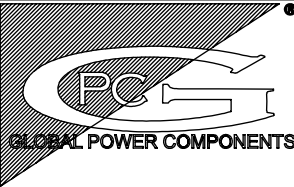


DRAWINGS PREPARED FOR: ROCKWELL
PROJECT NAME: ORO HONDO
LOCATION: LEAD, SD
GLOBAL POWER COMPONENTS JOB# 45-31329
DESIGN NOTES:

GLOBAL POWER COMPONENTS
2300 S. 51st ST
MILWAUKEE, WI 53219



THE WORK SPECIFIED HEREIN HAS BEEN DESIGNED IN ACCORDANCE WITH:
2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL FIRE CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2017 NATIONAL ELECTRICAL CODE

CODES LISTED ABOVE INCLUDED LEAD, SD AMENDMENTS

ROOF LIVE LOADS: 30 PSF
ULTIMATE WIND SPEED: 120 MPH, EXPOSURE C
FLOOR LOADING: 250 PSF
BASE DEFLECTION: L/240
BUILDING RISK CATEGORY: III
BUILDING OCCUPANCY CLASSIFICATION: U
BUILDING CONSTRUCTION TYPE: V-B
SEISMIC CATEGORY: B
SEISMIC SPECTRAL RESPONSE ACCELERATIONS: "Ss": 0.121g "S1": 0.043g
SITE CLASS: D
GROUND SNOW LOAD: 40 PSF
AREA: 292.5 SQ.FT
HEIGHT: 13'-10"
FIRE SEPERATION DISTANCE: >= 10FT
NUMBER OF STORIES: 1
DESIGN OCCUPANT LOAD: 1

WEIGHTS:
ENCLOSURE: 8517 LBS
LIFTBASE: 8183 LBS
ELECTRICAL GEAR: 29960 LBS
TOTAL WEIGHT: 46660 LBS

GENERAL NOTES:

1. THIS SYSTEM HAS BEEN DESIGNED AND SHALL BE FABRICATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2015 INTERNATIONAL BUILDING CODE
2. STEEL & ALUMINUM ENCLOSURE SHALL CONFORM TO THE DETAILS SHOWN HEREIN. ALL OTHER CONNECTIONS AND DETAILS NOT ILLUSTRATED IN THIS DOCUMENT SHALL CONFORM TO THE TYPICAL ASSEMBLY AS SET FORTH BY MANUFACTURER.
3. THE CONTRACTOR IS RESPONSIBLE TO INSULATE MEMBERS FROM DISSIMILAR MATERIALS TO PREVENT ELECTROLYSIS.
4. ALL SHEET STEEL & C-CHANNEL SHALL BE ASTM A36 MIN. OR ASTM 1010 MIN. OR A653CS STEEL TESTING OF A653CS MATERIAL TO BE DONE BY THIRD PARTY AGENCY ALL TUBE STEEL SHALL BE A500 GRADE B.
5. ALL FASTENERS TO BE #14 GREATER SAE GRADE 5 CADMIUM PLATED OR OTHERWISE CORROSION RESISTANT MATERIAL AND SHALL COMPLY WITH 5.1.1C, SPECIFICATIONS FOR ALUM. STRUCTURES -SECTION 1, THE ALUMINUM ASSOCIATION, INC., & APPLICABLE FEDERAL, STATE, AND LOCAL CODES.
6. WALL CONSTRUCTION UTILIZES 0.125" 3003-H14 FORMED ALUMINUM PANELS WITH TYPICAL SEAMS AT 16" OC UNLESS OTHERWISE. A +/-3" ALLOWABLE TOLERANCE MAY BE USED FOR THE SPACING OF PANEL SEAMS ILLUSTRATED HEREIN FOR CONSTRUCTABILITY AND INTERIOR OBSTRUCTIONS LOCATED WITHIN THE ENCLOSURE.
7. FOR STEEL MEMBERS ALL ANCHORS SHALL BE SPACED WITH 3x DIAMETER MIN. SPACING TO ADJACENT ANCHORS AND 3x DIAMETER MIN. END DISTANCE. FOR ALUMINUM MEMBERS ALL ANCHORS SHALL BE SPACED WITH 2x DIAMETER END DISTANCE AND 2.5x DIAMETER MIN. SPACING TO ADJACENT ANCHORS, UNLESS NOTED OTHERWISE.
8. ALL EXTRUDED MEMBERS SHALL BE ALUMINUM ALLOY TYPE 6063-T5 OR BETTER. ALL ALUMINUM FORMED PANELS SHALL BE 3003-H14 MIN. ALUMINUM. ALL CONCRETE SUBSTRATES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AS VERIFIED BY OTHERS U.N.O.
9. ALL WELDING IS IN CONFORMANCE WITH AWS D1.1 BY QUALIFIED WELDERS. ALL DIMENSIONS SHOWN HEREIN REPRESENT UNITS IN INCHES, UNLESS OTHERWISE NOTED
- 10.MINIMUM DESIGNED TEMP OF 75° FOR COOLING. HVAC SYSTEM DESIGNED FOR (2) PRIMARY UNITS TO PERFORM COOLING REQUIREMENTS.

SPECIAL CONDITIONS AND LIMITATIONS:

1. ACCESSIBILITY TO THIS BUILDING, INCLUDING PARKING IS TO BE PROVIDED BY OTHERS AND CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL BUILDING CODES.

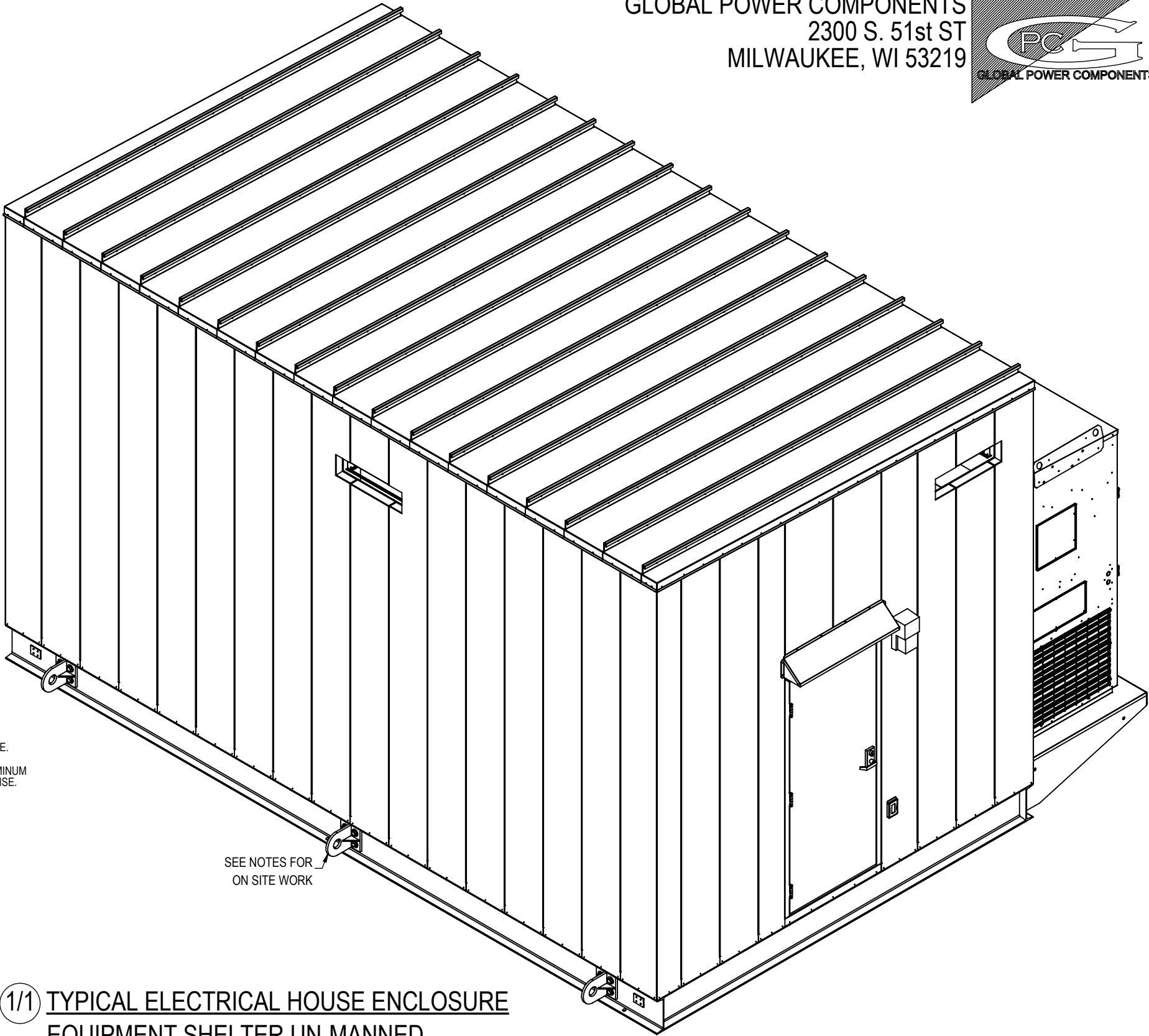
BUILDING THERMAL ENVELOPE EXEMPTION:

2. FLOOR AREA OF BUILDING UNDER 500 SQ FT.
3. BUILDING WILL HOUSE ELECTRICAL EQUIPMENT WITH INSTALLED EQUIPMENT POWER TOTALING NOT LESS THAN 7 WATTS PER SQUARE FOOT. THIS BUILDING IS NOT INTENDED FOR HUMAN OCCUPANCY.
4. HEATING SYSTEM CAPACITY IS NOT GREATER THAN 5KW AND HEATING THERMOSTAT SET POINT IS 50F MAXIMUM.
5. AVERAGE WALL AND ROOF U FACTER IS LESS THAN .120.
6. SOLAR REFLECTANT PAINT IS BEING UTILIZED ON THE ROOF.

ON SITE WORK:

7. HOIST STRUCTURE IS OUTSIDE THE SCOPE OF THIS CERTIFICATION AND SHALL BE DESIGNED BY OTHERS
8. ALL SITE WORK SUCH AS FOUNDATION, GRADING, ELECTRICAL UTILITY CONNECTION, GROUNDING, HVAC UNIT REINSTALLATION, GUTTERS, ETC. ARE TO BE INSTALLED BY OTHERS IN ACCORDANCE WITH LOCAL BUILDING CODES AND ARE SUBJECT TO APPROVAL OF LOCAL OFFICIALLIST

PLAN INDEX:	SHEET NO.
COVER SHEET-DESIGN NOTES & SPECIFICATIONS	1
PROJECT BILL OF MATERIALS	2
ENCLOSURE PLAN VIEW	3
FOUNDATION LOAD TABLE	4
CABLE TRAY LAYOUT	5
ELECTRICAL GEAR ISOMETRIC VIEW	6
EXTERIOR ELEVATION VIEW	7-8
LIFTBASE ELEVATION VIEW	9-11
SHIPPING DETAIL	12
INTERIOR ELEVATION VIEW	13-14
GENERAL CONSTRUCTION DETAILS	15-18
ELECTRICAL PLAN VIEW	E1
GROUNDING DETAL	E2
ELECTRICAL WIRING DIAGRAM	E3-E7



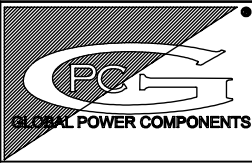
1/1 TYPICAL ELECTRICAL HOUSE ENCLOSURE
EQUIPMENT SHELTER UN-MANNED
NTS

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
0	INITIAL RELEASE	11/28/18	AJ
1	CUSTOMER REDLINES	1/10/19	SSP
2	PE REDLINES	1/24/19	SSP
3	ISSUED FOR CONSTRUCTION	2/6/19	SSP
4	UPDATED CABLE TRAY	3/22/19	RAS
5	AS BUILT	5/2/19	AWM

BILL OF MATERIALS				ITEM	DESCRIPTION	QTY	PART NO
CUSTOMER	ROCKWELL			HVAC	MARVAIR 12.5 TON, 8.6EER, W/ ECONOMIZER & 9KW HEATSTRIP	2	ECUDA150ACD090CU-A2-216
PROJECT NAME	ORO HONDO				SUPPLY GRILL	2	93189
JOB NO	45-31329				RETURN GRILL	2	93188
					COMMSTAT4 THERMOSTAT	1	S/07846
BUILDING CONSTRUCTION	INTERIOR WALL & CEILING: 0.080" ALUMINUM (Fy=21KSI)						
	EXTERIOR WALL & ROOF: 0.125" ALUMINUM (Fy=21KSI)			CABLE TRAY	24" W x 6" H x 144" L - STRAIGHT SECTION	2	RSI06A09SL-24-144
INSULATION					24" W x 6" H - 24" RADIUS - TEE SECTION	2	RSI06A09HT-24-R24
CEILING	12IN FIBERGLASS BATT W. BACKING	R38	KNAUF				
WALLS	3IN FIBERGLASS BATT W. BACKING	R15	KNAUF	SWITCHES	HUBBELL 3-WAY LIGHT SWITCH, 20A	4	HUBW CSB320I
LIFTBASE	1IN FOAMSULATE CELL SPRAY FOAM APPLIED POYURETHANE	R6.9	FOAMSULATE 220		THOMAS & BETTS STEEL CITY 4-11/16" DOUBLE SWITCH COVER	2	STL CTY RSL-5
	TECTYL 351S UNDERCOATING		TECTYL				
				RECEPTACLES	HUBBELL DUPLEX GFCI RECEPTACLE, 20A	4	HWS GFTWRST20I
FINISH					THOMAS & BETTS STEEL CITY 4-11/16" SINGLE GFCI COVER	2	STL CTY RSL-16
ENCLOSURE/LIFTBASE EXTERIOR	SPECTRUM GRAY (31745)				HUBBELL-TAYMAC EXPANDABLE WEATHERPROOF RECEPTACLE COVER	2	ML500G
ENCLOSURE INTERIOR	EGGSHELL WHITE						
LIFTBASE FLOOR COATING	HERCULINER GRAY			INTERIOR LIGHT	COOPER 4FT INTERIOR LED WRAPAROUND FIXTURE, 4000K, 44W	4	4WSNLEDLD444SLFUNVL840CD1U
ROOF TOPCOAT	HENRY (HE287SF)						
				EMERGENCY EXIT SIGN	COOPER LIGHTING EMERGENCY/EXIT LIGHTING	2	CPL APCH7R
ITEM	DESCRIPTION	QTY	PART NO.				
DOORS				EXTERIOR LIGHT	HUBBELL 17W PERIMETER LED WALL PACK W/ PHOTOCELL	2	NRG-356L-5K-U-PC
EXTERIOR	3070 PERSONNEL DOOR - LHR	1					
	16GA GAL PRIMED, WELDED, 3-3/4" RABBIT W/SILL	1	LAFORCE WHMF	GROUND LOOP	2" COPPER GROUND LOOP	69	N/A
	18GA GAL PRIMED, INSULATED, FLUSH, "B" LABELED, 1.5 HR FIRE RATED	1	LAFORCE HMD				
	STAINLESS STEEL HINGES	3	HAGER BB1191 NRP US32D				
	STAINLESS STEEL FIRE EXIT DEVICE (UL305)	1	VON DUPRIN 22EO-F SP28				
	AUTO DOOR CLOSER	1	CAL-ROYAL N900-PBF	CUSTOMER SUPPLIED			
	STAINLESS DOOR HANDLE	1	VON DUPRIN 230L SP28	TRANSFORMER	15KVA, 1PH, 240x480 PRIMARY VOLTS, 120/240 SECONDARY VOLTS	1	SG3N0015LE
	RIM STRIKE	1	VON DUPRIN 299F		112.5KVA 3PH, 2400V-480Y/277V 60HZ	1	MG3A0112RKSAHCO
	LOCK CYLINDER	1	SCHLAGE 20-001 C123				
	36" ALUMINUM THRESHOLD	1	NATIONAL GUARD PRODUCTS 891Vx36"	AC PANEL	18 CIRCUIT, 100A, FULLY RATED, 120/240V 1PH 3W, ALUMINUM BUS, 10k AIC, 2P BAB MAIN BREAKER (TOP FED), SURFACE MOUNTED	1	P1C100BT18AH01
	WEATHER STRIP	1	REESE 807A				
	SIGN "DANGER ELECTRICAL EQUIPMENT/AUTHORIZED PERSONNEL ONLY"	1	BRADY 84068				
				AC PANEL	42 CIRCUIT,250A BUS, FULLY RATED, 480Y/277V 3PH 4W, ALUMINUM BUS, 25k AIC, FD 3P MAIN BREAKER (TOP FED), SURFACE MOUNTED, 200A MCB	1	P3D250BT42AH01
	4080 PERSONNEL DOOR - RHR	1					
	16GA GAL PRIMED, WELDED, 3-3/4" RABBIT W/SILL	1	LAFORCE WHMF				
	18GA GAL PRIMED, INSULATED, FLUSH, "B" LABELED, 1.5 HR FIRE RATED	1	LAFORCE HMD	MCC INCOMING GEAR	FULL VOLTAGE TRANSFORMER FEEDER	1	1512BT
	STAINLESS STEEL HINGES (HEAVY WEIGHT)	4	HAGER BB1199 NRP US32D		VFD INPUT CONTACTOR UNIT	1	1512AD
	STAINLESS STEEL FIRE EXIT DEVICE (UL305)	1	VON DUPRIN 22EO-F SP28		FUSED LOAD BREAK SWITCH, MAIN	1	1592MT
	AUTO DOOR CLOSER	1	CAL-ROYAL N900-PBF		EXCITER	1	1591B
	STAINLESS DOOR HANDLE	1	VON DUPRIN 230L SP28				
	RIM STRIKE	1	VON DUPRIN 299F	MV VFD DRIVE	1750HP MV DRIVE	1	POWERFLEX 7000
	LOCK CYLINDER	1	SCHLAGE 20-001 C123				
	48" ALUMINUM THRESHOLD	1	NATIONAL GUARD PRODUCTS 891Vx48"				
	WEATHER STRIP	1	REESE 807A				
	SIGN "DANGER ELECTRICAL EQUIPMENT/AUTHORIZED PERSONNEL ONLY"	1	BRADY 84068				

2

OF 18



GLOBAL POWER COMPONENTS

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PH 414.475.3000 FAX 414.475.3441
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AS-BUILT

CUSTOMER I/D:
ROCKWELL

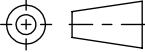
PROJECT NAME:
ORO HONDO

DRAWING REF:
XX

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
THE TOLERANCES ARE:

ONE PLACE .X ± .1
TWO PLACE .XX ± .06
ANGLE ± 2°
HOLE DIA. ± .005

THIRD ANGLE PROJECTION



DO NOT SCALE DRAWING

DRAWN BY
AJ

MATERIAL
VARIOUS CRS

FINISH
SEE NOTE

DATE
11/28/18

DESCRIPTION
PROJECT BILL OF MATERIALS

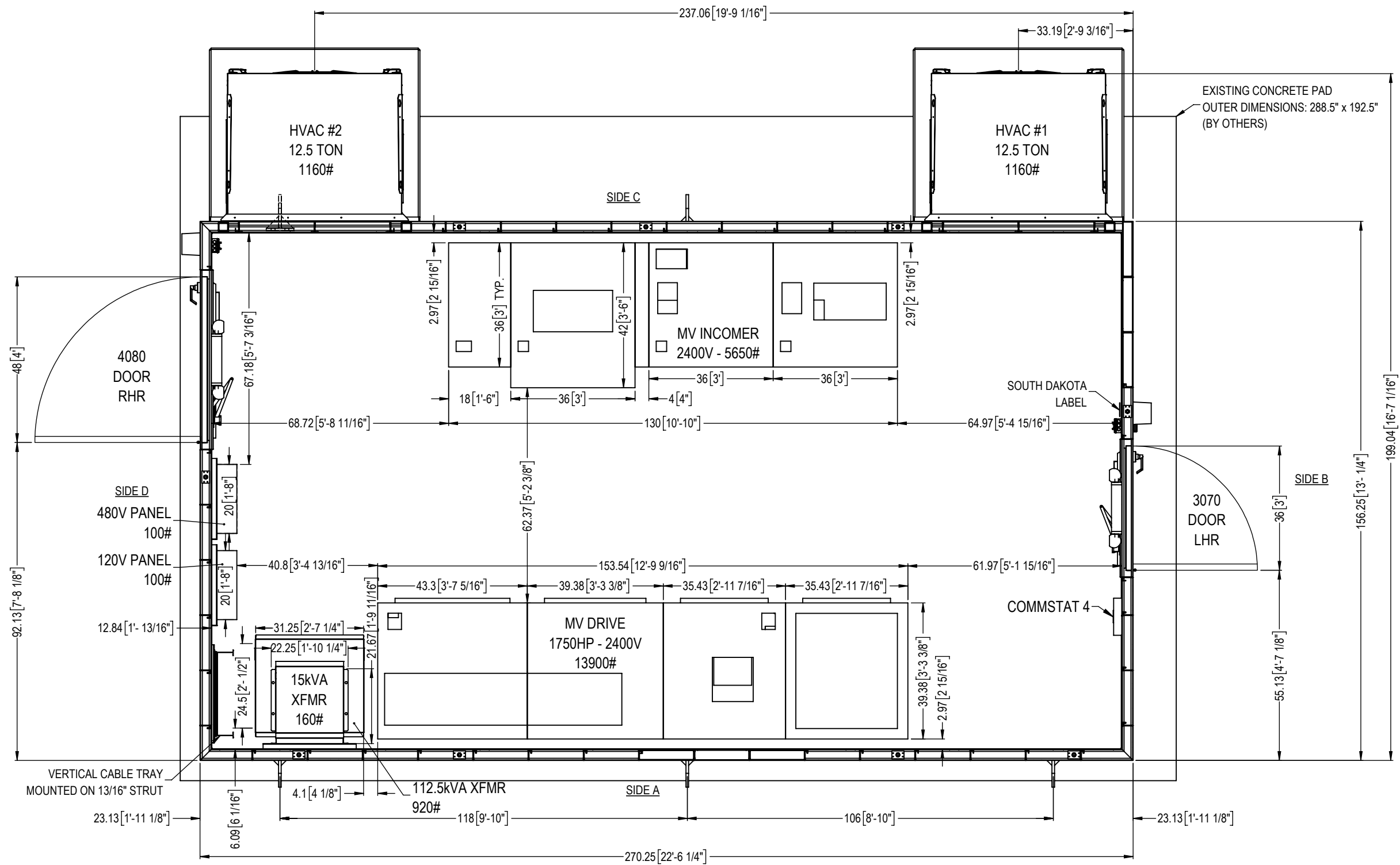
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DWG. NO.
45-31329

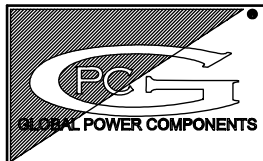
REV.
5

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NOTES:
1.INTERIOR CEILING HEIGHT AT 11.5 FT.



1/3 TYPICAL ENCLOSURE PLAN VIEW
1:32



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AS-BUILT

CUSTOMER I/D:
ROCKWELL
PROJECT NAME:
ORO HONDO
DRAWING REF:
XX

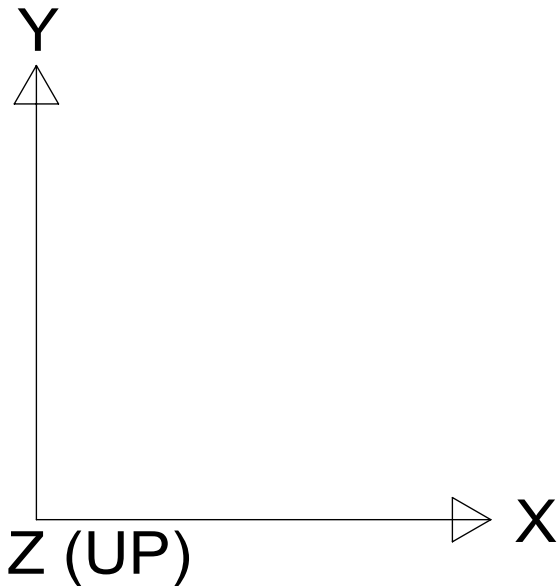
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DIMENSIONS ARE IN INCHES
THE TOLERANCES ARE:
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TWO PLACE .XX ± .06
ANGLE 2° ± 2°
HOLE DIA. ± .005

THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

DRAWN BY
AJ
DATE
11/28/18
MATERIAL
VARIOUS CRS
FINISH
SEE NOTE

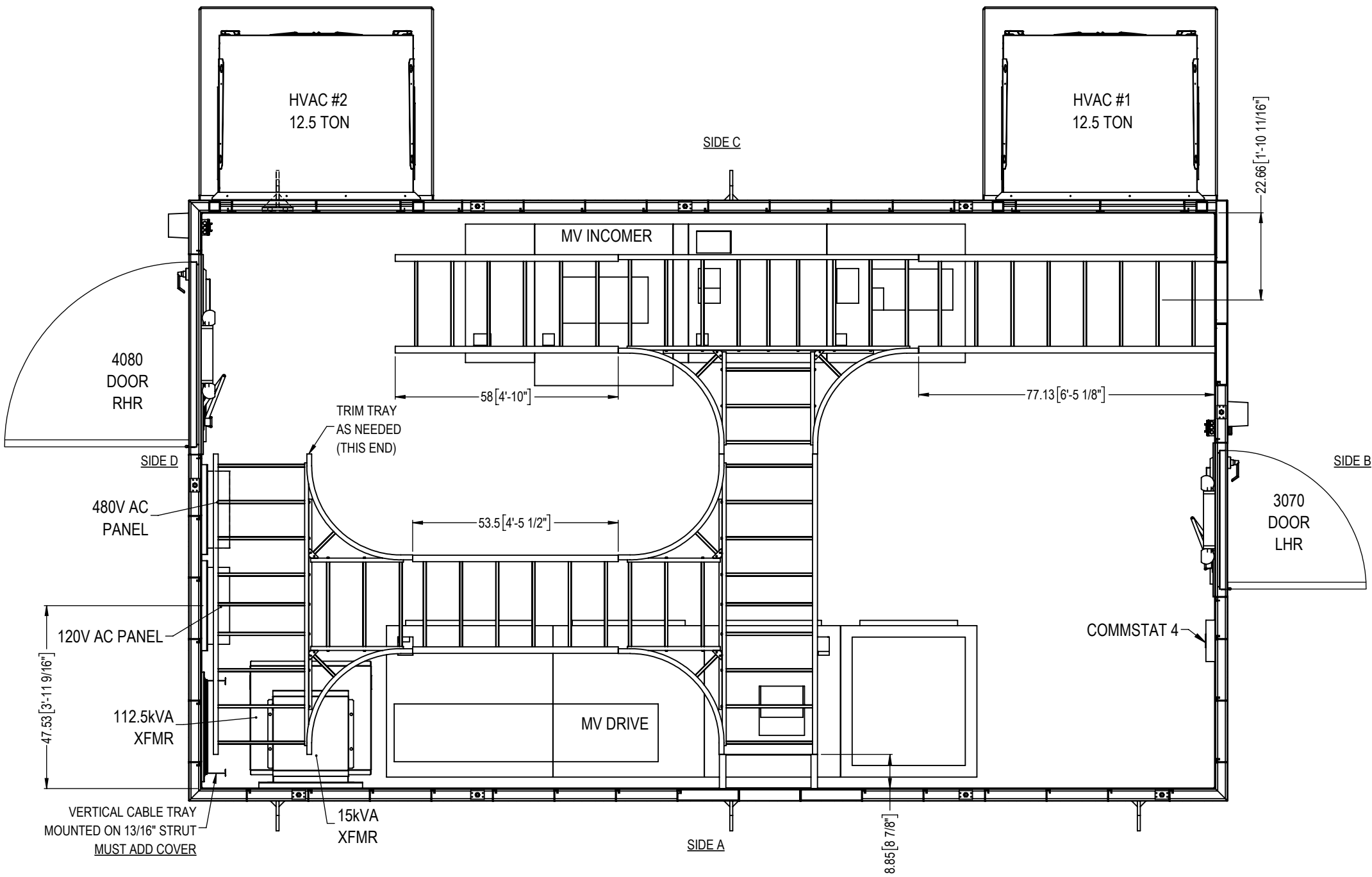
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ENCLOSURE PLAN VIEW
SIZE B DWG. NO. 45-31329 REV. 5
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Foundation Loading (Total Building Loads)			
All Forces in Kips, All Moments in kip-ft		Direction	Force/Moment
MIN DEAD	GRAVITY LOAD	(Z)	-16.70
MAX DEAD	GRAVITY LOAD	(Z)	-46.66
FLOOR LIVE	GRAVITY LOAD	(Z)	-73.13
ROOF LIVE	GRAVITY LOAD	(Z)	-8.78
SNOW	GRAVITY LOAD	(Z)	-9.01
WIND LOAD	X DIRECTION	(X)	4.67
		(Z)	7.98
		OTMy	105.29
	Y DIRECTION	(Y)	9.11
		(Z)	12.75
		OTMx	117.61
SEISMIC LOAD	X DIRECTION	(X)	3.96
		OTMy	36.80
	Y DIRECTION	(Y)	3.96
		OTMx	36.80



REACTIONS ARE AT THE BASE OF THE FLOOR STRUCTURE.
WIND AND SEISMIC LOADS ARE REVERSIBLE. VALUES SHOWN ARE FOR +X AND +Y DIRECTIONS
VERTICAL REACTIONS (Z) FOR WIND AND SEISMIC LOADS INCLUDE PORTION FROM THE OTM. (SEE CALCULATIONS)

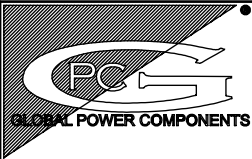
- NOTES:
1.INTERIOR CEILING HEIGHT AT 11.5 FT.
2.HEIGHT TO BOTTOM OF CABLE TRAY 120"



1/5 TYPICAL CABLE TRAY LAYOUT
1:32

CABLE TRAY BILL OF MATERIALS				
ITEM NO.	DESCRIPTION	PART NO.	QTY.	LENGTH
1	B-LINE REDI-RAIL	RSIO6A09HT-24-R24	3	
2	B-LINE REDI-RAIL	RSIO6A09SL-24-144	1	8.85
3	B-LINE REDI-RAIL	RSIO6A09SL-24-144	1	77.13
4	B-LINE REDI-RAIL	RSIO6A09SL-24-144	1	58.00
5	B-LINE REDI-RAIL	RSIO6A09SL-24-144	1	53.50

5 OF 18

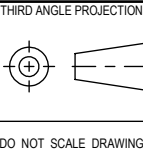


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CUSTOMER I/D:
ROCKWELL
PROJECT NAME:
ORO HONDO
DRAWING REF:
XX

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TWO PLACE .XX ± .06
ANGLE ± 2°
HOLE DIA. ± .005



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DRAWN BY
AJ
DATE
11/28/18
MATERIAL
VARIOUS CRS
FINISH
SEE NOTE

DESCRIPTION

CABLE TRAY LAYOUT

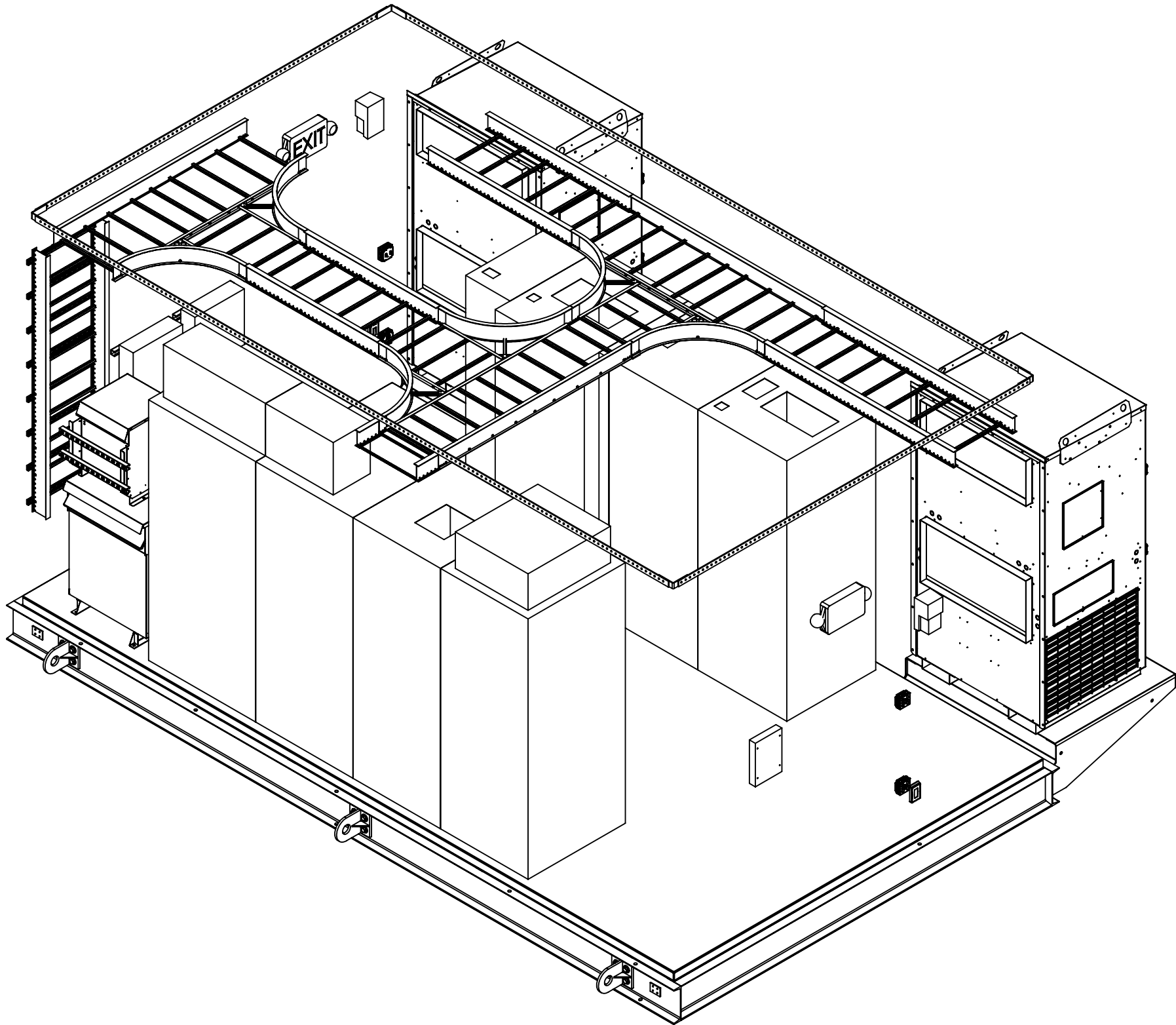
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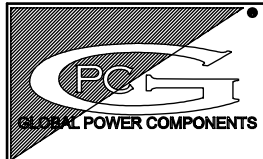
45-31329

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1/6 ELECTRICAL ISOMETRIC VIEW
NTS



