2.2	3	3.7	5.5	7.5	7.5	11	11	15	22	
		hp	2.9	4.0	5.0	7.4	10.1	10.1	14.7	14.7	20.1	29.5	
	500V	kW	2.2	3	5	7.5	9	9	11	15	18.5	22	
		hp	2.9	4.0	6.7	10.1	12.1	12.1	14.7	20.1	24.8	29.5	
	660/690 V	kW	2.2	3	5	10	11	11	12.5	15	20	25	
		hp	2.9	4.0	6.7	13.4	14.7	14.7	16.8	20.1	26.8	33.5	



CWB Series Contactors

WEG CWB Series Contactors Specifications – Main Contacts

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80		
<i>Utilization category AC-1 (3P NO)</i>													
Conventional thermal current I_{th} ($\theta \leq 55^\circ\text{C}$)		A	25	25	32	40	50	50	60	90	110	110	
Maximum orientative operational current according to ambient temperature		$\theta \leq 60^\circ\text{C } U_e \leq 690\text{V}$	A	25	25	32	40	50	50	60	90	110	110
Max Operational Power $\theta \leq 55^\circ\text{C}$ (Three-Phase Resistors)	220/230 V	kW	9.5	9.5	12	15	19	19	22.5	34	42	42	
	380/400 V	kW	16.5	16.5	21	26	33	33	39.5	59	72.5	72.5	
	415/440 V	kW	19	19	24.5	30.5	38	38	45.5	68.5	84	84	
	500V	kW	21.5	21.5	27.5	34.5	43	43	52	77	95	95	
	660/690 V	kW	28.5	28.5	36.5	45.5	57	57	66	100	125	125	
Current Values for Connection	2 poles in parallel		$I_e \times 1.7$										
	3 poles in parallel		$I_e \times 2.4$										
	4 poles in parallel		-										
Percentage of maximum operational current	600 ops/h	%	100	100	100	100	100	100	100	100	100	100	

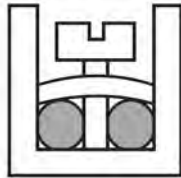
WEG CWB Series Contactors Specifications – Auxiliary Contacts

		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
<i>Utilization category AC-1 (3P NO)</i>											
Compliance		60947-5-1	IEC/EN								
Rated Insulation Voltage U_j (Pollution Degree 3)	IEC/EN 60947-4-1, VDE 0660	V	690								
	UL, CSA	V	600								
Rated Operational Voltage U_e	IEC/EN 60947-4-1, VDE 0660	V	690								
	UL, CSA	V	600								
Conventional Thermal Current I_{th} ($\theta \leq 55^\circ\text{C}$)		A	10								
Rated Operational Current I_e											
AC-15 (IEC/EN 60947-5-1)	220/230 V	A	10								
	380/400 V	A	4								
	500V	A	2.5								
	660/690 V	A	1.5								
DC-13 (IEC/EN 60947-5-1)	24V	A	4								
	48V	A	2								
	110V	A	0.7								
	220V	A	0.3								
	440V	A	0.15								
Making Capacity	$U_e \leq 690\text{V}$ 50/60 Hz – AC-15	A	10 x I_e								
Breaking Capacity	$U_e \leq 400\text{V}$ 50/60 Hz – AC-15	A	1 x I_e								
Short Circuit Protection With Fuse (RK5)		A	10								
Control Circuit Reliability		V/mA	17 / 5								
Electrical Lifespan	Million cycles		1								
Mechanical Lifespan	Million cycles		10								
Non-Overlapping Time Between NO and NC Contacts		ms	1.5								
Impedance of Contacts		m Ω	2.5								

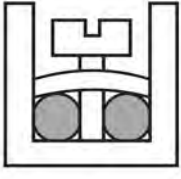


CWB Series Contactors

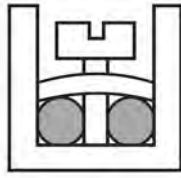
WEG CWB Series Contactors Specifications – Terminal Capacity and Tightening Torque

		<i>Power Circuit</i>									
		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Mounting System Screw Type		Phillips Number 2			Phillips Number 2			Allen (4mm)			
Flexible Conductor Without Terminal	AWG				1 x 16-10 2 x 16-10		1 x 16-10 2 x 16-10		1 x 14-3 2 x 14-3		
Flexible Conductor With Terminal	AWG				1 x 16-10 2 x 16-12		1 x 16-8 2 x 16-10		1 x 14-3 2 x 14-3		
Solid Wire	AWG				1 x 16-10 2 x 16-10		1 x 14-18 2 x 14-18		1 x 14-3 2 x 14-3		
Tightening Torque	N•m [lb•ft]				1.7 [1.25]		2.5 [1.84]		5.0 [3.69]		

Control and Auxiliary Circuit – Terminal Capacity and Tightening Torque

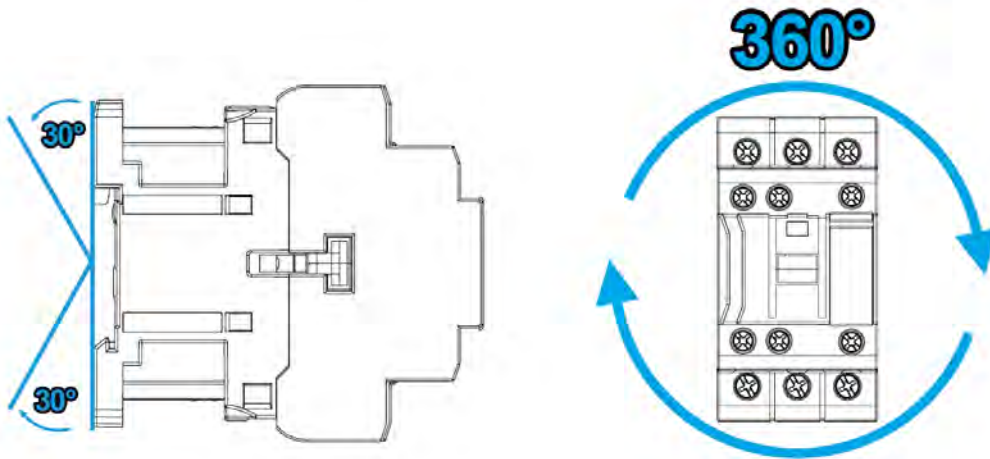
		CWB9	CWB12	CWB18	CWB25	CWB32	CWB38	CWB40	CWB50	CWB65	CWB80
Mounting System Screw Type		Phillips Number 2					Phillips Number 2				
Flexible Conductor Without Terminal	AWG						1 x 16-12 2 x 16-12		1 x 16-12 2 x 16-12		
Flexible Conductor With Terminal	AWG						1 x 16-12 2 x 16-14		1 x 16-12 2 x 16-14		
Solid Wire	AWG						1 x 16-12 2 x 16-12		1 x 16-12 2 x 16-12		
Tightening Torque	N•m [lb•ft]						1.0 [0.74]		1.0 [0.74]		

Auxiliary Contact Blocks – Terminal Capacity and Tightening Torque

		<i>BFB (Front)</i>			<i>BLB (Side)</i>		
Mounting System Screw Type		Phillips Number 2					
Flexible Conductor Without Terminal	AWG						
Flexible Conductor With Terminal	AWG						
Solid Wire	AWG						
Tightening Torque	N•m [lb•ft]						

CWB Series Contactors

Mounting Position (CWB9 through CWB80)



ECX Series 22mm Metal Pilot Devices

Audible annunciator

- 80dB @ 10cm
- 25mA @ 24V
- Intermittent sound when energized
- IP20 before installation
- IP65 after installation



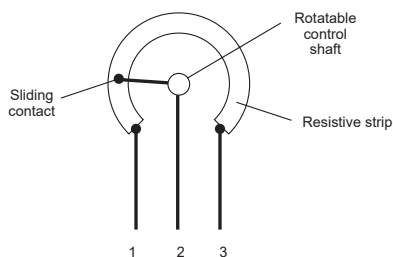
22mm Audible Annunciators				
Part Number	Color		Drawing Link	Description
ECX2070-24	Black		PDF	AutomationDirect audible alarm buzzer, piezoelectric, 80 dB at 10cm, 2.4 kHz tone frequency, pulse tone(s), 24 VAC/VDC, 22mm, panel mount, plastic housing, black, IP65.
ECX2070-127	Black		PDF	AutomationDirect audible alarm buzzer, piezoelectric, 80 dB at 10cm, 2.4 kHz tone frequency, pulse tone(s), 120 VAC/VDC, 22mm, panel mount, plastic housing, black, IP65.
ECX2071-24R	Red		PDF	AutomationDirect audible alarm buzzer, piezoelectric, 80 dB at 10cm, 2.8 kHz tone frequency, pulse tone(s), 24 VAC/VDC, permanent LED indicator(s), red, 22mm, panel mount, plastic housing, red, IP65.
ECX2071-127R	Red		PDF	AutomationDirect audible alarm buzzer, piezoelectric, 80 dB at 10cm, 2.8 kHz tone frequency, pulse tone(s), 120 VAC/VDC, permanent LED indicator(s), red, 22mm, panel mount, plastic housing, red, IP65.

