

Project Name: BCSC 2023 Eagle Elementary School Central Plant
Equipment Installation

DATE: May 14, 2024

This Addendum issued prior to bidding, alters, amends, corrects or clarifies the Proposal Documents to the extent stated herein and does hereby become a part of the Proposal Documents, and will become a part of the Contract Documents of the successful bidder.

GENERAL

A. SPECIFICATIONS

1. Section No. 23 21 23 – Hydronic Pumps and Ancillary Equipment
 - a. Equipment cutsheets for Owner pre-purchased pumps are included within this addendum.
2. Section No. 23 52 16 – Condensing Boilers
 - a. Equipment cutsheets for Owner pre-purchased boilers are included within this addendum.
3. Section No. 23 64 02 – Packaged Air-Cooled Water Chillers
 - a. Equipment cutsheets for Owner Pre-Purchased chiller are included within this addendum.
4. Section No. 26 24 16 – Panelboards
 - a. Equipment cutsheets for Owner Pre-Purchased panelboard are included within this addendum.
5. Section No. 26 29 23 – Variable Frequency Drives
 - a. Equipment cutsheets for Owner Pre-Purchased VFD's are included within this addendum.
6. Appendix
 - a. Add the attached equipment cutsheets to the Appendix for this project.

B. DRAWINGS

1. MD301 – Enlarged Plan – Mechanical Demolition
 - a. Replace this Drawing in its entirety with the attached Drawing with revisions to piping and General Notes and Plan Notes.
2. M301 – Enlarged Plan – Mechanical
 - a. Replace this Drawing in its entirety with the attached Drawing with revisions to piping and General Notes and Plan Notes.
3. M601 – Schedules – Mechanical
 - a. Replace this Drawing in its entirety with the attached Drawing with Owner pre-purchased equipment schedule revisions.

Attachments:

Appendix – Boilers

Appendix – Chillers

Appendix – Pumps

Appendix – VFDs

Appendix – Panelboard

MD301 Enlarged Plan – Mechanical Demolition

M301 Enlarged Plan – Mechanical

M601 Schedules – Mechanical

END OF ADDENDUM



Pump and Equipment Company, Inc.

5/1/2024

PROJECT: Eagle Elementary

HVAC PUMPS & ACCESSORIES

TAG	QTY	DESCRIPTION	PRICE (ea)	PRICE (total)
CHWP-A1, A2	2	Taco FI3013E4KCL1L0DXB1945D Frame Mounted End Suction Pump, 4" Suction, 3" Discharge, 13 1/2" Nominal Impeller Diameter, 1750 RPM, ODP, 25 HP, 230-460/60/3, 40 Deg C Ambient/NEMA STD./CCW (Standard), Baldor, Premium Efficiency: Meets MG1-12.55, AEGIS Shaft Grounding, Seal w/ Ceramic Seat, Carbon Rotor, EPT Rubber, 250 Deg F, Cast Iron Casing, Bronze Impeller and Bronze Shaft Sleeve with a Stainless Steel Shaft, ANSI Class 125 Flanges with Bronze Wear Ring NEMA Motor Frame 60Hz, Welded Base w/Drip Pan and Standard Coupler Guard, Woods Coupler 500 GPM @ 105' TDH		
ACCESSORY	2	Taco SD060040-5 6" x 4" Suction Diffuser		
HWP-A1, A2	2	Taco FI2511E4GCJ1L0DXB1942D Mounted End Suction Pump, 3" Suction, 2 1/2" Discharge, 11" Nominal Impeller Diameter, 1750 RPM, ODP, 10 HP, 230-460/60/3, 40 Deg C Ambient/NEMA STD./CCW (Standard), Baldor, Premium Efficiency: Meets MG1-12.55, AEGIS Shaft Grounding, Seal w/ Ceramic Seat, Carbon Rotor, EPT Rubber, 250 Deg F, Cast Iron Casing, Bronze Impeller and Bronze Shaft Sleeve with a Stainless Steel Shaft, ANSI Class 125 Flanges with Bronze Wear Ring NEMA Motor Frame 60Hz, Welded Base w/Drip Pan and Standard Coupler Guard, Woods Coupler 240 GPM @ 100' TDH		
ACCESSORY	2	Taco SD050030-5 5" x 3" Suction Diffuser		

R.E. Dimond and Associates, Inc.
 Reviewed and checked only for conformance with design concepts and with information given in the Contract Documents. Approval does not release the Contractor from the responsibility to provide appropriate quantities, field measurements, dimensional stability, installation, anchorage, and coordination with other trades, or release the Contractor from responsibility for deviations from the requirements of the Contract Documents, or from responsibility for errors and omissions contained thereon.

- Reviewed as Submitted
- Reviewed as Noted
- Rejected - Correct and Resubmit
- See Attached Comment Sheet(s)

Exter By: MJE
 Freight Date: 5/13/2024
 Applica
 Valid for 30 Days. TERMS, INC 130

COORDINATE SHIPMENT DATES WITH OWNER/INSTALLING CONTRACTOR.

FI Series Pump | Submittal Data

Submittal No: 301-1446D | Model: 3013D | RPM: 1760 - 60 Hz | Effective: January 27, 2020 | Supersedes: October 3, 2019

JOB: _____

REPRESENTATIVE: _____

ENGINEER: _____

CONTRACTOR: _____

PRODUCT DATA

ITEM NO. _____ MODEL NO. 3013D

IMPELLER DIAMETER _____ HORSEPOWER _____

GPM _____ VOLTAGE _____

HEAD/FT _____ RPM 1760

WEIGHT _____ PUMP/MOTOR _____

NSF 61 CERTIFIED YES NO

DIMENSIONS

Model No. | 3013D
Flange Size (Suction x Discharge) | 4 x 3 (102 x 76)

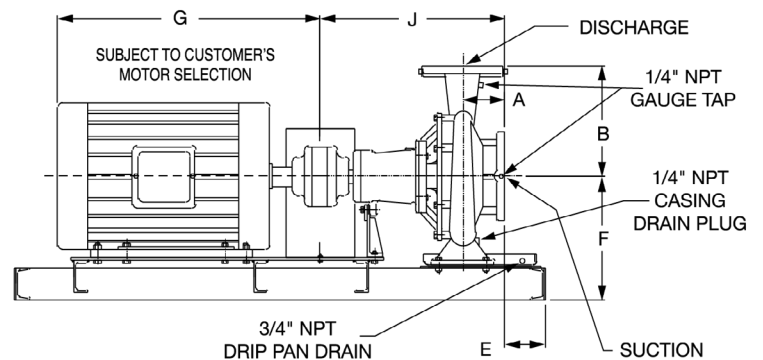
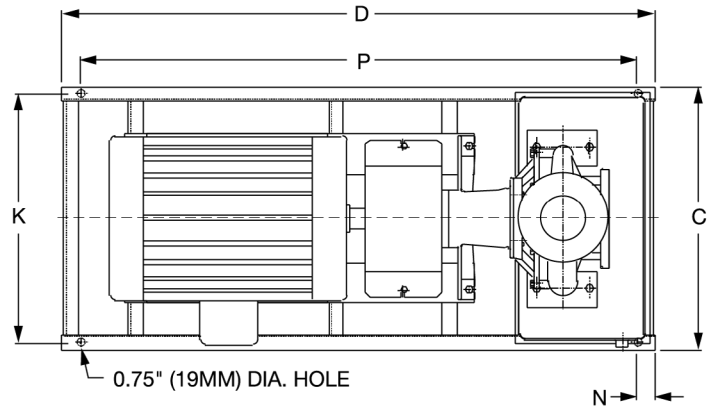
HORSEPOWER		15	20	25	30	40
ODP	MOTOR FRAME	254T	256T	284T	286T	324T
	G MAX	22.57 (573)		25.07 (636)		23.69 (601)
	MAXIMUM ASSEMBLY WEIGHT LBS. (KG)	859 (389)		1092 (495)		1172 (532)
TEFC	MOTOR FRAME	254T	256T	284T	286T	324T
	G MAX	23.41 (594)		27.89 (708)		30.52 (775)
	MAXIMUM ASSEMBLY WEIGHT LBS. (KG)	859 (389)		1092 (495)		1172 (532)
A	ANSI Class 125: 4.72 (120) ANSI Class 250: 5.03 (128)					
B	ANSI Class 125: 12.50 (318) ANSI Class 250: 12.88 (327)					
C	19.18 (487)					
D	52.0 (1321)					
E	ANSI Class 125: 1.54 (39) ANSI Class 250: 1.23 (31)					
F	14.03 (356)					
J	ANSI Class 125: 25.29 (642) ANSI Class 250: 25.60 (650)					
K	17.68 (449)					
N	2.00 (51)					
P	48.0 (1219)					

Configuration	DOE Basic Model Number	PEI Value		Energy Rating
Bare Pump	FI3013D-4P-BP	PEI _d	0.90	10
Pump + Motor	FI3013D-4P-PM	PEI _d	0.90	10

OPERATING SPECIFICATIONS

FLANGE	PRESSURE	TEMPERATURE
ANSI Class 125	175 PSIG* (1210 KPA)	250°F (120°C)
ANSI Class 250	300 PSIG** (2070 KPA)	250°F (120°C)

Motors: All NEMA Standard (T Frame)
* In accordance with ANSI Standard B16.1 Class 125
** In accordance with ANSI Standard B16.1 Class 250



English dimensions are in inches. Metric dimensions are in millimeters.
Metric data is presented in (). Do not use for construction purposes unless certified.

MATERIALS OF CONSTRUCTION		CASING	COVER	IMPELLER	WEAR RING	SHAFT	SHAFT SLEEVE	MECHANICAL SEAL	SEAL FLUSH LINE ASSEMBLY
STANDARD CONSTRUCTION	BRONZE FITTED	125# FLANGE Cast Iron ASTM A48/A48M-03 Class 30A	Cast Iron ASTM A48/A48M-03 Class 30A	Bronze ASTM B584 ALLOY C83600 or C84400	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	N/A
	250# FLANGE Ductile Iron ASTM A536-84 Grade 65-45-12	Cast Iron ASTM A48/A48M-03 Class 30A	Bronze ASTM B584 ALLOY C83600 or C84400	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	N/A	
OPTIONAL	125# OR 250#	N/A	N/A	Stainless Steel ASTM A351/A 351M-08	Bronze ASTM B584-98A C92200	N/A	Stainless Steel TYPE 303 ASTM A276	Tyngsten Carbide /EPT or Silicon-Carbide/EPT	Copper & Brass C3600
STANDARD CONSTRUCTION	NSF 61	125# FLANGE Cast Iron ASTM A48/A48M-03 Class 30A	Cast Iron ASTM A48/A48M-03 Class 30A	Stainless Steel ASTM A351/A 351M-08	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	Copper & Brass C3600
		250# FLANGE Ductile Iron ASTM A536-84 Grade: 65-45-12	Cast Iron ASTM A48/A48M-03 Class 30A	Stainless Steel ASTM A351/A 351M-08	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	Copper & Brass C3600
OPTIONAL	125# OR 250#	N/A	N/A	N/A	Bronze ASTM B584-98A C92200	N/A	N/A	N/A	N/A

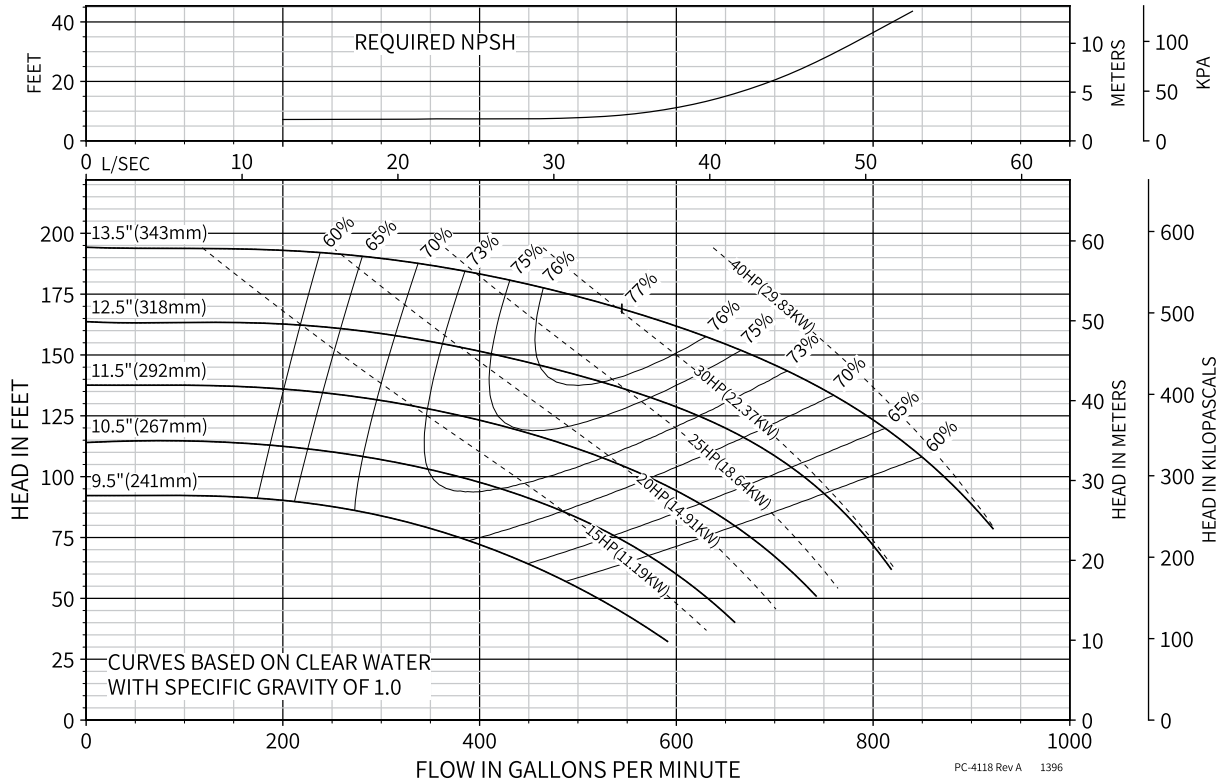
N/A - Not Available



FI Series | Model: 3013D | 1760 RPM

Curve No. 4118 | Min. Imp. Dia. 9.5" | Size 4x3x13.5 | January 29, 2020

Comfort Solutions® Energy Efficiency Rating: DOE Basic Model Number: FI3013D-4P-PM
 Pump & Motor: PE_{CL}: 0.9 | ER_{CL}: 10



COMMENTS



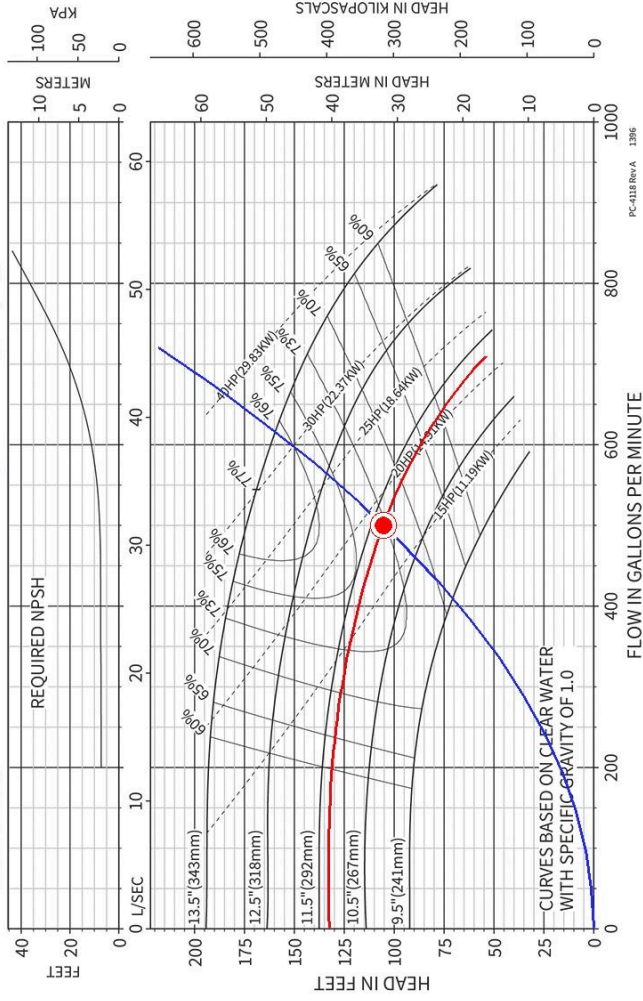
Tag:
CHWP-A-
A2

Flow Rate (GPM): 500
 Head (FT): 105
 Working Fluid: Water @ 60 F
 Efficiency (%): 73%
 Construction: Iron
 Design Hp: 18.22
 Nol Hp: 21.31
 Motor Hp: 8
 Npsh (Ft): 1760
 RPM: 1760

Model: FI3013D

FI Series | Model: 3013D | 1760 RPM

Curve No. 4118 | Min. Imp. Dia. 9.5" | Size 4x3x13.5 | January 29, 2020
Comfort Solutions® Energy Efficiency Rating: DOE Basic Model Number: FI3013D-4P-PM
 Pump & Motor: PEIcc: 0.9 | E_{RC}: 10



PC-4118 Rev A 1396



Taco Inc

No.: 02518OT3E284T-G

Date: 17-NOV-2016

Customer : G3212D_E0250N1D3L1T1FD

TECHNICAL PROPOSAL

Three-phase induction motor - Squirrel cage rotor

Product line : ODP General Purpose

Catalog Number : 02518OT3E284T-G

List Price

Notes: AEGIS SHAFT GROUNDING INSIDE

Performed by:

Checked:



Taco Inc

No.: 02518OT3E284T-G

Date: 17-NOV-2016

DATA SHEET

Three-phase induction motor - Squirrel cage rotor

Customer : G3212D_E0250N1D3L1T1FD
Product line : ODP General Purpose

Frame : 284T
Output : 25 HP
Frequency : 60 Hz
Poles : 4
Full load speed : 1770 rpm
Slip : 1.67 %
Voltage : 208-230/460 V
Rated current : 66.1-59.8/29.9 A
Locked rotor current : 401/200 A
Locked rotor current (I_L/I_n) : 6.7
No-load current : 24.0/12.0 A
Full load torque : 73.2 lb.ft
Locked rotor torque : 250 %
Breakdown torque : 280 %
Design : B
Insulation class : F
Temperature rise : 80 K
Locked rotor time : 15 s (hot)
Service factor : 1.15
Duty cycle : S1
Ambient temperature : -20°C - +40°C
Altitude : 1000 m
Degree of Protection : IP23
Approximate weight : 362 lb
Moment of inertia : 3.4055 sq.ft.lb
Noise level : 62 dB(A)

	D.E.	N.D.E.
Bearings	6311 Z-C3	6211 Z-C3
Regreasing interval	20000 h	20000 h
Grease amount	18 g	11 g

Load	Power factor	Efficiency (%)
100%	0.83	93.6
75%	0.78	93.0
50%	0.67	92.4

Notes:

Performed by

Checked

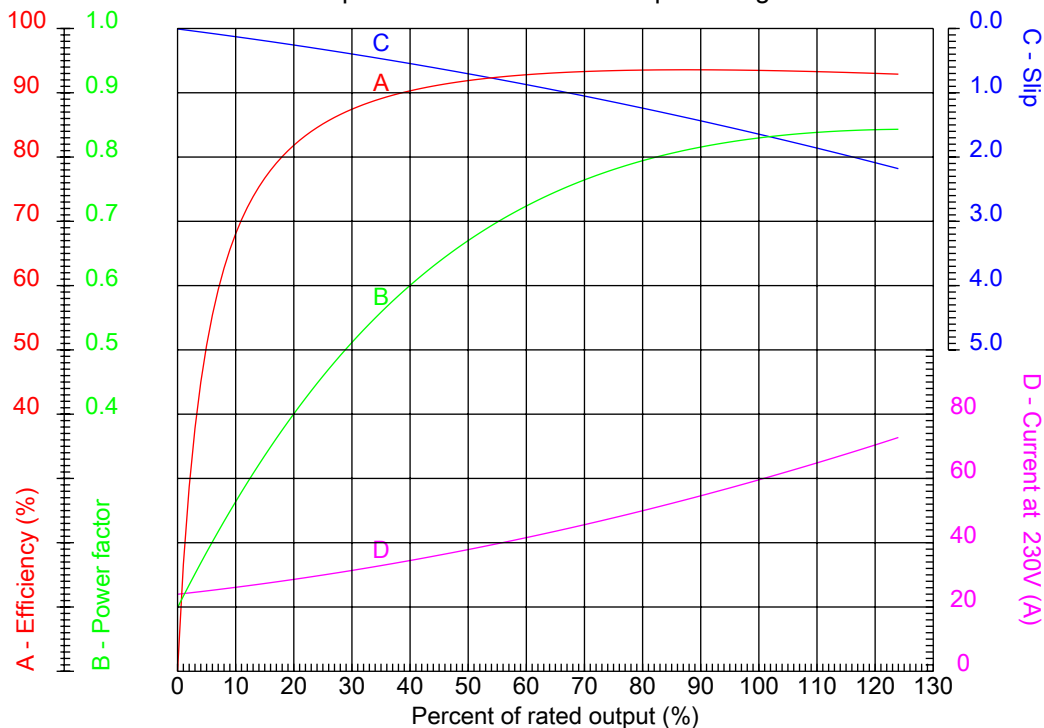


Taco Inc

No.: 02518OT3E284T-G

Date: 17-NOV-2016

PERFORMANCE CURVES RELATED TO RATED OUTPUT
Three-phase induction motor - Squirrel cage rotor



Customer : G3212D_E0250N1D3L1T1FD
Product line : ODP General Purpose

Frame : 284T	Locked rotor current (I _l /I _n) : 6.7
Output : 25 HP	Duty cycle : S1
Frequency : 60 Hz	Service factor : 1.15
Full load speed : 1770 rpm	Design : B
Voltage : 208-230/460 V	Locked rotor torque : 250 %
Rated current : 66.1-59.8/29.9 A	Breakdown torque : 280 %
Insulation class : F	

Notes:

Performed by

Checked

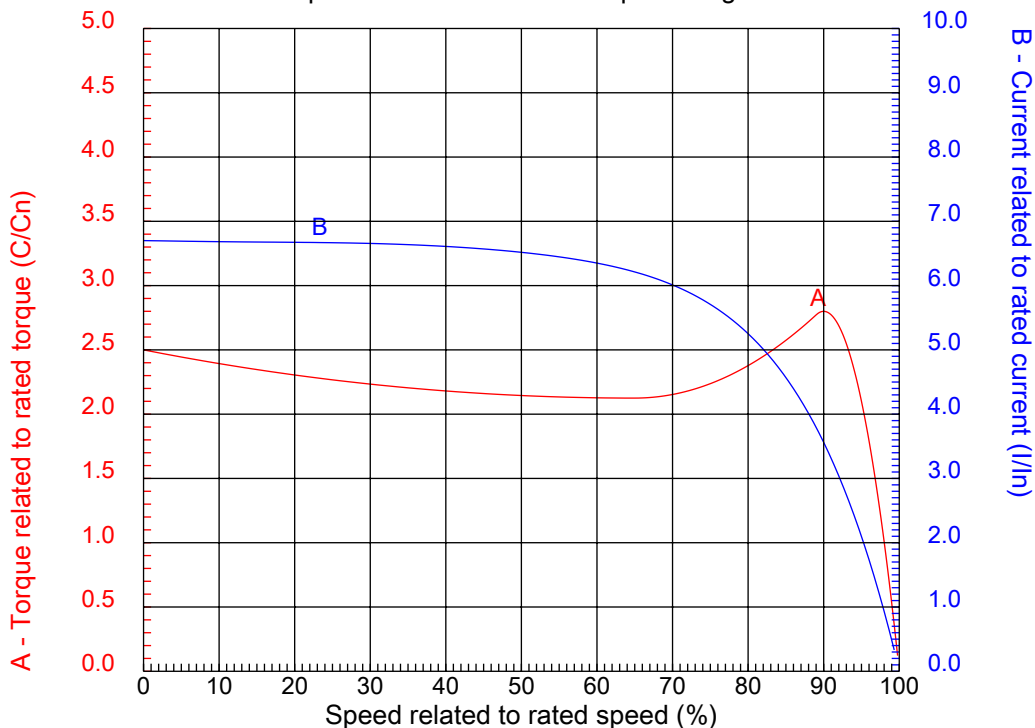


Taco Inc

No.: 02518OT3E284T-G

Date: 17-NOV-2016

CHARACTERISTIC CURVES RELATED TO SPEED
Three-phase induction motor - Squirrel cage rotor



Customer : G3212D_E0250N1D3L1T1FD
Product line : ODP General Purpose

Frame	: 284T	Locked rotor current (I _l /I _n)	: 6.7
Output	: 25 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.15
Full load speed	: 1770 rpm	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 250 %
Rated current	: 66.1-59.8/29.9 A	Breakdown torque	: 280 %
Insulation class	: F		

Notes:

Performed by

Checked

1 2 3 4 5 6 7 8

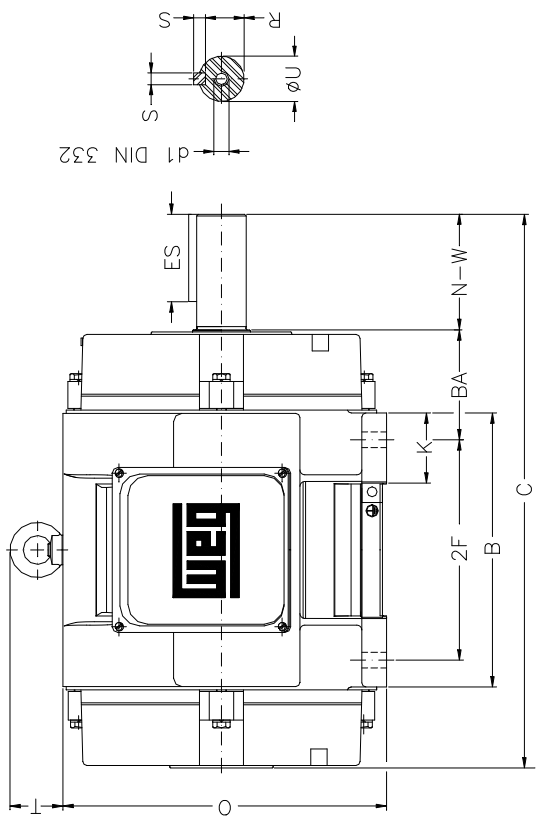
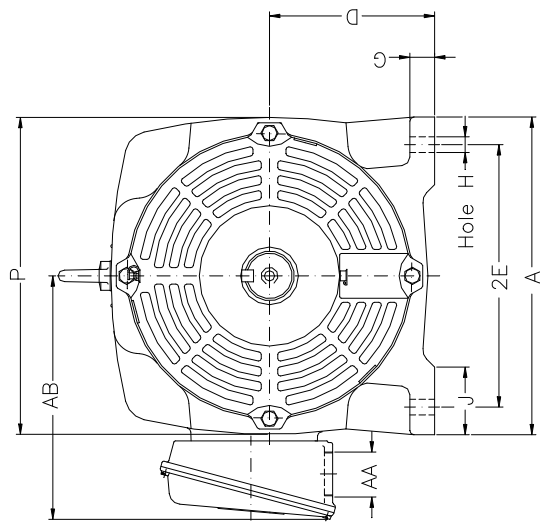
A

B

C

D

E



Notes:

Performed by:

Checked:

Customer: G3212D_E0250N1D3L1T1FD

ODP General Purpose

Three-phase induction motor
Frame 284T - IP23

17-NOV-2016

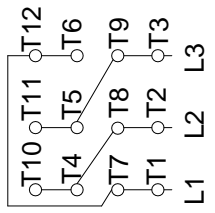
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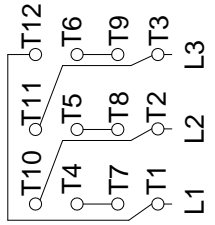
2E	A	2F	B	BA
11.000	13.780	9.500	11.574	4.750
J	K	P	ES	depth
3.150	2.960	13.700	3.149	0.500
S	D	N-W	G	U
0.500	7.000	4.622	1.102	1.875
O	T	R	H	AB
13.858	2.165	1.594	0.531	10.886
C	AA	d1		
23.386	NPT 1 1/2"	A 4		

1 2 3 4 5 6 7 8

LOW VOLTAGE

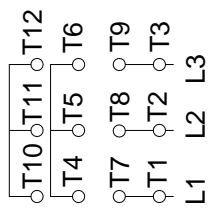


HIGH VOLTAGE

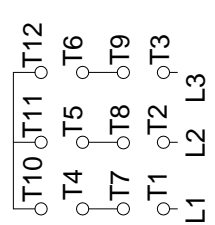


CONNECTIONS FOR STARTING ONLY:

LOW VOLTAGE



HIGH VOLTAGE



Notes:
Performed by:
Checked:
Customer: G3212D_E0250N1D3L1T1FD
ODP General Purpose
Three-phase induction motor Frame 284T - IP23
17-NOV-2016 025180T3E284





Submittal Data Information

Suction Diffuser Rear Strainer Pullout (RSP)

"Flanged"

301-239.1

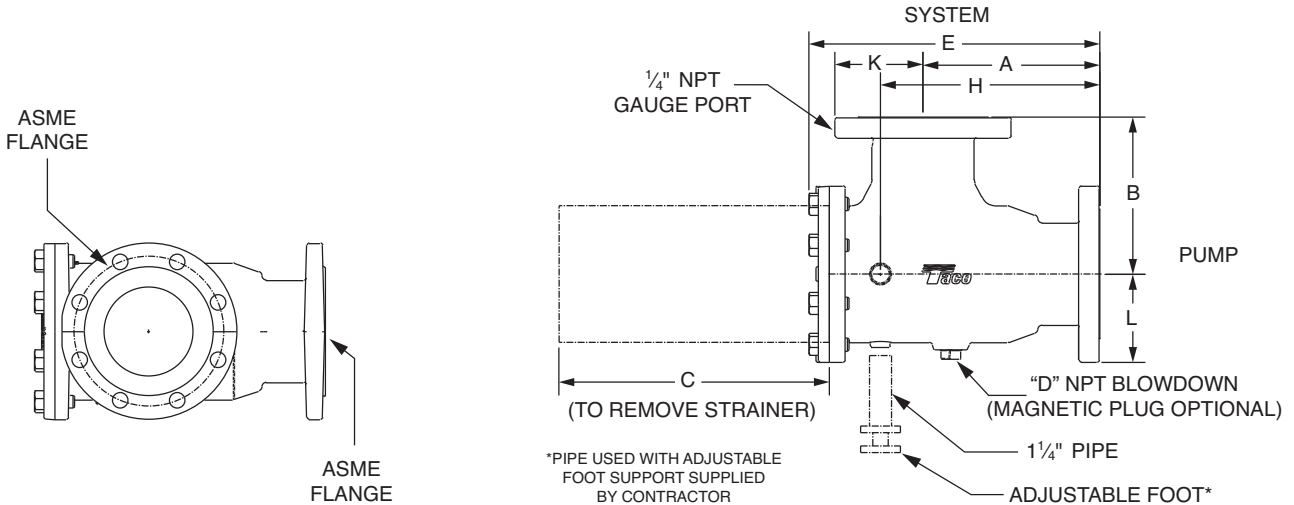
SUPERSEDES: September 17, 2013

EFFECTIVE: July 15, 2017

JOB _____ ENGINEER _____ CONTRACTOR _____ REP. _____

ITEM	QUANTITY	MODEL NO.	SIZE
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DIMENSIONS



Model Number	System	Pump	C _v	Free Area (sq. in.)	A (Class 125)*	A (Class 250)*	B	C	D	E (Class 125)*	E (Class 250)*	H (Class 125)*	H (Class 250)*	K (Class 125)*	K (Class 250)*	L (Class 125)*	L (Class 250)*	WGT. (Class 125)*	WGT. (Class 250)*
SD020015-5	2 Flanged	1½ Flanged	54	21	5.69 (145)	6.06 (154)	5.39 (137)	8.49 (216)	¾	9.25 (235)	9.62 (244)	6.92 (176)	7.29 (185)	3.00 (076)	3.25 (083)	2.50 (064)	3.06 (078)	22 (010)	27 (012)
SD020020-5	2 Flanged	2 Flanged	106	21	5.44 (138)	5.69 (145)	5.39 (137)	8.24 (209)	¾	9.00 (229)	9.25 (235)	6.67 (169)	6.92 (176)	3.00 (076)	3.25 (083)	3.00 (076)	3.25 (083)	24 (011)	28 (013)
SD025020-5	2½ Flanged	2 Flanged												3.50 (089)	3.75 (095)	3.00 (076)	3.25 (083)	27 (012)	35 (016)
SD030020-5	3 Flanged	2 Flanged												3.75 (095)	4.12 (105)	3.00 (076)	3.25 (083)	29 (013)	39 (018)
SD025025-5	2½ Flanged	2½ Flanged	135	24	6.06 (154)	6.56 (167)	6.01 (153)	8.97 (228)	¾	9.83 (250)	10.35 (263)	7.41 (188)	7.91 (201)	3.50 (089)	3.75 (095)	3.50 (089)	3.75 (095)	38 (017)	54 (025)
SD030025-5	3 Flanged	2½ Flanged			6.06 (154)	6.56 (167)	6.01 (153)		1	9.83 (250)		7.41 (188)	7.91 (201)	3.75 (095)	4.12 (105)	3.50 (089)	3.75 (095)	38 (017)	52 (024)
SD040025-5	4 Flanged	2½ Flanged			6.07 (154)	6.07 (154)	8.45 (215)		¾	8.93 (227)		7.59 (193)	7.59 (193)	4.43 (113)	4.93 (125)	3.50 (089)	3.75 (095)	52 (024)	65 (030)
SD030030-5	3 Flanged	3 Flanged	220	35	6.86 (174)	7.62 (194)	6.56 (167)	10.47 (266)	1	11.41 (290)	12.18 (309)	8.32 (211)	9.09 (231)	3.75 (095)	4.12 (105)	3.75 (095)	4.12 (105)	50 (023)	66 (030)
SD040030-5	4 Flanged	3 Flanged				6.86 (174)	8.94 (227)					8.51 (216)	8.51 (216)	4.93 (125)	5.43 (138)	3.75 (095)	4.13 (105)	65 (030)	83 (038)
SD050030-5	5 Flanged	3 Flanged				8.51 (216)	8.51 (216)					4.93 (125)	5.43 (138)	3.75 (095)	4.13 (105)	65 (030)	83 (038)		
SD040040-5	4 Flanged	4 Flanged	380	64	7.94 (202)	8.93 (227)	8.45 (215)	12.86 (327)	1	13.96 (355)	14.90 (378)	10.29 (261)	11.28 (287)	4.50 (114)	5.00 (127)	4.50 (114)	5.00 (127)	73 (033)	91 (041)
SD050040-5	5 Flanged	4 Flanged				5.00 (127)	5.50 (140)							4.50 (114)	5.00 (127)	75 (034)	97 (044)		
SD060040-5	6 Flanged	4 Flanged				5.50 (140)	6.25 (159)							4.50 (114)	5.00 (127)	79 (036)	109 (049)		

NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).

*C' is the distance required to replace strainer.

* Append 'A' for Class 250 working pressure flanged units (pump side) – e.g. Model Number SD040030-4A.

DIMENSIONS (continued)

Model Number	System	Pump	C _v	Free Area (sq. in.)	A (Class 125)*	A (Class 250)*	B	C	D	E (Class 125)*	E (Class 250)*	H (Class 125)*	H (Class 250)*	K (Class 125)*	K (Class 250)*	L (Class 125)*	L (Class 250)*	WGT. (Class 125)*	WGT. (Class 250)*
SD050050-5	5 Flanged	5 Flanged	669	100	10.06 (256)	10.06 (256)	8.94 (227)	15.36 (390)	1	16.54 (420)	16.54 (420)	12.48 (317)	12.48 (317)	5.00 (127)	5.50 (140)	5.00 (127)	5.50 (140)	90 (041)	116 (053)
SD060050-5	6 Flanged	5 Flanged					5.50 (140)					6.25 (159)	5.00 (127)	5.50 (140)	96 (044)	127 (058)			
SD080050-5	8 Flanged	5 Flanged					13.21 (336)					12.67 (322)	12.67 (322)	6.68 (170)	7.43 (189)	5.00 (127)	5.50 (140)	151 (069)	194 (088)
SD060060-5	6 Flanged	6 Flanged	985	146	11.58 (294)	12.08 (307)	11.17 (284)	19.02 (483)	1	20.39 (518)	20.89 (531)	16.17 (411)	16.67 (423)	5.50 (140)	6.25 (159)	5.50 (140)	6.25 (159)	151 (069)	193 (088)
SD080060-5	8 Flanged	6 Flanged												6.75 (171)	7.50 (191)	5.50 (140)	6.25 (159)	170 (077)	215 (098)
SD100060-5	10 Flanged	6 Flanged												8.00 (203)	8.75 (222)	5.50 (140)	6.25 (159)	182 (083)	238 (108)
SD080080-5	8 Flanged	8 Flanged	1657	248	14.43 (367)	15.31 (389)	13.21 (336)	23.79 (604)	1	25.32 (643)	26.19 (685)	20.22 (514)	21.1 (536)	6.75 (171)	7.50 (191)	6.75 (171)	7.50 (191)	271 (123)	319 (145)
SD100080-5	10 Flanged	8 Flanged												8.00 (203)	8.75 (222)	6.75 (171)	7.50 (191)	284 (129)	351 (159)
SD120080-5	12 Flanged	8 Flanged												9.50 (241)	10.25 (260)	6.75 (171)	7.50 (191)	305 (138)	388 (176)
SD100100-5	10 Flanged	10 Flanged	2650	394	18.36 (466)	19.61 (498)	14.54 (369)	29.40 (747)	1	31.10 (790)	32.35 (822)	25.64 (651)	26.89 (683)	8.00 (203)	8.75 (222)	8.00 (203)	8.75 (222)	400 (182)	482 (219)
SD120100-5	12 Flanged	10 Flanged												9.50 (241)	10.25 (260)	8.00 (203)	8.75 (222)	420 (191)	518 (235)
SD140100-5	14 Flanged	10 Flanged												11.50 (292)	10.25 (260)	8.00 (203)	8.75 (222)	441 (200)	557 (253)
SD120120-5	12 Flanged	12 Flanged	3000	570	20.39 (518)	22.64 (575)	16.62 (422)	33.72 (856)	1	35.50 (902)	37.75 (959)	29.83 (758)	32.08 (815)	9.50 (241)	10.25 (260)	9.50 (241)	10.25 (260)	589 (267)	703 (319)
SD140120-5	14 Flanged	12 Flanged												11.50 (292)	11.50 (292)	9.50 (241)	10.25 (260)	617 (280)	786 (357)
SD160120-5	16 Flanged	12 Flanged												11.75 (298)	12.75 (324)	9.50 (241)	10.25 (260)	651 (296)	802 (364)
SD140140-5	14 Flanged	14 Flanged	3940	628	22.31 (567)	22.31 (567)	19.26 (489)	34.00 (864)	1	37.66 (957)	37.66 (957)	31.61 (803)	31.61 (803)	10.50 (267)	11.50 (292)	10.50 (267)	11.50 (292)	895 (406)	1049 (476)
SD160140-5	16 Flanged	14 Flanged												11.75 (298)	12.75 (324)	10.50 (267)	11.50 (292)	934 (424)	1106 (502)

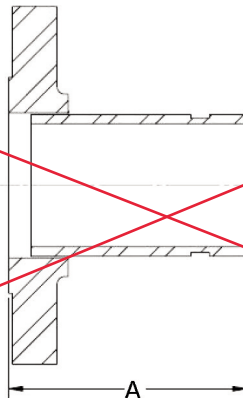
NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).
 *C' is the distance required to replace strainer.

* Append 'A' for Class 250 working pressure flanged units (pump side) – e.g. Model Number SDG040030-4A.

GROOVED ADAPTER

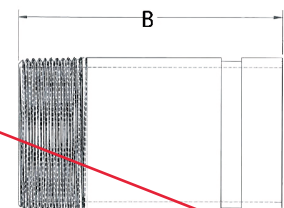
FLANGED - GROOVED

Class 125 Assembly Part No.	Class 250 Assembly Part No.	Size	'A'
FTG020-5	FTG020-5A	2"	4"
FTG025-5	FTG025-5A	2-1/2"	
FTG030-F	FTG030-5A	3"	
FTG040-5	FTG040-5A	4"	6"
FTG050-5	FTG050-5A	5"	
FTG060-5	FTG060-5A	6"	
FTG080-5	FTG080-5A	8"	8"
FTG100-5	FTG100-5A	10"	
FTG120-5	FTG120-5A	12"	
FTG140-5	FTG140-5A	14"	



THREADED - GROOVED

Class 125 + 250 Assembly Part No.	Size	'B'
TTG015-5	1-1/2"	4"
TTG020-5	2"	
TTG025-5	2-1/2"	



FLANGED - GROOVED

Note: Adapters required to convert flanged & threaded MPV to grooved.

FEATURES

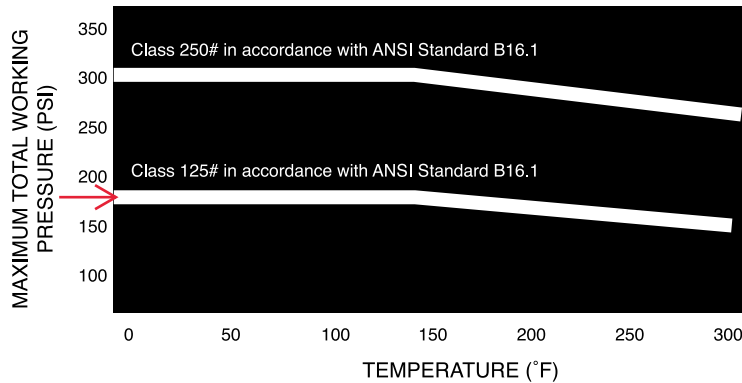
- Integral Cast Straightening Vanes ensure uniform flow to the suction inlet of the pump
- Oversized Body Cylinder ensures minimal pressure drop
- Metering Port allows for the monitoring of system conditions
- Disposable Fine Mesh Start-Up Strainer promotes cleaner, more trouble-free system
- Removable Cover Plate and reusable "O" Ring allows for easy access and maintenance of Permanent Strainer
- Blow Down port allows for routine maintenance and removal of sediment and debris
- Ductile Iron Body on all units
- Optional Magnetic Insert to trap small metallic particles
- Available with Class 125* flanges or Class 250* flanges. Consult pressure/temperature chart below for operating limitations. (Flanged units are raised faced design.)