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AS-BUILT

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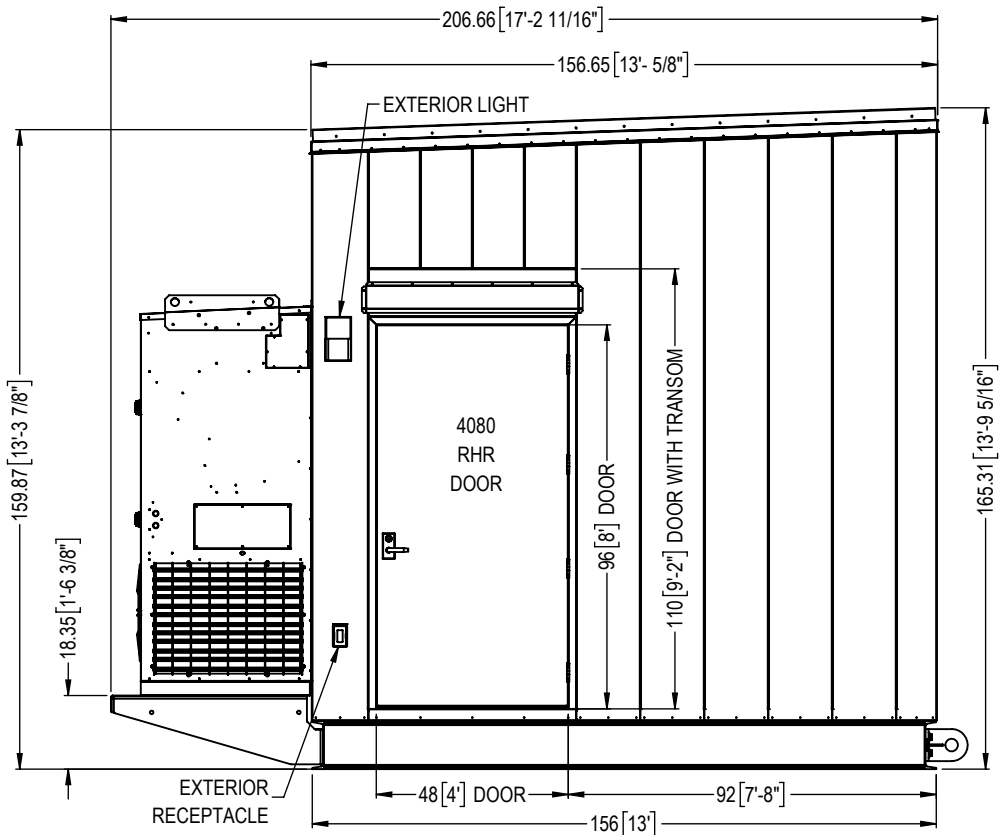
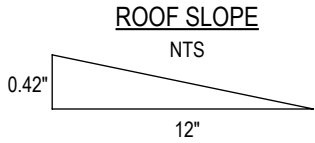
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ANGLE ± 2°
HOLE DIA. ± .005

THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

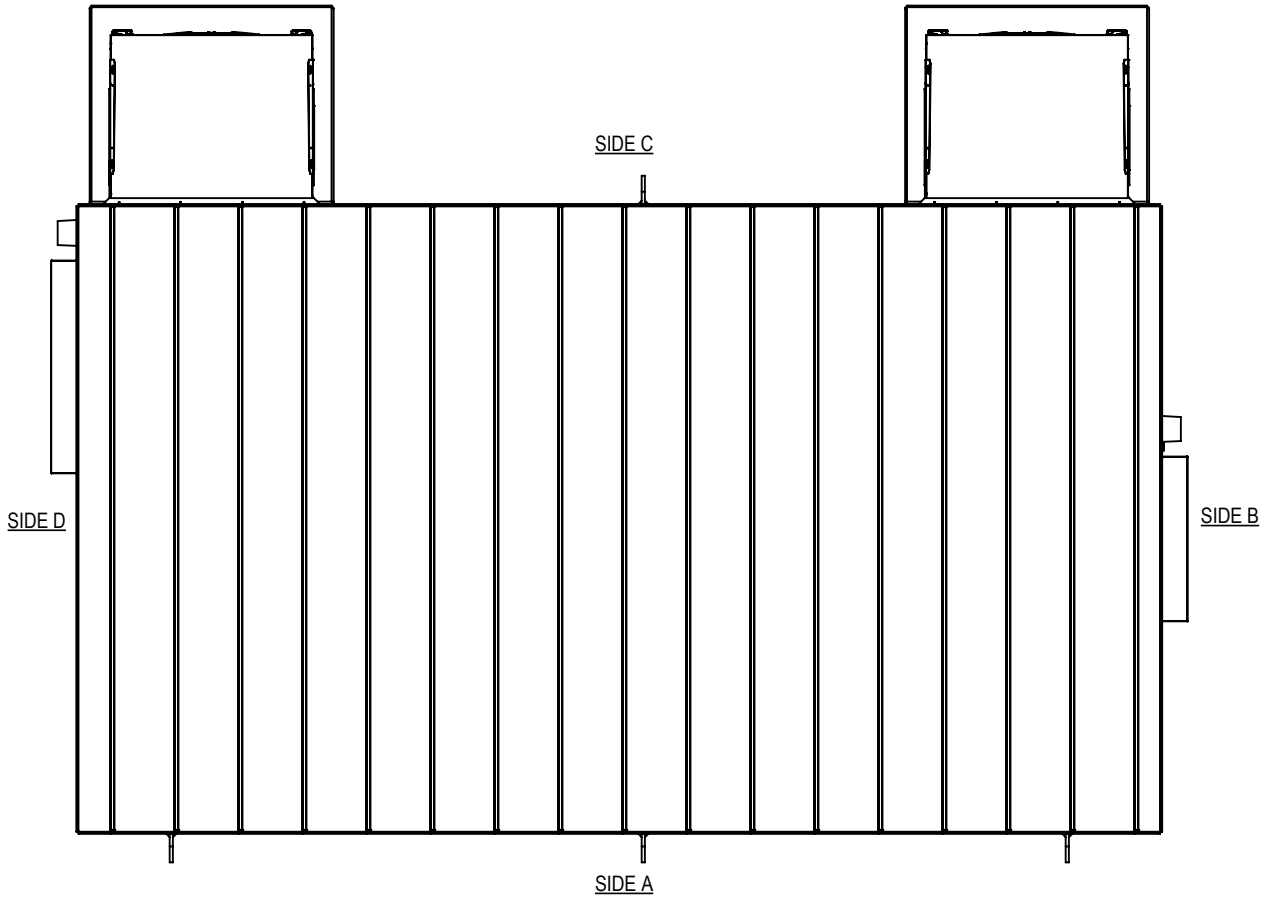
DRAWN BY AJ	DATE 11/28/18
MATERIAL VARIOUS CRS	
FINISH SEE NOTE	

DESCRIPTION ELECTRICAL ISOMETRIC VIEW	
SIZE B	DWG. NO. 45-31329
REV. 5	

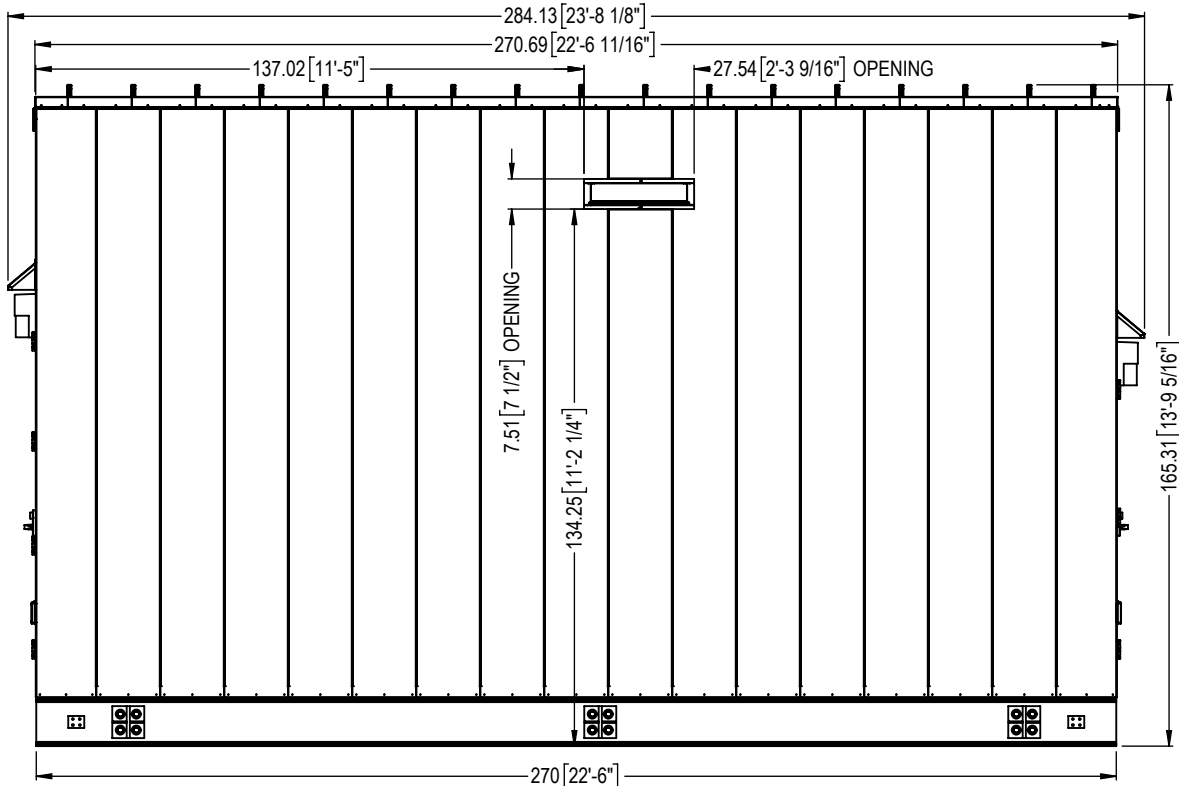
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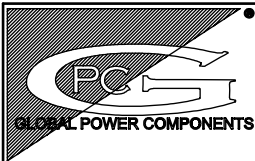
2/7 SIDE D EXTERIOR ELEVATION
1:48



3/7 PLAN VIEW EXTERIOR
1:48



1/7 SIDE A EXTERIOR ELEVATION
1:48

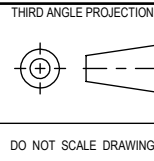


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DRAWING REF:
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ANGLE 2° ± 2°
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DO NOT SCALE DRAWING

DRAWN BY
AJ
MATERIAL
VARIOUS CRS
FINISH
SEE NOTE

DATE
11/28/18

DESCRIPTION

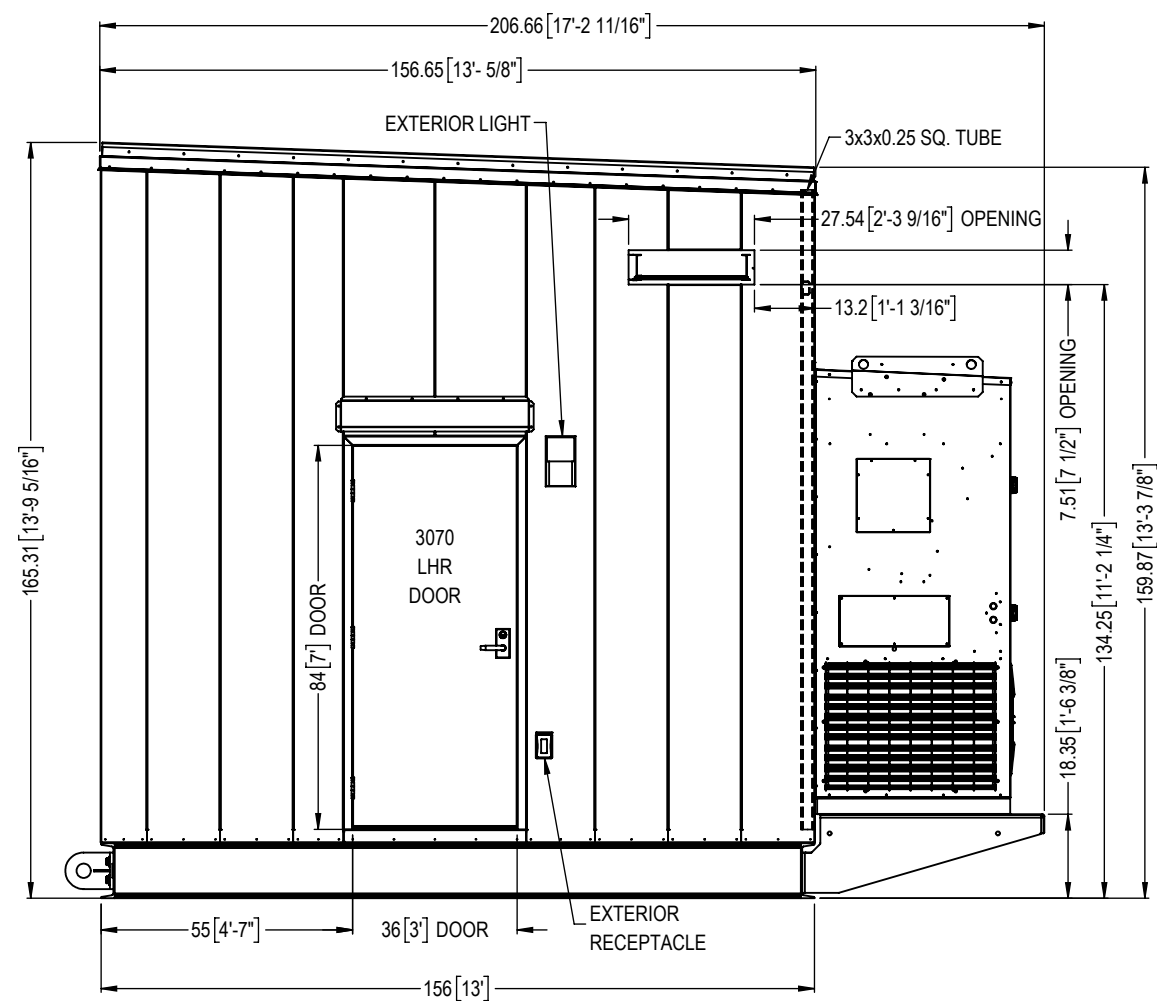
EXTERIOR ELEVATION VIEWS

SIZE
B

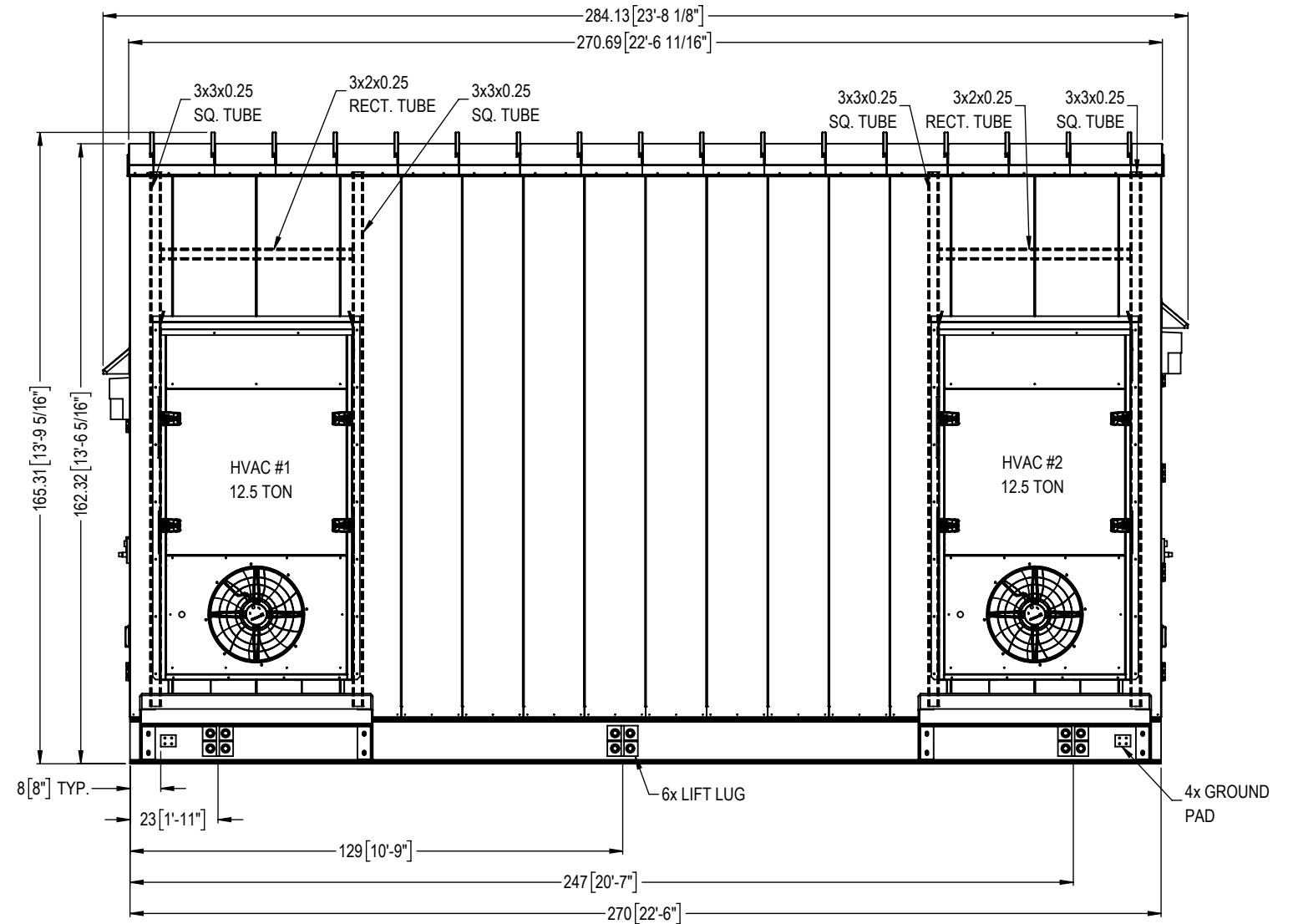
DWG. NO.
45-31329

REV.
5

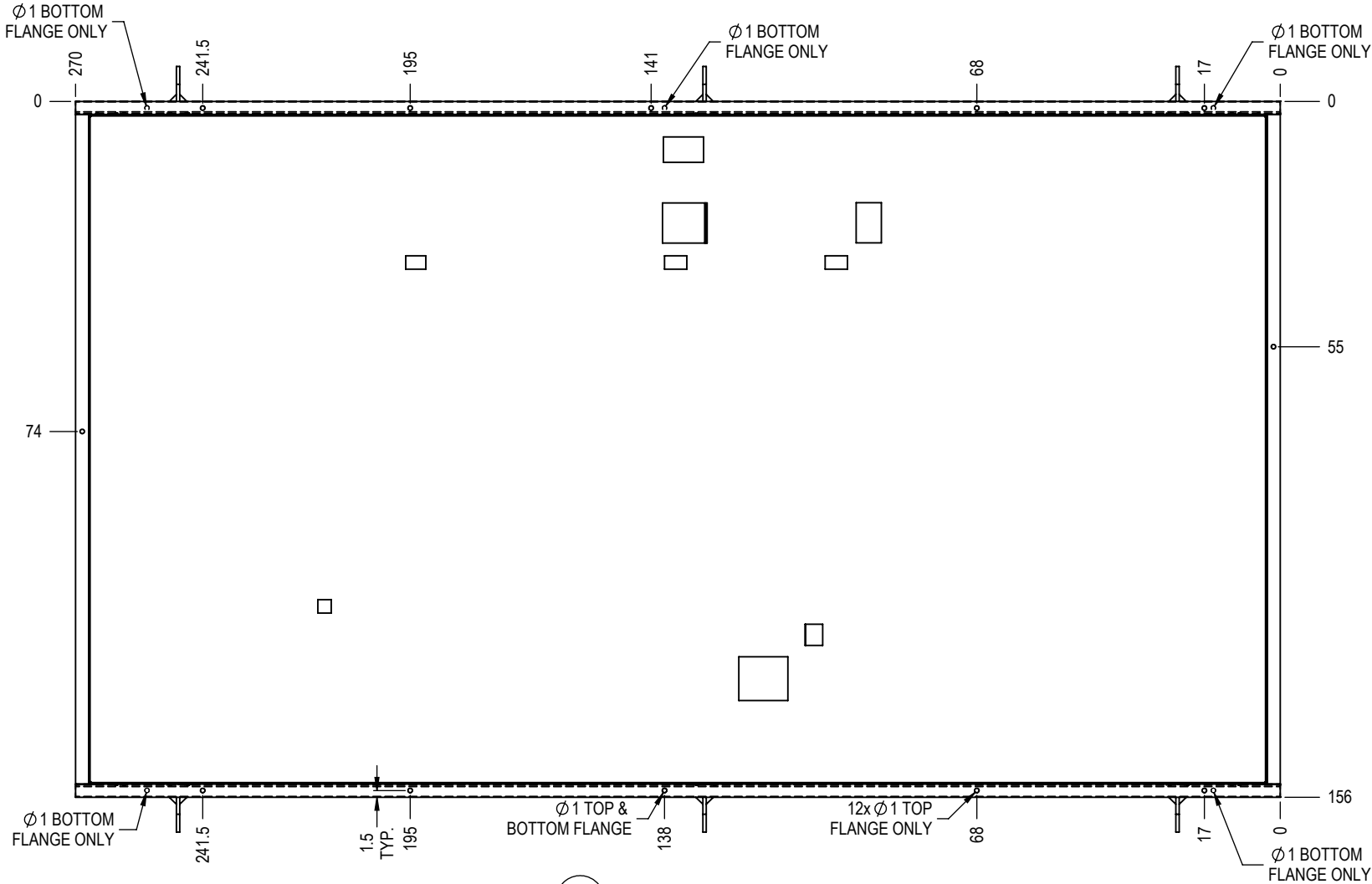
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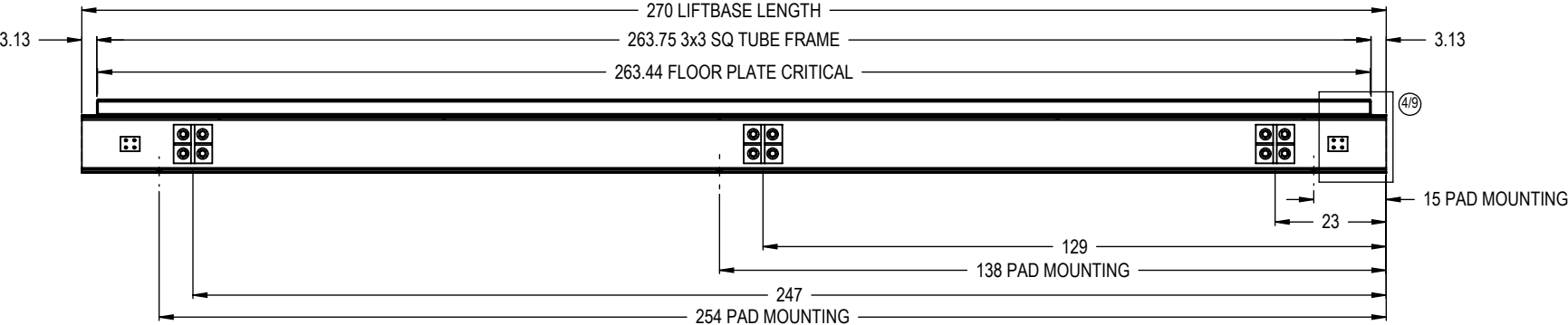
(2/8) SIDE B EXTERIOR ELEVATION
1:42



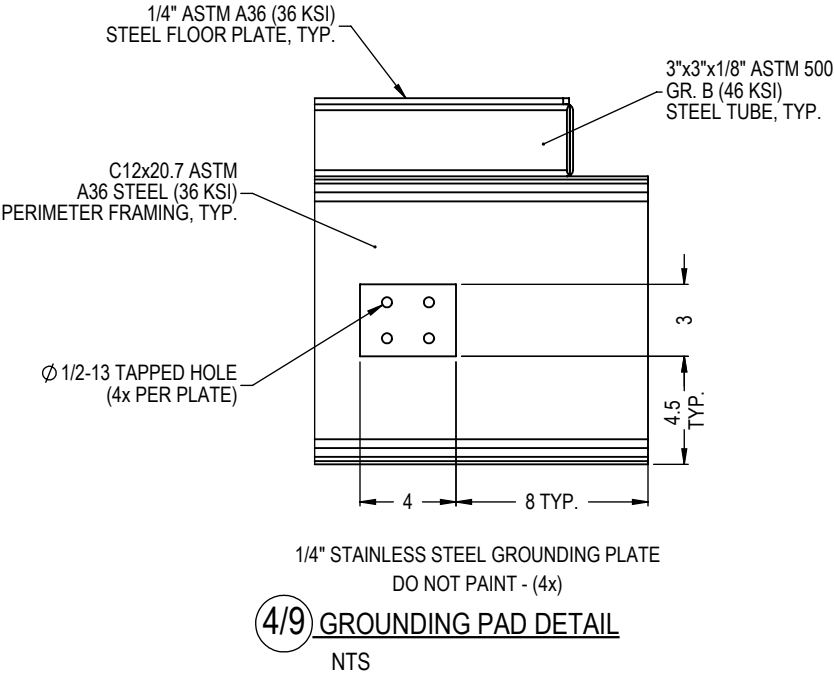
(1/8) SIDE C EXTERIOR ELEVATION
1:42



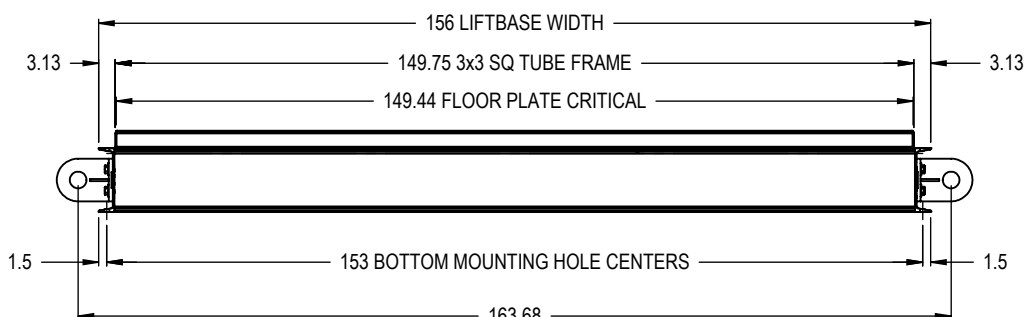
3/9 PLAN VIEW LIFTBASE
1:36



1/9 SIDE A LIFTBASE ELEVATION
1:36



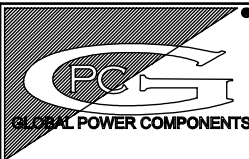
4/9 GROUNDING PAD DETAIL
NTS



2/9 SIDE B LIFTBASE ELEVATION
1:36

- NOTES: UNLESS OTHERWISE SPECIFIED
1. SPRAY FOAM UNDERSIDE OF LIFTBASE
 2. R6.9 - 1" MIN OF SPRAY FOAM
 3. PAINT COLOR: SPECTRUM GRAY (31745)
 4. USE 7/8-9 GRADE 8 HARDWARE FOR LIFTING PLATES
 5. APPLY HERCULINER GRAY TO ENTIRE FLOOR

LIFTBASE WEIGHT: 8183 LBS



GLOBAL POWER COMPONENTS
2300 S. 51st ST
MILWAUKEE, WI 53219
PH 414.475.3000 FAX 414.475.3441
www.globalpowercomponents.com

AS-BUILT

CUSTOMER I/D:
ROCKWELL
PROJECT NAME:
ORO HONDO
DRAWING REF:
XX

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
THE TOLERANCES ARE:
ONE PLACE .X ± .1
TWO PLACE .XX ± .06
ANGLE ± 2°
HOLE DIA. ± .005

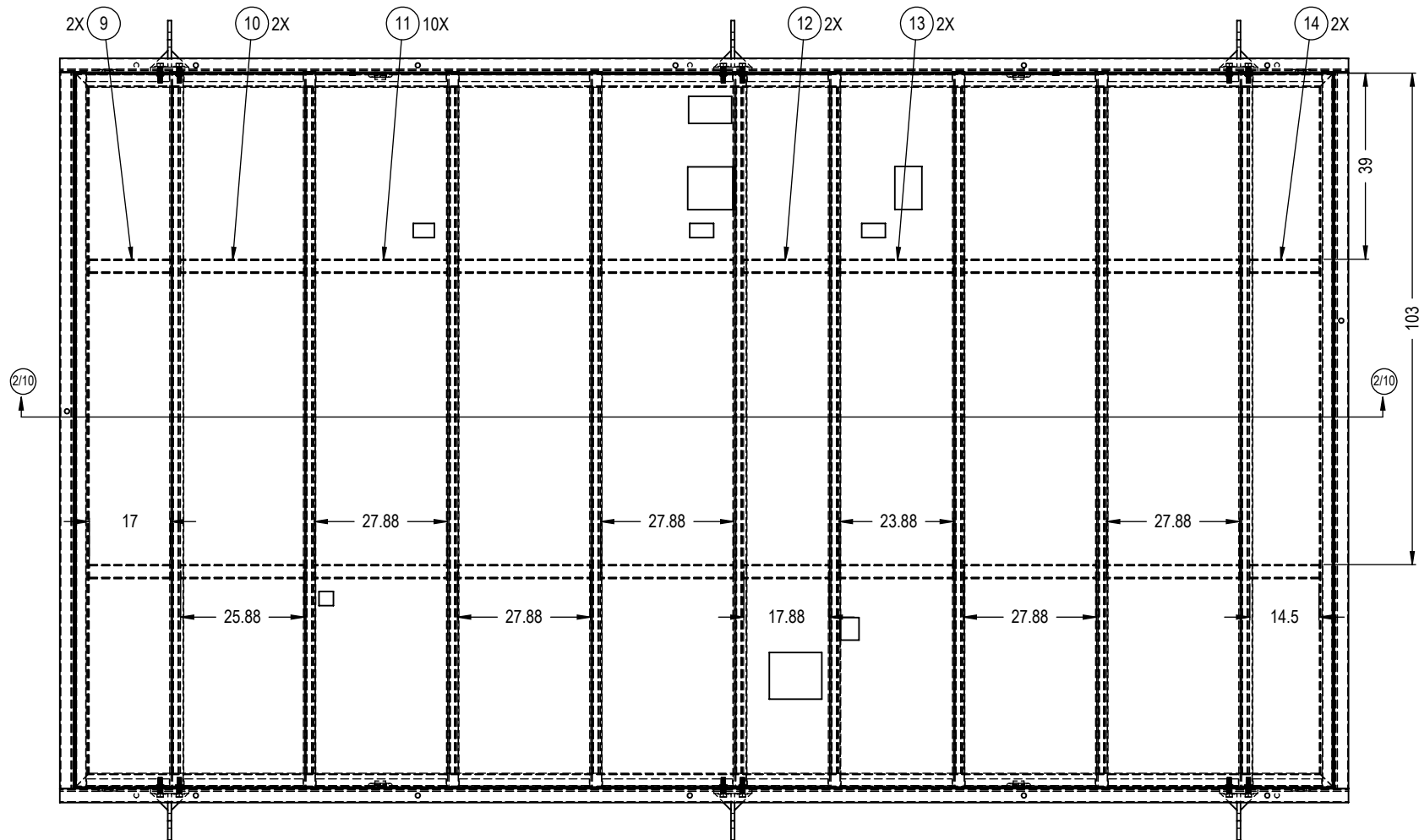
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

DRAWN BY
AJ
DATE
11/28/18
MATERIAL
VARIOUS CRS
FINISH
SEE NOTE

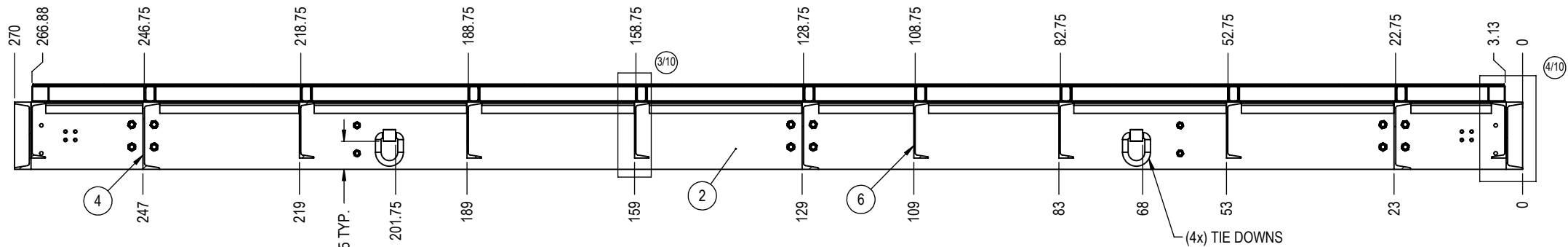
DESCRIPTION
LIFTBASE ASSEMBLY

SIZE DWG. NO.
B 45-31329F

REV.
5

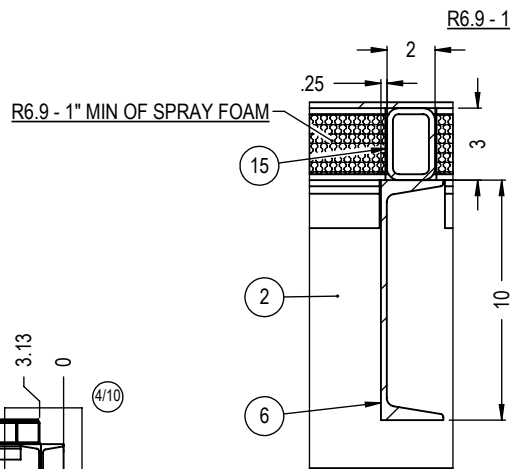


1/10 FLOOR FRAMING PLAN VIEW
1:34

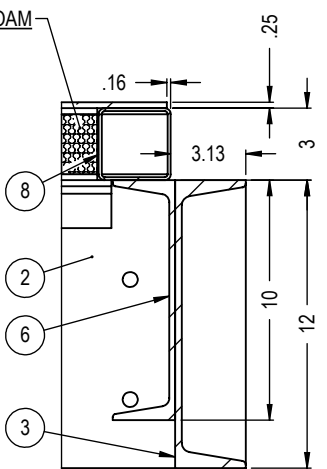


2/10 FLOOR FRAMING SECTION
1:25 - SECTION

STRUCTURAL BILL OF MATERIALS				
ITEM NO.	DESCRIPTION	MATERIAL	LENGTH	QTY.
1	C12x20.7 RT SIDE CHANNEL	ASTM A36	270.00	1
2	C12x20.7 LT SIDE CHANNEL	ASTM A36	270.00	1
3	C12x20.7 CHANNEL	ASTM A36	150.12	1
4	C12x20.7 CHANNEL	ASTM A36	150.12	3
5	C12x20.7 CHANNEL	ASTM A36	150.12	1
6	C10x15.3 CHANNEL	ASTM A36	150.12	8
7	3x3x0.125 SQ TUBING-MITER AT ENDS	ASTM A500 GRADE B	263.75	2
8	3x3x0.125 SQ TUBING-MITER AT ENDS	ASTM A500 GRADE B	149.75	2
9	3x3x0.125 SQ TUBING	ASTM A500 GRADE B	17.00	2
10	3x3x0.125 SQ TUBING	ASTM A500 GRADE B	25.88	2
11	3x3x0.125 SQ TUBING	ASTM A500 GRADE B	27.88	10
12	3x3x0.125 SQ TUBING	ASTM A500 GRADE B	17.88	2
13	3x3x0.125 SQ TUBING	ASTM A500 GRADE B	23.88	2
14	3x3x0.125 SQ TUBING	ASTM A500 GRADE B	14.50	2
15	3x2x0.25 RECT TUBING	ASTM A500 GRADE B	143.75	9



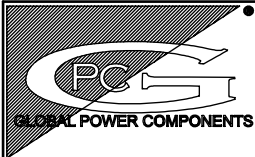
3/10 CROSS MEMBER SECTION
NTS



4/10 CROSS MEMBER SECTION
NTS

NOTES: UNLESS OTHERWISE SPECIFIED
1. SPRAY FOAM UNDERSIDE OF LIFTBASE
2. R6.9 - 1" MIN OF SPRAY FOAM
3. PAINT COLOR: SPECTRUM GRAY (31745)
4. USE 7/8-9 GRADE 8 HARDWARE FOR LIFTING PLATES
5. APPLY HERCULINER GRAY TO ENTIRE FLOOR