22mm potentiometer

- IP65



22mm Potentiometers				
Part Number	Quantity		Drawing Link	Description
ECX2300-5K	1		PDF	22mm potentiometer with 5k Ω resistance, $\pm 10\%$. Nominal voltage: 250V. Rated dissipation: 2W at 25°C. Temperature range -40 to 70°C. Black handle. Connection type is screw terminal, 3-pole, 22-14 AWG.
ECX2300-10K	1		PDF	22mm potentiometer with 10k Ω resistance, $\pm 10\%$. Nominal voltage: 250V. Rated dissipation: 2W at 25°C. Temperature range -40 to 70°C. Black handle. Connection type is screw terminal, 3-pole, 22-14 AWG.
ECX2640	1		NA	22mm legend plate for potentiometer with 0% to 100% marking, 50mm square. 50 x 50 x 1mm with 24.5 mm cutout.



GCX Series 22mm Plastic Pilot Devices Specifications

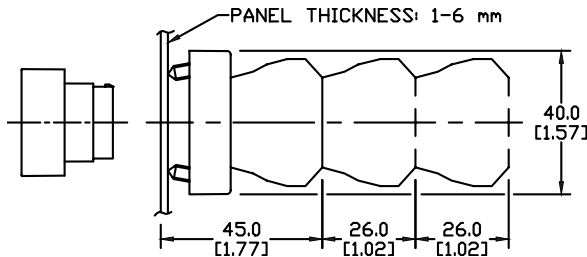
Assembly information

These pushbuttons and indicator lights are supplied with the appropriate contact blocks, unless otherwise indicated. Use these drawings as a guide to make sure there is adequate clearance behind the panel.

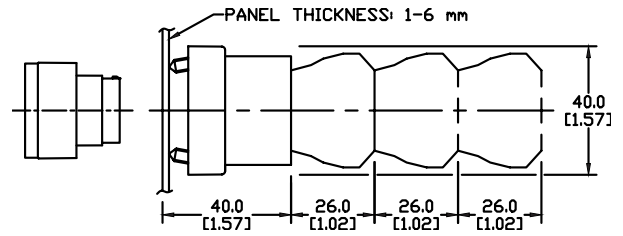
Dimensions

mm
[inches]

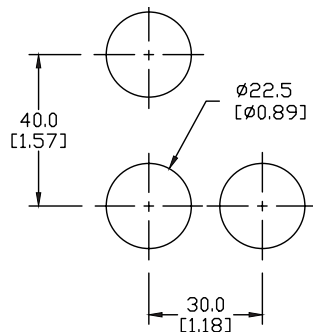
Pushbuttons and selector switches



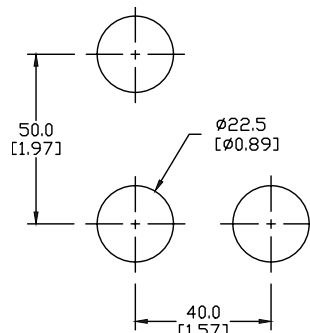
Illuminated pushbuttons and selector switches/indicator lights



Mounting



This layout is suitable if all switches are 230V or less and the same polarity.

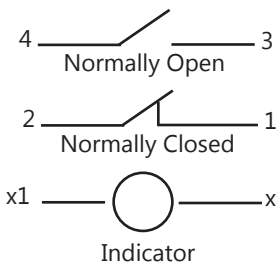


This layout is suitable if all switches are 400V or less and different polarity.

NOTE: Contact blocks can be arranged up to three deep by two wide.



Typical Wiring



Specifications

These specifications apply to all the GCX and ECX 22mm plastic pushbuttons and switches.

Physical Specifications		Electrical Specifications	
Standards Reference	CEI EN 60947-5-1, CSA C22-2 n.14	Rated Thermal Current (contact block)	A300, Q300 (Refer to E22 Series mounting/contact rating section for details)
Approvals	UL File E189258, IMQ (where specified)	Rated Insulation Voltage	Ui 660V according to CEI EN 60947-5-1, 300V according to CSA C22-2 n.14 and UL 508
Enclosure Material	Fiberglass reinforced thermoplastic	Dielectric Strength	3kV (1 second)
Contacts Material	Silver	Insulation Resistance	2MΩ min. (500VDC)
Protection Degree	IP40 for GCX3151-24, GCX3151-120, GCX3153-24 and GCX3153-120. IP65 for all others. (See Appendix of this catalog for explanation of IP ratings according to IEC 144 CEI 70-1.)	Initial Contact Resistance	≤ 25mΩ
Electric Shock Protection	IEC 536, Class II	Short-Circuit Protection*	Cartridge fuses gl 10 A-500V 10, 3x3811 100 KA
Temperature Ratings	Storage: -40 to 80°C (-40 to 176° F) Operating: -25° to +70°C (-13° to 158° F)	Terminal Markings	According to CENELEC EN 50013
Working Positions	All working positions are allowed	Connections	Single screw with non-loosening plate clamp, 14AWG max., Tighten to 0.8Nm max
Mechanical Life	Pushbuttons, selector switches, joy stick switches: 1,000,000 operations Emergency mushrooms and push-push pushbuttons: 300,000 operations	Contacts Operation	Self-cleaning types EN01 (N.C.) EN 10 (N.O.) slow-action, positive opening
Positive Opening Operation	(according to IEC 947-5-1) All functions incorporating an NC contact are positive opening operation	Operation Frequency	3600 operations per hour max.
		Utilization Category	AC15 (Control of AC electromagnetic loads) 24 volts AC at 10 amps 130 volts AC at 6.5 amps DC13 (Control of DC electromagnetic loads) 24 volts DC at 1.5 amps 110 volts DC at 0.5 amps

*Note: Recommended, not supplied

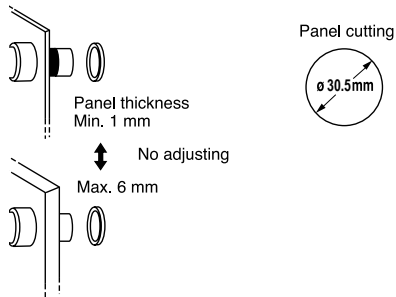
Fuji Electric 22mm Pilot Devices Overview

Pushbuttons, Selectors, Pilot Lights, Joysticks, Buzzers

Fuji Electric AR22 pilot devices can be mounted on panels up to 6mm thick by securing the operator with a locking nut from behind the panel without needing any adjustment.

Easy mounting

Fuji AR22 pilot devices can be mounted on panels between 1 and 6mm thick and are mountable in panel cutouts of 22.3 or 25.5 mm. The button and lens can be mounted on a panel while the operator is engaged.



Pushbuttons



AR22F0R-01RZA

Illuminated Pushbuttons



AR22F0L-10E3YZA

Pilot Lights



DR22E3L-E3SZA

E-Stop Pushbuttons



AR22V0R-01R

Selector Switches



AR22PR-210BZA

Buzzers



DR22B8-EB

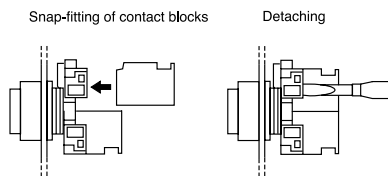
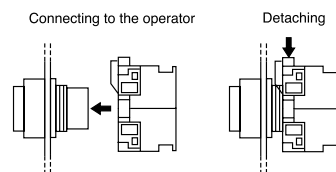
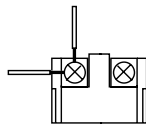
Quick contact block and transformer replacement

Fuji AR22 pilot devices have a snap-on mounting that makes replacing or adding a contact block and transformer unit easier.

Wiring

These pilot devices can be wired in both vertical and lateral directions making wiring in narrow spaces easier. Contact block color coding makes wiring even easier.

1N.O. Blue, 1N.C. Red
 Lamp terminal and transformer unit: black



Safety

AR22 pilot devices include terminal covers for added safety and security. Emergency stop pushbuttons include a trigger action mechanism that prevents the contacts from moving until the button is pushed and locked.

Protection

AR22 pilot devices feature oil and dust-tight operator construction (IP65), except for buzzers DR22B5 (IP00), DR22B8 (IP54).

Short depth

Fuji AR22 pilot devices are designed to occupy less space than traditional 22mm devices.