(All sizes available with optional DIN Flanges. Consult factory for details)

MATERIALS OF CONSTRUCTION

Body	- Ductile Iron
Cover	- Ductile Iron
Straightening Vanes	- Integral Ductile Iron
Permanent Strainer	- Stainless Steel (304)
Disposable Start Up Strainer	- Bronze (16 Mesh)
Cover O-Ring	- EPDM
Grooved Adapter	- Steel

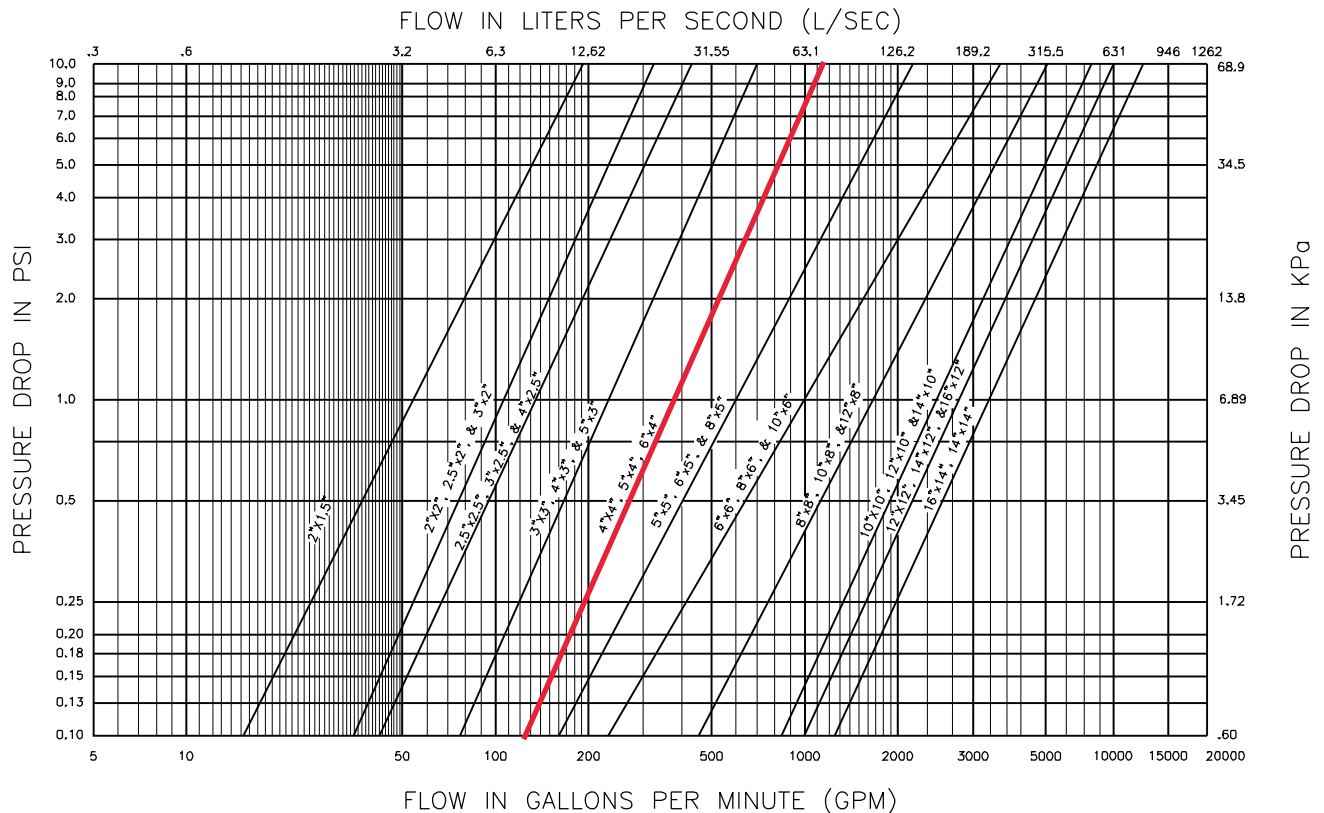
PRESSURE TEMPERATURE RATINGS



OPERATING SPECIFICATIONS

	Standard	Optional
Flange	Class 125*	Class 250*
Pressure	175 PSIG* (1210 KPA)	300 PSIG* (2070 KPA)
Temperature	250°F (120°C**)	250°F (120°C**)

* Per Pressure Temperature Ratings chart to left.



Taco Comfort Solutions® A Taco Family Company

Taco, Inc., 1160 Cranston Street, Cranston, RI 02920 | Tel: (401) 942-8000 | FAX: (401) 942-2360

Taco (Canada), Ltd., 8450 Lawson Road, Suite #3, Milton, Ontario L9T 0J8 | Tel: (905) 564-9422 | FAX: (905) 564-9436

Visit our web site: www.TacoComfort.com | Printed in USA | ©2017 Taco, Inc.



FI Series Pump | Submittal Data

Submittal No: 301-1436D | Model: 2511D | RPM: 1760 - 60 Hz | Effective: January 27, 2020 | Supersedes: July 12, 2018

JOB: _____

REPRESENTATIVE: _____

ENGINEER: _____

CONTRACTOR: _____

PRODUCT DATA

ITEM NO. _____ MODEL NO. 2511D

IMPELLER DIAMETER _____ HORSEPOWER _____

GPM _____ VOLTAGE _____

HEAD/FT _____ RPM 1760

WEIGHT _____ PUMP/MOTOR _____

NSF 61 CERTIFIED YES NO

DIMENSIONS

Model No. | 2511D
Flange Size (Suction x Discharge) | 3 x 2 1/2 (76 x 64)

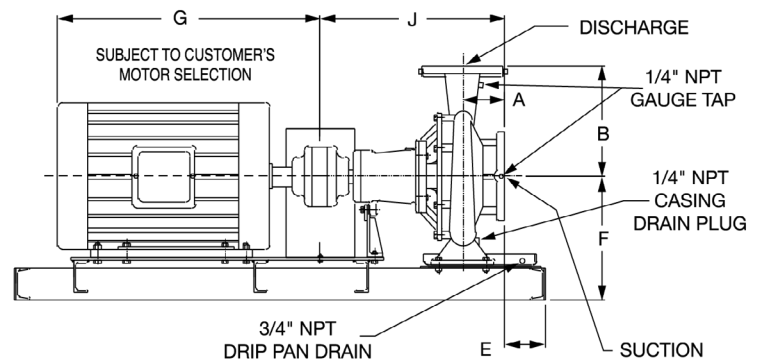
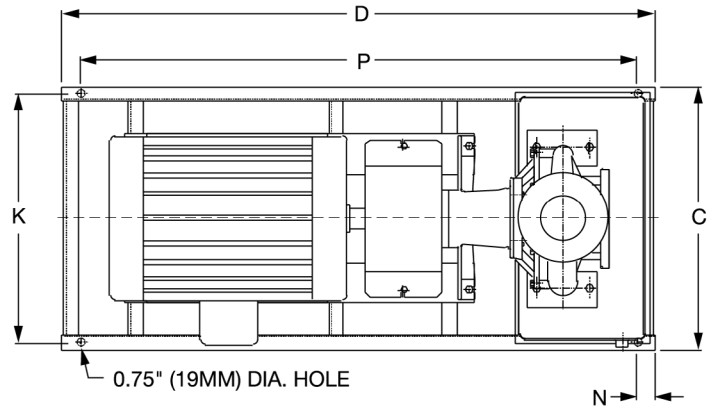
HORSEPOWER	5	7.5	10	15	
ODP	MOTOR FRAME	182T	213T	215T	254T
	G MAX	15.13 (384)	19.08 (484)		22.57 (573)
	MAXIMUM ASSEMBLY WEIGHT LBS. (KG)	461 (209)	627 (284)		734 (333)
TEFC	MOTOR FRAME	184T	213T	245T	254T
	G MAX	18.19 (462)	20.65 (524)		23.41 (594)
	MAXIMUM ASSEMBLY WEIGHT LBS. (KG)	461 (209)	627 (284)		734 (333)
A	ANSI Class 125: 4.72 (120)				
	ANSI Class 250: 5.09 (129)				
B	ANSI Class 125: 11.50 (292)				
	ANSI Class 250: 11.81 (300)				
C	19.17 (487)				
D	52.0 (1321)				
E	ANSI Class 125: 1.55 (39)				
	ANSI Class 250: 1.17 (30)				
F	14.03 (356)				
J	ANSI Class 125: 23.62 (600)				
	ANSI Class 250: 24.00 (610)				
K	17.67 (449)				
N	2.00 (51)				
P	48.0 (1219)				

Configuration	DOE Basic Model Number	PEI Value		Energy Rating
Bare Pump	FI2511D-4P-BP	PEI _d	0.87	13
Pump + Motor	FI2511D-4P-PM	PEI_d	0.87	13

OPERATING SPECIFICATIONS

FLANGE	PRESSURE	TEMPERATURE
ANSI Class 125	175 PSIG* (1210 KPA)	250°F (120°C)
ANSI Class 250	300 PSIG** (2070 KPA)	250°F (120°C)

Motors: All NEMA Standard (T Frame)
* In accordance with ANSI Standard B16.1 Class 125
** In accordance with ANSI Standard B16.1 Class 250



English dimensions are in inches. Metric dimensions are in millimeters.
Metric data is presented in (). Do not use for construction purposes unless certified.

MATERIALS OF CONSTRUCTION		CASING	COVER	IMPELLER	WEAR RING	SHAFT	SHAFT SLEEVE	MECHANICAL SEAL	SEAL FLUSH LINE ASSEMBLY	
STANDARD CONSTRUCTION	BRONZE FITTED	125# FLANGE	Cast Iron ASTM A48/A48M-03 Class 30A	Cast Iron ASTM A48/A48M-03 Class 30A	Bronze ASTM B584 ALLOY C83600 or C84400	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	N/A
	BRONZE FITTED	250# FLANGE	Ductile Iron ASTM A536-84 Grade 65-45-12	Cast Iron ASTM A48/A48M-03 Class 30A	Bronze ASTM B584 ALLOY C83600 or C84400	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	N/A
OPTIONAL		125# OR 250#	N/A	N/A	Stainless Steel ASTM A351/A 351M-08	Bronze ASTM B584-98A C92200	N/A	Stainless Steel TYPE 303 ASTM A276	Tyngsten Carbide /EPT or Silicon-Carbide/EPT	Copper & Brass C3600
STANDARD CONSTRUCTION	NSF 61	125# FLANGE	Cast Iron ASTM A48/A48M-03 Class 30A	Cast Iron ASTM A48/A48M-03 Class 30A	Stainless Steel ASTM A351/A 351M-08	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	Copper & Brass C3600
		250# FLANGE	Ductile Iron ASTM A536-84 Grade: 65-45-12	Cast Iron ASTM A48/A48M-03 Class 30A	Stainless Steel ASTM A351/A 351M-08	N/A	Stainless Steel TYPE 416™T ASTM A582	Bronze ASTM B584-98A C92200	Ceramic/EPT	Copper & Brass C3600
OPTIONAL		125# OR 250#	N/A	N/A	N/A	Bronze ASTM B584-98A C92200	N/A	N/A	N/A	N/A

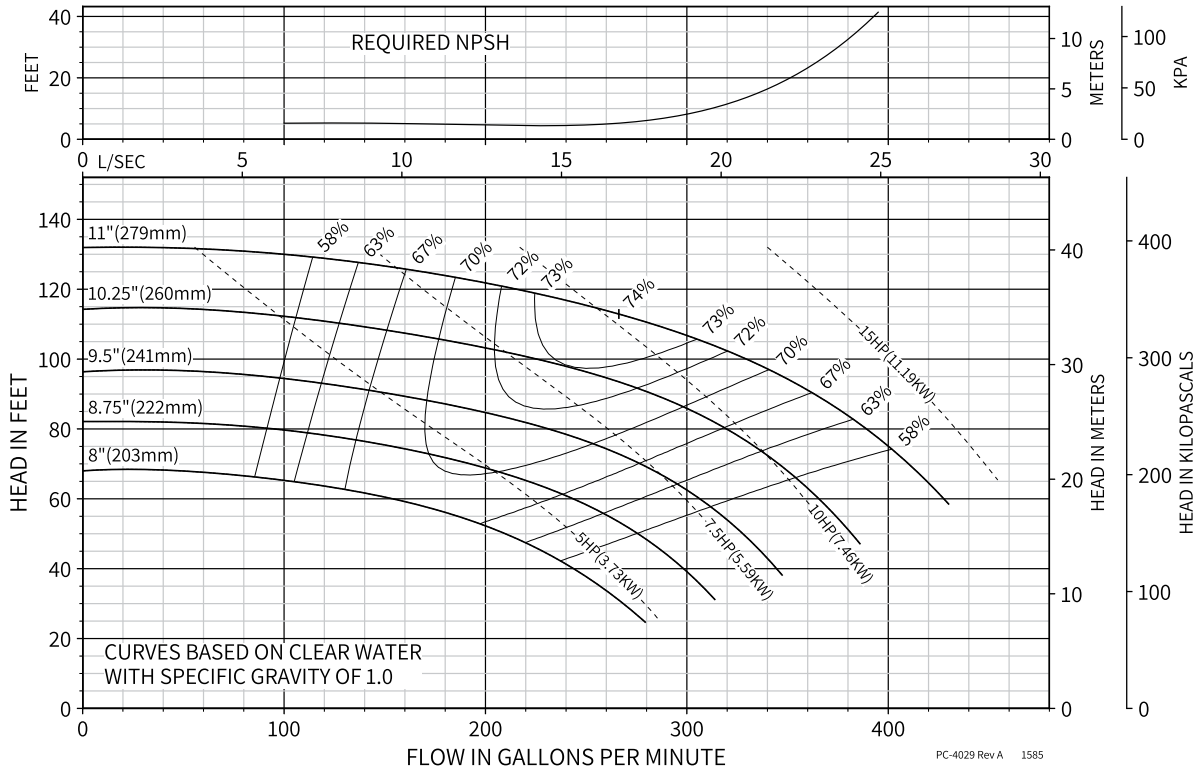
N/A - Not Available



FI Series | Model: 2511D | 1760 RPM

Curve No. 4029 | Min. Imp. Dia. 8.0" | Size 3x2.5x11.0 | February 03, 2020

Energy Efficiency Rating: DOE Basic Model Number: FI2511D-4P-PM
Pump & Motor: PE_{CL}: 0.87 | ER_{CL}: 13



COMMENTS



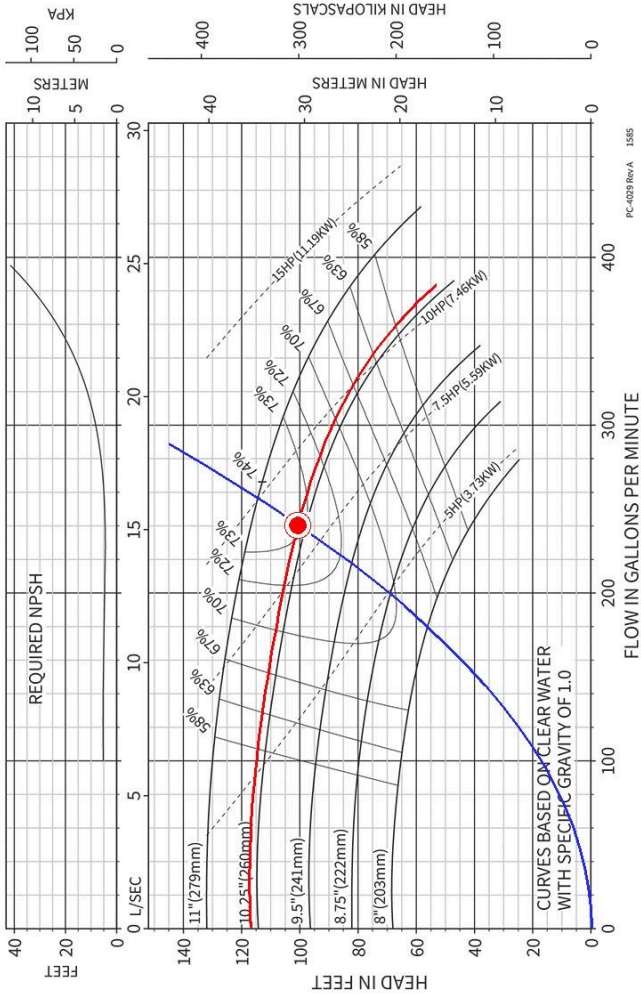
Tag:
HWP-A1,
A2

Flow Rate (GPM): 240
 Head (FT): 100
 Working Fluid: Water @ 60 F
 Efficiency (%): 73%
 Construction: Iron
 Design Hp: 8.30
 Nol Hp: 10.08
 Motor Hp: 10.00
 Npsh (Ft): 4
 RPM: 1760

Model: FI2511D

FI Series | Model: 2511D | 1760 RPM

Curve No. 4029 | Min. Imp. Dia. 8.0" | Size 3x2.5x11.0 | February 03, 2020
 DOE Basic Model Number: FI2511D-4P-PM
 Pump & Motor: PEI_{CL}: 0.87 | ER_{CL}: 13



PC-4029 Rev A 1/8/88



Taco Inc

No.: 01018OT3E215T-SG

Date: 17-NOV-2016

Customer : G3206D_E0100N1D3H1T1FD

TECHNICAL PROPOSAL

Three-phase induction motor - Squirrel cage rotor

Product line : W01 (Rolled Steel) General Purpose ODP

Catalog Number : 01018OT3E215T-SG

List Price

Notes: AEGIS SHAFT GROUNDING INSIDE

Performed by:

Checked:



Taco Inc

No.: 010180T3E215T-SG

Date: 17-NOV-2016

DATA SHEET Three-phase induction motor - Squirrel cage rotor

Customer : G3206D_E0100N1D3H1T1FD
Product line : W01 (Rolled Steel) General Purpose ODP

Frame : 213/5T
Output : 10 HP
Frequency : 60 Hz
Poles : 4
Full load speed : 1770 rpm
Slip : 1.67 %
Voltage : 208-230/460 V
Rated current : 27.4-24.8/12.4 A
Locked rotor current : 174/86.8 A
Locked rotor current (I_L/I_n) : 7.0
No-load current : 12.0/5.99 A
Full load torque : 29.3 lb.ft
Locked rotor torque : 250 %
Breakdown torque : 350 %
Design : B
Insulation class : F
Temperature rise : 80 K
Locked rotor time : 14 s (hot)
Service factor : 1.15
Duty cycle : S1
Ambient temperature : -20°C - +40°C
Altitude : 1000 m
Degree of Protection : ODP
Approximate weight : 137 lb
Moment of inertia : 1.2952 sq.ft.lb
Noise level : 59 dB(A)

	D.E.	N.D.E.
Bearings	6208 ZZ	6206 ZZ
Regreasing interval	---	---
Grease amount	---	---

Load	Power factor	Efficiency (%)
100%	0.83	91.7
75%	0.77	91.0
50%	0.64	90.2

Notes:

Performed by

Checked

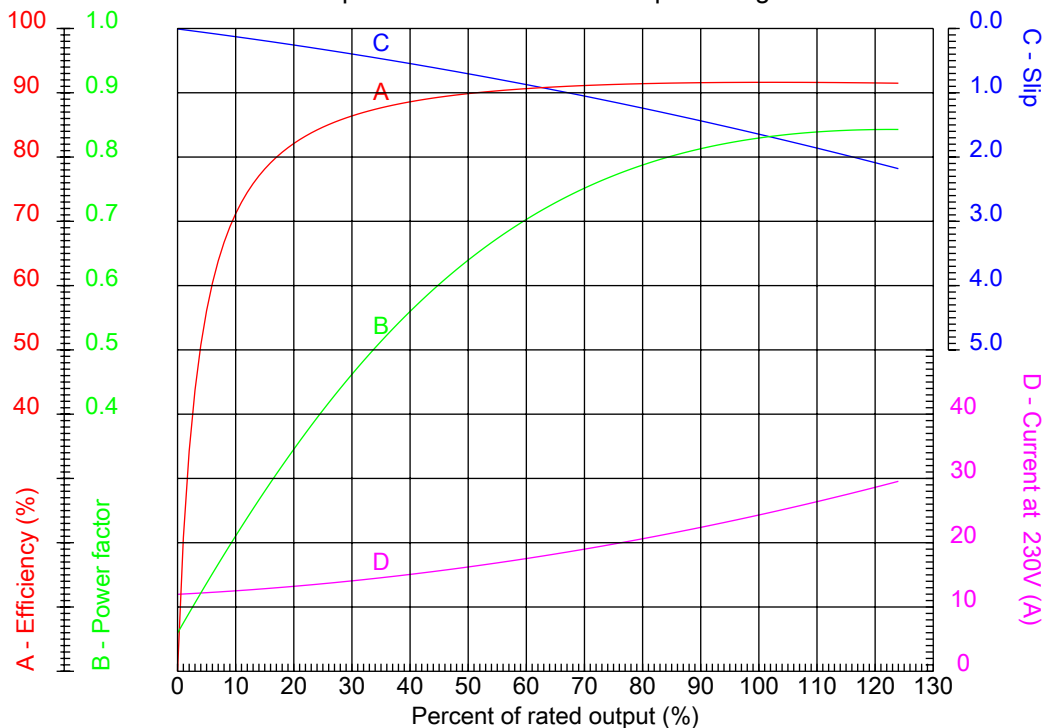


Taco Inc

No.: 01018OT3E215T-SG

Date: 17-NOV-2016

PERFORMANCE CURVES RELATED TO RATED OUTPUT
Three-phase induction motor - Squirrel cage rotor



Customer : G3206D_E0100N1D3H1T1FD
Product line : W01 (Rolled Steel) General Purpose ODP

Frame : 213/5T	Locked rotor current (I _l /I _n) : 7.0
Output : 10 HP	Duty cycle : S1
Frequency : 60 Hz	Service factor : 1.15
Full load speed : 1770 rpm	Design : B
Voltage : 208-230/460 V	Locked rotor torque : 250 %
Rated current : 27.4-24.8/12.4 A	Breakdown torque : 350 %
Insulation class : F	

Notes:

Performed by

Checked



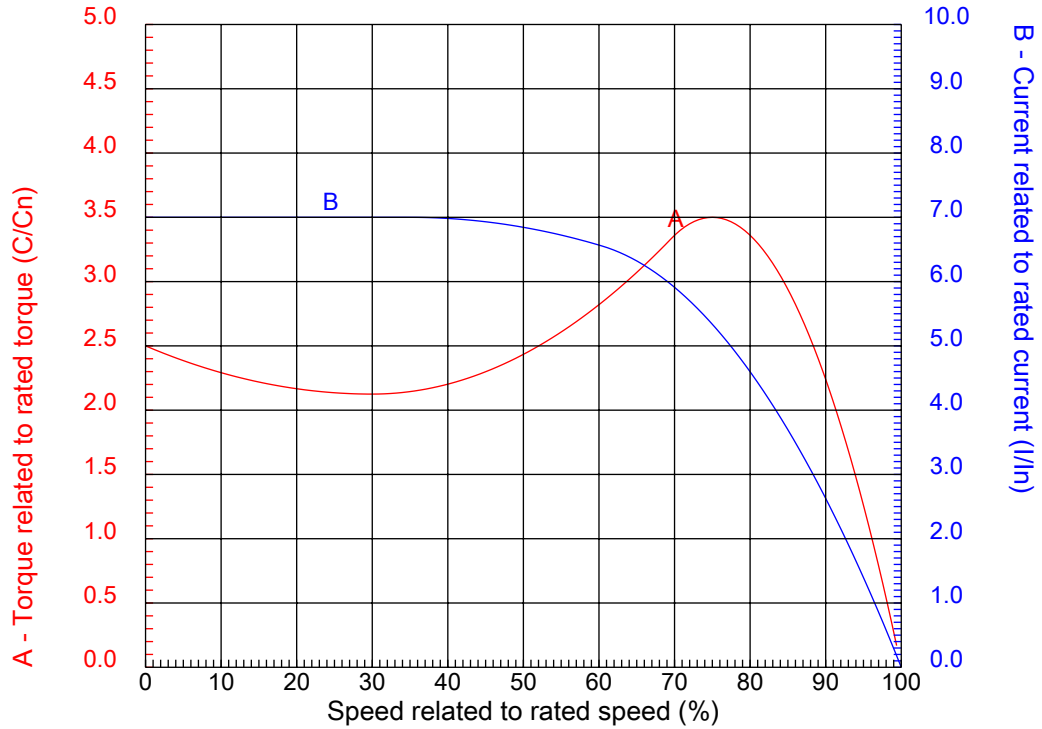
Taco Inc

No.: 01018OT3E215T-SG

Date: 17-NOV-2016

CHARACTERISTIC CURVES RELATED TO SPEED

Three-phase induction motor - Squirrel cage rotor



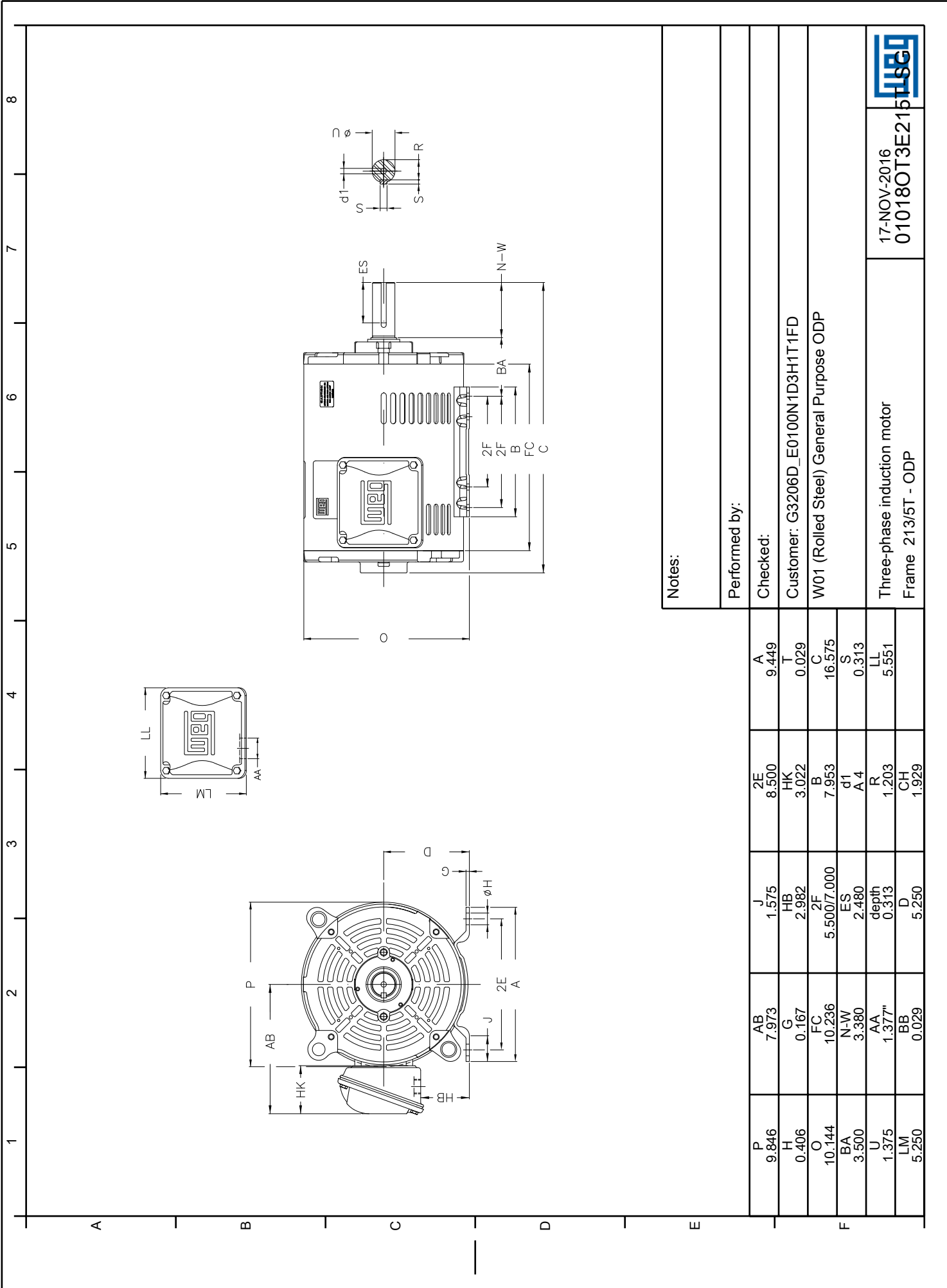
Customer : G3206D_E0100N1D3H1T1FD
Product line : W01 (Rolled Steel) General Purpose ODP

Frame	: 213/5T	Locked rotor current (I _l /I _{ln})	: 7.0
Output	: 10 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.15
Full load speed	: 1770 rpm	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 250 %
Rated current	: 27.4-24.8/12.4 A	Breakdown torque	: 350 %
Insulation class	: F		

Notes:

Performed by

Checked



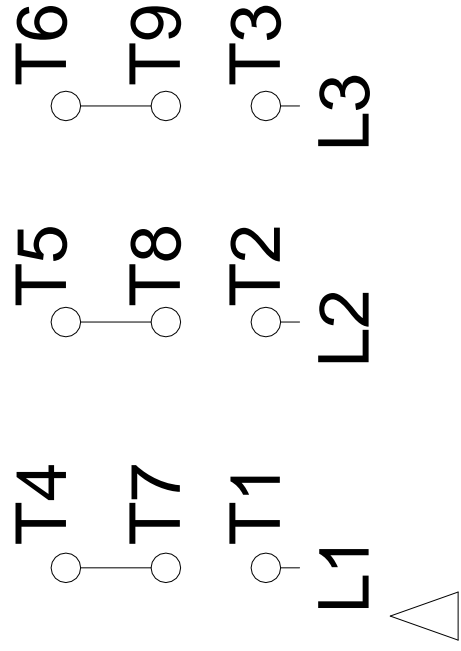
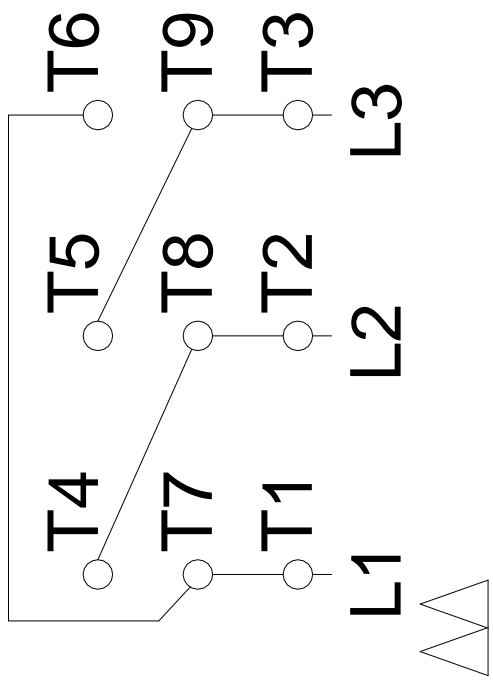
Notes:	
Performed by:	
Checked:	
Customer:	G3206D_E0100N1D3H1T1FD
W01 (Rolled Steel) General Purpose ODP	
Three-phase induction motor	17-NOV-2016
Frame 213/5T - ODP	01018OT3E21b



1 2 3 4 5 6 7 8

LOW VOLTAGE

HIGH VOLTAGE



Notes:	
Performed by:	
Checked:	
Customer: G3206D_E0100N1D3H1T1FD	
W01 (Rolled Steel) General Purpose ODP	
Three-phase induction motor Frame 213/5T - IP21	17-NOV-2016 01018OT3E215



Submittal Data Information

Suction Diffuser Rear Strainer Pullout (RSP)

"Flanged"

301-239.1

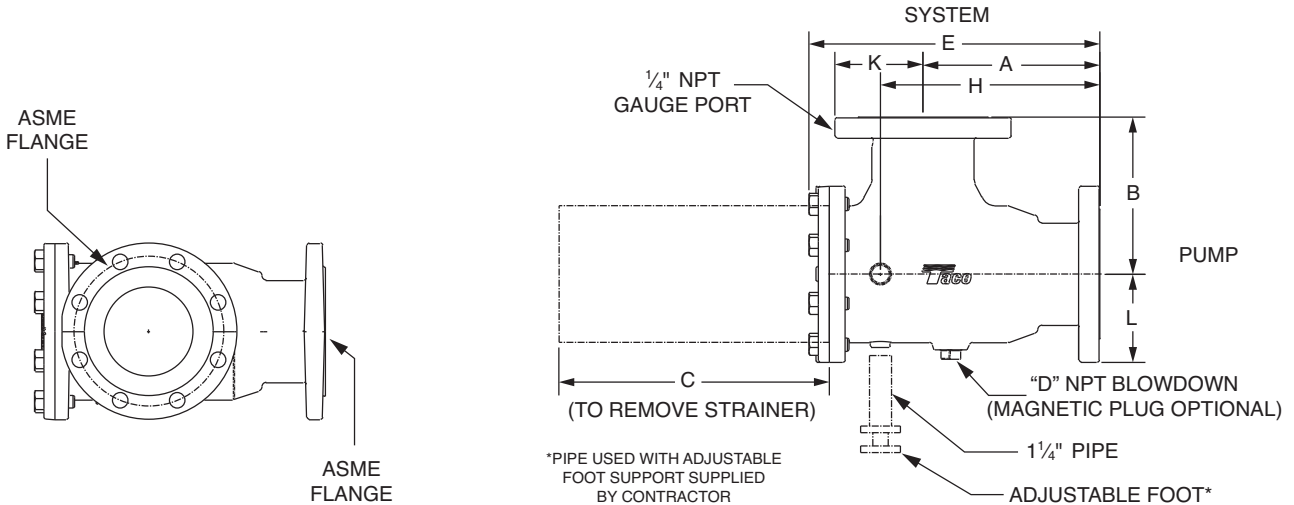
SUPERSEDES: September 17, 2013

EFFECTIVE: July 15, 2017

JOB _____ ENGINEER _____ CONTRACTOR _____ REP. _____

ITEM	QUANTITY	MODEL NO.	SIZE
------	----------	-----------	------

DIMENSIONS



Model Number	System	Pump	C _v	Free Area (sq. in.)	A (Class 125)*	A (Class 250)*	B	C	D	E (Class 125)*	E (Class 250)*	H (Class 125)*	H (Class 250)*	K (Class 125)*	K (Class 250)*	L (Class 125)*	L (Class 250)*	WGT. (Class 125)*	WGT. (Class 250)*
SD020015-5	2 Flanged	1 1/2 Flanged	54	21	5.69 (145)	6.06 (154)	5.39 (137)	8.49 (216)	3/4	9.25 (235)	9.62 (244)	6.92 (176)	7.29 (185)	3.00 (076)	3.25 (083)	2.50 (064)	3.06 (078)	22 (010)	27 (012)
SD020020-5	2 Flanged	2 Flanged	106	21	5.44 (138)	5.69 (145)	5.39 (137)	8.24 (209)	3/4	9.00 (229)	9.25 (235)	6.67 (169)	6.92 (176)	3.00 (076)	3.25 (083)	3.00 (076)	3.25 (083)	24 (011)	28 (013)
SD025020-5	2 1/2 Flanged	2 Flanged												3.50 (089)	3.75 (095)	3.00 (076)	3.25 (083)	27 (012)	35 (016)
SD030020-5	3 Flanged	2 Flanged												3.75 (095)	4.12 (105)	3.00 (076)	3.25 (083)	29 (013)	39 (018)
SD025025-5	2 1/2 Flanged	2 1/2 Flanged	135	24	6.06 (154)	6.56 (167)	6.01 (153)	8.97 (228)	3/4	9.83 (250)	10.35 (263)	7.41 (188)	7.91 (201)	3.50 (089)	3.75 (095)	3.50 (089)	3.75 (095)	38 (017)	54 (025)
SD030025-5	3 Flanged	2 1/2 Flanged			6.06 (154)	6.56 (167)	6.01 (153)		1	9.83 (250)		7.41 (188)	7.91 (201)	3.75 (095)	4.12 (105)	3.50 (089)	3.75 (095)	38 (017)	52 (024)
SD040025-5	4 Flanged	2 1/2 Flanged			6.07 (154)	6.07 (154)	8.45 (215)		3/4	8.93 (227)		7.59 (193)	7.59 (193)	4.43 (113)	4.93 (125)	3.50 (089)	3.75 (095)	52 (024)	65 (030)
SD030030-5	3 Flanged	3 Flanged	220	35	6.86 (174)	7.62 (194)	6.56 (167)	10.47 (266)	1	11.41 (290)	12.18 (309)	8.32 (211)	9.09 (231)	3.75 (095)	4.12 (105)	3.75 (095)	4.12 (105)	50 (023)	66 (030)
SD040030-5	4 Flanged	3 Flanged				6.86 (174)	8.94 (227)					4.50 (114)	5.00 (127)	3.75 (095)	4.12 (105)	55 (025)	72 (033)		
SD050030-5	5 Flanged	3 Flanged				6.86 (174)	8.94 (227)					8.51 (216)	8.54 (216)	4.93 (125)	5.43 (138)	3.75 (095)	4.43 (105)	65 (030)	83 (038)
SD040040-5	4 Flanged	4 Flanged	380	64	7.94 (202)	8.93 (227)	8.45 (215)	12.86 (327)	1	13.96 (355)	14.90 (378)	10.29 (261)	11.28 (287)	4.50 (114)	5.00 (127)	4.50 (114)	5.00 (127)	73 (033)	91 (041)
SD050040-5	5 Flanged	4 Flanged												5.00 (127)	5.50 (140)	4.50 (114)	5.00 (127)	75 (034)	97 (044)
SD060040-5	6 Flanged	4 Flanged												5.50 (140)	6.25 (159)	4.50 (114)	5.00 (127)	79 (036)	109 (049)

NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).

*C' is the distance required to replace strainer.

* Append 'A' for Class 250 working pressure flanged units (pump side) – e.g. Model Number SD040030-4A.

DIMENSIONS (continued)

Model Number	System	Pump	C _v	Free Area (sq. in.)	A (Class 125)*	A (Class 250)*	B	C	D	E (Class 125)*	E (Class 250)*	H (Class 125)*	H (Class 250)*	K (Class 125)*	K (Class 250)*	L (Class 125)*	L (Class 250)*	WGT. (Class 125)*	WGT. (Class 250)*
SD050050-5	5 Flanged	5 Flanged	669	100	10.06 (256)	10.06 (256)	8.94 (227)	15.36 (390)	1	16.54 (420)	16.54 (420)	12.48 (317)	12.48 (317)	5.00 (127)	5.50 (140)	5.00 (127)	5.50 (140)	90 (041)	116 (053)
SD060050-5	6 Flanged	5 Flanged					5.50 (140)					6.25 (159)	5.00 (127)	5.50 (140)	96 (044)	127 (058)			
SD080050-5	8 Flanged	5 Flanged					13.21 (336)					12.67 (322)	12.67 (322)	6.68 (170)	7.43 (189)	5.00 (127)	5.50 (140)	151 (069)	194 (088)
SD060060-5	6 Flanged	6 Flanged	985	146	11.58 (294)	12.08 (307)	11.17 (284)	19.02 (483)	1	20.39 (518)	20.89 (531)	16.17 (411)	16.67 (423)	5.50 (140)	6.25 (159)	5.50 (140)	6.25 (159)	151 (069)	193 (088)
SD080060-5	8 Flanged	6 Flanged												6.75 (171)	7.50 (191)	5.50 (140)	6.25 (159)	170 (077)	215 (098)
SD100060-5	10 Flanged	6 Flanged												8.00 (203)	8.75 (222)	5.50 (140)	6.25 (159)	182 (083)	238 (108)
SD080080-5	8 Flanged	8 Flanged	1657	248	14.43 (367)	15.31 (389)	13.21 (336)	23.79 (604)	1	25.32 (643)	26.19 (685)	20.22 (514)	21.1 (536)	6.75 (171)	7.50 (191)	6.75 (171)	7.50 (191)	271 (123)	319 (145)
SD100080-5	10 Flanged	8 Flanged												8.00 (203)	8.75 (222)	6.75 (171)	7.50 (191)	284 (129)	351 (159)
SD120080-5	12 Flanged	8 Flanged												9.50 (241)	10.25 (260)	6.75 (171)	7.50 (191)	305 (138)	388 (176)
SD100100-5	10 Flanged	10 Flanged	2650	394	18.36 (466)	19.61 (498)	14.54 (369)	29.40 (747)	1	31.10 (790)	32.35 (822)	25.64 (651)	26.89 (683)	8.00 (203)	8.75 (222)	8.00 (203)	8.75 (222)	400 (182)	482 (219)
SD120100-5	12 Flanged	10 Flanged												9.50 (241)	10.25 (260)	8.00 (203)	8.75 (222)	420 (191)	518 (235)
SD140100-5	14 Flanged	10 Flanged												11.50 (292)	10.25 (260)	8.00 (203)	8.75 (222)	441 (200)	557 (253)
SD120120-5	12 Flanged	12 Flanged	3000	570	20.39 (518)	22.64 (575)	16.62 (422)	33.72 (856)	1	35.50 (902)	37.75 (959)	29.83 (758)	32.08 (815)	9.50 (241)	10.25 (260)	9.50 (241)	10.25 (260)	589 (267)	703 (319)
SD140120-5	14 Flanged	12 Flanged												11.50 (292)	11.50 (292)	9.50 (241)	10.25 (260)	617 (280)	786 (357)
SD160120-5	16 Flanged	12 Flanged												11.75 (298)	12.75 (324)	9.50 (241)	10.25 (260)	651 (296)	802 (364)
SD140140-5	14 Flanged	14 Flanged	3940	628	22.31 (567)	22.31 (567)	19.26 (489)	34.00 (864)	1	37.66 (957)	37.66 (957)	31.61 (803)	31.61 (803)	10.50 (267)	11.50 (292)	10.50 (267)	11.50 (292)	895 (406)	1049 (476)
SD160140-5	16 Flanged	14 Flanged												11.75 (298)	12.75 (324)	10.50 (267)	11.50 (292)	934 (424)	1106 (502)

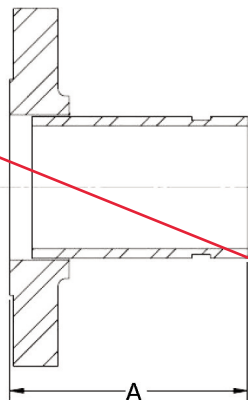
NOTE: Dimensions are in inches. Metric dimensions are in millimeters and are in parentheses (). Weights are in lb (kg).
 *C' is the distance required to replace strainer.

* Append 'A' for Class 250 working pressure flanged units (pump side) – e.g. Model Number SDG040030-4A.

GROOVED ADAPTER

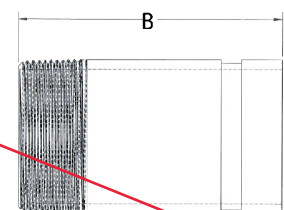
FLANGED - GROOVED

Class 125 Assembly Part No.	Class 250 Assembly Part No.	Size	'A'
FTG020-5	FTG020-5A	2"	4"
FTG025-5	FTG025-5A	2-1/2"	
FTG030-F	FTG030-5A	3"	6"
FTG040-5	FTG040-5A	4"	
FTG050-5	FTG050-5A	5"	
FTG060-5	FTG060-5A	6"	8"
FTG080-5	FTG080-5A	8"	
FTG100-5	FTG100-5A	10"	
FTG120-5	FTG120-5A	12"	
FTG140-5	FTG140-5A	14"	



THREADED - GROOVED

Class 125 + 250 Assembly Part No.	Size	'B'
TTG015-5	1-1/2"	4"
TTG020-5	2"	
TTG025-5	2-1/2"	



FLANGED - GROOVED

Note: Adapters required to convert flanged & threaded MPV to grooved.

FEATURES

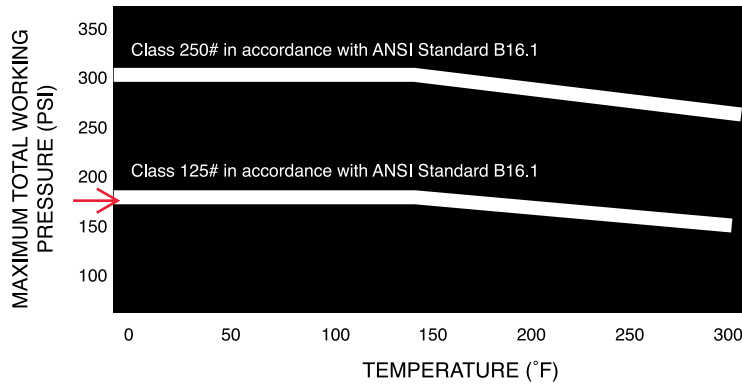
- Integral Cast Straightening Vanes ensure uniform flow to the suction inlet of the pump
- Oversized Body Cylinder ensures minimal pressure drop
- Metering Port allows for the monitoring of system conditions
- Disposable Fine Mesh Start-Up Strainer promotes cleaner, more trouble-free system
- Removable Cover Plate and reusable "O" Ring allows for easy access and maintenance of Permanent Strainer
- Blow Down port allows for routine maintenance and removal of sediment and debris
- Ductile Iron Body on all units
- Optional Magnetic Insert to trap small metallic particles
- Available with Class 125* flanges or Class 250* flanges. Consult pressure/temperature chart below for operating limitations. (Flanged units are raised faced design.)