10 OF 18
LIFTBASE WEIGHT: 8183 LBS



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AS-BUILT

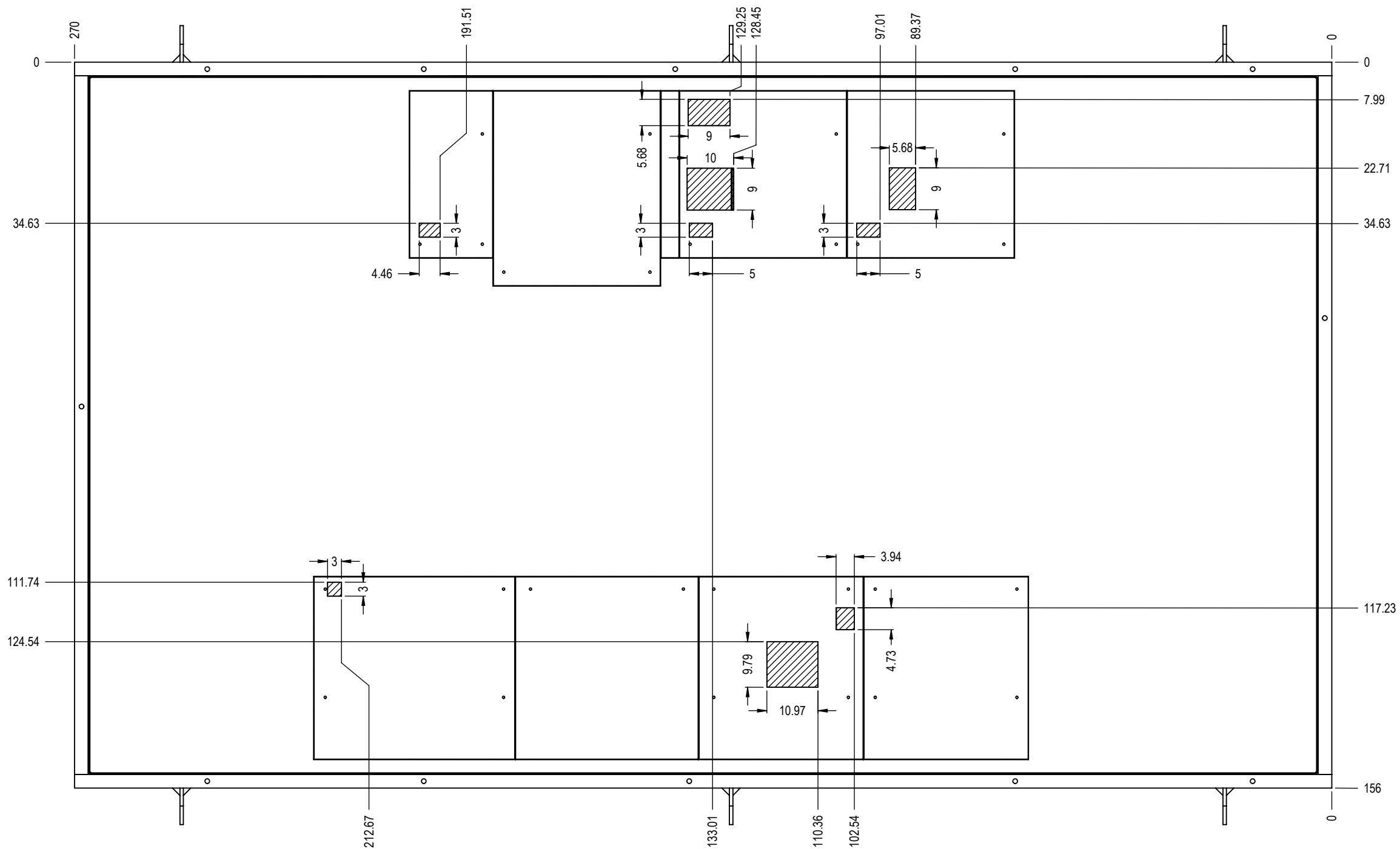
CUSTOMER I/D:
ROCKWELL
PROJECT NAME:
ORO HONDO
DRAWING REF:
XX

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
THE TOLERANCES ARE:
ONE PLACE .X ± .1
TWO PLACE .XX ± .06
ANGLE ± 2°
HOLE DIA. ± .005

THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

DRAWN BY
AJ
DATE
11/28/18
MATERIAL
VARIOUS CRS
FINISH
SEE NOTE

DESCRIPTION
LIFTBASE ASSEMBLY
SIZE
B
DWG. NO.
45-31329F
REV.
5

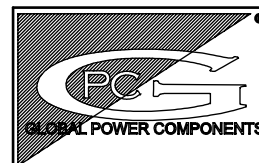


1/11 LIFTBASE FLOOR CUTOUTS
1:25

- NOTES: UNLESS OTHERWISE SPECIFIED
1. SPRAY FOAM UNDERSIDE OF LIFTBASE
 2. R6.9 - 1" MIN OF SPRAY FOAM
 3. PAINT COLOR: SPECTRUM GRAY (31745)
 4. USE 7/8-9 GRADE 8 HARDWARE FOR LIFTING PLATES
 5. APPLY HERCULINER GRAY TO ENTIRE FLOOR

11 OF 18

LIFTBASE WEIGHT: 8183 LBS



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AS-BUILT

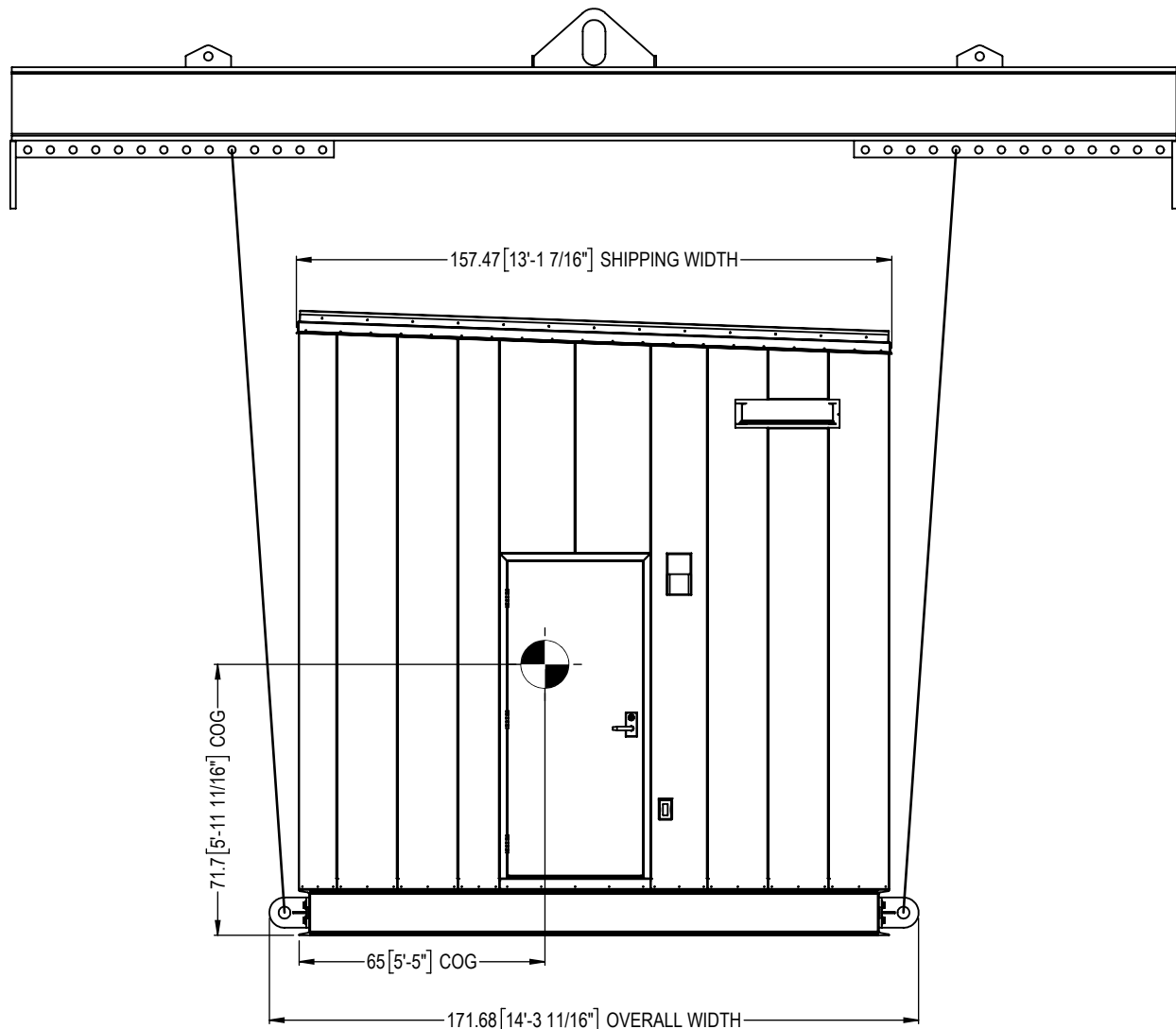
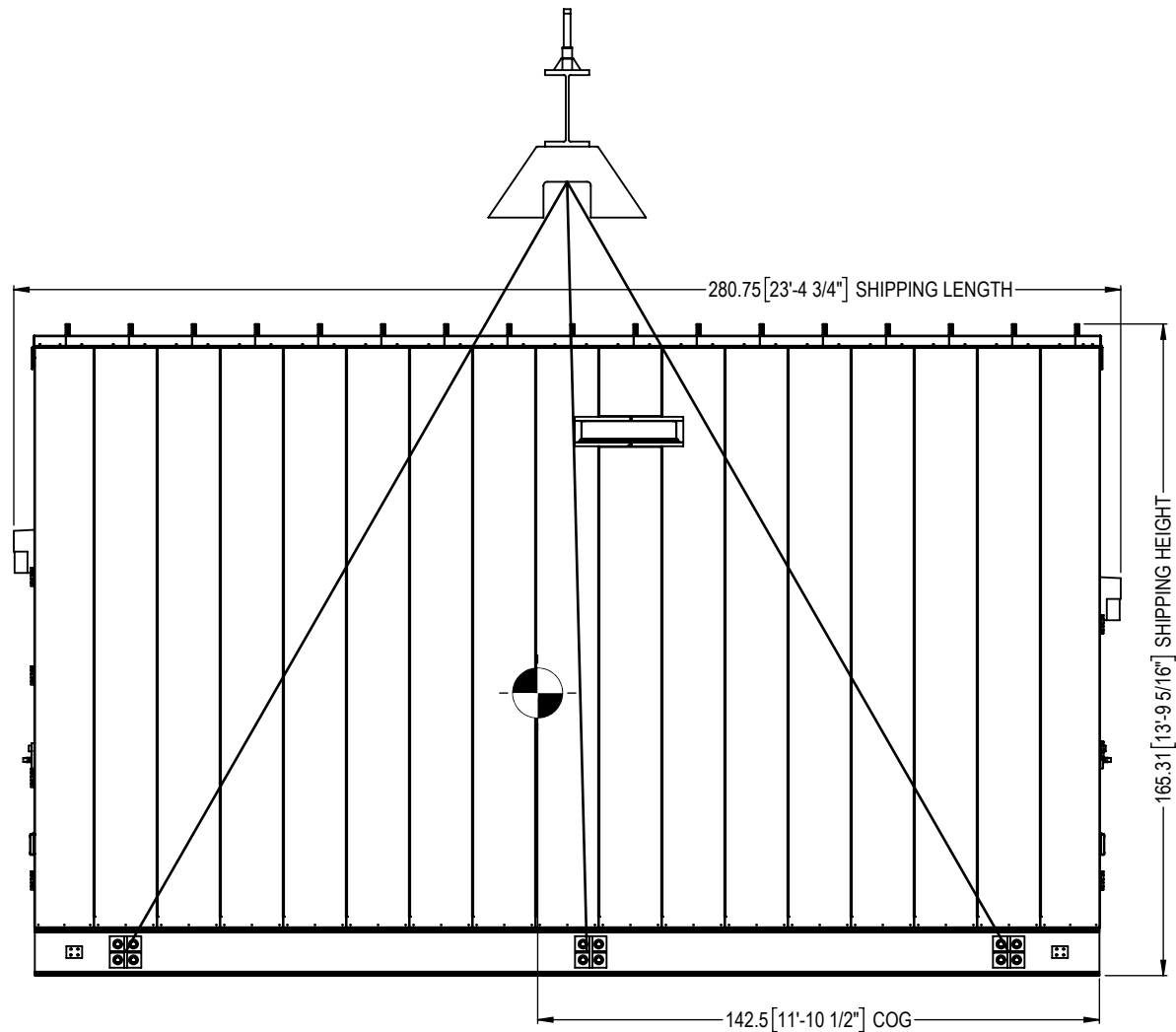
CUSTOMER I/D:
ROCKWELL
PROJECT NAME:
ORO HONDO
DRAWING REF:
XX

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DIMENSIONS ARE IN INCHES
THE TOLERANCES ARE:
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TWO PLACE .XX ± .06
ANGLE ± 2°
HOLE DIA. ± .005

THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

DRAWN BY
AJ
DATE
11/28/18
MATERIAL
VARIOUS CRS
FINISH
SEE NOTE

DESCRIPTION
LIFTBASE FLOOR CUTOUTS
SIZE
B
DWG. NO.
45-31329F
REV.
5



LIFTING NOTES:

1. THIS DRAWING IS FOR ILLUSTRATION PURPOSES ONLY
2. SIZING OF SPREADER BAR, CABLES, AND OTHER LIFT HARDWARE ARE THE RESPONSIBILITIES OF OTHERS
3. SUPPLY OF SPREADER BAR, CABLES, AND OTHER LIFT HARDWARE ARE THE RESPONSIBILITIES OF OTHERS
4. SLING ARRANGEMENT SHOULD BE ADJUSTED TO ALLOW FOR A LEVEL LIFT
5. SLING ARRANGEMENT SHOULD BE ADJUSTED SO THE CABLES ARE NOT LESS THAN 60° TO BASE
6. SHIPPED LOOSE ITEMS: RAIN HOODS AND HVAC UNITS

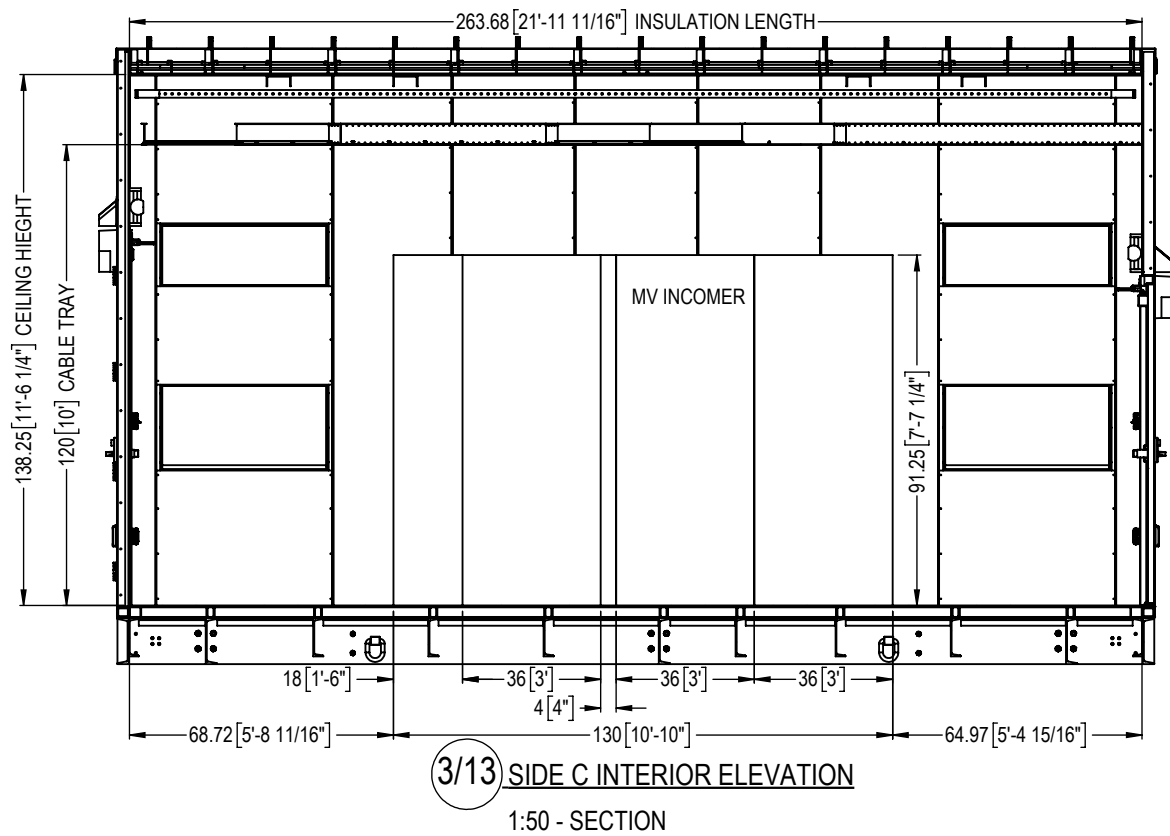
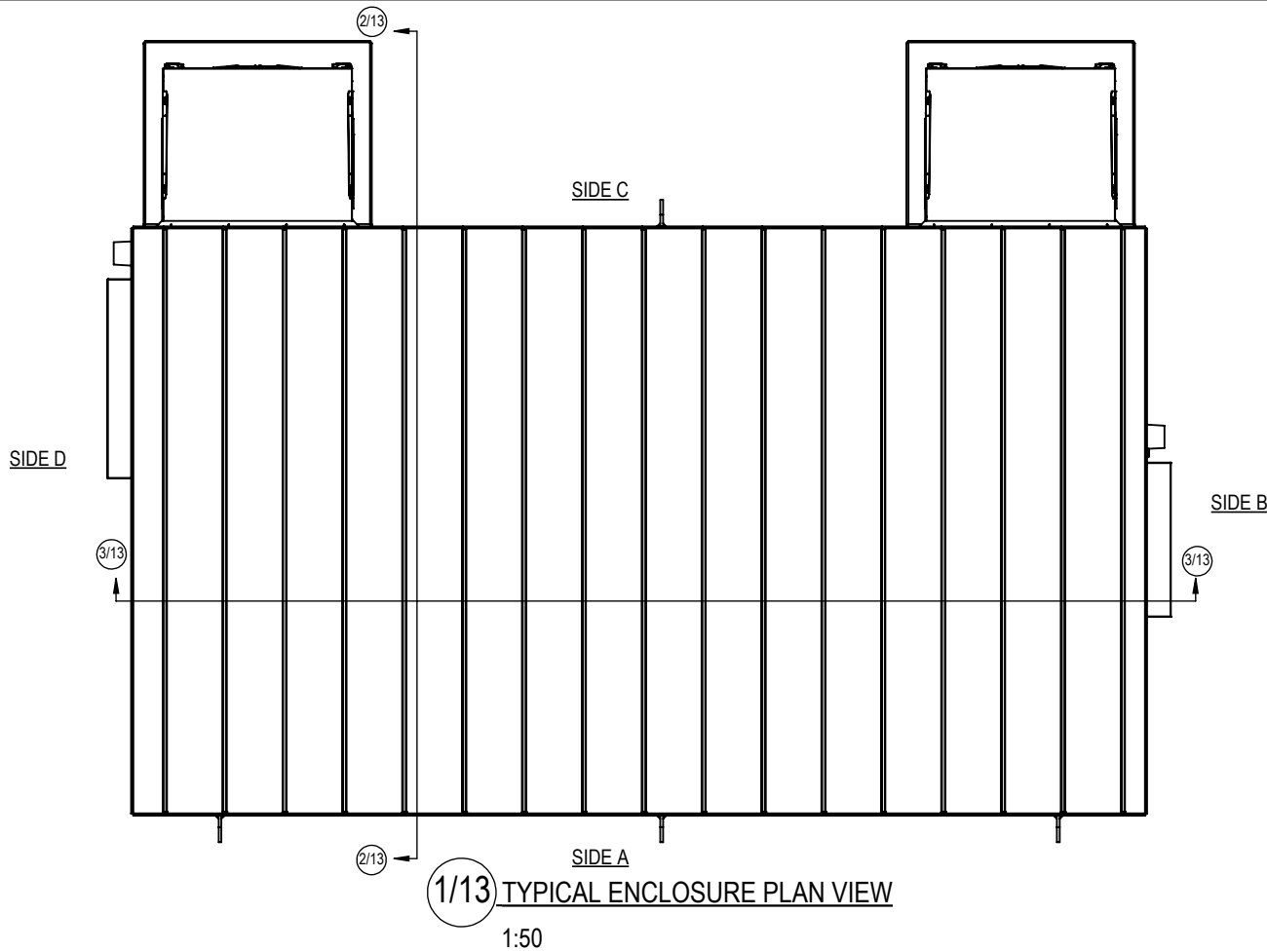
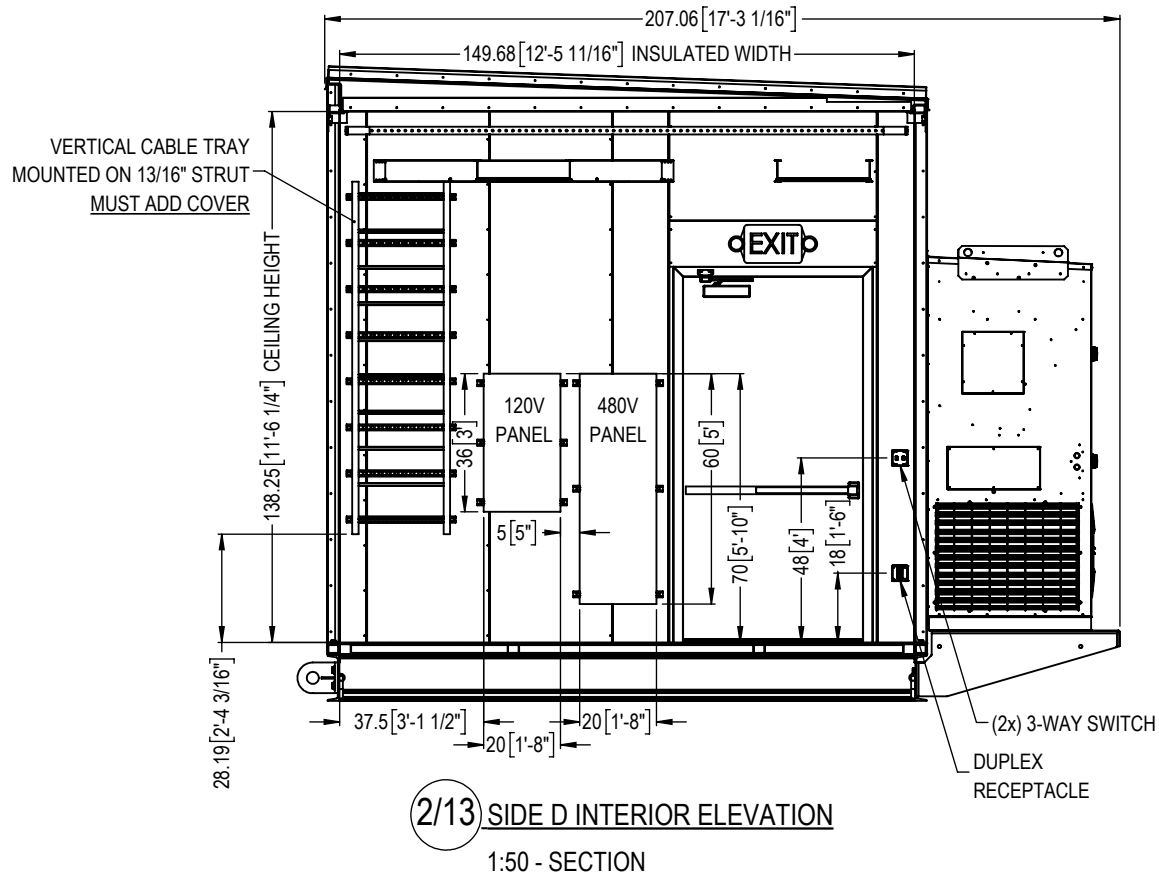
WEIGHTS:

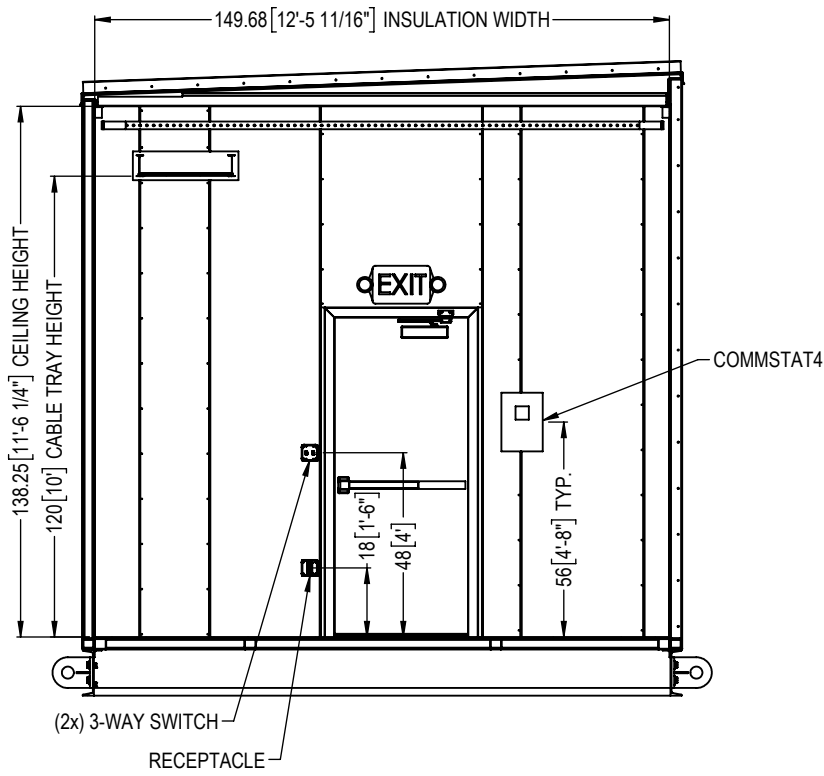
EMPTY BLDG WT: 16700 LBS

EQUIPMENT WT: 29960 LBS

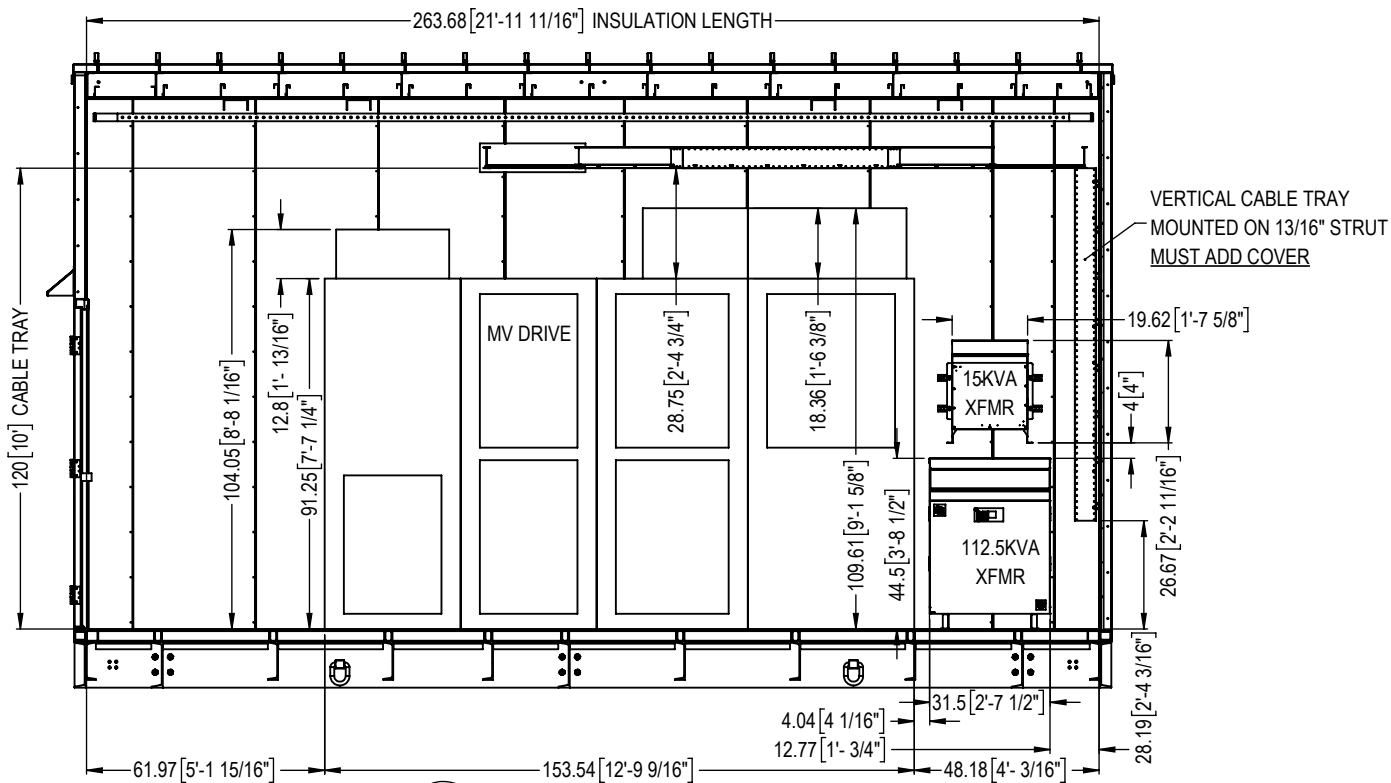
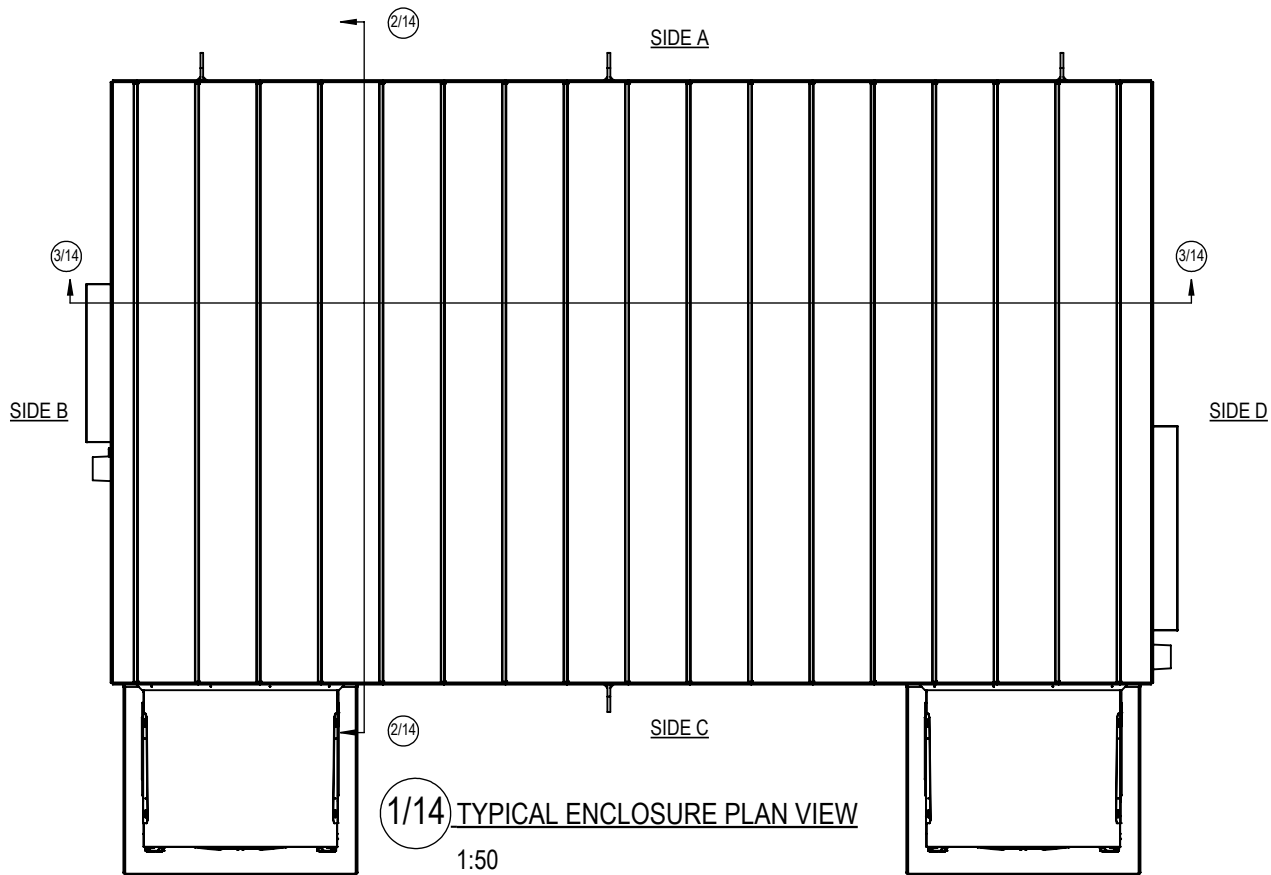
ESTIMATED TOTAL WT WO/ HVACs: 44340 LBS

ESTIMATED TOTAL WT W/ HVACs: 46660 LBS

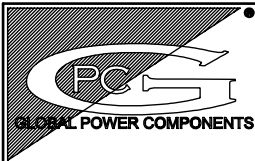




2/14 SIDE B INTERIOR ELEVATION
1:50 - SECTION



3/14 SIDE A INTERIOR ELEVATION
1:50 - SECTION



GLOBAL POWER COMPONENTS

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AS-BUILT

CUSTOMER I/D:
ROCKWELL

PROJECT NAME:
ORO HONDO

DRAWING REF:
XX

UNLESS OTHERWISE SPECIFIED
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THE TOLERANCES ARE:

ONE PLACE	X	± .1
TWO PLACE	XX	± .06
ANGLE		± 2°
HOLE DIA.		± .005

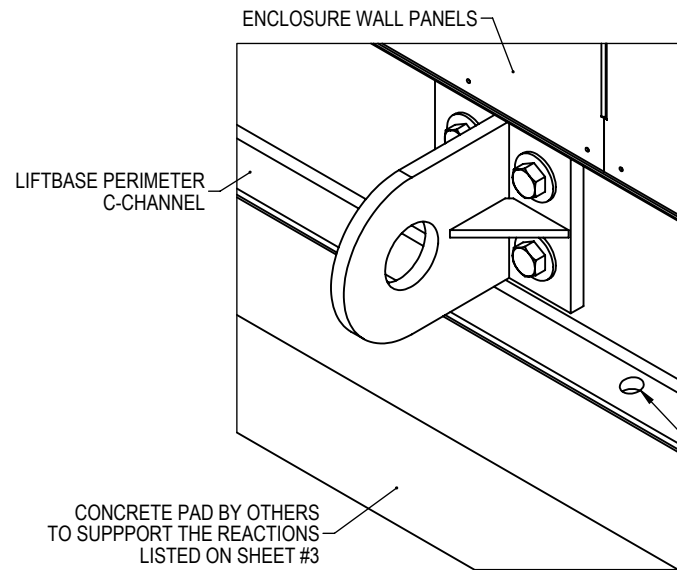
THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