Command 22mm Emergency Stop Pushbuttons



AR22VQR-01R



AR22VPR-12R



AR22VQL-01E3R



AR22VQL-12EAR



Command 22mm Emergency Stop Pushbuttons										
Part Number	Drawing Link	Contacts	Operator	Voltage	Bulb type	Action	Legend	Protection	Material	
AR22VQR-01R	PDF	(1) N.C.	40.0 mm, mushroom, red	—	—	Push to lock, pull or turn to reset	Arrow	IP65	Base: Plastic Bezel: Plastic	
AR22VQR-12R	PDF	(1) N.O. / (2) N.C.								
AR22VPR-01R	PDF	(1) N.C.	65.0 mm, mushroom, red	—	—	Push to lock, pull or turn to reset	Arrow	IP65	Base: Plastic Bezel: Plastic	
AR22VPR-12R	PDF	(1) N.O. / (2) N.C.								
AR22VQL-01E3R	PDF	(1) N.C.	40.0 mm, mushroom, red	24 VAC/VDC full voltage	LED illuminated	Push to lock, pull or turn to reset	Arrow	IP65	Base: Plastic Bezel: Plastic	
AR22VQL-12E3R	PDF	(1) N.O. / (2) N.C.								Interlocked LED illuminated
AR22VQL-01EAR	PDF	(1) N.C.								
AR22VQL-12EAR	PDF	(1) N.O. / (2) N.C.								



AR22V0R-01R



AR22V7R-01R



AR22Q2R-01R



AR22V0L-01E3R

Command 22mm Emergency Stop Pushbuttons										
Part Number	Drawing Link	Contacts	Operator	Voltage	Bulb Type	Action	Legend	Protection	Material	
AR22V0R-01R	PDF	(1) N.C.	40.0 mm, mushroom red	—	—	Twist-to-release	Arrow	IP65	Base: Plastic Bezel: Plastic	
AR22V7R-01R	PDF	(1) N.C.				Key operated release	—			
AR22Q2R-01R	PDF	(1) N.C.	35.0 mm, mushroom, red	—	—	Push to lock, pull to reset	—			
AR22V0L-01E3R	PDF	(1) N.C.	40.0 mm, mushroom, red	24 VAC/VDC full voltage	LED illuminated	Twist-to-release	Arrow	IP65	Base: Plastic Bezel: Plastic	
AR22V0L-01L3R	PDF	(1) N.C.		115–127 VAC transformer						

Accessory

AR9P719-5A	PDF	Fuji Electric oversized legend plate, aluminum, round, yellow field, yellow background, black engraved text, legend plate marking "EMERGENCY STOP". For use with 22mm pilot devices.
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AR9P719-5A

Command Series 22mm Emergency Stop Pushbuttons Specifications

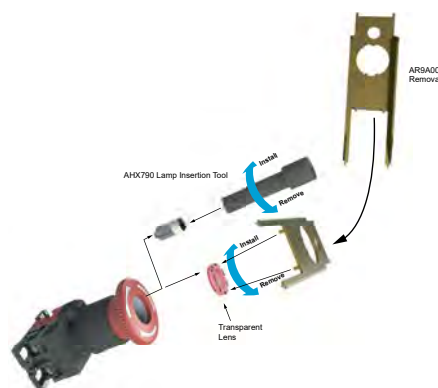
22mm Emergency Stop Pushbuttons Specifications (Indoor Use)		
Series	AR22 - V0R, V7R, Q2R, V0L	AR22 VQR, VPR, VQL
Rated thermal current (contact block)	A600 / P600	B300 / R300
Mechanical durability	See durability table	250,000 operations
Electrical durability	500,000 operations at 220 VAC 6A 1 million operations at 220 VAC 3A	100,000 operations
Operating frequency	1200 operations/hour (On-load factor: 40%)	900 operations/hour (On-load factor: 40%)
Operating force (Avg)	30-45N	Push to Lock: 40N, Pull to reset: 33N Turn to reset: 0.3 N·m
Positive opening operation	All functions incorporating a N.C. contact are positive-opening operation.	
Dielectric strength	2,500VAC, 1 minute (w/o transformer 2000VAC)	2000 VAC 1 min
Insulation resistance	100MΩ or more (500VDC megger)	
Rated impulse dielectric strength	6kV	2.5 kV
Conditional short-circuit current	1000A	1000A
Short-circuit protective device	Fuse 15A (recommended, not supplied)	Fuse 10A
Pollution degree	3	3
Vibration	Resonance: 10 to 55Hz, double amplitude 0.1 mm* Constant: 16.7 Hz, double amplitude 3mm	10 to 55Hz, double amplitude 0.7 mm/s ²
Shock	Malfunction durability: 100 m/s ² ** Mechanical durability: 500 m/s ²	Malfunction: 150m/s ² Durability: 1000 m/s ²
Ambient temperature (no condensation or no icing)	Non-illuminated -20 to +70°C [-4 to +158°F] Illuminated -20 to -50°C [-4 to -58°F]	Non-illuminated -20 to +60°C [-4 to 140°F] Illuminated -20 to +50°C [-4 to 122°F]
Temperature ratings	Storage: -40 to +80°C [-40 to +176°F]	
Humidity	45 to 85% RH (within -5° to +40°C)	
Degree of protection	IP65	
Initial contact resistance	≤ 50mΩ	≤ 50mΩ
Terminal markings	IEC 60445	
Connections	AWG 18 to 14; Stripping length: 8mm to 11mm Tightening torque: 0.8 to 1.0 N·m, 7.1 to 8.8 in·lb	Stranded wire: up to 1.25 mm ² , 24 to 16 AWG-CU Solid wire: up to ø1.2 mm, 24 to 16 AWG-CU Tightening torque: 1.0 to 1.5 N·m, 8.8 to 13.2 in·lb
Contacts operation	Self-cleaning types. Slow action. Positive opening.	
Operation frequency	1,200 cycle/hour (Application ratio 40%)	900 operations/hour (On-load factor: 40%)
Utilization category/ contact ratings	AC-15: 24VAC at 6A, 110VAC at 6A DC-13: 24VDC at 4A, 110VDC at 1.3 A	DC-13: 24VDC at 1A DC-12 24VDC at 2A
Rated insulation voltage	600 VAC/VDC***	250 VAC/VDC
Materials	Enclosure: Polyamide / Contacts: silver, nickel	
Standards	UL 508, CSA C22.2, No.14, TUV - EN60947-5-1	
Approvals	UL file E44592, CSA file LR20479	

* Emergency stop type: 10 to 500 Hz, double amplitude 0.7mm (acceleration 50m/s²), according to test condition of EN60947-5-5 (1998)

** Emergency stop type: 150 m/s²

***Illuminated type without transformer

To obtain the most current agency approval information, see the Agency Compliance & Certifications checklist section on the specific part number's web page.





Features & Options

- Etched Teflon Leadwires and Foamback Insulator
- Three Override Pushbutton Options
- Wide Selection of Temperature Sensing Elements
- Limited Lifetime Warranty

Wall Plates are ideal for areas where a discreet, rugged zone sensor is required. All Wall Plates feature ¼" closed cell foam backing which covers the plate and insulates it from wall temperature. All units also feature etched Teflon leadwires and double encapsulated sensors to create a watertight package that can perform in the real world.

Override

A momentary Override is available as a Keyswitch or three styles of Pushbutton — Standard and Low Profile. The Standard model features a small, momentary pushbutton. The Low Profile Model is water resistant for washdown/wipedown applications and is available with a green LED indicator.



Color and Finish Options

Wall Plates are available in aluminum or stainless steel with a metallic finish; however, many other color and finish options are available as special orders. Call BAPI for details.



Specifications

Material:

Aluminum or Stainless Steel

Sensing Element:

Thermistor or RTD

(See Sensors Sect. for Specs.)

Environmental Operation Range:

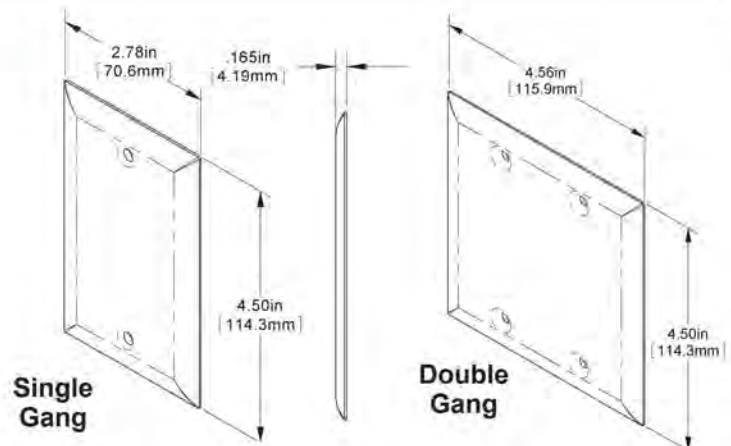
Temperature:

-40 °C to 100 °C

-20 °C to 70 °C with transmitter

Humidity:

0 to 95%, non-condensing



Associated Products

Spanner Security Screws & Spanner Bit

Spanner Security Screws and the Spanner Bit are available for any Stainless Steel Wall Plate Unit. For more info, see Accessories.





