AES Group, Inc.

Sales ▪ Construction ▪ Service

Powerex MDRC05074FA5

Laboratory Air Compressor System Equipment

Submittal Information

4330 Redwood Highway, Suite 100
San Rafael, CA 94903
Tel 415 507-9373 Fax 415 507-9376

Specification

General

The Powerex Medical Rotary Tooth Compressor Systems are designed to provide medical breathing air for hospital and medical institutions. This system meets NFPA 99 requirements for Risk Category 1 systems. Each system is completely tested before shipment and includes:

- Multiple rotary tooth air compressors and associated equipment mounted inside a rigid steel sound enclosure (number of compressor modules vary depending on size of system).
- Master control panel.
- Corrosion resistant air receiver.
- Redundant medical desiccant air dryers with purge control.
- Dew point and CO monitors.

System installation requirements:

- 120 VAC power connection to master control panel.
- 3 phase main power to each compressor unit, with appropriate branch circuit protection and service disconnect.
- Power wire for air receiver automatic drain to be connected to master control panel. (may require a field supplied junction box depending on location of tank and master control).
- Control signal wiring between master panel and each compressor unit.
- Remote inlet air connection to each module.
- Interconnecting plumbing connections between each compressor, tank, and dryer skid.

Oilless Rotary Tooth Compressor Pump

The compressors shall be shaft driven oil-less dual stage, air-cooled rotary tooth. The rotary design shall be rated for 100% continuous duty. The inlet and outlet for the air ends are located on symmetric faces, preventing axial loading and prolonging the life of the bearings. The rotors are made of stainless steel and highly resistant to corrosion. The air end assembly is rated for 40,000 hours of continuous use operation with regular maintenance. The pump is fully air-cooled requiring no external cooling fluid. An intercooler removes heat between the first and second compression stages, allowing for efficient performance. Compressors are rated for 109 psig (125 psig optional high pressure) maximum pressure at sea level.

Motor

The compressor shall be shaft-driven by a 2 pole, TEFC, IP55 rated, 3 phase induction motor with a squirrel cage rotor and cast iron frame. The motor shall run at 3565 RPM at full load and have a rated current of 57.7 Amps.

Compressor Cabinet Controls

Operation of the compressor and display of essential compressor systems is accomplished with a PLC and a touch screen color display for each compressor. This Programmable Logic Controller and display can easily be programmed to meet varying operating requirements.

Compressor Control Features

Compressor status indication

- Power on
- Standby mode
- Compressor loaded
- Compressor unloaded
- Real time clock

Hour meter

- Total operating hours
- Total loaded hours

Pressure indicators

- Package discharge air
- First stage discharge
- Inlet air filter
- Unload pressure set point
- Loaded pressure set point

Temperature indicators

- First stage air discharge
- Second stage air inlet
- Second stage air outlet

Service requirement indicators

- Routine maintenance

Pre-alarm indicators

- High 1st stage discharge temperature
- High 2nd stage suction temperature
- High 2nd stage outlet temperature
- Drain valve

Compressor safety shutdown indications

- High 1st stage outlet temperature
- High 2nd stage inlet temperature
- High 2nd stage outlet temperature
- Low oil pressure
- Drive motor overload
- Main starter fault
- Fan motor overload
- Oil pump motor overload
- Intake vacuum switch
- Maintenance interval

Additional devices

- Emergency stop button
- Event alarm log w/ ability to extract via USB
- Real time graphs of temperature and pressure data from each sensor
- Manual load/unload switch
- System auto restart

Remote input commands (optional)

- Start/stop
- Load/Unload

Remote output status

- Unit operating
- Loaded/unloaded
- Standby
- General alarm
- BACnet gateway for building management integration (optional)

Inlet Filter

The system includes a 2 stage inlet air filter with a star-pleated main element and an integrated high-efficiency pre-separator that promotes long element life. A silencer box with internal baffles is located prior to the inlet filter to reduce sound. The filter and the silencer box are located inside the sound reducing cabinet.

Oil Mist Catcher

The compressor pump will include an integrated oil mist catcher. The oil mist catcher eliminates oil mist from the gear casing and recycles the oil back into the sump.

Moisture Separator

The compressor comes equipped with two liquid separators with automatic no-loss electronic drains. The first is installed between the first and second stage air ends and the second separator is installed prior to the final discharge of the air compressor.

Heat Exchangers

Each compressor unit contains 3 different heat exchangers. An aluminum intercooler will be located between pump stages 1 and 2. An aluminum aftercooler will be located prior to the 2nd water separator and discharge. An aluminum oil cooler will be oriented next to the two air heat exchangers. A single cooling fan will remove the heat from the top of the system.

Sound Reducing Enclosure

The system is constructed with an internal frame and steel base system with individual vibration isolation mounted compressor modules. The sound reducing enclosure has access panels to allow service of the major components and electrical controls.

~~Optional~~ VFD Controller

Compressor to be equipped with an integrated VFD motor control to maximize energy efficiency of the compressor under partial load conditions.

NFPA 99 Multiplex Features

- Automatic lead/lag control
- Reserve in use alarm
- Auto restart after power failure
- Remote Inlet air adapter

The Air Treatment Center control panel provides power to the dryer skid, monitors, and tank auto drain. The touch screen control panel on each air compressor module has all the alarm contacts and operations for the compressor modules; the Air Treatment Center control panel has connections for the monitor alarms.

Air Receiver

The system shall include an ASME air receiver rated for 200 PSI for 400 gallon, 165 psi for 660 gallon MAWP. 400 gallon and larger tanks are shipped loose and include the accessories mentioned below. (Accessories may require field installation.) The tank shall be equipped with:

- Sight gauge
- Pressure gauge and a safety relief valve
- 3-valve bypass
- Zero air loss type automatic moisture drain (with manual drain valve back up)
- The receiver shall be internally lined for corrosion resistance.

Air Treatment Center

The medical dryer package is a skid mounted design consisting of dual desiccant air dryers, dual filtration system, CO and dew point monitors, a sample port and all bypass piping. All components are mounted and plumbed together with bypass valves in accordance with NFPA 99 for Medical Air Systems. Final safety relief valve also included. Piping to be brass, stainless, or type K copper, and cleaned for medical air use. Piping from the compressor outlet to the tank assembly is to be field furnished and installed. Compressed air from the tank assembly is routed to the Air Treatment Center by field provided and installed piping.

Desiccant Air Dryer

The twin-tower, heatless desiccant air dryer shall yield a pressure dew point of -20 degrees F. Dryer is on a separate skid for systems with 400 gal tanks. The dryer design shall be of the automatic pressure swing, heatless, regenerative type and shall include a purge muffler for quiet operation. The filtration system shall consist of 2 stages of filtration mounted and plumbed to the air dryer. The first stage of filtration shall include a .01 micron coalescing pre-filter with element change indicator and automatic condensate drain and installed up-stream of the air dryer. The second stage shall include a 1 micron particulate filter with element change indicator and installed downstream of the air dryer. Activated carbon final filters are standard per NFPA 99.

Dewpoint Monitor

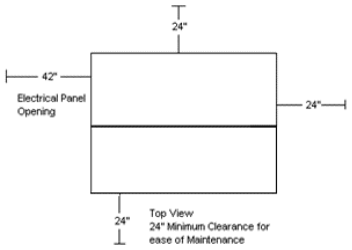
The system-integrated hygrometer shall be equipped with an LCD dew point display and high dew point alarm with dry contacts connected to main controls panel. The sensor shall include an auto calibration feature to ensure the accuracy of the dew point measurement.

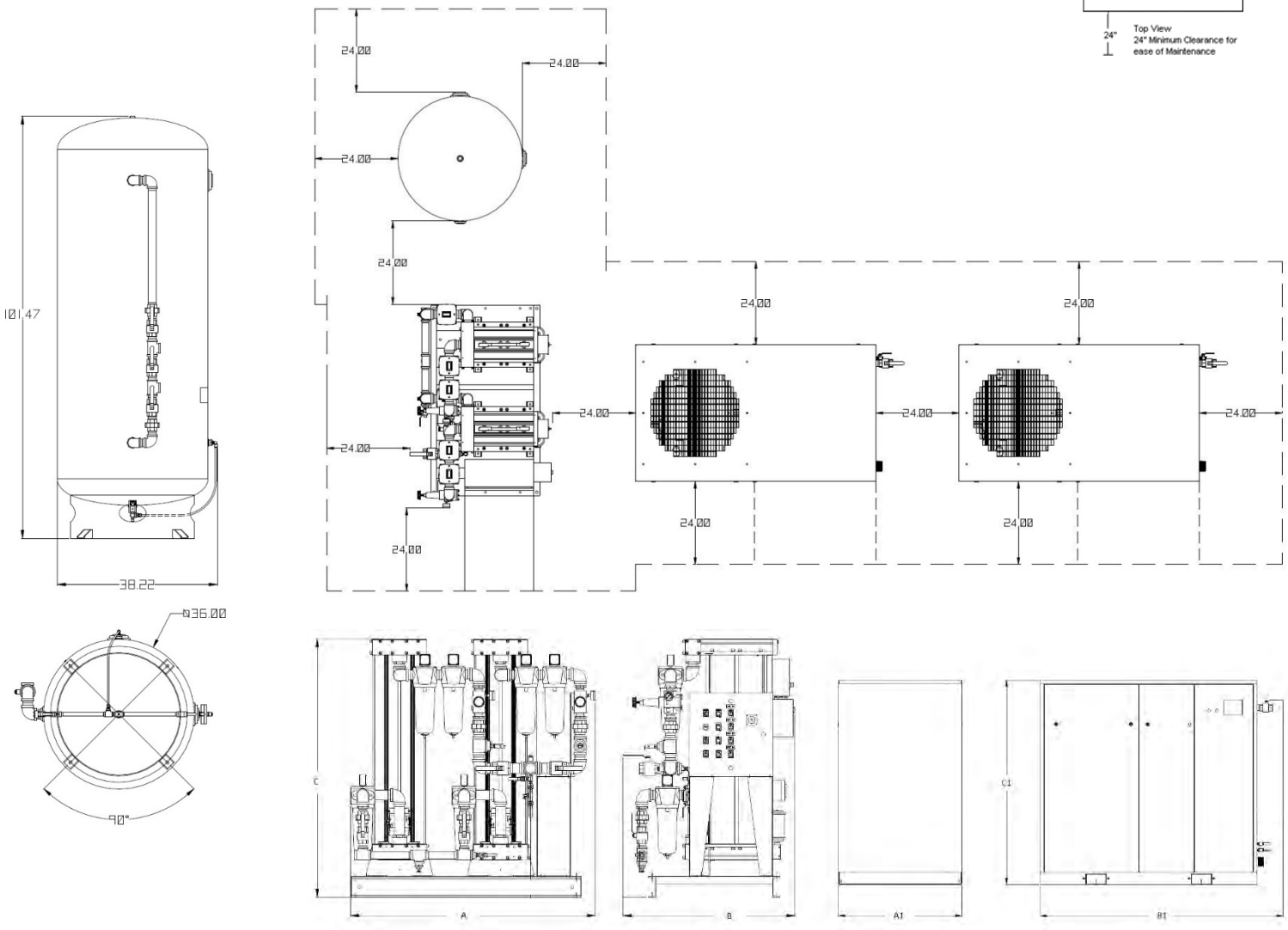
Carbon Monoxide Monitor

Carbon monoxide (CO) monitor is in an enclosure with LCD display of CO concentrations. The monitor shall continuously display the CO content of the discharge air and shall provide audible and visual high CO alarms. Dry contacts are provided for remote monitoring of the high CO alarm on the Air Treatment Center control panel.

Rotary Tooth Medical Air System
Duplex

Dimensions								
Model	Dim. A	Dim. B	Dim. C	Dim. A1	Dim. B1	Dim. C1	Inlet	Outlet
~~MDRC0507K~~	~~59”~~	~~42”~~	~~62”~~	~~40”~~	~~70”~~	~~66”~~	~~2 ½”~~	~~1 ½”~~
MDRC0507F	59”	42”	62”	40”	70”	66”	2 ½”	1 ½”

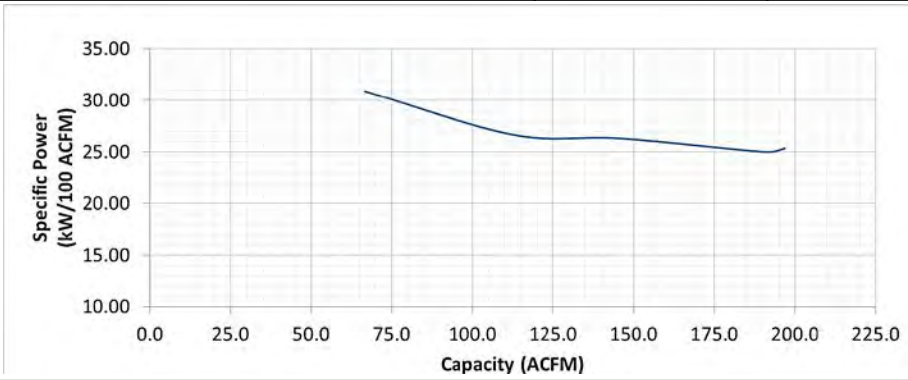




Rotary Tooth Medical Air System – Duplex										
Model	HP	Control	Maximum Pressure (PSIG)	SCFM @ 100 PSIG*	Tank Size (gal)	BTU/Hr*	dB(A) Level	System F.L.A.			System Weight (lbs)
								208V	230V	460V	
~~MDRC0507K~~	~~50 (2)~~	~~Load/Unload~~	~~109~~	~~204~~	~~400~~	~~127,250~~	~~68~~	~~147~~	~~128~~	~~64~~	~~5,880~~
MDRC0507F	50 (2)	VFD	109	67-207	400	127,250	68	152	132	66	5,880

*Shown with one compressor in reserve per NFPA 99

Model Data for Compressed Air – Variable Frequency Drive		
Manufacturer: Powerex, Inc.		
Model Number:	Date:	5/27/15
☒ Air-cooled ☐ Water-cooled	Type:	Other
☐ Oil-injected ☒ Oil-free	# of Stages:	2
Rated Operating Pressure:	109	psig[2]
Drive Motor Nominal Rating:	50	hp
Drive Motor Nominal Efficiency:	94	percent
Fan Motor Nominal Rating (if applicable):	1.0	hp
Fan Motor Nominal Efficiency:	75	percent
Input Power (kW)	Capacity (acfm)[1,4]	Specific Power (kW/100 acfm)[4]
49.9	196.8	25.34
47.7	194.3	24.57
38.4	145.8	26.31
30.1	112.8	26.65
20.6	66.6	30.90
Total Package Input Power at Zero Flow:[3,4]	13.0	kW



Notes:

1 – Measured at the discharge terminal point of the compressor package in accordance with ISO 1217, Annex C; ACFM is actual cubic feet per minute at inlet conditions.

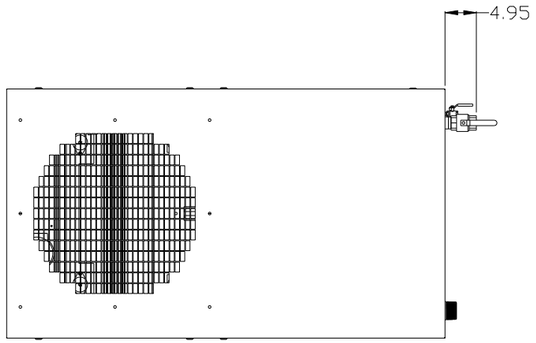
2 – The operating pressure at which the Capacity and Electrical Consumption were measured for this data sheet.

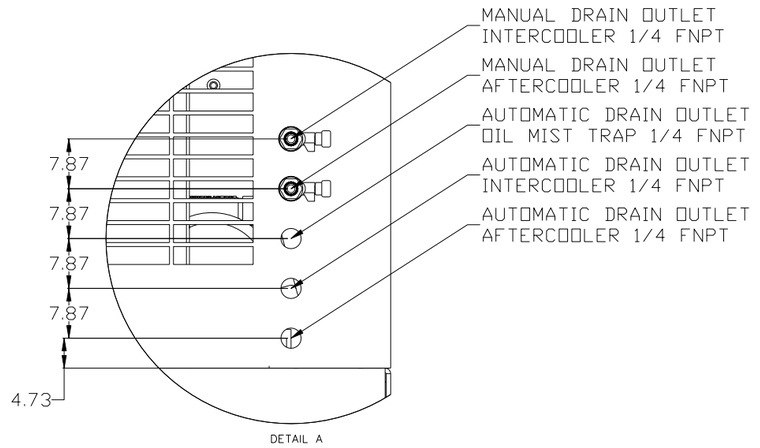
3 – Maximum pressure attainable at full flow, usually the unload pressure setting for load/no load control or the maximum pressure attainable before capacity control begins. May require additional power.