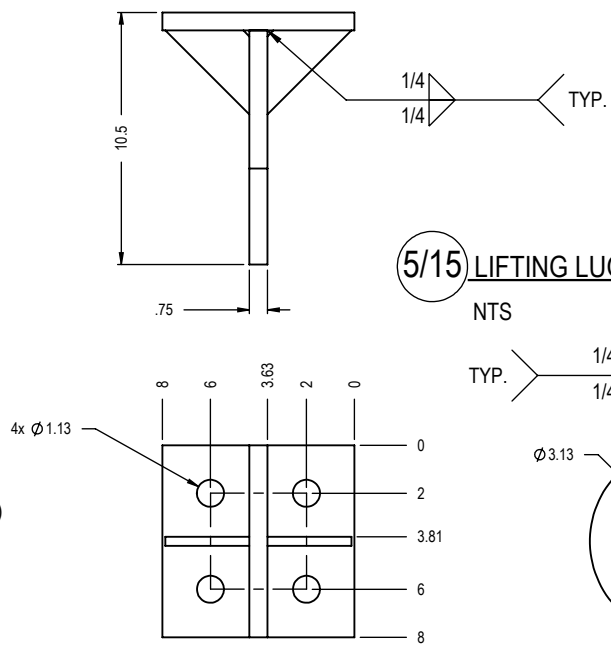
DRAWN BY	DATE
AJ	11/28/18
MATERIAL	
VARIOUS CRS	
FINISH	
SEE NOTE	

DESCRIPTION	
INTERIOR VIEW DETAILS	
SIZE B	DWG. NO. 45-31329
REV. 5	

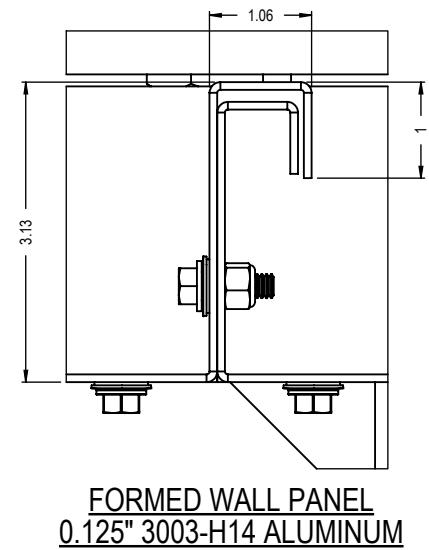
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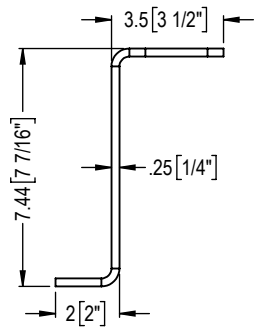
2/15 PERIMETER CHANNEL TO PAD DETAIL
NTS



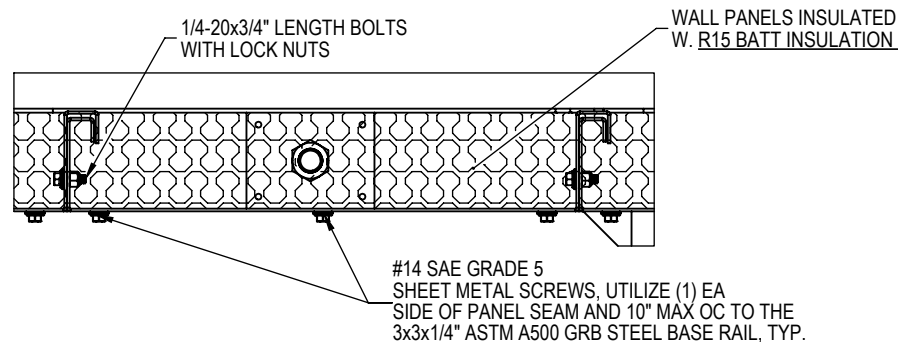
5/15 LIFTING LUG DETAIL
NTS



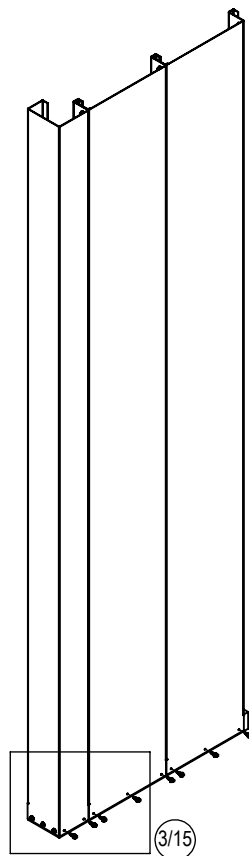
6/15 INTERIOR SKIN CONNECTION
NTS



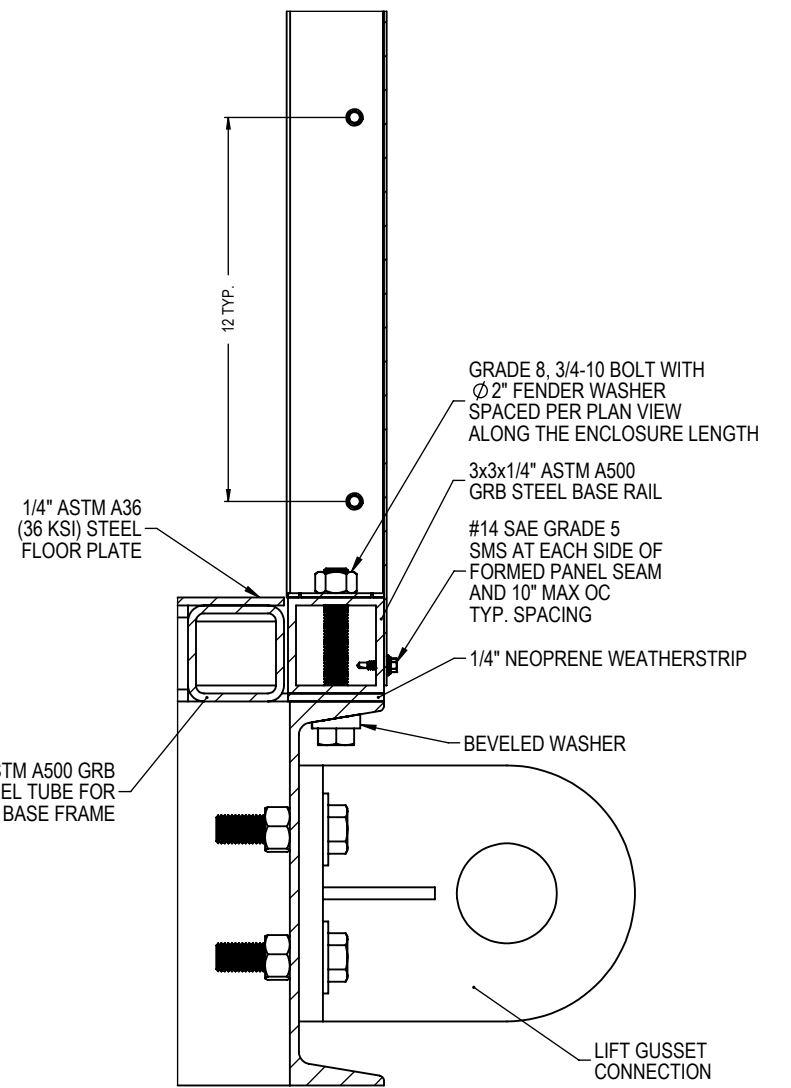
4/15 ENCLOSURE MOUNTING TO BASE FRAME
NTS - SECTION



1/15 INTERLOCKING PANELS
NTS - SECTION



3/15 INTERLOCKING PANEL TO BASE RAIL
NTS - ISOMETRIC VIEW



STEEL WALL CAP 1/4"
(Fy=33KSI, Fu=45KSI)

- NOTES:
1. ALL STEEL PARTS TO BE PRIMED PRIOR TO FABRICATION
 2. AIR BARRIER: COMPRISED OF SHEET STEEL AND CAULK ON EXTERIOR SEAMS WHICH MEET THE REQUIREMENTS OF AIR PERMEANCE NOT EXCEEDING 0.004 CFM/FT² PER IECC C402.5.1.2.1(15)

GLOBAL POWER COMPONENTS

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ISSUED FOR
CONSTRUCTION

AS-BUILT

CUSTOMER I/D:
ROCKWELL

PROJECT NAME:
XX

DRAWING REF:
XX

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
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ONE PLACE	.X	± .1
TWO PLACE	.XX	± .06
ANGLE		± 2°
HOLE DIA.		± .005

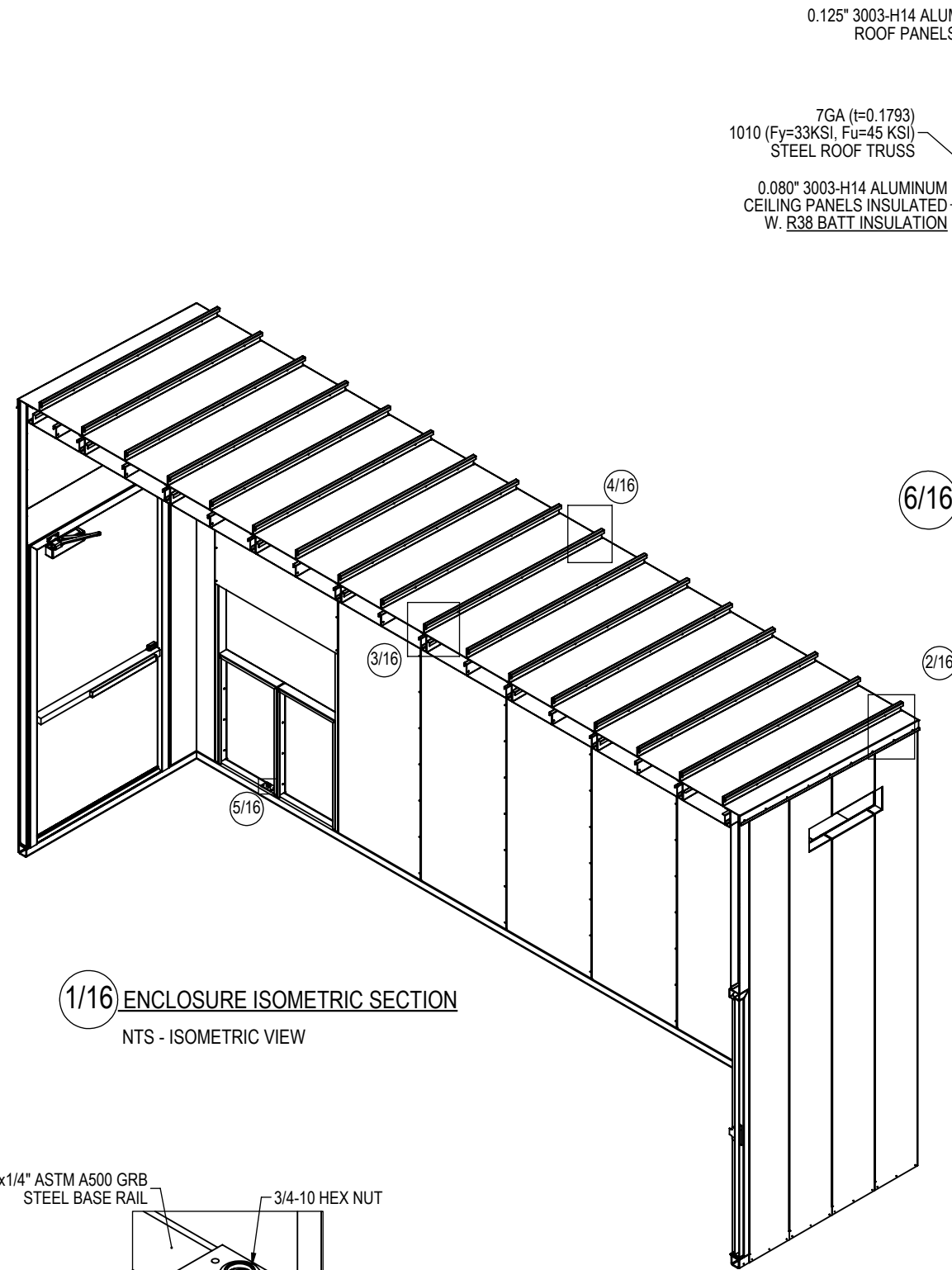
THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

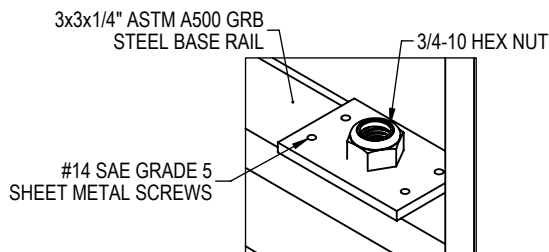
DRAWN BY AJ	DATE 11/28/18
MATERIAL VARIOUS CRS	
FINISH SEE NOTE	

DESCRIPTION GENERAL CONSTRUCTION DETAILS	
SIZE B	DWG. NO. 45-31329
REV. 5	

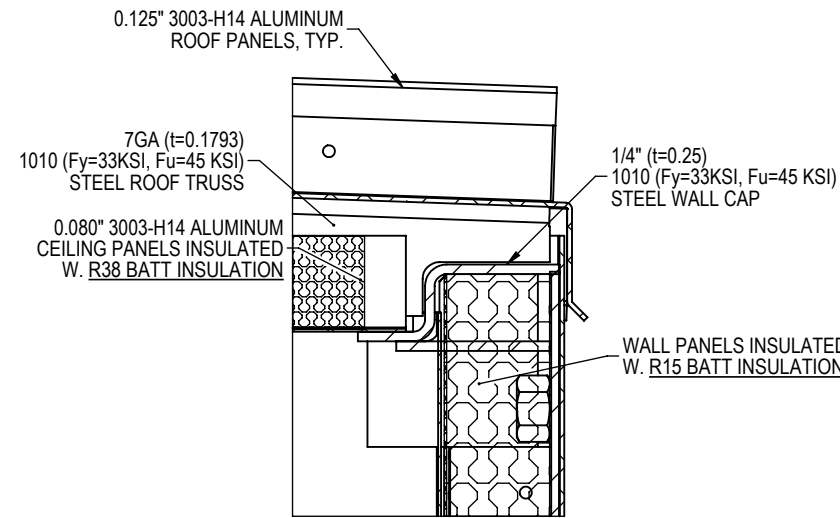
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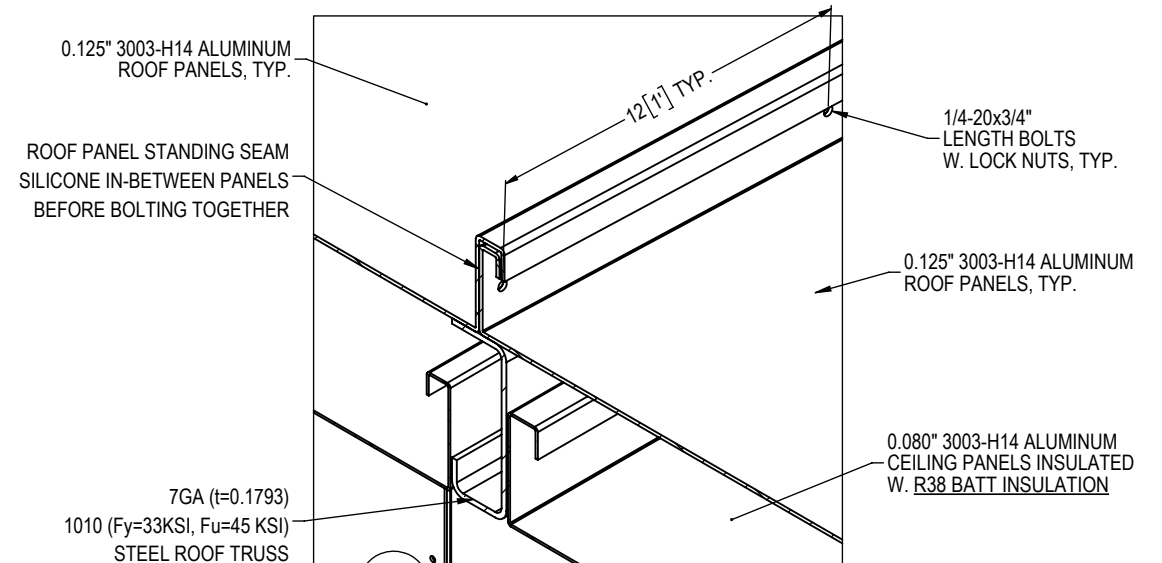
1/16 ENCLOSURE ISOMETRIC SECTION
NTS - ISOMETRIC VIEW



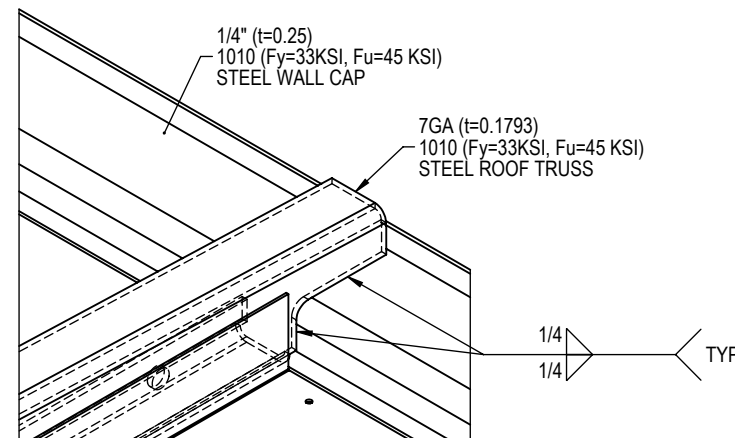
5/16 ENCLOSURE MOUNTING DETAIL
NTS - ISOMETRIC VIEW



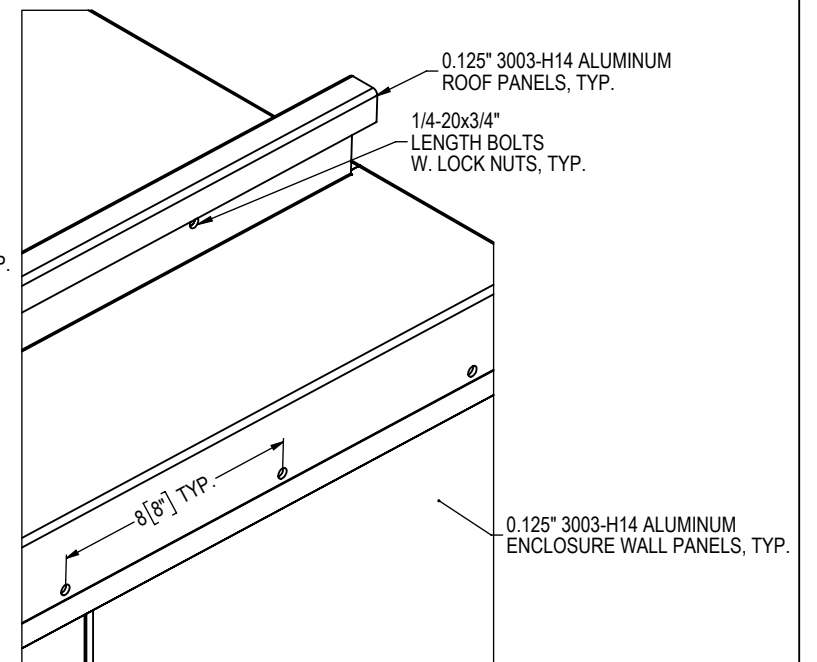
6/16 ENCLOSURE WALL DETAIL
NTS



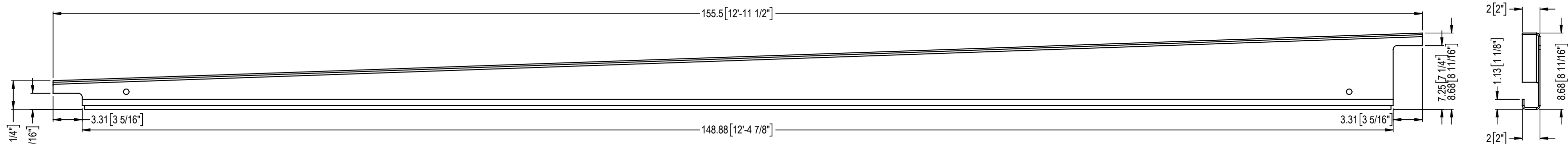
3/16 ROOF PANEL TO ROOF PANEL
NTS - ISOMETRIC VIEW



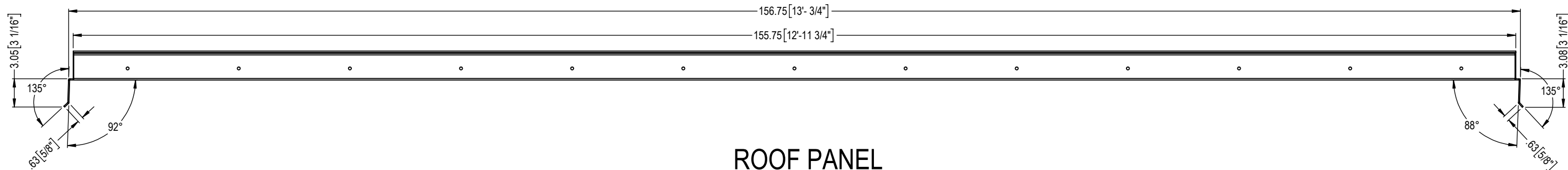
4/16 ROOF TRUSS TO WALL CAP
NTS - ISOMETRIC VIEW



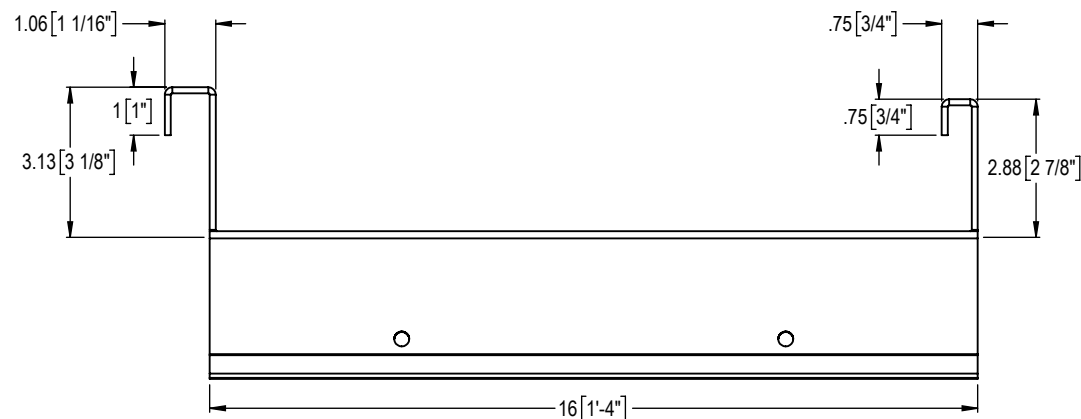
2/16 ROOF PANEL CONNECTION
NTS - ISOMETRIC VIEW



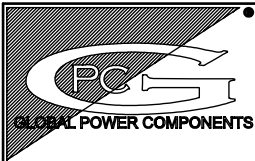
SINGLE SLOPE ROOF TRUSS
7GA.



ROOF PANEL
0.125" 3003-H14 ALUMINUM



NOTES:
1. ALL STEEL PARTS TO BE PRIMED PRIOR TO FABRICATION.

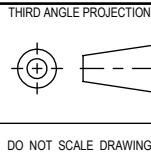


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AS-BUILT

CUSTOMER I/D:
ROCKWELL
PROJECT NAME:
ORO HONDO
DRAWING REF:
XX

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THE TOLERANCES ARE:
ONE PLACE .X ± .1
TWO PLACE .XX ± .06
ANGLE ± 2°
HOLE DIA. ± .005

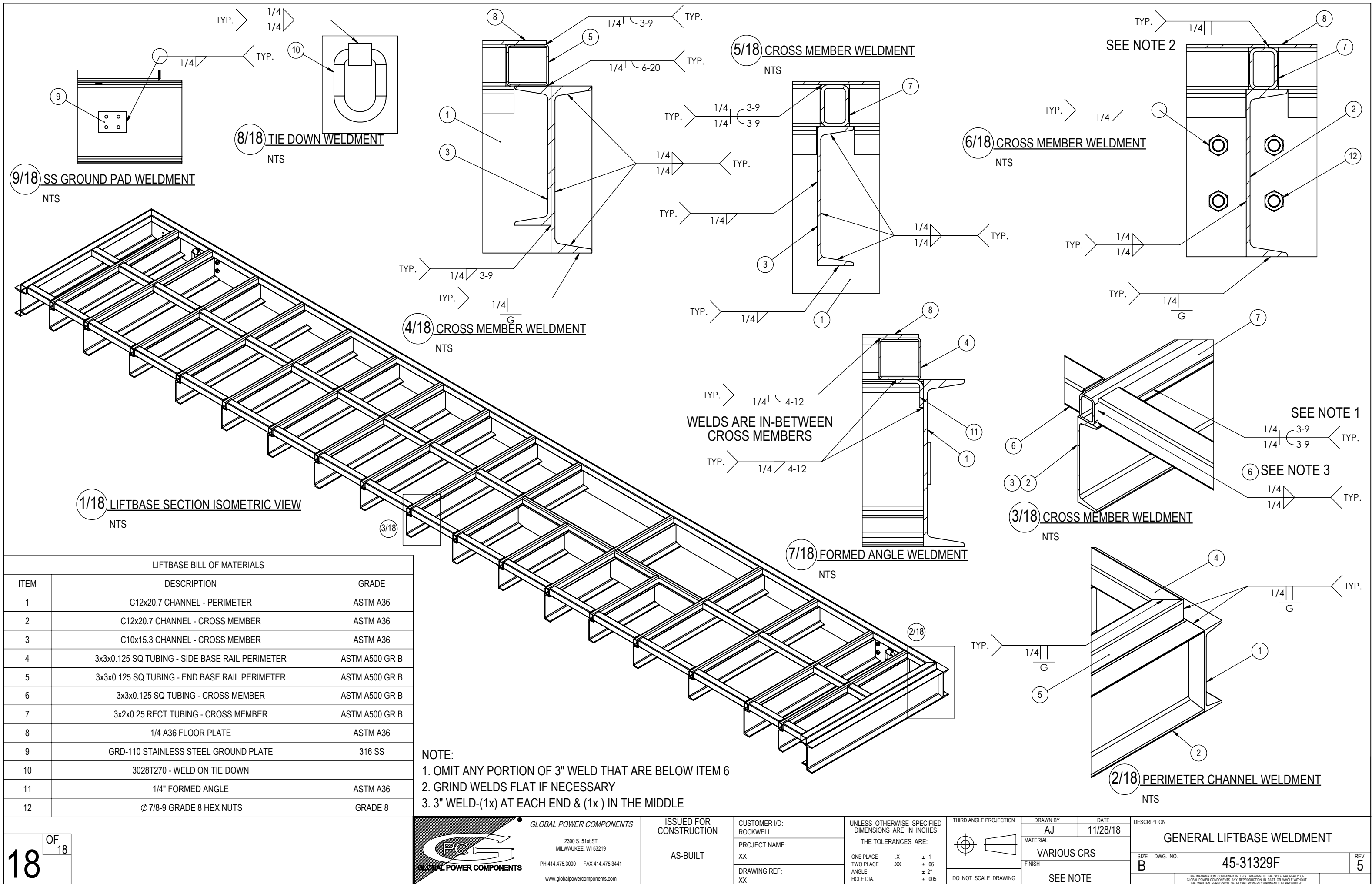


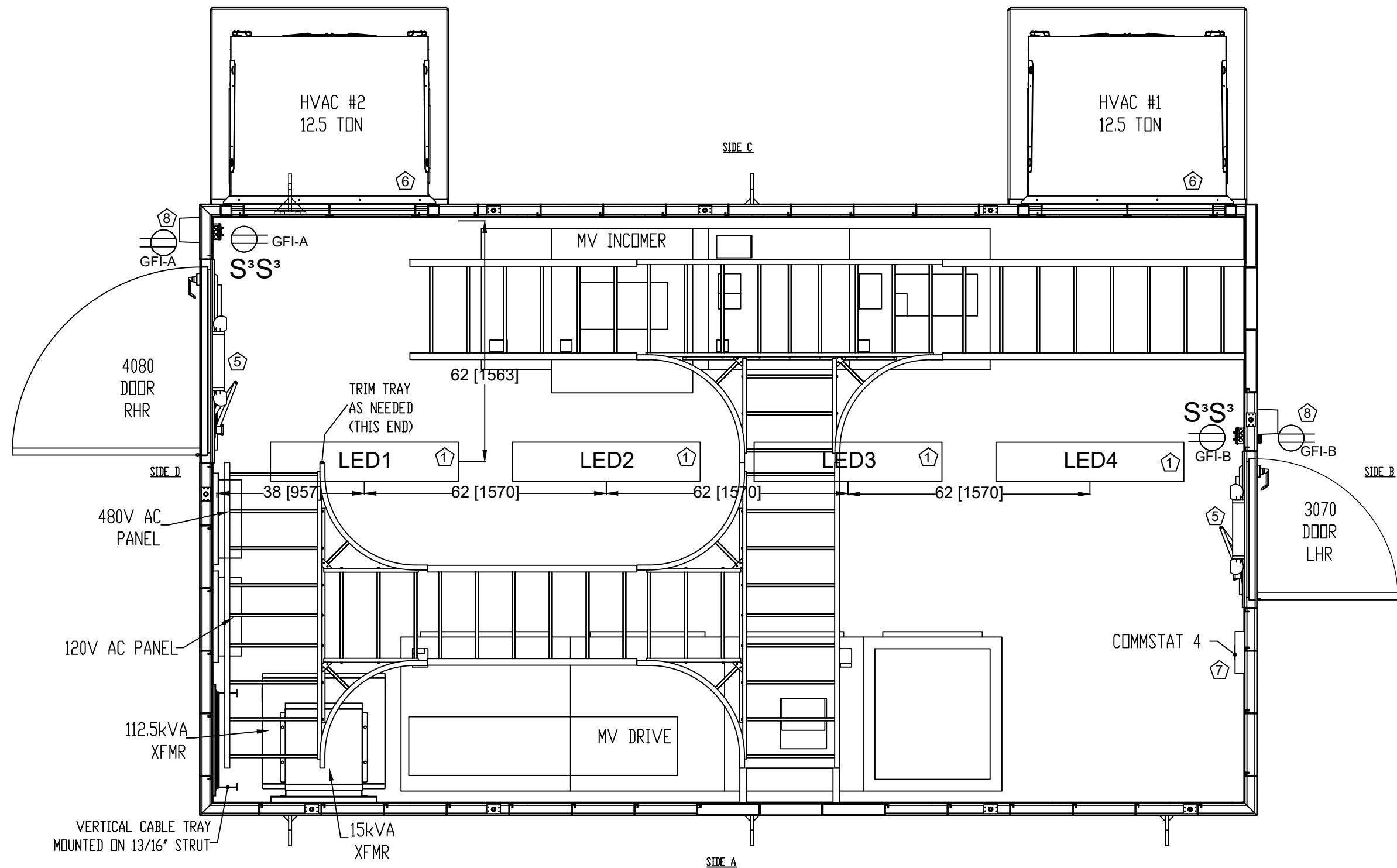
DO NOT SCALE DRAWING

DRAWN BY	DATE
AJ	11/28/18
MATERIAL	VARIOUS CRS
FINISH	SEE NOTE

DESCRIPTION		
GENERAL ENCLOSURE CONSTRUCTION		
SIZE	DWG. NO.	REV.
B	45-31329	5

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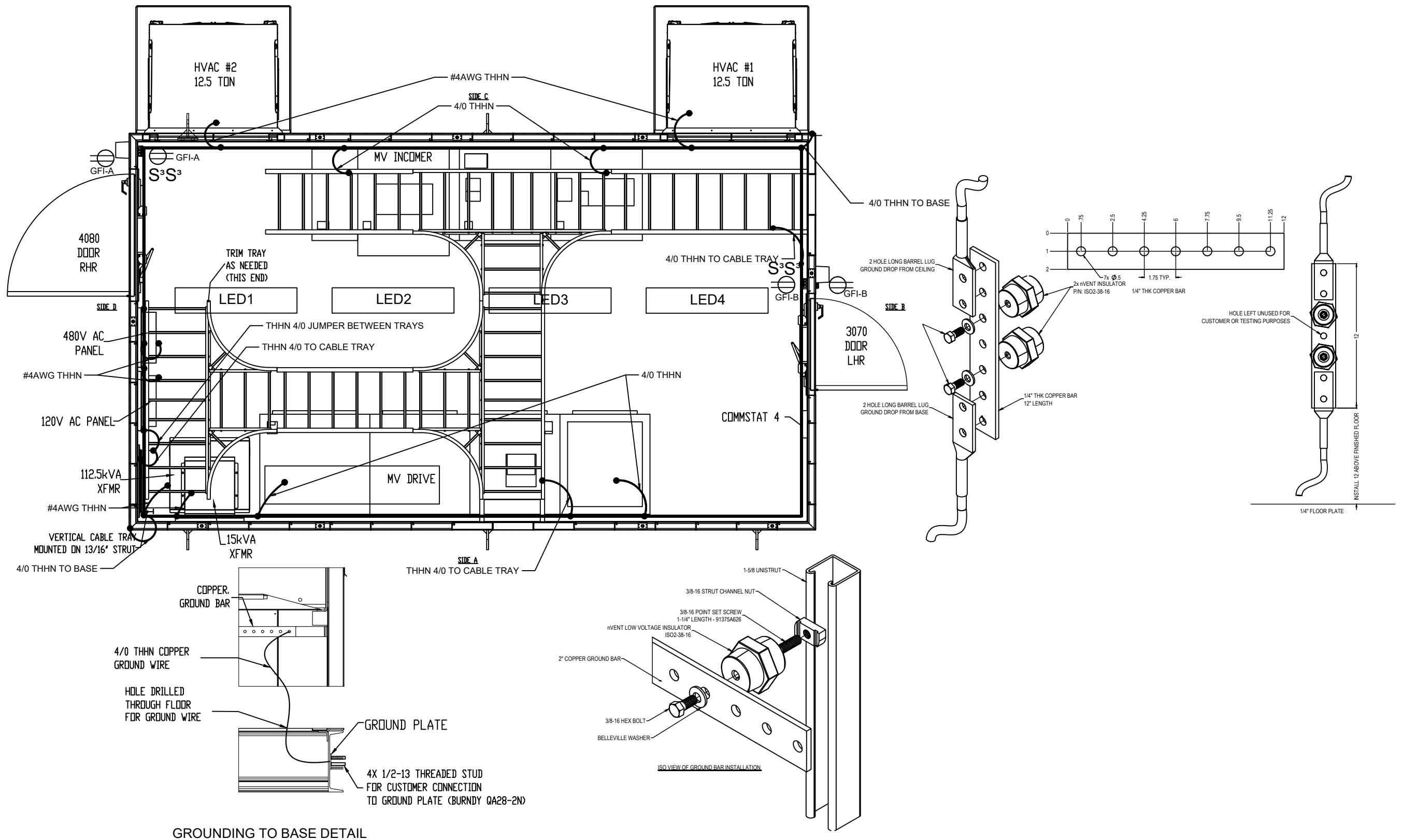
ELECTRIC BILL OF MATERIALS		
ITEM	DESCRIPTION	QTY:
1	LED INTERIOR LIGHT	4
2	3-WAY SWITCH	4
3	INTERIOR DUPLEX GFCI RECEPTACLE	2
4	EXTERIOR DUPLEX GFCI RECEPTACLE	2
5	LED EMERGENCY LIGHT/EXIT SIGN	2