Use the Option Selection Guide below to create your custom part number. Replace the number and parenthesis with the designator for each selection. Skip the designator and dashes for optional selections that are not required in your configuration.



Wall Plate Option Selection Guide

BA/ (#1) - (#2) - (#3) - (#4)

#1: Temperature Sensor (required)

- 1K[375] 1K Platinum RTD (375 curve)
- 1K[Ni]..... 1K Ω Nickel RTD
- 1K 1K Platinum RTD (385 curve)
- 1.8K 1.8K Thermistor
- 3K 3K Thermistor
- 10K-2 10K-2 Thermistor
- 10K-3 10K-3 Thermistor
- 10K-3[11K]..... 10K-3[11K] Thermistor
- 20K 20K Thermistor

Transmitters for 4 to 20 mA Output

- T1K[32 TO 212F] 1K Plat. RTD Transmitter, 4 to 20 mA Output, 32 to 212°F Range
- T1K[20 TO 120F] 1K Plat. RTD Transmitter, 4 to 20 mA Output, 20 to 120°F Range
- T1K[0 TO 100F] 1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°F Rang
- T1K[0 TO 100C] 1K Plat. RTD Transmitter, 4 to 20 mA Output, 0 to 100°C Range
- T1K[-7 TO 49C] 1K Plat. RTD Transmitter, 4 to 20 mA Output, -7 to 49°C Range
- T1K[-18 TO 38C] 1K Plat. RTD Transmitter, 4 to 20 mA Output, -18 to 38°C Range

Matched Transmitters are also available. Contact your BAPI representative for ordering.

#2: Room Sensor Style (required)

- SP Stainless Steel Wall Plate
- AP Aluminum Wall Plate

#3: Override Pushbutton (optional)

- O Standard Pushbutton
- O2 Low Profile Pushbutton
- O2G24 Low Profile with Green LED

#4: Security Screws (optional)

- SEC1 Spanner Security Screws

Additional options, such as rotary setpoint adjustment and communication jacks, are available for these units but not shown in this Selection Guide. Contact your BAPI representative for the complete list of options. Submittal sheets without List Prices can be downloaded from our website at www.bapihvac.com

Example Number: BA/ (**10K-2**) - (**SP**) - (**O2G24**) - ()

Actual Number (with parenthesis removed): BA/10K-2-SP-O2G24

Description: 10K-2 Thermistor, Stainless Steel Wall Plate Sensor, Low Profile Pushbutton Override with Green LED

Your Number: BA/





Features & Options

- Low Profile Delta Style Enclosure
- Humidity Only or Temp./Humidity Combo
- Optional Display
- 2% and 3% RH Accuracies
- Optional Communications Jack
- User Adjustable Toggle Rate Between Temperature and Humidity
- Wide Selection of Temperature Sensing Elements
- Full-range Temperature Compensation of RH Signal
- Two Year Warranty



Delta Style Enclosures with and without Display

The Delta Style room units are available as Humidity Only sensors or as Combination temperature and humidity sensors. The Delta Style enclosure features an optional display with a user adjustable toggle rate between humidity and temperature and can display in either °C or °F.

The unit is available with the entire line of BAPI temperature sensors. If a temperature transmitter and humidity transmitter are desired, then see the "X-Combo" Unit on pages B12-13 of this section.

For detailed specs on the individual Sensors & Transmitters, turn to the "Sensors" section.

* All Passive Thermistors 10K Ω and smaller are CE compliant.

The BAPI-Guard

- Prevents Tampering and Unauthorized Adjustment
- Exceptional Airflow
- Available in Two Sizes



(See Accessories for more info.)

Specifications

Power: 10 to 35 VDC (0 to 5 VDC or 4 to 20 mA Outputs)
 15 to 40 VDC (0 to 10 VDC Output)
 12 to 24 VAC (0 to 5 VDC Output)
 15 to 28 VAC (0 to 10 VDC Output)

Note: If AC power is used, it must be shielded from the signal wiring

Power Consumption:

22 mA max. DC (0 to 5 VDC or 4 to 20 mA Outputs)
 6 mA max DC (0 to 10 VDC Output)
 0.53 VA max. AC (0 to 5 VDC Output)
 0.14 VA max. AC (0 to 10 VDC Output)

Sensing Elements:

Temperature - Thermistor, RTD or Semiconductor
 Humidity - Capacitive Type, ±2% or ±3% RH, 20 to 80% @ 25°C

RH Calb. Adjustment: ±5% POT

Wiring: 2 to 3 pair of 16 to 22 AWG**

Mounting: Standard 2"x4" J-box or drywall mount - screws provided

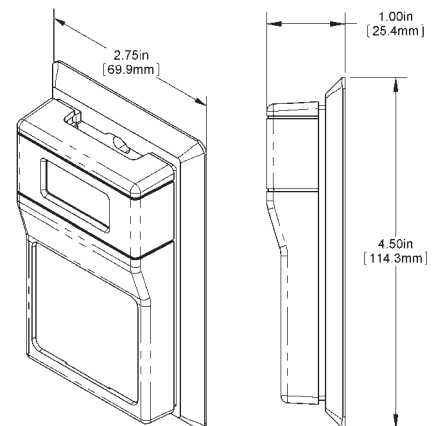
Environmental Operation Range:

Temperature: 32 to 122 °F (0 to 50 °C)
 Humidity: 5 to 95%, non-condensing

Material: ABS Plastic

Material Rating: UL94 HB

Agency: RoHS and CE* (for transmitters and select thermistors)



**BAPI recommends that you do not run wiring for the room units in the same conduit as line voltage wiring or with wiring used to supply highly inductive loads such as motors, generators and coils.





Delta Style Room Units

Item # 501

B15

Rev. 08/27/13

Humidity & Combination Temp/Humidity Sensors

Ordering Information		Delta Style Room Unit, Humidity only or Temp./Humidity Combo	
BA/			
Optional Temp. Sensor		Use the designator number, shown to the left in bold. Omit if ordering humidity only	
##-	THERMISTORS		
	1.8K	1.8K Ω @ 25 °C	100 100 Ω Platinum @ 0 °C, .385 Ω/°C temp. coeff.
	2.2K	2.2K Ω @ 25 °C	1K [375] 1K Ω Platinum @ 0 °C, 3.75 Ω/°C temp. coeff.
	3K	3K Ω @ 25 °C	1K[NI] 1K Ω Nickel @ 21°C, 5 Ω/°C temp. coeff.
	3.25K	3.25K Ω @ 25 °C (T30 type)	1K 1K Ω Platinum @ 0 °C, 3.85 Ω/°C temp. coeff.
	3.3K	3.3K Ω @ 25 °C	2K 2K Ω Silicon @ 20 °C, 8 Ω/°C temp. coeff.
	10K-2	10K Ω @ 25 °C	
	10K-3	10K Ω @ 25 °C	
	10K-3[11K]	5,238 Ω @ 25 °C	
	20K	20K Ω @ 25 °C	
	47K	47K Ω @ 25 °C	334 LM334 Semiconductor
	50K	50K Ω @ 25 °C	592 AD592 Semiconductor, 273 μA @ 0 °C
	100K	100K Ω @ 25 °C	
	RTDs		
	SEMICONDUCTORS		
TEMPERATURE TRANSMITTERS			
See X-Combo Unit on pages B12-13			
Humidity Transmitter		Must select one	
H200	±2% Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA*		
H210	±2% Humidity Transmitter with 0 to 10 V Output		
H300	±3% Humidity Transmitter with Interchangeable Output of 0 to 5 V or 4 to 20 mA*		
H310	±3% Humidity Transmitter with 0 to 10 V Output		
Delta Style Enclosure		Must select	
-R	Delta Style Room Enclosure		
		Optional LCD Display Omit if ordering a unit without display	
		D	LCD Display
		Optional Test & Balance Skip if not required	
		-TB	Three Position Switch - "Low" & "High" values vary, "Normal" is live sensor value. Call for details.
		Optional Comm. Jack Mounted in unit's base	
		-C35L	3.5 mm Phono Jack w/ Leads Attached
		-C35LT	3.5 mm Phono Jack w/ Leads & Terminal Block
		Optional Copla White Enclosure (Warm White is Standard)	
		-CPW	Copla White Enclosure Color
EXAMPLE			
BA/	10K-2	H200	-R D -C35L
Example Part Number: BA/10K-2-H200-RD-35L			
Your Part Number:			

*DC input voltage is required for current output.

See the "X-Combo" Unit on page B12-13 for more Temperature Transmitter & Humidity Transmitter combination options.

Call BAPI if you have questions about the above ordering grid or the configuration of the product you are ordering.