4 – Tolerance is specified in ISO 1217, Annex C, as shown in table below:

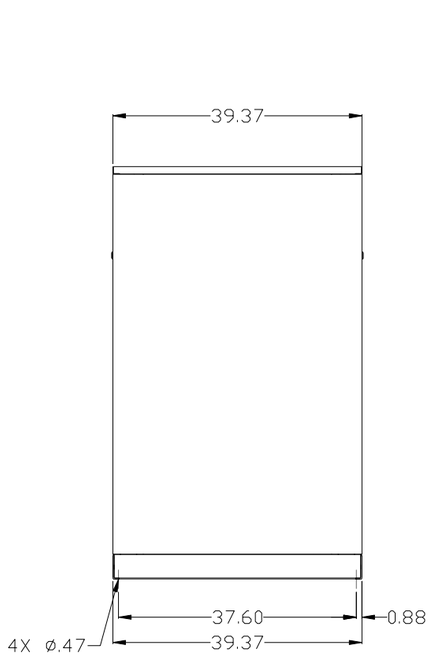
Volume Flow Rate at Specified Conditions		Volume Flow Rate (%)	Specific Energy Consumption (%)	No Load/Zero Flow Power (%)
(m3/min)	(ft3/min)			
Below 0.5	Below 15	+/- 7	+/- 8	+/- 10
0.5 to 1.5	15 to 50	+/- 6	+/- 7	
1.5 to 15	50 to 500	+/- 5	+/- 6	
Above 15	Above 500	+/- 4	+/- 5	

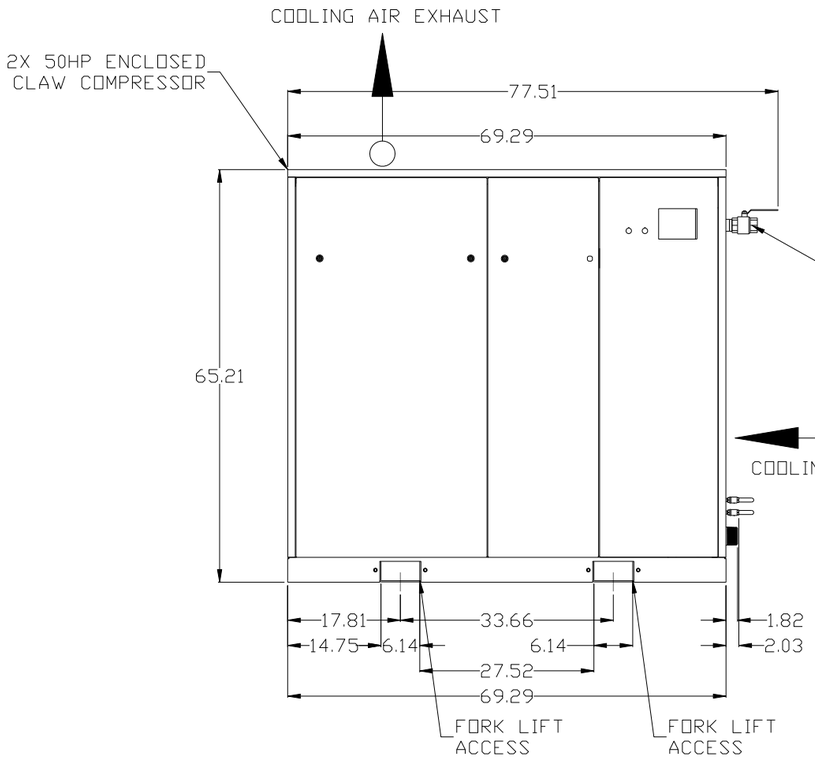
REV	ZONE	REVISION	DATE	ECN	NAME	CHKD
B-1	ALL	RELEASE TO PRODUCTION	2/3/16	PXEC014	MJD	AEK
C-1	3.5 ALL	UPDATED TO NANO NDL DRYERS	8/10/17	PXEC0174	AEK	GES
D-1	ALL	ADDED INDIVIDUAL COMPONENT WEIGHTS	4/30/18	PXEC0229	GES	DMS

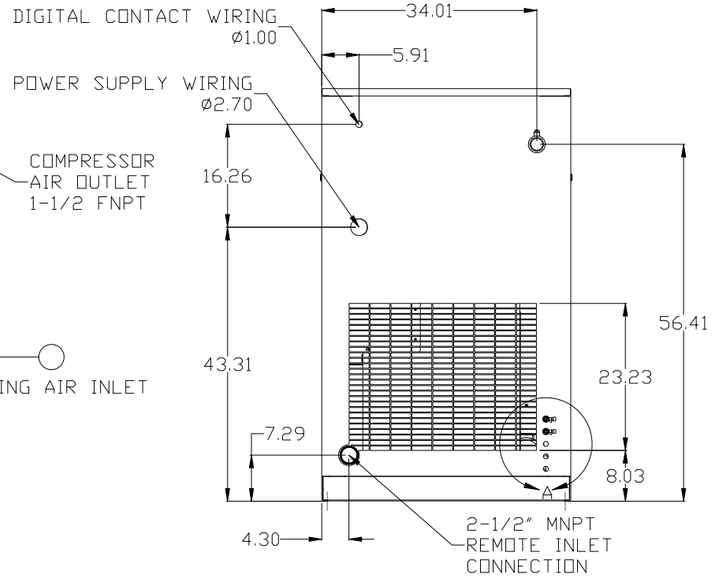




DETAIL A







ENCLOSURE WEIGHT EACH: 2940 LBS

SYMBOL LEGEND
⊖ = MINUS DRAFT
⊕ = PLUS DRAFT
▽ = ADDITIONAL CONTROL REQ'D
◇ (BHN) = BRINELL HARDNESS

Drawings to conform to the current revision of the following ANSI standards.
Y14.3 Multi- and sectional view dwgs.
Y14.5M Dimensioning and tolerancing

TOLERANCES NOT SPECIFIED
.XX ±
.XXX ±
∠(DEG.) ±

AUTOCAD REL.2014 LT
INCH

DO NOT SCALE DRAWING FOR DIMENSIONS

Sheet 1 of 5

SCALE 1: 12

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DRAWN BY	CHECKED BY	APPROVED BY ENGINEERING	APPROVED BY MFG/MRKTG
MJD	AEK	JAA	CT
2/3/16	2/3/16	2/3/16	2/3/16

MATERIAL
N/A

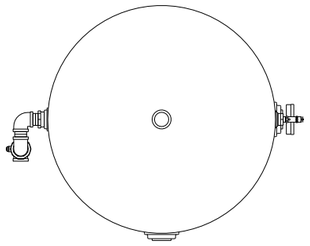
PART NAME
CLAW ENCLOSED COMPRESSOR DUPLEX
400GAL DUAL DESSICANT PACKAGE

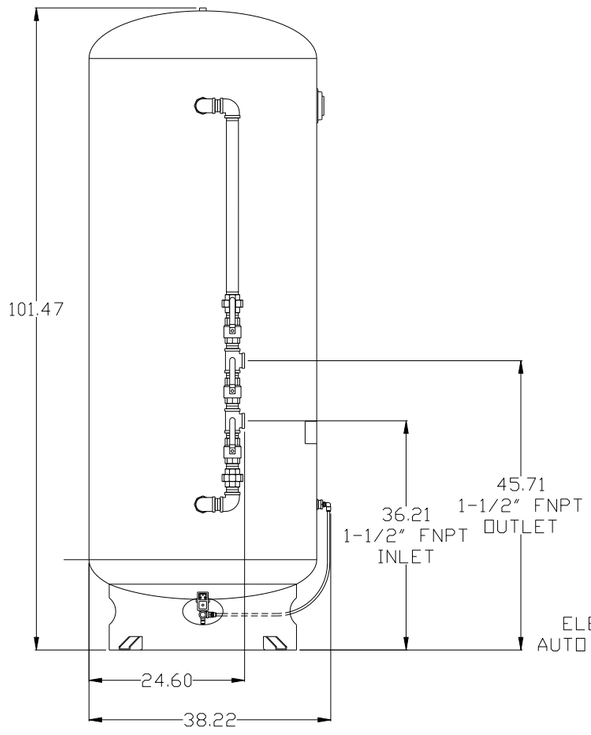
POWEREX
FLUID AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 FAX: (513) 367-3125

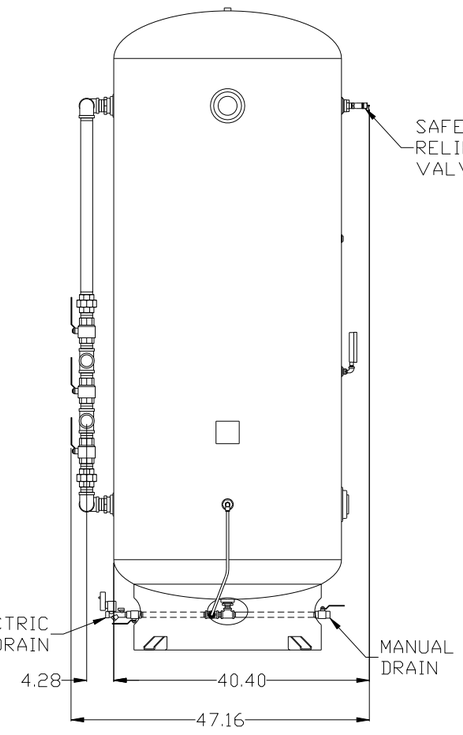
DWG NO MDRC0507
SIZE D

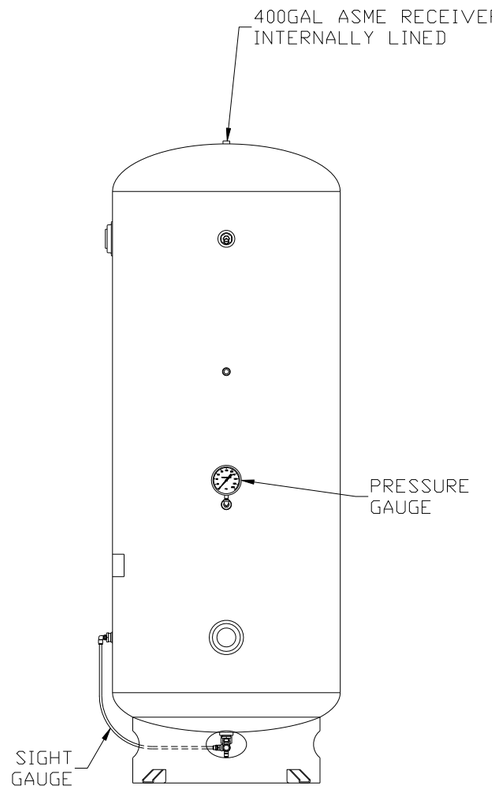
MDRC0507.dwg

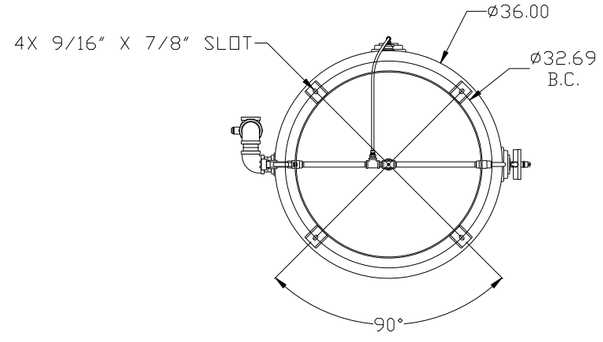
REV	ZONE	REVISION	DATE	ECN	NAME	CHKD
B-1	ALL	RELEASE TO PRODUCTION	2/3/16	PXEC014	MJD	AEK
C-1	3.5 ALL	UPDATED TO NANO NDL DRYERS	8/10/17	PXEC0174	AEK	GES
D-1	ALL	ADDED INDIVIDUAL COMPONENT WEIGHTS	4/30/18	PXEC0229	GES	DMS











400 GALLON TANK WEIGHT: 740 LBS

SYMBOL LEGEND
⊖ = MINUS DRAFT
⊕ = PLUS DRAFT
▽ = ADDITIONAL CONTROL REQ'D
◇ BHN = BRINELL HARDNESS

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Y14.5M Dimensioning and tolerancing

TOLERANCES NOT SPECIFIED
.XX ±
.XXX ±
∠(DEG.) ±

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Sheet 2 of 5

SCALE 1: 12

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MJD	AEK	JAA	CT
2/3/16	2/3/16	2/3/16	2/3/16

MATERIAL
N/A

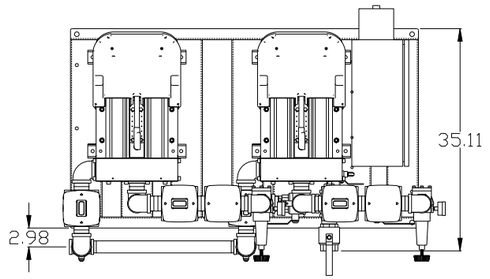
PART NAME
CLAW ENCLOSED COMPRESSOR DUPLEX
400GAL DUAL DESSICANT PACKAGE

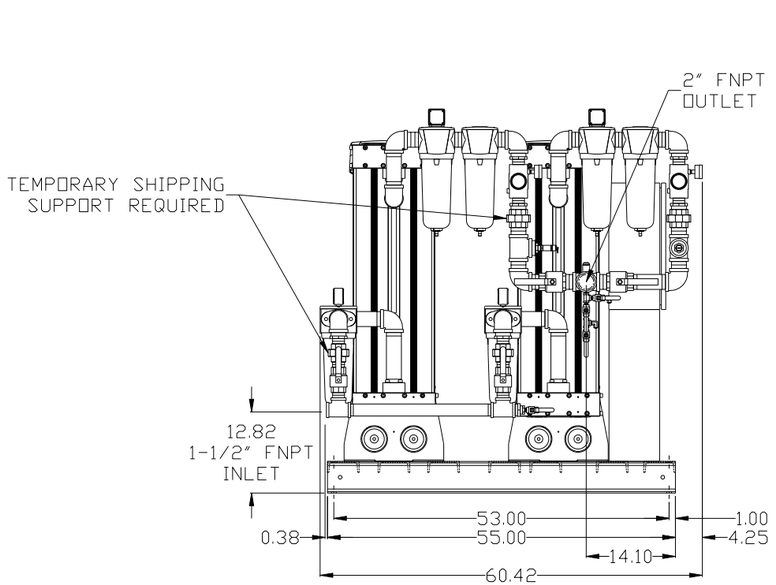
POWEREX
A DIVISION OF THE SCOTT FETZER CO.
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 FAX: (513) 367-3125

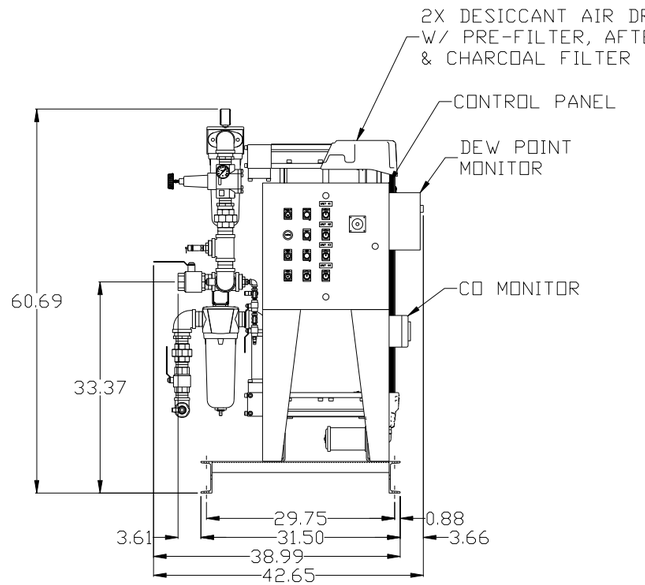
DWG NO MDRC0507
SIZE D

MDRC0507.dwg

REV	ZONE	REVISION	DATE	ECN	NAME	CHKD
B-1	ALL	RELEASE TO PRODUCTION	2/3/16	PXEC014	MJD	AEK
C-1	3,5 ALL	UPDATED TO NANO NDL DRYERS	8/10/17	PXEC0174	AEK	GES
D-1	ALL	ADDED INDIVIDUAL COMPONENT WEIGHTS	4/30/18	PXEC0229	GES	DMS







PURIFICATION SKID WEIGHT: 910 LBS

SYMBOL LEGEND
⊖ = MINUS DRAFT
⊕ = PLUS DRAFT
▽ = ADDITIONAL CONTROL REQ'D
RHRS = BRINELL HARDNESS

Drawings to conform to the current revision of the following ANSI standards.
Y14.3 Multi- and sectional view dwgs.
Y14.5M Dimensioning and tolerancing

TOLERANCES NOT SPECIFIED
.XX ±
.XXX ±
∠(DEG.) ±

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Sheet 3 of 5

SCALE 1: 12

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DRAWN BY	CHECKED BY	APPROVED BY ENGINEERING	MFG/MRKTG
MJD	AEK	JAA	CT
2/3/16	2/3/16	2/3/16	2/3/16