(All sizes available with optional DIN Flanges. Consult factory for details)

MATERIALS OF CONSTRUCTION

Body	- Ductile Iron
Cover	- Ductile Iron
Straightening Vanes	- Integral Ductile Iron
Permanent Strainer	- Stainless Steel (304)
Disposable Start Up Strainer	- Bronze (16 Mesh)
Cover O-Ring	- EPDM
Grooved Adapter	- Steel

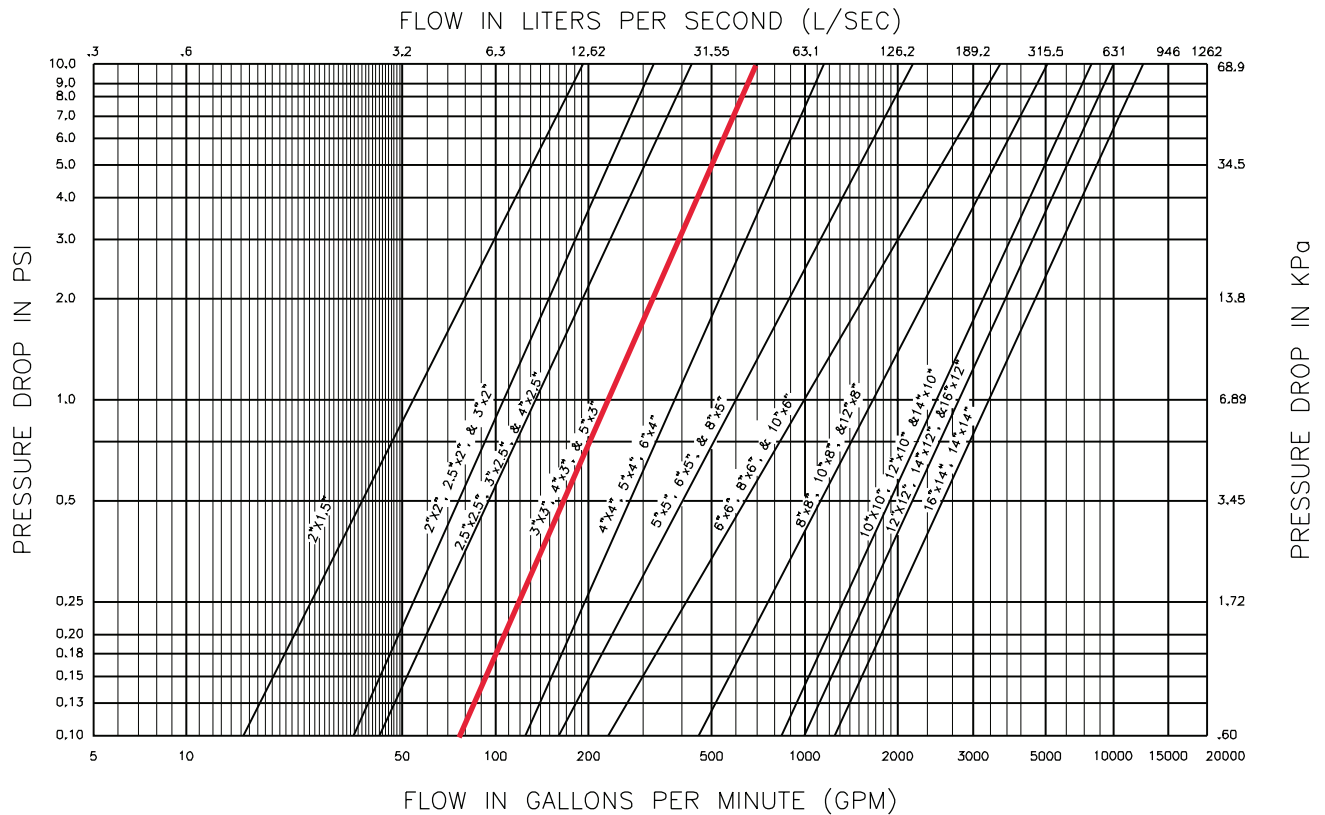
PRESSURE TEMPERATURE RATINGS



OPERATING SPECIFICATIONS

	Standard	Optional
Flange	Class 125*	Class 250*
Pressure	175 PSIG* (1210 KPA)	300 PSIG* (2070 KPA)
Temperature	250°F (120°C**)	250°F (120°C**)

* Per Pressure Temperature Ratings chart to left.



Taco Comfort Solutions® A Taco Family Company

Taco, Inc., 1160 Cranston Street, Cranston, RI 02920 | Tel: (401) 942-8000 | FAX: (401) 942-2360

Taco (Canada), Ltd., 8450 Lawson Road, Suite #3, Milton, Ontario L9T 0J8 | Tel: (905) 564-9422 | FAX: (905) 564-9436

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BBC

Pump and Equipment Company, Inc.

5/1/2024

PROJECT: Eagle Elementary

HVAC BOILERS & ACCESSORIES

TAG	QTY	DESCRIPTION
B-1, 2	2	Riello AR3000 Modular Condensing Boiler
ACCESSORY	2	Riello Condensate Neutralization Kit
ACCESSORY	2	Riello 10" Flue Adapter to AI294C
ACCESSORY	1	Riello BACnet Gateway
FLUE	1	Duravent SSD Flue Package, Includes: 27' - 10" Double Wall AI294C Straight Flue; Two (2) 90 Elbows; Two (2) Roof Thimbles; Two (2) Storm Collars; Two (2) Rail Caps; Lube
FREIGHT	1	Freight to Job Site or Contractor, Single Trip from Factory
START-UP	1	Start-Up Service per Specification

COORDINATE SHIPMENT DATES WITH OWNER/INSTALLING CONTRACTOR.

BOILER MFG. SHALL APPROVE CONTRACTOR VENTING LAYOUT PRIOR TO INSTALLATION.

R.E. Dimond and Associates, Inc.

Reviewed and checked only for conformance with design concepts and with information given in the Contract Documents. Approval does not release the Contractor from the responsibility to provide appropriate quantities, field measurements, dimensional stability, installation, anchorage, and coordination with other trades, or release the Contractor from responsibility for deviations from the requirements of the Contract Documents, or from responsibility for errors and omissions contained thereon.

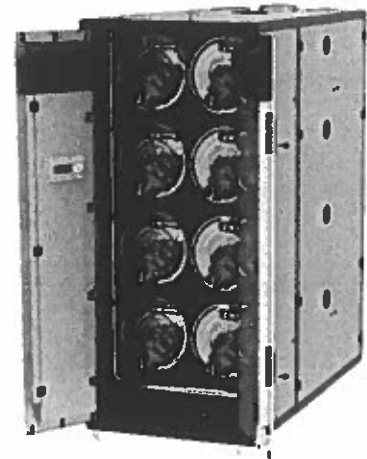
- Reviewed as Submitted
- Reviewed as Noted
- Rejected - Correct and Resubmit
- See Attached Comment Sheet(s)

By: MJE

Date: 4/13/2024



ARRAY CONDENSING BOILER



Project Details	Date:	5/2/2024
	Project Name:	Eagle Elementary
	Project Location:	Brownsburg, IN
	Installing Contractor:	
	Engineering Firm:	R.E Dimond
	Riello Representative:	BBC Pump and Equipment Company

Boiler Supply	AR 800 Qty.	
	AR 1000 Qty.	
	AR 1500 Qty.	
	AR 2000 Qty.	
	AR 3000 Qty.	2
	AR 4000 Qty.	

Project Notes:

General Boiler Data	BOILER TYPE	CONDENSING HYDRONIC HEATING BOILER
	AHRI CERTIFIED EFFICIENCY	96.1% (AHRI STANDARD 1500)
	MAX. TEMPERATURE	210°F (203± 5.5°F HIGH LIMIT)
	MAX. OPERATING TEMPERATURE	194°F
	VESSEL DESIGN	80 PSIG MAWP (ASME SECTION IV)
	PRESSURE RELIEF VALVES SETTING	75 PSIG (PER HEAT MODULE)
	FUEL TYPE: AS SHIPPED	NATURAL GAS, 1004 BTU/SCF HHV
	FUEL TYPE: ALTERNATE	PROPANE (REQUIRES CONVERSION KIT)
	MIN. GAS SUPPLY PRESSURE	4.0" W.C. Natural Gas / 8.0" W.C. Propane
	MAX. GAS SUPPLY PRESSURE	13.5" W.C.
	FLAME SAFEGUARD CONTROLLER	EBM PAPST 905MN, ASME CSD-1
	FLAME DETECTION	IONIZATION PROBE CURRENT
	APPROVALS	ASME, AHRI, ETL, SCAQMD (Where applicable)

Optional Accessories	INLET FLANGED WATER STRAINER(S)	
	MOTORIZED INTAKE AIR DAMPER(S)	
	CONDENSATE NEUTRALIZER KIT(S)	✓
	FLUE ADAPTER(S), TO STAINLESS	✓
	FLUE ADAPTER(S), TO CPVC	
	BOILER CLEANING KIT(S)	
	PROPANE CONVERSION KIT(S)	
	GATEWAY TO BACNET RS485 (MODBUS PROVIDED AS STANDARD)	✓
	LONWORKS GATEWAY RS232	
	DHW TEMP. SENSOR & WELL	
	SYSTEM TEMP. SENSOR & WELL (Std.)	•
OUTDOOR AIR TEMP. SENSOR (Std.)	•	

Factory Integrated Components

- Primary boiler pumps
- Main circuit breaker
- Sequencing controller
- Factory piped and wired;
 - Water-supply manifold
 - Water-return manifold
 - Stainless Exhaust manifold
 - Gas trains
 - Condensate drain manifold (no need for external traps)
 - Relief drain manifold
 - Pumps

Redundancy

- Multiple module design
- Controls for each module
- Isolation valves for each module
- Drain valves for each module

Performance Features

- 316Ti/L Stainless heat exchanger
- High turndown with low excess air
- Air-cooled housing
- Variable speed fans
- Variable water flow (staged pumps)
- Low NOx (30, 20, or 9 ppm)
- Provided with externally mounted gas supply filter**

Operation

- Password protected control levels
- Identified fault circuitry
- Vortex flow meters to each module
- Dynamic operating limits
- 7" color touch screen
- Chart displays
- Adjustable sequencing control and firing rate parameters
- Indirect DHW function and priority
- Hinged front door
- Identical spare parts
- Modbus communication to BMS (other gateways available)

Boiler Data Chart

	UNITS	AR 800	AR 1000	AR 1500	AR 2000	AR 3000	AR 4000	
Riello Product Code		20164509	20177312	20177313	20177314	20177315	20177316	
I&O Manual Code		20184133	0092303		0092302			
Redundancy								
Nº of Heating Modules	Qty.	2	2	3	4	6	8	
Combustion								
Maximum Input (<2,000 ft. alt., 30ppm NO _x)	BTU/hr (kW)	798,000 (234)	1,000,000 (293)	1,500,000 (440)	2,000,000 (586)	3,000,000 (879)	4,000,000 (1172)	
Minimum Input	BTU/hr (kW)	39,900 (11.7)	100,000 (29)	100,000 (29)	100,000 (29)	100,000 (29)	100,000 (29)	
Boiler Turndown	Ratio	20:1	10:1	15:1	20:1	30:1	40:1	
Exhaust O ₂ Range (Nat. Gas)	%	4.4 – 5.8 (dry basis)						
Emissions (Nat. Gas)	ppm	CO: <150 ppm, NO _x : <30 ppm std. (<20 ppm & 9 ppm with fuel-air ratio / max. input adjustment)						
Hydronic								
Water Volume (Total Boiler)	US Gal. (Liter)	14 53	17 (64)	24 (91)	35 (132)	55 (208)	69 (261)	
Electrical								
Single-Point Electrical Connection	V/ph/Hz	120/1/60	120/1/60	120/1/60	240/1/60 *	208-230/3/60	208-230/3/60	
Electrical Supply Terminals		L1, N, GND	L1, N, GND	L1, N, GND	L1, L2, N, GND	L1, L2, L3, N, GND	L1, L2, L3, N, GND	
Electrical – FLA	Amps	15.5A	15.5A	23.3A	15.5A	15.5A	23.3A	
Electrical – MOCP	Amps	20A	20A	30A	20A	20A	30A	
Electrical – MCA	Amps	16A	16A	24A	16A	16A	24A	
Connections								
Gas Inlet [NPT Male]	NPS Inch (DN mm)	1.5 (40)	1.5 (40)	1.5 (40)	1.5 (40)	2.0 (50)	2.0 (50)	
External Gas Filter [NPT Female]	NPS Inch (DN mm)	N/A	1.5 (40)	1.5 (40)	1.5 (40)	2.0 (50)	2.0 (50)	
Water Return / Supply [ANSI #150 Flange Raised]	NPS Inch (DN mm)	2.5 (65)	3 (80)	3 (80)	4 (100)	4 (100)	4 (100)	
Relief Drain Connection [NPT Female]	NPS Inch (DN mm)	2.5 (65)	2.5 (65)	2.5 (65)	2.5 (65)	2.5 (65)	2.5 (65)	
Condensate Drain Connection [PVC Female]	NPS Inch (DN mm)	1 (25)	1 (25)	1 (25)	1 (25)	1 (25)	1 (25)	
Flue Outlet [Female Centrotherm InnoFlue®]	NPS Inch (DN mm)	6 (160)		8 (200)		8†/10 (200†/250)		
Available Adapters & Suitable Vent Material	CPVC, PP, Stainless Steel, AL29-4C							
Air Inlet [Round Sheet-Metal Opening]	∅ Inch (∅ mm)	5.91" (150)	5.91" (150)		7.87" (200)	9.84" (250)		
System Sensor	NTC Type-4 Sensor: 45mm, 6mm∅ (shipped loose)							
System Sensor Thermowell	304 Stainless, ½" NPT x 4" (shipped loose)							
Misc.								
Ambient Storage Temperature	°F (°C)	5 to 158 (-15 to 70)						
Ambient Functioning Temperature	°F (°C)	32 to 120 (0 to 49)						
Heat Exchanger Surface Area (Per Module)	ft ² (m ²)	27 (2.5)	43 (4)					

* AR2000: It is possible to power this boiler using two (2) legs of a 208-230V/3PH/60HZ source, provided the system is balanced.

** Models AR1000-4000 include an in-line 20µm gas filter for external mounting. Female NPT connections on filter match boiler gas pipe size. Filter housing is 160mm end-to-end length, and up to 112mm wide. Rated max. 2bar (29 psi).

† Using the 8-inch (200mm) vent connection on the AR3000-AR4000 limits the allowable vent length, see venting section.

All models, SCCR = 5kA

Major Components Distribution

	Common to Boiler	On Each Independent Heat Module
Electrical Compartment	<ul style="list-style-type: none"> 7" Color touch screen (non-controlling) LCD service display and touchpad Electrical feed landing terminals Main boiler circuit breaker System input/output terminals 	<ul style="list-style-type: none"> Burner, sequencing, and flame safeguard controller Module on/off rocker switch Overload fuse
Water-Side	<ul style="list-style-type: none"> Internally Piped Manifolds: <ul style="list-style-type: none"> Supply water Return water Relief drain Condensate drain Low water-pressure switch Low water-level cut-off Boiler drain valve Boiler supply temperature sensor System supply temperature sensor and thermowell Outdoor air temperature sensor 	<ul style="list-style-type: none"> Safety relief valve: ASME rated 75 psig (517 kPa) setting. Hydronic Pump Temperature and pressure gauge (supply side) Supply manual isolation valve Return manual isolation valve Check valve Drain valve Module return temperature sensor Module supply temperature sensor Module high temperature limit control Module low water cut-off Automatic air vent Water flow meter
Gas-Side	<ul style="list-style-type: none"> Single connection to gas supply line Low gas pressure switch (manual reset) High gas pressure switch (manual reset) Blocked cabin air inlet switch 	<ul style="list-style-type: none"> Gas burner with variable speed blower Self-compensating zero governing gas valve with dual safety shut off function Manual gas shutoff valve (upstream of automatic valve) Manual gas shutoff valve before the burner Combination flame supervision & ignition electrode Flue gas temperature sensor Flue gas / condensate pressure switch Module exhaust backflow check valve (clapper)

Piping & Available Head Pressure

Important! The Array boiler includes internal boiler loop pumps. The boiler(s) must be piped primary-secondary, "hydraulically separated" from the system and other pumps. Boiler(s) must connect the distribution via closely spaced Tees or hydraulic separator. See IO&M Boiler Room Layout example.

Boiler loop piping must be sized to accommodate the required boiler maximum flow with pressure drop at or below the available head pressure. Below: Available head pressure for the boiler loop.

		Available Waterside Head Pressure					
		AR 800	AR 1000	AR 1500	AR 2000	AR 3000	AR 4000
ΔT 36°F Across Boiler	Water Flowrate (USgpm) (Est., No Glycol, Full Firing)	42	53	80	107	160	213
	Available Head (ft. W.C.) Water Only	16.0	7.5	7.0	8.0	4.5	4.0
	Available Head (ft. W.C.) 50% Glycol	14.4	7.0	6.0	7.0	4.0	3.0
ΔT 45°F Across Boiler	Water Flowrate (USgpm) (Est., No Glycol, Full Firing)	34	43	64	85	128	171
	Available Head (ft. W.C.) Water Only	20.0	16.5	16.0	16.5	14.5	14.0
	Available Head (ft. W.C.) 50% Glycol	18.0	16.0	15.5	15.5	14.0	13.5

Venting I – Specified in Total Equivalent Length

! See boiler installation manual for full venting requirements.

Maximum Equivalent Venting Length (Combined Exhaust + Combustion Air)			
Nominal Size	6"	8"	10"
Units	m (ft)	m (ft)	m (ft)
AR 800	30 (100)	-	-
AR 1000	30 (100)	-	-
AR 1500	30 (100)	-	-
AR 2000	-	30 (100)	-
AR 3000	-	21 (70)	30 (100)
AR 4000	-	12 (40)	30 (100)

45° Elbow Typical Equivalent Length			
Nominal Size	6"	8"	10"
Units	m (ft)	m (ft)	m (ft)
AR 800	1.5 (5)	-	-
AR 1000	1.5 (5)	-	-
AR 1500	1.5 (5)	-	-
AR 2000	-	2.1 (7)	-
AR 3000	-	2.1 (7)	1.5 (5)
AR 4000	-	2.1 (7)	1.5 (5)

90° Elbow Typical Equivalent Length			
Nominal Size	6"	8"	10"
Units	m (ft)	m (ft)	m (ft)
AR 800	1.8 (6)	-	-
AR 1000	1.8 (6)	-	-
AR 1500	1.8 (6)	-	-
AR 2000	-	2.8 (9)	-
AR 3000	-	2.8 (9)	1.8 (6)
AR 4000	-	2.8 (9)	1.8 (6)

Venting II – Specified as Total Allowable Pressure Drop

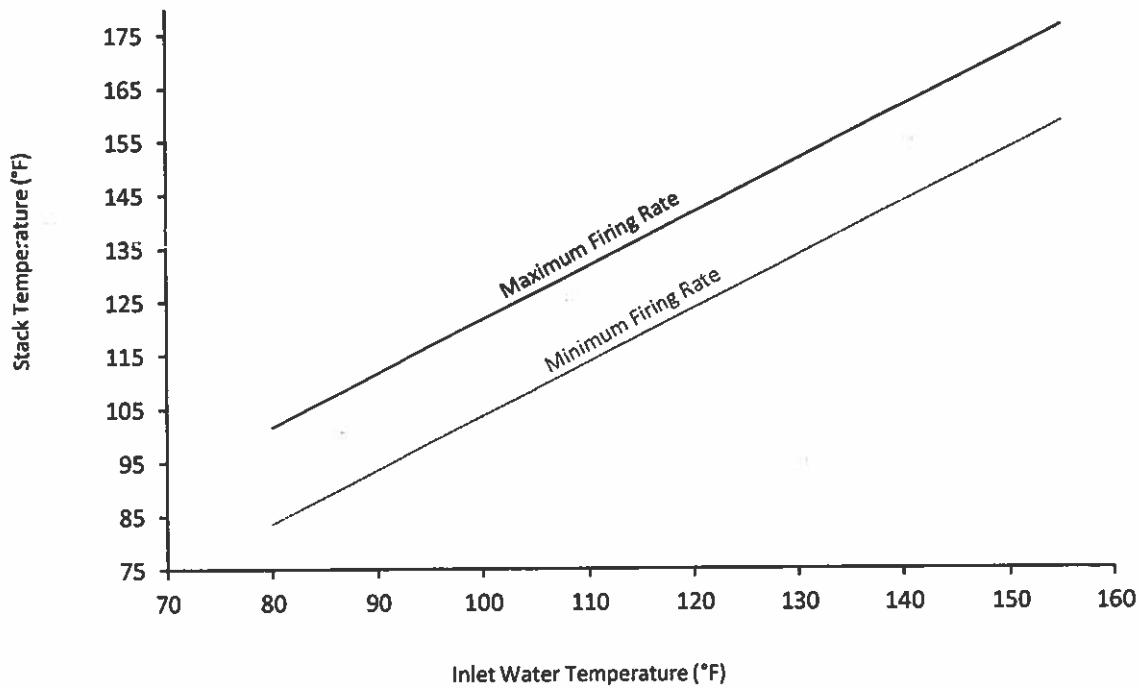
This section can be used for designing a multiple boiler common vent or for custom engineering single boiler venting.

Installation must comply with local requirements and with the National Fuel Gas Code ANSI Z223.1. Array boilers vent and air piping can be installed through the roof or through a sidewall. Suitable, UL approved, positive pressure, watertight vent materials **MUST** be used for safety and UL certification. (CPVC, PP, Stainless Steel, AL29-4C)

Model	Exhaust Mass Flow Rate	Max. Allowable Negative Draft at Boiler Exit	Allowable Vent Pressures	
			Max. Positive Vent Pressure at Boiler Exit ⁽¹⁾	
			176°F supply / 140°F return	104°F supply / 86°F return
AR 800	0.21 lbs/s	-62 Pa (-0.25" WC)	180 Pa (0.72" WC)	180 Pa (0.72" WC)
AR 1000	0.26 lbs/s	-62 Pa (-0.25")	202 Pa (0.81")	224 Pa (0.90")
AR 1500	0.40 lbs/s	-62 Pa (-0.25")	174 Pa (0.70")	197 Pa (0.79")
AR 2000	0.52 lbs/s	-62 Pa (-0.25")	187 Pa (0.75")	209 Pa (0.84")
AR 3000	0.78 lbs/s	-62 Pa (-0.25")	162 Pa (0.65")	179 Pa (0.72")
AR 4000	1.04 lb/s	-62 Pa (-0.25")	149 Pa (0.60")	167 Pa (0.67")

(1) Pressure drop from ducted combustion air must be subtracted from the allowable exhaust vent pressure.

Linearized Exhaust Temperature (approx.)
Operating at 36°F Across Boiler



General Dimensions & Weight

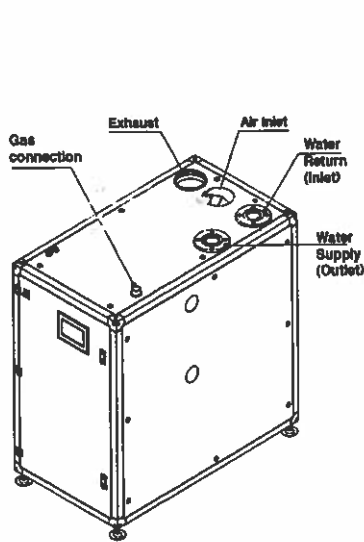
		AR 800	AR 1000	AR 1500	AR 2000	AR 3000	AR 4000
Width	Inches	29.4	33.3	33.3	33.3	35.4	35.4
	(mm)	(747)	(846)	(846)	(846)	(900)	(900)
Height*	Inches	54.2	67.2	67.2	83.0	83.0	83.0
	(mm)	(1,378)	(1,707)	(1,707)	(2,108)	(2,108)	(2,108)
Depth	Inches	52.4	60.8	60.8	60.8	72.8	72.8
	(mm)	(1,330)	(1,544)	(1,544)	(1,544)	(1,850)	(1,850)
Dry Weight	lbs.	926	1,058	1,323	1,676	2,315	2,998
	(kg)	(430)	(480)	(600)	(760)	(1,050)	(1,310)
Operating Weight	lbs.	1,008	1,200	1,523	1,968	2,774	3,574
	(kg)	(467)	(544)	(691)	(892)	(1,258)	(1,621)

*Overall height can be reduced a further two (2) inches during installation as boiler feet can be temporarily removed.

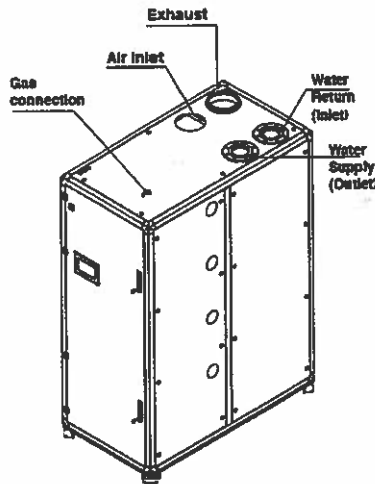
Recommended Clearance for Maintenance

Sides, Rear, Top	24"
Front	32"

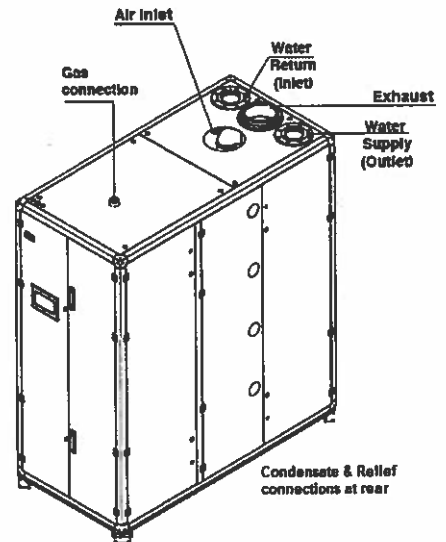
Installation to provide at least the minimum distances to obstructions for proper service access. These clearances apply the all ARRAY boiler sizes from AR 800 to AR 4000.



AR 800



AR 1000 | AR 1500 | AR 2000



AR 3000 | AR 4000

Not to scale

RIELLO NORTH AMERICA
Corporate Headquarters
2165 Meadowpine Blvd
Mississauga, ON L5N 6H6, Canada

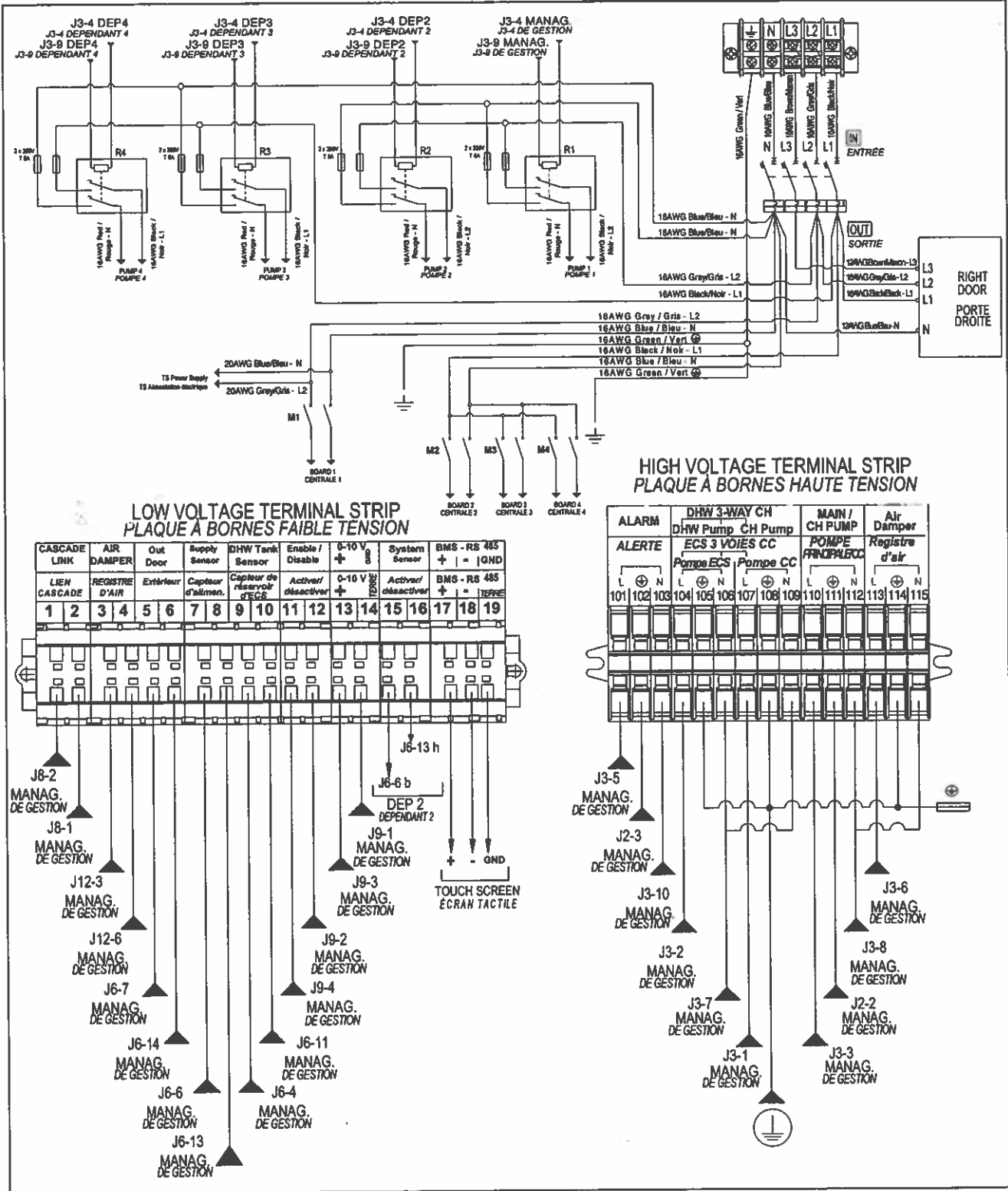
USA OFFICE
35 Pond Park Rd.
Hingham, MA 02043, USA

Phone: 905-542-0303
Fax: 905-542-1525

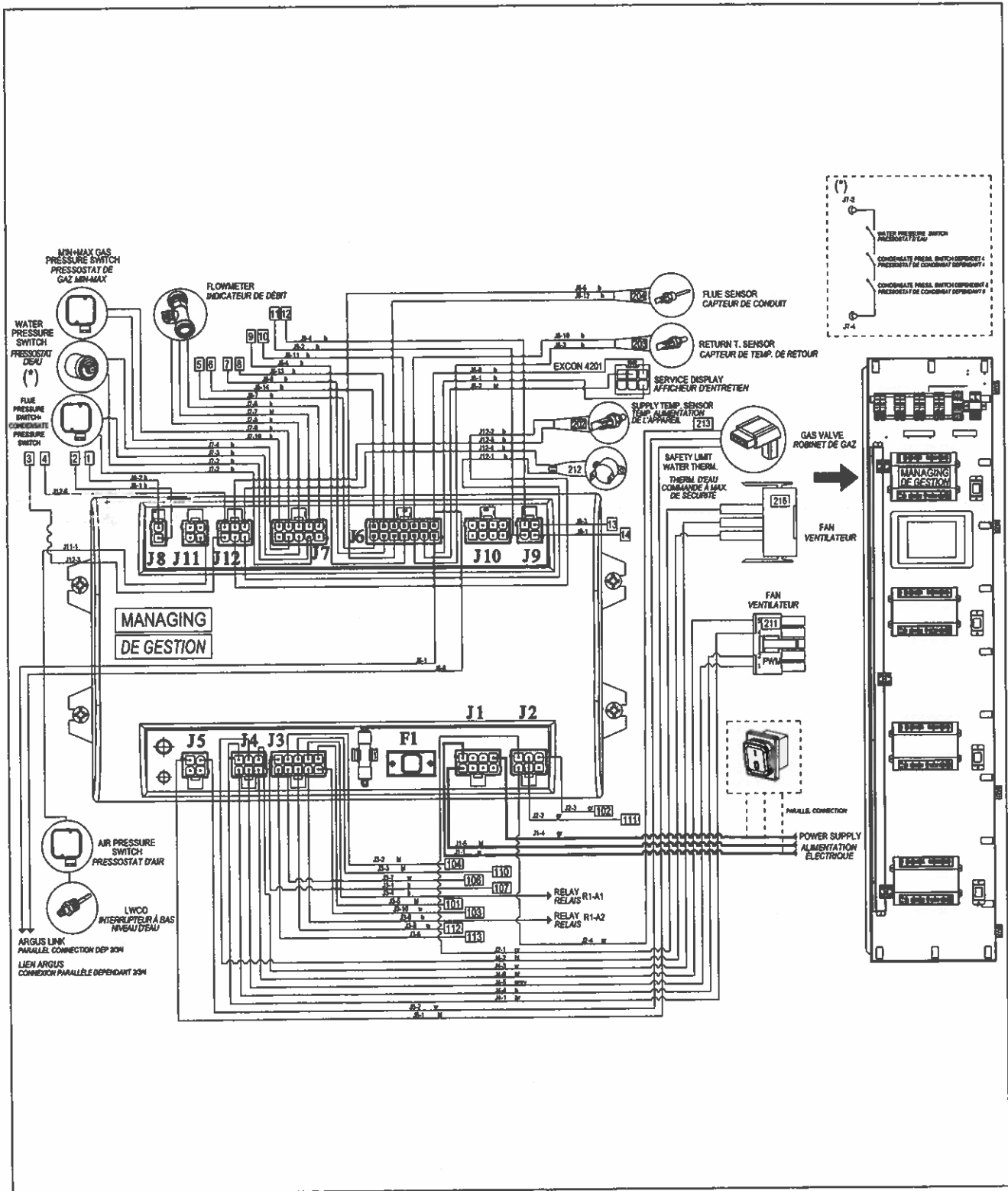


HIGH EFFICIENCY COMMERCIAL HEATING
 Stainless Steel Condensing Floor Standing Boilers

WIRING DIAGRAM ARRAY AR 3000, AR 4000
 ANNEXE A - SCHEMA DE CÂBLAGE

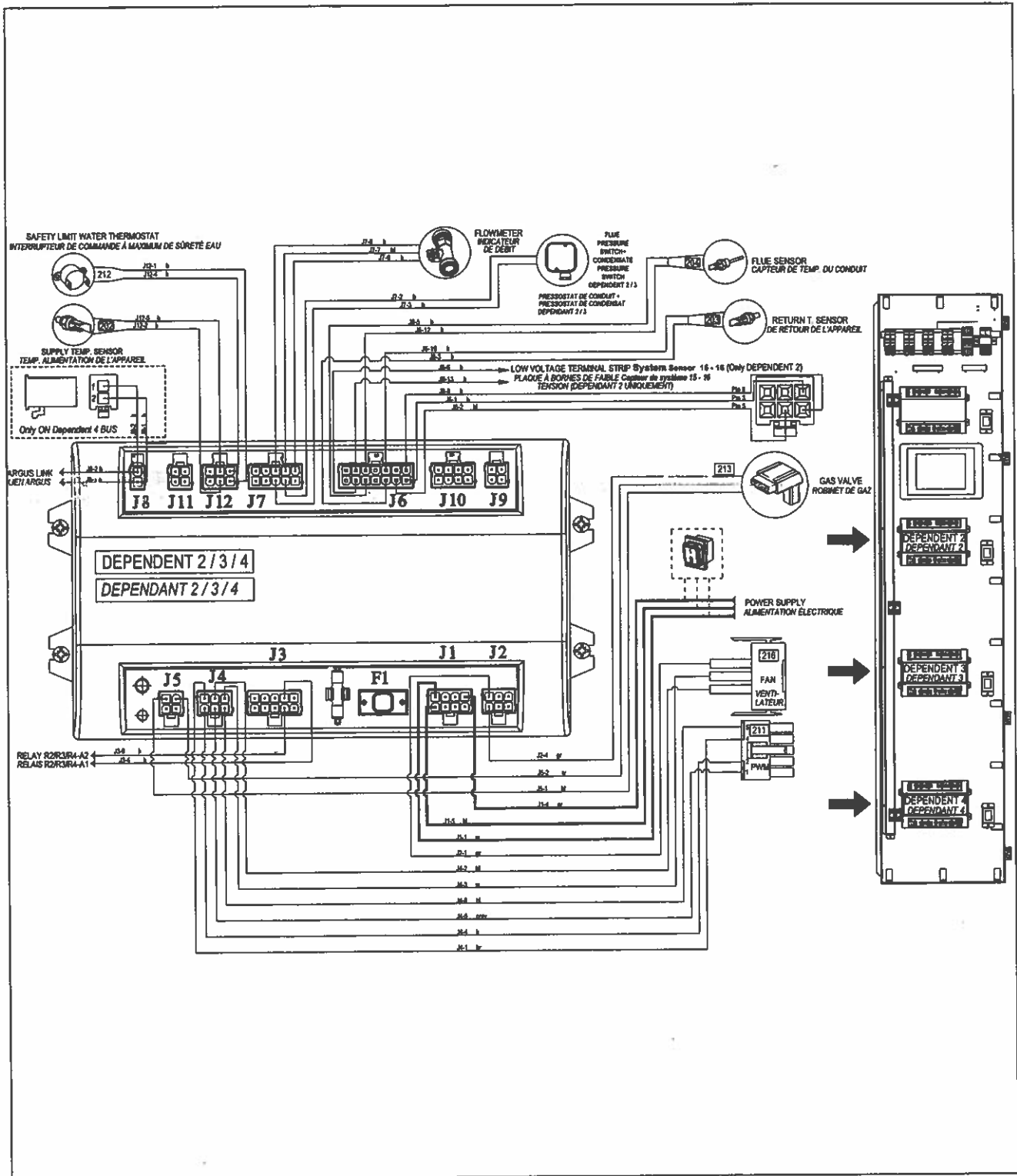


WIRING DIAGRAM ARRAY AR 3000, AR 4000 - MANAGING LEFT DOOR
SCHEMA DE CÂBLAGE - CHAUDIÈRE DE GESTION - PORTE GAUCHE

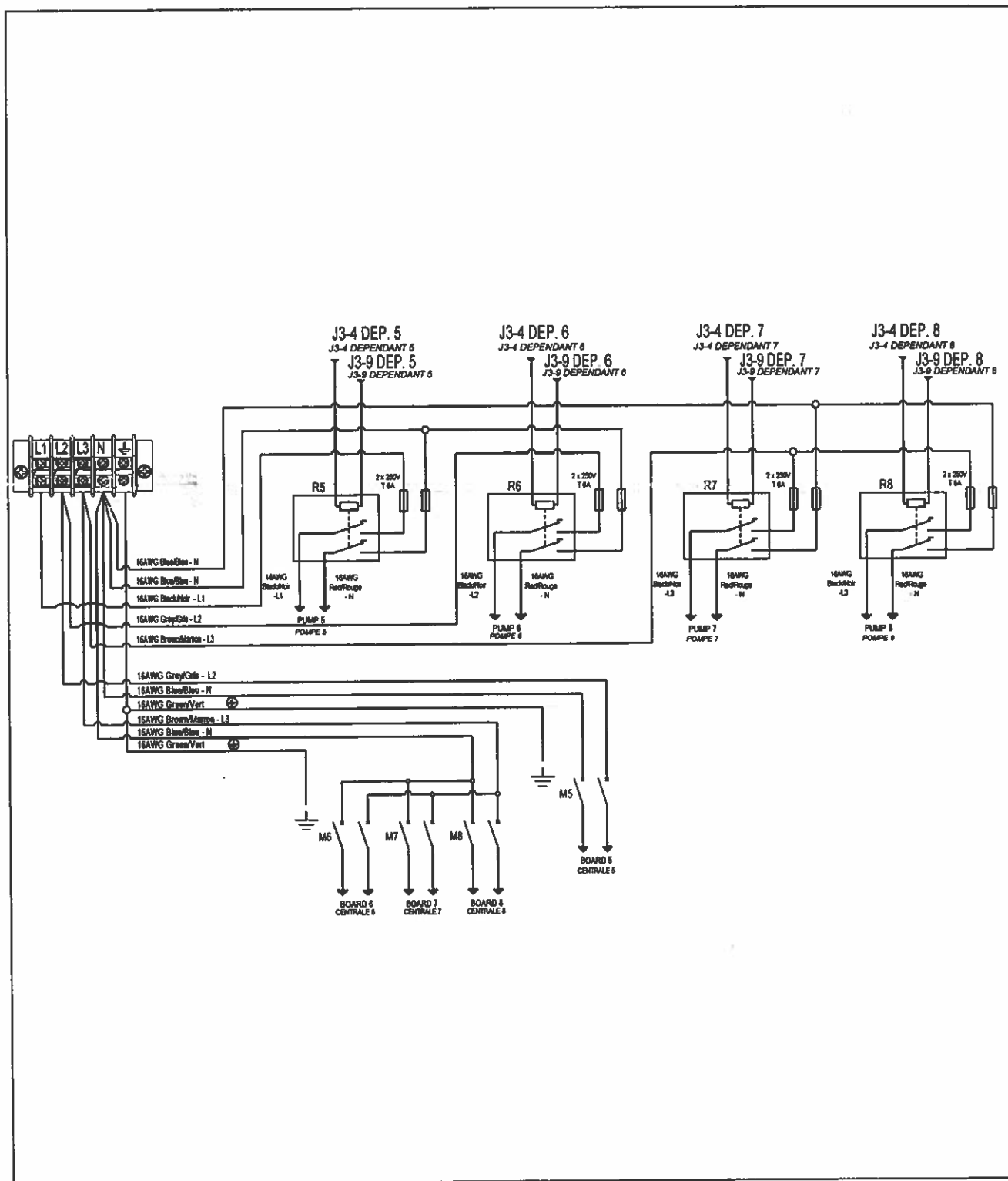


HIGH EFFICIENCY COMMERCIAL HEATING
 Stainless Steel Condensing Floor Standing Boilers

WIRING DIAGRAM ARRAY AR 3000, AR 4000 - DEPENDENT 2 / 3 / 4 - LEFT DOOR
SCHEMA DE CÂBLAGE DE LA CHAUDIÈRE - CHAUDIÈRE DÉPENDANTE 2/3/4 - PORTE GAUCHE

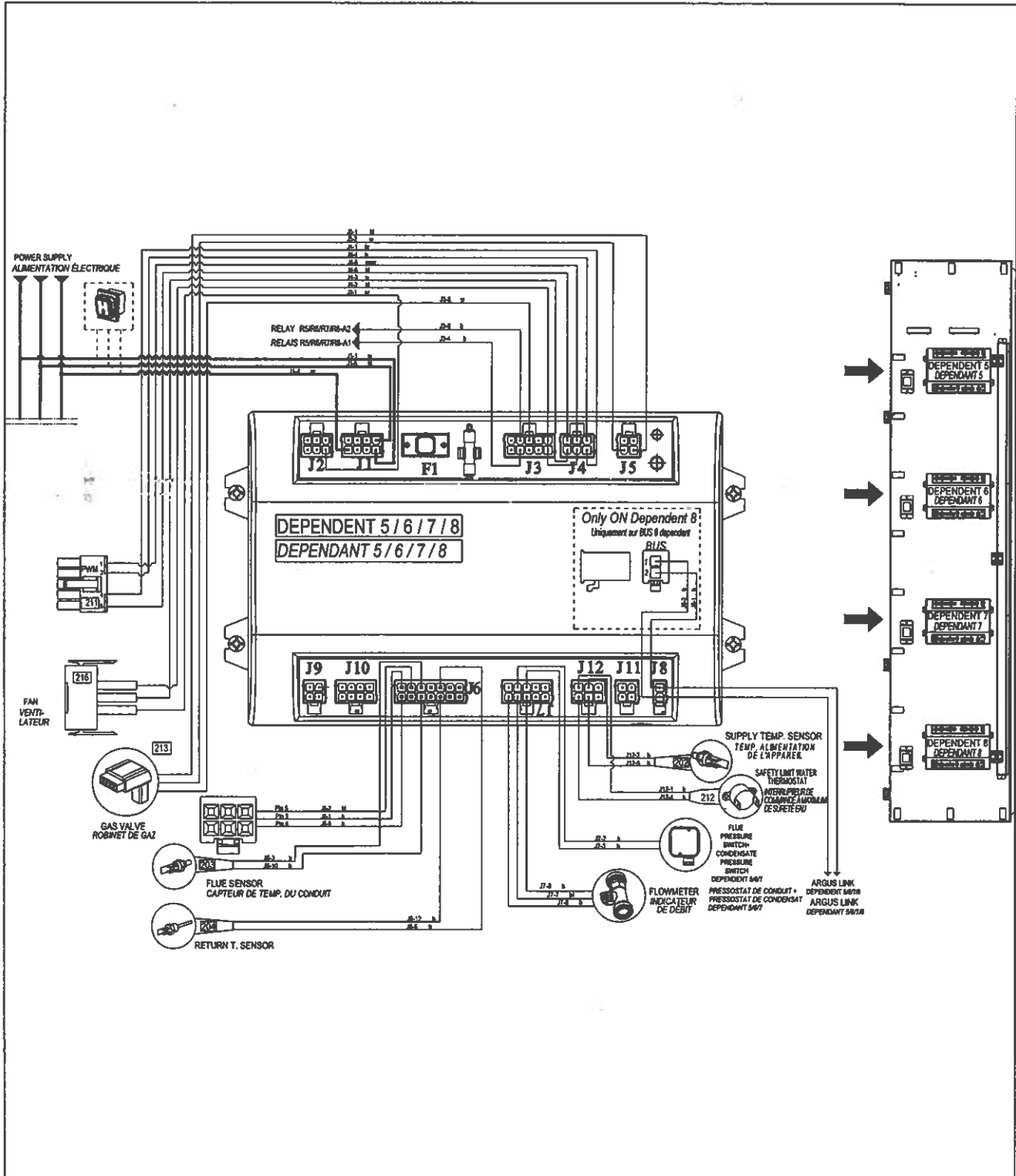


WIRING DIAGRAM ARRAY AR 3000, AR 4000 - RIGHT DOOR
SCHÉMA DE CÂBLAGE - PORTE DROITE



HIGH EFFICIENCY COMMERCIAL HEATING
Stainless Steel Condensing Floor Standing Boilers

WIRING DIAGRAM ARRAY AR 3000, AR 4000 – DEPENDENT 5 / 6 / 7 / 8 – RIGHT DOOR
SCHEMA DE CÂBLAGE DE LA CHAUDIÈRE – CHAUDIÈRE DÉPENDANTE 5/6/8 – PORTE DROITE





Submittal

CH-1

PACKAGED AIR-COOLED WATER CHILLERS
Spec Section 23 64 02

BROWNSBURG COMMUNITY SCHOOL CORPORATION

2024 Eagle Elementary School Central Plant

555 Sycamore St
Brownsburg, IN 46112

Engineer

R.E. DIMOND and ASSOCIATES , Inc.