Feed-through terminal block - PT 2,5

3209510

Item # 400



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Feed-through terminal block, nom. voltage: 800 V, nominal current: 24 A, connection method: Push-in connection, 1 level, Rated cross section: 2.5 mm², cross section: 0.14 mm² - 4 mm², mounting type: NS 35/7,5, NS 35/15, color: gray

Your advantages

- The Push-in connection terminal blocks are characterized by the system features of the CLIPLINE complete system and by easy and tool-free wiring of conductors with ferrules or solid conductors
- The compact design and front connection enable wiring in a confined space
- In addition to the testing facility in the double function shaft, all terminal blocks provide an additional test connection
- Tested for railway applications

Technical Data

Product properties

Product type	Feed-through terminal block
Number of positions	1
Area of application	Railway industry
	Machine building
	Plant engineering
	Process industry
Number of connections	2
Number of rows	1
Potentials	1

Insulation characteristics

Overvoltage category	III
Degree of pollution	3

Electrical properties

Rated surge voltage	8 kV
Maximum power dissipation for nominal condition	0.77 W

Connection data

Number of connections per level	2
Nominal cross section	2.5 mm ²

1 level

Stripping length	8 mm ... 10 mm
Internal cylindrical gage	A3
Conductor cross section solid	0.14 mm ² ... 4 mm ²
Cross section AWG	26 ... 12
Conductor cross section flexible	0.14 mm ² ... 4 mm ²
Conductor cross section, flexible [AWG]	26 ... 14
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.14 mm ² ... 2.5 mm ²
Flexible conductor cross section (ferrule with plastic sleeve)	0.14 mm ² ... 2.5 mm ²
2 conductors with the same cross section, flexible, with TWIN ferrule with plastic sleeve	0.5 mm ²
Nominal current	24 A (at 2.5 mm ²)
Maximum load current	28 A (with 4 mm ² conductor cross section, rigid)
Nominal voltage	800 V
Nominal cross section	2.5 mm ²

1 level Connection cross sections directly pluggable

Conductor cross section solid	0.34 mm ² ... 4 mm ²
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.34 mm ² ... 2.5 mm ²

Feed-through terminal block - PT 2,5

3209510

Item # 400



Flexible conductor cross section (ferrule with plastic sleeve)	0.34 mm ² ... 2.5 mm ²
--	--

Ex data

Rated data (ATEX/IECEX)

ATEX certificate	PTB 09 ATEX 1111 U
IEC Ex certificate	IECEX PTB 10.0021 U
Identification	□ II 2 G Ex eb IIC Gb
Operating temperature range	-60 °C ... 110 °C
Ex-certified accessories	3030417 D-ST 2,5 3030721 ATP-ST 4 1204517 SZF 1-0,6X3,5 3022276 CLIPFIX 35-5 3022218 CLIPFIX 35
Bridge data	19 A / 2.5 mm ²
Ex temperature increase	40 K (19 A / 2.5 mm ²)
Rated voltage	550 V
for bridging with bridge	550 V
- At bridging between non-adjacent terminal blocks	352 V
- At cut-to-length bridging	220 V
- At cut-to-length bridging with cover	275 V
- At cut-to-length bridging with partition plate	550 V
Rated insulation voltage	500 V

Ex level General

Rated current	19 A
Maximum load current	23 A
Contact resistance	0.93 mΩ

Ex connection data General

Nominal cross section	2.5 mm ²
Rated cross section AWG	14
Connection capacity rigid	0.14 mm ² ... 4 mm ²
Connection capacity AWG	26 ... 12
Connection capacity flexible	0.14 mm ² ... 2.5 mm ²
Connection capacity AWG	26 ... 14

Dimensions

Width	5.2 mm
End cover width	2.2 mm
Height	35.3 mm
Height NS 35/15	44 mm
Height NS 35/7,5	36.5 mm
Height	1.437 "
Length	48.6 mm

Feed-through terminal block - PT 2,5

3209510

Item # 400



Material specifications

Color	gray
Flammability rating according to UL 94	V0
Insulating material group	I
Insulating material	PA
Static insulating material application in cold	-60 °C
Temperature index of insulation material (DIN EN 60216-1 (VDE 0304-21))	125 °C
Relative insulation material temperature index (Elec., UL 746 B)	130 °C
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3
Calorimetric heat release NFPA 130 (ASTM E 1354)	27,5 MJ/kg
Surface flammability NFPA 130 (ASTM E 162)	passed
Specific optical density of smoke NFPA 130 (ASTM E 662)	passed
Smoke gas toxicity NFPA 130 (SMP 800C)	passed

Electrical tests

Surge voltage test

Test voltage setpoint	9.8 kV
Result	Test passed

Temperature-rise test

Requirement temperature-rise test	Increase in temperature ≤ 45 K
Result	Test passed
	Test passed
Short-time withstand current 2.5 mm ²	0.3 kA
Short-time withstand current 4 mm ²	0.48 kA
Result	Test passed

Power-frequency withstand voltage

Test voltage setpoint	2 kV
Result	Test passed

Mechanical properties

Mechanical data

Open side panel	Yes
-----------------	-----

Mechanical tests

Mechanical strength

Result	Test passed
--------	-------------

Attachment on the carrier

Feed-through terminal block - PT 2,5

3209510

Item # 400



DIN rail/fixing support	NS 35/7.5
Test force setpoint	1 N
Result	Test passed

Test for conductor damage and slackening

Rotation speed	10 rpm
Revolutions	135
Conductor cross section/weight	0.14 mm ² / 0.2 kg
	2.5 mm ² / 0.7 kg
	4 mm ² / 0.9 kg
Result	Test passed

Environmental and real-life conditions

Aging

Temperature cycles	192
Result	Test passed

Needle-flame test

Time of exposure	30 s
Result	Test passed

Oscillation/broadband noise

Specification	DIN EN 50155 (VDE 0115-200):2018-05
Spectrum	Service life test category 2, bogie-mounted
Frequency	$f_1 = 5 \text{ Hz}$ to $f_2 = 250 \text{ Hz}$
ASD level	6.12 (m/s ²) ² /Hz
Acceleration	3.12g
Test duration per axis	5 h
Test directions	X-, Y- and Z-axis
Result	Test passed

Shocks

Specification	DIN EN 50155 (VDE 0115-200):2018-05
Pulse shape	Half-sine
Acceleration	30g
Shock duration	18 ms
Number of shocks per direction	3
Test directions	X-, Y- and Z-axis (pos. and neg.)
Result	Test passed

Ambient conditions

Ambient temperature (operation)	-60 °C ... 105 °C (max. short-term operating temperature RTI Elec.)
Ambient temperature (storage/transport)	-25 °C ... 60 °C (for a short time, not exceeding 24 h, -60 °C to +70 °C)
Ambient temperature (assembly)	-5 °C ... 70 °C

Feed-through terminal block - PT 2,5

3209510

Item # 400



Ambient temperature (actuation)	-5 °C ... 70 °C
Permissible humidity (storage/transport)	30 % ... 70 %

Standards and regulations

Connection in acc. with standard	IEC 60947-7-1
	IEC 60947-7-1

Mounting

Mounting type	NS 35/7,5
	NS 35/15

Ground modular terminal block - PT 2,5-PE

3209536

Item # 401



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Ground modular terminal block, number of connections: 2, connection method: Push-in connection, 1 level, cross section: 0.14 mm² - 4 mm², mounting type: NS 35/7,5, NS 35/15, color: green-yellow

Your advantages

- The Push-in connection terminal blocks are characterized by the system features of the CLIPLINE complete system and by easy and tool-free wiring of conductors with ferrules or solid conductors
- The compact design and front connection enable wiring in a confined space
- In addition to the testing facility in the double function shaft, all terminal blocks provide an additional test connection
- Tested for railway applications

Technical Data

Product properties

Product type	Ground terminal block
Area of application	Railway industry
	Machine building
	Plant engineering
	Process industry
Number of connections	2
Number of rows	1

Insulation characteristics

Overvoltage category	III
Degree of pollution	3

Electrical properties

Rated surge voltage	6 kV
Maximum power dissipation for nominal condition	0.77 W

Connection data

Grounding foot	Yes
Number of connections per level	2
Nominal cross section	2.5 mm ²

1 level

Note	Please observe the current carrying capacity of the DIN rails.
Stripping length	8 mm ... 10 mm
Internal cylindrical gage	A3
Conductor cross section solid	0.14 mm ² ... 4 mm ²
Cross section AWG	26 ... 12
Conductor cross section flexible	0.14 mm ² ... 4 mm ²
Conductor cross section, flexible [AWG]	26 ... 12
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.14 mm ² ... 2.5 mm ²
Flexible conductor cross section (ferrule with plastic sleeve)	0.14 mm ² ... 2.5 mm ²
Maximum load current	with 4 mm ² conductor cross section, rigid