MATERIAL
N/A

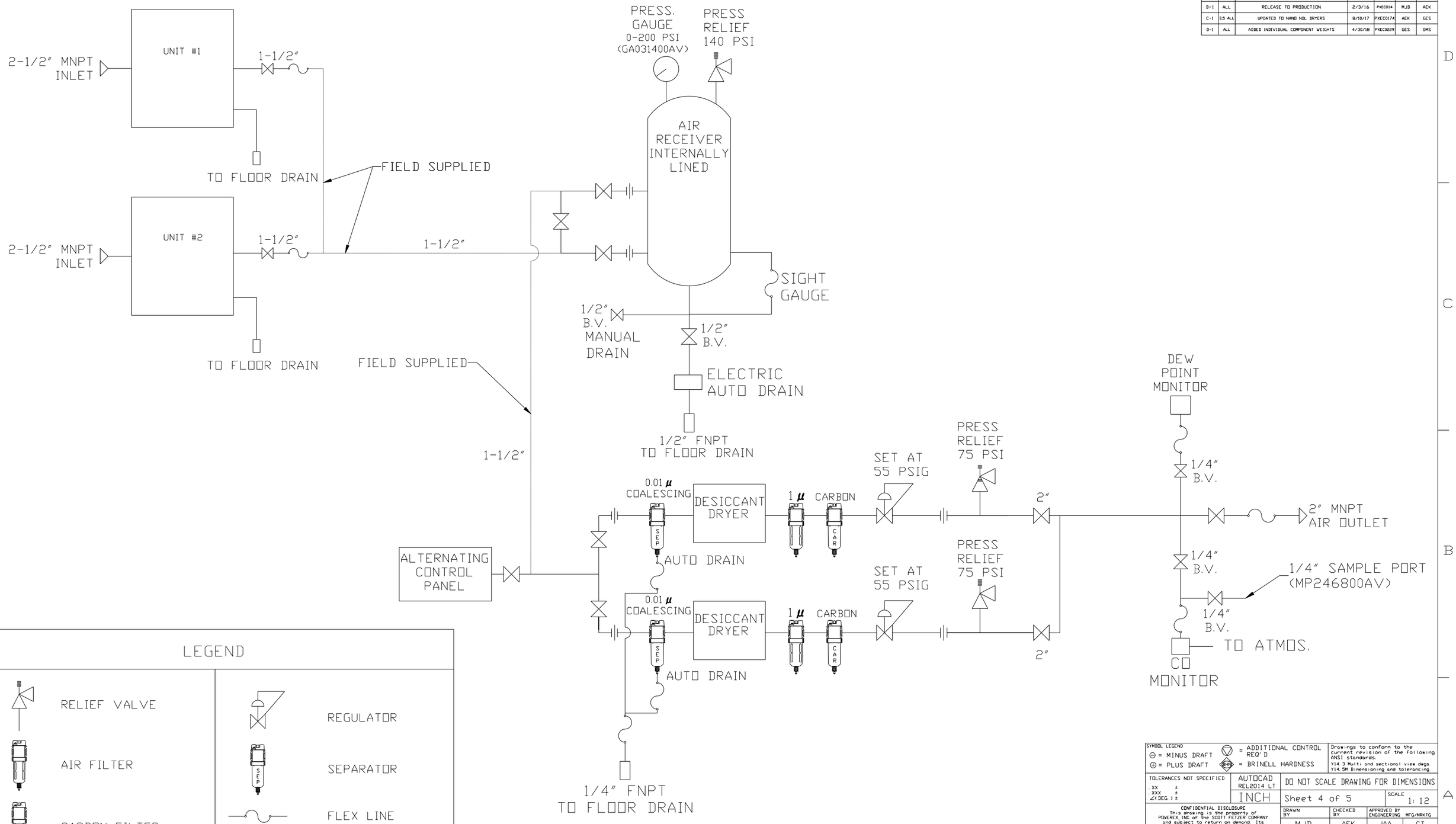
PART NAME
CLAW ENCLOSED COMPRESSOR DUPLEX
400GAL DUAL DESSICANT PACKAGE

POWEREX
FLUID AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 FAX: (513) 367-3125

DWG NO MDRC0507
SIZE D

MDRC0507.dwg

REV	ZONE	REVISION	DATE	ECN	NAME	CHKD
B-1	ALL	RELEASE TO PRODUCTION	2/3/16	PXEC014	MJD	AEK
C-1	3.5 ALL	UPDATED TO NANO NDL DRYERS	8/10/17	PXEC0174	AEK	GES
D-1	ALL	ADDED INDIVIDUAL COMPONENT WEIGHTS	4/30/18	PXEC0229	GES	DMS



LEGEND

- RELIEF VALVE
- AIR FILTER
- CARBON FILTER
- REGULATOR
- SEPARATOR
- FLEX LINE
- UNION
- BALL VALVE

SYMBOL LEGEND
⊖ = MINUS DRAFT
⊕ = PLUS DRAFT
= ADDITIONAL CONTROL REQ'D
= BRINELL HARDNESS

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Y14.5M Dimensioning and tolerancing

TOLERANCES NOT SPECIFIED
.XX ±
.XXX ±
∠(DEG.) ±

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Sheet 4 of 5
SCALE 1: 12

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DRAWN BY	CHECKED BY	APPROVED BY ENGINEERING	MFG/MRKTG
MJD	AEK	JAA	CT
2/3/16	2/3/16	2/3/16	2/3/16

MATERIAL: N/A

PART NAME: CLAW ENCLOSED COMPRESSOR DUPLEX

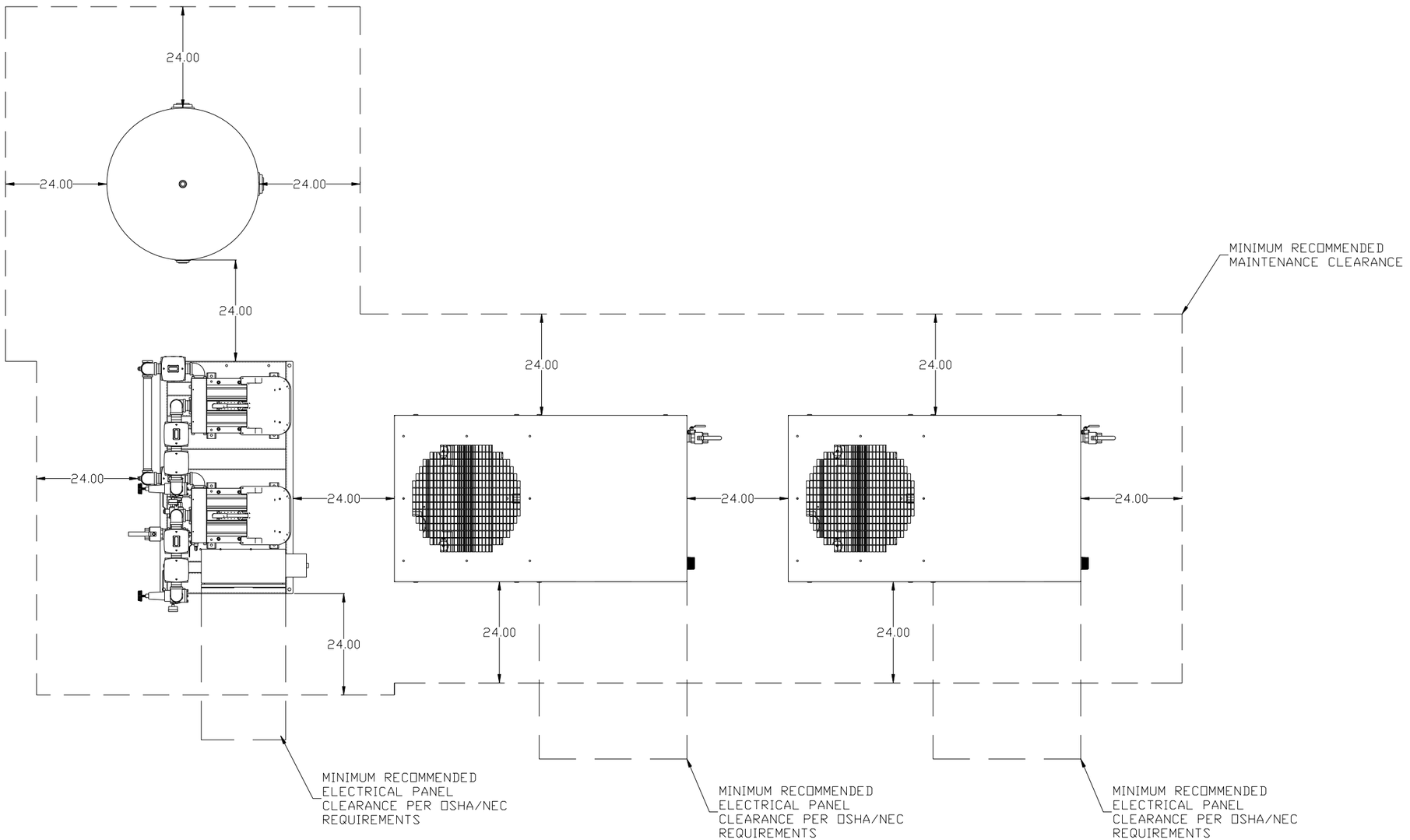
FLOW SCHEMATIC

POWEREX
FLUID AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 FAX: (513) 367-3125

DWG NO: MDRC0507
SIZE: D

MDRC0507.dwg

REV	ZONE	REVISION	DATE	ECN	NAME	CHKD
B-1	ALL	RELEASE TO PRODUCTION	2/3/16	PXEC014	MJD	AEK
C-1	3.5 ALL	UPDATED TO NANO NDL DRYERS	8/10/17	PXEC0174	AEK	GES
D-1	ALL	ADDED INDIVIDUAL COMPONENT WEIGHTS	4/30/18	PXEC0229	GES	DMS



TOTAL UNIT WEIGHT: 7530 LBS

SYMBOL LEGEND
⊖ = MINUS DRAFT
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▽ = ADDITIONAL CONTROL REQ'D
(RHN) = BRINELL HARDNESS

Drawings to conform to the current revision of the following ANSI standards.
Y14.3 Multi and sectional view dwgs.
Y14.5M Dimensioning and tolerancing

TOLERANCES NOT SPECIFIED
.XX ±
.XXX ±
∠(DEG.) ±

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Sheet 5 of 5

SCALE 1: 14

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DRAWN BY	CHECKED BY	APPROVED BY ENGINEERING	APPROVED BY MFG/MRKTG
MJD	AEK	JAA	CT
2/3/16	2/3/16	2/3/16	2/3/16

MATERIAL
N/A

PART NAME
CLAW ENCLOSED COMPRESSOR DUPLEX

400GAL DUAL DESSICANT PACKAGE

POWEREX
A SCOTT FETZER COMPANY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 FAX: (513) 367-3125

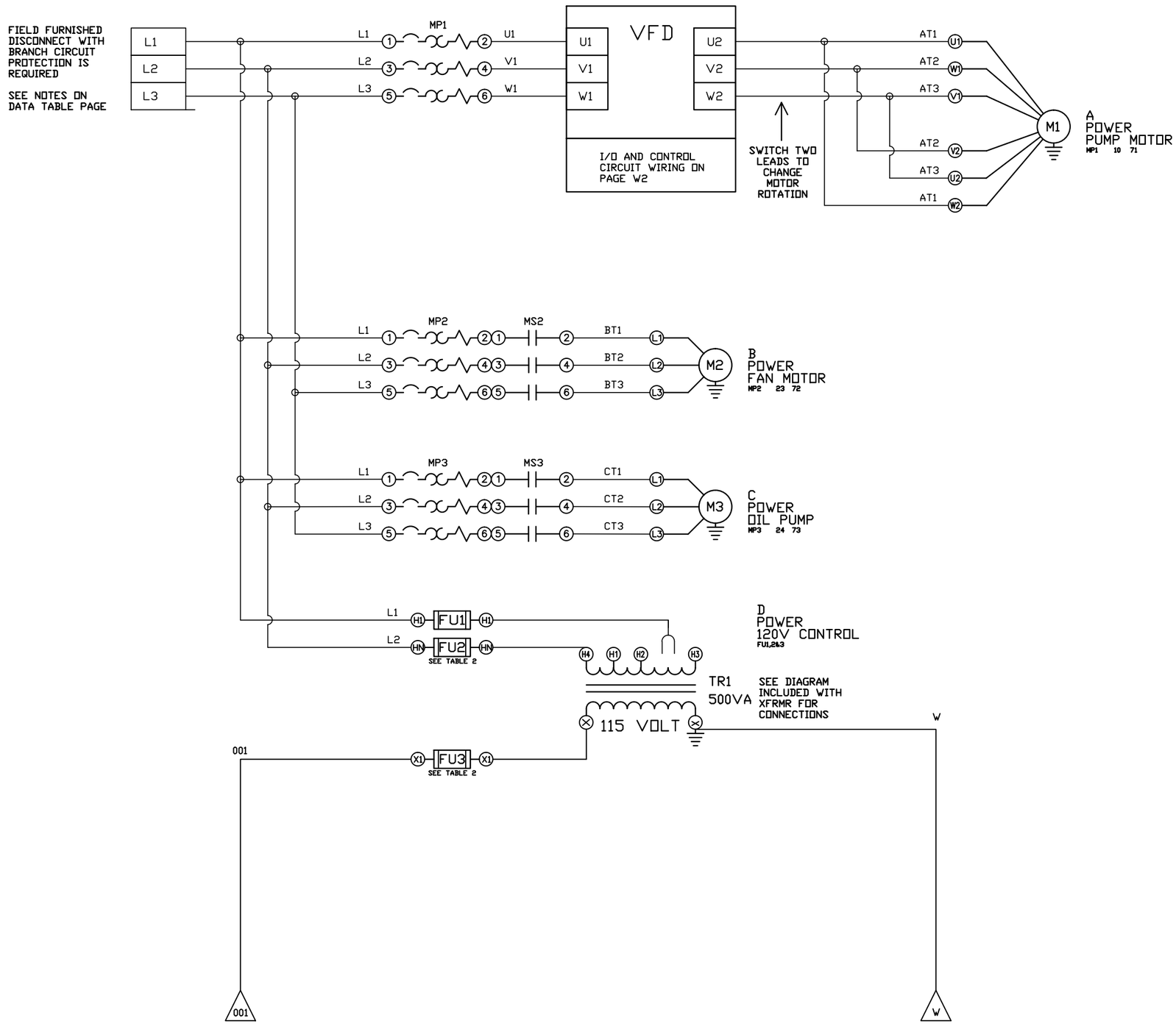
DWG NO MDRC0507

SIZE D

MDRC0507.dwg

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA



OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE WIRING

DWG. NO.

PBMI-CV116

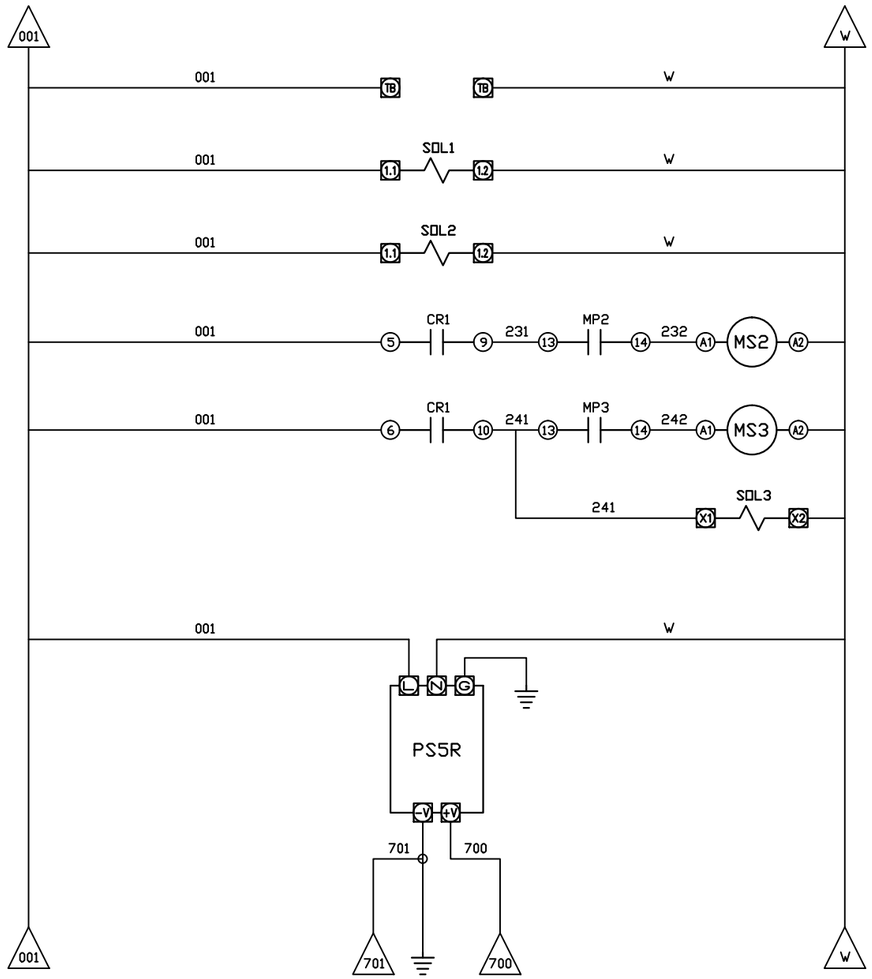
SHEET W-1

SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA



20
120VAC
DEVICE POWER
TANK DRAIN, PNL FANS

21
ELECTRIC DRAIN VALVE
ON INTERCOOLER
SOL1 19 74 TB

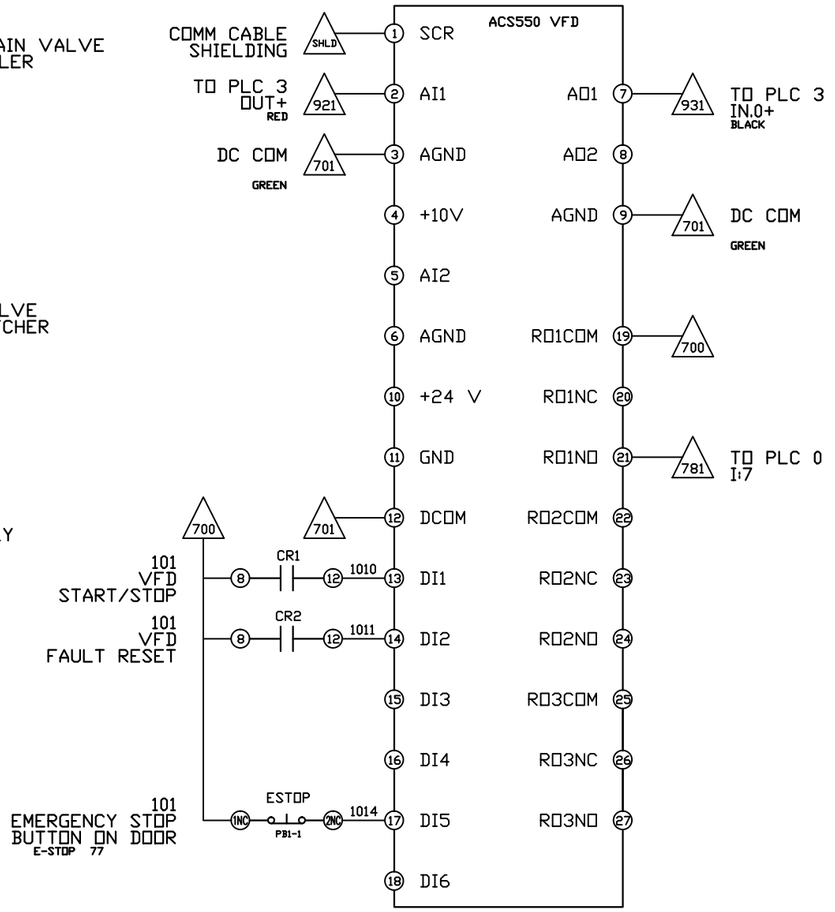
22
ELECTRIC DRAIN VALVE
ON AFTERCOOLER
SOL2 75 TB

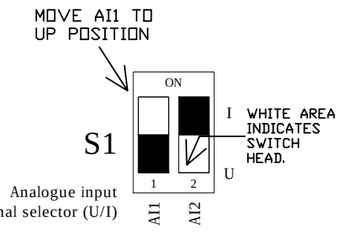
23
CONTROL
FAN
MS2 B

24
CONTROL
OIL PUMP
MS3 C

SOLENOID VALVE
OIL MIST CATCHER
SOL3 TB

70
24 VOLT DC
POWER SUPPLY
30W PS5R





JUMPERS ARE LOCATED AT TOP OF DRIVE NEXT TO TERMINAL NUMBER 1.