732 N. Capital Ave
Indianapolis, IN 46204
(317) 634-4672

Mechanical Contractor

TBD

Chiller Manufacturer

Johnson Controls / YORK
5920 Castleway West Dr.
Indianapolis, IN 46250
Tom.P.Jones@jci.com
(317) 273-9616

R.E. Dimond and Associates, Inc.

Reviewed and checked only for conformance with design concepts and with information given in the Contract Documents. Approval does not release the Contractor from the responsibility to provide appropriate quantities, field measurements, dimensional stability, installation, anchorage, and coordination with other trades, or release the Contractor from responsibility for deviations from the requirements of the Contract Documents, or from responsibility for errors and omissions contained thereon.

- Reviewed as Submitted
- Reviewed as Noted
- Rejected - Correct and Resubmit
- See Attached Comment Sheet(s)

COORDINATE SHIPMENT DATES WITH OWNER/INSTALLING CONTRACTOR.

CONTRACTOR SHALL PROVIDE ALL NECESSARY REFRIGERANT AND OIL REQUIRED. MFG. SHALL CONFIRM QTY REQUIRED WITH INSTALLING CONTRACTOR BASED ON FINAL PIPING ARRANGMENT.

By: MJE

Date: 5/13/2024

INITIALS: _____

ITEM I: Air Cooled Scroll Chiller

- Motor: 460 volts, 3 phase, 60 Hz
- Single Point Circuit Breaker w/ Lockable Handle and **65k AIC**
- Refrigerant Type: R-410a (Not supplied)
- Remote Evaporator Application
- Evaporator Ships Separately – 1.5” Thick Insulation
- Chiller ships with Nitrogen Charge
- Microchannel Condenser Coil
- Low Sound Fans with VSD Control
- Control Transformer
- Low Ambient (Operation to 0 °F)
- Louvered Solid Panels – aesthetic and Hail Guard Protection
- V-Bank Condenser Coils provide Inherent Hail Guard Protection
- Service Isolation Valves
- Smart Equipment Board with BACnet Compatibility
- Connected Services
- Unit Warranty: 24 Months (2 Year) Entire Unit Parts & Labor
- Chiller Start up by JCI
- FOB Jobsite
- Owner Training as required

Items included but Installed by Others:

- Neoprene Isolators
- Flow Switch with Extension Kit

Items NOT included:

- Hauling, Unloading, Rigging and Installation of Equipment
- Taxes, Delayed Shipment, Expedited Freight, and Long Term Storage
- Anything not specifically listed above

Refrigerant Charge Circuit A: 125 lbs of 410a

Refrigerant Charge Circuit B: 125 lbs of 410a

Total APPROX REQUIRED is 250 lbs. Verify pipe sizing, qty, etc. with contractor. Review and approve proposed layout prior to installation.

INITIALS: _____

Project Name: **Eagle Elementary**

Unit Tag: **CH-1**

Qty.: **1**

Model: **YLAA0230HE46XC**

Full Load - Design

PIN

YLAA0230HE	46XCBBCTXA	SXBLXCXX45	XEXXXHXDX	XARXXXBBX	XVGNXXXXXX			
...5...10	...5...20	...5...30	...5...40	...5...50	...5...60	...5...70	...5...80	...5...90



Unit	
Model No.	YLAA0230HE46XCB
Number of Compressors	6
Compressor Type	Scroll - Hermetic
Number of Compressor Circuits	2
Refrigerant	R410A
Performance Data	
Cooling Capacity [tons.R]	228.0
Total Power Input [kW]	264.4
EER [Btu/W.h]	10.35
NPLV.IP [Btu/W.h]	17.85
A-Weighted Sound Power [dB(A)]	99.0
Sound Pressure (Hemispherical Method) [dB(A)]	69.0
Sound Pressure Measured at [ft]	30.0
Electrical Data	
Nominal Voltage / Voltage Limits	460/3/60 / 414-506
Compressor RLA (each circuit) [A]	73.0 / 73.0 / 73.0 / 73.0 / 73.0 / 73.0
High LRA Current (each circuit) [A]	408.0 / 408.0 / 408.0 / 408.0 / 408.0 / 408.0
Fan QTY (each circuit)	6 / 6
Fan FLA (each circuit) [A]	4.0 / 4.0
Min. Circuit Ampacity [A]	504.0
Recommended Fuse / CB Rating [A]	600.0
Max. Inverse Time CB Rating [A]	600.0
Max. Dual Element Fuse Size [A]	600.0
Unit Short Circuit Withstand [kA]	65kA 5 kA
Wires Per Phase	2 + 3
Wire Range (Lug Size)	250 - 500 kcmil + #2/0 AWG - 400 kcmil
Compressor kW	244.2

Performance Impacting Options	
Starter Type	Across the line starter
Power Factor Correction Capacitor	No Power Capacitor required
Remote Evaporator	Remote Cooler required
Remote Evaporator Feet	100
Sound Kit	Acoustic Blanket Required
Fan	Low Sound Fans with VSD
Weight & Dimensional Data	
Shipping Weight [lbs]	9972
Operating Weight [lbs]	10099
Refrigerant Charge [lbs]	TBD 200
Length [in]	274.8
Width [in]	88.3
Height [in]	94.2

Project Name: Eagle Elementary	Unit Tag: CH-1	Qty.: 1	Model: YLAA0230HE46XC
---------------------------------------	-----------------------	----------------	------------------------------

Heat Exchanger Performance			
Evaporator		Condenser (Air Cooled)	
Heat Exchanger Type	Plate Heat Exchanger	Ambient Air Temperature* [°F]	95.0
Entering Fluid Temperature* [°F]	60.00	Altitude* [ft]	800
Leaving Fluid Temperature* [°F]	45.00	Condensing Temperature [°F]	123.95 / 123.95
Flow Rate [USGPM]	363.2	Number of Fans	6 / 6
Fouling Factor* [h ft ² F/Btu]	0.000100	Total Air Flow [cfm]	180000
Fluid Type*	Water	Total Fan Power [kW]	20.16
Fluid Volume [USGAL]	12.7		
Evaporating Temperature [°F]	39.42		
Evaporator Pressure Drop [ft H ₂ O]	8.96		
Strainer Pressure Drop [ft H ₂ O]	3.36		
Extension Kit Pressure Drop [ft H ₂ O]	0.932		
Total Pressure Drop [ft H ₂ O]	13.2		
Fluid Connection Diameter [in]	5		
Minimum Flow Rate [USGPM]	230.0		
Maximum Flow Rate [USGPM]	650.0		

* Designates user specified input

Within the scope of AHRI Air-Cooled Water-Chilling Packages Using Vapor Compression Cycle Certification Program. AHRI Certified performance may be obtained from the manufacturer's representative.

Part Load Performance (Based on Standard AHRI Unloading)				
Percent Load	Ambient [°F]	Capacity [tons.R]	Power Input [kW]	Unit Efficiency [Btu/W.h]
100.0	95.0	228.0	264.4	10.35
75.2	80.1	171.5	138.9	14.81
56.7	80.1	129.4	100.4	15.45
61.5	65.1	140.1	89.59	18.77
41.5	65.1	94.65	56.18	20.22
43.8	55.0	99.81	52.76	22.70
21.0	55.0	47.88	25.48	22.54

Project Name: **Eagle Elementary**

Unit Tag: **CH-1**

Qty.: **1**

Model: **YLAA0230HE46XC**

Sound Power Levels (In Accordance with AHRI 370)

Percent Load	Ambient [°F]	Octave Band Center Frequency [Hz]								LWA
		63	125	250	500	1000	2000	4000	8000	
100.0	95.0	102.0	101.0	99.0	97.0	93.0	89.0	85.0	82.0	99.0
75.2	80.1	98.0	98.0	96.0	93.0	89.0	86.0	82.0	78.0	95.0
56.7	80.1	96.0	96.0	94.0	91.0	87.0	84.0	79.0	76.0	93.0
61.5	65.1	96.0	96.0	94.0	91.0	87.0	84.0	79.0	76.0	93.0
41.5	65.1	93.0	93.0	92.0	87.0	84.0	81.0	75.0	71.0	90.0
43.8	55.0	93.0	93.0	92.0	87.0	84.0	81.0	75.0	71.0	90.0
21.0	55.0	90.0	90.0	89.0	84.0	81.0	78.0	72.0	68.0	87.0

Note: Unit is equipped with Acoustic Blanket Required and Low Sound Fans with VSD.

Measurement of sound pressure used to obtain the sound power data presented is based on AHRI-370.

Air-cooled chillers are rated in terms of sound power not sound pressure. Johnson Controls provides estimates of sound pressure, but this is not the rating metric.

For an air-cooled chiller, sound pressure calculated from sound power varies depending on how the chiller is assumed to behave, i.e. the radiation model. In other words, determining sound pressure from sound power requires making assumptions that result in different answers at a given distance from the chiller. The environment also influences sound pressure in the field installation. Sound pressure estimation radiation models pertaining to air-cooled chillers include the 'traditional' hemispherical model, parallelepiped model and equivalent hemispherical model.

Regarding sound power, Johnson Controls references tolerance limits based on ASHRAE guidelines. These are +/- 6dB in the 63Hz octave band, +/- 4dB in all other octave bands and +/- 3dB for the overall dBA.

Tolerance limits are based on uncertainties associated with:

1. Measurement Test Procedure
2. Repeatability
3. Production / Manufacturing Variability

Standard deviation associated with air-cooled chiller sound data is a measure of spread i.e. it indicates the range of probability of sound levels. Note that for operating conditions other than AHRI's Standard Rating Condition, higher levels of uncertainty can be expected.

Lead times for factory performance testing depend on test laboratory availability. Please confirm with Johnson Controls Customer Service.

Estimated Sound Pressure Levels at 30.0 ft (Derived from AHRI 370 Sound Power using Hemispherical Method)

Percent Load	Ambient [°F]	Octave Band Center Frequency [Hz]								LpA
		63	125	250	500	1000	2000	4000	8000	
100.0	95.0	72.0	71.0	69.0	67.0	63.0	59.0	55.0	52.0	69.0
75.2	80.1	68.0	68.0	66.0	63.0	60.0	56.0	52.0	48.0	65.0
56.7	80.1	66.0	66.0	65.0	61.0	58.0	54.0	49.0	46.0	63.0
61.5	65.1	66.0	66.0	65.0	61.0	58.0	54.0	49.0	46.0	63.0
41.5	65.1	63.0	63.0	62.0	57.0	54.0	51.0	45.0	41.0	60.0
43.8	55.0	63.0	63.0	62.0	57.0	54.0	51.0	45.0	41.0	60.0
21.0	55.0	60.0	60.0	59.0	54.0	51.0	48.0	42.0	38.0	57.0

Project Name: **Eagle Elementary**

Unit Tag: **CH-1**

Qty.: **1**

Model: **YLAA0230HE46XC**

Performance at AHRI Conditions			
Evaporator		Condenser	
EFT [°F]	54.00	Ambient Temp. [°F]	95.0
LFT [°F]	44.00	Altitude [ft]	0.00
Flow Rate [USGPM]	529.3	Performance	
Pressure Drop [ft H2O]	18.2	EER [Btu/W.h]	10.21
Fluid Type	Water	IPLV.IP [Btu/W.h]	17.56
Fouling Factor [h ft ² F/Btu]	0.000100	Net Cooling Capacity [tons.R]	221.7
Fluid Volume [USGAL]	12.7		

Note: Unit rated at design condition capacity.

Part Load Performance (Based on AHRI 550/590 - 2018 (IP))				
Percent Load	Ambient [°F]	Capacity [tons.R]	Power Input [kW]	Unit Efficiency [Btu/W.h]
100.0	95.0	221.7	260.6	10.21
75.6	80.0	167.6	137.3	14.65
56.6	80.0	125.5	99.07	15.20
61.4	65.0	136.2	88.29	18.51
41.0	65.0	90.94	55.22	19.76
43.3	55.0	96.02	51.88	22.21
20.9	55.0	46.31	25.12	22.12

Notes:

Country of Origin: Mexico

Min flow rate is for chillers using water. For glycol chillers please contact the application engineering team.

This unit does not have a coil coating selected.

Compliant with ASHRAE 90.1 - 2010,2013,2016,2019,2022.

Compliant with IECC - 2012,2015,2018.

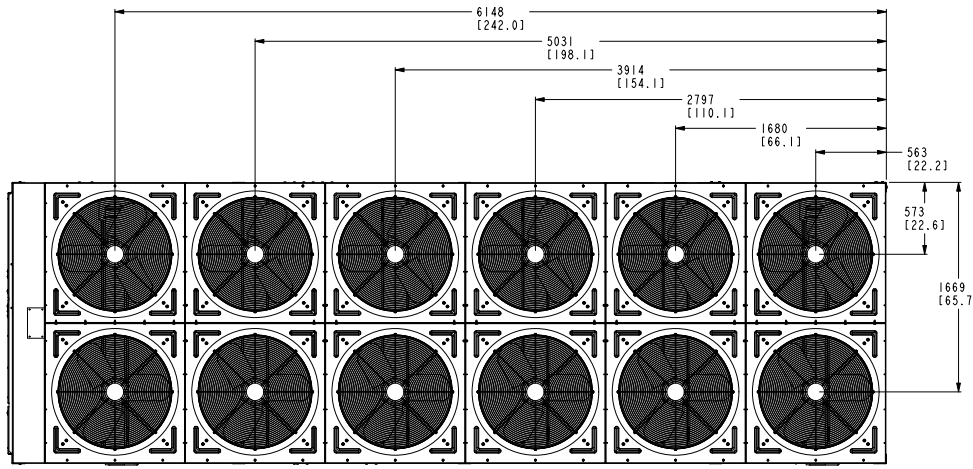
Compliant with the requirements of the LEED Energy and Atmosphere Enhanced Refrigerant Management Credit (EAc4).

The product image shown is for illustrative purposes only and is not representative of selected options.

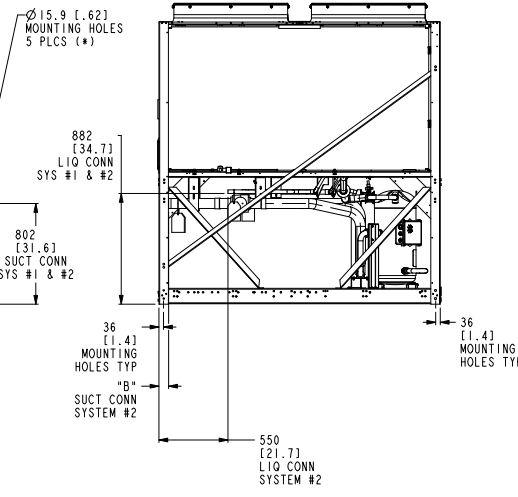
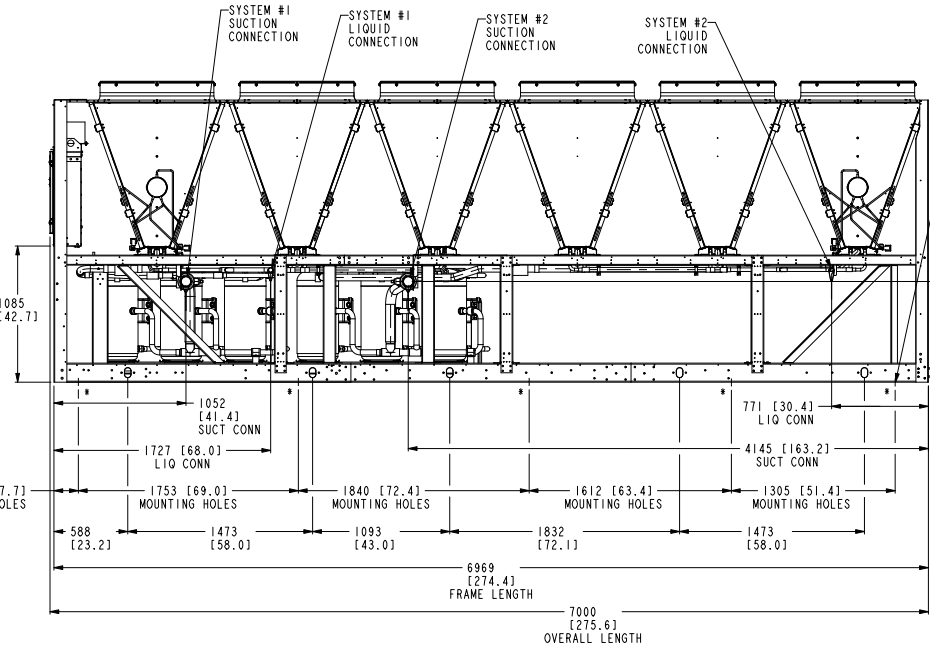
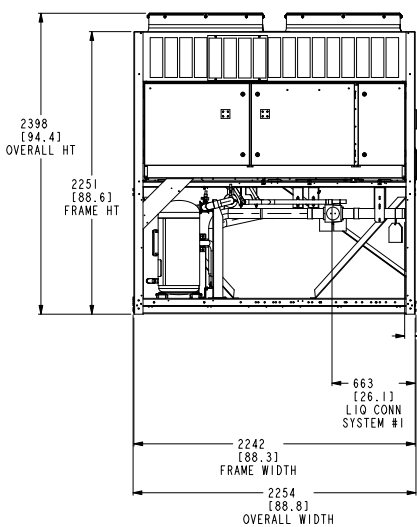
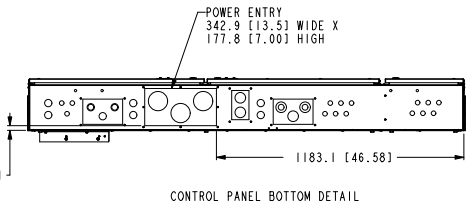
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

NOTES:

- PLACEMENT ON A LEVEL SURFACE FREE OF OBSTRUCTIONS (INCLUDING SNOW, FOR WINTER OPERATION) OR AIR-CIRCULATION ENSURES RATE PERFORMANCE, RELIABLE OPERATION AND EASE OF MAINTENANCE. SITE RESTRICTIONS MAY COMPROMISE MINIMUM CLEARANCES INDICATED BELOW, RESULTING IN UNPREDICTABLE AIR FLOW PATTERNS AND POSSIBLE DIMINISHED PERFORMANCE. JOHNSON CONTROLS UNIT CONTROLS WILL OPTIMIZE OPERATION WITHOUT NUISANCE HIGH PRESSURE SAFETY CUTOFF. HOWEVER, THE SYSTEM DESIGNER MUST CONSIDER POTENTIAL PERFORMANCE DEGRADATION.
 - RECOMMENDED MINIMUM CLEARANCES:
 - SIDE TO WALL - 1828.8mm[72.00]
 - REAR TO WALL - 1828.8mm[72.00]
 - CONTROL PANEL TO WALL - 1219.2mm[48.00]
 - TOP - NO OBSTRUCTIONS ALLOWED.
 - DISTANCE BETWEEN ADJACENT UNITS - 3048mm[120.00]
 - NO MORE THAN ONE ADJACENT WALL MAY BE HIGHER THAN UNIT.
- WEIGHT AND CENTRE OF GRAVITY- REF TO AVM REPORT
- INSTALLING CONTRACTOR MUST INCLUDE VENT AND DRAIN ACCOMMODATIONS IN CHILLED WATER PIPING NEAR EVAPORATOR.
- NUMBER OF COMPRESSORS MAY VARY FROM DRAWING.
 - REFER TO YORKWORKS REPORTS.
- FOR MONTERREY, MEXICO, SAN ANTONIO, TEXAS BUILDS ONLY.



MODEL NUMBER	DIMENSION "A"	DIMENSION "B"
YLAA 0200 HE, HJ	84 [3.3]	77 [3.0]
YLAA 0230 HE, HJ	103 [4.1]	96 [3.8]



THIS DRAWING PERTAINS TO THE FOLLOWING MODELS:

YLAA 0200 HE	
YLAA 0230 HE	
YLAA 0200 HJ	
YLAA 0230 HJ	

REV.	DATE	EC. NO.	DR.	CHK.	ENG.
A	10-MAY-2023	ECR23-0279	RWA	DBN	AR
UPDATE TABLES TO INCLUDE YLAA 0200/0230 "HJ" MODELS					

CONTINUED

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Johnson Controls JOHNSON CONTROLS - BUILDING EFFICIENCY
507 EAST MICHIGAN STREET, MILWAUKEE, WI, 53202 USA

THIRD ANGLE

DO NOT SCALE

PRODUCT DRAWING: YLAA 12 FAN REMOTE

MATERIAL: ENG. STD. PART NO. COT SIZE

SCALE: 1:000 MASS (kg): 0.000 ORIG. NO.: 035-24059-112 SHEET 1 OF 1

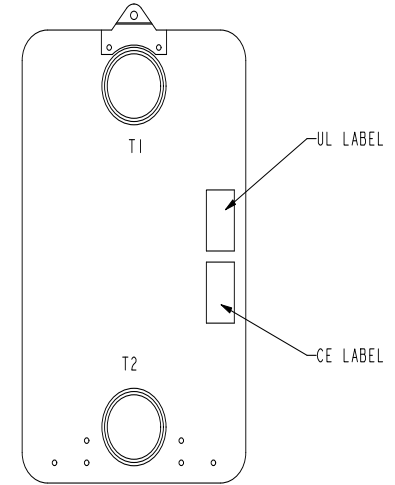
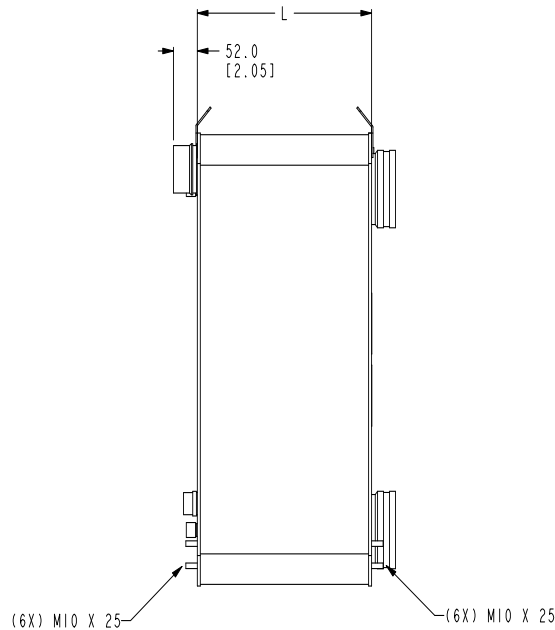
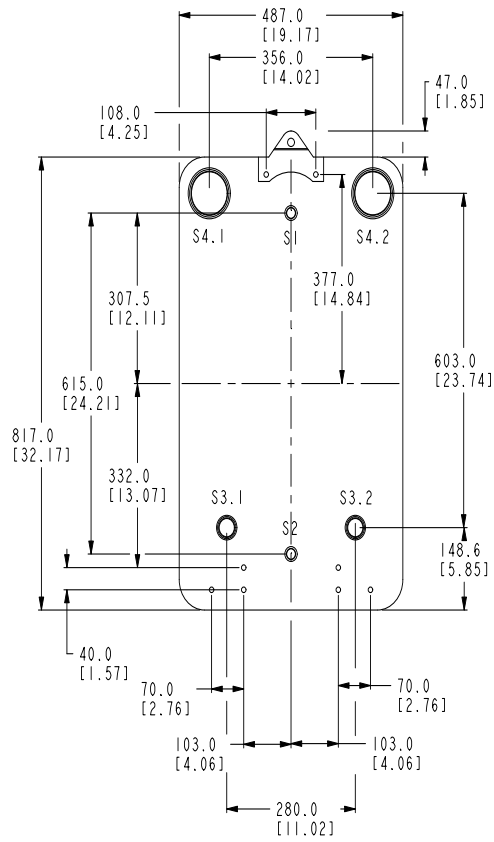
DRWN: D.B. NEWSWANGER 25-SEP-2019
MODLER: D.B. NEWSWANGER 25-SEP-2019
CHKD: D.B. NEWSWANGER 25-SEP-2019
ENG

CAGE NUMBER: A1 66935
DRAWING NUMBER: 035-24059-114
REVISION: VERSTON

Eng Ckg

16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

YLAA Model Number	JCI Brazed Plate Heat Exchanger Part Number	Brazed Plate Heat Exchanger Model	Brazed Plate Heat Exchanger Approximate Dry Weight lbs (kg)
YLAA0041HE (60Hz)	026-50261-004	ACH-240DQ-74AH-F	85 (39)
YLAA0048HE (60Hz)	026-50261-005	ACH-240DQ-102AH-F	115 (53)
YLAA0058HE (60Hz)	026-50102-090	ACH-502DQ-90AH-F	240 (109)
YLAA0065HE (60Hz)	026-50102-090	ACH-502DQ-90AH-F	240 (109)
YLAA0070SE (60Hz)	026-50102-090	ACH-502DQ-90AH-F	240 (109)
YLAA0080SE (60Hz)	026-50102-106	ACH-502DQ-106AH-F	270 (122)
YLAA0081HE (60Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0082HE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0089SE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0092HE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0100SE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0101HE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0115SE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0120SE (60Hz)	026-50102-210	ACH-502DQ-210AH-F	462 (210)
YLAA0125HE (60Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0136SE (60Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0139HE (60Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0142HE (60Hz)	026-50102-211	ACH-502DQ-210AH-F	462 (210)
YLAA0150SE (60Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0155SE (60Hz)	026-50102-210	ACH-502DQ-210AH-F	462 (210)
YLAA0156HE (60Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0170SE (60Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0175HE (60Hz)	026-50102-230	ACH-502DQ-230AH-F	499 (226)
YLAA0200HE (60Hz)	026-49649-150	ACH-1000DQ-150AH-F	535 (243)
YLAA0230HE (60Hz)	026-49649-170	ACH-1000DQ-170AH-F	605 (274)
YLAA0221HE (50Hz)	026-50102-106	ACH-502DQ-106AH-F	270 (122)
YLAA0241SE (50Hz)	026-50102-090	ACH-502DQ-90AH-F	240 (109)
YLAA0261HE (50Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0286SE (50Hz)	026-50102-106	ACH-502DQ-106AH-F	270 (122)
YLAA0301HE (50Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA0391HE (50Hz)	026-50102-210	ACH-502DQ-210AH-F	462 (210)
YLAA0442HE (50Hz)	026-50102-210	ACH-502DQ-210AH-F	462 (210)
YLAA0457HE (50Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA0517HE (50Hz)	026-50102-230	ACH-502DQ-230AH-F	499 (226)
YLAA180SE (50Hz)	026-50102-090	ACH-502DQ-90AH-F	240 (109)
YLAA195HE (50Hz)	026-50102-106	ACH-502DQ-106AH-F	270 (122)
YLAA210SE (50Hz)	026-50102-090	ACH-502DQ-90AH-F	240 (109)
YLAA320SE (50Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA350HE (50Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA360SE (50Hz)	026-50102-142	ACH-502DQ-142AH-F	336 (153)
YLAA400SE (50Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA435SE (50Hz)	026-50102-162	ACH-502DQ-162AH-F	373 (169)
YLAA485SE (50Hz)	026-50102-210	ACH-502DQ-210AH-F	462 (210)



ITEM	QTY	DESCRIPTION	REF.
S1	1	1/2" 14 NPT1	WATER IN TEMP. WELL
S2	1	1/2" 14 NPT1	WATER OUT TEMP. WELL
S3.1	1	SOLDERING Ø35.2	REFRIG. 1- IN
S3.2	1	SOLDERING Ø35.2	REFRIG. 2- IN
S4.1	1	SOLDERING Ø79.5	REFRIG. 1- OUT
S4.2	1	SOLDERING Ø79.5	REFRIG. 2- OUT
T1	1	VICTAULIC 5"	WATER IN
T2	1	VICTAULIC 5"	WATER OUT

PART NUMBER	ALFA-LAVAL MODEL	UL	CE	LENGTH L
026-49649-150	ACH1000DQ-150AH-F	YES	-	379.5 [14.94]
026-49649-170	ACH1000DQ-170AH-F	YES	-	427.7 [16.84]
026-50608-000	ACH1000DQ-150AH-F-CRN	YES	-	379.5 [14.94]
026-50608-170	ACH1000DQ-170AH-F-CRN	YES	-	427.7 [16.84]

Johnson Controls JOHNSON CONTROLS - BUILDING EFFICIENCY
507 EAST MICHIGAN STREET, MILWAUKEE, WI, 53202 USA

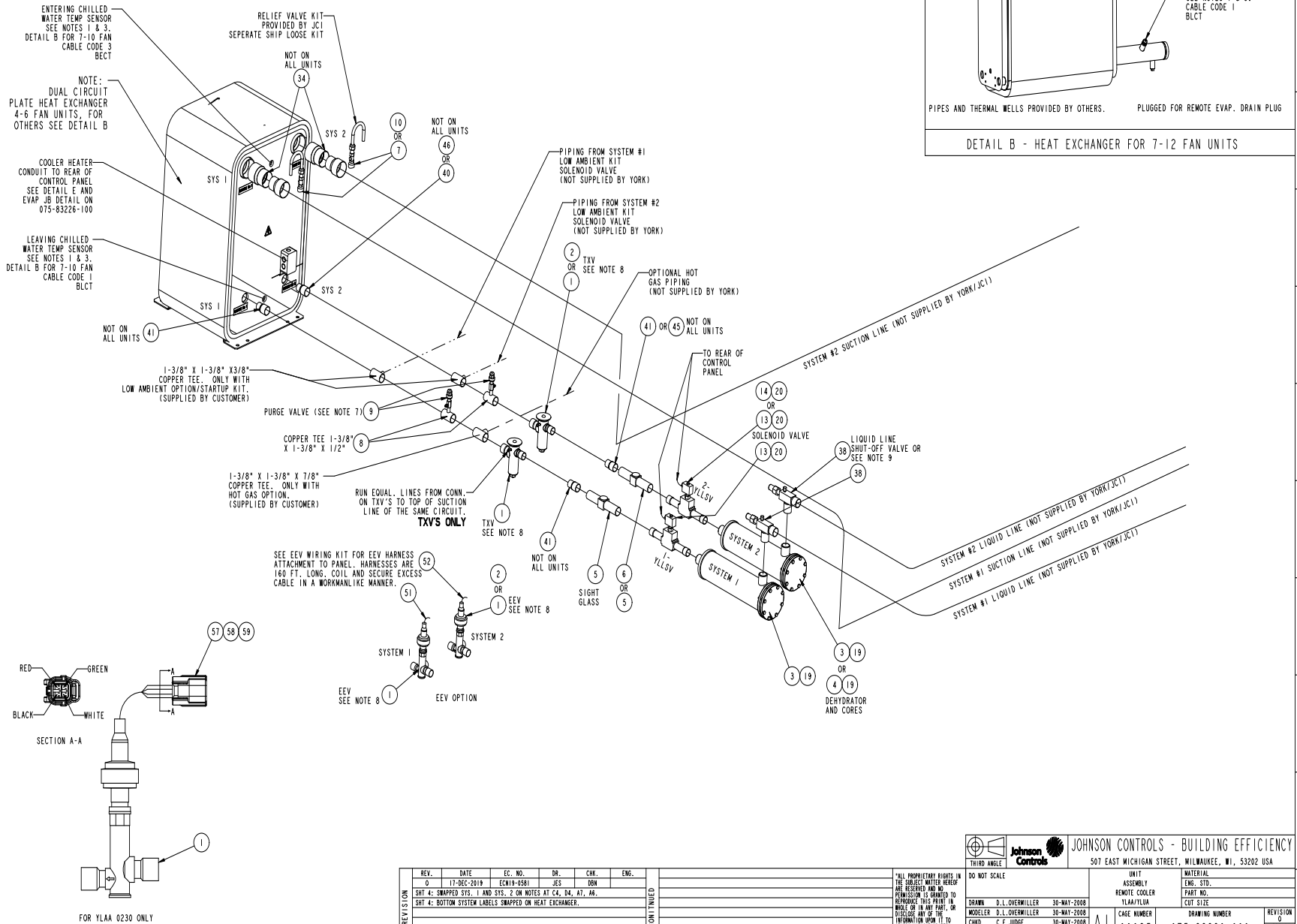
THIRD ANGLE		DO NOT SCALE		HEAT EXCHANGER		MATERIAL -	
				ALFA LAVA ACH1000DQ		ENG. STD. -	
						PART NO. -	
						CUT SIZE -	
DRAWN M. LUPTON 15-FEB-2016		CAGE NUMBER		DRAWING NUMBER		REVISION	
MODELER M. LUPTON 15-FEB-2016		A2 66935		026-49649-000		D	
CHKD A. SAYCH 15-FEB-2016						VERSION	
ENG A. KELLY 15-FEB-2016						1	
SCALE: 0.150		MASS (kg): 0.000		ORIG. NO.:		SHEET 1 OF 1	
						Released	

REV.	DATE	EC. NO.	DR.	CHK.	ENG.
D	23-MAR-2018	DX18-0030	BSD	AK	AK

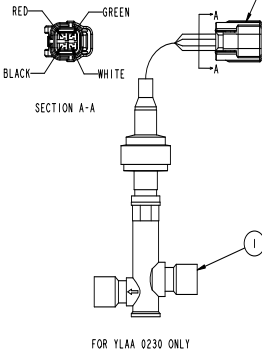
ADDED PARTS ACH1000DQ-150AH-F-CRN & ACH1000DQ-170AH-F-CRN SHOWING THE CANADIAN REGISTRATION.

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VIEW FOR BRAZE PLATE HEAT EXCHANGER ACH1000



DETAIL B - HEAT EXCHANGER FOR 7-12 FAN UNITS

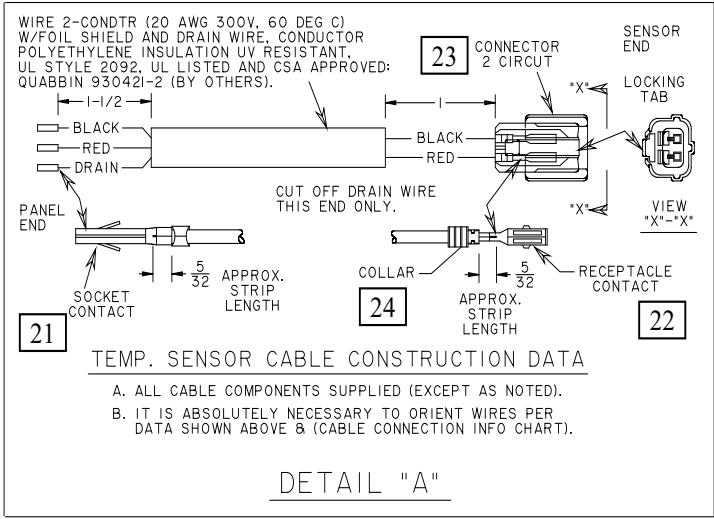


REV.	DATE	EC. NO.	DR.	CHK.	ENG.
0	17-DEC-2019	ECN19-0581	JES	DBN	
SHT 4: SWAPPED SYS. 1 AND SYS. 2 ON NOTES AT CA, DA, AT, AB.					
SHT 4: BOTTOM SYSTEM LABELS SWAPPED ON HEAT EXCHANGER.					

CONTINUED

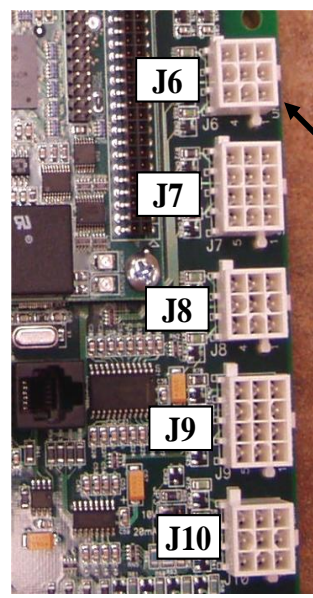
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		JOHNSON CONTROLS - BUILDING EFFICIENCY 507 EAST MICHIGAN STREET, MILWAUKEE, WI, 53202 USA	
THIRD ANGLE	DO NOT SCALE	UNIT ASSEMBLY	MATERIAL
		REMOTE COOLER	ENG. STD.
		YLAA/YLAA	PART NO.
			CUT SIZE
DRAWN: D.L. OVERMILLER 30-MAY-2008 MODELER: D.L. OVERMILLER 30-MAY-2008 CHKD: C.F. JUDGE 30-MAY-2008 ENG:	A1 CAGE NUMBER: 66935 SCALE: .017 MASS 1kg: .000 DRWG. NO.: 075-82440-001	DRAWING NUMBER: 075-83226-000 SHEET 6 OF 6	REVISION VERSION



NOTE:
 THIS DRAWING IS REFERENCED WITH DRAWING 075-83226-000

ITEM	QTY	DESCRIPTION
1	2*	EXPANSION VALVE
2*	1	SMALLER EXPANSION VALVE
3	2*	DEHYDRATOR LESS CORES
4*	1	SMALLER DEHYDRATOR LESS CORES
5	2*	INDICATOR MOIST LIQUID
6*	1	SMALLER INDICATOR MOIST LIQUID
7	2*	SADDLE
8	2	TEE SLD C X C X C 1-3/8 X
9	2	VALVE, CHARGING BRASS
10*	1	SMALLER SADDLE
11	2	SENSOR TEMP 3000 OHMS
12	1	SPRING SPADE
13	2	VALVE SOLENOID
19	4	CTG DEHY 100 PERCENT MOLECULAR
20	2	CONNECTOR DIN 43650
21	6	CONTACT SOCKET MINI UNIVERSAL
22	4	CONTACT RECEPTACLE, 070 SERIES
23	2	CONNECTOR PLUG HSG, 2 POSITION
24	4	COLLAR RUBBER, BLACK, 070
25	1	DWG-UNIT ASSEMBLY (REMOTE CLR)
26	1	INSTR 1 COPY OF DWG
34	2	RED SLD FTG X C 3-1/8 X
35	2	FERR SPLICE CAP FOR USE WITH
36	2	INSR ELEC FOR USE WITH
38	2*	LIQUID SERVICE VALVE
39*	1	LIQUID SERVICE VALVE



CABLE TO PLUG (J6) CONNECTION INFORMATION CHART

PLUG DETAIL	BOARD PLUG NO.	CABLE CODE	PLUG PIN NO.	WIRE COLOR	FUNCTION	LEGEND
	MICRO P6	1	7	BLK	LEAVING WATER TEMP.	BLCT
			4	RED		
			1	DRAIN		
			8	BLK		
		3	5	RED	ENTER. WATER TEMP.	BECT
			2	DRAIN		

ROUTE BLCT AND BECT CABLES INTO PANEL WITH EXISTING CABLES ON REAR OF PANEL

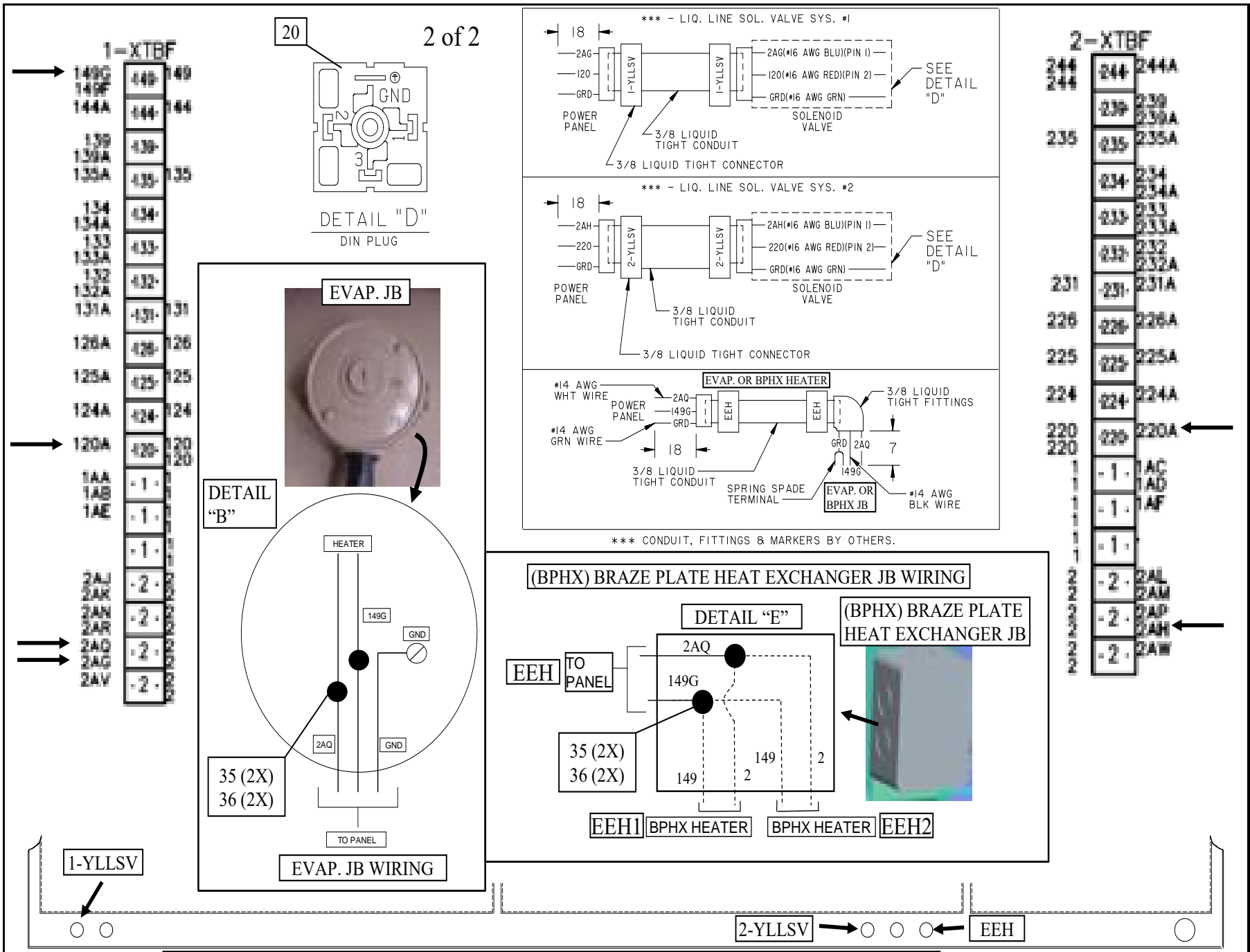
PARTIAL VIEW OF MICROBOARD



PARTIAL VIEW OF PANEL BOTTOM (VIEWED WITH DOORS OPEN)

* - INDICATES THE PART IS NOT ALWAYS USED, WHEN IT IS USED THE CORRESPONDING PART WITH THE SAME NAME IS A CHANGED TO A QTY OF 1(QTY ALSO LABELED WITH *).