1 level Connection cross sections directly pluggable

Conductor cross section solid	0.34 mm ² ... 4 mm ²
Flexible conductor cross section flexible (ferrule, w/o plastic sleeve)	0.34 mm ² ... 2.5 mm ²
Flexible conductor cross section (ferrule with plastic sleeve)	0.34 mm ² ... 2.5 mm ²

Ex data

Rated data (ATEX/IECEx)

ATEX certificate	PTB 09 ATEX 1111 U
IEC Ex certificate	IECEX PTB 10.0021 U
Identification	□ II 2 G Ex eb IIC Gb
Operating temperature range	-60 °C ... 110 °C
Ex-certified accessories	3030417 D-ST 2,5
	1204517 SZF 1-0,6X3,5
	3022276 CLIPFIX 35-5
	3022218 CLIPFIX 35

Ex connection data General

Nominal cross section	2.5 mm ²
Rated cross section AWG	14
Connection capacity rigid	0.14 mm ² ... 4 mm ²
Connection capacity AWG	26 ... 12
Connection capacity flexible	0.14 mm ² ... 2.5 mm ²
Connection capacity AWG	26 ... 14

Dimensions

Width	5.2 mm
End cover width	2.2 mm
Height	35.3 mm
Height NS 35/15	44 mm
Height NS 35/7,5	36.5 mm
Height	1.437 "
Length	48.5 mm

Material specifications

Color	green-yellow
Flammability rating according to UL 94	V0
Insulating material group	I
Insulating material	PA
Static insulating material application in cold	-60 °C
Temperature index of insulation material (DIN EN 60216-1 (VDE 0304-21))	125 °C
Relative insulation material temperature index (Elec., UL 746 B)	130 °C
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3
Calorimetric heat release NFPA 130 (ASTM E 1354)	27,5 MJ/kg
Surface flammability NFPA 130 (ASTM E 162)	passed
Specific optical density of smoke NFPA 130 (ASTM E 662)	passed
Smoke gas toxicity NFPA 130 (SMP 800C)	passed

Mechanical properties

Mechanical data

Open side panel	Yes
-----------------	-----

Environmental and real-life conditions

Oscillation/broadband noise

Specification	DIN EN 50155 (VDE 0115-200):2008-03
Spectrum	Service life test category 2, bogie-mounted
Frequency	$f_1 = 5 \text{ Hz}$ to $f_2 = 250 \text{ Hz}$
ASD level	6.12 (m/s ²)/Hz
Acceleration	3.12g
Test duration per axis	5 h
Test directions	X-, Y- and Z-axis
Result	Test passed

Shocks

Specification	DIN EN 50155 (VDE 0115-200):2008-03
Pulse shape	Half-sine
Acceleration	30g
Shock duration	18 ms
Number of shocks per direction	3
Test directions	X-, Y- and Z-axis (pos. and neg.)
Result	Test passed

Ambient conditions

Ambient temperature (operation)	-60 °C ... 105 °C (max. short-term operating temperature RTI Elec.)
Ambient temperature (storage/transport)	-25 °C ... 60 °C (for a short time, not exceeding 24 h, -60 °C to +70 °C)
Ambient temperature (assembly)	-5 °C ... 70 °C
Ambient temperature (actuation)	-5 °C ... 70 °C
Permissible humidity (storage/transport)	30 % ... 70 %

Standards and regulations

Connection in acc. with standard	IEC 60947-7-2
----------------------------------	---------------

Mounting

Mounting type	NS 35/7,5
	NS 35/15

End cover - D-ST 2,5

3030417

Item # 402



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End cover, length: 48.6 mm, width: 2.2 mm, height: 29.1 mm, color: gray



Technical Data

Product properties

Product type	End cover
--------------	-----------

Ambient conditions

Ambient temperature (operation)	-60 °C ... 105 °C (max. short-term operating temperature RTI Elec.)
Ambient temperature (storage/transport)	-25 °C ... 60 °C (for a short time, not exceeding 24 h, -60 °C to +70 °C)
Ambient temperature (assembly)	-5 °C ... 70 °C
Ambient temperature (actuation)	-5 °C ... 70 °C
Permissible humidity (storage/transport)	30 % ... 70 %

Material specifications

Color	gray
Material	PA
Flammability rating according to UL 94	V0
Static insulating material application in cold	-60 °C
Temperature index of insulation material (DIN EN 60216-1 (VDE 0304-21))	125 °C
Relative insulation material temperature index (Elec., UL 746 B)	130 °C
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3
Calorimetric heat release NFPA 130 (ASTM E 1354)	27,5 MJ/kg
Surface flammability NFPA 130 (ASTM E 162)	passed
Specific optical density of smoke NFPA 130 (ASTM E 662)	passed
Smoke gas toxicity NFPA 130 (SMP 800C)	passed

Dimensions

Width	2.2 mm
Height	29.1 mm
Length	48.6 mm

End clamp - CLIPFIX 35-5

3022276

Item # 430



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Quick mounting end clamp for NS 35/7,5 DIN rail or NS 35/15 DIN rail, with marking option, with parking option for FBS...5, FBS...6, KSS 5, KSS 6, width: 5.15 mm, color: gray

Your advantages

- Large-surface labeling
- Design width of just 5.2 mm
- Phoenix Contact has engineered its CLIPFIX end brackets to maintain a secure grip on the various DIN rail systems
- Parking option for bridges and plugs

Technical Data

Product properties

Product type	End block
--------------	-----------

Dimensions

Width	5.15 mm
Height	35.3 mm
Height NS 35/15	44 mm
Height NS 35/7,5	36.5 mm
Length	48.6 mm

Material specifications

Color	gray
Material	PA
Flammability rating according to UL 94	V0
Static insulating material application in cold	-60 °C
Relative insulation material temperature index (Elec., UL 746 B)	65 °C
Fire protection for rail vehicles (DIN EN 45545-2) R22	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R23	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R24	HL 1 - HL 3
Fire protection for rail vehicles (DIN EN 45545-2) R26	HL 1 - HL 3

Environmental and real-life conditions

Ambient conditions

Ambient temperature (operation)	-60 °C ... 65 °C (max. short-term operating temperature RTI Elec.)
Ambient temperature (storage/transport)	-25 °C ... 60 °C (for a short time, not exceeding 24 h, -60 °C to +70 °C)
Ambient temperature (assembly)	-5 °C ... 70 °C
Ambient temperature (actuation)	-5 °C ... 70 °C
Permissible humidity (storage/transport)	30 % ... 70 %

Mounting

Mounting type	NS 35/7,5
	NS 35/15

Edison Power Distribution Blocks



Short-Circuit Current Rated Power Distribution Blocks

We offer distinctly different styles of short-circuit current rated Power Distribution Blocks and Terminal Blocks to match different application needs.

- Enclosed style or Open style
- UL1953 Listed power distribution blocks or UL1059 Recognized terminal blocks, that have different minimum spacing requirements.

The table below can assist in the selection of the correct series for your application requirements.

Why are these important?

Assembly short-circuit current ratings (SCCRs) are now required in the 2005 NEC® and UL508A Listed industrial control panels.

Marking the SCCR on:

- Industrial Control Panels (NEC® 409.110)
- Industrial Machinery Electrical Panels (NEC® 670.3(A))
- HVAC equipment (NEC® 440.4(B))

The above sections are now required by the National Electrical Code. Power Distribution Blocks or Terminal Blocks not marked with an SCCR are typically one of the weakest links and may limit an assembly to no more than 10 kA SCCR per Table SB4.1 UL508A. The EPDB series and HPB series Power Distribution Blocks have increased spacing required where used in feeder circuits in equipment listed to UL508A. The PB series UL1059 Terminal Blocks must be evaluated for proper spacing. Also, for building wiring systems, the EPDB series and HPB series power distribution blocks can be used to meet the 2005 NEC® requirements in section 376.56(B) for power distribution blocks in wireways.

Edison Power Distribution Blocks Selection Guide*

Series	UL	† Enclosed	High SCCR**	Spacing*** 1" Air 2" Surface	Industrial Control Panels UL 508A Branch Circuit	Industrial Control Panels UL 508A Feeder Circuit	HVAC UL 1995	Wireways NEC® 376.56(B) (Requires UL 1953)
EPDB	UL 1953 Listed Power Distribution Blocks	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HPB	UL 1953 Listed Power Distribution Blocks	No****	Yes	Yes	Yes	Yes	Yes	Yes (with optional cover)
PB	UL 1059 Recognized Terminal Blocks	No****	Yes	No****	Yes	No*****	Yes	No

† IP-20 finger-safe under specific conditions.

*Refer to specific UL standards and NEC sections for a complete application guide.

**When protected by proper fuse class with maximum ampere rating specified or smaller.

This does not apply to PB40, PB51 and PB71 series.

***See Minimum Space Requirements for Equipment table below.

****Optional covers are available. They are not IP-20 rated, but do provide additional protection against direct contact with Live Parts.