OPTIONAL:

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PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE
ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE WIRING

DWG. NO.
PBMI-CV116

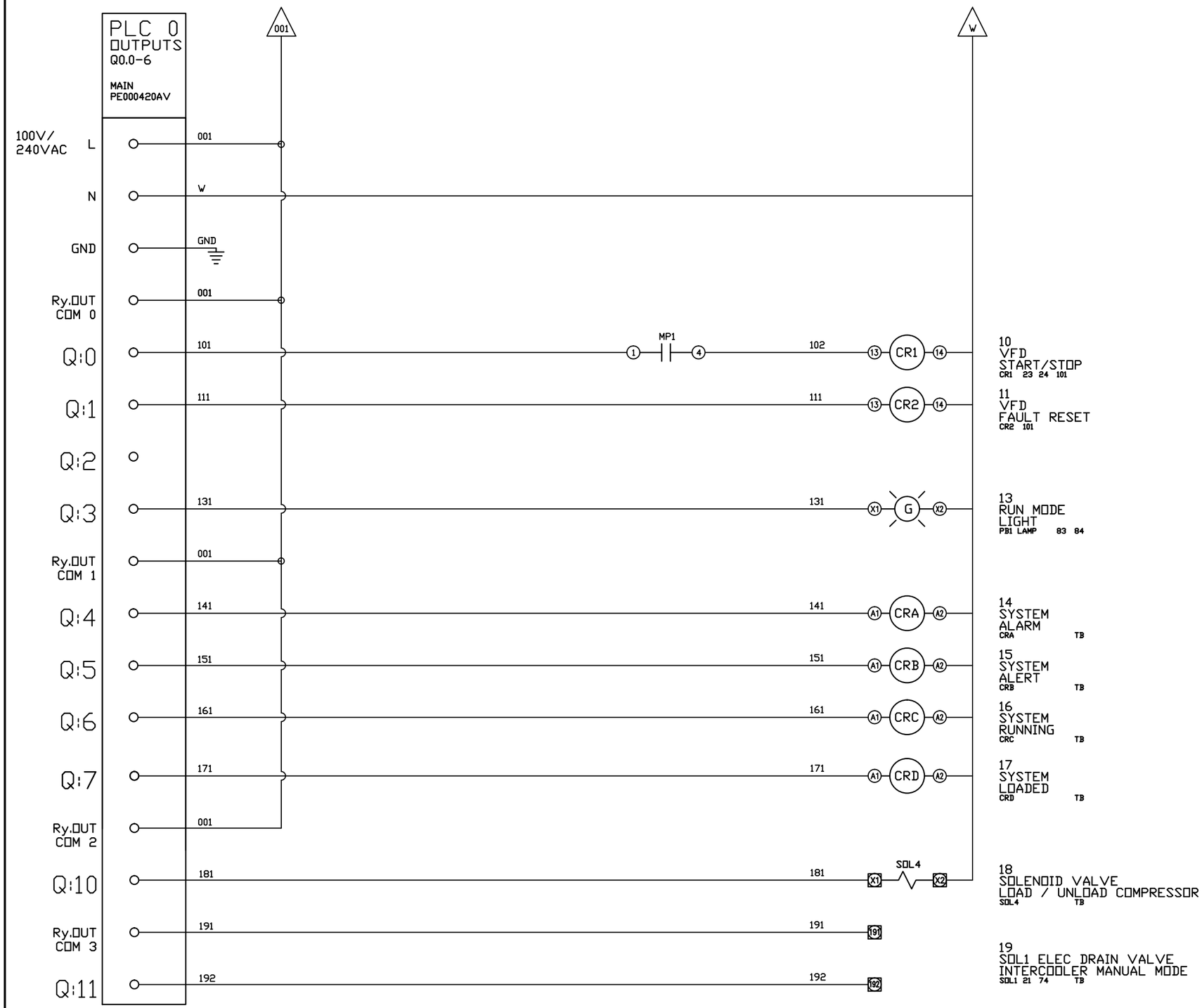
SHEET W-2

SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA



OPTIONAL:

POWEREX
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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR
VFD

DWG. TYPE WIRING

DWG. NO.

PBMI-CV116

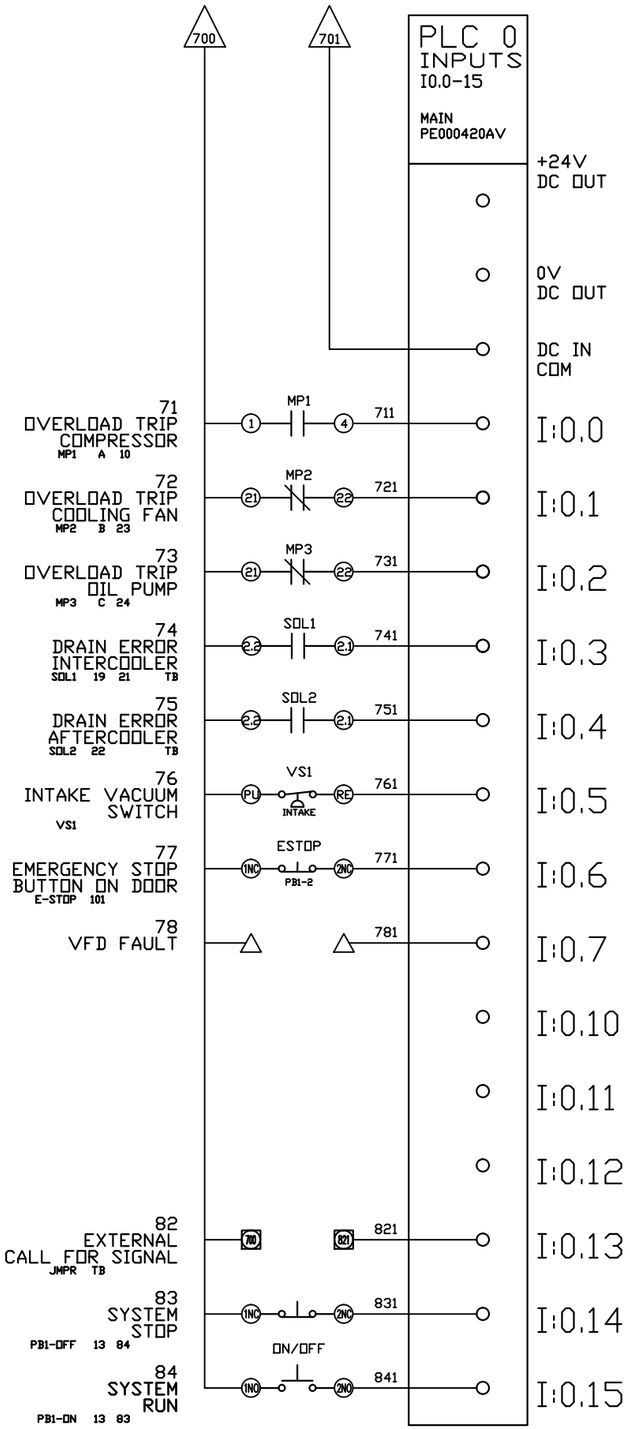
SHEET W-3

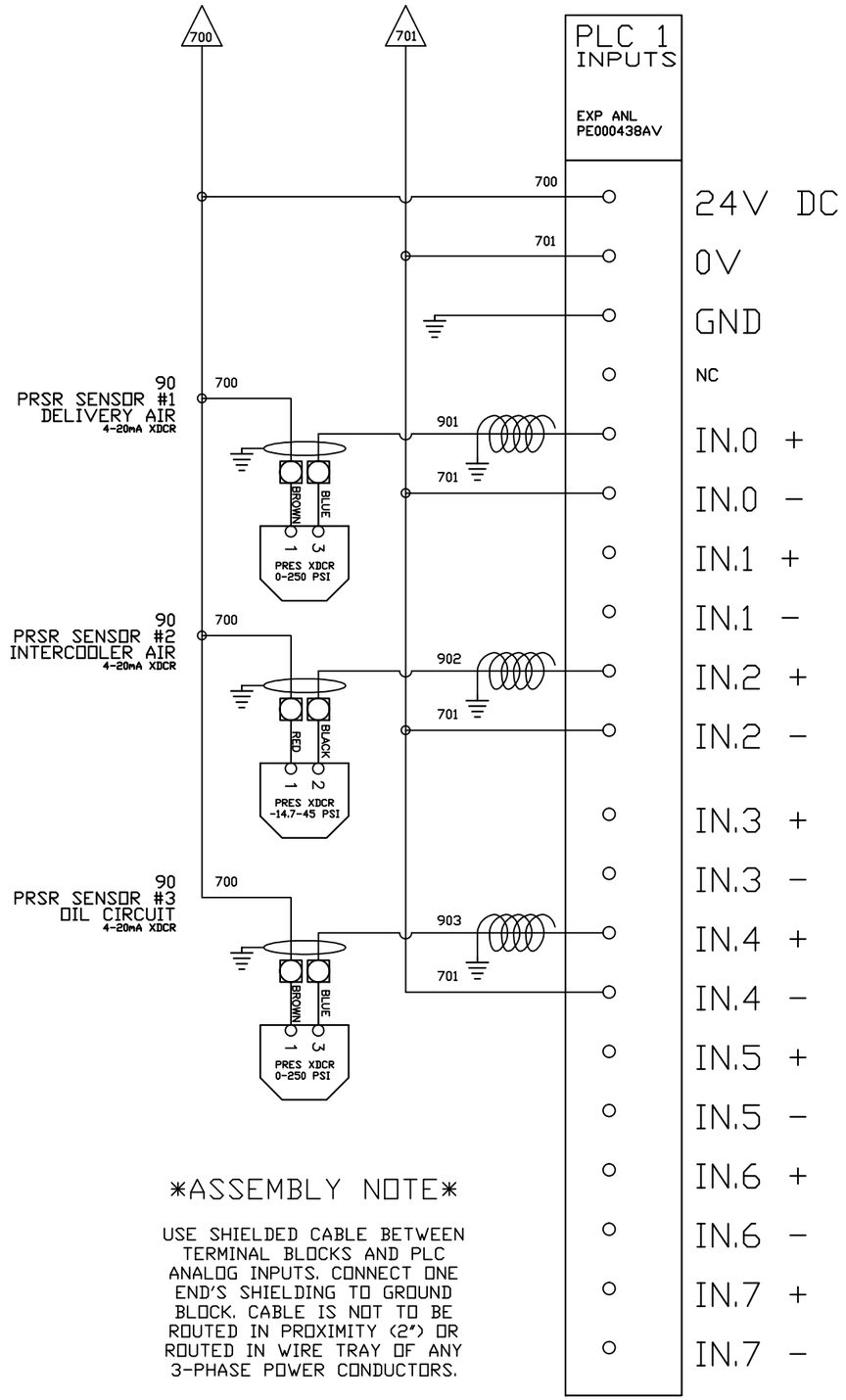
SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA





ASSEMBLY NOTE

USE SHIELDED CABLE BETWEEN TERMINAL BLOCKS AND PLC ANALOG INPUTS. CONNECT ONE END'S SHIELDING TO GROUND BLOCK. CABLE IS NOT TO BE ROUTED IN PROXIMITY (2") OR ROUTED IN WIRE TRAY OF ANY 3-PHASE POWER CONDUCTORS.

OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE WIRING

DWG. NO.

PBMI-CV116

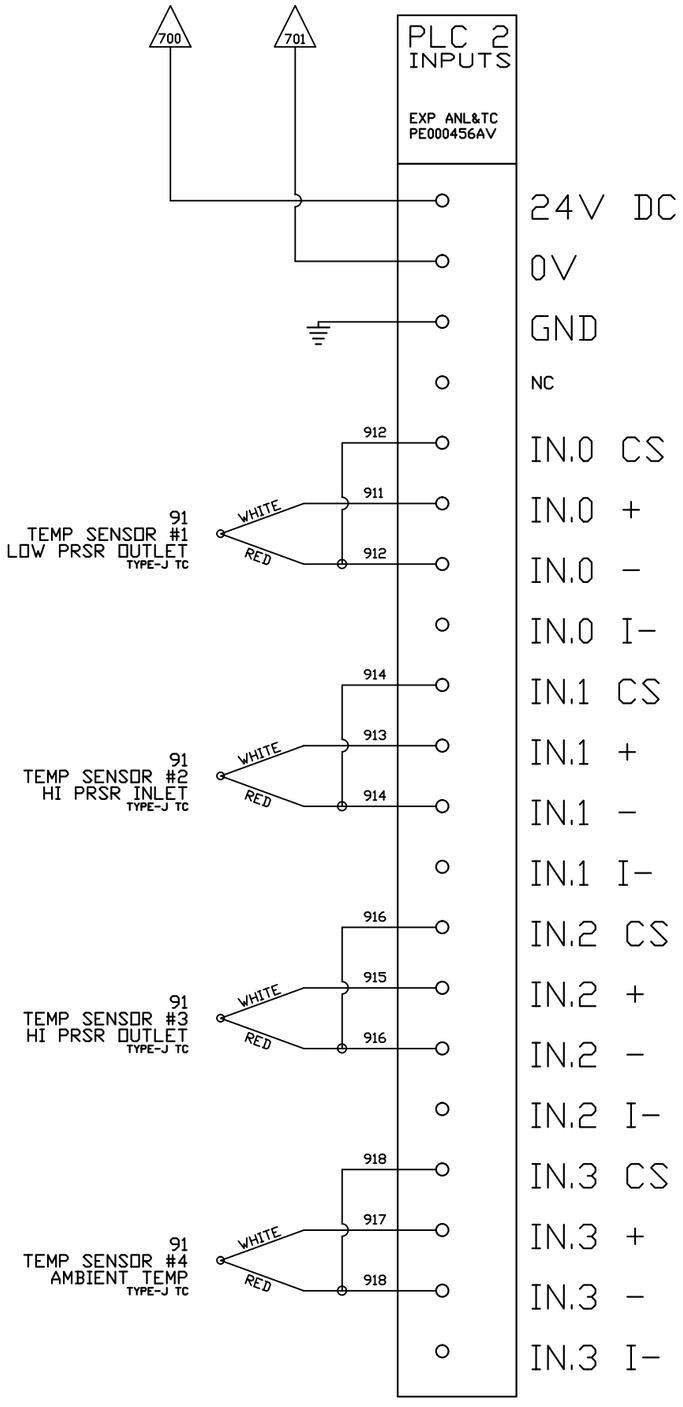
SHEET W-4

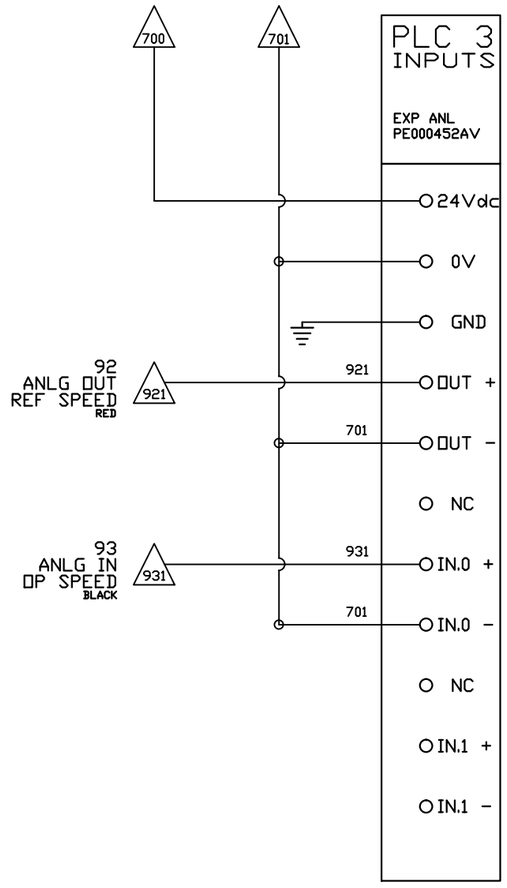
SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA





ASSEMBLY NOTE

TYPE J RED THERMOCOUPLE WIRE MUST BE USED FOR 912, 914, 916, & 918 JUMPER WIRES.

OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE WIRING

DWG. NO.

PBMI-CV116

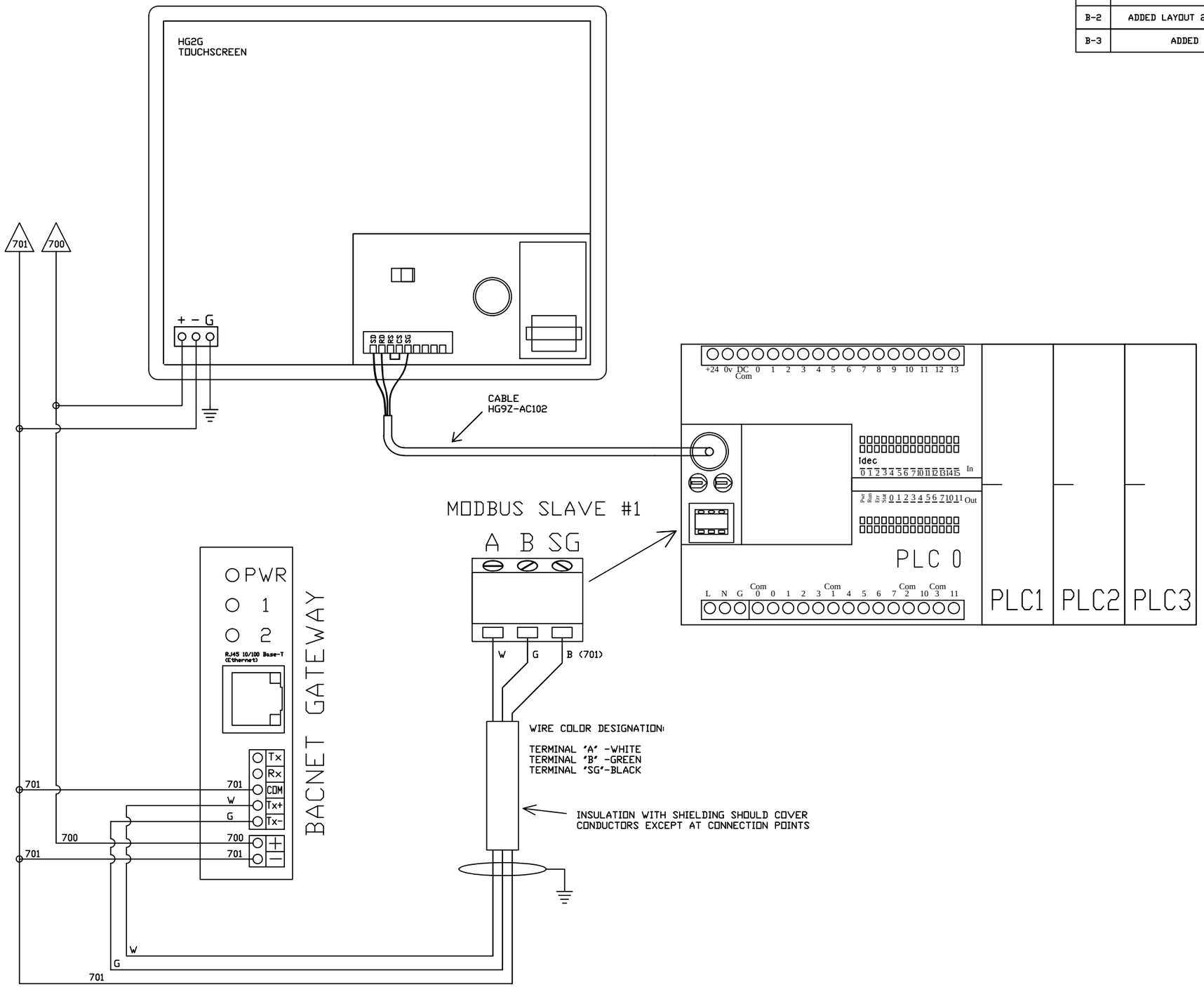
SHEET W-5

SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA



OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

CONFIDENTIAL DISCLOSURE:
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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR
VFD

DWG. TYPE WIRING

DWG. NO.

PBMI-CV116

SHEET W-6

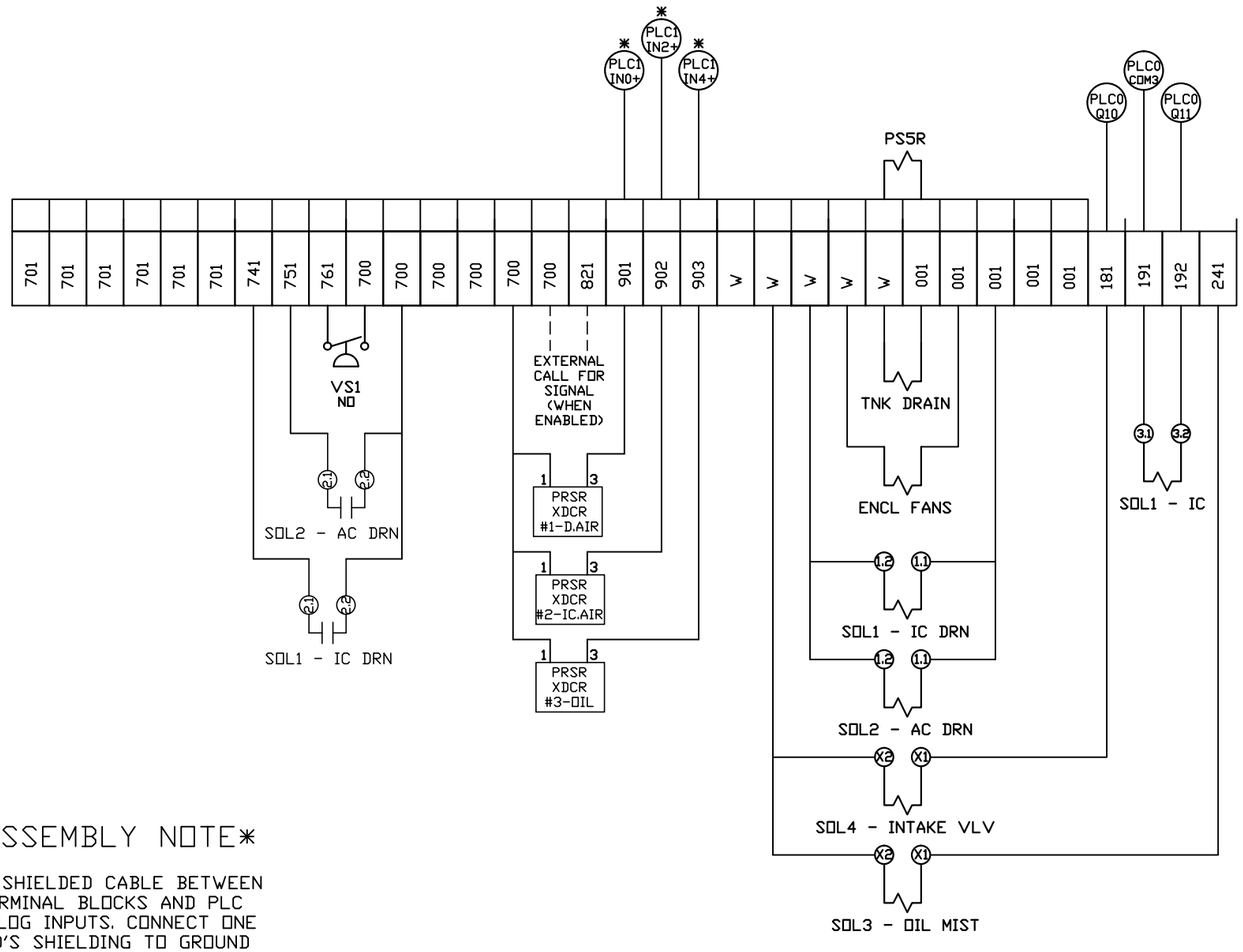
SIZE B

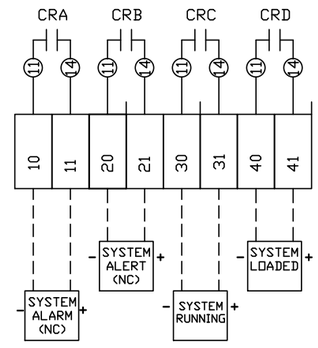
PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA

TERMINAL BLOCKS





DRY CONTACTS FOR CUSTOMER REMOTE ALARM CONNECTION

ASSEMBLY NOTE

USE SHIELDED CABLE BETWEEN TERMINAL BLOCKS AND PLC ANALOG INPUTS. CONNECT ONE END'S SHIELDING TO GROUND BLOCK. CABLE IS NOT TO BE ROUTED IN PROXIMITY (2") OR ROUTED IN WIRE TRAY OF ANY 3-PHASE POWER CONDUCTORS.

OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE WIRING

DWG. NO.

PBMI-CV116

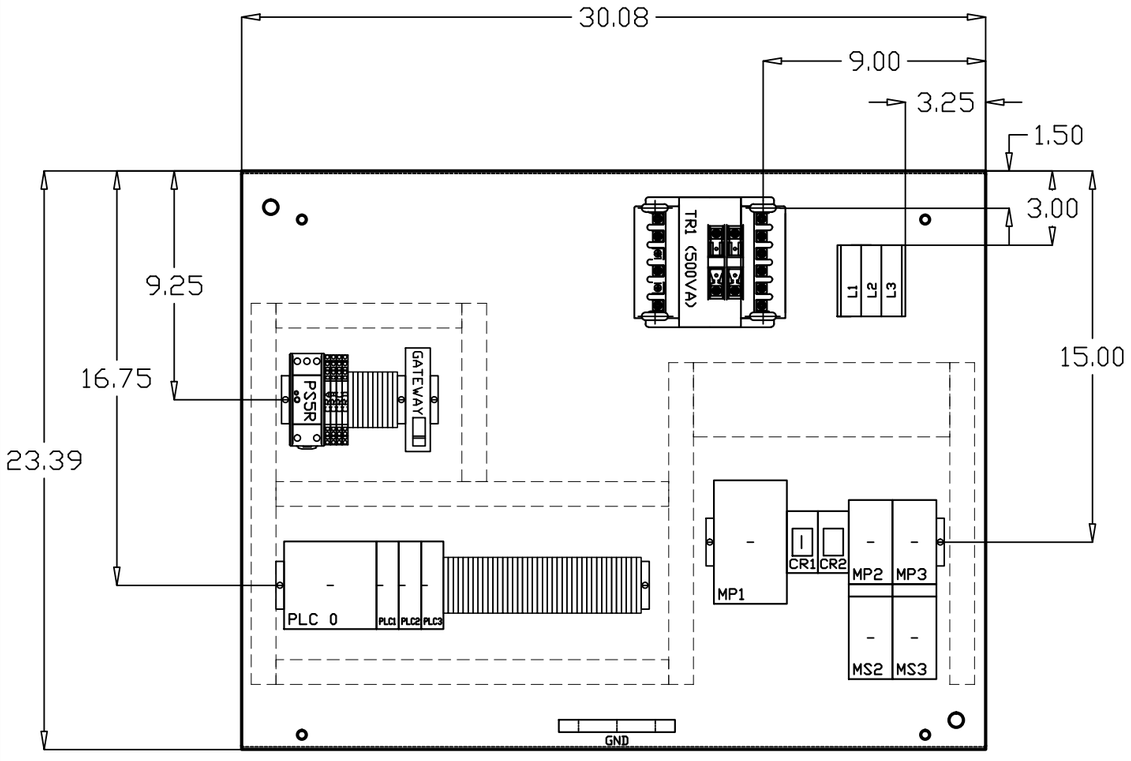
SHEET W-7

SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA



OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE LAYOUT

DWG. NO.

PBMI-CV116

SHEET L-1

SIZE B

PBMI-CV116_B1

ASSEMBLY NOTE

SUBPLATE HAS A DISTINCT TOP AND BOTTOM. CONFIRM BEFORE MOUNTING HARDWARE.

NOTE: VFD located in cabinet bay behind control sub-panel.

Enclosure Wiring

INSTRUCTIONS FOR VFD SUPPLEMENTARY FAN ASSEMBLY:

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA

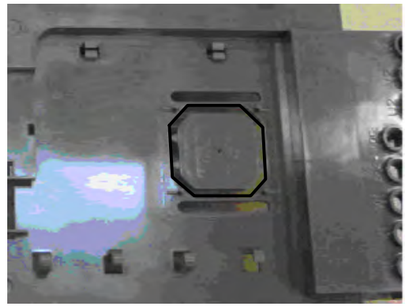
1. Break the tabs holding the octagonal cover in place and discard it.

2. Join the fan and fan finger guard, making sure to point the fan's arrow DOWN, away from the guard's grating and towards the drive itself.

3. Clip the fan and guard assembly into the slotted holes, making sure the fan cord is exiting the guard at the lower right position, as seen in photo #2.

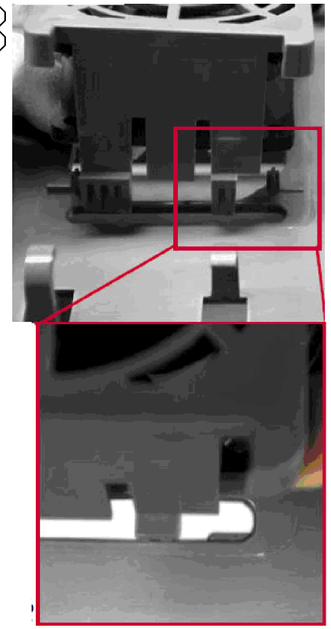
4. Route the fan extension cord as shown in 4A, making a loop around the 2 circled posts, clipping the plug into the receptacle near the top of the drive. Detail shown in 4B.

1

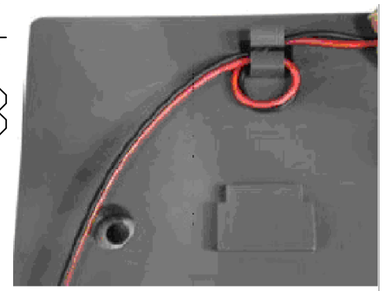


2

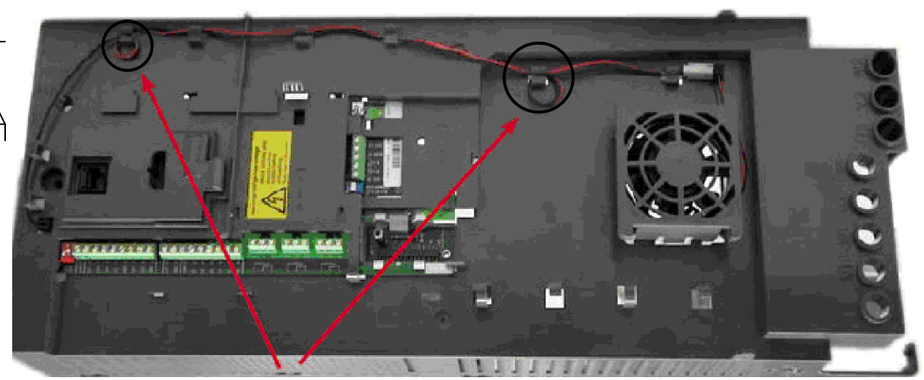
3



4 B



4 A



OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE

ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE LAYOUT

DWG. NO.