REV.	A	DWG. BY	BRW	CHK	WAS	DATE:	9/5/2013	ECN NO.	KIT, MISC PARTS	FILE NAME
REV. DESCRIPTION	REVISED B.O.M.: INCLUDED ITEMS 2, 4, 6, 10, 38, 39 AND ALSO ADDED NOTE BELOW B.O.M.							DX13-0424	REMOTE COOLER YLAA	075-83226-100



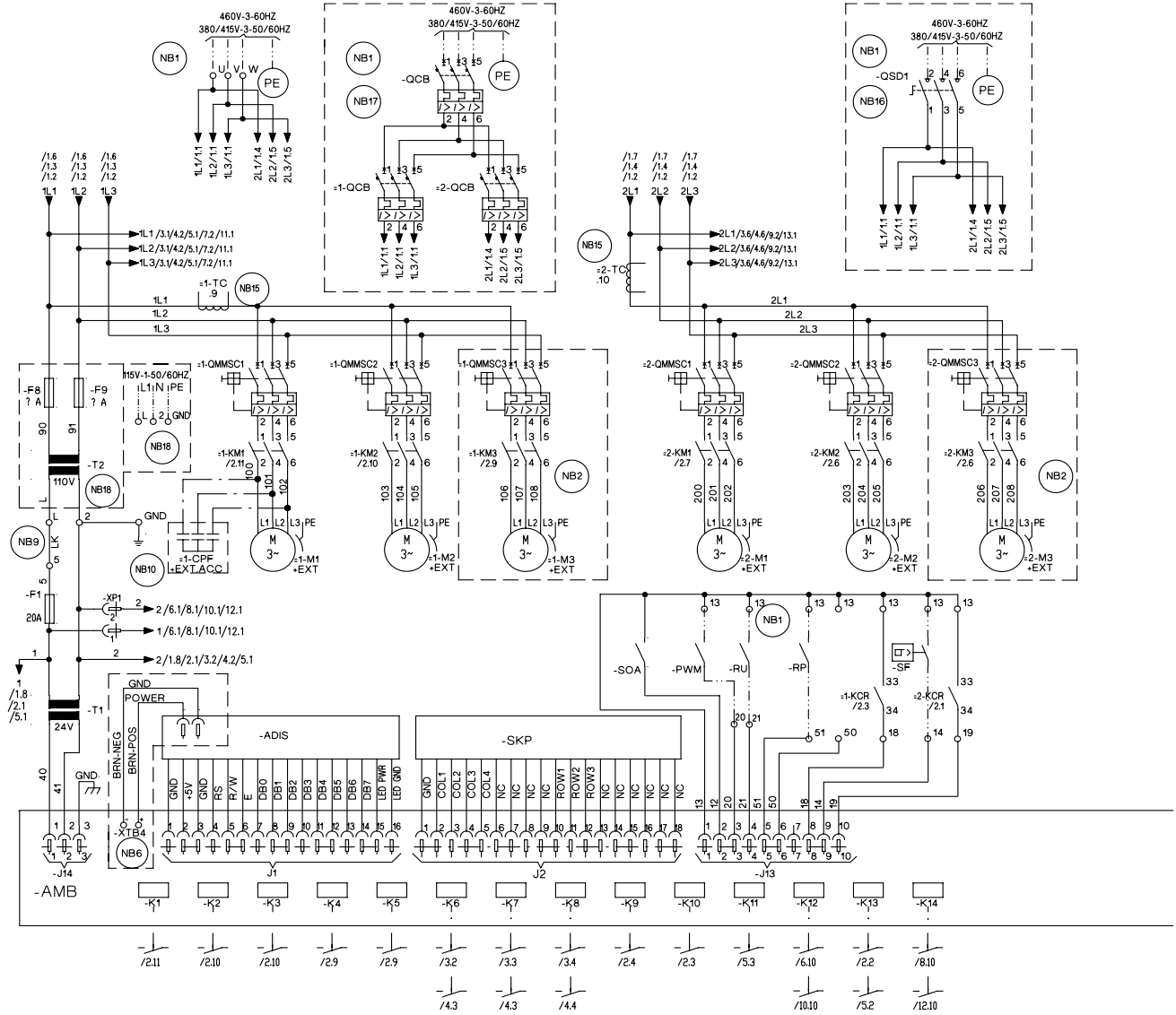
PARTIAL VIEW OF PANEL BOTTOM (VIEWED WITH DOORS OPEN)

REV.						DATE:					ECN NO.		KIT, MISC PARTS REMOTE COOLER YLAA	FILE NAME
A	BRW	CHK	WAS	9/5/2013	DX13-0424						075-83226-100			
REV. DESCRIPTION	REVISED B.O.M.: INCLUDED ITEMS 2, 4, 6, 10, 38, 39 AND ALSO ADDED NOTE BELOW B.O.M.													

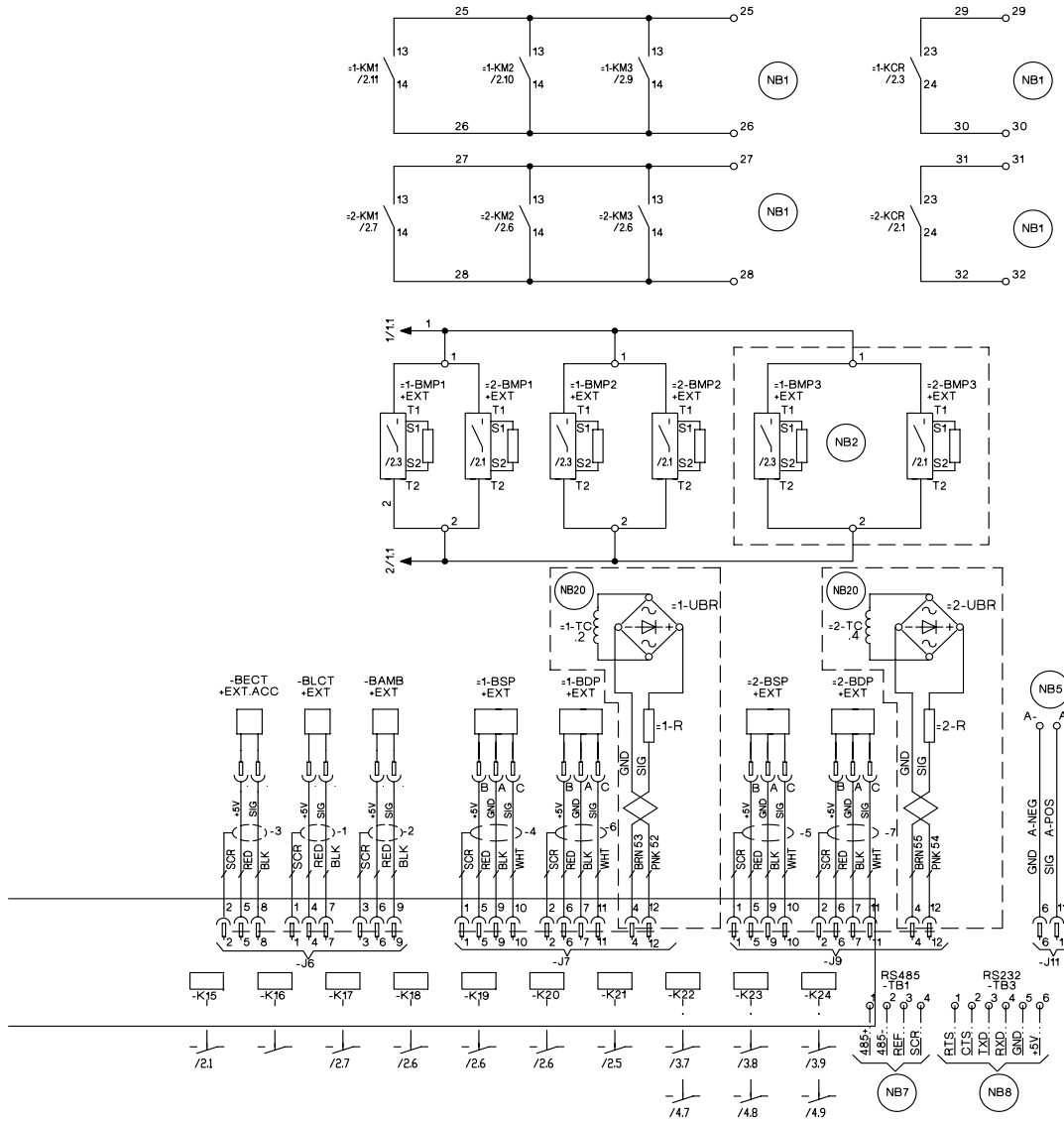
TABLE 1 - BRAZED PLATE HEAT EXCHANGER CONNECTIONS

CALLOUT	DESCRIPTION
1	Dual circuit plate heat exchanger, 4-6 fan units
2	System 2
3	Not on all units
4	System 1
5	Relief valve kit, provided by Johnson Controls as a separately shipped loose kit
6	Entering chilled water temperature sensor
7	Cooler heater conduit to rear of control panel
8	Piping from system 2 low ambient kit solenoid valve, not supplied by Johnson Controls
9	Piping from system 1 low ambient kit solenoid valve, not supplied by Johnson Controls
10	TXV
11	Optional hot gas piping, not supplied by Johnson Controls
12	To rear of control panel
13	Solenoid valve
14	1-YLLSV
15	Heat exchanger for 7-12 fan units
16	Vent plug
17	Pipes and thermal wells not supplied by Johnson Controls. Plugged for remote evaporator drain plug.
18	System 1 suction line, not supplied by Johnson Controls
19	Liquid line shut-off valve
20	System 1 liquid line, not supplied by Johnson Controls
21	System 2 liquid line, not supplied by Johnson Controls
22	System 2 suction line, not supplied by Johnson Controls
23	Dehydrator and cores
24	2-YLLSV
25	Sight glass
26	EEV
27	EEV option, scale 0.160
28	See EEV wiring kit for EEV harness attachment to panel. Harnesses are 160 ft long.
29	Run equal lines from connection on TXVs to the top of suction line of the same circuit. TXVs only.
30	1 3/8 in. x 1 3/8 in. x 7/8 in. copper tee. Only with hot gas option (supplied by customer).
31	Copper tee 1 3/8 in. x 1 3/8 in. x 1/2 in.
32	Purge valve
33	1 3/8 in. x 1 3/8 in. x 3/8 in. copper tee. Only with low ambient option or starter kit (supplied by customer).
34	Leaving chilled water temperature sensor

Wiring diagram



Wiring diagram (Cont'd)



LD18444

Wiring diagram (Cont'd)

Designation	DESCRIPTION
ACC	ACCESSORY
- ADIS	DISPLAY BOARD
- AMB	MICRO BOARD

- BAMB	AMBIENT
- BDP	DISCHARGE PRESSURE
- BECT	ENTERING CHILLED TEMP
- BLCT	LEAVING CHILLED TEMPERATURE
NOT FITTED ON REMOTE EVAP UNITS	

-BMP	MOTOR PROTECTOR COMP
- BSP	SUCTION PRESSURE

-CPF	CAPACITOR POWER FACTOR
------	------------------------

- ECH	CRANKCASE HEATER
-EEH	EVAPORATOR HEATER
-EPH	PUMP HEATER
-EXT	EXTERNAL TO CONTROL PANEL

- F	FUSE
- FHP	HIGH PRESSURE CUTOUT
-FSI	FAN SPEED INHIBIT TWO SPEED FAN OPTION ONLY

GND	GROUND
G/Y	GREEN / YELLOW

J	PLUG BOARD CONNECTOR
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-K	CIRCUIT BOARD RELAY
-KF	FAN CONTACTOR LINE
-KFH	FAN CONTACTOR HIGH SPEED (INCLUDING COIL SUPPRESSOR)
-KFL	FAN CONTACTOR LOW SPEED (INCLUDING COIL SUPPRESSOR)
-KFOL	FAN OVERLOAD
-KFS	RELAY FAN SPEED
-KM	COMPRESSOR CONTACTOR (INCLUDING COIL SUPPRESSOR)
-KCR	CONTROL RELAY
-KP	PUMP CONTACTOR PART (INCLUDING COIL SUPPRESSOR)

- M	COMPRESSOR MOTOR
-MF	MOTOR FAN
-MP	MOTOR PUMP

NU	NOT USED
----	----------

PE	PROTECTIVE EARTH
PWM	PULSE WIDTH MODULATION TEMP RESET or REMOTE UNLOAD 2nd STEP

Designation	DESCRIPTION
-QCB	CIRCUIT BREAKER
-QMMS	MANUAL MOTOR STARTER COMP
-QMMS	MANUAL MOTOR STARTER PUMP
-QSD	SWITCH DISCONNECT

R	RESISTOR
RED	RED
RP	RUN PERMISSIVE
RU	REMOTE UNLOAD 1st STEP

CR	SCREEN
- SF	FLOW SWITCH
- SKP	KEYPAD
- SOA	SWITCH OFF AUTO

- T	TRANSFORMER
-TC	TRANSFORMER CURRENT

-UBR	BRIDGE RECTIFIER
------	------------------

WHT	WHITE
-----	-------

- XTBC	TERMINAL BLOCK CUSTOMER
- XTBF	TERMINAL BLOCK FACTORY

-YHGSV	HOT GAS SOLENOID VALVE (INCLUDING COIL SUPPRESSOR)
- YLLSV	LIQUID LINE SOLENOID VALVE (INCLUDING COIL SUPPRESSOR)
FIELD MOUNTED AND WIRED ON REMOTE EVAP UNITS	

- ZCPR	COMPRESSOR
--------	------------

(NB)	NOTE WELL (SEE NOTE)
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-----	WIRING AND ITEMS SHOWN THUS ARE STANDARD YORK ACCESSORIES
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-----	WIRING AND ITEMS SHOWN THUS ARE NOT SUPPLIED BY JOHNSON CONTROLS
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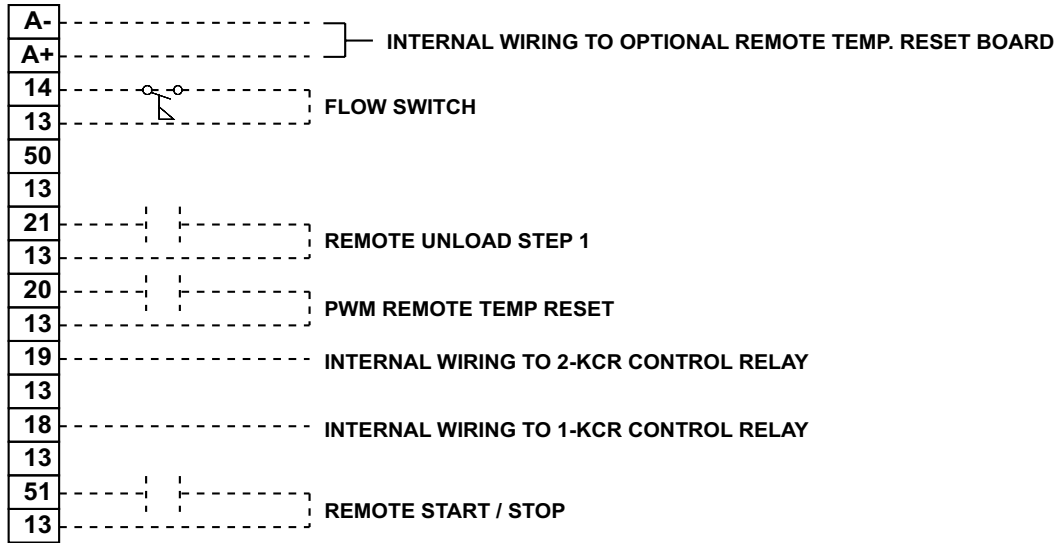
— — —	ITEMS THUS ENCLOSED FORM A COMPONENTS OR SETS OF COMPONENTS
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Wiring diagram (Cont'd)

- A. This drawing is based on IEC symbols.
 - B. Field wiring to be in accordance with the relevant electrical code as well as all other applicable codes and specifications.
 - C. All sources of supply shown on this diagram to be taken from one main isolator, not shown or supplied by the chiller manufacturer.
 - D. Green and yellow wire is used for earth, multicolored cable used for low voltage. Red wire used for AC control, blue wire for neutral, black wire for AC and DC power. Orange wire should be used for interlock control wiring supplied by external source.
 - E. Legend designation depicts component abbreviations. Number prefix located, if applicable, on schematic circuit, refers to system thereon, e.g.= 1-FHP2 refers to high pressure cutout no 2 on system no 1.
 - F. All wiring to control section voltage free contacts requires a supply provided by the customer maximum voltage 240 volts. The customer must take particular care when deriving the supplies for the voltage free terminals with regard to a common point of isolation. Thus, these circuits when used must be fed via the common point of isolation the voltage to these circuits is removed when the common point of isolation to the unit is opened. This common point of isolation is not supplied. The voltage free contacts are rated at 100 VA. All inductive devices {relays} switch by the voltage free contacts must have their coil suppressed using standard r/c suppressors.
 - G. Customer voltage free contacts connected to terminal 13 must be rated at 30 V 5 mA.
 - H. No controls {relays etc.} Should be mounted in any section of the control panel. Additionally, control wiring not connected to the control panel should not be run through the panel. If these precautions are not followed, electrical noise could cause malfunctions or damage to the unit and its controls.
1. Refer to installation commissioning operation and maintenance manual for customer connections and customer connection notes, non compliance to these instructions will invalidate unit warranty.
 2. Wiring and components for compressor 3 only fitted when unit has 3 compressors on the system. 1-BMP3 is replaced by a link across terminals 134 and 135. 2-BMP3 is replaced by a link across terminals 234 and 235.
 3. FHP2 is only fitted on 0089 and above. When not fitted 1-FHP2 is replaced by a link across terminals 132 and 139. 2-FHP2 is replaced by a link across terminals 232 and 239.
 4. Fitted on units with hot gas bypass option.
 5. EMS option is wired as shown.
 6. This wiring must be used for old display 031-0110-000.
 7. Network connection point.
 8. Printer port.
 9. Remote emergency stop can be wired between terminal 1 and 5 after removing link.
 10. Power factor correction accessory. Power factor correction fitted to each compressor contactor.
 11. Not fitted on compressors with internal motor protection. For system 1 terminals 132 and 133, 133 and 134 And 134 and 135 are linked. For system 2 terminals 232 and 233, 233 and 234 and 234 and 235 are linked.
 12. Only fitted on systems with 3 or 4 fans.
 13. Only fitted on systems with 4 fans.
 14. Only fitted on systems with 5 fans.
 15. Only fitted on systems with 6 fans.
 16. Input switch disconnect or circuit breaker option replaces input terminal block.
 17. Input switch disconnect and system circuit breaker option replaces input terminal block.
 18. 115 V control circuit requires a 115 V supply unless control circuit transformer -T2 and -F3 are fitted.
 19. For optional hydro kit. Heater -EPH is fitted and wired as shown. On single pump -KP1, -QMMSP1 and -MP1 are fitted and wired as shown. On two pump hydro kits -KP2, -QMMSP2 and -MP2 are also fitted and wired as shown.
 20. Current measurement option wired as shown.
 21. Only fitted on systems with single speed fans.
 22. Only fitted on systems with two speed fans.
 23. Optional compressor manual motors starters.
 24. See sheet 3 of connection diagram for power input options.

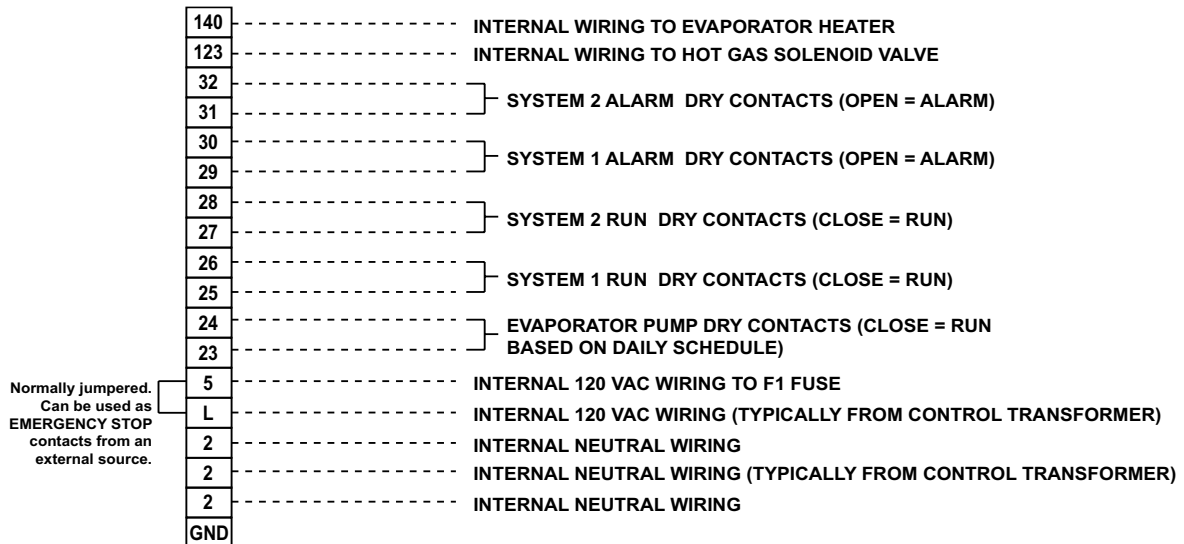
User control wiring

User control wiring inputs



XTBC1

User control wiring outputs



XTBC2

CERTIFICATE OF LIMITED WARRANTY

JOHNSON CONTROLS EQUIPMENT

Contract Number:
Ship Date:

Model No.: YLAA0230HE46XC
Start Date:

Serial Number:

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material. **The warranty period begins at start up, or six (6) months from the ship date, whichever occurs first.** Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined herein or in separate related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, components, or services has been received by Johnson Controls.

Warranty Type	Warranty Duration	Expiration Date
Standard - Entire Unit - Parts and Labor	1 Year	Not provided
Extended - Entire Unit - Parts and Labor	2 Years	Not provided

EXCLUSIONS:

Unless specifically agreed to in the contract documents, or associated with additional warranty options listed above, this warranty does not include the following costs and expenses:

- I. Labor to repair, remove, or reinstall any equipment, materials or components.
- II. Special shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
- III. Cost of refrigerant.
- IV. Freight damage.
- V. Field applied coatings added to any surface or heat exchanger.
- VI. Rental chillers.
- VII. Normal wear and tear or corrosion.

ALL WARRANTIES ARE VOID IF:

- A. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
- B. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory.
- C. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
- D. Equipment is not applied, installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
- E. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.



STANDARD LIMITED WARRANTY ENGINEERED SYSTEMS EQUIPMENT

SERVICE POLICY

Su persed es: 50.05-NM2 (812)

Form 50.05-NM2 (1212)

POLICY STATEMENT

Johnson Controls (JCI) warrants all equipment and associated factory supplied materials or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of eighteen (18) months from date of shipment, or twelve (12) months from date of start up, whichever occurs first. Subject to the exclusions listed below, Johnson Controls, at its option, will repair or replace, FOB point of shipment, such products or components as it finds defective.

Except for reciprocating replacement compressors, which Johnson Controls warrants for a period of twelve (12) months from date of shipment, Johnson Controls warrants Johnson Controls reconditioned or replacement materials, or installation or start-up services performed by Johnson Controls in connection therewith, against defects in workmanship and material for a period of (90) days from date of shipment.

The above represents the minimum warranty policy Johnson Controls will extend to customers. Additional product specific coverage is provided as outlined in related warranty policies. No warranty repairs or replacements will be made until payment for all equipment, materials, or components has been received by Johnson Controls.

EXCLUSIONS:

Unless specifically agreed to in the contract documents, this warranty does not include the following costs and expenses:

1. Labor to remove or reinstall any equipment, materials or components.
2. Shipping, handling or transportation charges, including cranes, safety walks or other safety requirements specific to jobsites.
3. Cost of refrigerant.
4. Freight damage.
5. Field applied coatings added to any surface or heat exchanger
6. Rental Chillers.

ALL WARRANTIES ARE VOID IF:

1. Equipment is used with refrigerants, oil, additives, or antifreeze agents other than those authorized by supplying factory.
2. Equipment is used with any material or any equipment such as evaporators, tubing, other low side equipment or refrigerant controls not approved by supplying factory
3. Equipment has been damaged by freezing because it was not properly protected during cold weather or damaged by fire or any other conditions not ordinarily encountered.
4. Equipment is not installed, operated, maintained and serviced in accordance with instructions issued by Johnson Controls.
5. Equipment is damaged due to dirt, air, moisture, or other foreign matter entering the refrigerant system.
6. Equipment is not properly stored, protected, or inspected by the customer during the period from date of shipment to date of initial start-up.
7. Field coating of coil has occurred.
8. Equipment is damaged due to acts of god, abuse, including shipping damage, neglect, sabotage, or acts of terrorists.
9. Equipment has modifications carried out that have an effect on the original design of the product without such work being authorized by the factory. Any on site design changes or unit modification/replacement shall be authorized in advance by the factory.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESS OR IMPLIED IN LAW OR IN FACT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE WARRANTIES CONTAINED HEREIN SET FORTH BUYER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A DEFECT IN WORKMANSHIP OR MATERIALS. IN NO EVENT SHALL JOHNSON CONTROLS' LIABILITY FOR DIRECT OR COMPENSATORY DAMAGES EXCEED THE PAYMENTS RECEIVED BY JOHNSON CONTROLS FROM BUYER FOR THE MATERIAL OR EQUIPMENT INVOLVED, NOR SHALL JOHNSON CONTROLS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES. THESE LIMITATIONS ON LIABILITY AND DAMAGES SHALL APPLY UNDER ALL THEORIES OF LIABILITY OR CAUSES OF ACTION, INCLUDING BUT NOT LIMITED TO, CONTRACT, WARRANTY, TORT, (INCLUDING NEGLIGENCE) OR STRICT LIABILITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF JOHNSON CONTROLS SUPPLIERS AND SUBCONTRACTORS.





Eagle ES Prepurchase

U45-00023376 | Eagle ES Prepurchase - Original Version

April 18, 2024

mbourne@centralsupplycompany.com



Item	Qty	Description	Sell Price
1	1	Power Panelboard, ReliaGear neXT	9,100.00
		Marks: 4L1A	
		1 Section(s), Nema 1 Enclosure	
		400 Amps, 3 Phase 4 Wire 480Y/277V, 50/60 Hz	
		Minimum Interrupt Rating: 35kA Fully Rated	
		Incoming Feed: Bottom	
		Surface Mounted	
		UL67 Certified	
		Height: 84 Inches; Width: 40 Inches; Depth: 11 Inches; Est. Weight: 528 lbs	
	1	400 Amps Main Lugs	
		Main Lug (2) #2-500 mcm, No Feed Through	
		Main Option Details	
	1	Aluminum Bus Heat Rated	
	1	100% Rated Neutral	
	1	NEMA 1 Enclosure	
		Feeders	
	1	Breaker Device 125 Amps 3 Poles XT1SU3125AYD000XXX	
	1	TMF	
	1	(1) 10 - 2/0 AWG	
	2	Breaker Device 70 Amps 3 Poles XT1SU3070AYD000XXX	
	2	TMF	
	2	(1) 10 - 2/0 AWG	
	2	Breaker Device 30 Amps 3 Poles XT1SU3030AYD000XXX	
	2	TMF	
	2	(1) 10 - 2/0 AWG	
	4	Breaker Device 25 Amps 3 Poles XT1SU3025AYD000XXX	
	4	TMF	
	4	(1) 10 - 2/0 AWG	
	3	Breaker Device 20 Amps 3 Poles XT1SU3020AYD000XXX	
	3	TMF	
	3	(1) 10 - 2/0 AWG	
	6	Breaker Space Device 20 Amps 3 Poles XT1SU3020AYD000XXX	
	6	TMF	
	6	(1) 10 - 2/0 AWG	
	1	Ground: GDBG47AL	
	1	Interior Bus Stack: IN3204BL3H1	
	1	Neutral: NL04I0NSTNDAL	
	1	Enclosure: ER8440A	
	1	Interior Frame: IF3240F	
	1	Front 1 of 2: FT40S00135	
	1	Front 2 of 2: FT40S00280	

R.E. Dimond and Associates, Inc.
 Reviewed and checked only for conformance with design concepts and with information given in the Contract Documents. Approval does not release the Contractor from the responsibility to provide appropriate quantities, field measurements, dimensional stability, installation, anchorage, and coordination with other trades, or release the Contractor from responsibility for deviations from the requirements of the Contract Documents, or from responsibility for errors and omissions contained thereon.

- Reviewed as Submitted
- Reviewed as Noted
- Rejected - Correct and Resubmit
- See Attached Comment Sheet(s)

By: PS

Date: 5/13/2024

COORDINATE SHIPMENT DATES WITH OWNER/INSTALLING CONTRACTOR.



Item	Qty	Description	Sell Price
	1	Gutter Covers: GC40F32BLA	
	1	WirePost: BP40F	
	1	Surge Protection: SP277Y12X402	
	3	MLO and/or FTL Kit: LGML260A	
	1	2X Filler & Blank: SR02BF	
	1	3X Blank only: SR03BB	
	1	1 XT1 Mtg Kit, Narrow: SR1XBR	
	1	2 XT1 Mtg Kit, Wide: SR2XBF	
	1	5 XT1 Mtg Kit, Wide: SR5XBF	
	2	5 XT1 Mtg Kit, Narrow: SR5XBR	
	6	XT1 Blank only: SRT1BB	
	1	Lifting Bar: IL40F	
	1	PPXT FA INT	
	1	PPXT FA BOX	

TERMS AND CONDITIONS OF SALE

General Policies and Conditions

1. This Proposal is offered subject to the following: 1) attached TERMS AND CONDITIONS OF SALE, 2) an executed Master Supply Agreement ("MSA"), and 3) ABB Inc.'s current general Terms and Condition of Sale. Any conflict among the documents comprising the terms of this Proposal shall be resolved in accordance with the following order of precedence: (i) an executed MSA incorporating the following Terms and Conditions of Sale (ii) attached TERMS AND CONDITIONS OF SALE incorporating ABB Inc. General Terms and Conditions of Sale (iii) or ABB Inc. General Terms and Conditions of Sale. Non-ABB preprinted PO terms have no force and/or effect and are hereby rejected by ABB.
2. Buyer represents and warrants that there are no federal, state, or local (collectively "Governmental") contracting provisions, regulations, flow-downs, or requirements that apply to this transaction, including without limitation any Governmental domestic preference or prevailing wage, other than such terms that have been disclosed and agreed to by Seller in writing. Buyer assumes sole responsibility for any costs associated with non-compliance of terms not agreed by Seller in writing. Unless expressly provided in writing, Seller makes no representation that the quoted product(s) or service(s) comply with any Governmental contracting provisions and regulations.
3. This proposal expires in 30 calendar days, unless terminated sooner by notice. This proposal is not inclusive of taxes of any kind, unless explicitly stated.
4. Orders not requiring engineered drawings for approval must be released by Buyer for manufacture within 90 days of PO receipt. If engineered drawings are required, they must be returned and approved by Buyer for release within 60 days of mailing. If not, and/or shipment is delayed for any reason the price will increase by 1.5% for each partial/full month that shipment release is delayed after the 90-day period. If project is delayed 6 months or more after PO receipt, project will be repriced based off current market values.
5. For MV Transformers (including Padmount, Substation, & Power transformers), refer to the factory proposal for applicable terms and conditions including, but not limited to quote validity, price validity, escalation, warranty, cancellation, estimated delivery, and freight terms.

Payment Terms

1. Net 30 days from the date of invoice
2. For projects up to \$1,000,000 net, terms of payment are 100% upon invoicing.
3. If project value exceeds \$1,000,000 net, progress payments are required payable at the following milestones. These milestones will be applied at a line-item level and will be tailored to the project schedule.
 - 20% upon delivery of drawings
 - 30% upon release of equipment
 - 50% upon shipment

Warranty

1. The warranty for Products shall expire one (1) year from date of installation or eighteen (18) months after date of shipment, whichever occurs first, except that software is warranted for ninety (90) days from delivery. The warranty for Services shall expire one (1) year after performance of the Service, except that software related Services are warranted for ninety (90) days.
2. Additional 12 months available for 2% adder, 24 months for 4% adder. Engage ABB representative if longer durations are needed.
3. All warranty claim remedies are provided under the General Terms and Conditions of Sale, or any applicable MSA, whichever is applicable between the parties.

Order Cancellation – Schedule of Charges

1. 10% - Order received.
2. 30% - Drawings for approval submitted, if required.
3. 50% - Revisions to approval drawings submitted, if required.
4. 80% - Order released for manufacturing and shipment.
5. 100% - Production started.

Delivery and Transportation

1. CPT/FCA ABB's facility, place of manufacture or warehouse (Incoterms 2020). Title and risk of loss passes upon shipment.
2. ABB will assume the risk of loss or damage to the destination for a 2% adder (but not less than \$500 net) applied to the total price of the equipment. "Destination" is defined as ABB's common carrier's delivery point nearest first destination or point of export within the continental U.S.
3. Transportation and handling are prepaid and billed, unless otherwise noted in this quotation or MSA.
4. Shipment via Air or Open Top/Flatbed/Lift gate truck not included unless specifically listed herein.
5. Special Instruction - The Receiving Associate is required to sign, date, and note specific visible or concealed damage on Bill of Lading at time of delivery. Freight Company Associate is required to witness Receiver's signature, date, and damage claim annotations. ABB's Post Sales Service Department must be provided with copy of annotated BOL within five (5) days of delivery or Shipper's responsibility ends.

Other Notes

1. Standard factory test procedures will be performed. Customer inspections, customer witness tests, and any other non-standard test procedures are not included unless specifically noted herein.
2. The accompanying Bill of Material is our interpretation of what is required to meet the intent of the listed Drawings and Specifications. Please review thoroughly for accuracy and completeness and advise immediately if any revisions are required. This proposal is limited to the attached Bill of Material only. Selective coordination of the system should be verified by a qualified engineer and may require changes to the design, Bill of Material, and price.
3. The Parties are aware of the shortage of raw materials, electronic components worldwide which is likely to last for the foreseeable future, as well as, of market fluctuations in the availability and cost of other raw materials, commodities, other critical components, and transportation capacities. Notwithstanding anything to the contrary in the contract terms and conditions / purchase order, if after the date of ABB's proposal / offer or during the term of the performance of the contract / purchase order there are any changes to availability and / or market conditions for electronic components, raw materials, commodities, and transportation capabilities directly or indirectly affecting ABB's performance, ABB shall be entitled to relief in the schedule of the performance or delivery of the directly or indirectly affected scope of work under the contract / purchase order. In such circumstances, the Parties shall meet without delay and discuss in good faith to find a mutually agreeable solution, with equitable adjustment to the contract / purchase order date of delivery or completion. Customer hereby acknowledges and agrees that in said circumstances ABB may not be able to comply with the originally agreed delivery or completion schedule and that ABB shall not be liable for any liquidated or actual damages in connection thereto.

ABB INC. GENERAL TERMS AND CONDITIONS OF SALE

(2022-01 U.S.)

1. General.

The terms and conditions contained herein, together with any additional or different terms contained in ABB's proposal, quotation and/or invoice ("Proposal"), if any, submitted to Purchaser (which Proposal, Policies, Addendum(s), if any, submitted to Purchaser shall control over any conflicting terms), constitute the entire agreement (the "Agreement") between the parties with respect to the purchase order and supersede all prior communications and agreements regarding the purchase order. Acceptance by ABB of the purchase order, or Purchaser's acceptance of ABB's Proposal, is expressly limited to and conditioned upon Purchaser's acceptance of these terms and conditions, payment for or acceptance of any performance by ABB being acceptance. These terms and conditions may not be changed or superseded by any different or additional terms and conditions proposed by Purchaser to which terms ABB hereby objects. Unless the context otherwise requires, the term "Equipment" as used herein means all of the equipment, parts, accessories sold, and all software and software documentation, if any, licensed to Purchaser by ABB ("Software") under the purchase order. Unless the context otherwise requires, the term "Services" as used herein means all labor, supervisory, technical and engineering, installation, repair, consulting or other services provided by ABB under the purchase order. As used herein, the term "Purchaser" shall also include the initial end user of the Equipment and/or services; provided, however, that Article 14(a) shall apply exclusively to the initial end user.

2. Prices.

(a) Unless otherwise specified in writing, all Proposals expire thirty (30) days from the date thereof and may be modified or withdrawn by ABB before receipt of Purchaser's conforming acceptance. All quoted prices are subject to revision at any time in the event of any increase in raw material, energy costs or governmental actions such as tariffs.

(b) Unless otherwise stated herein, Services prices are based on normal business hours (8 a.m. to 5 p.m. Monday through Friday). Overtime and Saturday hours will be billed at one and one-half (1 1/2) times the hourly rate; and Sunday hours will be billed at two (2) times the hourly rate; holiday hours will be billed at three (3) times the hourly rate. If a Services rate sheet is attached hereto, the applicable Services rates shall be those set forth in the rate sheet. Rates are subject to change without notice.

(c) The price does not include any federal, state or local property, license, privilege, sales, use, excise, gross receipts, or other like taxes which may now or hereafter be applicable. Purchaser agrees to pay or reimburse any such taxes which ABB or its suppliers are required to pay or collect. If Purchaser is exempt from the payment of any tax or holds a direct payment permit, Purchaser shall, upon purchase order placement, provide ABB a copy, acceptable to the relevant governmental authorities of any such certificate or permit.

(d) The price includes customs duties and other importation or exportation fees, if any, at the rates in effect on the date of ABB's Proposal. Any change after that date in such duties, fees, or rates, shall increase the price by ABB's additional cost.

3. Payment.

(a) Unless specified to the contrary in writing by ABB, payment terms are net cash, payable without offset, in United States Dollars, 30 days from date of invoice by wire transfer to the account designated by ABB in the Proposal. ABB is not required to commence or continue its performance unless and until invoiced payments have been received in a timely fashion. For each day of delay in receiving required payments, ABB shall be entitled to a matching extension of the schedule.

(b) If in the judgment of ABB, the financial condition of Purchaser at any time prior to delivery does not justify the terms of payment specified, ABB may require payment in advance, payment security satisfactory to ABB and suspend its performance until said advance payment or payment security is received or may terminate the purchase order, whereupon ABB shall be entitled to receive reasonable cancellation charges. If delivery is delayed by Purchaser, payment shall be due on the date ABB is prepared to make delivery. Delays in delivery or nonconformities in any installments delivered shall not relieve Purchaser of its obligation to accept and pay for remaining installments.

(c) Purchaser shall pay, in addition to the overdue payment, a late charge equal to the lesser of 1 1/2% per month or any part thereof or the highest applicable rate allowed by law on all such overdue amounts plus ABB's attorneys' fees and court costs incurred in connection with collection. If Purchaser fails to make payment of any amounts due under any purchase order and fails to cure such default within ten (10) days after receiving written

notice specifying such default, then ABB may by written notice, at its option, suspend its performance under the purchase order until such time as the full balance is paid or terminate the purchase order, as of a date specified in such notice. In the event of suspension, cancellation or termination hereunder, ABB will be entitled to recover all costs for work performed to date, costs associated with suspension, cancellation or termination of the work and all other costs recoverable at law.

4. Changes.

(a) Any changes requested by Purchaser affecting the ordered scope of work must first be reviewed by ABB and any resulting adjustments to affected provisions, including price, schedule, and guarantees mutually agreed in writing prior to implementation of the change.

(b) ABB may, at its expense, make such changes in the Equipment or Services as it deems necessary, in its sole discretion, to conform the Equipment or Services to the applicable specifications. If Purchaser objects to any such changes, ABB shall be relieved of its obligation to conform to the applicable specifications to the extent that conformance may be affected by such objection.

5. Delivery.

(a) All Equipment manufactured, assembled or warehoused in the continental United States is delivered FCA ABB point of shipment, Incoterms® 2020 unless otherwise mutually agreed in writing. Equipment shipped outside the continental United States is delivered FCA Incoterms® 2020 United States port of export unless otherwise mutually agreed in writing. Purchaser shall be responsible for any and all demurrage or detention charges.

(b) If the scheduled delivery of Equipment is delayed by Purchaser or by Force Majeure, ABB may move the Equipment to storage for the account of and at the risk of Purchaser whereupon it shall be deemed to be delivered.

(c) Shipping and delivery dates are contingent upon Purchaser's timely approvals and delivery by Purchaser of any documentation required for ABB's performance hereunder.

(d) Claims for shortages or other errors in delivery must be made in writing to ABB within ten (10) days of delivery. Equipment may not be returned except with the prior written consent of and subject to terms specified by ABB. Claims for damage after delivery shall be made directly by Purchaser with the common carrier.

6. Title & Risk of Loss.

Except with respect to Software (for which title shall not pass, use being licensed) title to Equipment shall transfer to Purchaser upon delivery according to the applicable freight term. Notwithstanding any agreement with respect to delivery terms or payment of transportation charges, risk of loss or damage with respect to the sale of Equipment shall pass from ABB to Purchaser at delivery as defined in this Agreement. With respect to a purchase order that obligates ABB to complete the installation of purchased Equipment, risk of loss for the Equipment shall pass from ABB to Purchaser at the earlier of the time Purchaser puts the installation to its specified purpose or until the completion of the installation pursuant to this Agreement.

7. Inspection, Testing and Acceptance.

(a) Any inspection by Purchaser of Equipment on ABB's premises shall be scheduled in advance to be performed during normal working hours and subject to rules and regulations in place at the ABB premises.

(b) If the purchase order provides for factory acceptance testing, ABB shall notify Purchaser when ABB will conduct such testing prior to shipment. Unless Purchaser states specific objections in writing within ten (10) days after completion of factory acceptance testing, completion of the acceptance test constitutes Purchaser's factory acceptance of the Equipment and its authorization for shipment.

(c) If the purchase order provides for site acceptance testing, testing will be performed by ABB personnel to verify that the Equipment has arrived at site complete, without physical damage, and in good operating condition. Completion of site acceptance testing constitutes full and final acceptance of the Equipment. If, through no fault of ABB, acceptance testing is not completed within thirty (30) days after arrival of the Equipment at the site, the site acceptance test shall be deemed completed and the Equipment shall be deemed accepted.

8. Warranties and Remedies.

(a) **Equipment and Services Warranty.** ABB warrants that Equipment (excluding Software, which is warranted as specified in paragraph (d) below) shall be delivered free of defects in material and workmanship and that

Services shall be free of defects in workmanship. The Warranty Remedy Period for Equipment (excluding Software and Spare Parts) shall end twelve (12) months after installation or eighteen (18) months after date of shipment, whichever first occurs. The Warranty Remedy Period for new spare parts shall end twelve (12) months after date of shipment. If the purchase order includes the sale of refurbished or repaired parts, the Warranty Remedy Period for such parts shall end ninety (90) days after date of shipment. The Warranty Remedy Period for Services shall end ninety (90) days after the date of completion of Services.

(b) **Equipment and Services Remedy.** If a nonconformity to the foregoing warranty is discovered in the Equipment or Services during the applicable Warranty Remedy Period, as specified above, under normal and proper use and provided the Equipment has been properly stored, installed, operated and maintained and written notice of such nonconformity is provided to ABB promptly after such discovery and within the applicable Warranty Remedy Period, ABB shall, at its option, either (i) repair or replace the nonconforming portion of the Equipment or re-perform the nonconforming Services or (ii) refund the portion of the price applicable to the nonconforming portion of Equipment or Services. If any portion of the Equipment or Services so repaired, replaced or re-performed fails to conform to the foregoing warranty, and written notice of such nonconformity is provided to ABB promptly after discovery and within the original Warranty Remedy Period applicable to such Equipment or Services or thirty (30) days from completion of such repair, replacement or re-performance, whichever is later, ABB will repair or replace such nonconforming Equipment or re-perform the nonconforming Services. The original Warranty Remedy Period shall not otherwise be extended.

(c) **Exceptions.** ABB shall not be responsible for providing temporary power, removal, installation, reimbursement for labor costs or working access to the nonconforming Equipment, including disassembly and re-assembly of non-ABB supplied equipment, or for providing transportation to or from any repair facility, or for any other expenses incurred in connection with the repair or replacement, all of which shall be at Purchaser's risk and expense. ABB shall have no obligation hereunder with respect to any Equipment which (i) has been improperly repaired or altered; (ii) has been subjected to misuse, negligence or accident; (iii) has been used in a manner contrary to ABB's instructions; (iv) is comprised of materials provided by or a design specified by Purchaser; or (v) has failed as a result of ordinary wear and tear. Equipment supplied by ABB but manufactured by others is warranted only to the extent of the manufacturer's warranty, and only the remedies, if any, provided by the manufacturer will be allowed.