*****Exception: Yes, if single pole units installed with proper spacings.

Minimum Space Requirements for Equipment

UL Standard	Spacing Between Live Parts of Opposite Polarity		Spacing Between Live Parts and Grounded Parts or Enclosures, Through Air and Over Surface @ 600V
	Through Air @ 600V	Over Surface @ 600V	
508A Feeder Circuits, Table 10.2	1"	2"	1"
508A Branch Circuits, Table 10.1	3/8"	1/2"	1/2"
UL 1995 HVAC	3/8"	1/2"	1/2"

Note: Refer to specific UL standards for complete spacing details.

EPDB Series Edison Finger-Safe Power Distribution Blocks

Finger-safe distribution blocks

Use Finger-safe Power Distribution Blocks to manage your power distribution needs, from splitting primary power circuits into a variety of branch circuits to providing a fixed junction tap-off point. The modular design allows the end user to select and configure the number of poles required by each application. These blocks are engineered to allow copper and aluminium conductors and maintain an SCCR rating of 200kA. These features make these blocks the perfect solution to today's power circuit wiring requirements.

Features

- Fully enclosed block for touch-safe isolation of live parts
- IP20 rating under specific conditions
- Integrated DIN-rail or direct panel mounting. (Panel mount only for EPDB306 and EPDB702)
- Captive termination screws cannot be lost
- Used in UL508A panels for both feeder and branch circuit applications
- Suitable for both factory and field wiring
- Tin-plated aluminum connectors suitable for copper and aluminum conductors

Ratings

- Ampere ratings from 175 Amps to 760
- 600 VAC or VDC
- Short Circuit Current Rating (SCCR) 200kA with proper fusing
- Flammability: UL 94V0

Agency Approvals

- UL 1953 Listed - File E256146, Guide QPQS
- CSA Certified - Class 6228-01, File 700490
- CE component IEC 60947-7-1
- IEC-60529, IP20 (Finger-Safe)
See table for specific conditions.

Finger-safe Power Distribution Blocks Selection Table						
Series	Part Number	Amps	Description	SCCR Rtg	Qty	Weight
Finger-safe (EPDB)	EPDB101	175 max	1 pole distribution block, 1 in/1 out	200 kA	1	3.4 oz.
	EPDB104	175 max	1 pole distribution block, 1 in/4 out	200 kA	1	4.2 oz.
	EPDB301	310 max	1 pole distribution block, 1 in/1 out	200 kA	1	8.1 oz.
	EPDB306	380 max	1 pole distribution block, 1 in/6 out	200 kA	1	9.1 oz.
	EPDB512	570 max	1 pole distribution block, 2 in/12 out	200 kA	1	12.5 oz.
	EPDB702	760 max	1 pole distribution block, 2 in/2 out	200 kA	1	16.4 oz.
Accessory	DN-EB35*	-	End bracket	-	50	1.87 lb.

*Note: DIN-rail anchors are required on block or blocks. Anchors must be used to prevent damage to the plastic housing when tightening terminals.

Finger-safe Power Distribution Block General Specifications	
Wire Type	75°C*, Cu/Al
Voltage	600 VAC or VDC maximum (UL 1953), 690 VAC/VDC (IEC)
Operating Temperature	-10°C to 60°C (14°F to 140°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Mounting	35mm DIN rail (DN-R35S1) or surface mount.

*Note: Amp Rating is based on NEC table 310.16 for 75°C wire.



EPDB Series Edison Finger-Safe Power Distribution Blocks Specifications

Edison Finger-Safe Power Distribution Blocks Wire and Torque Range Specifications								
Part Number	Line				Load			
	CU/Al (unless otherwise noted) Wire Range	Torque Lb-in (Nm)	Trim Length in (mm)	Hex Key	CU (unless otherwise noted) Wire Range	Torque Lb-in (Nm)	Trim Length in (mm)	Hex Key
EPDB101	2/0 to 8 AWG, 70 to 10 mm ²	110 [12.4]	0.850 [21.6]	3/16"	2/0 to 8 AWG, 70 to 10 mm ²	110 [12.4]	0.970 [24.6]	3/16"
EPDB104	2/0 to 8 AWG, 70 to 10 mm ²	120 [13.6]	0.750 [19.0]	3/16"	4 to 12 AWG, 25 to 16 mm ²	35 [4.0]	0.550 [14.0] top row, 0.850 [21.6] bottom row	1/8"
	10 to 14 AWG, Cu				8 AWG, 10 mm ²	25 [2.8]		
		10 to 14 AWG, 6 to 2.5 mm ² 4 to 8 AWG, Al	20 [2.3] 35 [4.0]					
EPDB301	350 kcmil to 6 AWG, 185 to 16 mm ²	275 [31.1]	1.350 [34.3]	5/16"	350 Kcmil to 6 AWG, 185 to 16 mm ²	275 [31.1]	1.250 [31.8]	5/16"
EPDB306	500 kcmil to 6 AWG, 240 to 16 mm ²	500 [56.5]	1.250 [31.8]	3/8"	2 to 3 AWG, 35 mm ²	50 [5.7]	0.590 [15.0] top row 1.200 [30.5] bottom row	1/8"
					4 to 6 AWG, 25 to 16 mm ²	45 [5.1]		
					8 AWG, 10 mm ²	40 [4.5]		
10 to 14 AWG, 6 to 2.5 mm ² 2 to 12 AWG, Al	35 [4.0] 50 [5.7]							
EPDB512	300 kcmil to 4 AWG, 150 to 25mm ²	275 [31.1]	1.15 [29.2] top row 1.400 [35.6] bottom row	1/4"	4 to 6 AWG, 25 to 16 mm ²	35 [4.0]	0.550 [14.0] top row, 1.00 [25.4] middle row, 1.220 [31.0] bottom row	1/8"
					8 AWG, 10 mm ²	25 [2.8]		
					10 to 14 AWG, 6 to 2.5 mm ² 4 to 12 AWG, Al	20 [2.3] 35 [4.0]		
EPDB702	500 kcmil to 6 AWG, 240 to 16 mm ²	500 [56.5]	1.250 [31.8]	3/8"	500 kcmil to 6 AWG, 240 to 16 mm ²	500 [56.5]	1.250 [31.8]	3/8"

Short-Circuit Current Rating Data										
Part Number (All Single Pole)	Capacity*	Line		Load		Maximum Fuse Class and Amps***				
		Openings per Pole	Wire Range Cu/Al (unless otherwise noted)	Openings per Pole	Wire Range Cu/Al (unless otherwise noted)	Class J(JDL)	Class T (A3T/A6T)	Class RK1 (LENRK/LESRK)	Class RK5 (ECNR/ECSR)	SCCR Rating
EPDB101	175A	1	2/0 to 8 AWG 70 to 10 mm ²	1	2/0 to 8 AWG 70 to 10 mm ²	200	200	100	60	200kA
EPDB104	175A	1	2/0 to 14 AWG, Cu 2/0 to 8 AWG, Al	4	4 to 12 AWG, Cu	200	200	100	60	200kA
					4 to 14 AWG, Cu	175	175	100	30	100kA
						200	200	100	60	50kA
EPDB301	310A	1	350 kcmil to 6 AWG 185 to 16 mm ²	1	350 kcmil to 6 AWG 150 to 16 mm ²	400	400	200	100	200kA
EPDB306	380A	1	500 kcmil to 6 AWG 240 to 16 mm ²	6	2 to 6 AWG, Cu	400	400	200	100	200kA
					2 to 14 AWG, Cu	200	200	100	60	50kA
						175	175	100	30	100kA
EPDB512	570A	2	300 kcmil 150 mm ²	12	4 to 8 AWG Cu	600	600	400	200	200kA
			300 kcmil to 4 AWG 150 to 12 mm ²		4 AWG, Cu	600	400	200	100	50kA
					4 to 14 AWG, Cu	200	200	100	30	50kA
EPDB702	760A	2	500 kcmil 240 mm ²	2	500 kcmil 240 mm ²	600	600**	400	200	200kA
			500 kcmil to 6 AWG 240 to 16 mm ²		600	800**	600	200	100kA	
					500 kcmil to 6 AWG 240 to 16 mm ²	600	600	400	200	100kA