****NOTE**-LED 3 MOUNTED UNDERNEATH CABLE TRAY**

6	12.5 TON HVAC	2
7	COMMSTAT-4 TSTAT	1
8	LED EXTERIOR LIGHT	2

SYMBOL LEGEND		
		
GFCI RECEPTACLE	LED LIGHT	3-WAY SWITCH

REV	DESCRIPTION	DATE	APPR.	 GLOBAL POWER COMPONENTS	GLOBAL POWER COMPONENTS 2300 S 51ST ST MILWAUKEE, WI 53219 PH (414) 475-3000 FAX (414) 475-3441 www.globalpowercomponents.com	CUSTOMER I/D: ROCKWELL JOB REF: ORD HONDO DRAWING REF: XXX	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES THE TOLERANCES ARE: ONE PLACE .X ± .1 TWO PLACE .XX ± .06 ANGLE ± 2° HOLE DIA. ± .005	 DO NOT SCALE DRAWING	DRAWN BY	DATE	DESCRIPTION ELECTRICAL PLAN VIEW SIZE DWG. NO. 45-31329 REV. 5 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF GLOBAL POWER COMPONENTS. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF GLOBAL POWER COMPONENTS IS PROHIBITED.
			JL						11/30/2018		
			MATERIAL						VARIOUS CRS		
			FINISH						SEE NOTE		



REV	DESCRIPTION	DATE	APPR.		GLOBAL POWER COMPONENTS 2300 S 51ST ST MILWAUKEE, WI 53219 PH (414)475-3000 FAX (414) 475-3441 www.globalpowercomponents.com	CUSTOMER I/D: ROCKWELL JOB REF: DRO HONDD DRAWING REF: XXX	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES THE TOLERANCES ARE: ONE PLACE .X ± .1 TWO PLACE .XX ± .06 ANGLE ± 2° HOLE DIA. ± .005	 DO NOT SCALE DRAWING	DRAWN BY	DATE	DESCRIPTION GROUNDING DETAIL SIZE DWG. NO. 45-31329 REV. 5
		JL	11/30/2018						MATERIAL	VARIOUS CRS	
									FINISH		

SCHEDULE FOR: 120/240V AC PANEL		LOCATION: MEC		FED FROM: 15kVA XFMR	
VOLTAGE	120/240V	NEUTRAL	YES	MIN. A.I.C RATING	10000
MAIN BUS	100A	NUMBER OF POLES	18	COMMENTS	120/240VAC 1PHASE-3WIRE
MCB RATING	100A	EQUIP. GROUND BUS	YES	MOUNTING	SURFACE

* - PROVIDED BY OTHERS
 _____GPC WIRING
 _____WIRING BY OTHERS

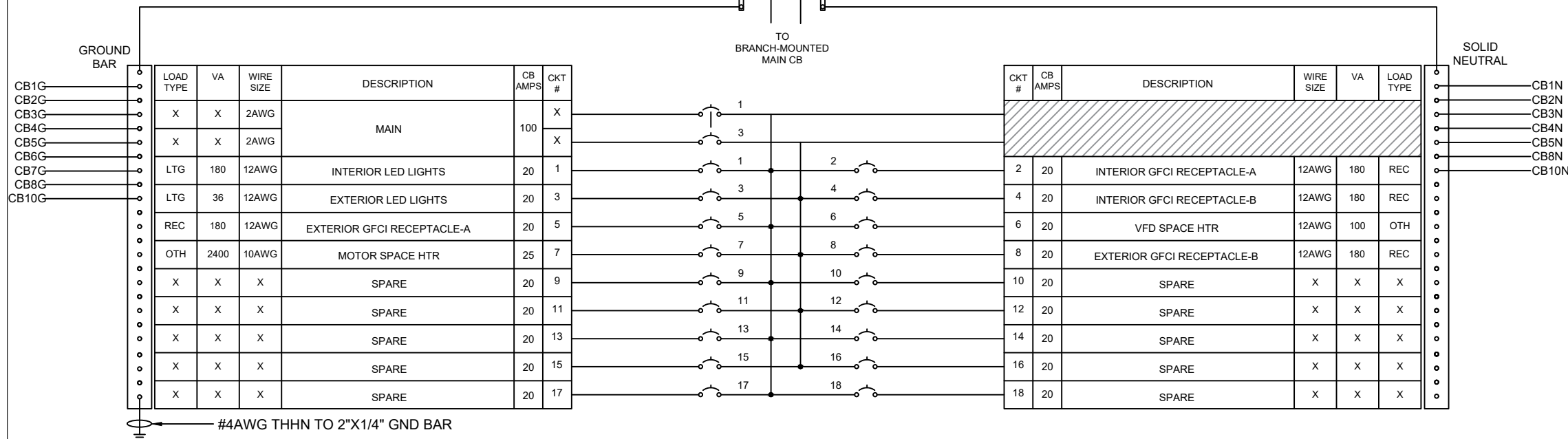
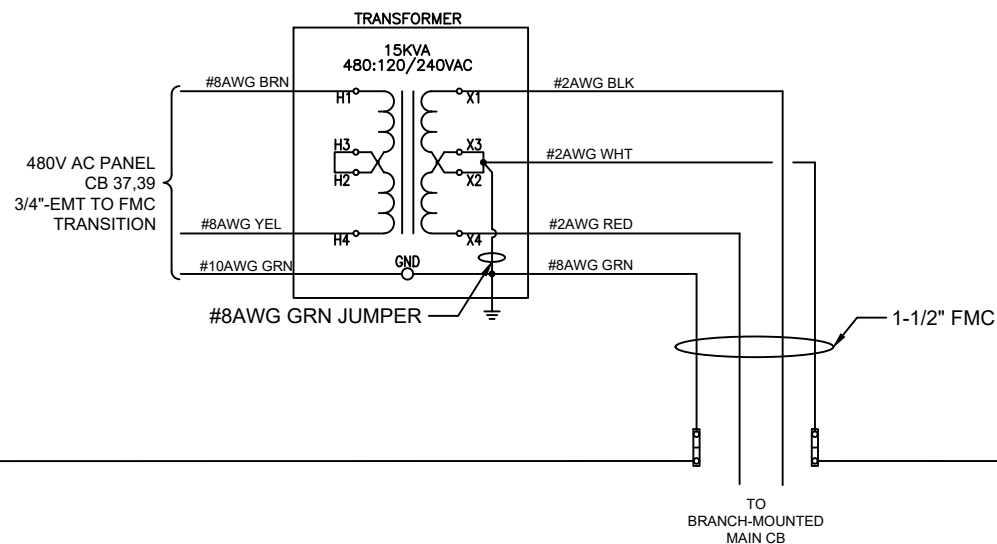
NOTES:

- MINIMUM 12AWG THHN STRANDED WIRING TO BE USED FOR DISTRIBUTION PANEL FEEDER CIRCUITS UNLESS OTHERWISE NOTED, HVAC CONTROLS #18AWG THERMOSTAT CABLE.
- ALL INTERIOR CIRCUITS TO BE WIRED IN MINIMUM 3/4" EMT CONDUIT.
- ALL EXTERIOR CIRCUITS TO BE WIRED IN MINIMUM 3/4" RIGID CONDUIT.
- ALL CABLES LOCATED IN A PLENUM SHALL BE SPECIFICALLY LISTED FOR USE WITHIN AN AIR HANDLING SPACE.
- ALL FIXTURES TO BE MOUNTED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

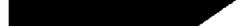
LOAD TYPES:

EX	EXISTING
LTG	LIGHTING
REC	RECEPTACLES
MOT	MOTOR
HAC	HVAC
HNC	NONCOINCIDENT HEATING
CNC	NONCOINCIDENT COOLING
OTH	OTHER
FUT	FUTURE

PHASE A TOTAL LOAD	640 VA
PHASE B TOTAL LOAD	2796 VA
TOTAL CONNECTED LOAD	3436 VA



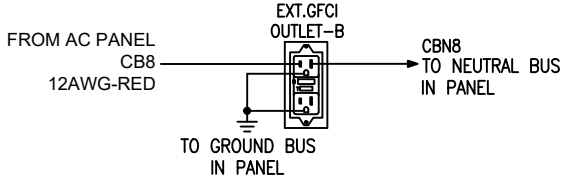
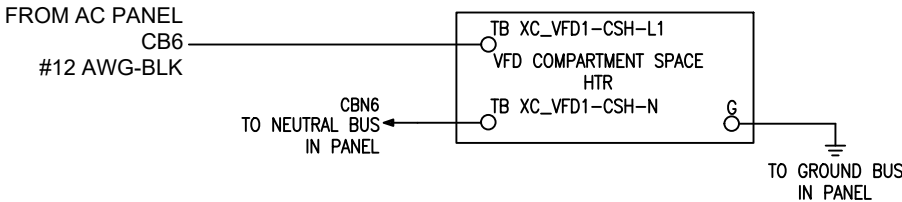
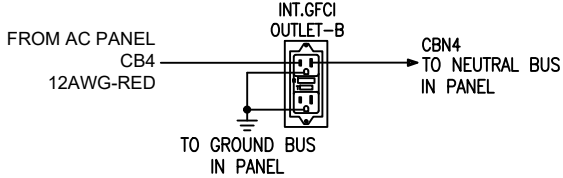
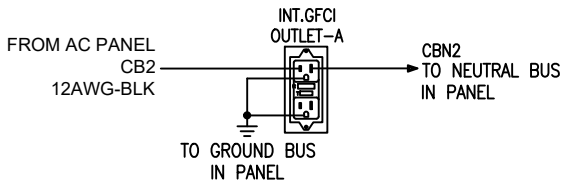
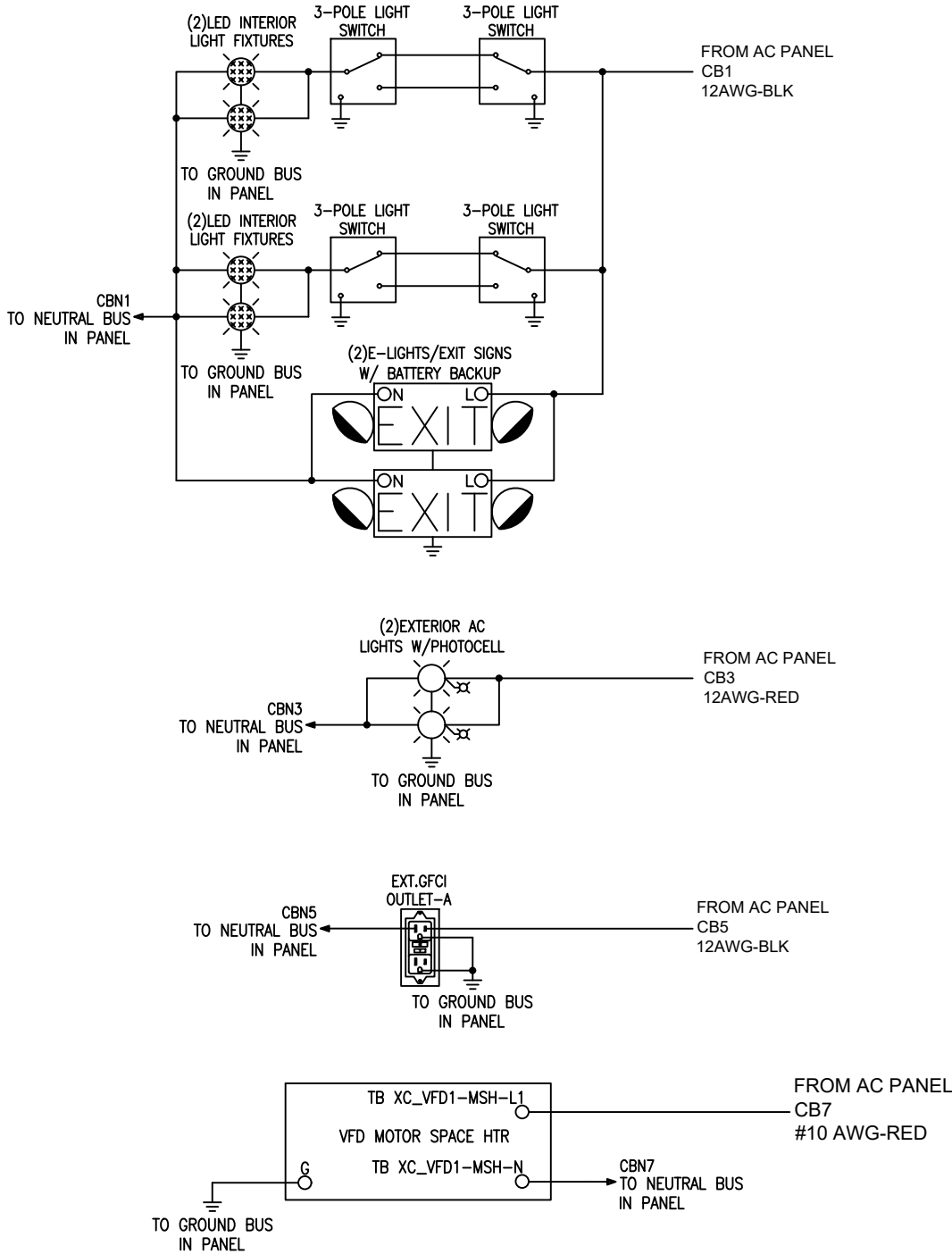
CONTINUOUS LOAD TOTAL	216 VA
NON-CONTINUOUS LOAD TOTAL	3220 VA
125% OF CONTINUOUS LOAD	270 VA
LOAD TOTAL	3490 VA
CALCULATED MINIMUM FEEDER WIRE SIZE	#12AWG PER PHASE #12AWG GND
FEEDER WIRE SIZE	#2AWG PER PHASE #8AWG GND

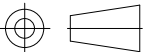
REV	DESCRIPTION	DATE	APPR.	 GLOBAL POWER COMPONENTS 2300 S 51ST ST MILWAUKEE, WI 53219 PH (414) 475-3000 FAX (414) 475-3441 www.globalpowercomponents.com	GLOBAL POWER COMPONENTS 2300 S 51ST ST MILWAUKEE, WI 53219 PH (414) 475-3000 FAX (414) 475-3441 www.globalpowercomponents.com	CUSTOMER I/D: ROCKWELL JOB REF: ORD HONDO DRAWING REF: XXX	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES THE TOLERANCES ARE: ONE PLACE .X ± .1 TWO PLACE .XX ± .06 ANGLE ± 2° HOLE DIA. ± .005	 DO NOT SCALE DRAWING	<table><tr><td>DRAWN BY</td><td>DATE</td></tr><tr><td>JL</td><td>11/30/2018</td></tr><tr><td>MATERIAL</td><td rowspan="2">VARIOUS CRS</td></tr><tr><td>FINISH</td></tr></table>	DRAWN BY	DATE	JL	11/30/2018	MATERIAL	VARIOUS CRS	FINISH	<table><tr><td colspan="3">DESCRIPTION</td></tr><tr><td colspan="3">120-240V AC PANEL</td></tr><tr><td>SIZE</td><td>DWG. NO.</td><td>REV.</td></tr><tr><td>B</td><td>45-31329</td><td>5</td></tr></table>	DESCRIPTION			120-240V AC PANEL			SIZE	DWG. NO.	REV.	B	45-31329	5
DRAWN BY	DATE																												
JL	11/30/2018																												
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				THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF GLOBAL POWER COMPONENTS. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN CONSENT OF GLOBAL POWER COMPONENTS IS PROHIBITED.																									

- * - PROVIDED BY OTHERS
- GPC WIRING
- - - WIRING BY OTHERS

NOTES:

- MINIMUM 12AWG THHN STRANDED WIRING TO BE USED FOR DISTRIBUTION PANEL FEEDER CIRCUITS UNLESS OTHERWISE NOTED, HVAC CONTROLS #18AWG THERMOSTAT CABLE.
- ALL INTERIOR CIRCUITS TO BE WIRED IN MINIMUM ¾" EMT CONDUIT.
- ALL EXTERIOR CIRCUITS TO BE WIRED IN MINIMUM ¾" RIGID CONDUIT.
- ALL CABLES LOCATED IN A PLENUM SHALL BE SPECIFICALLY LISTED FOR USE WITHIN AN AIR HANDLING SPACE.
- ALL FIXTURES TO BE MOUNTED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.



REV	DESCRIPTION	DATE	APPR.		GLOBAL POWER COMPONENTS 2300 S 51ST ST MILWAUKEE, WI 53219 PH (414)475-3000 FAX (414) 475-3441 www.globalpowercomponents.com	CUSTOMER I/D: ROCKWELL JOB REF: ORD HONDD DRAWING REF: XXX	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES THE TOLERANCES ARE: ONE PLACE .X ± .1 TWO PLACE .XX ± .06 ANGLE ± 2° HOLE DIA. ± .005	 DO NOT SCALE DRAWING	DRAWN BY	DATE	DESCRIPTION 120-240V AC PANEL DETAIL SIZE B DWG. NO. 45-31329 REV. 5 THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF GLOBAL POWER COMPONENTS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF GLOBAL POWER COMPONENTS IS PROHIBITED.
		MATERIAL	VARIOUS CRS								
		FINISH	SEE NOTE								

SCHEDULE FOR: 480/277 VAC PANEL		LOCATION: MEC		FED FROM: 112.5kVA XFMR	
VOLTAGE	480/277V	NEUTRAL	YES	MIN. A.I.C RATING	25000
MAIN BUS	250A	NUMBER OF POLES	42	COMMENTS	480/277VAC 3PHASE-4WIRE
MCB RATING	200A	EQUIP. GROUND BUS	YES	MOUNTING	SURFACE

- * - PROVIDED BY OTHERS

GPC WIRING

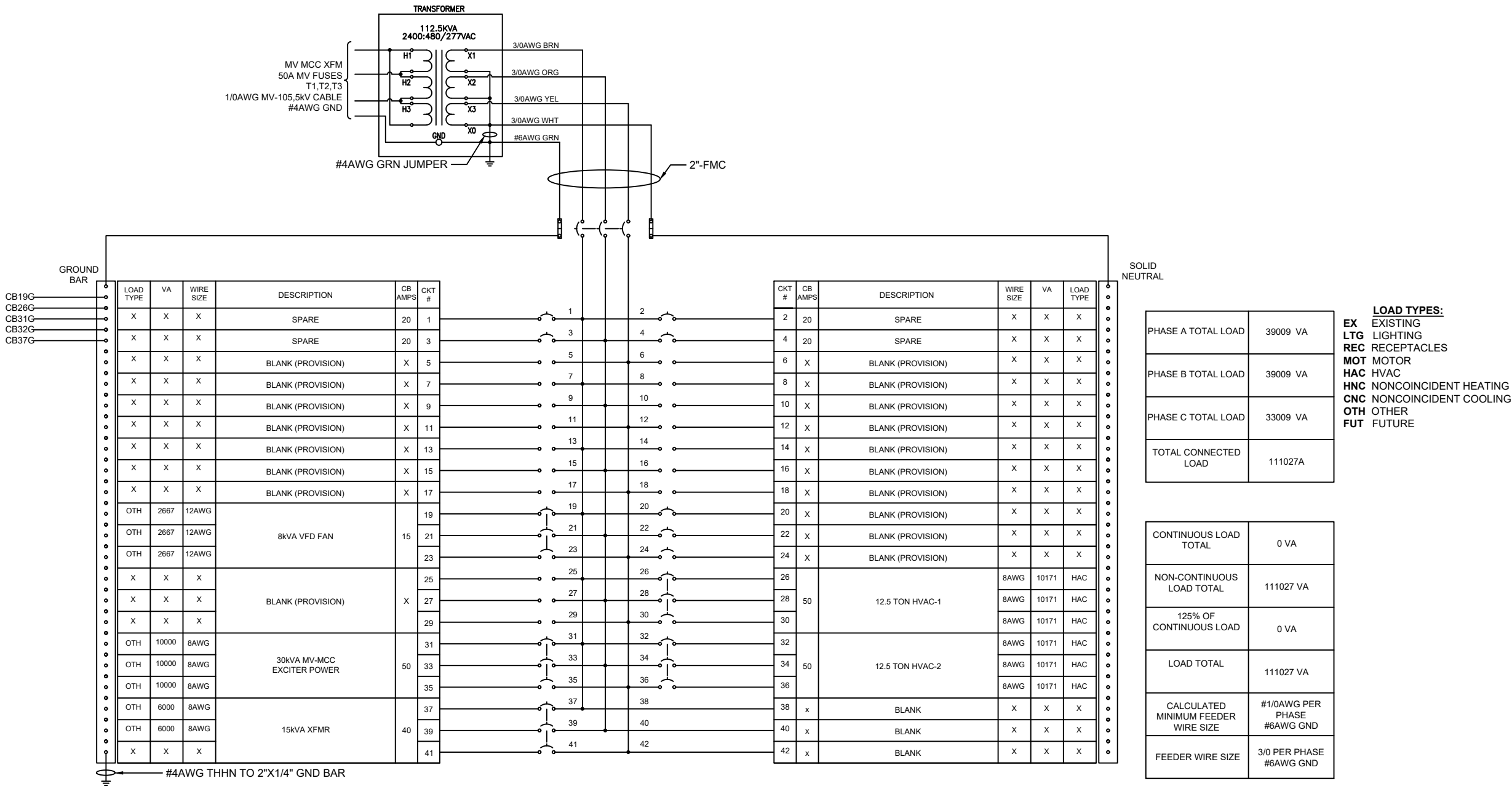
WIRING BY OTHERS
- NOTES:
- MINIMUM 12AWG THHN STRANDED WIRING TO BE USED FOR DISTRIBUTION PANEL FEEDER CIRCUITS UNLESS OTHERWISE NOTED, HVAC CONTROLS #18AWG THERMOSTAT CABLE.

• ALL INTERIOR CIRCUITS TO BE WIRED IN MINIMUM ¾" EMT CONDUIT.

• ALL EXTERIOR CIRCUITS TO BE WIRED IN MINIMUM ¾" RIGID CONDUIT.

• ALL CABLES LOCATED IN A PLENUM SHALL BE SPECIFICALLY LISTED FOR USE WITHIN AN AIR HANDLING SPACE.

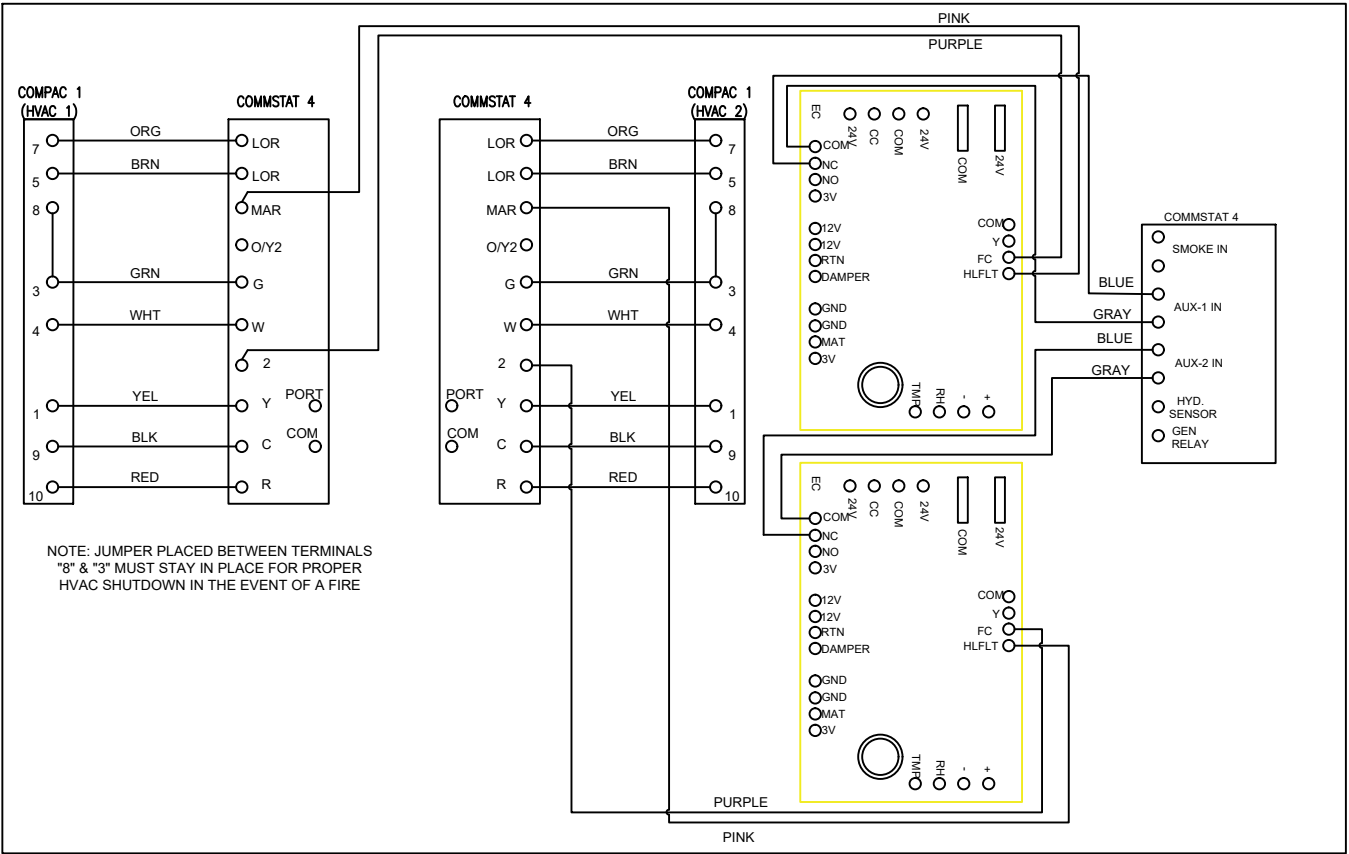
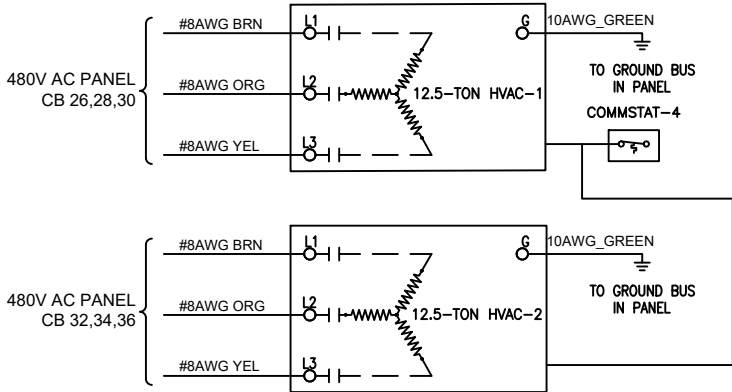
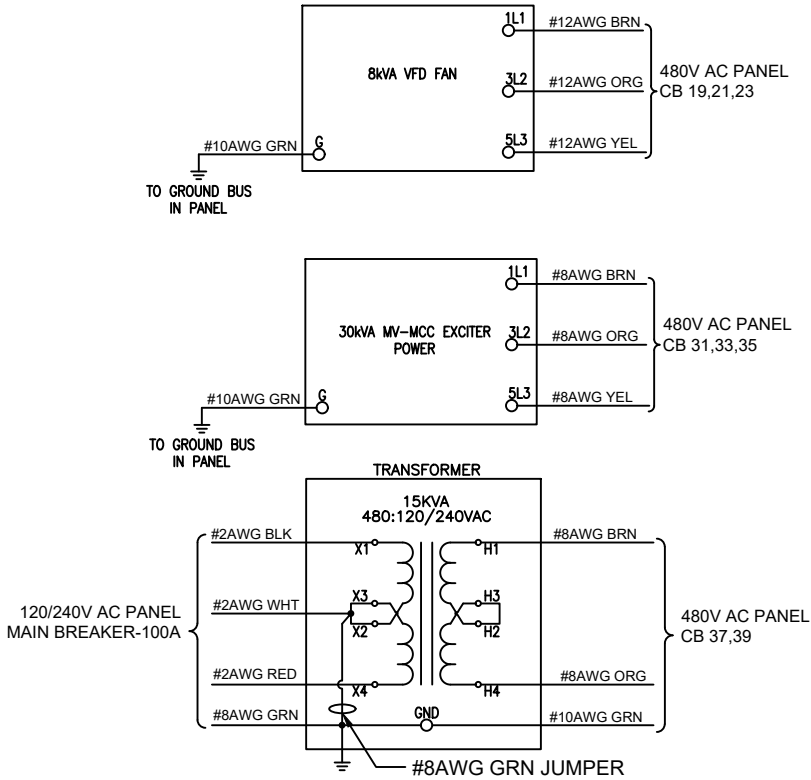
• ALL FIXTURES TO BE MOUNTED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

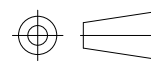


- * - PROVIDED BY OTHERS
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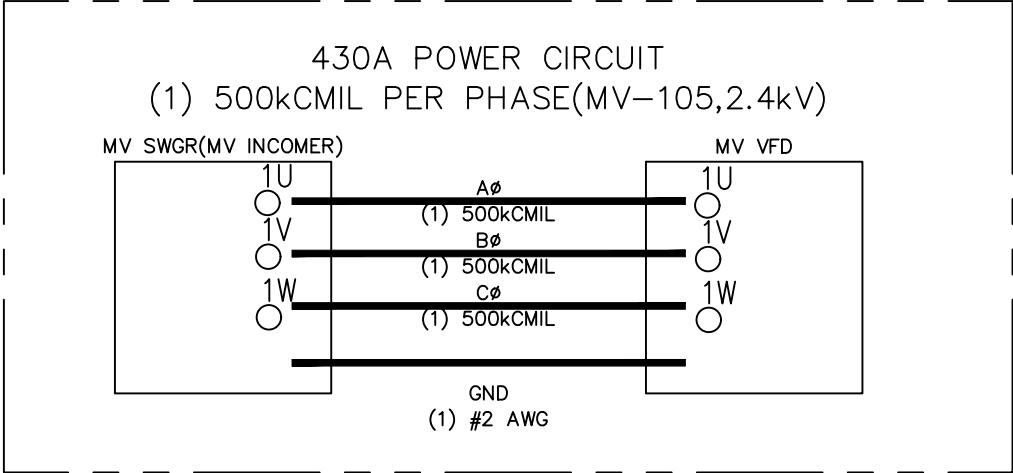


REV	DESCRIPTION	DATE	APPR.	 GLOBAL POWER COMPONENTS	GLOBAL POWER COMPONENTS 2300 S 51ST ST MILWAUKEE, WI 53219 PH (414)475-3000 FAX (414) 475-3441 www.globalpowercomponents.com	CUSTOMER I/D: ROCKWELL JOB REF: ORD HONDD DRAWING REF: XXX	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES THE TOLERANCES ARE: ONE PLACE .X ± .1 TWO PLACE .XX ± .06 ANGLE 2° ± .005 HOLE DIA.	 DO NOT SCALE DRAWING	DRAWN BY	DATE	DESCRIPTION 480-277V AC PANEL DETAIL SIZE DWG. NO. 45-31329 REV. 5
									JL	11/30/2018	

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--- GPC WIRING
--- WIRING BY OTHERS

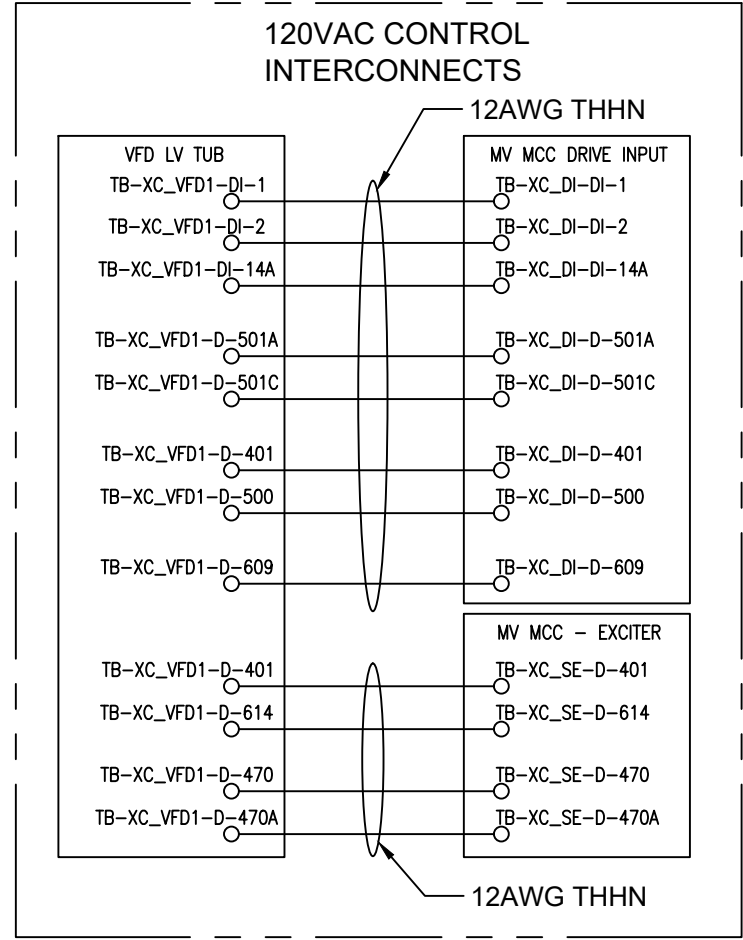
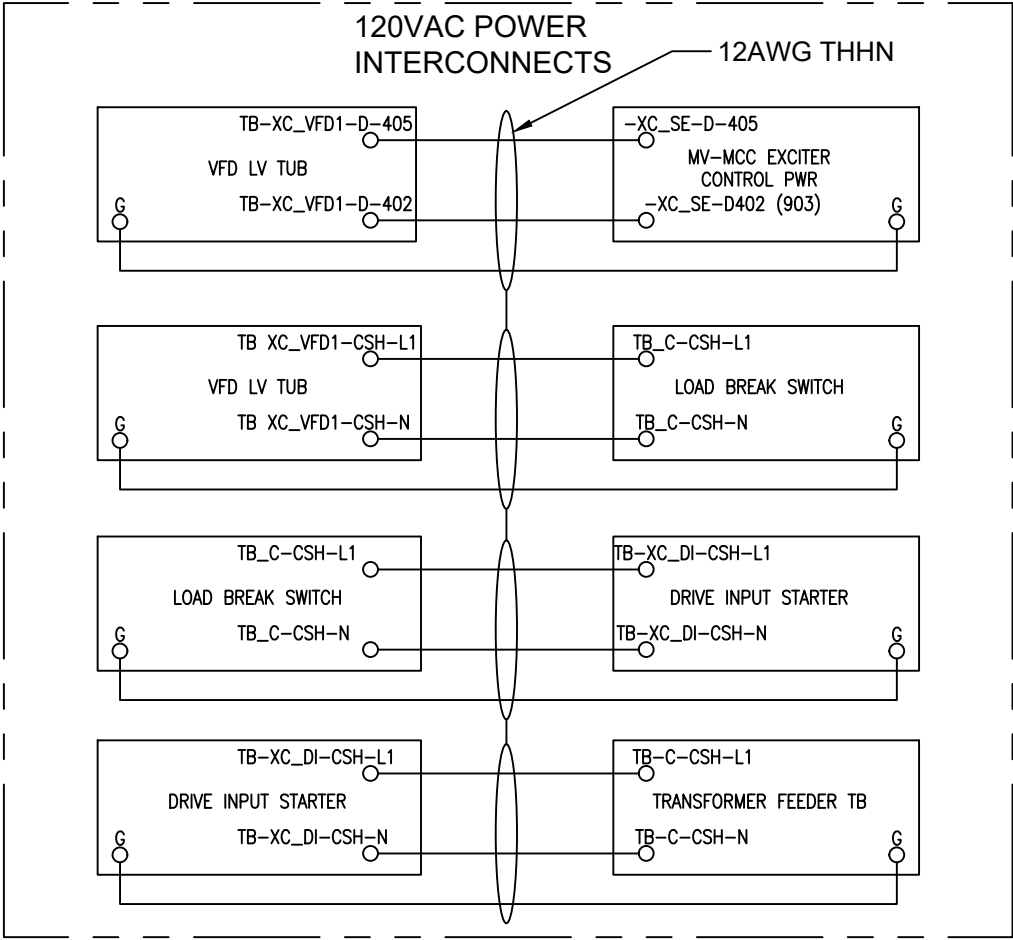
NOTES:

- MINIMUM 12AWG THHN STRANDED WIRING TO BE USED FOR DISTRIBUTION PANEL FEEDER CIRCUITS UNLESS OTHERWISE NOTED, HVAC CONTROLS #18AWG THERMOSTAT CABLE.
- ALL INTERIOR CIRCUITS TO BE WIRED IN MINIMUM 3/4" EMT CONDUIT.
- ALL EXTERIOR CIRCUITS TO BE WIRED IN MINIMUM 3/4" RIGID CONDUIT.
- ALL CABLES LOCATED IN A PLENUM SHALL BE SPECIFICALLY LISTED FOR USE WITHIN AN AIR HANDLING SPACE.
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**NOTE:

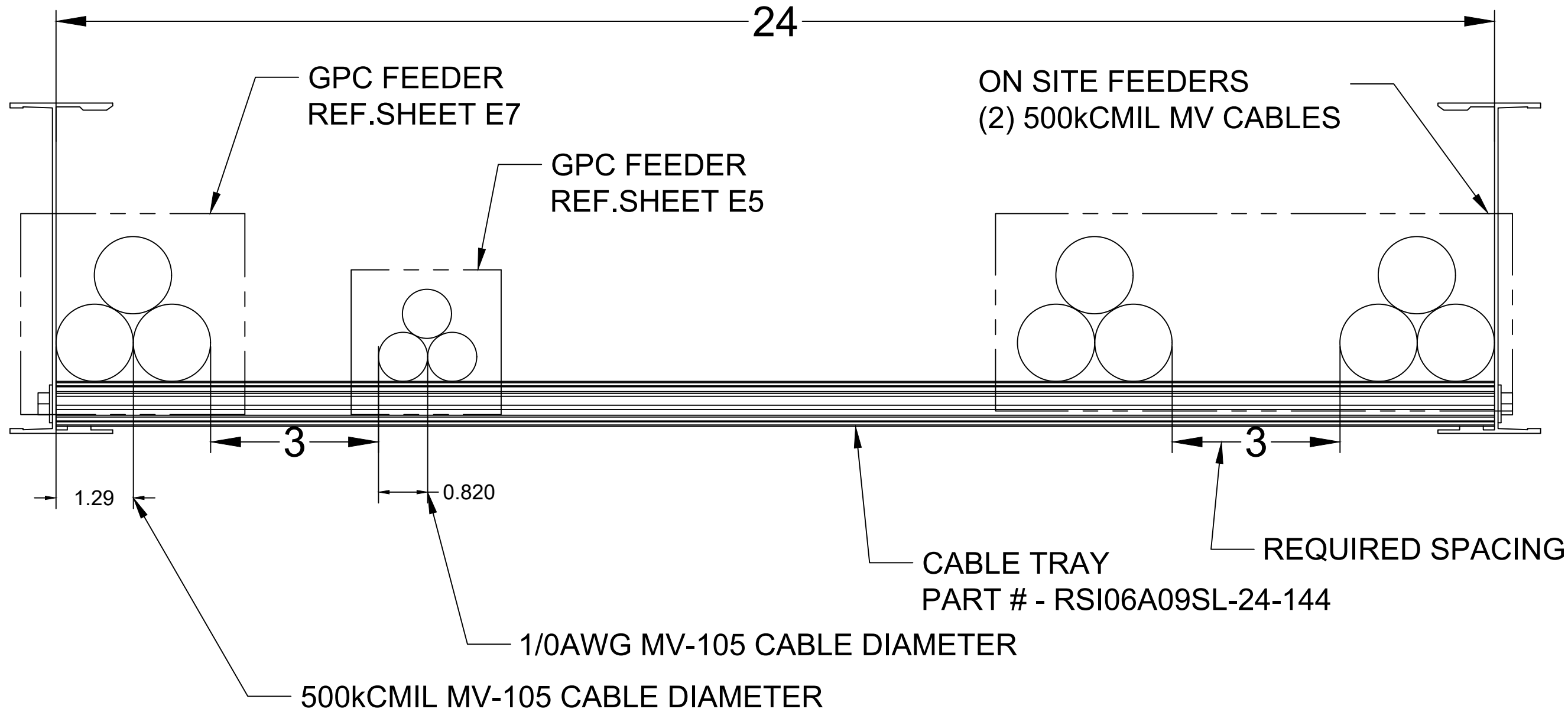
- MV-CABLES TO BE TRIPLEXED IN CABLE TRAY.
- TRANSITION FROM CABLE TRAY TO GEAR MUST BE FREE AIR. (NO CONDUIT STUBS)
- TRANSITION FROM CABLE TRAY TO GEAR MUST NOT EXCEED SIX(6) FEET.**

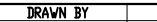


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									MATERIAL	2/14/2019						
									FINISH	SEE NOTE			THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF GLOBAL POWER COMPONENTS. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF GLOBAL POWER COMPONENTS IS PROHIBITED.			

Rockwell Automation

PROJECT: VFD REPLACEMENT PF7000B

CUSTOMER: FERMILAB - FRA LLC

PROJECT NUMBER: MVB6504154112

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION, INC.		
A	J. HAD	2018-10-05	APPROVAL					
00	J. HAD	2018-11-15	REL TO MFG					
01	J. HAD	2019-03-06	AS SHIPPED					
				CUSTOMER: FERMILAB - FRA LLC	MV PROJECT PROJECT TITLE PAGE	SHEET 0001 OF 0001 SIZE A1 10004347574 VER 01		
				ORDER-LINE NUMBER: MVB6504154112				
PROJ. DOC. TYPE: TLP				LANG: EN	DRAWN BY: J. HAD	DATE: 2018-10-05		

PROJECT INDEX

DOCUMENT NO	TYPE	VER	DESCRIPTION	ASSIGNED TO
10004347574	TLP	01	MV PROJECT, PROJECT TITLE PAGE	MVB6504154112
10004347576	IDX	01	MV PROJECT, PROJECT INDEX	MVB6504154112
10004347575	NTS	00	MV PROJECT, PROJECT GENERAL NOTES	MVB6504154112
10004347513	DDSL	00	MV BULLETIN 7000MCC, LINEUP SPECIFICATION AND LAYOUT	MVB6504154112-01
10004347573	DDSL	00	MV BULLETIN 1500MCC, LINEUP SPECIFICATION AND LAYOUT	MVB6504154112-02
10004347551	OLD	01	MV BULLETIN 7000MCC, LINEUP MV POWER ONELINE,	MVB6504154112-01
10004347571	OLD	01	MV BULLETIN 1500MCC, LINEUP MV POWER ONELINE,	MVB6504154112-02
10004347552	ILK	00	MV BULLETIN 7000MCC, LINEUP MECHANICAL INTERLOCK DIAGRAM	MVB6504154112-01
10004347572	ILK	01	MV BULLETIN 1500MCC, LINEUP MECHANICAL INTERLOCK DIAGRAM	MVB6504154112-02
10004347216	DDSD	00	MV BULLETIN 7000STR, STRUCTURE LAYOUT	MVB6504154112-01-01-01
10004347255	DDSD	00	MV BULLETIN 1500STR, STRUCTURE LAYOUT	MVB6504154112-02-01-01
10004347269	DDSD	00	MV BULLETIN 1500STR, STRUCTURE LAYOUT	MVB6504154112-02-02-01
10004347357	DDSD	00	MV BULLETIN 1500STR, STRUCTURE LAYOUT	MVB6504154112-02-04-01
10004346731	SPC	00	MV BULLETIN 7000, UNIT SPECIFICATION	MVB6504154112-01-01-01-01
10004347082	ELD	01	MV BULLETIN 7000 DIRECT TO DRIVE, UNIT ELECTRICAL DIAGRAM	MVB6504154112-01-01-01-01
10004346898	SPC	00	MV BULLETIN 1592M, UNIT SPECIFICATION	MVB6504154112-02-01-01-01
10004346893	ELD	00	MV BULLETIN 1592M, UNIT ELECTRICAL DIAGRAM	MVB6504154112-02-01-01-01
10004346957	SPC	01	MV BULLETIN 1512AD, UNIT SPECIFICATION	MVB6504154112-02-02-01-01
10004346953	ELD	01	MV BULLETIN 1512AD, UNIT ELECTRICAL DIAGRAM	MVB6504154112-02-02-01-01
10004347009	SPC	01	AC BRUSHLESS EXCITER, UNIT SPECIFICATION	MVB6504154112-02-04-01-01
10004347005	ELD	01	AC BRUSHLESS EXCITER UNIT, UNIT ELECTRICAL DIAGRAM	MVB6504154112-02-04-01-01
10004347089	SPC	01	MV BULLETIN 1512B, UNIT SPECIFICATION	MVB6504154112-02-04-01-02
10004385893	ELD	01	MV BULLETIN 1512BT, UNIT ELECTRICAL DIAGRAM	MVB6504154112-02-04-01-02

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A	J. HAD	2018-10-05	APPROVAL					
00	J. HAD	2018-11-16	REL TO MFG					
01	J. HAD	2019-03-18	AS SHIPPED					
				CUSTOMER: FERMILAB - FRA LLC	MV PROJECT PROJECT INDEX			
				ORDER-LINE NUMBER: MVB6504154112				
PROJ. DOC. TYPE:IDX				LANG:EN	DRAWN BY: J. HAD		DATE: 2018-10-05	
						SHEET	0001 OF 0001	
						SIZE	A1	VER
							10004347576	01

PROJECT GENERAL NOTES

[illegible]

CUSTOMER MODIFICATION DESCRIPTIONS

CUSTOMER MODIFICATION DESCRIPTIONS		ITEM 101	ITEM 201	ITEM 202	ITEM 204	
		7000B VFD	1592MT LBS	1512AD VFD INPUT	1591B-TOP	1512BT-BOTTOM
CMOD1	AC BRUSHLESS EXCITER LOCATED IN 1591B UNIT - 38A @ 480V OUTPUT TO THE MOTOR FIELD, THE MOTOR EXCITATION IS 17KW, 136A @ 125VDC.	X			X	
CMOD4	ADD RTD SCANNER 857-RAD FOR MPR 857 IN LV SECTION OF 1512AD.			X		
CMOD5	VIRTUAL SUPPORT ENGINEER WITH ETHERNET COMMUNICATION.	X				
CMOD6	3000HP MOTOR RUNNING WITH 40% LOAD AT FULL SPEED, THE ESTIMATED CURRENT AT 40% LOAD IS 320A, THE VFD RATING SELECTED IS 430A.	X				
CMOD7	SITE ALTITUDE IS 4950 FEET.	X	X	X	X	X
CMOD8	CONTROLLOGIX PLC FOR EXCITER CONTROL				X	
CMODX	---					
CMODX	---					

DUE TO 1000M-2000M HIGH ALTITUDE, THE FOLLOWING HAVE BEEN DE RATED:

1512AD POWER CELL DEREATED FROM 540A TO 525A

1512BT POWER CELL DERATED FROM 180A TO 170A

1592MT POWER CELL DERATED FROM 1200A TO 1170A

BIL DERATED FROM 60KV TO 54KV

POWER FUSED DERATED FOR 6%.

[illegible]

PROJECT:	VFD REPLACEMENT PF7000B
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CUSTOMER:	FERMILAB - FRA LLC
-----------	--------------------

ORDER-LINE NUMBER:	MVB6504154112
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LANG: EN



MV PROJECT
PROJECT GENERAL NOTES

DRAWN BY: J. HAD

DATE: 2018-10-05

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SIZE
A1

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ABBREVIATIONS

AC	ALTERNATING CURRENT
DC	DIRECT CURRENT
JC	JUMPER CUSTOMER
JM	JUMPER MANUFACTURING
LV	LOW VOLTAGE
MV	MEDIUM VOLTAGE
N/A	NOT APPLICABLE
PH	PHASE
REM	REMOTE
RASEP	RA SEPARATE
SHD	SHIELD
SS	SHIPPING SPLIT

COLOR DESIGNATIONS

AM	AMBER
BK	BLACK
BN	BROWN
BU	BLUE
CL	CLEAR
GD	GOLD
GN	GREEN
GY	GREY
OG	ORANGE
PK	PINK
RD	RED
SR	SILVER
TQ	TURQUOISE
VT	VIOLET
WH	WHITE
YE	YELLOW

PART TYPE DESIGNATIONS

DR	DOORS
PL	WIRE PANEL
WB	BOTTOM PANEL
WL	FAN AND CMC PANEL
WP	PUMP PANEL
WT	LOW VOLTAGE TUB

LINEUP CUSTOMER INFORMATION

END USER LANGUAGE OF CHOICE	ENGLISH
DISPLAYED UNITS OF MEASURE	IMPERIAL (IN FT LBS HP)
CUST. SPECIFIED CERTIFICATION	CULUS
EXPORT PACKAGING REQUIRED	NO
DRAWING FORMAT	IEC
CONFIGURATION TYPE	POWERFLEX 7000
DRIVE SYNCHRONOUS TRANSFER	NONE SELECTED
DRIVE SYSTEM COMMUNICATION	NONE SELECTED
OPERATING ALTITUDE	1001-2000 M (3300-6600 FT)
HIGH OPERATING AMBIENT	0 - 35 DEG C (99.5)

LINEUP INCOMING POWER

NOMINAL SYSTEM VOLTAGE (V)	2400 VAC (L-L)
LINE FREQUENCY (HZ)	60
POWER SYSTEM CONFIGURATION	DELTA (UNGROUND)
LINEUP CONNECTION TYPE	NOT APPLICABLE
INCOMING CABLE DIRECTION	NOT APPLICABLE
LINEUP INCOMING POWER LOCATION	NOT APPLICABLE
VFD POWER BUS SHORT CIRCUIT CURRENT	25KA RMS SYM, 5 CYCLE (WITHSTAND)

LINEUP ENCLOSURE

LOW VOLTAGE WIREWAY	2 X 4 INCH (50 X 100MM)
SEISMIC RATED	NONE SELECTED
SHIPPING BLOCK CONFIGURATION	SINGLE STRUCTURE PER BLOCK

LINEUP FEATURES COMMON TO ALL UNITS

CONTROL POWER SOURCE	CONTROL POWER TRANSFORMERS
CONTROL VOLTAGE (V)	120 VAC (L-GND)
CONTROL CIRCUIT WIRING TYPE	TEW OR MTW TINNED COPPER
LOAD CABLE EXIT DIRECTION	TOP EXIT

LINEUP CERTIFICATIONS

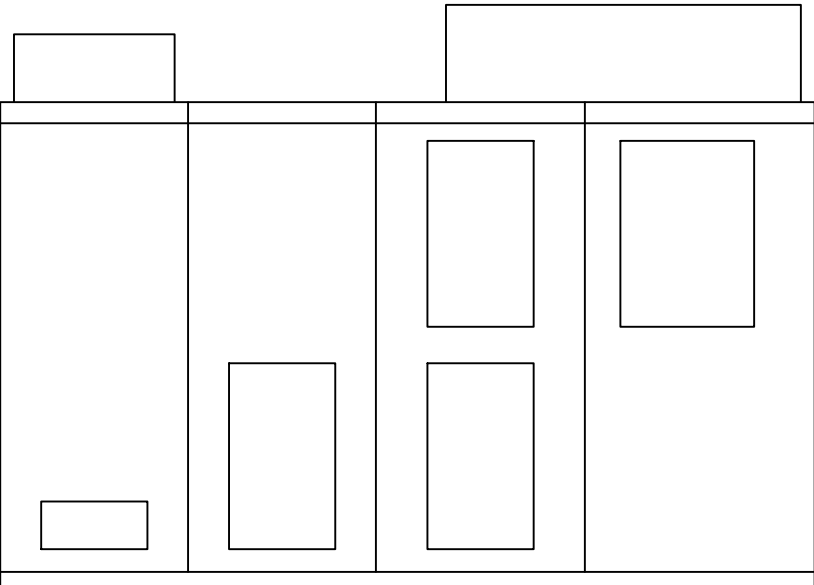
CUST. SPECIFIED CERTIFICATION	CULUS
OTHER CERTIFICATION REQUIRED	NONE SELECTED

LINEUP NAMEPLATES

MASTER NAMEPLATE ON LINEUP	WHITE W/ BLACK LETTERS 3 LINES
UNIT NAMEPLATES	WHITE W/ BLACK LETTERS 3 LINES

LINEUP LAYOUT AND STRUCTURE SPECIFICATION

PROJECT ID	MVB6504154112
LINEUP ID	01
SHIPPING BLOCK ID	01
STRUCTURE ID	01
UNIT 'A' ID	
UNIT 'B' ID	N/A
UNIT 'A' LOCATION	
UNIT 'B' LOCATION	N/A
UNIT 'A' BULLETIN	
UNIT 'B' BULLETIN	N/A
UNIT DDSID	10004347216
STRUCTURE WEIGHT	6310 KG (13900 LBS)
STRUCTURE WIDTH	3900 MM (153.54 IN)
STRUCTURE DEPTH	1000 MM (39.37 IN)
STRUCTURE HEIGHT	2784 MM (109.61 IN)
STRUCTURE CONFIGURATION CODE	D3900.1 (900 + 900 + 1000 + 1100)
ENCLOSURE TYPE	1/IP21(G)
ARC RESISTANT	NO
EXTERNAL PAINT COLOR	LT GRAY TEXTURED+BLACK LV DOOR
CUSTOM COLOR DESCRIPTION	NONE SELECTED
POWER BUS LINE CABLES PRESENT	NONE SELECTED
STRUCTURE POSITION IN SHIPPING BLOCK	STAND-ALONE (COMPLETE)
LOW VOLTAGE PANEL PRESENT	N/A
LOW VOLTAGE WIREWAY	2 X 4 INCH (50 X 100MM)
KEY INTERLOCK SWITCH	N/A



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	J. HAD	2018-10-05	APPROVAL				
00	J. HAD	2018-11-15	REL TO MFG	CUSTOMER: FERMILAB - FRA LLC	MV BULLETIN 7000MCC LINEUP SPECIFICATION AND LAYOUT	SHEET 0001 OF 0001	
						SIZE A1	VER 00
				ORDER-LINE NUMBER: MVB6504154112		10004347513	
PROJ. DOC. TYPE: DDSL				LANG: EN	DRAWN BY: J. HAD	DATE: 2018-10-05	

LINEUP CUSTOMER INFORMATION

END USER LANGUAGE OF CHOICE	ENGLISH
DISPLAYED UNITS OF MEASURE	IMPERIAL (IN FT LBS HP)
CUST. SPECIFIED CERTIFICATION	NONE SELECTED
OTHER CERTIFICATION REQUIRED	NONE SELECTED
EXPORT PACKAGING REQUIRED	NO
CONFIGURATION TYPE	MOTOR CONTROL CENTER
DRIVE SYNCHRONOUS TRANSFER	--
COMMUNICATION NETWORK	NO COMMUNICATION NETWORK
OPERATING ALTITUDE	1001-2000 M (3300-6600 FT)
HIGH OPERATING AMBIENT	0 - 35 DEG C

LINEUP INCOMING POWER

NOMINAL SYSTEM VOLTAGE (V)	2400 VAC (L-L)
LINE FREQUENCY (HZ)	60
POWER SYSTEM CONFIGURATION	DELTA (UNGROUND)
LINEUP CONNECTION TYPE	MAIN LOAD BREAK SWITCH
INCOMING CABLE DIRECTION	TOP
LINEUP INCOMING POWER LOCATION	LEFT END OF LINEUP

LINEUP ENCLOSURE

ARC RESISTANT	NO
ARC EXHAUST TYPE	NONE SELECTED
SYSTEM ENCLOSURE TYPE	1 / IP21 (WITH DOOR GASKETS)

LINEUP BUS WORK

BUS BAR CURRENT RATING (A)	1200 A
BUS BAR MATERIAL	COPPER
BUS BAR PLATING	TIN PLATED
BUS BAR INSULATION	NON-INSULATED
BUS BAR BRACING	50KA (RMS SYMMETRICAL) 0.5 SEC
GROUND BUS SIZE	3/8 X 2 INCH (9.5 X 51MM)
GROUND BUS PLATING	TIN PLATED
BACK-TO-BACK BUS LINKS	NO
MCC POWER BUS SHORT CIRCUIT CURRENT	50KA RMS SYM, 5 CYCLE (WITHSTAND)

LINEUP FEATURES COMMON TO ALL UNITS

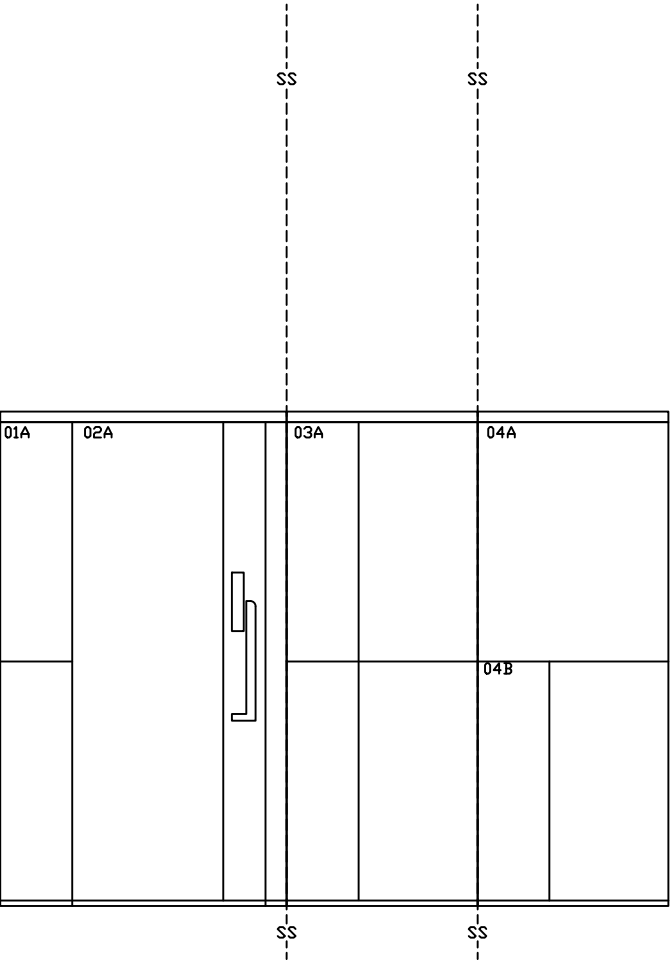
CONTROL POWER SOURCE	CONTROL POWER TRANSFORMERS
CONTROL VOLTAGE (V)	120 VAC (L-GND)
CONTROL CIRCUIT WIRING TYPE	TEW OR MTW TINNED COPPER
LOAD CABLE EXIT DIRECTION	TOP EXIT

LINEUP NAMEPLATES

MASTER NAMEPLATE ON LINEUP	WHITE W/ BLACK LETTERS 3 LINES
UNIT NAMEPLATES	WHITE W/ BLACK LETTERS 3 LINES

LINEUP LAYOUT AND STRUCTURE SPECIFICATION

PROJECT ID	MVB6504154112		
LINEUP ID	02		
SHIPPING BLOCK ID	01	02	04
STRUCTURE ID	01	01	01
UNIT 'A' ID			
UNIT 'B' ID	N/A	N/A	
UNIT 'A' LOCATION			
UNIT 'B' LOCATION	N/A	N/A	
UNIT 'A' BULLETIN			
UNIT 'B' BULLETIN	N/A	N/A	
UNIT DSD	10004347255	10004347269	10004347357
STRUCTURE WEIGHT	1135 KG [2500 LBS]	612 KG [1350 LBS]	802 KG [1770 LBS]
STRUCTURE WIDTH	1473 MM [58 IN]	914 MM [36 IN]	914 MM [36 IN]
STRUCTURE DEPTH	1067 MM [42 IN]	914 MM [36 IN]	914 MM [36 IN]
STRUCTURE HEIGHT	2311 MM [91 IN]	2311 MM [91 IN]	2311 MM [91 IN]
STRUCTURE CONFIGURATION CODE	A147333 (18+36+4 1592M_94M 1200A TOP EXT)	A914.1 (36 FVNR)	A914.11 (36 1591B / 1512B_BP_BT)
ENCLOSURE TYPE	1/IP21(G)	1/IP21(G)	1/IP21(G)
ARC RESISTANT	NO	NO	NO
EXTERNAL PAINT COLOR	CUSTOMER SPECIFIED COLOR	CUSTOMER SPECIFIED COLOR	CUSTOMER SPECIFIED COLOR
CUSTOM COLOR DESCRIPTION	LIGHT GRAY TEXTURED	LIGHT GRAY TEXTURED	LIGHT GRAY TEXTURED
POWER BUS LINE CABLES PRESENT	TOP	NONE SELECTED	NONE SELECTED
STRUCTURE POSITION IN SHIPPING BLOCK	LEFT	CENTER	RIGHT
LOW VOLTAGE PANEL PRESENT	LV PANEL IN UNIT A	LV PANEL IN UNIT A	LV PANEL IN UNIT A AND B
LOW VOLTAGE WIREWAY	2 X 4 INCH (50 X 100MM)	2 X 4 INCH (50 X 100MM)	2 X 4 INCH (50 X 100MM)
KEY INTERLOCK SWITCH	1 KEY IN UNIT A	1 KEY IN UNIT A	NONE SELECTED



REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-05	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG

PROJ. DOC. TYPE: DDSL			

PROJECT: VFD REPLACEMENT PF7000B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG: EN

Rockwell Automation	
MV BULLETIN 1500MCC LINEUP SPECIFICATION AND LAYOUT	
DRAWN BY: J. HAD	DATE: 2018-10-05

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SHEET 0001 OF 0001	VER 00
SIZE A1	10004347573

SYSTEM IS SHOWN IN THE
DE-ENERGIZED STATE.

DANGER: THE CUSTOMER MUST ENSURE THAT THE KEY INTERLOCK SCHEME FOR THIS EQUIPMENT IS INTEGRATED INTO THEIR OPERATION IN A PREDETERMINED SAFE SEQUENCE, THEREFORE ELIMINATING MISS OPERATIONS RESULTING IN DAMAGE TO THIS EQUIPMENT.

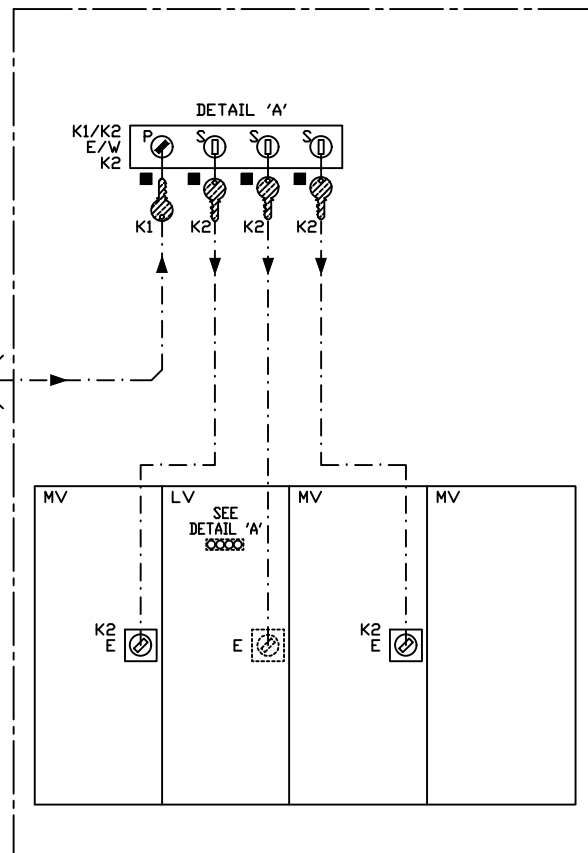
DANGER: ELECTRICAL SHOCK HAZARD.
WILL CAUSE SEVERE INJURY OR
DEATH.

DUPLICATE KEYS

EXTREME DANGER EXISTS WITH THE MISUSE OF ANY DUPLICATE KEY(S) USED TO CIRCUMVENT THE DESIGNED SEQUENTIAL OPERATION OF A TRAPPED KEY SYSTEM. DUPLICATE KEYS DEFEAT THE PROTECTION PROVIDED BY ANY TRAPPED KEY SYSTEM.

AFTER FINAL INSTALLATION,
DUPLICATE KEYS MUST BE DESTROYED
OR SECURED AND CONTROLLED BY A
RESPONSIBLE PERSON TO PREVENT
ANY MISUSE OF THE DUPLICATED KEY.
CONSULT THE KEY INTERLOCK
DRAWINGS TO DETERMINE THE NUMBER
OF KEYS REQUIRED FOR SAFE
EQUIPMENT OPERATION.

FROM CORRESPONDING
SYSTEM
INPUT CONTACTOR
LOCATED IN
SEPARATE LINEUP



	SWITCH HANDLE
	SWITCH INTERLOCK - BOLT EXTENDED
	SWITCH INTERLOCK - BOLT WITHDRAWN
	SWITCH INTERLOCK, MULTI KEY UNIT
	ACCESS DOOR INTERLOCK - BOLT EXTENDED
	ACCESS DOOR INTERLOCK - BOLT WITHDRAWN
	ACCESS DOOR INTERLOCK - MULTI KEY UNIT
	LV CONTROL COMPARTMENT INTERLOCK - BOLT EXTENDED
TRANSFER INTERLOCK	
P - PRIMARY KEY	
S - SECONDARY KEY	
SECONDARY KEYS RELEASED WHEN PRIMARY KEY IS TRAPPED	
	ADDITIONAL INTERLOCK KEYS HAVE BEEN SHIPPED FOR INSTALLATION PURPOSES. THE QUANTITY OF KEYS REQUIRED FOR SAFE EQUIPMENT OPERATION IS INDICATED BY INSTANCES OF THIS SYMBOL IN THIS DIAGRAM.

	KEY IS SHIPPED WITH SEPARATE EQUIPMENT
	KEY IS SHIPPED WITH LOCK
	KEY FLOW
	MECHANICAL INTERLOCK
E	KEY CAN BE RELEASED WHEN INTERLOCK BOLT IS EXTENDED
W	KEY CAN BE RELEASED WHEN INTERLOCK BOLT IS WITHDRAWN

LO	DEVICE IS LOCKED IN OPEN POSITION
LC	DEVICE IS LOCKED IN CLOSED POSITION
LO/LC	DEVICE IS LOCKED IN OPEN OR CLOSED POSITION
	RAM INTERLOCK
	LOW VOLTAGE PANEL INTERLOCK
	PROVISION FOR PADLOCK

	DOOR CLIP FASTENED TO TOP DOOR
	DOOR CLIP FASTENED TO BOTTOM DOOR
	DOOR CABINET SLIDER INTERLOCK (TOP/BOTTOM)
	CABINET SLIDER INTERLOCK (RIGHT/LEFT)
	CABINET SLIDER INTERLOCK (LEFT/RIGHT)
	REVERSE DOOR INTERLOCK

REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-05	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
PROJ. DOC. TYPE:ILK			

PROJECT:	VFD REPLACEMENT PF7000B
----------	-------------------------

CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:	MVB6504154112
--------------------	---------------

LANG: EN

Rockwell Automation

MV BULLETIN 7000MCC
LINEUP MECHANICAL INTERLOCK DIAGRAM

DRAWN BY: J. HAD

DATE: 2018-10-05

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SHEET 0001 OF 0001

SIZE	10004347552
------	-------------

ER
0

KEY INTERLOCK SYSTEM SUPPLIED BY
ROCKWELL AUTOMATION

SYSTEM IS SHOWN IN THE
DE-ENERGIZED STATE.

DANGER: THE CUSTOMER MUST ENSURE
THAT THE KEY INTERLOCK SCHEME
FOR THIS EQUIPMENT IS INTEGRATED
INTO THEIR OPERATION IN A
PREDETERMINED SAFE SEQUENCE,
THEREFORE ELIMINATING MISS
OPERATIONS RESULTING IN DAMAGE TO
THIS EQUIPMENT.

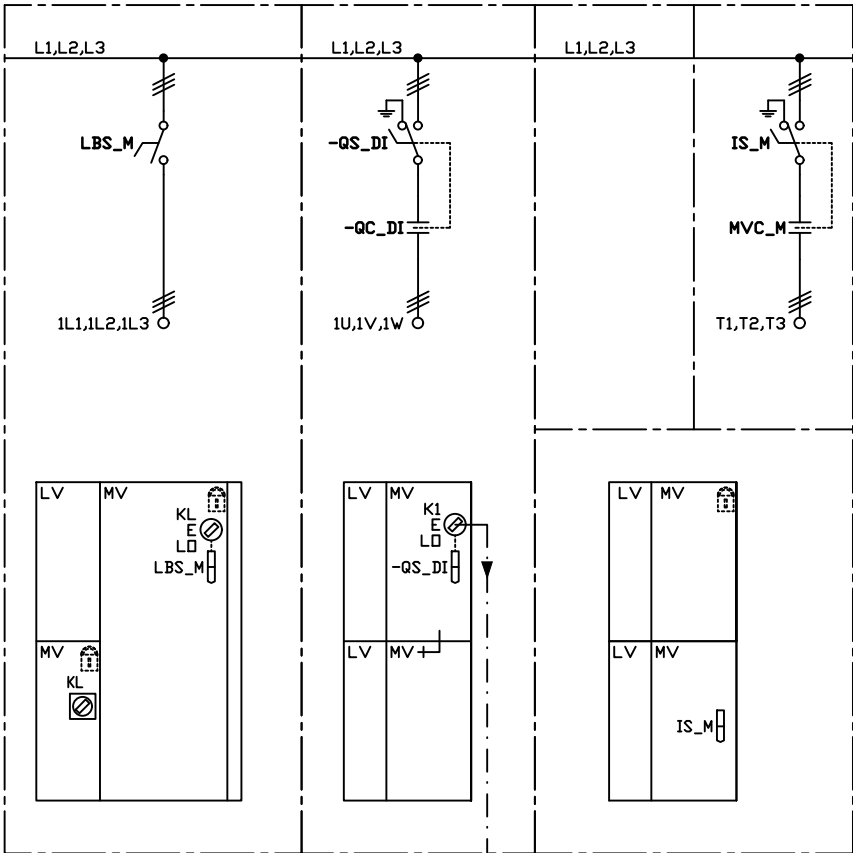
DANGER: ELECTRICAL SHOCK HAZARD.
WILL CAUSE SEVERE INJURY OR
DEATH.

DUPLICATE KEYS

EXTREME DANGER EXISTS WITH THE
MISUSE OF ANY DUPLICATE KEY(S)
USED TO CIRCUMVENT THE DESIGNED
SEQUENTIAL OPERATION OF A
TRAPPED KEY SYSTEM. DUPLICATE
KEYS DEFEAT THE PROTECTION
PROVIDED BY ANY TRAPPED KEY
SYSTEM.