(d) **Software Warranty and Remedies.** ABB warrants that, except as specified below, the Software will, when properly installed, execute in accordance with ABB's published specification. If a nonconformity to the foregoing warranty is discovered during the period ending one (1) year after the date of shipment and written notice of such nonconformity is provided to ABB promptly after such discovery and within that period, including a description of the nonconformity and complete information about the manner of its discovery, ABB shall correct the nonconformity by, at its option, either (i) modifying or making available to the Purchaser instructions for modifying the Software; or (ii) making

(b) ABB shall have no obligation hereunder and this provision shall not apply to: (i) any other equipment or processes, including Equipment or Processes which have been modified or combined with other equipment or process not supplied by ABB; (ii) any Equipment or Process supplied according to a design other than an ABB design required by Purchaser; (iii) any products manufactured by the Equipment or Process; (iv) any use of the Equipment or Process contrary to ABB instructions; (v) any patent issued after the date hereof; or (vi) any action settled or otherwise terminated without the prior written consent of ABB.

(c) If, in any such action, the Equipment is held to constitute an infringement, or the practice of any Process using the Equipment is finally enjoined, ABB shall, at its option and at its own expense, procure for Purchaser the right to continue using said Equipment; or modify or replace it with non-infringing equipment or, with Purchaser's assistance, modify the Process so that it becomes non-infringing; or remove it and refund the portion of the price allocable to the infringing Equipment. **THE FOREGOING PARAGRAPHS STATE THE EXCLUSIVE LIABILITY OF ABB AND EQUIPMENT MANUFACTURER FOR ANY INTELLECTUAL PROPERTY INFRINGEMENT.**

(d) To the extent that said Equipment or any part thereof is modified by Purchaser, or combined by Purchaser with equipment or processes not furnished hereunder (except to the extent that ABB is a contributory infringer) or said Equipment or any part thereof is used by Purchaser to perform a process not furnished hereunder by ABB or to produce an article, and by reason of said modification, combination, performance or production, an action is brought against ABB, Purchaser shall defend and indemnify ABB in the same manner and to the same extent that ABB would be obligated to indemnify Purchaser under this "Intellectual Property Indemnification" provision.

10. Waiver of Consequential Damages.

In no event shall ABB, its suppliers or subcontractors be liable for special, indirect, incidental or consequential damages, whether in contract, warranty, tort, negligence, strict liability or otherwise, including, but not limited to, loss of profits or revenue, loss of data, loss of use, loss of use of any of the Equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, downtime costs, delays, and claims of customers of the Purchaser or other third parties for any such damages.

11. Limitation of Liability.

(a) ABB's aggregate liability for all claims whether in contract, warranty, tort, negligence, strict liability, or otherwise for any loss or damage arising out of, connected with, or resulting from this Agreement or the performance or breach thereof, or from the design, manufacture, sale, delivery, resale, repair, replacement, installation, technical direction of installation, inspection, operation or use of any equipment covered by or furnished under this Agreement, or from any services rendered in connection therewith, shall in no case (except as provided in the section entitled "Intellectual Property Indemnification") exceed the purchase order price.

available at ABB's facility necessary corrected or replacement programs. ABB shall have no obligation with respect to any nonconformities resulting from (i) unauthorized modification of the Software or (ii) Purchaser-supplied software or interfacing. ABB does not warrant that the functions contained in the software will operate in combinations which may be selected for use by the Purchaser, or that the software products are free from errors in the nature of what is commonly categorized by the computer industry as "bugs".

(e) THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY AND PERFORMANCE, WHETHER WRITTEN, ORAL OR IMPLIED, AND ALL OTHER WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USAGE OF TRADE ARE HEREBY DISCLAIMED. THE REMEDIES STATED HEREIN CONSTITUTE PURCHASER'S EXCLUSIVE REMEDIES AND ABB'S ENTIRE LIABILITY FOR ANY BREACH OF WARRANTY.

9. Intellectual Property Infringement.

(a) ABB shall defend at its own expense any action brought against Purchaser alleging that the Equipment or the use of the Equipment to practice any process for which such Equipment is specified by ABB (a "Process") directly infringes a patent in effect in the United States, an European Union member state or the country of the Site (provided there is a corresponding patent issued by the U.S., UK or an EU member state), or any copyright or trademark registered in the country of the Site and to pay all damages and costs finally awarded in any such action, provided that Purchaser has given ABB prompt written notice of such action, all necessary assistance in the defense thereof and the right to control all aspects of the defense thereof including the right to settle or otherwise terminate such action in behalf of Purchaser.

shall be conducted only in the state or federal courts functioning in the State of New York, Manhattan County and waive the defense of an inconvenient forum in respect to any such litigation. If any provision hereof, partly or completely, shall be held invalid or unenforceable, such invalidity or unenforceability shall not affect any other provision or portion hereof and these terms shall be construed as if such invalid or unenforceable provision or portion thereof had never existed.

13. OSHA.

ABB warrants that the Equipment will comply with the relevant standards of the Occupational Safety and Health Act of 1970 ("OSHA") and the regulations promulgated thereunder as of the date of the Proposal. Upon prompt written notice from the Purchaser of a breach of this warranty, ABB will replace the affected part or modify it so that it conforms to such standard or regulation. ABB's obligation shall be limited to such replacement or modification. In no event shall ABB be responsible for liability arising out of the violation of any OSHA standards relating to or caused by Purchaser's design, location, operation, or maintenance of the Equipment, its use in association with other equipment of Purchaser, or the alteration of the Equipment by any party other than ABB.

14. Software License. (a) ABB owns all rights in or has the right to sublicense all of the Software, if any, to be delivered to Purchaser under this Agreement. As part of the sale made hereunder Purchaser hereby obtains a limited license to use the Software, subject to the following: (i) the Software may be used only in conjunction with equipment specified by ABB; (ii) the Software shall be kept strictly confidential; (iii) the Software shall not be copied, reverse engineered, or modified; (iv) the Purchaser's right to use the Software shall terminate immediately when the specified equipment is no longer used by the Purchaser or when otherwise terminated, e.g. for breach, hereunder; and (v) the rights to use the Software are non-exclusive and non-transferable, except with ABB's prior written consent. (b) Nothing in this Agreement shall be deemed to convey to Purchaser any title to or ownership in the Software or the intellectual property contained therein in whole or in part, nor to designate the Software a "work made for hire" under the Copyright Act, nor to confer upon any person who is not a named party to this Agreement any right or remedy under or by reason of this Agreement. In the event of termination of this License, Purchaser shall immediately cease using the Software and, without retaining any copies, notes or excerpts thereof, return to ABB the Software and all copies thereof and shall remove all machine-readable Software from all of Purchaser's storage media.

15. Intellectual Property, Inventions and Information.

(a) "Intellectual Property Rights" means all current and future rights in copyrights, trade secrets, trademarks, mask works, patents, design rights, trade dress, and any other intellectual property rights that may exist anywhere in the world, including, in each case whether unregistered, registered or comprising an application for registration, and all rights and forms of protection of a similar nature or having equivalent or similar effect to any of the foregoing. "Technology" means all inventions, discoveries, ideas, concepts, methods, code, executables, manufacturing processes, unique compositions, mask works, designs, marks, and works of authorship fixed in the medium of expression, and materials pertaining to any of the preceding; whether or not patentable, copyrightable or subject to other forms of protection.

(b) ABB shall maintain all right, title and interest in any Technology and Intellectual Property Rights that ABB owned, created, conceived or discovered prior to entering into this Agreement, or owns, creates or discovers separately from the activities contemplated by this Agreement. Unless otherwise agreed in writing by ABB and Purchaser, ABB shall have all right, title and interest in any Technology and Intellectual Property Rights that ABB creates, conceives or discovers in furtherance of this Agreement, and ABB shall have all right, title and interest in any Technology and Intellectual Property Rights embodied in the Equipment and Services. Any design, manufacturing drawings or other information submitted to the Purchaser remains the exclusive property of ABB. Purchaser shall not, without ABB's prior written consent, copy or disclose such information to a third party, unless required by a public information request from a governmental body. Such information shall be used solely for the operation or maintenance of the Equipment and not for any other purpose, including the duplication thereof in whole or in part.

16. Force Majeure.

ABB shall neither be liable for loss, damage, detention or delay nor be deemed to be in default for failure to perform when prevented from doing so by causes beyond its reasonable control including but not limited to acts of war (declared or undeclared), delays attributable to outbreaks, epidemics and pandemics (including any variations), Acts of God, fire, strike, labor difficulties, acts or omissions of any governmental authority or of Purchaser, compliance with

(d) Purchaser understands that Seller's Code of Conduct is available for consultation online at <http://www.abb.com/integrity>. Purchaser agrees to perform its contractual obligations hereunder with substantially similar standards of ethical behavior as those found in Supplier's Code of Conduct.

(e) Seller has established the following reporting channels where Purchaser and its employees may report suspected violations of applicable laws, policies or standards of conduct:

(Web portal: www.abb.com/integrity
(Telephone: number specified on the above Web portal
(Mail: address specified on the above Web portal

(b) All causes of action against ABB arising out of or relating to this Agreement or the performance or breach hereof shall expire unless brought within one (1) year of the time of accrual thereof.

(c) In no event, regardless of cause, shall ABB be liable for penalties or penalty clauses of any description or for indemnification of Purchaser or others for costs, damages, or expenses arising out of or related to the Equipment and/Services.

(d) The rights and remedies of the parties contained under these terms and conditions shall be sole and exclusive.

12. Laws and Regulations.

ABB does not assume any responsibility for compliance with federal, state or local laws and regulations, except as expressly set forth herein, and compliance with any laws and regulations relating to the operation or use of the Equipment or Software is the sole responsibility of the Purchaser. All laws and regulations referenced herein shall be those in effect as of the Proposal date. In the event of any subsequent revisions or changes thereto, ABB assumes no responsibility for compliance therewith. If Purchaser desires a modification as a result of any such change or revision, it shall be treated as a change per Article 4. Nothing contained herein shall be construed as imposing responsibility or liability upon ABB for obtaining any permits, licenses or approvals from any agency required in connection with the supply, erection or operation of the Equipment. This Agreement shall in all respects be governed by, and construed, interpreted and enforced in accordance with the laws of the State of New York, USA, excluding its conflicts of laws rules and the provisions of the United Nations Convention on Contracts for the International Sale of Goods, and both parties hereby agree that any litigation concerning, arising out of, or related to this Agreement, whether claims are based on contract, tort, equity or otherwise,

government regulations, insurrection or riot, embargo, delays or shortages in transportation or inability to obtain necessary labor, materials, or manufacturing facilities from usual sources or from defects or delays in the performance of its suppliers or subcontractors due to any of the foregoing enumerated causes. In the event of delay due to any such cause, the date of delivery will be extended by period equal to the delay plus a reasonable time to resume production, and the price will be adjusted to compensate ABB for such delay.

17. Cancellation.

Special order, custom designed, and made-to-order Equipment are non-cancelable and non-returnable. Any other purchase order may be cancelled by Purchaser only upon prior written notice and payment of termination charges as set forth in the cancellation schedule included in the Proposal or payment of, including but not limited to, the purchase price of the work performed prior to the effective date of notice of termination, the costs identified to the purchase order incurred by ABB for work not completed, and all expenses incurred by ABB attributable to the termination, plus a fixed sum of ten (10) percent of the final total price to compensate for disruption in scheduling, planned production and other indirect costs.

18. Termination.

(a) No termination by Purchaser for material default shall be effective unless, within fifteen (15) days after receipt by ABB of Purchaser's written notice specifying such default, ABB shall have failed to initiate and pursue with due diligence correction of such specified default.

(b) If the event of termination for a material default, ABB shall reimburse Purchaser the difference between that portion of the Agreement price allocable to the terminated scope and the actual amounts reasonably incurred by Purchaser to complete that scope, and Purchaser shall pay to ABB the portion of the Agreement price allocable to Equipment completed and any amounts due for Services performed before the effective date of termination.

(c) ABB may terminate the Agreement (or any affected portion thereof) immediately for cause if Purchaser becomes insolvent/bankrupt, or materially breaches the Agreement, including, but not limited to, failure or delay in Purchaser making any payment when due, or fulfilling any payment conditions.

19. Export Control.

(a) Purchaser represents and warrants that the Equipment and Services provided hereunder, and the "direct product" thereof are intended for civil use only and will not be used, directly or indirectly, for the production of chemical or biological weapons or of precursor chemicals for such weapons, or for any direct or indirect nuclear end use. Purchaser agrees not to disclose, use, export or re-export, directly or indirectly, any information provided by ABB or the "direct product" thereof as defined in the Export Control Regulations of the United States Department of Commerce, except in compliance with such Regulations.

(b) If applicable, ABB shall file for a U.S. export license, but only after appropriate documentation for the license application has been provided by Purchaser. Purchaser shall furnish such documentation within a reasonable time after purchase order acceptance. Any delay in obtaining such license shall suspend performance of this Agreement by ABB. If an export license is not granted or, if once granted, is thereafter revoked or modified by the appropriate authorities, this Agreement may be canceled by ABB without liability for damages of any kind resulting from such cancellation. At ABB's request, Purchaser shall provide to ABB a Letter of Assurance and End-User Statement in a form reasonably satisfactory to ABB.

20. Bribery and Corruption.

(a) Purchaser hereby warrants that it will not, directly or indirectly, and it has no knowledge that other persons will, directly or indirectly, make any payment, gift or other commitment to its customers, to government officials or to agents, directors and employees of Seller or any other party in a manner contrary to applicable laws (including but not limited to the Corruption of Foreign Public Officials Act (Canada), the Foreign Corrupt Practices Act (United States) and, where applicable, legislation enacted by member States and signatories implementing the OECD Convention Combating Bribery of Foreign Officials) and shall comply with all relevant laws, regulations, ordinances and rules regarding bribery and corruption.

(b) Nothing hereunder shall render Seller liable to reimburse Purchaser for any such consideration given or promised.

(c) Purchaser's material violation of any of the obligations contained in Section 19(a) above may be considered by Seller to be a material breach hereunder and shall entitle Seller to terminate this agreement with immediate effect and without prejudice to any further right or remedies on the part of Seller hereunder or applicable law. Purchaser shall indemnify Seller for all liabilities, damages, costs or expenses incurred as a result of any such violation of the above-mentioned obligations and termination of this agreement.

documentation shall in no way release Purchaser from its responsibility for said conditions. Purchaser shall disclose to ABB industrial hygiene and environmental monitoring data regarding conditions that may affect ABB's work or personnel at the Site. Purchaser shall keep ABB informed of changes in any such conditions.

(g) ABB shall promptly notify Purchaser if ABB becomes aware of: (i) conditions at the Site differing materially from those disclosed by Purchaser, or (ii) previously unknown physical conditions at Site differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Agreement. If any such conditions cause an increase in ABB's cost of, or the time required for, performance of any part of the work under the Agreement, an equitable adjustment in price and schedule shall be made.

(h) If ABB encounters Hazardous Materials in Purchaser's equipment or at the Site that require special handling or disposal, ABB is not obligated to continue work affected by the hazardous conditions. In such an event, Purchaser shall at its sole cost and expense

21. Assignment.

Any assignment of this Agreement or of any rights or obligations under the Agreement without prior written consent of ABB shall be void.

22. Nuclear.

Equipment and Services sold hereunder are not intended for use in connection with any nuclear facility or activity, and Purchaser warrants that it shall not use or permit others to use Equipment or Services for such purposes, without the advance written consent of ABB. If in breach of this, any such use occurs, ABB (and its parent, affiliates, suppliers and subcontractors) disclaims all liability for any nuclear or other damage, injury or contamination, including without limitation any physical damage to a nuclear facility itself, resulting from a nuclear incident and, in addition to any other rights of ABB, Purchaser shall indemnify and hold ABB (and its parent, affiliates, suppliers and subcontractors) harmless against all such liability including, but not limited to, any physical damage to the nuclear facility or surrounding properties, if any. Consent of ABB to any such use, if any, will be conditioned upon additional terms and conditions that ABB determines to be acceptable for protection against nuclear liability including but not limited to the requirement that the Purchaser and/or its end user customer shall have complete insurance protection against liability and property damage including without limitation physical damage to a nuclear facility itself or any surrounding properties, if any, resulting from a nuclear incident and shall indemnify ABB, its subcontractors, suppliers and vendors against all claims resulting from a nuclear incident including, but not limited to, any physical damage to the nuclear facility.

23. Resale.

If Purchaser resells any of the Equipment or Services, the sale terms shall limit ABB's liability to the buyer to the same extent that ABB's liability to Purchaser is limited hereunder. Additionally, if the end-user intends to use the Equipment or Services in connection with any nuclear facility or activity, the Purchaser shall require the end-user comply with the financial requirements under Price-Anderson Act (PAA) and secure a written release of liability which flows from the end-user to the benefit of ABB.

24. Environmental, Health and Safety Matters.

(a) Purchaser shall be obligated to maintain safe working conditions at its facility or location (the "Site"), including the implementing of appropriate procedures regarding Hazardous Materials, confined space entry, and energization and de-energization of power systems (electrical, mechanical and hydraulic) using safe and effective lock-out/tag-out ("LOTO") procedures including physical LOTO or a mutually agreed upon alternative method.

(b) Purchaser shall immediately advise ABB in writing of all applicable Site-specific health, safety, security and environmental requirements and procedures. Without limiting Purchaser's responsibilities hereunder, ABB has the right but not the obligation to, from time to time, review, audit and inspect applicable health, safety, security and environmental documentation, procedures and conditions at the Site.

(c) If, in ABB's reasonable opinion, the health, safety, or security of personnel or the Site is or is likely to be imperiled by security risks, the presence of or threat of exposure to Hazardous Materials, or unsafe working conditions, ABB may, in addition to other rights or remedies available to it, remove some or all of its personnel from Site, suspend performance of all or any part of the purchase order, and/or remotely perform or supervise work. Any such occurrence shall be considered a Force Majeure event. Purchaser shall reasonably assist in ensuring the safe departure of personnel from the Site.

(d) Purchaser shall not require or permit ABB's personnel to operate Purchaser's equipment at Site.

(e) Purchaser will make its Site medical facilities and resources reasonably available to ABB personnel who need medical attention.

(f) ABB has no responsibility or liability for the pre-existing condition of Purchaser's equipment or the Site, which is the sole responsibility of Purchaser. Prior to ABB starting any work at Site, Purchaser will provide documentation that identifies the presence and condition of any Hazardous Materials existing in or about Purchaser's equipment or the Site that ABB may encounter while performing under this Agreement. The provision of such

(d) As to any individual item of Confidential Information, the restrictions under this Article 24 shall expire five (5) years after the date of disclosure. This Article 24 does not supersede any separate confidentiality or nondisclosure agreement signed by the parties.

26. Non-Survival.

The following Articles shall not survive termination or cancellation of this Agreement: 5, 7, 8, 17 and 18. All other Articles shall survive the termination or cancellation of the Agreement.

27. Entire Agreement.

This Agreement constitutes the entire agreement between ABB and Purchaser. There are no agreements, understandings, restrictions, warranties, or representations between ABB and Purchaser other than those set forth herein or herein provided. As stated in Article 1 of this Agreement, ABB's Proposal, Policies, Addendum(s), if any, submitted to Purchaser, shall control over any conflicting terms. ABB specifically rejects any exceptions to this Agreement, Proposals, Policies, and/or Addendum(s) on the face of any purchase order. Purchaser shall advise ABB in writing of all conflicts, errors, omissions, or discrepancies among the Proposal, Policies, Addendum(s) and this Agreement immediately upon discovery. This Agreement shall supersede any standard, preprinted terms and conditions that are automatically attached to purchase orders issued by Purchaser.

28. US Government Contracts.

(a) This Article 28 applies only if the Agreement is for the direct or indirect sale to any agency of the U.S. government and/or is funded in whole or in part by any agency of the U.S. government.

(b) Purchaser agrees that all Equipment and Services provided by ABB meet the definition of "commercial-off-the-shelf" ("COTS") or "commercial item" as those terms are defined in Federal Acquisition Regulation ("FAR") 2.101. Purchaser agrees, consistent with FAR 12.212, that commercial computer software and commercial computer software documentation are licensed under ABB's Software License. To the extent the Buy America(n) Act, Trade Agreements Act, or other domestic preference requirements are applicable to this Agreement, the country of origin of Equipment is unknown unless otherwise specifically stated by ABB in this Agreement. Purchaser agrees any Services offered by ABB are exempt from the Service Contract Act of 1965 (FAR 52.222-41). The version of any applicable FAR clause listed in this Article 28 shall be the one in effect on the effective date of this Agreement.

(c) If Purchaser is an agency of the U.S. Government, then as permitted by FAR 12.302, Purchaser agrees that all paragraphs of FAR 52.212-4 (except those listed in 12.302(b)) are replaced with these Terms and Conditions. Purchaser further agrees the subparagraphs of FAR 52.212-5 apply only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the Agreement price.

(d) If Purchaser is procuring the Equipment or Services as a contractor, or subcontractor at any tier, on behalf of any agency of the U.S. Government, then Purchaser agrees that FAR 52.212-5(e) or 52.244-6 (whichever is applicable) applies only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the purchase order price.

29. Data Protection.

(a) The parties agree that the protection of Personal Data is very important. If Purchaser discloses Personal Data to ABB, ABB shall comply with all applicable data protection laws and regulations. Purchaser shall comply with all applicable data protection laws and regulations in respect of any Personal Data it receives from ABB in the course of receiving the Equipment or Services.

(b) The parties agree that neither will withhold or delay its consent to any changes to this clause which are required to be made in order to comply with applicable data protection

eliminate the hazardous conditions in accordance with applicable laws and regulations so that ABB's work under the Agreement may safely proceed, and ABB shall be entitled to an equitable adjustment of the price and schedule to compensate for any increase in ABB's cost of, or time required for, performance of any part of the work. Purchaser shall properly store, transport and dispose of all Hazardous Materials introduced, produced or generated in the course of ABB's work at the Site.

(i) Purchaser shall indemnify ABB for any and all claims, damages, losses, and expenses arising out of or relating to any Hazardous Materials which are or were (i) present in or about Purchaser's equipment or the Site prior to the commencement of ABB's work, (ii) improperly handled or disposed of by Purchaser or Purchaser's employees, agents, contractors or subcontractors, or (iii) brought, generated, produced or released on Site by parties other than ABB.

25. Confidentiality.

a) ABB and Purchaser (as to information disclosed, the "Disclosing Party") may each provide the other party (as to information received, the "Receiving Party") with Confidential Information in connection with this Agreement. "Confidential Information" means (a) information that is designated in writing as "confidential" or "proprietary" by Disclosing Party at the time of written disclosure, and (b) information that is orally designated as "confidential" or "proprietary" by Disclosing Party at the time of oral or visual disclosure and is confirmed to be "confidential" or "proprietary" in writing within fifteen (15) days after the oral or visual disclosure. In addition, prices for Products and Services shall be considered ABB's Confidential Information.

(b) Receiving Party agrees: (i) to use the Confidential Information only in connection with the Agreement and use of Products and Services, (ii) to take reasonable measures to prevent disclosure of the Confidential Information to third parties, and (iii) not to disclose the Confidential Information to a competitor of Disclosing Party. Notwithstanding these restrictions, each party shall permit access to the other's Confidential Information only to its employees who: (i) reasonably require access to Confidential Information for purposes approved by this Agreement, and (ii) have undertaken a binding obligation of confidentiality with respect to the confidential information of others entrusted to him or her, and (iii) have been apprised of the confidentiality obligations hereunder. ABB may disclose Confidential Information to its affiliates and subcontractors in connection with performance of the purchase order. A Receiving Party may only disclose Confidential Information to any other third party with the prior written permission of Disclosing Party, and in each case, only so long as the Receiving Party obtains a non-disclosure commitment from any such third party that prohibits disclosure of the Confidential Information and provided further that the Receiving Party remains responsible for any unauthorized use or disclosure of the Confidential Information. Receiving Party shall upon request return to Disclosing Party or destroy all copies of Confidential Information except to the extent that a specific provision of the Agreement entitles Receiving Party to retain an item of Confidential Information. ABB may also retain one archive copy of Purchaser's Confidential Information.

(c) The obligations under this Article 24 shall not apply to any portion of the Confidential Information that: (i) is or becomes generally available to the public other than as a result of disclosure by Receiving Party, its representatives or its affiliates; (ii) is or becomes available to Receiving Party on a non-confidential basis from a source other than Disclosing Party when the source is not, to the best of Receiving Party's knowledge, subject to a confidentiality obligation to Disclosing Party; (iii) is independently developed by Receiving Party, its representatives or affiliates, without reference to the Confidential Information; (iv) is required to be disclosed by law or valid legal process provided that the Receiving Party intending to make disclosure in response to such requirements or process shall promptly notify the Disclosing Party in advance of such disclosure and reasonably cooperate in attempts to maintain the confidentiality of the Confidential Information.

laws and regulations and/or with guidelines and order from any competent supervisory authority, and their application to the Equipment or Services from time to time, and agrees to implement any such changes at no additional cost to the other party.

(c) The parties acknowledge that the processing of Personal Data in accordance with this purchase order may require the conclusion of additional data processing agreements or additional data protection agreements. If and to the extent such additional data processing agreements or additional data protection agreements are not initially concluded as part of the purchase order, the parties shall, and shall ensure that their relevant affiliates or subcontractors shall, upon the other's request promptly enter into any such agreement with an affiliate, as designated by the other party and as required by mandatory law or a competent data protection or other competent authority.

FULLER

FULLER ENGINEERING COMPANY, LLC

ABB

R.E. Dimond and Associates, Inc.

Reviewed and checked only for conformance with design concepts and with information given in the Contract Documents. Approval does not release the Contractor from the responsibility to provide appropriate quantities, field measurements, dimensional stability, installation, anchorage, and coordination with other trades, or release the Contractor from responsibility for deviations from the requirements of the Contract Documents, or from responsibility for errors and omissions contained thereon.

- Reviewed as Submitted
- Reviewed as Noted
- Rejected - Correct and Resubmit
- See Attached Comment Sheet(s)

Project Submittal

By: PS/MJE

Date: 5/13/2024

Brownsburg Eagle Elementary Central Plant

Equipment: *ABB Variable Frequency Drives*

Owner: Brownsburg Community School Corporation

Engineer: RE Dimond

Submitted By: Patrick Lynch, Fuller Engineering

Revision: 0

Date: May 13th, 2024

Submittal Schedule

This schedule includes the products supplied as part of this submittal.

Schedule			Motor Data ¹			Drive Data			
Item	Qty	Tag	HP	FLA	Volts	Product ID	HP	Amps	Volts
1	2	CHWP-A1, CHWP-A2	25	34	460 VAC	ACH580-VCR-034A-4	25	34	
2	2	HWP-A1, HWP-A2	10	14	460 VAC	ACH580-VCR-014A-4	10	14	

Notes: 1. AC motor data is per National Electrical Code Table 430.250 for typical motors used in most applications. It is provided as typical data only. DC motor data is per typical industry standards. Actual motor data may vary

Fuller Engineering to provide factory authorized check, test, and startup performed during normal working hours, to allow 36-month parts, travel, and labor warranty.

COORDINATE SHIPMENT DATES WITH OWNER/INSTALLING CONTRACTOR.

Submittal Schedule Details for CHWP-A1, CHWP-A2

Item	Tag / Equipment ID	Product ID
1	CHWP-A1, CHWP-A2	ACH580-VCR-034A-4

Item Description
<p>Input Voltage: 480 VAC Three Phase Rated Output Current: 34A Enclosure: UL (NEMA) Type 1 Nominal Horsepower: 25 HP Frame Size: R3 Input Disconnecting Means: Circuit Breaker Bypass: E-Clipse Bypass (Vertical) Input Impedance: 5% equivalent impedance Short Circuit Current Rating: 100 kA Communication Protocols: Johnson Controls N2, Modbus RTU, BACnet (MS/TP) Other Options:</p>

Drive Input Fuse Ratings	
Fuse Class	Amps (600 V)
Class T	60

Wire Size Capacities of Power Terminals		
Input Wiring	Output Wiring	Ground Wiring
#14...#1/0 5.2 lbf-ft	#14...#2 #14...#8: 35 in-lbs; #6...#4: 45 in-lbs; #3...#2: 50 in-lbs	#14...#2 #14...#10: 2.9 lbf-ft; #6...#4: 3.8 lbf-ft; #2: 4.1 lbf-ft

Dimensions and Weights			
Height <i>in</i> (<i>mm</i>)	Width <i>in</i> (<i>mm</i>)	Depth <i>in</i> (<i>mm</i>)	Weight <i>lbs</i> (<i>kg</i>)
47.7 (1212)	8.4 (214)	10.9 (277)	59 (27)

Heat Dissipation & Airflow Requirements			
Power Losses		Airflow	
BTU/Hr	Watts	CFM	CM/Hr
1,964	576	105	178.4

Submittal Schedule Details for HWP-A1, HWP-A2

Item	Tag / Equipment ID	Product ID
2	HWP-A1, HWP-A2	ACH580-VCR-014A-4

Item Description
<p>Input Voltage: 480 VAC Three Phase Rated Output Current: 14A Enclosure: UL (NEMA) Type 1 Nominal Horsepower: 10 HP Frame Size: R2 Input Disconnecting Means: Circuit Breaker Bypass: E-Clipse Bypass (Vertical) Input Impedance: 5% equivalent impedance Short Circuit Current Rating: 100 kA Communication Protocols: Johnson Controls N2, Modbus RTU, BACnet (MS/TP) Other Options:</p>

Drive Input Fuse Ratings	
Fuse Class	Amps (600 V)
Class CC	30

Wire Size Capacities of Power Terminals		
Input Wiring	Output Wiring	Ground Wiring
#14...#1/0 5.2 lbf-ft	#20...#6 1.2 lbf-ft	#14...#4 3 lbf-ft

Dimensions and Weights			
Height <i>in</i> <i>(mm)</i>	Width <i>in</i> <i>(mm)</i>	Depth <i>in</i> <i>(mm)</i>	Weight <i>lbs</i> <i>(kg)</i>
44.1 (1120)	5.4 (137)	10.8 (274)	51 (23)

Heat Dissipation & Airflow Requirements			
Power Losses		Airflow	
BTU/Hr	Watts	CFM	CM/Hr
873	256	59	100.3

ACH580-01/-31

The ACH580 drive sets new standards in both simplicity and reliability, and ensures smooth, energy-efficient operation of your HVAC systems in normal and mission-critical situations.

ACH580-01, wall-mounted base drives

The ACH580-01 wall-mounted drives are available from 1 to 100 HP at 208/240 V, 1 to 350 HP at 480 V, and 2 to 250 HP at 575 V. The ACH580-01 drives are available in UL (NEMA) Type 1 and 12 configurations. In standard installations, the drive is mounted directly onto a wall and uses the provided conduit box. Conduit openings are provided for bottom conduit entry & exit. For mounting in a customer-supplied cabinet, the conduit box may be removed. The drive has a 100 kA SCCR rating when paired with appropriately sized upstream fuses.

ACH580-31, ultra low harmonic wall-mounted base drives

The ACH580-31 wall-mounted drives are available from 5 to 75 HP @208/230v and 5 to 400 HP @ 480 V. The ACH580-31 are available in UL (NEMA) Type 1 and 12 configurations. In standard installations, the drive is mounted directly onto a wall and uses the provided conduit box. Conduit openings are provided for bottom conduit entry and exit. For mounting in a customer-supplied cabinet, the conduit plate may be removed.

Features for HVAC

The ACH580 comes standard with an intuitive control panel used to configure, control, and monitor the drive. An optional Bluetooth control panel allows the drive to be configured via the control panel or the DriveTune app.

A robust HVAC firmware package provides drive, motor, and application protection features. Examples of drive protection features include undervoltage, overvoltage, overcurrent, and ground fault protection. The ACH580 also has a variety of motor protection features including overload and stall protections.

Application specific features, such as accepting four separate start interlocks (safeties), along with broken belt detection, are also included. The drive includes BACnet MS/TP, Modbus RTU, and Johnson N2 as standard. Additional protocols, such as BACnet/IP and LonWorks, are available with optional fieldbus adapters.

Technical specifications

Product compliance (complete list on following page)

ACH580-01/-31 CE, UL, cUL, and EAC

Supply connection

Input voltage (U_1)	
ACH580-xx-xxxA-2	208/230V
ACH580-xx-xxxA-4	480V
ACH580-xx-xxxA-6	600V
Input voltage tolerance	+10% / -15%
Phase	3-phase (1-phase, 240 V)
Frequency	48 to 63 Hz
Line Limitations	Max $\pm 3\%$ of nominal phase to phase input voltage
Power Factor ($\cos \phi$) at nominal load	
ACH580-01	0.98
ACH580-31	1.0
Efficiency at rated power	
ACH580-01	98.0%
ACH580-31	96.5%
Power Loss	Approximately 2% of rated power

Motor connection

Supported motor control	Scalar and vector
Supported motor types	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)
Voltage	3-phase, from 0 to supply voltage
Frequency	0 to 500 Hz
Short Term Overload Capacity Variable Torque	110% for 1 min/10min
Peak Overload Capacity Variable Torque	1.35 for 2 second (2 sec / 10 min)
Switching Frequency	2, 4, 8 or 12 kHz Automatic fold back in case of overload
Acceleration/Deceleration Time	0 to 1800 s
Short Circuit Current Rating (SCCR)	100 ka with fusing

Inputs and outputs (drive)

2 analog inputs	Selection of Current/Voltage input mode is user programmable.
Voltage reference	0 (2) to 10 V, $R_{in} > 200 \text{ k}\Omega$
Current reference	0 (4) to 20 mA, $R_{in} = 100 \Omega$
Potentiometer reference value	10 V $\pm 1\%$ max. 20 mA
2 analog outputs	AO1 is user programmable for current or voltage. AO2 current
Voltage reference	0 to 10 V, $R_{load} > 100 \text{ k}\Omega$
Current reference	0 to 20 mA, $R_{load} < 500 \Omega$
Applicable potentiometer	1 k Ω to 10 k Ω
Internal auxiliary voltage	24 V DC $\pm 10\%$, max. 250 mA
Accuracy	+/- 1% full scale range at 25°C (77°F)
Output updating time	2 ms
6 digital inputs	12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input. PNP or NPN connection (5 DIs with NPN connection).

	Programmable
Input Updating Time	2 ms
3 relay outputs	Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms. Programmable, Form C
Adjustable filters on analog inputs and outputs	
All control inputs isolated from ground and power	
Operation	
Air temperature	0 to -15 °C (32 to 5 °F). -15 to +50 °C (5 to 122 °F): No frost allowed. Output derated above +40 °C (104 °F)
Installation site altitude	0 to 4000 m (13123 ft) above sea level Output derated above 1000 m (3281 ft)
Relative humidity	5 to 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric pressure	70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres
Vibration	Risk category IV Certified (IBC 2018)
Environmental protections	
Chemical Gasses	Class 3C2
Solid Particles	Class 3S2 No conductive dust allowed
Pollution degree (IEC/EN 61800-5-1)	Pollution degree 2
Product compliance	
Standards and directives	Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC 60721-3-3: 2002 60721-3-1:1997 Quality assurance system ISO 9001 and Environmental system ISO 14001 CE, UL, cUL, and EAC approvals Galvanic isolation according to PELV RoHS2 (Restriction of Hazardous Substances) EN 61800-5-1: 2007; IEC/EN 61000-3-12; EN61800-3: 2017 + A1: 2012 Category C2 (1st environment restricted distribution); Safe torque off (EN 61800-5-2) BACnet Testing Laboratory (BTL) Seismic (IBC, OSHPD) Plenum (ACH580-01 only)
EMC (according to EN61800-3)	ACH580-01 and ACH580-31 class C2 (1st environment restricted distribution)

Storage (in Protective Shipping Package)

Air Temperature	-40 to +70 °C (-40 to +158 °F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Chemical Gasses	Class 1C2
Solid Particles	Class 1S2 Contact ABB regarding Class 1S3
Atmospheric pressure	70 to 106 kPa 0.7 to 1.05 atmospheres
Vibration (ISTA)	
R1...R4	In accordance with ISTA 1A
R5...R9	In accordance with ISTA 3E

Transportation (in Protective Shipping Package)

Air Temperature	-40° to 70°C (-40° to 158°F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric Pressure	60 to 106 kPa (8.7 to 15.4 PSI) 0.6 to 1.05 atmospheres
Free Fall	R1: 76 cm (30 in) R2: 61 cm (24 in) R3: 46 cm (18 in) R4: 31 cm (12 in) R5: 25 cm (10 in)
Chemical Gasses	Class 2C2
Solid Particles	Class 2S2
Shock/ Drop (ISTA)	
R1...R4	In accordance with ISTA 1A
R5...R9	In accordance with ISTA 3E
Vibration (ISTA)	
R1...R4	In accordance with ISTA 1A
R5...R9	In accordance with ISTA 3E

Feature overview

Communication

Protocols as standard (EIA-485): BACnet MS/TP, Modbus RTU, Johnson Controls N2
Available as plug-in options: BACnet/IP, Modbus TCP, PROFIBUS-DP, DeviceNet, EtherNet/IP, LonWorks (coming 2019)

Application functions

Start interlock
Delayed start
Run permissive (damper monitoring)
Override operation mode
Real-time clock (scheduling)
PID controllers for motor and process
Motor flying start
Motor preheating
Energy optimizer and calculators
Timer
2 or 3 wire start/stop
Ramp to stop
2 independent adjustable accel/decel ramp

Protection functions

Overvoltage controller
Undervoltage controller
Motor earth-leakage monitoring
Motor short-circuit protection
Motor overtemperature protection
Output and input switch supervision
Motor overload protection (UL508C)
Phase-loss detection (both motor and supply)
Under load supervision (belt loss detection)
Overload supervision
Stall protection
Loss of reference
Panel loss
Ground fault
External events
Overcurrent
Current limit regulator
Transient/Surge protection (MOV and choke)

Panel functions

First start assistant
Primary settings for HVAC applications
Hand-Off-Auto operation mode
HVAC quick set-up
Includes Day, Date and Time
Operator Panel Parameter Backup (read/write)
Full Graphic and Multilingual Display for Operator Control,
Parameter Set-Up and Operating Data Display:

- Output Frequency (Hz)
- Speed (RPM)
- Motor Current
- Calculated % Motor Torque
- Calculated Motor Power (kW)
- DC Bus Voltage
- Output Voltage
- Heatsink Temperature
- Elapsed Time Meter (resettable)
- kWh (resettable)
- Input / Output Terminal Monitor
- PID Actual Value (Feedback) & Error Fault Text
- Warning Text
- Three (3) Scalable Process Variable Displays
- User-Definable Engineering Units

Motor control features

Scalar (V/Hz) and vector modes of motor control
V/Hz shapes

- Linear
- Squared

Energy optimization
IR compensation
Slip compensation
Three (3) Critical Frequency Lockout Bands

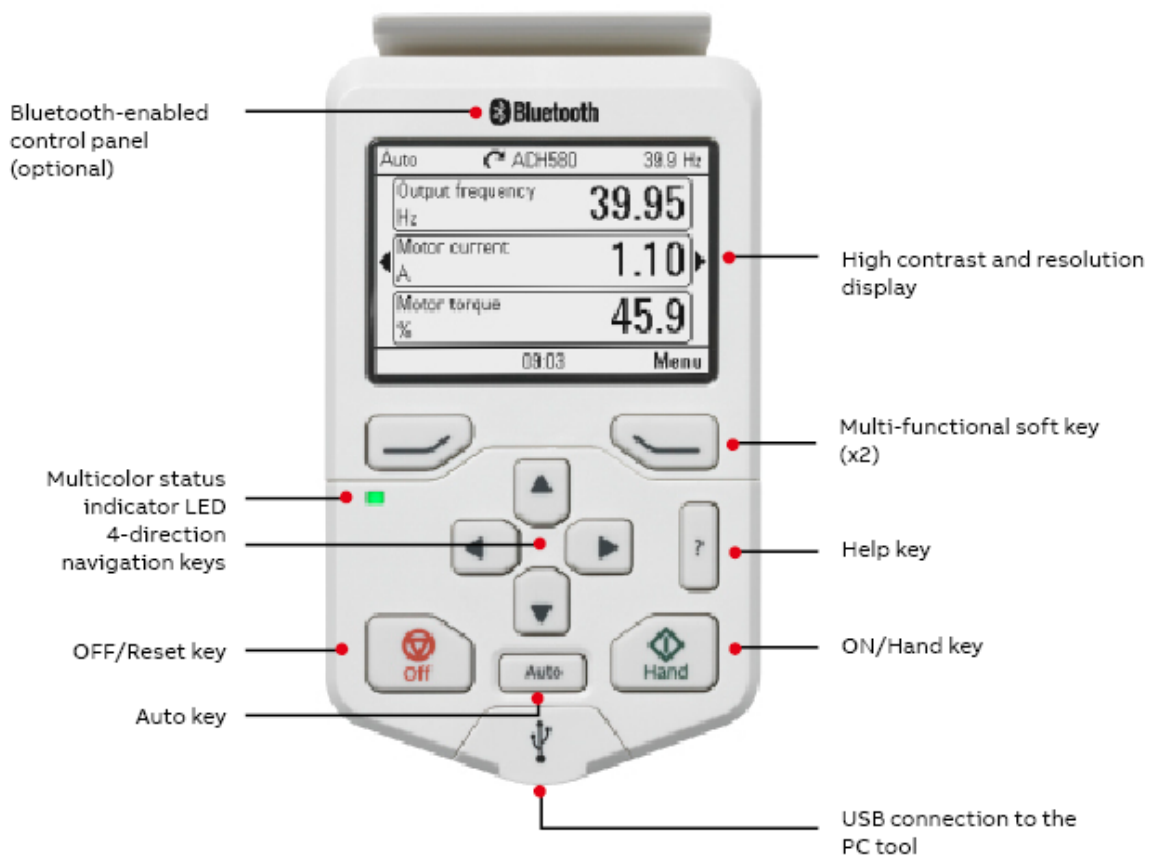
PID control

One (1) Process PID
Four (4) Integral Independent Programmable PID Setpoint Controllers (Process and External)
External Selection between Two (2) Sets of Process PID Controller Parameters
PID Sleep/Wake-Up

Control panel features

The ACH580 Assistant Control Panel features:

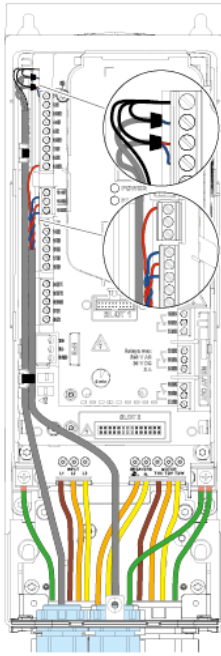
- Intuitive to operate
- Primary Setting menu to ease drive commissioning
- Real-time clock
- Diagnostic and maintenance functions
- Full-graphic display, including chart, graph, and meter options
- 21 editable home views
- USB interface for PC and tool connection as standard
- Parameters are alpha-numeric
- North American version supports 14 languages as standard
- Dedicated "Help" key
- 4 user sets
- Parameters are stored in control panel memory for later transfer to other drives or for backup of a particular system
- Back-up and restore parameters and/or motor data
- Automatic back-up 2 hours after parameter change
- Modified parameter display
- Creates unique short menu
- Shows parameters that differ from the default
- Bluetooth connectivity for use with mobile device (requires +J429 option)



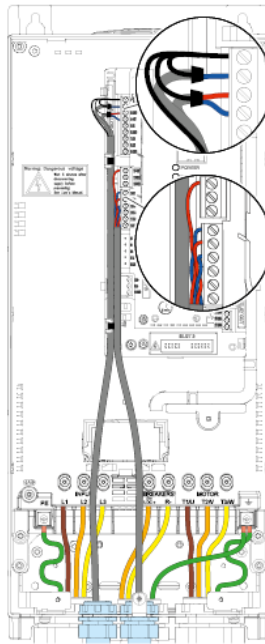
Cable connections

The following illustrations show the ACH580-01 and ACH580-31 cable connection points for the base drive. The illustrations indicate the location of input and output power connections as well as equipment and motor grounding connection points.

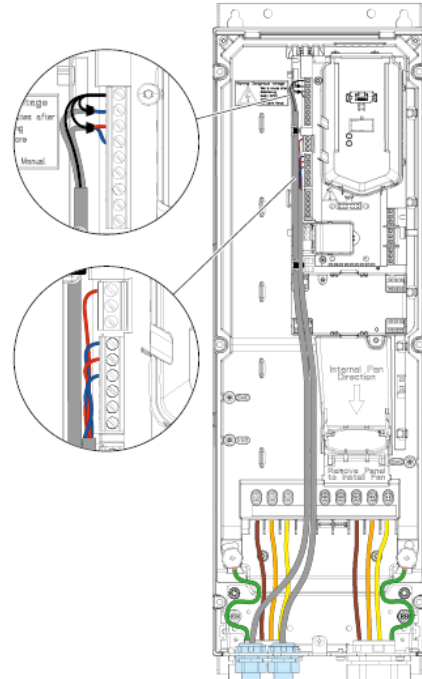
ACH580 drives are configured for wiring access from the bottom only. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals.