PBMI-CV116

SHEET L-2

SIZE B

PBMI-CV116_B1

Enclosure Wiring

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	06/08/15	PXEC0077	KMD	AJL
B-2	ADDED LAYOUT 2 SHOWING VFD SUPP FAN	07/12/16	PXEC0077	KMD	AJL
B-3	ADDED TEMP SENSOR #4	11/06/17	PXEC0187	AKH	JA

TABLE 1

PANEL DATA 3Ø – 60 Hz
500VA CONTROL CIRCUIT

LOAD SPECIFICATIONS							BRANCH CIRCUIT PROTECTION – PROVIDED BY INSTALLER		
PANEL PART NUMBER	COMPRESSOR SIZE	POWER (V/PH/Hz)	(M1) MOTOR LOAD (FLA)	(M2) MOTOR LOAD (FLA)	(M3) MOTOR LOAD (FLA)	PANEL LOAD TOTAL (FLA)	NONTIME DELAY FUSE	TIME-DELAY FUSE	INVERSE-TIME CIRCUIT BREAKER
PBMICV116L2AJ	50	208V/3Ø/60	126	3.1	2.05	137	400A	250A	350A
PBMICV116L3AJ	50	230V/3Ø/60	114	2.8	1.86	125	400A	225A	300A
PBMICV116L4AJ	50	460V/3Ø/60	57.7	1.4	0.9	66	200A	110A	175A

NOTE– ADJUST OVERCURRENT PROTECTION DEVICE NOT TO EXCEED 115% OF MOTOR NAMEPLATE FLA VALUE

CONTROL TRANSFORMERS - 500VA				
FUSE TYPE		208 VOLT	230 VOLT	460 VOLT
FU1,2A FU1,2B	FNQR	6A	5A	5A
FU3A,B	FNM	7A	7A	7A

SEE XFRMR FOR CONNECTIONS

OPTIONAL:

WIRE TYPE TABLE			
VOLTAGE	WIRE NUMBERS	GAUGE	COLOR
120VAC	001-599	16-18AWG	RED/BLK
0VAC	W	16-18AWG	WHT/BLK
24VDC	600-1100	16-18AWG	PURPLE & SHLD CBL
0VDC	701	16-18AWG	PURPLE
GND	–	VARIES	GREEN
CUSTOMER SUPPLY	01-99	16-18AWG	YELLOW

NOTES:

1. RECOMMENDED TIGHTENING TORQUES FOR WIRE TERMINALS:
   208-460 VOLT POWER 120 POUND INCHES
   120 VOLT POWER AND CONTROL 15 POUND INCHES
2. PANEL GROUND MUST BE CONNECTED TO EARTH GROUND
3. INSTALLER TO PROVIDE MAIN DISCONNECTING DEVICE WITH SHORT CIRCUIT PROTECTION FOR THIS ELECTRICAL ASSEMBLY. SEE TABLE 1 ON DATA TABLE PAGE FOR REQUIREMENTS.
4. ALL WIRES MUST BE LABELED ON BOTH ENDS
5. TRANSFORMER IS SIZED FOR LOADS SHOWN ON DRAWING ONLY. DO NOT CONNECT ANY OTHER DEVICES
6. FIELD WIRING INDICATED BY ----------. WIRE TO BE COPPER RATED AT 75° C.
7. DRY CONTACT RATING: 6A 30VDC or 6A 250VAC.
8. △ -INDICATES A DRAWING WIRE CONNECTION TO ANOTHER PAGE.

Sequence of Operations

The VFD operates the rotary tooth compressor by adjusting the frequency of the power to the motor in order to match the pressure demand to what the pump is supplying. The compressor will turn on into the run mode either by pressing the ON switch on the door or after a power cycle if the compressor was in the run mode prior to the power cycle as long as the "automatic restart" feature is enabled.

If the target pressure setting isn't met, the VFD ramps up the main motor along with the oil pump and ventilation fan. Five seconds later the intake valve opens and the compressor is loaded and producing compressed air. The drive will turn the motor between 40 and 105 percent of the motor's nominal speed depending on the system pressure.

If the maximum pressure setting is met, the intake valve is closed, choking the compressor until the system bleeds back down to the minimum pressure setting upon which the intake valve will reopen. This cycle repeats itself as long as necessary until the criteria are met to turn the main motor off. The motor has a seven minute minimum run time (loaded or unloaded) with the final three minutes being unloaded before the main motor will turn off, shutting down the oil pump and ventilation fan with it.

While the pump is running and loaded, pressing the OFF switch on the door switches the unit to the unloaded state for ten seconds before shutting down. If the pump is running but already unloaded, the system will account for the unloaded time already accumulated and take it off of the ten second countdown. The Emergency Stop button on the door should only be used in a state of emergency to shut the compressor down. Otherwise the OFF button should be pushed for the proper shutdown procedure.

POWEREX
PURE AIR TECHNOLOGY

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	KMD
06/08/15	06/08/15	06/08/15

PANEL TYPE
ROTARY TOOTH COMPRESSOR VFD

DWG. TYPE DATA

DWG. NO.
PBMI-CV116

SHEET D-1

SIZE B

PBMI-CV116_B1

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL

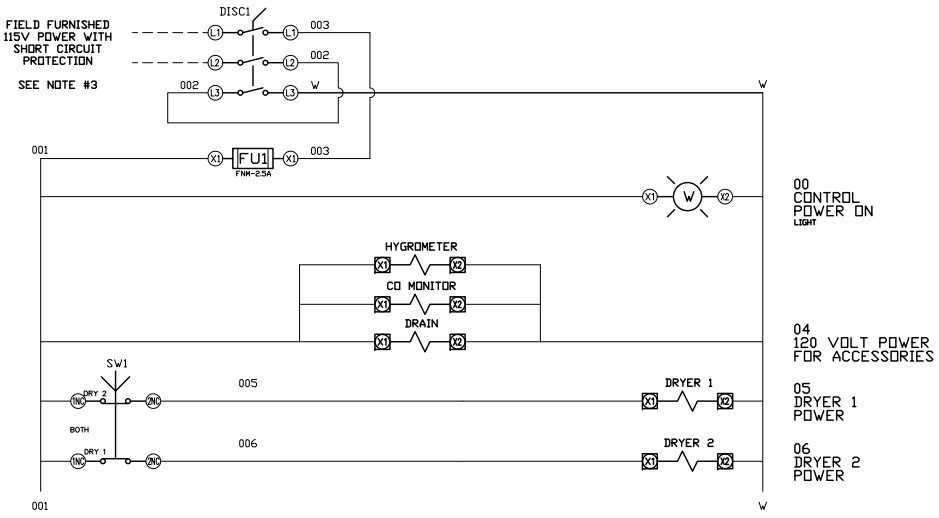

TABLE 1

PANEL DATA		
LOAD SPECIFICATIONS		
PANEL PART NUMBER	POWER (V/PH/HZ)	PANEL LOAD TOTAL (FLA)
PXTM215X1AJ	115/1/60	2A

WIRE TYPE TABLE			
VOLTAGE	WIRE NUMBERS	GAUGE	COLOR
120VAC	001-599	16-18AWG	RED/BLK
0VAC	W	16-18AWG	WHT/BLK
24VDC	600-999	16-18AWG	PURPLE
0VDC	701	16-18AWG	PURPLE
GND	-	VARIES	GREEN
CUSTOMER SUPPLY	01-99	16-18AWG	YELLOW

OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 Fax: (513) 367-3125

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE

NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

DWG. TYPE WIRING

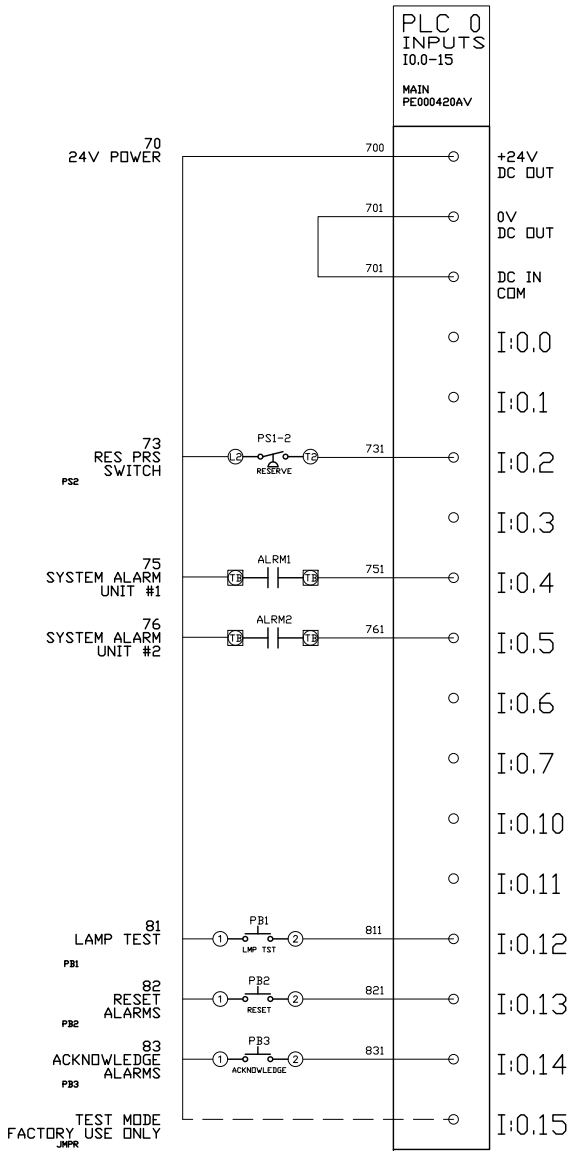
DWG. NO.

PXTM215X1AJ

SHEET W-1

SIZE B

PXTM-215



REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL

WIRE TYPE TABLE			
VOLTAGE	WIRE NUMBERS	GAUGE	COLOR
120VAC	001-599	16-18AWG	RED/BLK
0VAC	W	16-18AWG	WHT/BLK
24VDC	600-999	16-18AWG	PURPLE
0VDC	701	16-18AWG	PURPLE
GND	-	VARIES	GREEN
CUSTOMER SUPPLY	01-99	16-18AWG	YELLOW

OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 Fax: (513) 367-3125

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE

NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

DWG. TYPE WIRING

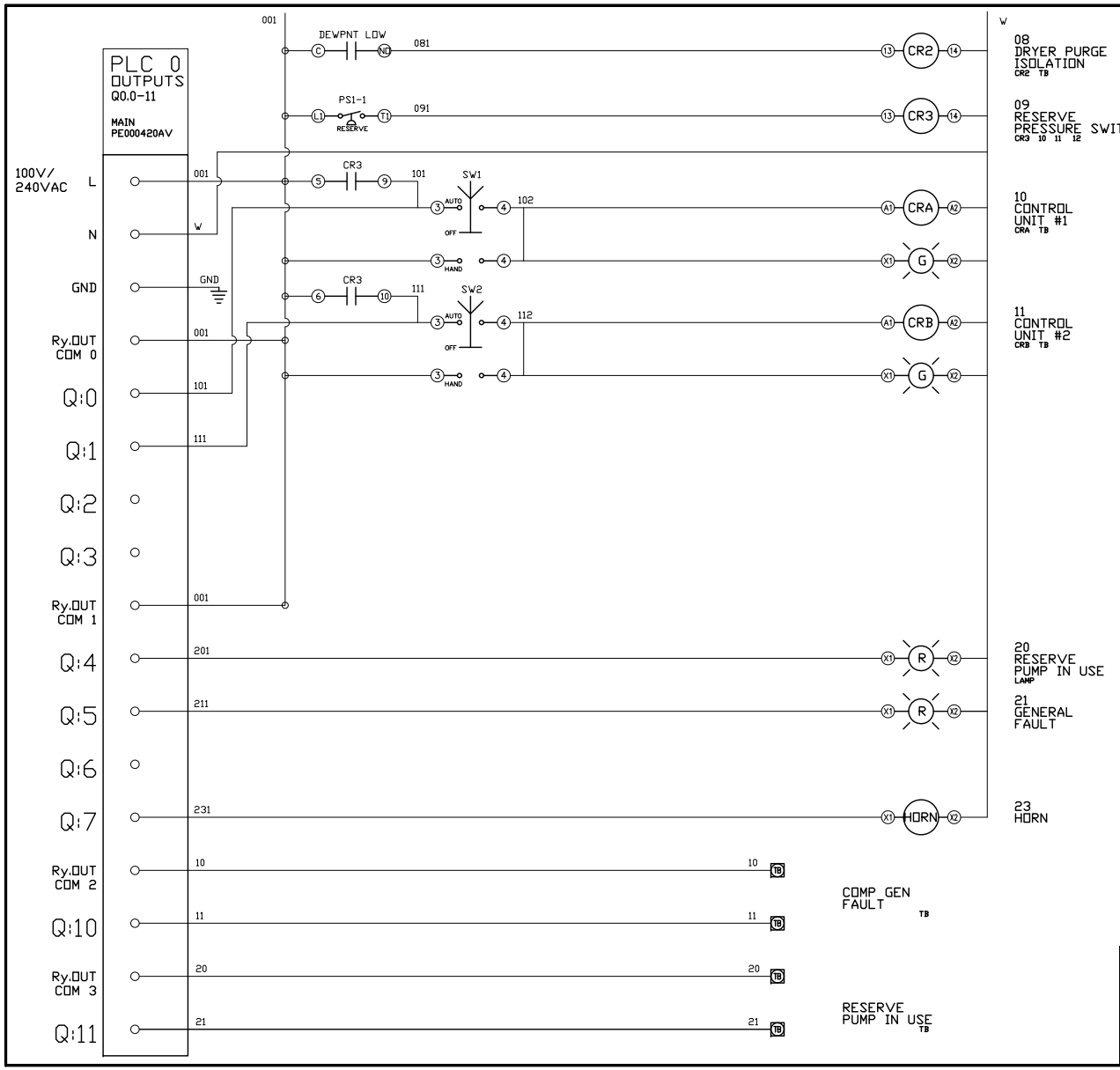
DWG. NO.

PXTM215X1AJ

SHEET W-2

SIZE B

PXTM-215



REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL

WIRE TYPE TABLE			
VOLTAGE	WIRE NUMBERS	GAUGE	COLOR
120VAC	001-599	16-18AWG	RED/BLK
0VAC	W	16-18AWG	WHT/BLK
24VDC	600-999	16-18AWG	PURPLE
0VDC	701	16-18AWG	PURPLE
GND	-	VARIES	GREEN
CUSTOMER SUPPLY	01-99	16-18AWG	YELLOW

OPTIONAL:

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE

NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

DWG. TYPE WIRING

DWG. NO.

PXTM215X1AJ

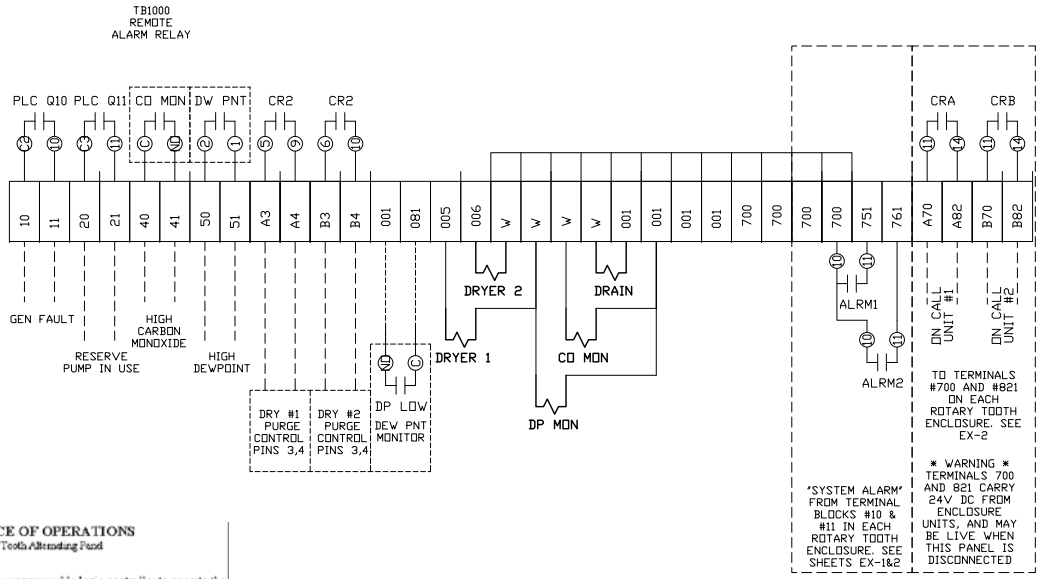
SHEET W-3

SIZE B

PXTM-215

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL

TERMINAL BLOCKS



SEQUENCE OF OPERATIONS
Rotary Tooth Alternating Panel

Each rotary tooth unit utilizes a programmable logic controller to operate the pump based on pressure demand. The controller also monitors the system for a System Alarm due to an overload trip, high temperature condition, low oil pressure or service alarm and signals the main alternating panel when an error occurs. The onboard HMI will display the fault cause which must be cleared at the rotary tooth unit first, then the alternation panel.

Depending on the overall system's plex size, the alternating panel will place each rotary tooth unit on call as the "Lead", "Lag-1", "Lag-2", or "Reserve". The call comes by way of a low voltage signal which is based on the alternating sequence and the system demand. When a system is placed on call, that call will remain active for 7-minutes via programmed minimum run timers. This is to prevent quick starts & stops during cycle alternation.

In a Quad configuration the alternating system operates as follows: one unit, the "Lead", is always on call from the alternating panel. The next unit is the "Lag-1" which is called for based on pressure switch #1's setting. The next unit is "Lag-2" which is called for based on pressure switch #2's setting. The last unit is the "Reserve" which is based on pressure switch #3's setting. For a triplex, "Lag-2" will not be present, and for a duplex only "Lead" and "Reserve" will be in service. Each enclosure will alternate into the "Lead" every 18-hours to equalize the runtime on each system.

The alternating panel is pre-wired and programmed to operate the entire system. For the system to operate correctly, each rotary tooth unit must be enabled to be controlled externally. To do that navigate to the "System Setup" page on each rotary tooth HMI and change the "External Control" mode to "On". To disable a unit from the alternation sequence, press the red portion of the red/green switch beside the rotary tooth's HMI. To re-enable the unit to be controlled externally by the alternation panel, repeat the steps above to turn the "External Control" mode back "On". Do not press the green portion of the physical switch beside the HMI. That action will turn the unit on independently from the alternation panel's call for signals.

All wiring connections between the alternation panel and each rotary tooth should be made through the labeled terminal blocks. Reference the alternation panel's wiring schematics when performing the connections.