AFTER FINAL INSTALLATION,
DUPLICATE KEYS MUST BE DESTROYED
OR SECURED AND CONTROLLED BY A
RESPONSIBLE PERSON TO PREVENT
ANY MISUSE OF THE DUPLICATED KEY.
CONSULT THE KEY INTERLOCK
DRAWINGS TO DETERMINE THE NUMBER
OF KEYS REQUIRED FOR SAFE
EQUIPMENT OPERATION.

PROJECT ID	MVB6504154112			
LINEUP ID	02			
SHIPPING BLOCK ID	01	02	04	
STRUCTURE ID	01	01	01	
UNIT ID	01	01	01	02
UNIT LOCATION	01A	03A	04A	04B
UNIT BULLETIN	1592M	1512AD	1591B	1512BT
UNIT ELD	10004346893	10004346953	10004347005	10004388593



WHEN KEY K1 FROM THE -QS_DI ISOLATOR IS INSTALLED IN TRANSFER BLOCK OF THE
CORRESPONDING SYSTEM VFD (LOCATED IN A SEPARATE LINEUP) THE
VC_CEW_S_IK_HDL_KB_DEFINED KEYS FOR THE MV DOORS OF THE VFD ARE RELEASED FROM
THE TRANSFER BLOCK AND CAN BE USED TO OPEN THE DOORS OF THE VFD. (KEY IS
SHIPPED WITH THE VFD)

KEY INTERLOCK SYMBOLS

	SWITCH HANDLE
	SWITCH INTERLOCK - BOLT EXTENDED
	SWITCH INTERLOCK - BOLT WITHDRAWN
	SWITCH INTERLOCK, MULTI KEY UNIT
	ACCESS DOOR INTERLOCK - BOLT EXTENDED
	ACCESS DOOR INTERLOCK - BOLT WITHDRAWN
	ACCESS DOOR INTERLOCK - MULTI KEY UNIT
	LV CONTROL COMPARTMENT INTERLOCK - BOLT EXTENDED
	TRANSFER INTERLOCK P - PRIMARY KEY S - SECONDARY KEY SECONDARY KEYS RELEASED WHEN PRIMARY KEY IS TRAPPED
	ADDITIONAL INTERLOCK KEYS HAVE BEEN SHIPPED FOR INSTALLATION PURPOSES. THE QUANTITY OF KEYS REQUIRED FOR SAFE EQUIPMENT OPERATION IS INDICATED BY INSTANCES OF THIS SYMBOL IN THIS DIAGRAM.

	KEY IS SHIPPED WITH SEPARATE EQUIPMENT
	KEY IS SHIPPED WITH LOCK
	KEY FLOW
	MECHANICAL INTERLOCK
E	KEY CAN BE RELEASED WHEN INTERLOCK BOLT IS EXTENDED
W	KEY CAN BE RELEASED WHEN INTERLOCK BOLT IS WITHDRAWN

LD	DEVICE IS LOCKED IN OPEN POSITION
LC	DEVICE IS LOCKED IN CLOSED POSITION
LD/LC	DEVICE IS LOCKED IN OPEN OR CLOSED POSITION
	RAM INTERLOCK
	LOW VOLTAGE PANEL INTERLOCK
	PROVISION FOR PADLOCK

	DOOR CLIP FASTENED TO TOP DOOR
	DOOR CLIP FASTENED TO BOTTOM DOOR
	DOOR CABINET SLIDER INTERLOCK (TOP/BOTTOM)
	CABINET SLIDER INTERLOCK (RIGHT/LEFT)
	CABINET SLIDER INTERLOCK (LEFT/RIGHT)
	REVERSE DOOR INTERLOCK

REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-05	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-03-18	AS SHIPPED

PROJECT:
VFD REPLACEMENT PF7000B

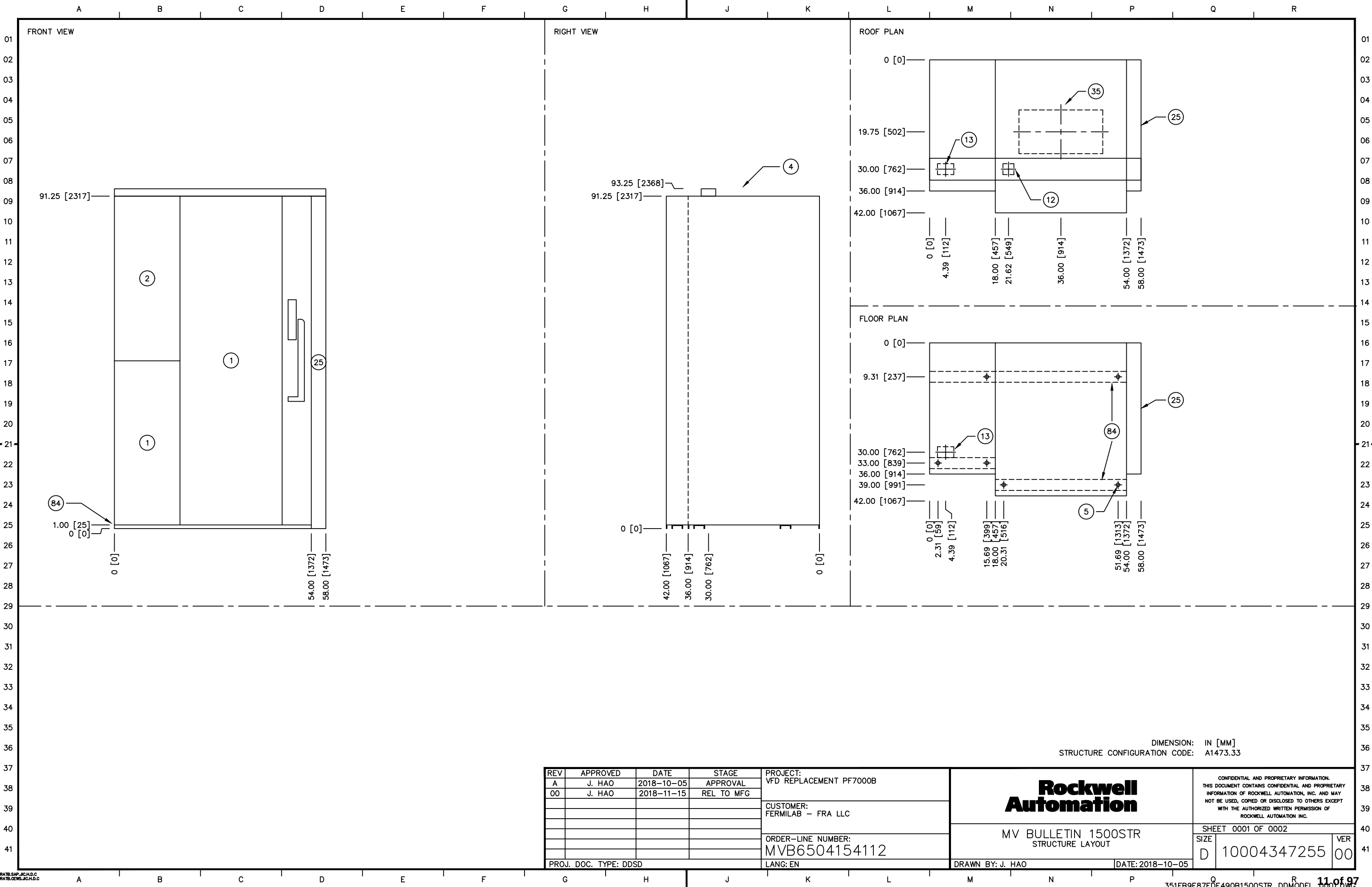
CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

PROJ. DOC. TYPE:ILK

LANG:EN

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MV BULLETIN 1500MCC LINEUP MECHANICAL INTERLOCK DIAGRAM		SHEET 0001 OF 0001
SIZE A1	10004347572	VER 01
DRAWN BY: J. HAD		DATE: 2018-10-05



DIMENSION: IN [MM]
STRUCTURE CONFIGURATION CODE: A1473.33

REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B
00	J. HAO	2018-11-15	REL TO MFG	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
PROJ. DOC. TYPE: DDSD				LANG: EN

Rockwell Automation

MV BULLETIN 1500STR
STRUCTURE LAYOUT

DRAWN BY: J. HAO

DATE: 2018-10-05

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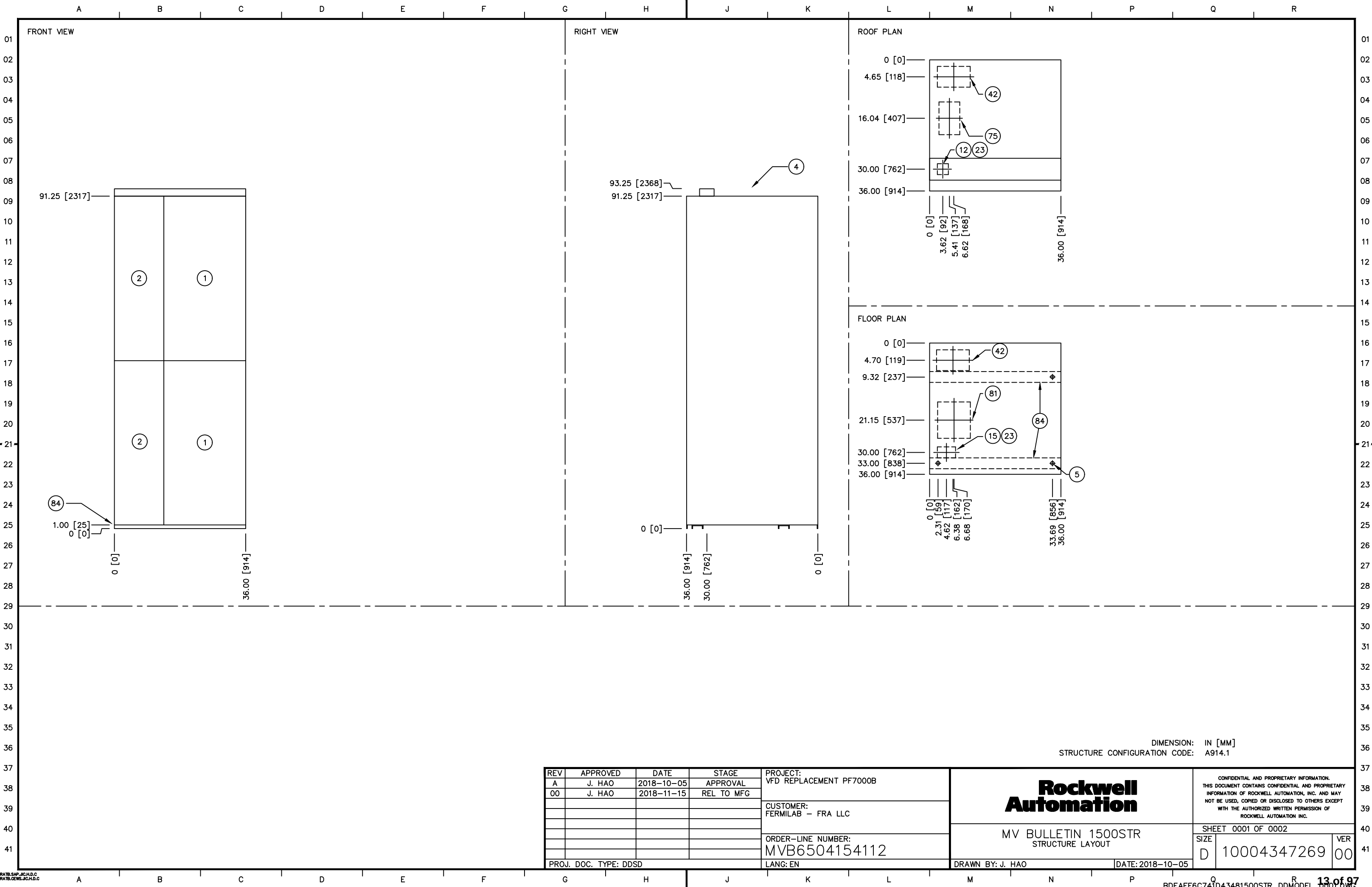
SHEET 0001 OF 0002

SIZE D 10004347255 VER 00

FOOTNOTES

NOTE	DESCRIPTION
1	MEDIUM VOLTAGE COMPARTMENT
2	LOW VOLTAGE COMPARTMENT
4	REMOVABLE LIFTING ANGLES (2) SUPPLIED (NOT SHOWN)
5	MOUNTING HOLES FOR 0.50 [12] DIA. ANCHOR BOLTS
12	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 3.00 [76]
13	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 4.46 [113]
25	FILLER FOR TIE SWITCH, 4.00 [102]
35	LINE CABLE CONDUIT OPENING, 12.00 [305] X 23.00 [584]
84	NON-REMOVABLE SILL CHANNELS, 1.00 [25] X 3.00 [76]

REV	APPROVED	DATE	STAGE	PROJECT:	Rockwell Automation		CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.		
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B					
00	J. HAO	2018-11-15	REL TO MFG	CUSTOMER: FERMILAB – FRA LLC	MV BULLETIN 1500STR FOOTNOTES		SHEET 0002 OF 0002		
							SIZE	10004347255	VER
					ORDER-LINE NUMBER: MVB6504154112		D		00
PROJ. DOC. TYPE: DDSD				LANG: EN	DRAWN BY: J. HAO		DATE: 2018-10-05		



DIMENSION: IN [MM]
STRUCTURE CONFIGURATION CODE: A914.1

REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B
00	J. HAO	2018-11-15	REL TO MFG	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
PROJ. DOC. TYPE: DDSD				LANG: EN

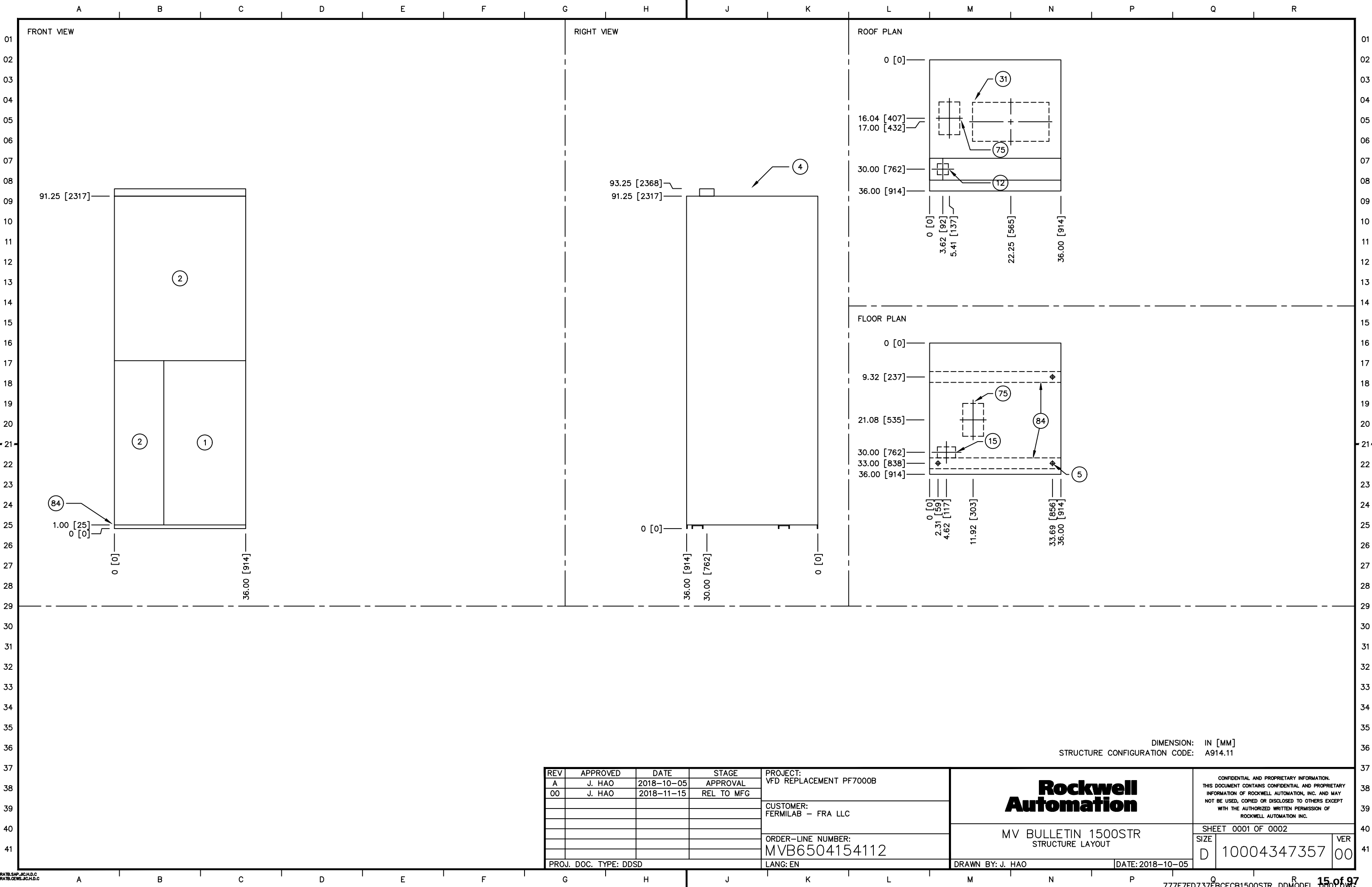
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MV BULLETIN 1500STR STRUCTURE LAYOUT		SHEET 0001 OF 0002	
DRAWN BY: J. HAO		SIZE D	VER 00
DATE: 2018-10-05		10004347269	

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ROCKWELL AUTOMATION INC.

FOOTNOTES

NOTE	DESCRIPTION
1	MEDIUM VOLTAGE COMPARTMENT
2	LOW VOLTAGE COMPARTMENT
4	REMOVABLE LIFTING ANGLES (2) SUPPLIED (NOT SHOWN)
5	MOUNTING HOLES FOR 0.50 [12] DIA. ANCHOR BOLTS
12	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 3.00 [76]
15	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 5.00 [127]
23	EACH OPENING PROVIDES ACCESS TO BOTH TOP AND BOTTOM COMPARTMENTS
42	LINE CABLE CONDUIT OPENING, 5.68 [144] X 9.00 [229]
75	LOAD CABLE CONDUIT OPENING, 5.68 [144] X 9.00 [229]
81	LOAD CABLE CONDUIT OPENING, 9.00 [229] X 10.00 [254]
84	NON-REMOVABLE SILL CHANNELS, 1.00 [25] X 3.00 [76]

REV	APPROVED	DATE	STAGE	PROJECT:	Rockwell Automation			CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.			
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B							
00	J. HAO	2018-11-15	REL TO MFG								
				CUSTOMER:	MV BULLETIN 1500STR FOOTNOTES			SHEET 0002 OF 0002			
				FERMILAB – FRA LLC							
				ORDER-LINE NUMBER:	MVB6504154112			SIZE	D	10004347269	VER 00
PROJ. DOC. TYPE: DDSD				LANG: EN	DRAWN BY: J. HAO			DATE: 2018-10-05			



	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	
01																	01
02																	02
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41																	41
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	

FOOTNOTES

NOTE	DESCRIPTION
1	MEDIUM VOLTAGE COMPARTMENT
2	LOW VOLTAGE COMPARTMENT
4	REMOVABLE LIFTING ANGLES (2) SUPPLIED (NOT SHOWN)
5	MOUNTING HOLES FOR 0.50 [12] DIA. ANCHOR BOLTS
12	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 3.00 [76]
15	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 5.00 [127]
31	LINE CABLE CONDUIT OPENING, 10.68 [271] X 21.00 [533]
75	LOAD CABLE CONDUIT OPENING, 5.68 [144] X 9.00 [229]
84	NON-REMOVABLE SILL CHANNELS, 1.00 [25] X 3.00 [76]

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation MV BULLETIN 1500STR FOOTNOTES		CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.	
A	J. HAO	2018-10-05	APPROVAL	CUSTOMER: FERMILAB - FRA LLC				
00	J. HAO	2018-11-15	REL TO MFG					
				ORDER-LINE NUMBER: MVB6504154112				
				LANG: EN	DRAWN BY: J. HAO		DATE: 2018-10-05	
PROJ. DOC. TYPE: DDSD						SIZE D	10004347357	VER 00

BASE UNIT DATA

CATALOG NUMBER	7000-F430DABD-RPDTD
UNIT DESCRIPTION	POWERFLEX 7000 AIR COOLED
SYSTEM VOLTAGE CLASS	5KV
DRIVE CURRENT RATING CODE	430 A
DRIVE RATING CODE	ND HIGH ALTITUDE 5000M
DRIVE RECTIFIER CODE	RPDTD
INTEGRAL DRIVE INPUT CODE	NONE SELECTED
CONTROLLER SIZE	NONE SELECTED
CONTACTOR CONTROL TYPE	NONE SELECTED
TRANSFORMER TYPE	NONE SELECTED
OPERATING AMBIENT TEMPERATURE	0 - 35 DEG C
CONTROL POWER SOURCE	SEPARATE CONTROL POWER
DRIVE SYSTEM CONFIGURATION	BASIC CONTROL, AC BRUSHLESS EXCITER W/ PLC
MOTOR VOLTAGE (V)	2400 VAC (L-L)
ENCLOSURE TYPE	1/IP21G)

DOOR MOUNTED PILOT DEVICES

PUSH BUTTONS - NON-ILLUM #1	START
PUSH BUTTONS - NON-ILLUM #3	STOP
PUSH BUTTONS - NON-ILLUM #4	NONE SELECTED
PUSH BUTTONS - EMERGENCY STOP	EMERGENCY STOP W/ SAFETY RELAY
LENS COLOR - FORWARD	NONE SELECTED
LENS COLOR - REVERSE	NONE SELECTED
LENS COLOR - OFF	NONE SELECTED
LENS COLOR - ON	NONE SELECTED
LENS COLOR - DRIVE READY	GREEN
LENS COLOR - DRIVE RUNNING	RED
LENS COLOR - FAULT	RED
LENS COLOR - WARNING	AMBER
SELECTOR SWITCH #1	LOCAL-REMOTE
SELECTOR SWITCH #3	NONE SELECTED
SPEED POTENTIOMETER	10KOHM SINGLE TURN

PROTECTION & MONITORING

OPERATOR INTERFACE	HMI /ETHERNET W/CABLE PORT
RTD MONITORING RELAYS	NONE SELECTED
TORQPROVE CONTROL	--
DRIVE FUNCTIONAL SAFETY	--

METERING DEVICES

METERING - ANALOG CLUSTER	NONE SELECTED
TACHOMETER INTERFACE	NONE SELECTED

AUXILIARY CONTROL RELAYS

AUXILIARY RELAYS - IEC	RUNNING/READY/FAULT/WARNING
------------------------	-----------------------------

COMMUNICATION & ANALOG SIGNALS

ISOLATED ANALOG INTERFACE SRI	SPEED REFERENCE INPUT
ISOLATED ANALOG INTERFACE SD	SPEED OUTPUT
ISOLATED ANALOG INTERFACE VD	NONE SELECTED
ISOLATED ANALOG INTERFACE CD	CURRENT OUTPUT
ISOLATED ANALOG INTERFACE LD	NONE SELECTED
ISOLATED ANALOG INTERFACE TD	NONE SELECTED
COMM ADAPTERS DPI	DPI TO MODBUS
COMM ADAPTERS PORT #1	DPI TO ETHERNET
COMM ADAPTERS CONTROL LOGIX	NONE SELECTED

CONTROL CIRCUIT WIRING

CONTROL TERMINAL BLOCK TYPE	IEC TERMINAL BLOCKS
CONTROL CIRCUIT WIRING TYPE	TEW OR MTW TINNED COPPER
HEAT SHRINK TUBING	NONE SELECTED
CONTROL CIRCUIT LUGS	NONE SELECTED

SPACE HEATERS

MOTOR SPACE HEATER CIRCUIT	2400W AT 120VAC EXT. SOURCE
CABINET SPACE HEATER	150W AT 120VAC EXT. SOURCE

ADDITIONAL COOLING OPTIONS

REDUNDANT FAN	NONE SELECTED
DUCTED VFD EXHAUST	NONE SELECTED
HEAT EXCHANGER	NONE SELECTED

MISCELLANEDUS

DEVICE NAMEPLATES	NONE SELECTED
POWER CELL DOOR VENTED	NONE SELECTED
HIGH ALTITUDE OPTION	1001-2000 M (3300-6600 FT)
DRIVE UV RIDE THROUGH	STANDARD 5 CYCLE
REDUNDANT POWER SUPPLY	NONE SELECTED
UNIT HAS MASTER NAMEPLATE	YES
REMOTE MONITORING AND ANALYTICS	VSE ETHERNET COMMUNICATION

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.	
A	J. HAD	2018-10-05	APPROVAL				
00	J. HAD	2018-11-15	REL TO MFG				
				CUSTOMER: FERMILAB - FRA LLC			
				ORDER-LINE NUMBER: MVB6504154112			
PROJ. DOC. TYPE:SPC				LANG:EN	DRAWN BY:J. HAD	DATE: 2018-10-05	
					MV BULLETIN 7000 UNIT SPECIFICATION	SHEET 0001 OF 0001	
					SIZE A1	10004346731	VER 00

DRAWING SHEET INDEX															
SHEET NO		DESCRIPTION													
0001		DRAWING SHEET INDEX, FOOTNOTES													
0002		DEVICE DESIGNATIONS													
0003		DEVICE DESIGNATIONS													
0004		TERMINAL STRIP REPORT													
0005		TERMINAL STRIP REPORT													
0006		TERMINAL STRIP REPORT													
0007		SPACE HEATER CIRCUITS													
0008		ETHERNET SWITCH AND AUXILIARY RELAY CONTACTS													
0009		ISLATED ANALOG INTERFACE MODULE (IFM)													
0010		INPUT POWER CIRCUIT AND LINE SIDE CURRENT TRANSFORMERS													
0011		LINE REACTOR, LINE SIDE VOLTAGE SENSING													
0012		RECTIFIER/INVERTER, COMMON MODE CHOKE													
0013		MACHINE SIDE VOLTAGE AND CURRENT SENSING, LOAD TERMS													
0014		THREE PHASE FAN CIRCUIT													
0015		SINGLE PHASE FAN CIRCUIT													
0016		AC/DC CONVERTER CIRCUIT													
0017		AC CONTROL POWER DISTRIBUTION													
0018		AC CONTROL CIRCUIT													
0019		ACB - CONNECTOR J1 CONTROL CIRCUIT													
0020		ACB - CONNECTOR J1 CONTROL CIRCUIT													
0021		XID1 - CONNECTOR J6 CONTROL CIRCUIT													
0022		XID1 - CONNECTOR J7 CONTROL CIRCUIT													
0023		XID1 - CONNECTOR J1, J2 CONTROL CIRCUIT													
0024		INVERTER POWER AND FIBER OPTIC CIRCUIT													
0025		RECTIFIER POWER AND FIBER OPTIC CIRCUIT													
0026		56VDC CONVERTER CIRCUITS													
0027		24VDC CONVERTER CIRCUITS													
0028		ACB - CONNECTORS J9, J10													
0029		ACB, DPM, XID1 - CROSS REFERENCES													

/0050.4D CROSS REFERENCE: SHEET AND CO-ORDINATE

+WT-1-1 PART TYPE-SECTION-ZONE

-KG_DI DEVICE DESIGNATION

NOTE A : E-HOUSE VENDOR TO PROVIDE THE CABLING/WIRING BETWEEN THE UNITS

NOTE B : CUSTOMER TO PROVIDE THE CABLING/WIRING TO THE UNIT.

WIRING LEGEND

	WIRING SUPPLIED AND INSTALLED BY ROCKWELL AUTOMATION.
-----	WIRING SUPPLIED AND INSTALLED BY OTHERS.
-----	WIRING SUPPLIED BY ROCKWELL AUTOMATION TO BE COMPLETED BY OTHERS.

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM DRAWING SHEET INDEX, FOOTNOTES		CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.	
A	J. HAD	2018-10-11	APPROVAL	CUSTOMER: FERMILAB - FRA LLC				
00	J. HAD	2018-11-15	REL TO MFG					
01	J. HAD	2019-02-26	AS SHIPPED					
				CUSTOMER: FERMILAB - FRA LLC				
PROJ. DOC. TYPE:ELD				LANG:EN	DRAWN BY: J. HAD		DATE: 2018-10-11	