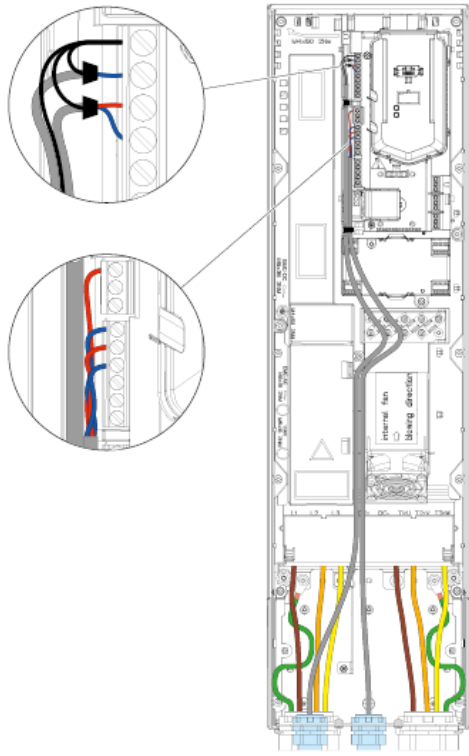
ACH580-01, R1-R2, UL (NEMA) Type 1 and 12



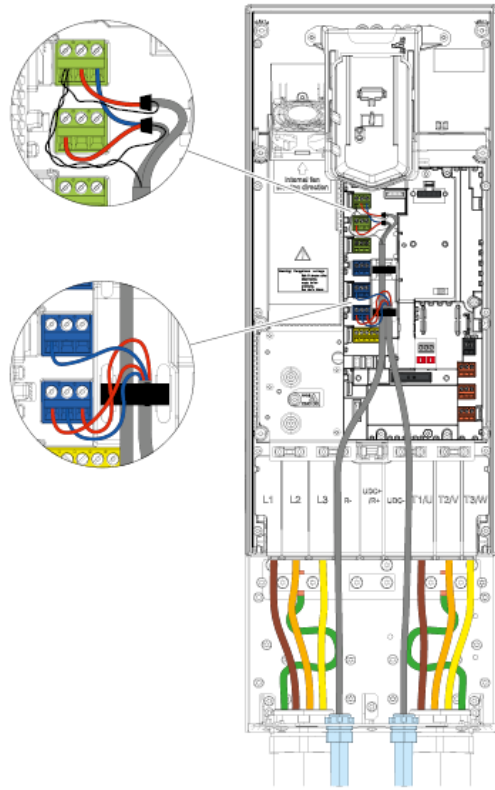
ACH580-01, R3, UL (NEMA) Type 1 and 12



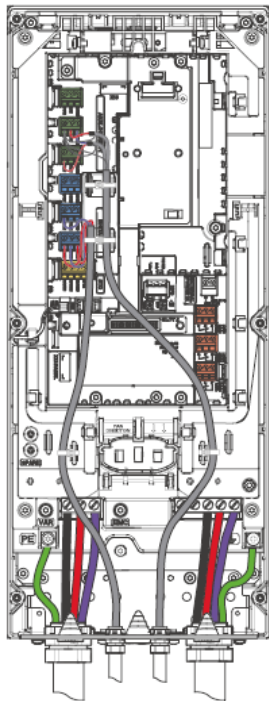
ACH580-01, R4, UL (NEMA) Type 1 and 12



ACH580-01, R5, UL (NEMA) Type 1 and 12



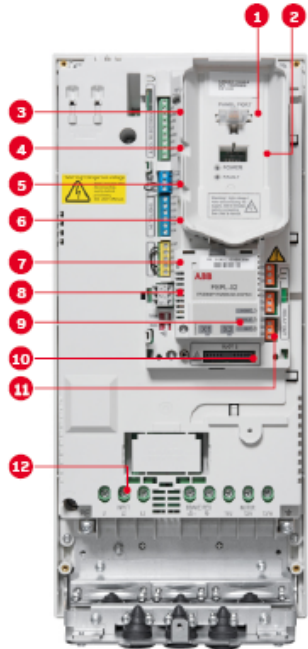
ACH580-01, R6-9, UL (NEMA) Type 1 and 12



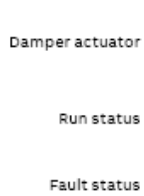
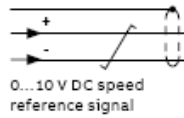
ACH580-31, R3, UL (NEMA) Type 1 and 12

Control connections

Default control connections



1. Panel port (PC tools, control panel)
2. ABB drive customizer port for programming the drive without mains
3. Analog inputs (2 × AI)
4. Analog outputs (2 × AO)
5. 24 V DC output
6. Digital inputs (6 × DI)
7. Safe torque off (STO)
8. Embedded fieldbus
9. Communication options (fieldbuses)
10. Analog and digital I/O extensions
11. Relay outputs (3 × RO)
12. Mains connection



Terminal	Meaning	Default macro connections	
X1 Reference voltage and analog inputs and outputs			
1	SCR	Signal cable shield (screen)	
2	AI1	Output frequency/speed reference: 0 to 10 V	
3	AGND	Analog input circuit common	
4	+10 V	Reference voltage 10 V DC	
5	AI2	Actual feedback: 0 to 20 mA	
6	AGND	Analog input circuit common	
7	AO1	Output frequency: 0 to 10 V	
8	AO2	Motor current: 0 to 20 mA	
9	AGND	Analog output circuit common	
X2 & X3 Aux. voltage output and programmable digital inputs			
10	+24 V	Aux. voltage output +24 V DC, max. 250 mA	
11	DGND	Aux. voltage output common	
12	DCOM	Digital input common for all	
13	DI1	Stop (0)/Start (1)	
14	DI2	Not configured	
15	DI3	Constant frequency/speed selection	
16	DI4	Start interlock 1 (1 = allow start)	
17	DI5	Not configured	
18	DI6	Not configured	
X6, X7, X8 Relay outputs			
19	RO1C	Damper control 250 V AC/30 V DC 2 A Energize damper 19 connected to 21	
20	RO1A		
21	RO1B		
22	RO2C	Running 250 V AC/30 V DC 2 A Running 22 connected to 24	
23	RO2A		
24	RO2B		
25	RO3C	Fault (-1) 250 V AC/30 V DC 2 A Fault condition 25 connected to 26	
26	RO3A		
27	RO3B		
X5 Embedded fieldbus			
29	B+	Embedded fieldbus, EFB (EIA-485)	
30	A-		
31	DGND		
54	TERM		Termination switch
55	BIAS		Bias resistors switch
X4 Safe torque off			
34	OUT1	Safe torque off. Factory connection. Both circuits must be closed for the drive to start. See chapter <i>The Safe torque off function in the hardware manual of the drive.</i>	
35	OUT2		
36	SGND		
37	IN1		
38	IN2		
X10 24 V AC/DC			
40	24 V AC/DC+ in	R6-R11 only: Ext. 24V AC/DC input to power up the control unit when the main supply is disconnected.	
41	24 V AC/DC- in		

Notes:

- Connected with jumpers at the factory.
- Only frames R6-R11 have terminals 40 and 41 for external 24 V AC/DC input.

ACH580 E-Clipse Bypass

The ACH580 drive sets new standards in both simplicity and reliability, and ensures smooth, energy-efficient operation of your HVAC systems in normal and mission-critical situations.

The ACH580 with ABB E-Clipse bypass is an ACH580 HVAC Drive in an integrated UL (NEMA) Type 1, 12 or 3R enclosure with a bypass motor starter. The ACH580 with ABB E-Clipse bypass provides an input disconnect switch or circuit breaker with door mounted and interlocked operator (padlockable in the OFF position), a bypass starter, electronic motor overload protection, a door mounted control panel with graphical display for local control, provisions for external control connections, and serial communications capability. Configurations with the +F267 option include a drive service switch.

UL (NEMA) Type 1 and 12 E-Clipse units are available from 1 to 100 HP at 208/230V, 1 to 350 HP at 460V, and 2 to 150 HP at 575V. UL (NEMA) Type 1 and 12 units are wall mounted from 1 to 200 HP.

For outdoor applications, UL (NEMA) Type 3R E-Clipse unit are available from 1 to 100 HP at 208/230V, 1 to 350 HP at 460V and 2 to 150 HP at 575V. Construction is sheet steel with a tough powder coat paint finish for corrosion resistance. A thermostatically controlled space heater and forced ventilated air cooling system are standard.

The ACH580 with ABB E-Clipse bypass includes two contactors. One contactor is the bypass contactor, used to connect the motor directly to the incoming power line in the event that the ACH580 is out of service. The other contactor is the ACH580 output contactor that disconnects the ACH580 from the motor when the motor is operating in the Bypass mode. The drive output contactor and the bypass contactor are electrically interlocked to prevent "back feeding".

The ACH580 with ABB E-Clipse bypass is a microprocessor-controlled "intelligent" system which features programmable Class 10, 20, or 30 overload curves, programmable underload (broken belt) and overload trip or indication. Also included as standard features are single-phase protection in bypass mode, programmable manual or automatic transfer to bypass, fireman's override, smoke control, damper control, no contactor chatter on brown-out power conditions and serial communications. Should a drive problem occur, fast acting fuses exclusive to the ACH580 drive path disconnect the drive from the line prior to clearing upstream branch circuit protection, maintaining bypass capability.

Technical specifications

Product compliance (complete list on following page)

ACH580-VxR/BxR UL508A

Supply connection

Input voltage (U ₁)	
ACH580-xx-xxxA-2	208/240V
ACH580-xx-xxxA-4	480V
ACH580-xx-xxxA-6	600V
Input voltage tolerance	+10% / -15%
Phase	3-phase
Frequency	48 to 63 Hz
Line Limitations	Max ±3% of nominal phase to phase input voltage
Power Factor (cos φ) at nominal load	
ACH580-VxR	0.98
ACH580-BxR	0.98
Efficiency at rated power	
ACH580-VxR	98.0%
ACH580-BxR	98.0%
Power Loss	Approximately 2% of rated power

Motor connection

Supported motor control	Scalar and vector
Supported motor types	Asynchronous motor
Voltage	3-phase, from 0 to supply voltage
Frequency	0 to 500 Hz
Short Term Overload Capacity Variable Torque	110% for 1 min/10min
Peak Overload Capacity Variable Torque	1.35 for 2 second (2 sec / 10 min)
Switching Frequency	2, 4, 8 or 12 kHz Automatic fold back in case of overload
Acceleration/Deceleration Time	0 to 1800 s
Short Circuit Current Rating (SCCR)	

	240V	480V	600V
-VCR	100kA	100kA	10 kA
-VDR*	100kA	100kA	100 kA
-BCR	100kA	100kA	10 kA
-BDR*	100kA	100kA	100 kA

* External fuses are required for 100 kA rating as specified in the "Technical Data" section of User Manual [3AXD50000289554](#).

Technical specifications

Inputs and outputs (drive)	
2 analog inputs	Selection of Current/Voltage input mode is user programmable.
Voltage reference	0 (2) to 10 V, $R_{in} > 200 \text{ k}\Omega$
Current reference	0 (4) to 20 mA, $R_{in} = 100 \text{ }\Omega$
Potentiometer reference value	10 V $\pm 1\%$ max. 20 mA
2 analog outputs	AO1 is user programmable for current or voltage. AO2 current
Voltage reference	0 to 10 V, $R_{load} > 100 \text{ k}\Omega$
Current reference	0 to 20 mA, $R_{load} < 500 \text{ }\Omega$
Applicable potentiometer	1 k Ω to 10 k Ω
Internal auxiliary voltage	24 V DC $\pm 10\%$, max. 250 mA
Accuracy	+/- 1% full scale range at 25°C (77°F)
Output updating time	2 ms
6 digital inputs	12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input. PNP or NPN connection (5 DIs with NPN connection). Programmable
Input Updating Time	2 ms
3 relay outputs	Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms. Programmable, Form C
Contact material	Silver Tin Oxide (AgSnO ₂)
PTC, PT100 and PT1000	Any of the analog inputs, or digital input 6, are configurable for PTC with up to 6 sensors.
Adjustable filters on analog inputs and outputs	
All control inputs isolated from ground and power	
Operation	
Air temperature	0 to -15 °C (32 to 5 °F). -15 to +50 °C (5 to 122 °F): No frost allowed. Output derated above +40 °C (104 °F)
Installation site altitude	0 to 1000 m (3281 ft) above sea level Output derated above 1000 m (3281 ft)
Relative humidity	5 to 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric pressure	70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres
Siesmic	Risk category IV Certified (IBC 2018)

Feature overview

Communication

Protocols as standard (EIA-485): BACnet MS/TP, Modbus RTU, Johnson Controls N2
Available as plug-in options: BACnet/IP, Modbus TCP, PROFIBUS-DP, DeviceNet, EtherNet/IP

Application functions

Start interlock
Delayed start
Run permissive (damper monitoring)
Override operation mode
Real-time clock (scheduling)
PID controllers for motor and process
Motor flying start
Motor preheating
Energy optimizer and calculators
Timer
2 or 3 wire start/stop
Ramp to stop
2 independent adjustable accel/decel ramp

Protection functions

Overvoltage controller
Undervoltage controller
Motor earth-leakage monitoring
Motor short-circuit protection
Motor overtemperature protection
Output and input switch supervision
Motor overload protection (UL508C)
Phase-loss detection (both motor and supply)
Under load supervision (belt loss detection)
Overload supervision
Stall protection
Loss of reference
Panel loss
Ground fault
External events
Overcurrent
Current limit regulator
Transient/Surge protection (MOV and choke)

Panel functions

First start assistant
Primary settings for HVAC applications
Hand-Off-Auto operation mode
HVAC quick set-up
Includes Day, Date and Time
Operator Panel Parameter Backup (read/write)
Full Graphic and Multilingual Display for Operator Control,
Parameter Set-Up and Operating Data Display:

- Output Frequency (Hz)
- Speed (RPM)
- Motor Current
- Calculated % Motor Torque
- Calculated Motor Power (kW)
- DC Bus Voltage
- Output Voltage
- Heatsink Temperature
- Elapsed Time Meter (resettable)
- kWh (resettable)
- Input / Output Terminal Monitor
- PID Actual Value (Feedback) & Error Fault Text
- Warning Text

- Three (3) Scalable Process Variable Displays
- User-Definable Engineering Units

Motor control features

Scalar (V/Hz) and vector modes of motor control
V/Hz shapes

- Linear
- Squared

Energy optimization

IR compensation

Slip compensation

Three (3) Critical Frequency Lockout Bands

PID control

One (1) Process PID

Four (4) Integral Independent Programmable PID

Setpoint Controllers (Process and External)

External Selection between Two (2) Sets of Process

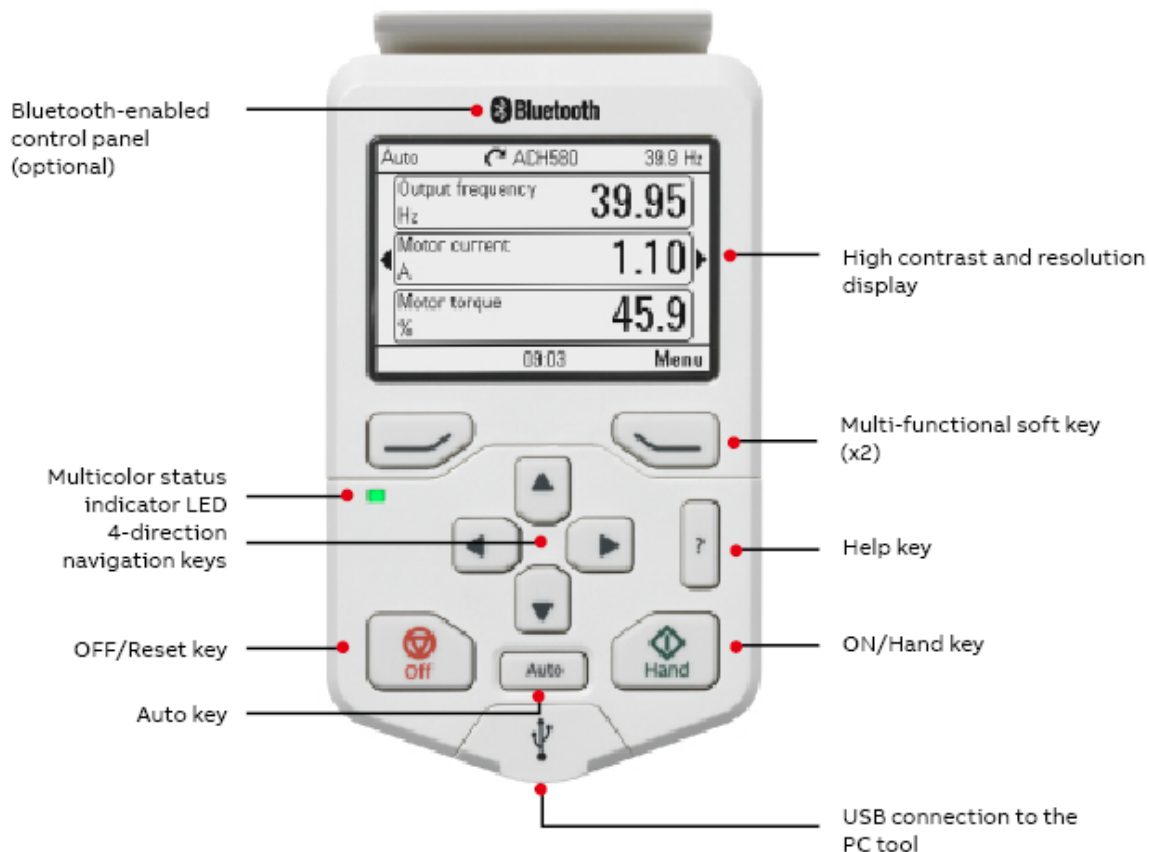
PID Controller Parameters

PID Sleep/Wake-Up

Control panel features

The ACH580 Assistant Control Panel features:

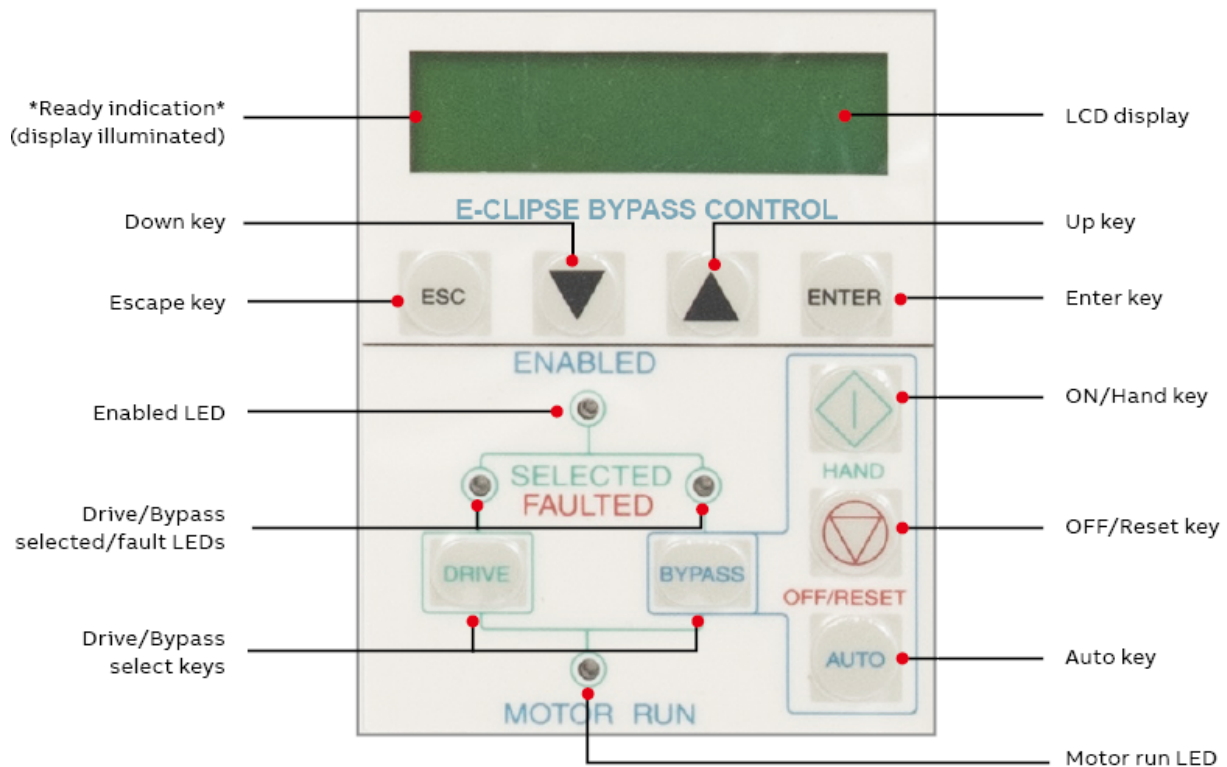
- Intuitive to operate
- Primary Setting menu to ease drive commissioning
- Real-time clock
- Diagnostic and maintenance functions
- Full-graphic display, including chart, graph, and meter options
- 21 editable home views
- USB interface for PC and tool connection as standard
- Parameters are alpha-numeric
- North American version supports 14 languages as standard
- Dedicated "Help" key
- 4 user sets
- Parameters are stored in control panel memory for later transfer to other drives or for backup of a particular system
- Back-up and restore parameters and/or motor data
- Automatic back-up 2 hours after parameter change
- Modified parameter display
- Creates unique short menu
- Shows parameters that differ from the default
- Bluetooth connectivity for use with mobile device (requires +J429 option)



E-Clipse control panel features

The ACH580 E-Clipse Control Panel features:

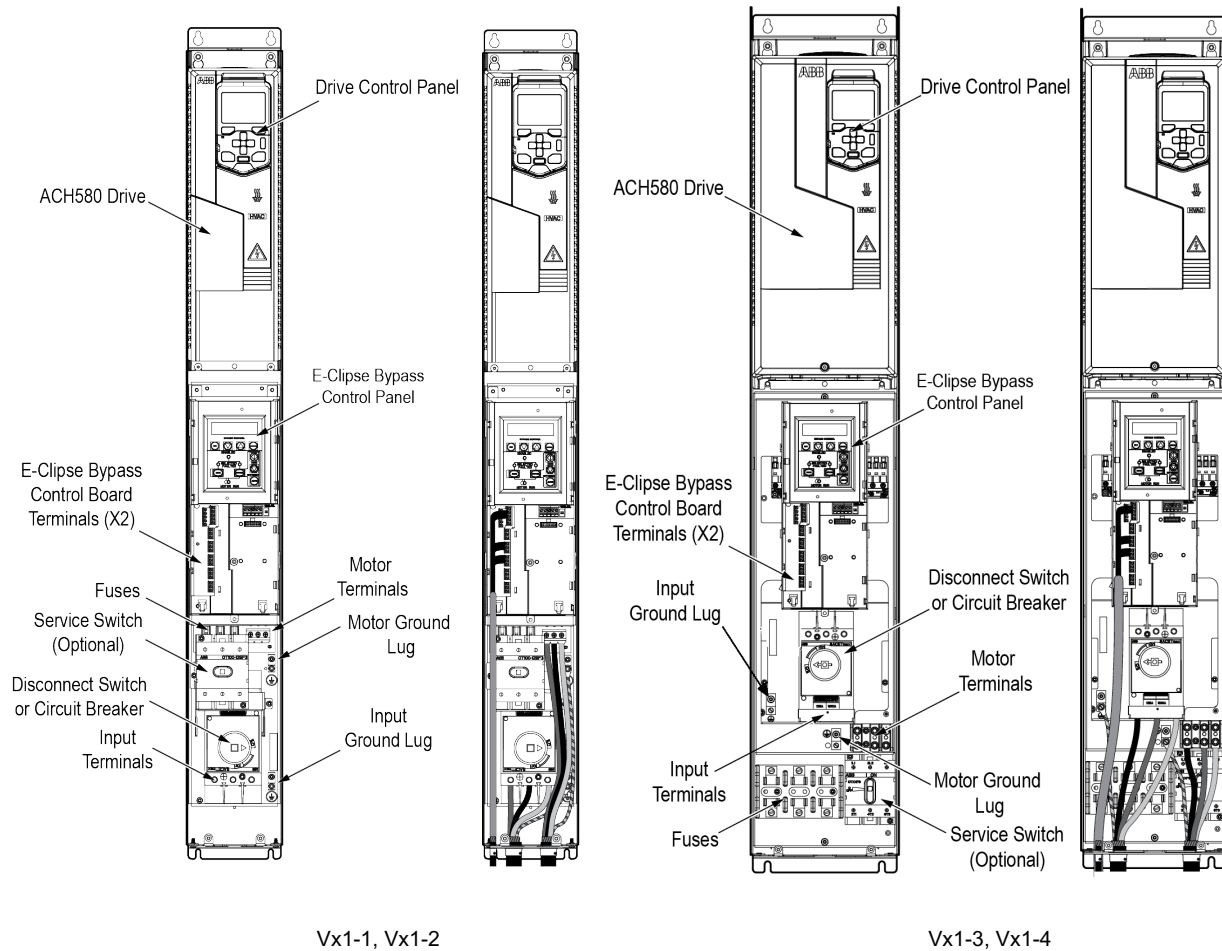
- Dedicated programming and operating controls (keys) are logically grouped on the keypad by their function.
 - o H-O-A, Drive/Bypass Selection keys (Control)
 - o UP/DOWN arrows, ESC, ENTER keys (Programming)
- LCD display provide:
 - o Operating Control Status
 - o Bypass Status
 - o Fault/Warning annunciation
 - o Parameter Lists and Values
 - o Power On indication
- Individual LEDs arranged to provide a logical control path visual:
 - o System Enabled
 - o Separate multi colored Drive and Bypass "SELECTED/FAULTED LEDs in separate paths
 - o Motor Run Indicator
 - o LEDs that illuminate, change color, and flash to provide visible indication of system status
- Provides System control from one location



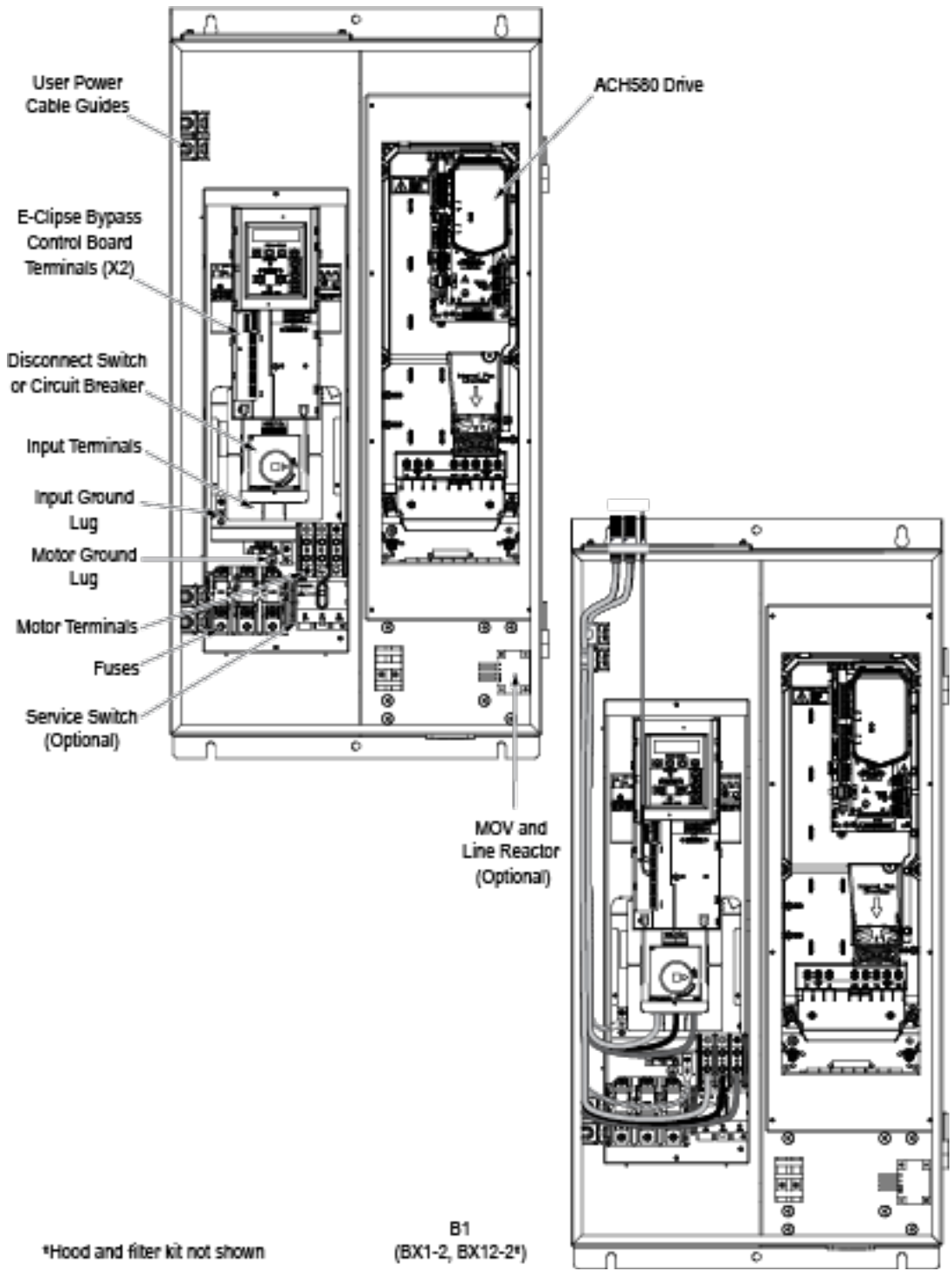
Cable connections

The following illustrations show the ACH580 with ABB E-Clipse bypass cable connection points for the various enclosure styles. The illustrations indicate the location of input and output power connections as well as equipment and motor grounding connection points.

ACH580 drives are configured for wiring access from the bottom only on Vertical ABB E-Clipse bypass units and from the top only on Standard ABB E-Clipse bypass units. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals.

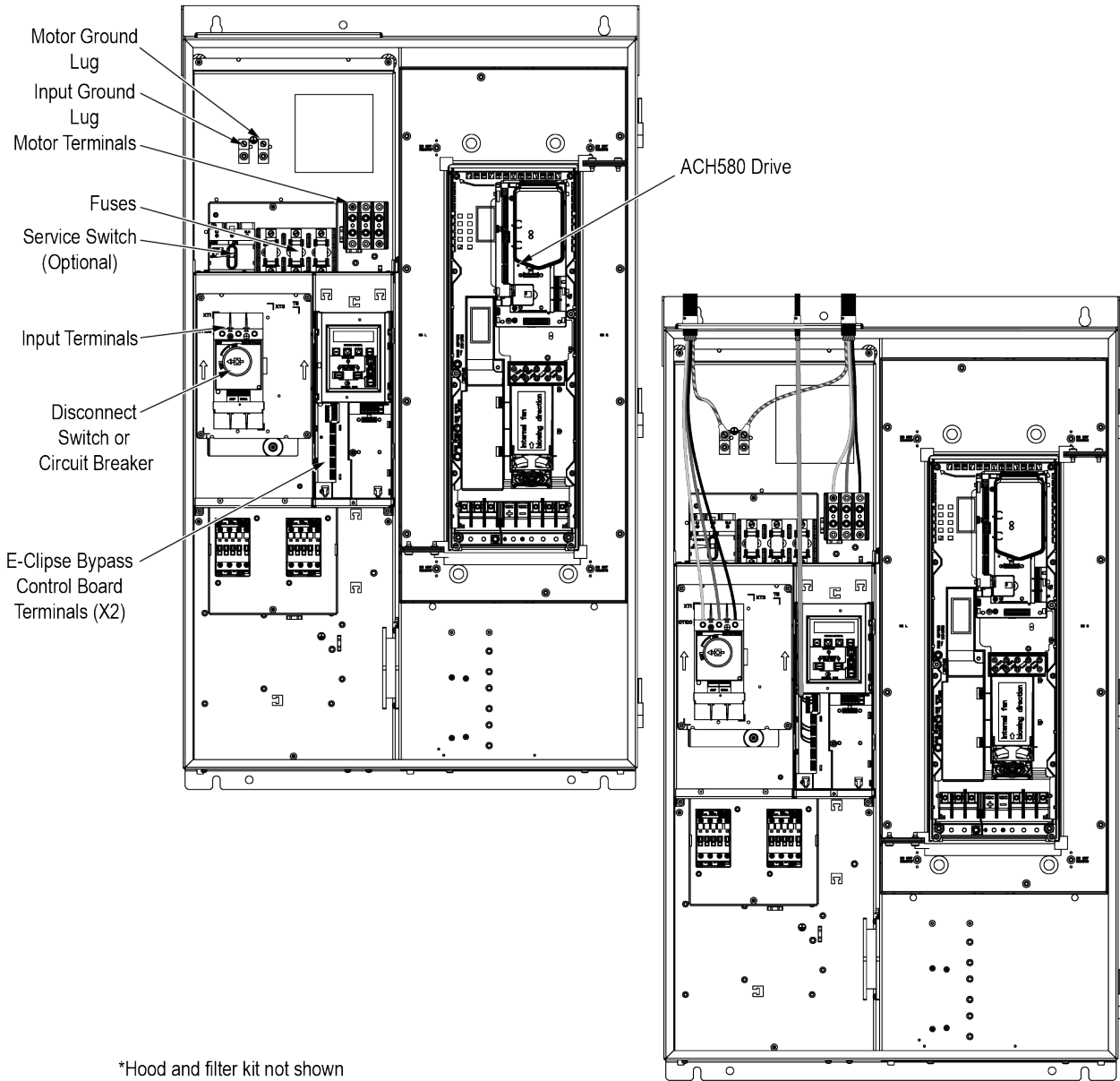


Cable connections



Bx1-1, Bx12-1, Bx3R-1

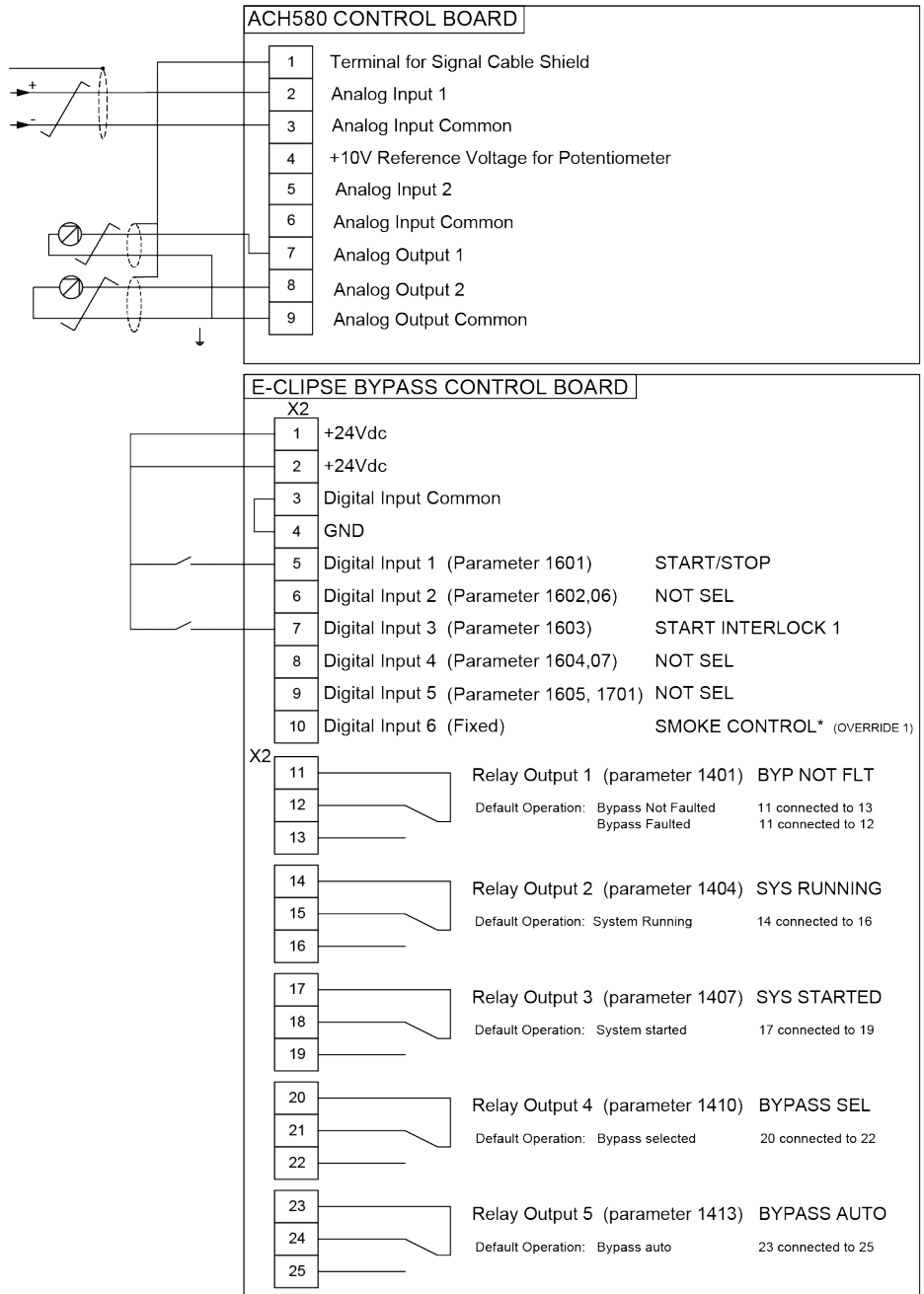
Control connections



Bx1-3*, Bx12-3*

Control connections

The control wiring includes connections to an analog speed command signal and a start/stop relay contact for controlling the motor in the AUTO mode. There may also be connections to external run permissive interlock contacts and a connection from the Motor Run contact to an external status indication circuit. For a detailed description of the control circuit functions and alternate Control Connection diagrams, refer to the ACH580 E-Clipse bypass and packaged drive manual.



Engineering Data Summary

Replacement Fuses

Drive input fuses are recommended to disconnect the drive from power in the event that a component fails in the drive's power circuitry. Recommended drive input fuse specifications are listed in the *Submittal Schedule Details* and in the *Fuse Ratings Table*. Fuse rating information is provided for customer reference.

Item	Catalog Number	Drive Input Fuse Ratings	
		Amps (600V)	Bussmann Type
1	ACH580-VCR-034A-4	60	Class T
2	ACH580-VCR-014A-4	30	Class CC

Terminal Sizes / Cable Connection Requirements

Power and motor cable terminal sizes and connection requirements are shown in the *Submittal Schedule Details* and in the *Terminal Sizes / Cable Connection Requirements Table*. The information provided below is for connections to input power and motor cables. These connections may be made to an input circuit breaker or disconnect switch, a motor terminal block, overload relay, and/or directly to bus bars and ground lugs. The table also lists torque that should be applied when tightening terminals and spacing requirements where multiple mounting holes are provided in the bus bar.

Item	Catalog Number	Input Wiring	Output Wiring	Ground Wiring
1	ACH580-VCR-034A-4	#14...#1/0 5.2 lbf-ft	#14...#2 #14...#8: 35 in-lbs; #6...#4: 45 in-lbs; #3...#2: 50 in-lbs	#14...#2 #14...#10: 2.9 lbf-ft; #6...#4: 3.8 lbf-ft; #2: 4.1 lbf-ft
2	ACH580-VCR-014A-4	#14...#1/0 5.2 lbf-ft	#20...#6 1.2 lbf-ft	#14...#4 3 lbf-ft

Heat Dissipation Requirements

The cooling air entering the drive must be clean and free from corrosive materials. The *Submittal Schedule Details* and the *Heat Dissipation Requirements table* below give the heat dissipated into the hot air exhausted from the drives. If the drives are installed in a confined space, the heat must be removed from the area by ventilation or air conditioning equipment.

Item	Catalog Number	Watts	BTU/Hr
1	ACH580-VCR-034A-4	576	1,964
2	ACH580-VCR-014A-4	256	873

Dimensions and Weights

Dimensions and weights of the drives provided are given in the *Submittal Schedule Details* and in the *Dimensions and Weights Table*. The table also lists the applicable dimension drawings that include additional detail. Dimension drawings may be provided in the back of this submittal.

Item	Catalog Number	Height mm (in)	Width mm (in)	Depth mm (in)	Weight kg (lbs)
1	ACH580-VCR-034A-4	1212 (47.72)	214 (8.43)	277 (10.91)	27 (60)
2	ACH580-VCR-014A-4	1120 (44.10)	137 (5.40)	274 (10.79)	23 (51)

Product Short Circuit Current Rating

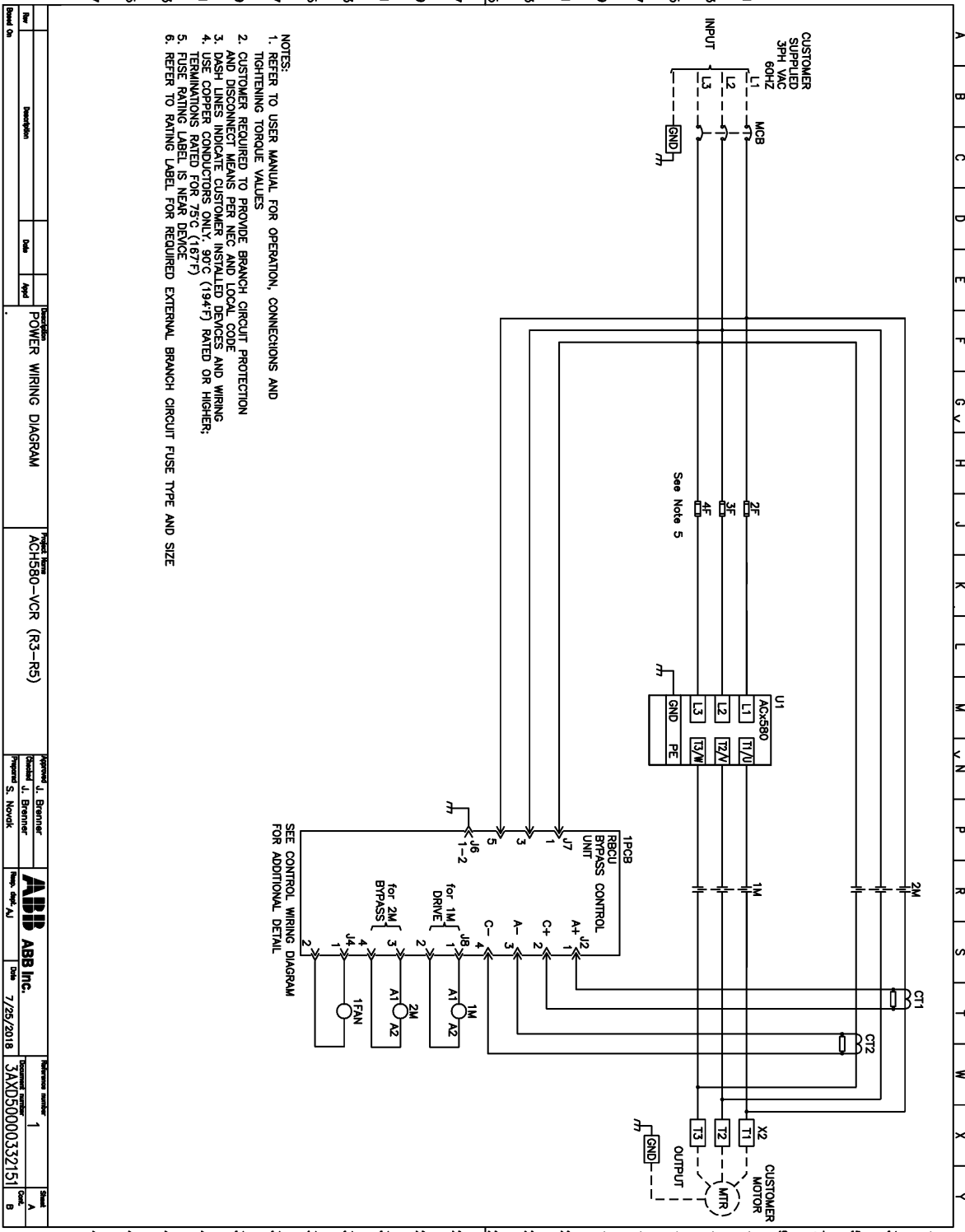
Short circuit ratings shown below are as show on the device rating label.