NOTES:

1. RECOMMENDED TIGHTENING TORQUES FOR WIRE TERMINALS:
   115 VOLT POWER, CONTROL 20 POUND INCHES
   AND LOW VOLTAGE
2. PANEL GROUND MUST BE CONNECTED TO EARTH GROUND
3. INSTALLER TO PROVIDE MAIN DISCONNECTING DEVICE WITH SHORT CIRCUIT PROTECTION FOR THIS ELECTRICAL ASSEMBLY.
4. ALL WIRES MUST BE LABELED ON BOTH ENDS
5. PANEL IS SIZED FOR LOADS SHOWN ON DRAWING ONLY.
   DO NOT CONNECT ANY OTHER DEVICES
6. ALL REMOTE ALARM CONTACTS ARE ENERGIZED (CLOSED) IN GOOD CONDITION AND DE-ENERGIZED (OPEN) FOR ALARM.

FIELD CONNECTIONS REQUIRED

OPTIONAL:

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PURE AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 Fax: (513) 367-3125

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE
NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

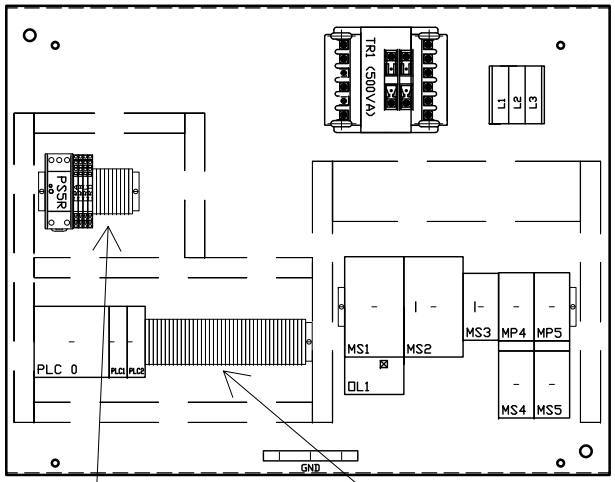
DWG. TYPE WIRING

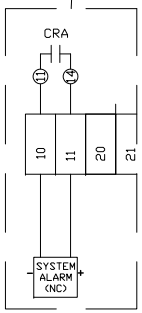
DWG. NO.
PXTM215X1AJ

SHEET	SIZE
W-4	B

PXTM-215

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL

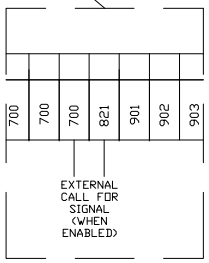




SYSTEM ALARM WIRING BETWEEN ALTERNATION PANEL & ROTARY TOOTH PANEL

700/751 OR 700/761

SEE TERMINAL BLOCKS ON SHEET W-4



EXTERNAL CALL FOR SIGNAL WIRING BETWEEN ALTERNATION PANEL & ROTARY TOOTH PANEL

A/B 70/82

SEE TERMINAL BLOCKS ON SHEET W-4

OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY
150 PRODUCTION DRIVE, HARRISON, OHIO 45030
Ph: 888-769-7979 Fax: (513) 367-3125

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE

NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

DWG. TYPE EXT CONNECT

DWG. NO.

PXTM215X1AJ

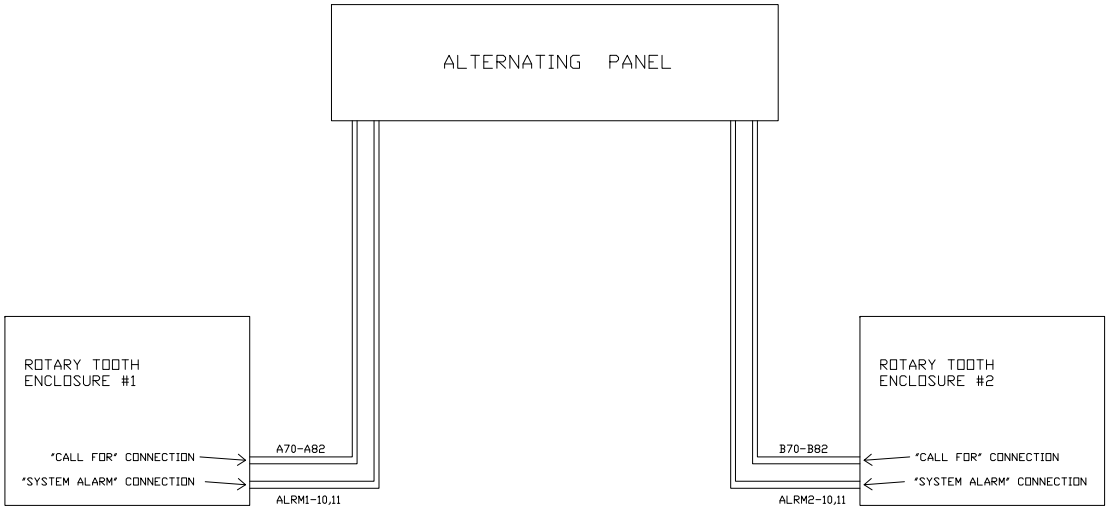
SHEET EX-1

SIZE B

PXTM-215

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL

"CALL FOR" AND "SYSTEM ALARM" SIGNALS ARE SOURCED 24VDC. NO EXTERNAL VOLTAGE IS REQUIRED.
LOW VOLTAGE CONDUCTORS 16-20 AWG (THHN, MTW TYPE) ARE SUFFICIENT.



OPTIONAL:

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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE

NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

DWG. TYPE EXT CONNECT

DWG. NO.

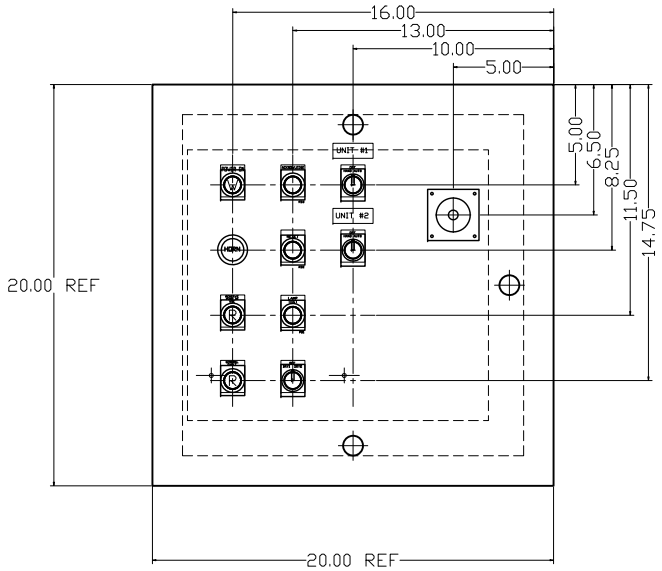
PXTM215X1AJ

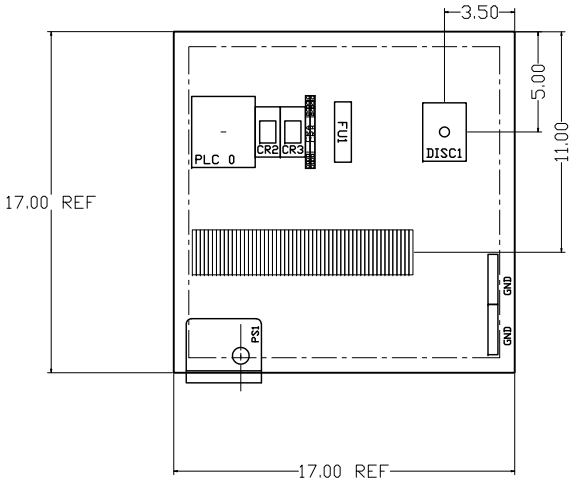
SHEET EX-2

SIZE B

PXTM-215

REV	REVISION	DATE	ECN	NAME	CHKD
B-1	RELEASE TO PRODUCTION	01/22/16	PXEC0138	KMD	AJL





OPTIONAL:

POWEREX
PURE AIR TECHNOLOGY

150 PRODUCTION DRIVE, HARRISON, OHIO 45030
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DRAWN BY	CHECKED BY	ENGINEERING APPROVAL
KMD	AJL	DMS
01/22/16	02/02/16	02/02/16

PANEL TYPE

NFPA ROTARY TOOTH DUPLEX ALTERNATION PANEL

DWG. TYPE LAYOUT

DWG. NO.

PXTM215X1AJ

SHEET L-1

SIZE B

PXTM-215

POWEREX®

PURE AIR TECHNOLOGY

Rotary Tooth Oil-Free Medical Air Systems

OIL-FREE ROTARY TOOTH TECHNOLOGY

The Powerex Medical Rotary Tooth Compressor Systems are designed to provide medical breathing air for hospital and medical institutions. All Powerex medical air packages meet NFPA 99 requirements for Risk Category 1 systems.

COMPRESSION PRINCIPLE

Intake
Begin compression
Compression
Discharge

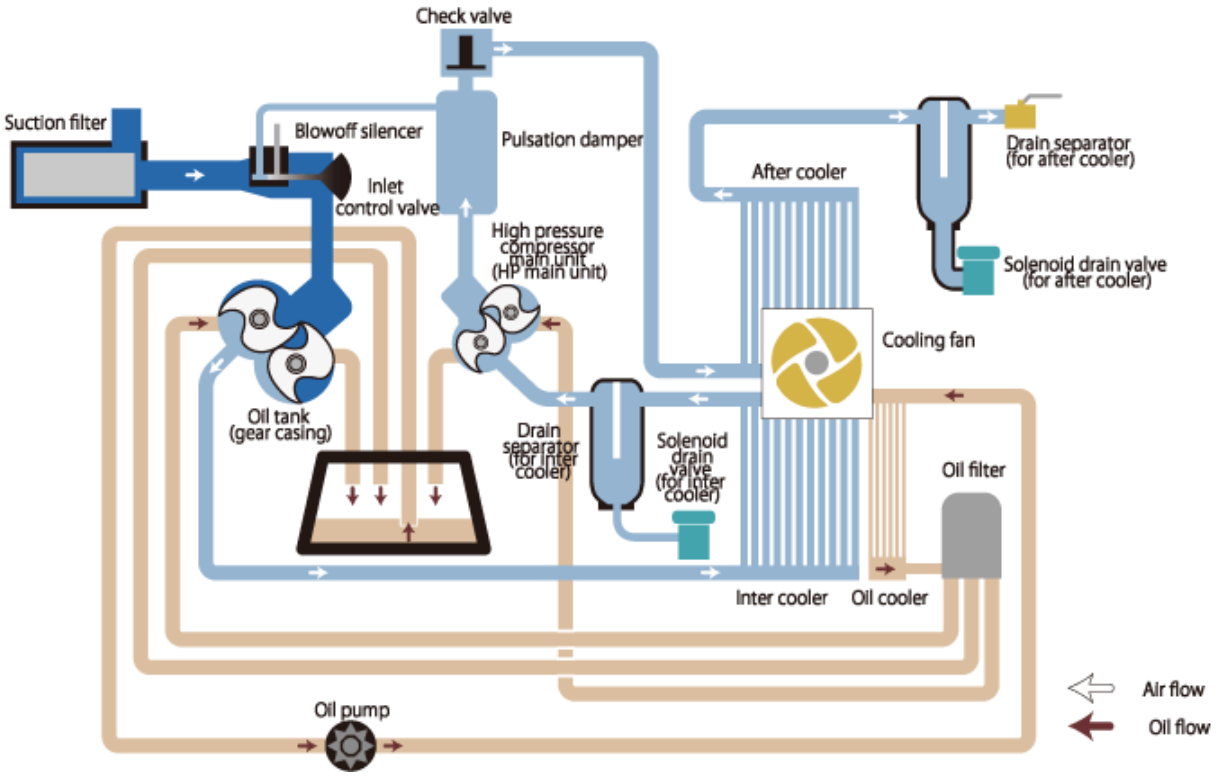
As the teeth rotate in opposite directions, they suck in air, then begin compression as the air is sealed in the chamber. As the teeth continue to rotate, they compress the air further, which is then discharged through the outlet.

WhisperAIR™ SOUND ENCLOSURE CABINET

WhisperAIR™ OIL-FREE ROTARY TOOTH

Powerex's trademarked oil-free enclosure systems offer the lowest noise levels in the industry. Each system is packaged in a rigid steel frame with powder coated panels and lined with sound-deadening insulation. The low noise levels are unmatched in the industry and allow installation at the point of use, while the small footprint simultaneously maximizes floor space.

AIR/OIL FLOW



50 HP MODEL

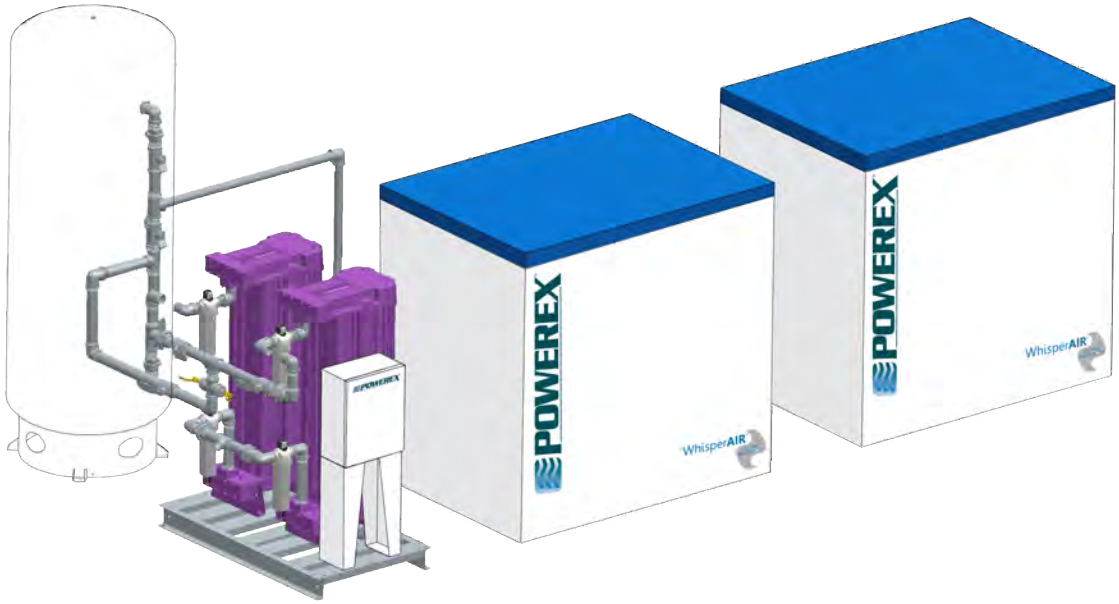
- Quiet operation – enclosure reduces sound to 68 dB(A).
- 100% oil-free air – ISO 8753-1 Class "0" equivalent.
- Smallest system footprint in its class – saves valuable floor space.
- Symmetrical, precision stainless steel rotors optimize pump performance and improve bearing life.
- Air cooling requires no additional cooling water system – greater simplicity and reliability.
- High quality, zero-loss condensate drains.
- Maintenance-free water separators.
- Advanced color HMI touchscreen control panel.
  - Real-time temperature and pressure graphs.
  - Easily programmable limits.
  - Internal data-logging, able to be extracted via USB.
- Dry contacts for remote monitoring with optional BACnet gateway.

OPTIONAL VFD CONTROLLER

- Saves up to 35% in energy costs vs. standard Load/Unload.
- System runs at the target psi vs. max.
- Reduces waste from system running in unload.

STANDARD NFPA 99 FEATURES

- Multiple rotary tooth air compressors and associated equipment.
- Master control panel.
- Corrosion resistant air receiver.
- Redundant medical desiccant air dryers with purge control.
- Dewpoint and CO monitors.
- Dual filtration systems including activated carbon filters.
- Dual regulators and safety valves.



SYSTEMS SPECIFICATIONS

Model	HP	Control	Maximum Pressure (PSIG)	SCFM @ 100 PSIG*	Tank Size (gal)
MDRC0507K	50 (2)	Load/Unload	109	204	400
MDRC0507F	50 (2)	VFD	109	67-207	400
MTRC0507K	50 (3)	Load/Unload	109	408	400
MTRC0507F	50 (3)	VFD	109	134-414	400
MQRC0508K	50 (4)	Load/Unload	109	612	660
MQRC0508F	50 (4)	VFD	109	201-621	660

**Shown with one compressor in reserve per NFPA 99.*

nano
PURIFICATION SOLUTIONS

D-Series

ultra-high purity compressed air dryers

flow capacity: 3 - 1110 scfm (5 -1900 Nm^3/hr)

$D^1/D^2/D^3$

D-Series
ultra-high purity compressed air dryers
flow capacity: 3 - 1110 scfm (5 - 1900 Nm^3/hr)

$D^1/D^2/D^3$

Leading edge technology and more than 100 years of **experience**...nano-purification solutions, your world-class provider of state-of-the-art compressed air and gas solutions to industry.

Our commitment at n-psi is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

A wealth of experience and leading edge products are only part of the equation. n-psi realize that world-class customer **service** is the most important component to any successful business.

Experience.Customer.Service...**n-psi**

Clean and Dry

Clean and dry compressed air is essential in every efficient and profitable manufacturing and process operation worldwide. nano-purification solutions' vast experience includes food, beverage, chemical, laboratory, medical and natural gas applications.

n-psi understands your needs and has created the nano range of high-performance, energy-saving compressed air and gas purification products to provide clean and dry compressed air and gases at an affordable price with unrivaled reliability.