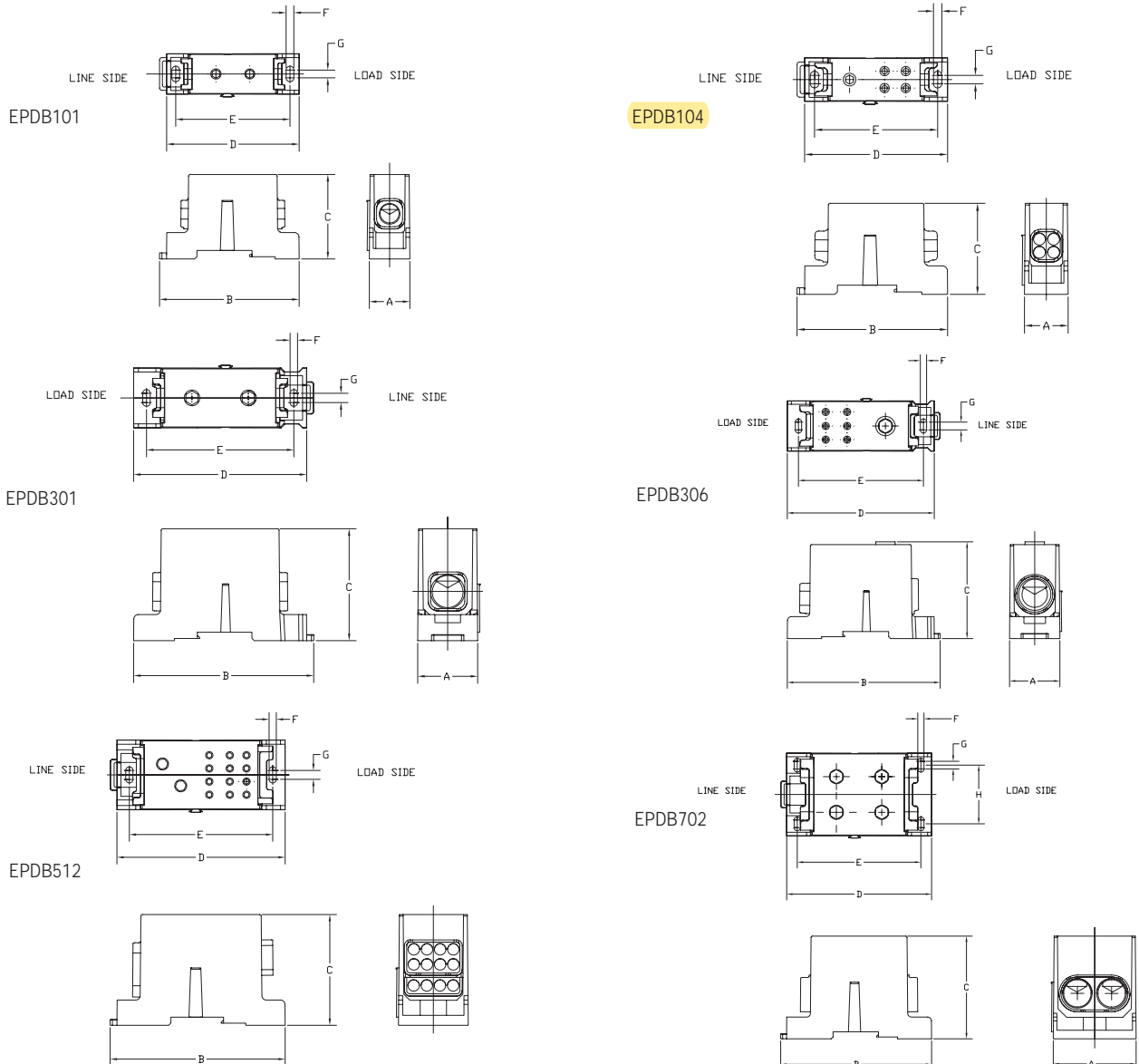
*Amp ratings are based on NEC® Table 310.16 for 75°C wire and UL508A Table 28.1.

**Class L 800A or less fuses are suitable for this particular SCCR case.

***Class G 60A or less, or Class CC 30A or less fuses are suitable for all SCCRs in this table.

EPDB Series Edison Finger-Safe Power Distribution Blocks Dimensions

Edison Finger-Safe Power Distribution Blocks Dimensions (in[mm])								
Part Number	Width	Length	Height	D	E	F	G	H
	A	B	C					
EPDB101	1.03 [26.2]	3.55 [90.2]	2.15 [54.6]	3.37 [85.6]	2.90 [73.7]	0.2 [5.1]	0.2 [5.1]	N/A
EPDB104	1.03 [26.2]	3.55 [90.2]	2.15 [54.6]	3.37 [85.6]	2.90 [73.7]	0.2 [5.1]	0.2 [5.1]	N/A
EPDB301	1.54 [39.1]	4.62 [117.3]	2.87 [72.9]	4.44 [112.8]	3.78 [96.0]	0.2 [5.1]	0.24 [6.1]	N/A
EPDB306	1.54 [39.1]	4.62 [117.3]	2.87 [72.9]	4.44 [112.8]	3.78 [96.0]	0.2 [5.1]	0.24 [6.1]	N/A
EPDB512	1.86 [47.2]	4.65 [118.1]	2.95 [74.9]	4.47 [113.5]	3.81 [96.8]	0.2 [5.1]	0.24 [6.1]	N/A
EPDB702	2.56 [65.0]	4.65 [118.1]	3.17 [80.5]	4.47 [113.5]	3.81 [96.8]	0.2 [5.1]	0.24 [6.1]	1.81 [46.0]



Part Number	Minimum Enclosure Size in(mm)*
EPDB101	16 x 16 x 6.75 [406.4 x 406.4 x 171.45]
EPDB104	16 x 16 x 6.75 [406.4 x 406.4 x 171.45]
EPDB301	36 x 30 x 12.63 [914.4 x 762 x 320.80]
EPDB306	24 x 20 x 6.75 [609.6 x 508 x 171.45]
EPDB512	24 x 20 x 6.75 [609.6 x 508 x 171.45]
EPDB702	36 x 30 x 12.63 [914.4 x 762 x 320.80]

Wire Connector Hole Diameter		
Part Number	Line in (mm)	Load in (mm)
EPDB101	0.450 [11.43]	0.450 [11.43]
EPDB104	0.450 [11.43]	0.246 [6.25]
EPDB301	0.720 [18.29]	0.720 [18.29]
EPDB306	0.870 [22.10]	0.314 [7.98]
EPDB512	0.687 [17.45]	0.265 [6.73]
EPDB702	0.875 [22.23]	0.875 [22.23]

*Note: Terminal block SCCR determined based on testing in minimum-size enclosure

EPDB Series Edison Finger-Safe Power Distribution Blocks IP-20 Finger-safe Status Requirements

Specific Conditions to Achieve IP-20 Finger-Safe Status for EPDB Series								
Part Number	Line				Load			
	Trim Length in [mm]	Installed Wire	IP-20		Trim Length in [mm]	Installed Wire	IP-20	
			Conductor Openings	Screw Opening			Conductor Openings	Screw Opening
EPDB101	0.850 [21.6]	2/0 to 8 AWG 70 to 10mm ²	Yes	Yes	0.970 [24.6]	2/0 to 8 AWG 70 to 10mm ²	Yes	Yes
EPDB104	0.750 [19.0]	2/0 to 8 AWG 70 to 10mm ²	Yes	Yes	0.550 [14.0] top row, 0.850 [21.6] bottom row	4 to 14 AWG 25 to 2.5mm ²	Yes	Yes
						screws fully opened	N/A	Yes
						no wire in hole	No	N/A
EPDB301	1.350 [34.3]	350 Kcmil to 2/0 AWG 185 to 70mm ²	Yes	Yes	1.250 [31.8]	350 Kcmil to 2/0 AWG 185 to 70mm ²	Yes	Yes
		1/0 to 6 AWG 50 to 16mm ²	No	Yes		1/0 to 6 AWG 50 to 16mm ²	No	Yes
EPDB306	1.250 [31.8]	500 to 250 Kcmil 240 to 150mm ²	Yes	Yes	0.590 [15.0] top row, 1.200 [30.5] bottom row	2 to 14 AWG 35 to 2.5mm ²	Yes	Yes
		4/0 to 6 AWG 120 to 16mm ²	No	Yes		screws fully opened	N/A	Yes
		N/A	N/A	N/A		no wire in hole	No	N/A
EPDB512	1.15 [29.2] top row, 1.400 [35.6] bottom row	300 Kcmil to 4/0 AWG 150 to 120mm ²	Yes	Yes	0.550 [14.0] top row 1.00 [25.4] middle row 1.220 [31.0] bottom row	4 to 14 AWG 25 to 2.5mm ²	Yes	Yes
		3/0 to 4 AWG 95 to 25mm ²	No	Yes		screws fully opened	N/A	Yes
		screws fully opened	N/A	No		no wire in hole	Yes	N/A
		no wire in hole	No	N/A				
EPDB702	1.250 [31.8]	500 to 350 Kcmil 240 to 185mm ²	Yes	Yes	1.250 [31.8]	500 to 350 Kcmil 240 to 185mm ²	Yes	Yes
		300 Kcmil to 6 AWG 150 to 16mm ²	No	Yes		300 Kcmil to 6 AWG 150 to 16mm ²	No	Yes
		screws fully opened	N/A	No		screws fully opened	N/A	No
		no wire in hole	No	N/A		no wire in hole	No	N/A