Item	Catalog Number	Short Circuit Current Rating
1	ACH580-VCR-034A-4	100 kA
2	ACH580-VCR-014A-4	100 kA

Item 1	Part Number ACH580-VCR-034A-4	Customer Designation CHWP-A1, CHWP-A2
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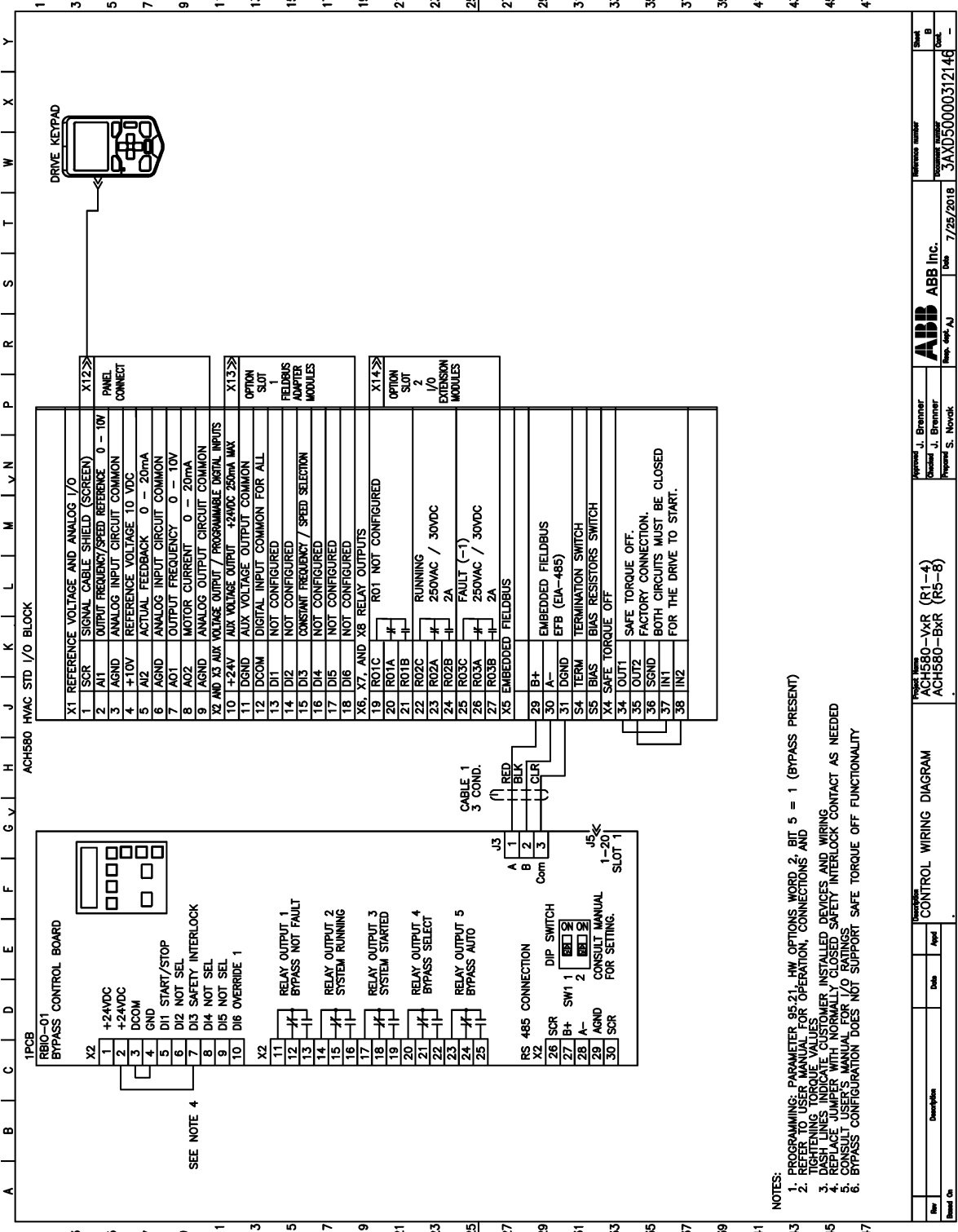


- NOTES:**
1. REFER TO USER MANUAL FOR OPERATION, CONNECTIONS AND TIGHTENING TORQUE VALUES
 2. CUSTOMER REQUIRED TO PROVIDE BRANCH CIRCUIT PROTECTION AND DISCONNECT MEANS PER NEC AND LOCAL CODE
 3. DASH LINES INDICATE CUSTOMER INSTALLED DEVICES AND WIRING
 4. USE COPPER CONDUCTORS ONLY, 90°C (194°F) RATED OR HIGHER; TERMINATIONS RATED FOR 75°C (167°F)
 5. FUSE RATING LABEL IS NEAR DEVICE
 6. REFER TO RATING LABEL FOR REQUIRED EXTERNAL BRANCH CIRCUIT FUSE TYPE AND SIZE

Rev	Revision	Date	App'd	Approved	Project Name	Issued	Revision number	Sheet
					ACH580-VCR (R3-R5)	7/25/2018	1	A
Drawn	Checked	Designed	Reviewed	Approved	Project	Date	Revision number	Sheet
					S. Kovack	7/25/2018	3AXD50000332151	B

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Item	Part Number	Customer Designation
1	ACH580-VCR-034A-4	CHWP-A1, CHWP-A2

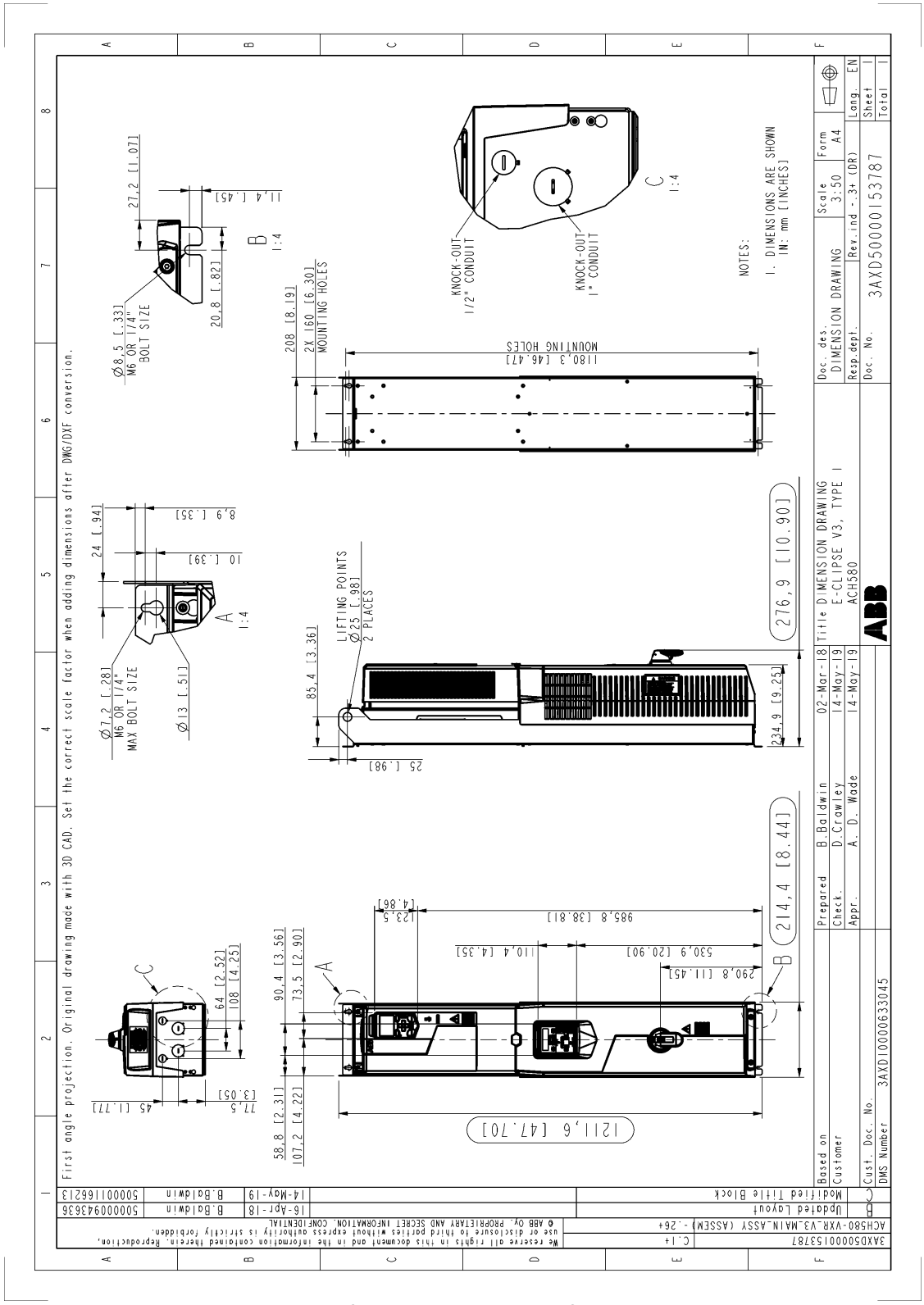


- NOTES:
- PROGRAMMING: PARAMETER 95.21, HW OPTIONS WORD 2, BIT 5 = 1 (BYPASS PRESENT)
 - REFER TO USER MANUAL FOR OPERATION, CONNECTIONS AND WIRING
 - USH JUMPS MUST BE INSTALLED ON CUSTOMER INSTALLED DEVICES AND WIRING
 - REPLACE JUMPER WITH NORMALLY CLOSED SAFETY INTERLOCK CONTACT AS NEEDED
 - CONSULT USER'S MANUAL FOR I/O RATINGS
 - BYPASS CONFIGURATION DOES NOT SUPPORT SAFE TORQUE OFF FUNCTIONALITY

Rev	Description	Date	App'd
CONTROL WIRING DIAGRAM			
Project Name	ACH580-VxR (R1-4) ACH580-BxR (R5-8)	Project Manager	ABB Inc.
Project Engineer	J. Brenner	Date	7/25/2018
Project Engineer	S. Novak	Reference Number	3AXD50000312146
Sheet No.	1	Sheet Total	1

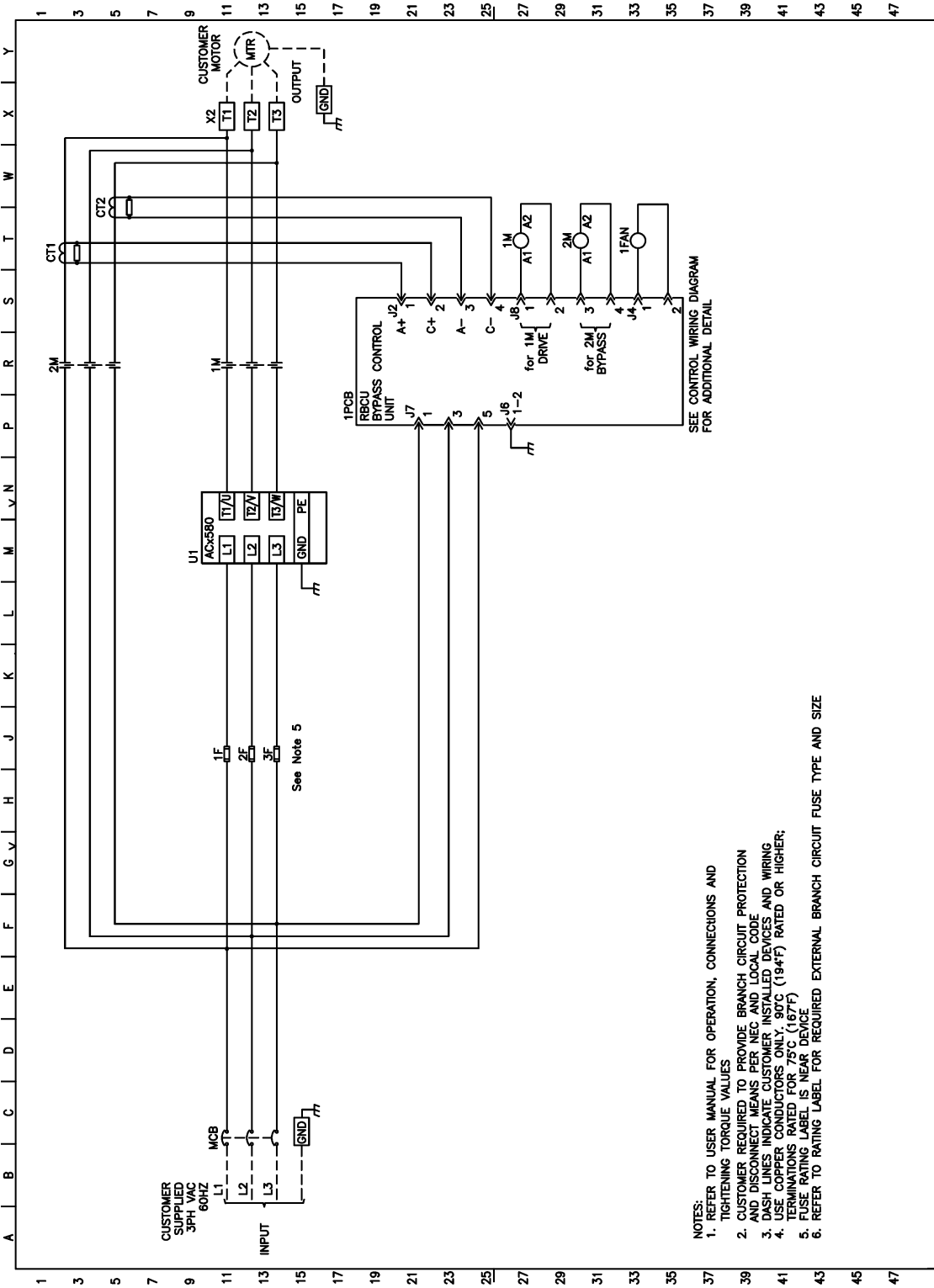
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Item 1	Part Number ACH580-VCR-034A-4	Customer Designation CHWP-A1, CHWP-A2
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Item 2	Part Number ACH580-VCR-014A-4	Customer Designation HWP-A1, HWP-A2
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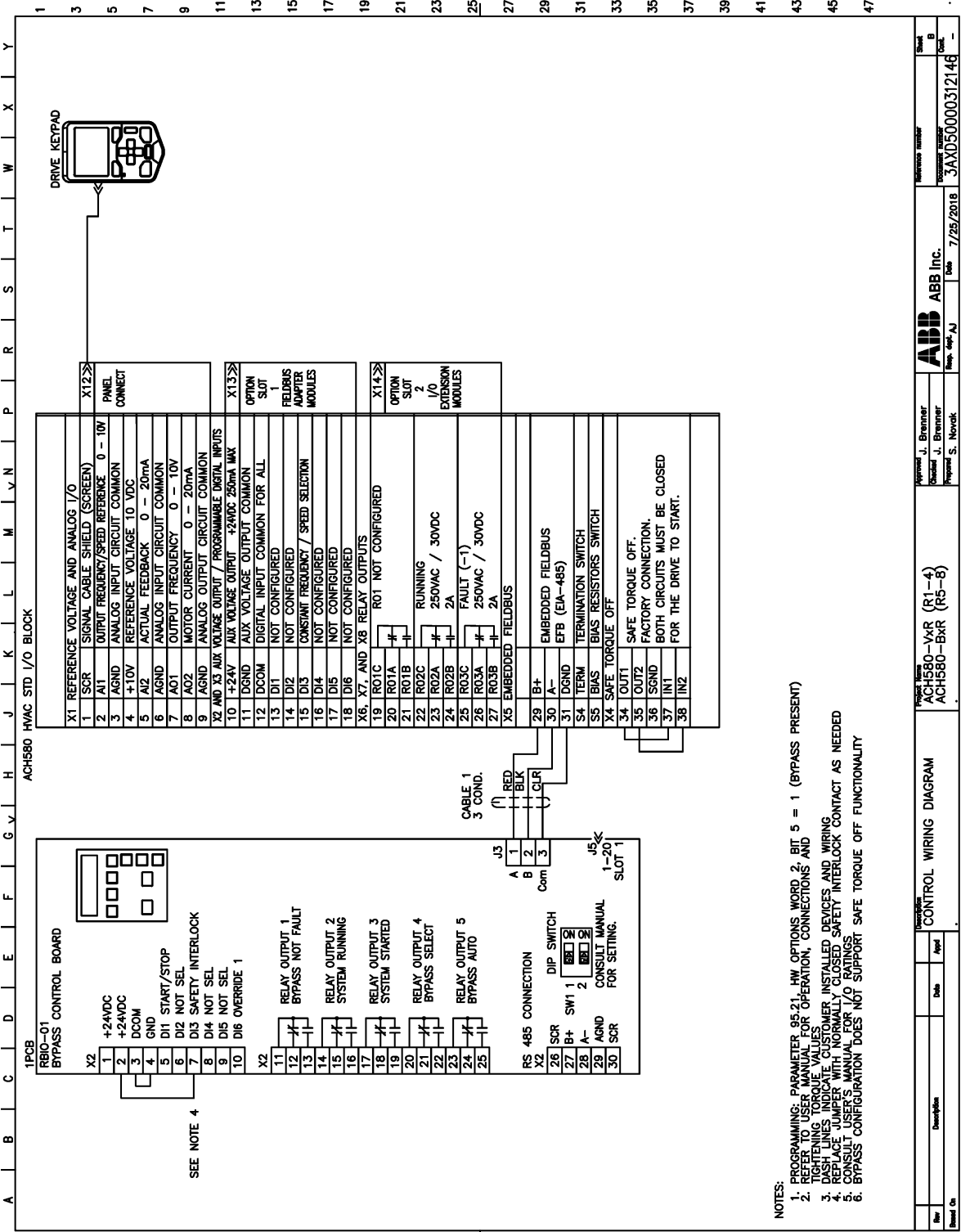
- NOTES:**
- REFER TO USER MANUAL FOR OPERATION, CONNECTIONS AND TIGHTENING TORQUE VALUES
 - CUSTOMER REQUIRED TO PROVIDE BRANCH CIRCUIT PROTECTION AND DISCONNECT MEANS PER NEC AND LOCAL CODE
 - DASH LINES INDICATE CUSTOMER INSTALLED DEVICES AND WIRING
 - USE COPPER CONDUCTORS ONLY, 90°C (194°F) RATED OR HIGHER; TERMINATIONS RATED FOR 75°C (167°F)
 - FUSE RATING LABEL IS NEAR DEVICE
 - REFER TO RATING LABEL FOR REQUIRED EXTERNAL BRANCH CIRCUIT FUSE TYPE AND SIZE

SEE CONTROL WIRING DIAGRAM FOR ADDITIONAL DETAIL

Revised On		Revised By		Project Name	ACH580-VCR (R1-R2)	Reference number	1	Sheet	A
Date		Author		Power Wiring Diagram		Customer number	3AXD50000313457	Cost	B
		Checked	J. Brenner	ABB	ABB Inc.	Accession number			
		Designed	J. Brenner	Rep. no.	AJ	Date	7/25/2018		
		Presented	S. Novak						

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Item 2	Part Number ACH580-VCR-014A-4	Customer Designation HWP-A1, HWP-A2
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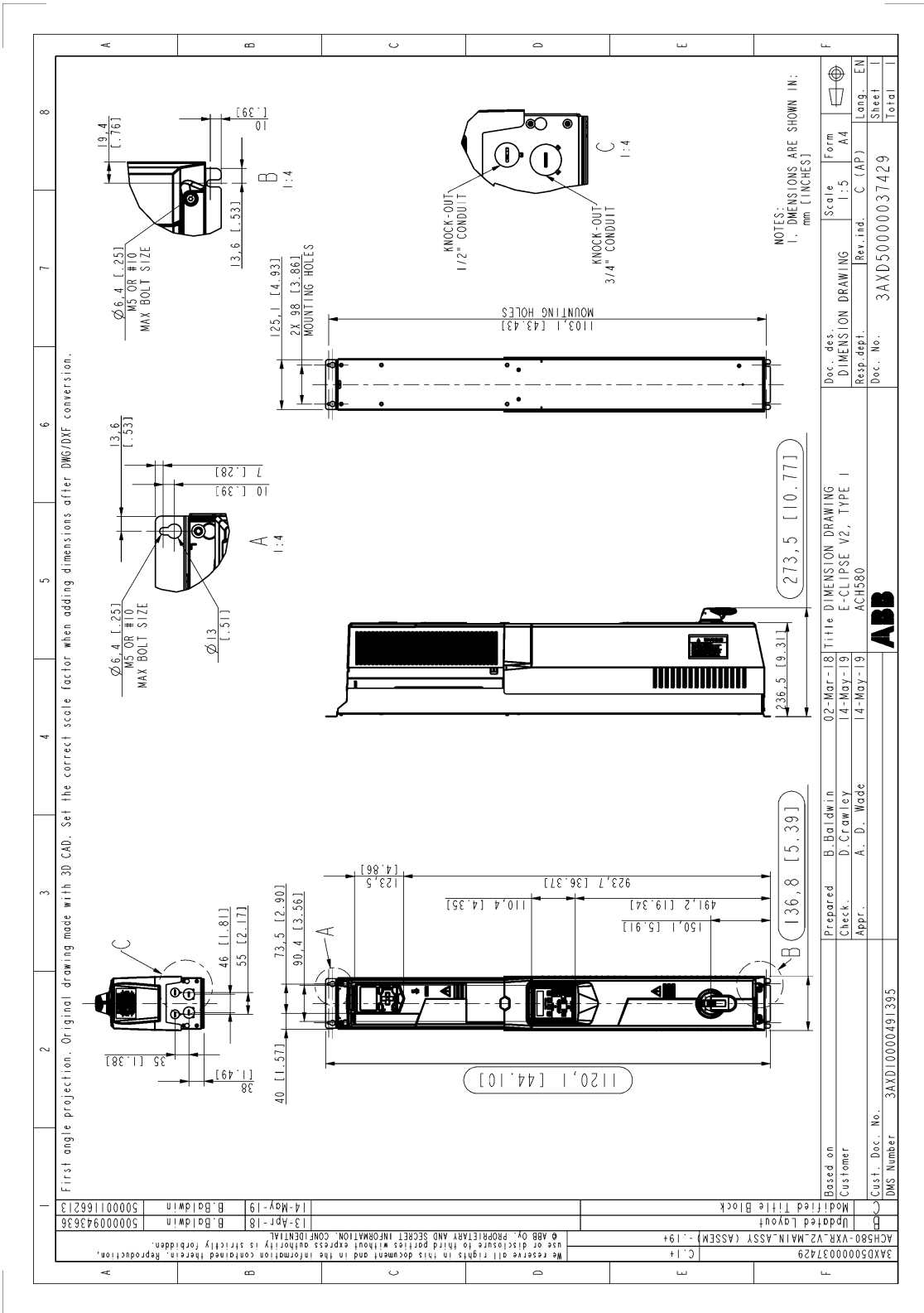
NOTES:

- PROGRAMMING: PARAMETER 95.21, HW OPTIONS WORD 2, BIT 5 = 1 (BYPASS PRESENT)
- REFER TO USER MANUAL FOR OPERATION, CONNECTIONS AND WIRING
- USH JUMPS MUST BE INSTALLED ON CUSTOMER INSTALLED DEVICES AND WIRING
- REPLACE JUMPER WITH NORMALLY CLOSED SAFETY INTERLOCK CONTACT AS NEEDED
- CONSULT USER'S MANUAL FOR I/O RATINGS
- BYPASS CONFIGURATION DOES NOT SUPPORT SAFE TORQUE OFF FUNCTIONALITY

Revised On	Revised By	Revised Date	Revised Description
			CONTROL WIRING DIAGRAM
Revised On	Revised By	Revised Date	Revised Description
			ACH580-VxR (R1-4) ACH580-BxR (R5-8)
Approved	Checked	Date	Reference number
Present S. Novak	Present S. Novak	7/25/2018	3AXD50000312146
Approved	Checked	Date	Reference number
Present J. Brenner	Present J. Brenner		ABB ABB Inc.
Doc #	Doc #		

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Item 2	Part Number ACH580-VCR-014A-4	Customer Designation HWP-A1, HWP-A2
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D&A #24019
R.E. Dimond
and Associates, Inc.

Consulting Engineers

732 North Capitol Avenue
Indianapolis, IN 46204
Phone: (317) 634-4672
Fax: (317) 638-8725

CERTIFIED BY:



05/02/2024

REVISIONS:

NO.	DESCRIPTION	DATE
1	Addendum 1	05/14/2024

BROWNSBURG COMMUNITY SCHOOL CORPORATION
EAGLE ES CENTRAL PLANT EQUIPMENT INSTALLATION
 555 SYCAMORE STREET, BROWNSBURG, IN 46112

PROJECT DESCRIPTION:

KEYPLAN



DRAWN BY: EJ/UCB/MJE DESIGNED BY: ME/JCB

SCALE: REFER TO DRAWING CHECKED BY: MJE

DATE: 05/02/2024 JOB NO.: 24019

SHEET DESCRIPTION:

ENLARGED PLAN - MECHANICAL DEMOLITION

SHEET NUMBER:

MD301

DEMOLITION LEGEND:

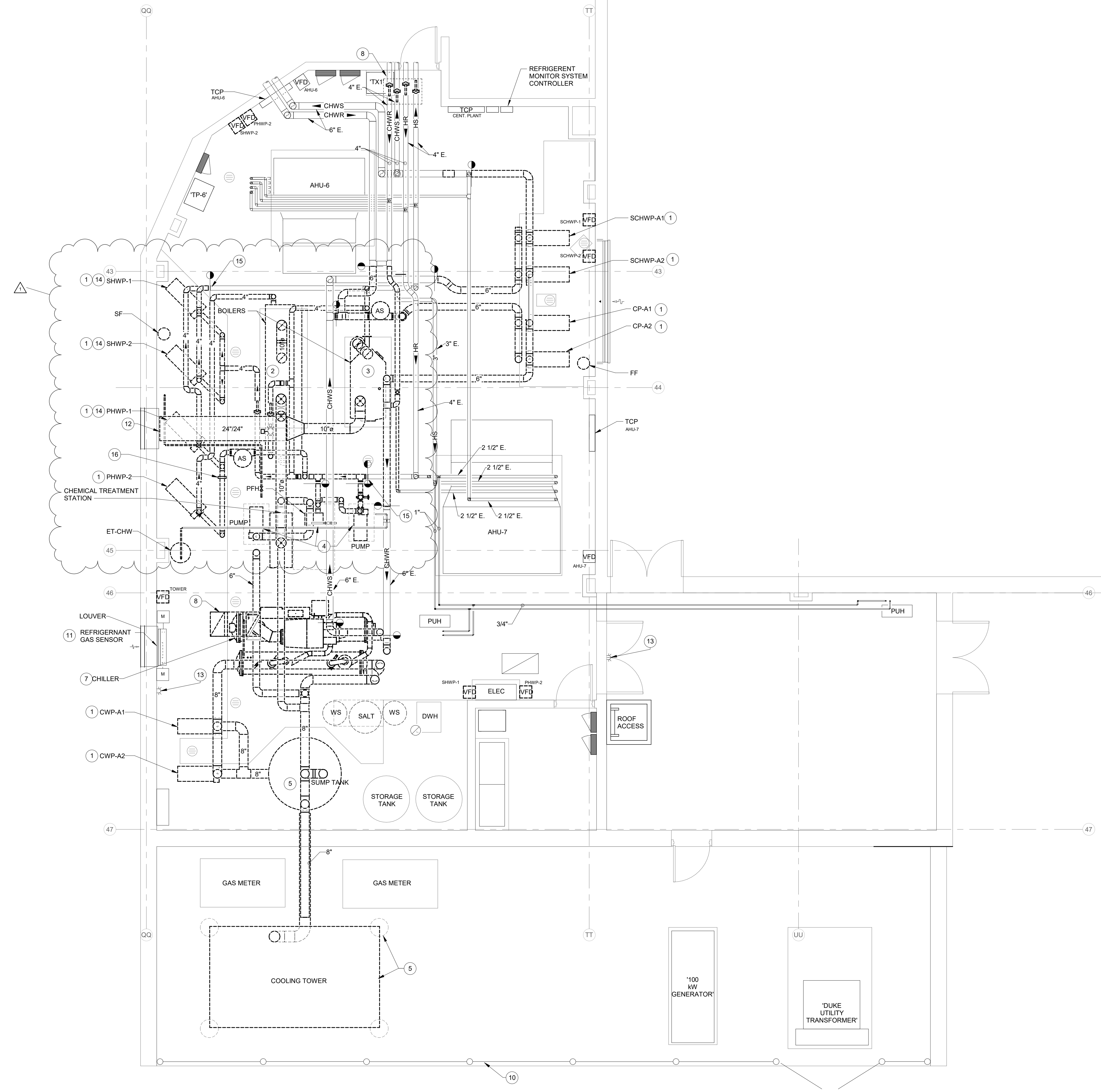
- WORK TO BE REMOVED
- WORK TO REMAIN

GENERAL NOTES - DEMOLITION:

1. PIPING IS SHOWN DIAGRAMMATICALLY. REMOVE ALL PIPING, VALVES, PIPING ACCESSORIES, HANGERS, ETC. ASSOCIATED WITH HEATING WATER SYSTEM WITHIN THE BOILER ROOM.
2. SEE SHEET PM001 FOR ADDITIONAL DEMOLITION NOTES.

PLAN NOTES:

1. REMOVE PUMP, BASE, ASSOCIATED PIPING, HANGERS, VENTING, AND CONTROLS COMPLETE BACK TO LOCATIONS SHOWN.
2. REMOVE BOILER, ASSOCIATED PIPING, HANGERS, VENTING, AND CONTROLS COMPLETE BACK TO LOCATIONS SHOWN.
3. REMOVE BOILER, ASSOCIATED PIPING, HANGERS, AND CONTROLS COMPLETE BACK TO LOCATIONS SHOWN. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF BOILER COMPONENTS. DEMOLITION OF BOILER SHALL NOT COMMENCE UNTIL NEW BOILERS ARE INSTALLED.
4. REMOVE PLATE FRAME HEAT EXCHANGER, ASSOCIATED PUMPS, PIPING, HANGERS, AND CONTROLS COMPLETE.
5. REMOVE SUMP TANK, ASSOCIATED PIPING, HANGERS, AND CONTROLS COMPLETE BACK TO LOCATIONS SHOWN.
6. REMOVE COOLING TOWER, SUPPORT PIERS, AND PIPING COMPLETE.
7. REMOVE WATER-COOLED CHILLER, ASSOCIATED PIPING, HANGERS, AND CONTROLS COMPLETE BACK TO LOCATIONS SHOWN. CONTRACTOR TO RECLAIM R-134A REFRIGERANT AND TURN OVER TO OWNER. STORAGE CONTAINERS SHALL BE PROVIDED BY CONTRACTOR AND DELIVERED TO OWNER'S DESIGNATED LOCATION WITHIN THE DISTRICT.
8. REMOVE EXHAUST DUCT UP TO ROOF DECK.
9. REMOVE ISOLATION VALVES FOR REPLACEMENT.
10. REMOVE CHAINLINK FENCE AS REQ'D FOR WORK. PROTECT FOR RE-INSTALLATION.
11. REMOVE REFRIGERANT SENSOR LOW ON WALL FOR RELOCATION TO SOUTH WALL. SEE M301.
12. BLANK OFF LOUVER WITH 2" RIGID INSULATION AND SHEET METAL.
13. MECHANICAL ROOM ALARM LIGHT TO REMAIN.
14. DEMOLITION OF PUMP, AND RESPECTIVE PIPING SHALL NOT COMMENCE UNTIL NEW BOILERS AND PUMPS ARE INSTALLED AND OPERATIONAL.
15. INSTALL ISOLATION VALVE AT THIS LOCATION TO FACILITATE PROJECT PHASING AND DEMOLITION.
16. INSTALL CAP AT THIS LOCATION TO FACILITATE PROJECT PHASING AND DEMOLITION.



ENLARGED PLAN - MECHANICAL DEMOLITION
 SCALE: 1/4" = 1'-0"
 NORTH



D&A #24019
R.E. Dimond
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Consulting Engineers

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Indianapolis, IN 46204
Phone: (317) 634-4672
Fax: (317) 638-8725

CERTIFIED BY:



05/02/2024

REVISIONS:

NO.	DESCRIPTION	DATE
1	Addendum 1	05/14/2024

RENOVATION LEGEND:

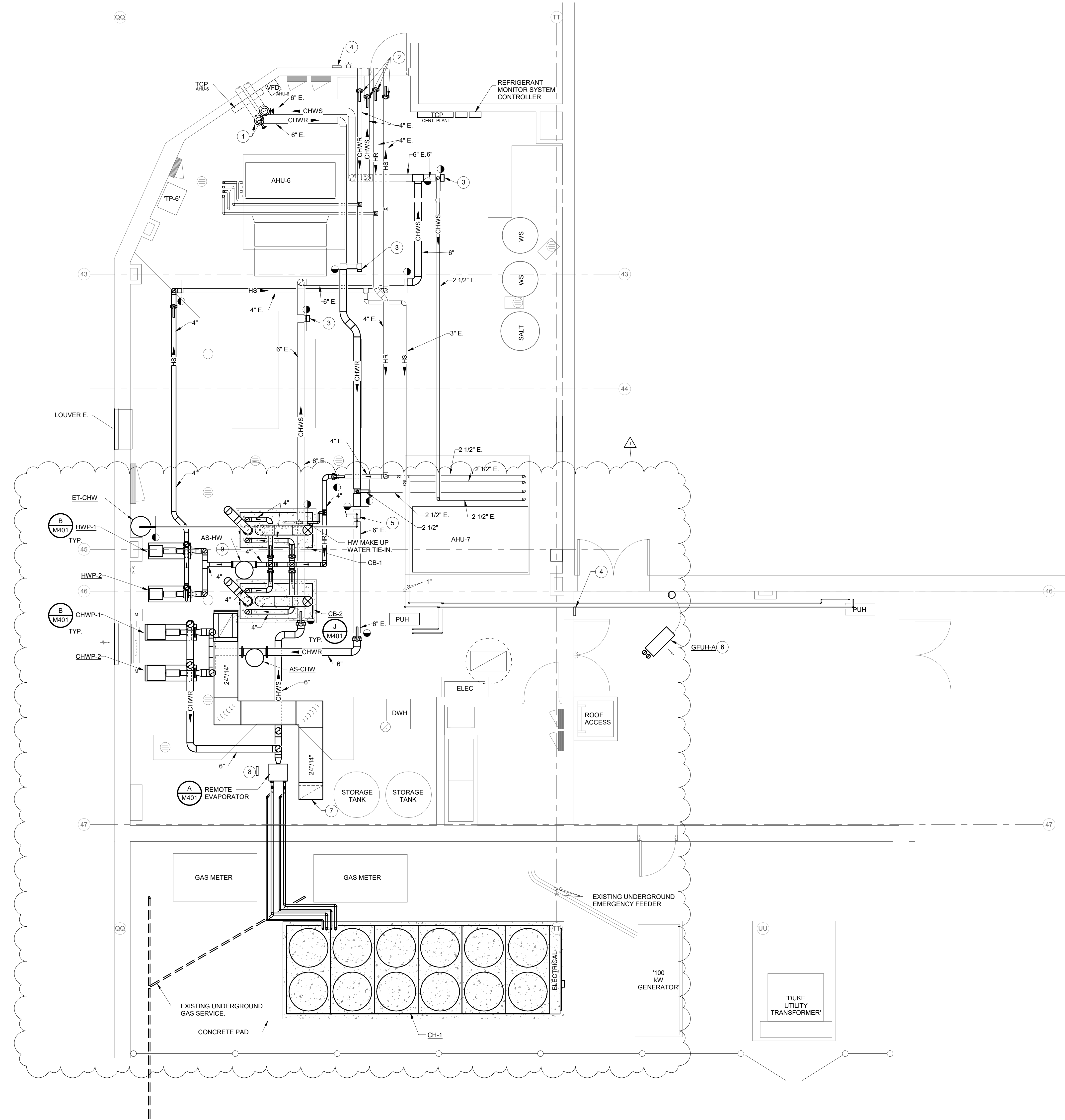
- WORK TO BE INSTALLED
- WORK TO REMAIN

GENERAL NOTES:

1. SEE SHEETS M700 SERIES DRAWINGS FOR ADDITIONAL PIPING AND HVAC REQUIREMENTS AND ADDITIONAL INFORMATION.
2. UPDATE REFRIGERANT MONITOR SYSTEM CONTROLLER/SENSORS AS REQUIRED FOR CHILLER REFRIGERANT.
3. SEE ALSO DRAWING PM001 FOR ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. INSTALL ISOLATION VALVE IN VERTICAL PIPING.
2. INSTALL ISOLATION VALVES.
3. CAP PIPING.
4. REFRIGERANT ALARM SIGNAGE BY OWNER.
5. CHILLED WATER SYSTEM MAKE UP WATER. SEE P-SERIES.
6. COORDINATE EXACT LOCATION OF HEATER WITH EXISTING CONDITIONS. PROVIDE MISC. SUPPORT STEEL AS REQUIRED. TERMINATE VENTING AT ROOF WITH CONCENTRIC VENT.
7. TERMINATE EXHAUST AIR DUCT AT 12" A.F.F. PROVIDE HARDWARE CLOTH OVER OPENING.
8. RE-INSTALL REFRIGERANT MONITOR SYSTEM AT APPROXIMATELY THIS LOCATION. RECALIBRATE SYSTEM AND VERIFY OPERATION.
9. HEATING WATER SYSTEM MAKE UP WATER. SEE P-SERIES.
10. 8" BOILER VENT (BY BOILER MFG.) UP THROUGH ROOF AND TERMINATE.



ENLARGED PLAN - MECHANICAL
SCALE: 1/4" = 1'-0"
NORTH

BROWNSBURG COMMUNITY SCHOOL CORPORATION
EAGLE ES CENTRAL PLANT EQUIPMENT INSTALLATION
555 SYCAMORE STREET, BROWNSBURG, IN 46112

PROJECT DESCRIPTION:
KEYPLAN

KEYPLAN



DRAWN BY: JCB	DESIGNED BY: MJE/JCB
SCALE: REFER TO DRAWING	CHECKED BY: MJE
DATE: 05/02/2024	JOB NO.: 24019

SHEET DESCRIPTION:

ENLARGED PLAN - MECHANICAL

SHEET NUMBER:

M301



D&A #24019

R.E. Dimond
and Associates, Inc.

Consulting Engineers

732 North Capitol Avenue
Indianapolis, IN 46204
Phone: (317) 634-4672
Fax: (317) 638-8725

CERTIFIED BY:



05/02/2024

REVISIONS:

NO.	DESCRIPTION	DATE
1	Addendum 1	05/14/2024

BROWNSBURG COMMUNITY SCHOOL CORPORATION
EAGLE ES CENTRAL PLANT EQUIPMENT INSTALLATION
 555 SYCAMORE STREET, BROWNSBURG, IN 46112

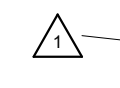
PROJECT DESCRIPTION:

KEYPLAN

DRAWN BY: WK
 DESIGNED BY: MJE
 SCALE: REFER TO DRAWING
 CHECKED BY: MJE
 DATE: 05/02/2024
 JOB NO.: 24019

SHEET DESCRIPTION:
SCHEDULES - MECHANICAL

SHEET NUMBER:
M601



AIR-COOLED CHILLER SCHEDULE - PRE-PURCHASE

MARK NO	SYSTEM SERVED	SPECIFICATION			MANUFACTURER & MODEL NO	TOTAL CAPACITY	FLOW (GPM)	EWT	LWT	IPLV (W/W)	NPLV (W/W)	PRESS DROP (FT HD)	PERFORMANCE DATA (KW/TON)	OPERATING WEIGHT	REFRIG	ELECTRICAL DATA				REMARKS
		SECTION	NAME	EQUIPMENT TYPE												MCA	MOCP	VOLTS	PHASE	
CH-1	CHILLED WATER	23 64 01	PACKAGED AIR-COOLED WATER CHILLERS	AIR COOLED WATER CHILLER	YORK YLAA0230	228	363	60.0	45.0	17.6	16.9	8.9	1.16	10,000	R-410a	504	600	480	3	REFER TO CHILLER SUBMITTAL INFORMATION WITHIN THE APPENDIX

PUMP SCHEDULE - PRE-PURCHASE

MARK NO	SYSTEM SERVED	SPECIFICATION			MANUFACTURER & MODEL NO	FLUID	GPM	FT HD WATER	EFF %	IMP DIA	SUCTION	DISCHARGE	MOTOR DATA					REMARKS	
		SECTION	NAME	EQUIPMENT TYPE									HP	BHP	RPM	VOLTS	PHASE		VFD
CHWP-A1, A2	CHILLED WATER	23 21 23	HYDRONIC PUMPS	BASE MOUNTED END SUCTION	TACO F13013D	WATER	500	105'	73	11.3"	4"	6"	25	18.1	1750	480	3	DIV. 26	CHILLED WATER PUMPS BALANCE TO SCHEDULED CHILLER GPM.
HWP-A1, A2	HEATING WATER	23 21 23	HYDRONIC PUMPS	BASE MOUNTED END SUCTION	TACO F12511	WATER	240	100'	73	11"	3"	2.5"	10	8.2	1770	480	3	DIV. 26	BUILDING HOT WATER LOOP.

CONDENSING BOILER SCHEDULE - PRE-PURCHASE

MARK NO.	SYSTEM SERVED	SPECIFICATION			MANUFACTURER & MODEL NO	FUEL	MBH INPUT	MBH OUTPUT	EWT	LWT	WATER FLOW (GPM)	MAX WPD (FT)	OPERATING WEIGHT (LBS)	MOTOR DATA			REMARKS
		SECTION	NAME	EQUIPMENT TYPE										MCA / MOCP	VOLTS	PHASE	
CB-1, CB-2	HEATING WATER	23 52 16	CONDENSING BOILER	CONDENSING BOILER	RIELLO AR-3000	NATURAL GAS	3,000	2,640	144	180	160	5	2,800	16A / 20A	208	3	8"-13.5" GAS PRESSURE; IN-LINE PUMP BY BOILER MFG. REFER TO BOILER SUBMITTAL INFORMATION WITHIN THE APPENDIX

EXPANSION TANK SCHEDULE

MARK NO	SYSTEM SERVED	SPECIFICATION			MANUFACTURER & MODEL NO	WEIGHT (LBS) WET	APPROXIMATE SYSTEM VOLUME (GAL)	TANK VOLUME (GAL)	MIN ACCEPTANCE VOLUME (GAL)	REMARKS
		SECTION	NAME	EQUIPMENT TYPE						
ET-CHW	CHILLED WATER	23 21 13	HYDRONIC PIPING SYSTEMS	EXPANSION TANK	B&G B-200	651	---	53	1-1/2" SYSTEM CONNECTION, 3/4" DRAIN	

MISCELLANEOUS EQUIPMENT SCHEDULE

MARK NO	DRAWING NAME AND/OR PURPOSE	SPECIFICATION			MANUFACTURER & MODEL NO.	MOTOR DATA			WEIGHT (LBS.)	REMARKS
		SECTION	NAME	EQUIPMENT TYPE		HP/KW	VOLTS	PHASE		
GFUH-A	MISC. HEAT	23 55 13	GAS FIRED UNIT HEATERS	---	REZNOL UDXC-45	100W	120	1	80	45 MBH INPUT, 37 MBH OUTPUT FLA 2.4, MOCP 15, THERMOSTAT, CONCENTRIC VENT, DISCONNECT SWITCH

AIR SEPARATOR SCHEDULE

MARK NO	SYSTEM SERVED	SPECIFICATION			MANUFACTURER & MODEL NO	DRY/WET WEIGHT (LBS)	PIPE SIZE (IN)	PIPE SIZE TO TANK (IN NPT)	MAX WPD (FT)	STRAINER REQUIRED	REMARKS
		SECTION	NAME	EQUIPMENT TYPE							
AS-CHW	CHILLED WATER	23 21 13	HYDRONIC PIPING SYSTEMS	AIR SEPARATORS	B&G CRSN-6F	165/366	6	3/4"	2.10	N/A	512 GPM
AS-HW	HEATING WATER	23 21 13	HYDRONIC PIPING SYSTEMS	AIR SEPARATORS	B&G CRSN-6F	165/366	6	3/4"	1.98	N/A	500 GPM