Design

Our experienced team of design engineers are world leading specialists in the design of new and unique industrial compressed air treatment products and compressed air dryers.

Research & Development

A core element of our capabilities - founded on cumulative decades of practical engineering expertise - our R&D team is continually looking for improved performance and reliability.

Manufacture

Ultra-high purity compressed air dryers are manufactured at our state of the art facility to the highest standards of build quality to ensure equipment reliability and high levels of performance.

nano D-Series compressed air dryers

Clean and dry compressed air is easily achieved with the nano D-Series ultra-high purity compressed air dryers.

D-Series dryers reliably give you:

- More for your money - everything needed for installation is in the box
- Moisture & particulate protection of your production process
- Lower life cycle costs - low energy costs and simplified maintenance
- Built in dewpoint monitoring (optional)
- Space saving - models up to 177 scfm can be easily wall mounted
- Safe and quiet operation
- Flows 3 - 1110 scfm at 100 psig operating pressure
- Peace of mind - The most reliable product of its kind

Designed for use in the compressor room, at the point of application or integrated into your original equipment, nano dryers are an effective solution to the problems caused by contaminated compressed air.

Reliability is built in... and backed by our 5 year product warranty!

benefits - get more for your money

Guaranteed Performance

- The nano D-Series dryers have been 100% function and performance tested at the factory to ensure the highest standard of performance, delivering compressed air purity in accordance with ISO8573:1 – 2001, Class 2 dirt (1 micron) and Class 2 water (-40^{o} F pressure dewpoint)

Reliable Operation

- High efficiency moisture removal and reliable operation with PLC controlled solenoid valves
- Integral volumetric flow limiter prevents overflow ensuring consistent dewpoint performance

Quiet Depressurization

- Unique exhaust air silencers significantly reduce noise levels

Energy Saving Design

- Integrated outlet filtration eliminates the need for external after filter
- Advanced design limits regeneration purge air usage to approximately 15%
- Energy saving dewpoint monitoring option can save up to 60% during reduced inlet moisture loading

PLC Controls and Digital Display

- A clear digital display provides a full view of PLC operation and monitoring data

High Quality Construction

- 100% tested for leaks, proper operation and dewpoint performance

Easy to Install Space Saving Design

- Easy to install & ready for use, the D1/D2 packages include a power cable and mounting brackets for either floor or wall mounting
- The compact design of the D3 allows installation in spaces too small for a traditional dryer

Easy to Maintain

- Patented, combined filter and desiccant cartridges (D1/D2) can be serviced in less than 15 minutes
- Integrated filtration
- Convenient service kits for easy and efficient maintenance
- Integrated exhaust air silencers require no maintenance or replacement

D-Series nano dryers – D3 in detail

Combined desiccant & after filter column.

- High density filled desiccant columns provides maximum adsorption capacity
- Built in after filter ensures reliable downstream air quality

PLC controlled operation

- The dryer is operated by a robust and reliable PLC control system, offering valuable features including 'power on', 'hours run' and 'service required' indicators
- Memory retention built into the PLC enables the controller to pick up where it left off in the drying cycle, ensuring consistently clean and dry air downstream
- Compressor synchronization is a standard energy saving feature which starts and stops the dryer with a signal from the compressor or point-of-use equipment to eliminate purge loss when drying is not required

Energy saving dewpoint control option

- With this option, a dewpoint sensor is incorporated into the dryer providing the ultimate in energy savings
- The outlet dewpoint is constantly monitored allowing the cycle time to be adjusted depending on the actual moisture load - saving valuable purge air
- Dewpoint is conveniently displayed on the PLC

Optimum dewpoint performance

- D-Series dryers are provided as standard set for a -40°F dewpoint. Optional dewpoints from -4°F to -100°F are available

Constant flow and pressure

- Pressure is equalized before switching columns to ensure uninterrupted compressed air and consistent air pressure. Equalization also ensures long desiccant life due to minimized desiccant attrition

Two stage maintenance free silencer

- Exhaust air is directed into perforated chambers housed within the lower manifold eliminating external mufflers. The air is then directed under the dryer away from operators and traffic lanes in the compressor room

Maximum corrosion protection

- High tensile aluminum columns are first alocromed and then externally powder coated to provide maximum protection for corrosive environments

PLC controller with clear text display

High density filled desiccant columns

Flexibility is built right in

We've designed the D-Series[3] with simplicity of service in mind. As standard, the columns are high density filled and include a built in after filter for reliable downstream air quality. For even greater ease of service, pre-filled and pre-assembled desiccant / after filter cartridges are available as a time saving option.

Reliable high performance valves

Inlet, exhaust and outlet air are controlled using coaxial flow valves integrated into the upper and lower manifolds. The valves provide unrestricted flow capacity and are designed for durability, ease of maintenance and long service life.

sizing & specifications

Model	Maximum Rated Flow [1]	Inlet & Outlet Connections		Dimensions inches (mm)				Approximate Weight	Model with Energy Saving Dewpoint Sensor	Service Kit (Desiccant or Cartridges) [2]
	scfm (Nm³/hr)	Size	Type	A	B	C	D	lbs (kg)		
D-Series[1]										
NDL 010	3 (5.1)	3/8"	Push to Connect	17 (447)	9 (241)	6 (160)	10 (252)	18 (8.3)	NDL 010 ES	NDK 010
NDL 020	5 (8.5)			17 (447)	9 (241)	6 (160)	10 (252)	18 (8.3)	NDL 020 ES	NDK 020
NDL 030	10 (17)			25 (647)	9 (241)	6 (160)	10 (252)	28 (13)	NDL 030 ES	NDK 030
NDL 040	15 (26)			35 (897)	9 (241)	13 (330)	10 (252)	36 (16)	NDL 040 ES	NDK 040
NDL 050	24 (41)	1/2"		43 (1097)	9 (241)	13 (330)	10 (252)	43 (19)	NDL 050 ES	NDK 050
D-Series[2]										
NDL 060	34 (58)	1"	NPT	30 (734)	17 (440)	12 (295)	13 (335)	88 (40)	NDL 060 ES	NDK 060
NDL 070	41 (70)			30 (734)	17 (440)	12 (295)	13 (335)	88 (40)	NDL 070 ES	NDK 070
NDL 080	53 (90)			36 (914)	17 (440)	12 (295)	13 (335)	119 (54)	NDL 080 ES	NDK 080
NDL 090	66 (112)			36 (914)	17 (440)	12 (295)	13 (335)	119 (54)	NDL 090 ES	NDK 090
NDL 100	88 (150)			43 (1089)	17 (440)	12 (295)	13 (335)	141 (64)	NDL 100 ES	NDK 100
NDL 110	106 (180)			49 (1239)	17 (440)	12 (295)	13 (335)	172 (78)	NDL 110 ES	NDK 110
NDL 120	132 (224)			59 (1489)	17 (440)	12 (295)	13 (335)	209 (95)	NDL 120 ES	NDK 120
NDL 130	177 (301)			72 (1839)	17 (440)	12 (295)	13 (335)	262 (119)	NDL 130 ES	NDK 130
D-Series[3]										
NDL 2110	212 (360)			47 (1186)	12 (295)	25 (625)	-	366 (166)	NDL 2110 ES	NDK 2110
NDL 2120	276 (469)	2"	NPT	57 (1435)	12 (295)	25 (625)	-	441 (200)	NDL 2120 ES	NDK 2120
NDL 2130	400 (680)			70 (1786)	12 (295)	25 (625)	-	547 (248)	NDL 2130 ES	NDK 2130
NDL 3130	560 (951)			70 (1786)	12 (295)	31 (792)	-	778 (353)	NDL 3130 ES	NDK 3130
NDL 4130	750 (1274)	2-1/2"	NPT	70 (1786)	12 (295)	38 (960)	-	1010 (458)	NDL 4130 ES	NDK 4130
NDL 6120	828 (1407)			57 (1435)	12 (295)	51 (1295)	-	1155 (524)	NDL 6120 ES	NDK 6120
NDL 6130	1110 (1886)			70 (1786)	12 (295)	51 (1295)	-	1473 (668)	NDL 6130 ES	NDK 6130

If dryer is to be installed downstream of an oil lubricated compressor, install a nano F1 M01 (0.01 micron) coalescing filter immediately upstream. To order with a pre-filter add "-F" to the model number (i.e. NDL 120-F). See Price List or contact support@n-psi.com for recommended filtration.

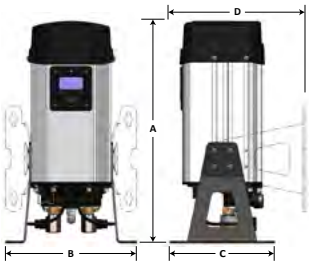
(1) Maximum Rated Inlet Flow assumes an inlet air pressure of 100 psig (7.0 barg) and temperature of 100°F (37.7°C).
(2) NDL 010 to 130 service kit includes desiccant cartridges with built in after filter. NDL 2110 to 6130 service kit includes desiccant and after filter.

correction factors	To calculate the maximum rated flow for any model at operating conditions other than those above: Rated Flow (from table above) x K1 x K2 x K3 (from tables below) = Rated Flow at new conditions [3]												
Inlet air pressure (psig)	60	75	90	100	115	130	145	160	175	190	205	220	232
K1	0.63	0.75	0.88	1	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13
Inlet air temperature (°F)	75	100	104	113	122	Pressure dewpoint (°F)					-4	-40	-100
K2	1	1	0.97	0.88	0.73	K3					1.10	1	0.70

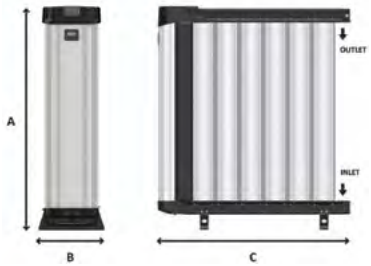
(3) To be used as a rough guide only. All applications should be confirmed by n-psi. Contact support@n-psi.com for sizing assistance.

specifications		
ISO8573 – 1: 2001 Quality Classes	Dirt	Class 2 (1 micron)
	Water	Class 2 (-40°F / -40°C Pressure Dewpoint) [4]
Allowable working pressure		58 to 232 psig (4 to 16 barg)
Allowable inlet temperature		34.7 to 122°F (1.5 to 50°C)
Power supply		100 – 240VAC / 50 – 60Hz

(4) See Price List for -4°F and -100°F pressure dewpoint applications.



NDL 010 to 130



NDL 2110 to 6130

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POWEREX®
PURE AIR TECHNOLOGY

Dewpoint Monitor

ENGINEERING SPECIFICATIONS

- Sensor Output: 0V-5V
- Alarm Indication: Audible alarm, red alarm light with push to test, and push to acknowledge
- Alarm Output: 10 AMP @ 115 VAC rated normally closed contact.
- Alarm Horn: 95+ dB(A), at 120 VAC, at 24 inches (61 cm), at 25°C
- Dryer Control Signals: 10 AMP @ 115 VAC rated normally open contact
- Dimensions: 9.1” x 5.5” x 5”
- Net Weight: 5 lbs
- Enclosure: UL Listed Polycarbonate NEMA-4X Electrical Box
- Power Requirements: 110-120VAC
- Fuse: Type FNM 1.25-amp
- Operating Pressure: 10-150 psig with a minimal flow rate
- Operating Temperature: 32°F to 131°F

FEATURES

- Patented auto calibration to ensure accuracy
- Polymer sensor technology for fast response times
- Sensor is immune to water, particulate contamination, oil vapor and most chemicals
- Visual and audible alarms for high dewpoint (includes dry contacts)
- Dewpoint demand purge control feature to control desiccant air dryers

Model	Dewpoint Range	Enclosure	High Alarm	Contact Open for Purge Rate Fixed Mode	Contact Closed for Purge Saver Mode
PDPM1001JJ*	-60°F to 54°F	NEMA 4	35°F	-10°F to 54°F	Below -15°F
PDPM1001AJ	-60°F to 54°F	NEMA 4	35°F	-10°F to 54°F	Below -15°F
PDPM1001JJL†	-60°F to 54°F	NEMA 4	40°F	N/A	N/A
PDPM1004AJ	-60°F to 54°F	NEMA 4	-20°F	-40°F to 54°F	Below -45°F
PDPM2001AJ	-148°F to 32°F	NEMA 4	Specified	N/A	N/A

* -JJ model comes with power cord. -AJ model does not.
† -JJL model is commonly used with refrigerated dryers.

POWEREX®
PURE AIR TECHNOLOGY

Carbon Monoxide Monitor

ABOUT

The CO Monitor is compact, easy to install and operate. The instrument incorporates a rotameter for confirmation of proper air flow, a backlit digital display, and a highly specific electrochemical carbon monoxide sensor for trouble-free and reliable operation.

The monitor is designed for use in a wide variety of applications, ranging from automotive, medical, paint spray operations to wood finishing. This monitor can be used in virtually any commercial or industrial process that requires CO monitoring of compressed breathing air for personnel working in such operations.

FEATURES

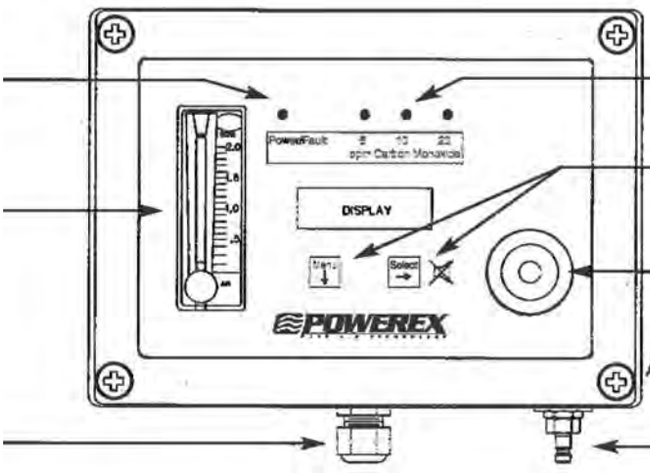
- Compact design
- Digital display
- User programmable alarms & relays
- 4-20 mA output
- RS-485 digital communication capability
- 110 VAC, 220 VAC, 24 VDC power options
- "Intelli-Cal" push-button calibration procedure
- 3 levels of alarms
- Protected maintenance functions
- Audio and visual alarms
- High integrity polycarbonate enclosure
- High capacity relays
- Flow meter for confirmation of airflow

SPECIFICATIONS

- Range: 0-50 ppm CO
- Alarm Levels:
  - Alarm 1: 5 ppm CO, user adjustable
  - Alarm 2: 10 ppm CO, user adjustable
  - Alarm 3: 20 ppm CO, user adjustable
- Alarm Adjustment: All three alarms are user adjustable between 3 to 50 ppm
- Audible Alarm: 105 dB at 12 in (30 cm)
- Visual Gas Alarm: 3 red LEDs
- Visual Power/Fault: Green/red LED
- Display: 8 character, high contrast dot matrix LCD with backlight
- Resolution: 1 ppm
- Sensor: Electrochemical
- Response Time: t_{90} = 30 sec
- Accuracy: +/- 10% of reading
- Temperature Range: 32° to 104°F (0° to 40°C)
- Outputs:
  - Relays: 4 form C, 10A SPDT contacts, 3 gas alarms and 1 fault
  - Analog: 4-20 mA
  - RS-485 Modbus
- Power: 110 VAC, 220 VAC and/or 24 VDC, 15 W
- Power Connection: Supplied with strain relief for 0.20 to 0.35 in diameter cable
- Inlet Air Line Connection: ¼" NPT female
- Air Line Sample Hose to Monitor: 5 ft length
- Inlet Pressure: 60 to 150 psi, air supply lines, 55 psi regulated to monitor
- Enclosure: Polycarbonate
- Size, Instrument Only: 7 x 5 x 3 in (18 x 13 x 8 cm)
- Weight, Instrument Only: 2 lbs (0.9 kg)

ACO-600-105 COMPACT COMPRESSED AIR LINE CARBON MONOXIDE MONITOR/ALARM

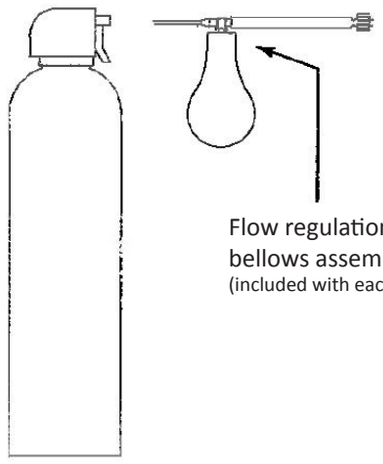
EXTERNAL CO MONITOR FEATURES



ORDERING INFORMATION

Instrument	**Part Number**
CO Monitor	ACO-600-105
Calibration Kit	
Aerosol Gas, 20 ppm CO, 11 liter, w/ bellows assembly*	ACO01514
Aerosol Gas, 20.9% O2, 11 liter, w/ bellows assembly*	
Calibration Equipment Case	

*NOTE: These aerosol cylinders can ship by ground transportation without a HAZMAT fee



11 liter aerosol gas cylinder

Flow regulation bellows assemly
(included with each cylinder)

WARNING

CO Monitor should not be used without an oxygen monitor unless there is complete assurance that inert gas cannot be accidentally injected into the breathing air line.

For more information, contact your local Powerex distributor or Powerex sales representative today!

POWEREX

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