SHEET 0001 OF 0029		VER 01
SIZE A1	10004347082	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
A	DEVICE DESIGNATIONS																A
	ID	DESCRIPTION	XREF														
	-AR_MSR	RELAY - PROTECTION, MONITORING SAFETY	/0018.10B														
	-BC_1U_1W	TRANSFORMER - CURRENT ASSEMBLY	/0010.10B														
	-BC_DC1	TRANSFORMER - CURRENT, HALL EFFECT	/0012.10F														
	-BC_GF	TRANSFORMER - CURRENT, GROUND FAULT	/0010.14B														
	-BC_U_W	TRANSFORMER - CURRENT, HALL EFFECT ASSEMBLY	/0013.8B														
B	-BG_AP0	SENSOR - AIR PRESSURE DIFFERENTIAL	/0028.2A														
	-BH_CMCCSH	TEMPERATURE ACTUATED SWITCH - COMMON MODE CHOKE CABINET SPACE HEATER	/0007.8E														
	-BH_CNVC SH	TEMPERATURE ACTUATED SWITCH - CONVERTER CABINET SPACE HEATER	/0007.8D														
	-BH_INCCSH	TEMPERATURE ACTUATED SWITCH - INCOMING CABINET SPACE HEATER	/0007.8C														
	-BH_LRCSH	TEMPERATURE ACTUATED SWITCH - LINE REACTOR CABINET SPACE HEATER	/0007.8C														
	-BV_CPT1	TRANSFORMER - VOLTAGE, CONTROL POWER	/0014.7E														
	-CC_LF1	CAPACITOR - LINE FILTER	/0011.7D														
	-CC_LF2	CAPACITOR - LINE FILTER	/0011.8D														
	-CC_MF1	CAPACITOR - MOTOR FILTER	/0013.4D														
	-CC_MF2	CAPACITOR - MOTOR FILTER	/0013.6D														
C	-EH_CMCCSH	SPACE HEATER/HEATER ELEMENT - COMMON MODE CHOKE CABINET	/0007.9E														
	-EH_CNVC SH	SPACE HEATER/HEATER ELEMENT - CONVERTER CABINET	/0007.9D														
	-EH_INCCSH	SPACE HEATER/HEATER ELEMENT - INCOMING CABINET	/0007.9C														
	-EH_LRCSH	SPACE HEATER/HEATER ELEMENT - LINE REACTOR CABINET	/0007.9C														
	-EH_MSH	SPACE HEATER/HEATER ELEMENT - MOTOR	/0007.11J														
	-FA_SA1	SURGE ARRESTOR 1	/0010.8D														
	-FA_SA2	SURGE ARRESTOR 2	/0010.9D														
	-FA_SA3	SURGE ARRESTOR 3	/0010.9D														
	-FB_CPT1	CIRCUIT BREAKER - MINIATURE, PRIMARY OF CONTROL POWER TRANSFORMER 1	/0014.7D														
	-FB_CSH	CIRCUIT BREAKER - MINIATURE, PRIMARY OF CABINET SPACE HEATER CIRCUIT	/0007.6C														
	-FB_CTRL_2	CIRCUIT BREAKER - MINIATURE, PRIMARY OF DRIVE CONTROL CIRCUIT 2	/0017.4K														
	-FB_LRFN	CIRCUIT BREAKER - MINIATURE, PRIMARY OF LINE REACTOR FAN ASSEMBLY	/0015.3E														
	-FB_MSH	CIRCUIT BREAKER - MINIATURE, PRIMARY OF MOTOR SPACE HEATER CIRCUIT	/0007.5J														
	-FB_OI1	CIRCUIT BREAKER - MINIATURE, PRIMARY OF OPERATOR INTERFACE	/0017.7E														
E	-FB_PS1_1	CIRCUIT BREAKER - MINIATURE, PRIMARY OF -TR_PS1_1	/0016.3C														
	-FB_PS4	CIRCUIT BREAKER - MINIATURE, PRIMARY OF -TR_PS4	/0017.7C														
	-FB_SE_CTRL	CIRCUIT BREAKER - MINIATURE, PRIMARY OF EXCITER CONTROL POWER	/0018.3H														
	-FE_ACBJ1_1	FERRITE - ANALOG CONTROL BOARD J1	/0029.4B														
	-FE_EN	FERRITE - ETHERNET CABLE	/0008.5H														
	-FE_RJ45	FERRITE - RJ45 CABLE	/0008.5L														
	-FF_CVR	FUSE - PRIMARY OF CONVENIENCE RECEPTACLE	/0015.2D														
	-FV_CTRL	VARISTOR - METAL OXIDE, CONTROL CIRCUIT	/0015.2B														
F	-GND_PE	GROUND - EARTH POTENTIAL	/0010.7C														
	-GND_PE_CUST2	GROUND - EARTH POTENTIAL, CUSTOMER	/0014.4C														
	-GND_SG	GROUND - SAFETY	/0011.10F														
	-JC_10	JUMPER CUSTOMER	/0018.10H														
	-JC_ESTP1	JUMPER CUSTOMER - REMOTE EMERGENCY STOP 1	/0018.8C														
	-JC_ESTP2	JUMPER CUSTOMER - REMOTE EMERGENCY STOP 2	/0018.7C														
	-JC_IN_PRTC_2	JUMPER CUSTOMER - INPUT PROTECTION	/0022.5E														
	-JC_MTR_PRTC	JUMPER CUSTOMER - MOTOR PROTECTION	/0022.5H														
	-JC_STP	JUMPER CUSTOMER - REMOTE STOP	/0021.4C														
	-KA_FLT	RELAY - AUXILIARY, FAULT	/0023.7F														
	-KA_RDY	RELAY - AUXILIARY, READY	/0023.7L														
	-KA_RUN	RELAY - AUXILIARY, RUN	/0023.7H														
	-KA_WRN	RELAY - AUXILIARY, WARNING	/0023.7E														
	-KF_ACB	ELECTRONIC ASSEMBLY - ANALOG CONTROL BOARD	/0029.1G														
	-KF_DPM	ELECTRONIC ASSEMBLY - DRIVE PROCESSOR MODULE	/0029.6K														
	-KF_IFM1	ELECTRONIC ASSEMBLY - INTERFACE MODULE 1	/0009.7B														
	-KF_INV_U	ELECTRONIC ASSEMBLY - INVERTER DEVICES PHASE U	/0024.4A														
	-KF_INV_V	ELECTRONIC ASSEMBLY - INVERTER DEVICES PHASE V	/0024.4C														
	-KF_INV_W	ELECTRONIC ASSEMBLY - INVERTER DEVICES PHASE W	/0024.4D														
	-KF_OIB	ELECTRONIC ASSEMBLY - OPTIC INTERFACE	/0024.9B														
	-KF_OIBB1	ELECTRONIC ASSEMBLY - OPTIC INTERFACE BASE BOARD, INVERTER	/0024.12A														
	-KF_OIBBR	ELECTRONIC ASSEMBLY - OPTIC INTERFACE BASE BOARD, RECTIFIER	/0025.12A														
	-KF_PFNI	ELECTRONIC ASSEMBLY - NETWORK INTERFACE BOARD	/0029.7J														
	-KF_REC_2U	ELECTRONIC ASSEMBLY - RECTIFIER DEVICES PHASE 2U	/0025.4A														
	-KF_REC_2V	ELECTRONIC ASSEMBLY - RECTIFIER DEVICES PHASE 2V	/0025.4D														
	-KF_REC_2W	ELECTRONIC ASSEMBLY - RECTIFIER DEVICES PHASE 2W	/0025.4G														
	-KF_SRVC_PC	PERSONAL COMPUTER - SERVICE	/0008.8L														
	-KF_VSB1	ELECTRONIC ASSEMBLY - VOLTAGE SENSING BOARD 1	/0011.7F														
	-KF_VSB2	ELECTRONIC ASSEMBLY - VOLTAGE SENSING BOARD 2	/0013.7H														
	-KF_XID1	ELECTRONIC ASSEMBLY - EXTERNAL I/O BOARD 1	/0029.10C														
	-KG_DI	RELAY - CONTROL, DRIVE INPUT	/0020.14G														
	-KI_DIM	DEVICE - DRIVE IDENTITY MODULE	/0029.7J														
	-MV_LRFN	MOTOR - LINE REACTOR FAN ASSEMBLY	/0015.8E														
	-MV_MFN	MOTOR - MAIN COOLING FAN	/0014.14B														
	-MV_MTR	MOTOR- AC INDUCTION	/0013.14B														
	-NI_DPI-EN2	NETWORK INTERFACE - DPI TO ETHERNET ADAPTER 2	/0008.6C														
	ID	DESCRIPTION	XREF														
	-NI_DPI-MBUS1	NETWORK INTERFACE - DPI TO MODBUS ADAPTER 1	/0008.5B														
	-NI_ES1	NETWORK INTERFACE - ETHERNET SWITCH	/0008.1G														
	-NI_EXT_DPI1	NETWORK INTERFACE - EXTERNAL DPI ADAPTER	/0008.5C														
	-NI_VSE	NETWORK INTERFACE - VIRTUAL SUPPORT ENGINEER	/0008.8G														
	-PI_CUST_INT	CUSTOMER INTERNET	/0008.10G														
	-PI_EN1	CUSTOMER ETHERNET NETWORK 1	/0008.6H														
	-PI_ICD	CUSTOMER ISOLATED CURRENT OUTPUT SIGNAL	/0009.14E														
	-PI_ISI	CUSTOMER ISOLATED SPEED INPUT SIGNAL	/0009.6B														
	-PI_ISD	CUSTOMER ISOLATED SPEED OUTPUT SIGNAL	/0009.14C														
	-PI_LVCSH	CUSTOMER LOW VOLTAGE SUPPLY FOR CABINET SPACE HEATER CIRCUIT	/0007.8B														
	-PI_LVMFN	CUSTOMER LOW VOLTAGE SUPPLY FOR MAIN FAN CIRCUIT	/0014.4B														
	-PI_LVM SH	CUSTOMER LOW VOLTAGE SUPPLY FOR MOTOR SPACE HEATER CIRCUIT	/0007.8H														
	-PI_MBUS1	CUSTOMER MODBUS NETWORK 1	/0008.7B														
	-PL_FLT	PILOT LIGHT - FAULT	/0023.7E														
	-PL_VFDRDY	PILOT LIGHT - DRIVE READY	/0023.7K														
	-PL_VFDRUN	PILOT LIGHT - DRIVE RUNNING	/0023.7H														
	-PL_WRN	PILOT LIGHT - WARNING	/0023.7D														
	-PM_OI	OPERATOR INTERFACE TERMINAL	/0017.8E														
	-PV_SPD	RESISTOR - POTENTIOMETER, SPEED	/0028.9A														
	-Q_DI	CONTROLLER - DRIVE INPUT	/0010.6B														
	-Q_SE	CONTROLLER - AC BRUSHLESS EXCITER	/0013.15C														
	-QB_MFN	CIRCUIT BREAKER - MAIN COOLING FAN	/0014.10B														
	-QC_MFN	CONTACTOR - MAIN COOLING FAN	/0023.7C														
	-QC_MSH	CONTACTOR - MOTOR SPACE HEATER	/0023.7J														
	-QS_APS	SWITCH - DISCONNECT AUXILIARY POWER SOURCE	/0014.6B														
	-RR_ACBJ2B_1	RESISTOR - BURDEN	/0010.12G														
	-RR_ACBJ2T_1	RESISTOR - BURDEN	/0010.10G														
	-RR_ACBJ5B_1	RESISTOR - BURDEN	/0013.10G														
	-RR_ACBJ5T_1	RESISTOR - BURDEN	/0013.8G														
	-RR_ACBJ6T_1	RESISTOR - BURDEN	/0012.7D														
	-RR_NR	RESISTOR - NEUTRAL	/0013.3D														
	-RU_EMI	SUPPRESSOR - ELECTRO-MAGNETIC INTERFERENCE	/0016.5B														
	-RX_CMC	REACTOR - COMMON MODE CHOKE	/0012.7F														
	-RX_DIL	REACTOR - DRIVE INPUT LINE	/0011.3B														
	-SE_ESTP	PUSHBUTTON - EMERGENCY STOP	/0018.4C														
	-SG_REM_STR	PUSHBUTTON - REMOTE CUSTOMER START	/0021.7E														
	-SG_STP	PUSHBUTTON - STOP	/0021.7C														
	-SG_STR	PUSHBUTTON - START	/0021.7E														
	-SS_LR	SWITCH - SELECTOR, LOCAL-REMOTE	/0021.4E														
	-TM_TSC	TRANSDUCER - CURRENT OUTPUT	/0009.11E														
	-TR_IGDI1	CONVERTER - 56VDC/20VDC	/0026.7J														
	-TR_IGDR1	CONVERTER - 56VDC/20VDC	/0026.3J														
	-TR_IGDR2	CONVERTER - 56VDC/20VDC	/0026.5J														
	-TR_PS1_1	CONVERTER - 85-264VAC/56VDC	/0016.5C														
	-TR_PS2	CONVERTER - 56VDC/24VDC	/0026.7C														
	-TR_PS4	CONVERTER - 100-240VAC/24-28VDC	/0017.8C														
	-WC_ACBJ10-SPD	CABLE - ANALOG CONTROL BOARD TO SPEED POTENTIOMETER	/0028.11A														
	-WC_ACBJ17-XCOMM	CABLE - ANALOG CONTROL BOARD TO 20-XCOMM-DC-BASE	/0008.4C														
	-WC_ACBJ8-IFM1	CABLE - ANALOG CONTROL BOARD TO INTERFACE MODULE 1	/0009.10H														
	-WC_ACBJ9-AP0	CABLE - ANALOG CONTROL BOARD TO AIR PRESSURE DIFFERENTIAL SENSOR 0	/0028.4A														
	-WC_CSDC1-ACBJ6T	CABLE - HALL EFFECT CURRENT SENSOR TO ANALOG CONTROL BOARD	/0012.9E														
	-WC_CSU-ACBJ5T	CABLE - HALL EFFECT CURRENT SENSOR TO ANALOG CONTROL BOARD	/0013.8D														
	-WC_CSW-ACBJ5B	CABLE - HALL EFFECT CURRENT SENSOR TO ANALOG CONTROL BOARD	/0013.10D														
	-WC_CTIU-ACBJ2T	CABLE - CURRENT TRANSFORMER TO ANALOG CONTROL BOARD	/0010.10E														
	-WC_CTIW-ACBJ2B	CABLE - CURRENT TRANSFORMER TO ANALOG CONTROL BOARD	/0010.12E														
	-WC_CTGF-ACBJ7T	CABLE - GROUND FAULT CURRENT TRANSFORMER TO ANALOG CONTROL BOARD	/0010.14E														
	-WC_ESIP1-RJ45	CABLE - ETHERNET SWITCH 1 TO RJ45 PORT	/0008.4L														
	-WC_ESIP2-OI	CABLE - ETHERNET SWITCH 1 TO OPERATOR INTERFACE	/0008.4K														
	-WC_ESIP4-PFNIJ3	CABLE - ETHERNET SWITCH 1 TO PFNI	/0008.4J														
	-WC_ESIP5-EN1	CABLE - ETHERNET SWITCH 1 TO CUSTOMER ETHERNET	/0008.4H														
	-WC_ESIP6-VSE	CABLE - ETHERNET SWITCH 1 TO VIRTUAL SERVICE ENGINEER	/0008.4H														
	-WC_ICD	CABLE - ISOLATED CURRENT OUTPUT	/0009.14E														
	-WC_IGD	CABLE - ISOLATED GATE DRIVER 56V POWER SUPPLY	/0026.3H														
	-WC_ISI	CABLE - ISOLATED SPEED INPUT	/0009.7B														
	-WC_ISD	CABLE - ISOLATED SPEED OUTPUT	/0009.10C														
	-WC_OIBBIJ1-DPMJ11	CABLE - INVERTER OPTICAL INTERFACE TO DRIVE PROCESSOR MODULE	/0024.12A														
	-WC_OIBBRJ1-DPMJ12	CABLE - RECTIFIER OPTICAL INTERFACE TO DRIVE PROCESSOR MODULE	/0025.12A														
	-WC_PC	CABLE - PERSONAL COMPUTER	/0008.7L														
	-WC_PS1_1-ACBJ15	CABLE - AC/DC CONVERTER 1 TO ANALOG CONTROL BOARD	/0026.4B														
	-WC_PS1_1CN3-ACBJ18	CABLE - AC/DC CONVERTER 1 TO ANALOG CONTROL BOARD	/0016.7D														
	-WC_PS2P2-ACBJ14	CABLE - DC/DC CONVERTER PORT 2 TO ANALOG CONTROL BOARD	/0026.8D														
	-WC_PS2P4-ACBJ13	CABLE - DC/DC CONVERTER PORT 4 TO ANALOG CONTROL BOARD	/0026.9D														
	-WC_SGCT	CABLE - ISOLATED GATE DRIVER POWER TO SGCT	/0024.3B														
	REV	APPROVED	DATE	STAGE	PROJECT:	Rockwell Automation MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM DEVICE DESIGNATIONS SHEET 0002 OF 0029 SIZE A1 10004347082 VER 01											
	A	J. HAD	2018-10-11	APPROVAL													
	00	J. HAD	2018-11-15	REL TO MFG													
	01	J. HAD	2019-02-26	AS SHIPPED													
					CUSTOMER:	FRA LLC											
					ORDER-LINE NUMBER:	MVB6504154112											
					PROJ. DOC. TYPE:ELD	LANG:EN											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																																																																																																
A																	A																																																																																																															
B	<table><tr><td>ID</td><td>DESCRIPTION</td><td>XREF</td></tr><tr><td>-WC_TSC</td><td>CABLE - CURRENT TRANSDUCER</td><td>/0009.10E</td></tr><tr><td>-WC_VSB1J1-ACBJ27</td><td>CABLE - VOLTAGE SENSING TO ANALOG CONTROL BOARD</td><td>/0011.10F</td></tr><tr><td>-WC_VSB2J1-ACBJ26</td><td>CABLE - VOLTAGE SENSING TO ANALOG CONTROL BOARD</td><td>/0013.10H</td></tr><tr><td>-WC_XID1J4-ACBJ22</td><td>CABLE - EXTERNAL I/O1 TO ANALOG CONTROL BOARD</td><td>/0029.13E</td></tr><tr><td>-WD_LINE</td><td>TERMINAL - POWER DISTRIBUTION BLOCK, CT BYPASS TERMINAL ASSEMBLY</td><td>/0010.8B</td></tr><tr><td>-WD_LOAD</td><td>TERMINAL - POWER DISTRIBUTION BLOCK, LOAD TERMINAL ASSEMBLY</td><td>/0013.13B</td></tr><tr><td>-WF_SGCT_TFB</td><td>CABLE - FIBER OPTIC, SGCT AND TFB TO DIB</td><td>/0024.8B</td></tr><tr><td>-WP_CMC</td><td>CABLE - POWER, COMMON MODE CHOKE</td><td>/0012.7F</td></tr><tr><td>-WP_DIL</td><td>CABLE - POWER, DRIVE INPUT LINE REACTOR</td><td>/0011.3B</td></tr><tr><td>-WP_LFC</td><td>CABLE - POWER, LINE FILTER CAPACITORS</td><td>/0011.6D</td></tr><tr><td>-WP_MFC</td><td>CABLE - POWER, MOTOR FILTER CAPACITORS</td><td>/0013.4C</td></tr><tr><td>-WP_SA</td><td>CABLE - POWER, SURGE ARRESTOR</td><td>/0010.8C</td></tr><tr><td>-WP_VSB</td><td>CABLE - POWER, VOLTAGE SENSING BOARD</td><td>/0011.7F</td></tr><tr><td>-XC_VFD1</td><td>TERMINAL BLOCK ASSEMBLY - CUSTOMER</td><td>/0004.1A</td></tr><tr><td>-XC_VFD5</td><td>TERMINAL BLOCK ASSEMBLY - CUSTOMER</td><td>/0005.1A</td></tr><tr><td>-XP_ACBJ1</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0029.4C</td></tr><tr><td>-XP_ACBJ10</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0028.11A</td></tr><tr><td>-XP_ACBJ15</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0026.5C</td></tr><tr><td>-XP_ACBJ2B</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0010.12E</td></tr><tr><td>-XP_ACBJ2T</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0010.10E</td></tr><tr><td>-XP_ACBJ5B</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0013.10E</td></tr><tr><td>-XP_ACBJ5T</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0013.8E</td></tr><tr><td>-XP_ACBJ6B</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0012.12D</td></tr><tr><td>-XP_ACBJ6T</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0012.8D</td></tr><tr><td>-XP_ACBJ7T</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0010.14E</td></tr><tr><td>-XP_ACBJ9</td><td>CONNECTOR - ANALOG CONTROL BOARD</td><td>/0028.6A</td></tr><tr><td>-XP_RJ45</td><td>CONNECTOR - ETHERNET RJ45</td><td>/0008.6L</td></tr><tr><td>-XP_XID1J1</td><td>CONNECTOR - EXTERNAL I/O 1</td><td>/0029.13A</td></tr><tr><td>-XP_XID1J2</td><td>CONNECTOR - EXTERNAL I/O 1</td><td>/0029.15C</td></tr><tr><td>-XP_XID1J6</td><td>CONNECTOR - EXTERNAL I/O 1</td><td>/0029.9A</td></tr><tr><td>-XP_XID1J7</td><td>CONNECTOR - EXTERNAL I/O 1</td><td>/0029.8C</td></tr><tr><td>-XS_CVR</td><td>CONNECTOR - COMMISSIONING CONVENIENCE RECEPTACLE</td><td>/0015.5D</td></tr><tr><td>-XX_RA10</td><td>TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE</td><td>/0006.1G</td></tr><tr><td>-XX_RA2</td><td>TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE</td><td>/0006.1A</td></tr><tr><td>-XX_RA5</td><td>TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE</td><td>/0006.1J</td></tr><tr><td>-XX_RA6</td><td>TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE</td><td>/0006.1F</td></tr></table>																ID	DESCRIPTION	XREF	-WC_TSC	CABLE - CURRENT TRANSDUCER	/0009.10E	-WC_VSB1J1-ACBJ27	CABLE - VOLTAGE SENSING TO ANALOG CONTROL BOARD	/0011.10F	-WC_VSB2J1-ACBJ26	CABLE - VOLTAGE SENSING TO ANALOG CONTROL BOARD	/0013.10H	-WC_XID1J4-ACBJ22	CABLE - EXTERNAL I/O1 TO ANALOG CONTROL BOARD	/0029.13E	-WD_LINE	TERMINAL - POWER DISTRIBUTION BLOCK, CT BYPASS TERMINAL ASSEMBLY	/0010.8B	-WD_LOAD	TERMINAL - POWER DISTRIBUTION BLOCK, LOAD TERMINAL ASSEMBLY	/0013.13B	-WF_SGCT_TFB	CABLE - FIBER OPTIC, SGCT AND TFB TO DIB	/0024.8B	-WP_CMC	CABLE - POWER, COMMON MODE CHOKE	/0012.7F	-WP_DIL	CABLE - POWER, DRIVE INPUT LINE REACTOR	/0011.3B	-WP_LFC	CABLE - POWER, LINE FILTER CAPACITORS	/0011.6D	-WP_MFC	CABLE - POWER, MOTOR FILTER CAPACITORS	/0013.4C	-WP_SA	CABLE - POWER, SURGE ARRESTOR	/0010.8C	-WP_VSB	CABLE - POWER, VOLTAGE SENSING BOARD	/0011.7F	-XC_VFD1	TERMINAL BLOCK ASSEMBLY - CUSTOMER	/0004.1A	-XC_VFD5	TERMINAL BLOCK ASSEMBLY - CUSTOMER	/0005.1A	-XP_ACBJ1	CONNECTOR - ANALOG CONTROL BOARD	/0029.4C	-XP_ACBJ10	CONNECTOR - ANALOG CONTROL BOARD	/0028.11A	-XP_ACBJ15	CONNECTOR - ANALOG CONTROL BOARD	/0026.5C	-XP_ACBJ2B	CONNECTOR - ANALOG CONTROL BOARD	/0010.12E	-XP_ACBJ2T	CONNECTOR - ANALOG CONTROL BOARD	/0010.10E	-XP_ACBJ5B	CONNECTOR - ANALOG CONTROL BOARD	/0013.10E	-XP_ACBJ5T	CONNECTOR - ANALOG CONTROL BOARD	/0013.8E	-XP_ACBJ6B	CONNECTOR - ANALOG CONTROL BOARD	/0012.12D	-XP_ACBJ6T	CONNECTOR - ANALOG CONTROL BOARD	/0012.8D	-XP_ACBJ7T	CONNECTOR - ANALOG CONTROL BOARD	/0010.14E	-XP_ACBJ9	CONNECTOR - ANALOG CONTROL BOARD	/0028.6A	-XP_RJ45	CONNECTOR - ETHERNET RJ45	/0008.6L	-XP_XID1J1	CONNECTOR - EXTERNAL I/O 1	/0029.13A	-XP_XID1J2	CONNECTOR - EXTERNAL I/O 1	/0029.15C	-XP_XID1J6	CONNECTOR - EXTERNAL I/O 1	/0029.9A	-XP_XID1J7	CONNECTOR - EXTERNAL I/O 1	/0029.8C	-XS_CVR	CONNECTOR - COMMISSIONING CONVENIENCE RECEPTACLE	/0015.5D	-XX_RA10	TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE	/0006.1G	-XX_RA2	TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE	/0006.1A	-XX_RA5	TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE	/0006.1J	-XX_RA6	TERMINAL BLOCK ASSEMBLY - SUPPORT ROCKWELL AUTOMATION USE	/0006.1F	B
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REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAD	2018-10-11	APPROVAL	VFD REPLACEMENT PF7000B
00	J. HAD	2018-11-15	REL TO MFG	
01	J. HAD	2019-02-26	AS SHIPPED	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
PROJ. DDC, TYPE	ELD			LANG:EN

Rockwell Automation		MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM DEVICE DESIGNATIONS		SHEET 0003 OF 0029	
				SIZE A1	10004347082
				VER 01	
DRAWN BY: J. HAD		DATE: 2018-10-11			

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1321DD1318C74C027000BRPDT DNS_0003.DWG

+WT-2-1
-XC_VFD1

/0004.7L

-KA_RUN /0008.15E REMOTE RELAY - AUXILIARY, RUN [N.O.] D-639A

-KA_FLT /0008.12F REMOTE RELAY - AUXILIARY, FAULT [N.O.] D-640

-KA_FLT /0008.13F REMOTE RELAY - AUXILIARY, FAULT [N.O.] D-640A

-KA_FLT /0008.12F REMOTE RELAY - AUXILIARY, FAULT [N.C.] D-641

-KA_FLT /0008.13F REMOTE RELAY - AUXILIARY, FAULT [N.C.] D-641A

-KA_FLT /0008.12G REMOTE RELAY - AUXILIARY, FAULT [N.C.] D-642

-KA_FLT /0008.13G REMOTE RELAY - AUXILIARY, FAULT [N.C.] D-642A

-KA_FLT /0008.12H REMOTE RELAY - AUXILIARY, FAULT [N.D.] D-643

-KA_FLT /0008.13H REMOTE RELAY - AUXILIARY, FAULT [N.D.] D-643A

-KA_WRN /0008.15F REMOTE RELAY - AUXILIARY, WARNING [N.O.] D-644

-KA_WRN /0008.15F REMOTE RELAY - AUXILIARY, WARNING [N.O.] D-644A

-KA_WRN /0008.15F REMOTE RELAY - AUXILIARY, WARNING [N.C.] D-645

-KA_WRN /0008.15F REMOTE RELAY - AUXILIARY, WARNING [N.C.] D-645A

-KA_WRN /0008.15G REMOTE RELAY - AUXILIARY, WARNING [N.C.] D-646

-KA_WRN /0008.15G REMOTE RELAY - AUXILIARY, WARNING [N.C.] D-646A

-KA_WRN /0008.15H REMOTE RELAY - AUXILIARY, WARNING [N.O.] D-647

-KA_WRN /0008.15H REMOTE RELAY - AUXILIARY, WARNING [N.O.] D-647A

-PI_LVMSH /0007.8H REMOTE CUSTOMER LOW VOLTAGE SUPPLY FOR MOTOR SPACE HEATER CIRCUIT MSH-L1

-EH_MSH /0007.11J REMOTE SPACE HEATER/HEATER ELEMENT - MOTOR MSH-L1B

-EH_MSH /0007.11J REMOTE SPACE HEATER/HEATER ELEMENT - MOTOR MSH-N

-PI_LVMSH /0007.9H REMOTE CUSTOMER LOW VOLTAGE SUPPLY FOR MOTOR SPACE HEATER CIRCUIT CSH-L1

-PI_LVCSH /0007.8B REMOTE CUSTOMER LOW VOLTAGE SUPPLY FOR CABINET SPACE HEATER CIRCUIT CSH-N

-Q_DI /0007.8F RA SEP. CONTROLLER - DRIVE INPUT [CSH_PWR]

-PI_LVCSH /0007.9B REMOTE CUSTOMER LOW VOLTAGE SUPPLY FOR CABINET SPACE HEATER CIRCUIT

-Q_DI /0007.9F RA SEP. CONTROLLER - DRIVE INPUT [CSH_PWR]

-JC_ESTP1 /0018.8C <JUMPER> JUMPER CUSTOMER - REMOTE EMERGENCY STOP 1 D-1100

-JC_ESTP1 /0018.8C <JUMPER> JUMPER CUSTOMER - REMOTE EMERGENCY STOP 1 D-1100A

-JC_ESTP2 /0018.7C <JUMPER> JUMPER CUSTOMER - REMOTE EMERGENCY STOP 2 D-1100B

-JC_ESTP2 /0018.7C <JUMPER> JUMPER CUSTOMER - REMOTE EMERGENCY STOP 2 1100C

-Q_DI /0019.6C RA SEP. CONTROLLER - DRIVE INPUT [DI_IS_STAT] D-401

-Q_SE /0022.4F RA SEP. CONTROLLER - AC BRUSHLESS EXCITER [SE_AUX_TRIP] D-401

-JC_STP /0021.4C <JUMPER> JUMPER CUSTOMER - REMOTE STOP D-401

-JC_MTR_PRTC /0022.5H <JUMPER> JUMPER CUSTOMER - MOTOR PROTECTION D-401

-JC_MTR_PRTC /0022.5H <JUMPER> JUMPER CUSTOMER - MOTOR PROTECTION D-401

-JC_IN_PRTC_2 /0022.5E <JUMPER> JUMPER CUSTOMER - INPUT PROTECTION D-401

-JC_STP /0021.4C <JUMPER> JUMPER CUSTOMER - REMOTE STOP D-401

-JC_10 /0018.10H <JUMPER> JUMPER CUSTOMER D-402

-Q_SE /0018.6H RA SEP. CONTROLLER - AC BRUSHLESS EXCITER [SE_CTRL_PWR] 402

-JC_10 /0018.10H <JUMPER> JUMPER CUSTOMER 402

-JC_10 /0018.10H <JUMPER> JUMPER CUSTOMER 402

-Q_DI /0010.5D RA SEP. CONTROLLER - DRIVE INPUT DI-1

-Q_DI /0010.5D RA SEP. CONTROLLER - DRIVE INPUT DI-2

-Q_DI /0010.5C RA SEP. CONTROLLER - DRIVE INPUT DI-14A

-Q_SE /0018.5H RA SEP. CONTROLLER - AC BRUSHLESS EXCITER [SE_CTRL_PWR] D-405

-Q_SE /0013.14C RA SEP. CONTROLLER - AC BRUSHLESS EXCITER D-470

-Q_SE /0013.14C RA SEP. CONTROLLER - AC BRUSHLESS EXCITER D-470A

-Q_DI /0019.7C RA SEP. CONTROLLER - DRIVE INPUT [DI_IS_STAT] D-500

-Q_DI /0019.6F RA SEP. CONTROLLER - DRIVE INPUT [DI_CNT_STAT] D-501A

-Q_DI /0019.5F RA SEP. CONTROLLER - DRIVE INPUT [DI_CNT_STAT] D-501C

-JC_STP /0021.4C <JUMPER> JUMPER CUSTOMER - REMOTE STOP D-600A

-SG_REM_STR /0021.7E REMOTE PUSHBUTTON - REMOTE CUSTOMER START [N.O.] D-601

-SG_REM_STR /0021.7E REMOTE PUSHBUTTON - REMOTE CUSTOMER START [N.O.] D-601B

-Q_DI /0022.5C RA SEP. CONTROLLER - DRIVE INPUT [DI_CNT_PRTC] D-609

-JC_MTR_PRTC /0022.5H <JUMPER> JUMPER CUSTOMER - MOTOR PROTECTION D-612

-JC_IN_PRTC_2 /0022.5E <JUMPER> JUMPER CUSTOMER - INPUT PROTECTION D-613

-Q_SE /0022.5F RA SEP. CONTROLLER - AC BRUSHLESS EXCITER [SE_AUX_TRIP] D-614

-KA_RDY /0008.12C REMOTE RELAY - AUXILIARY, READY [N.O.] D-622

-KA_RDY /0008.13C REMOTE RELAY - AUXILIARY, READY [N.O.] D-632

-KA_RDY /0008.12D REMOTE RELAY - AUXILIARY, READY [N.C.] D-633

-KA_RDY /0008.13D REMOTE RELAY - AUXILIARY, READY [N.C.] D-633A

-KA_RDY /0008.12D REMOTE RELAY - AUXILIARY, READY [N.C.] D-634

-KA_RDY /0008.13D REMOTE RELAY - AUXILIARY, READY [N.C.] D-634A

-KA_RDY /0008.12E REMOTE RELAY - AUXILIARY, READY [N.O.] D-635

-KA_RDY /0008.13E REMOTE RELAY - AUXILIARY, READY [N.O.] D-635A

-KA_RUN /0008.15C REMOTE RELAY - AUXILIARY, RUN [N.O.] D-636

-KA_RUN /0008.15C REMOTE RELAY - AUXILIARY, RUN [N.O.] D-636A

-KA_RUN /0008.15D REMOTE RELAY - AUXILIARY, RUN [N.C.] D-637

-KA_RUN /0008.15D REMOTE RELAY - AUXILIARY, RUN [N.C.] D-637A

-KA_RUN /0008.15D REMOTE RELAY - AUXILIARY, RUN [N.C.] D-638

-KA_RUN /0008.15D REMOTE RELAY - AUXILIARY, RUN [N.C.] D-638A

-KA_RUN /0008.15E REMOTE RELAY - AUXILIARY, RUN [N.O.] D-639

/0004.15A

REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJECT:
VFD REPLACEMENT PF7000B

CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

PROJ. DOC. TYPE:ELD

LANG:EN

DRAWN BY: J. HAD

DATE: 2018-10-11

SHEET 0004 OF 0029

SIZE A1

VER 01

MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
TERMINAL STRIP REPORT

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1321DDI318C74C027000BRPDT DNS_0004.DWG

Diagram showing a unit electrical diagram for a Rockwell Automation MV Bulletin 7000 Direct to Drive. The diagram includes a table of jumpers and a detailed terminal strip report.

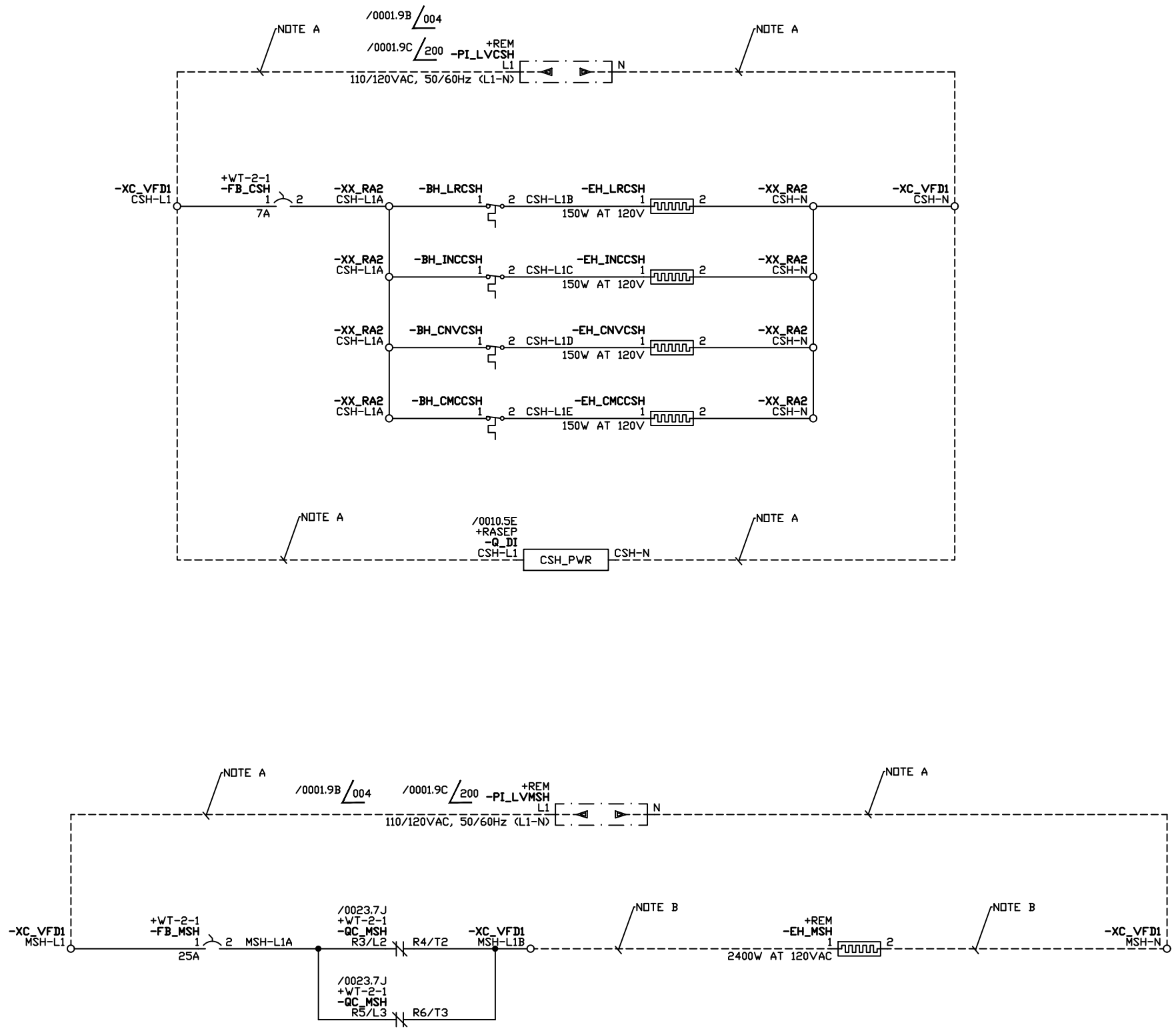
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					MFN-T2	
					MFN-T3	
					SPARE	
					SPARE	
					SPARE	
					SPARE	
					SPARE	

REV	APPROVED	DATE	STAGE	PROJECT	CUSTOMER	ORDER-LINE NUMBER	PROJ. DOC. TYPE
A	J. HAD	2018-10-11	APPROVAL	VFD REPLACEMENT PF7000B			
00	J. HAD	2018-11-15	REL TO MFG				
01	J. HAD	2019-02-26	AS SHIPPED				

Rockwell Automation		SHEET 0005 OF 0029	
MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM TERMINAL STRIP REPORT		SIZE A1	VER 01

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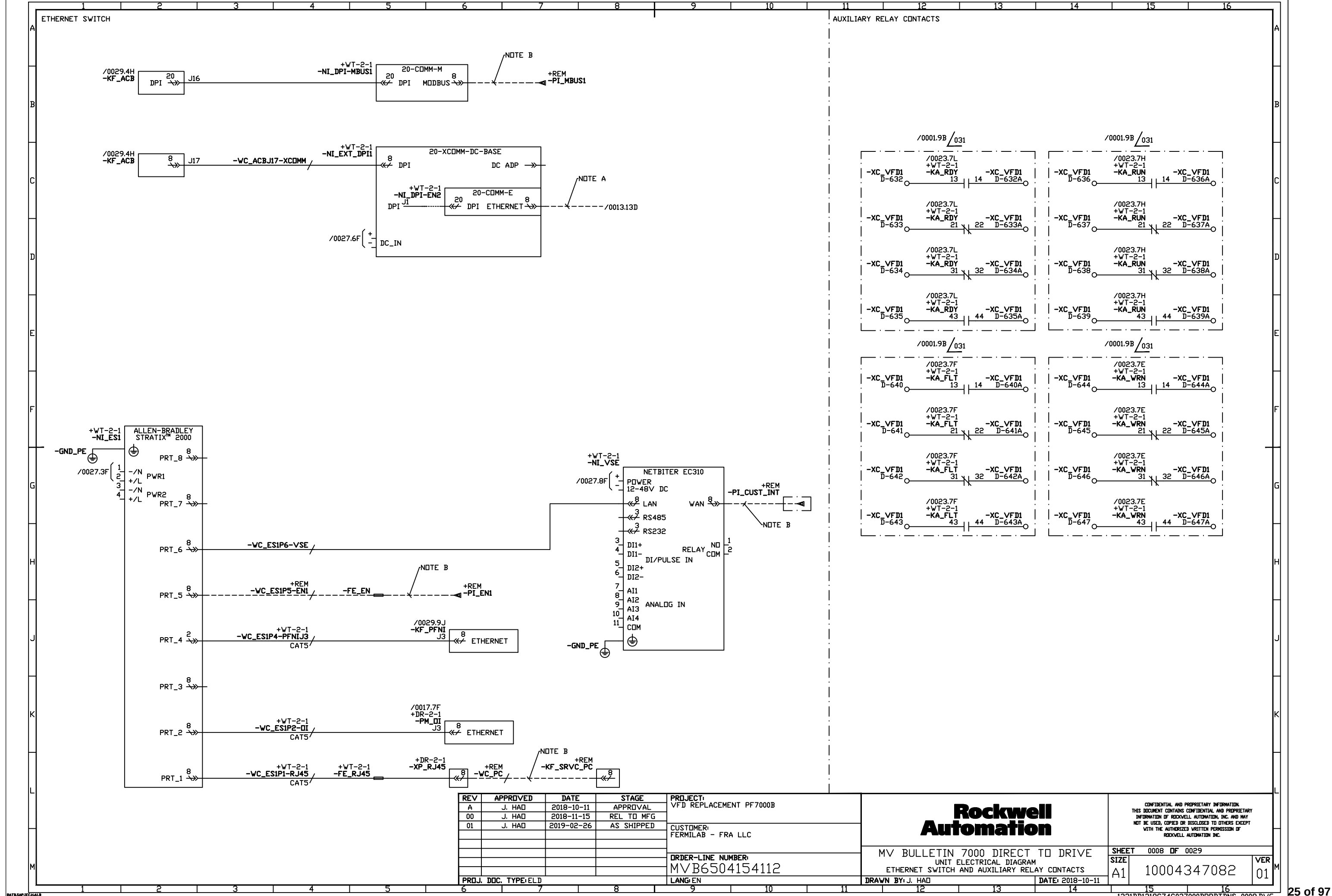


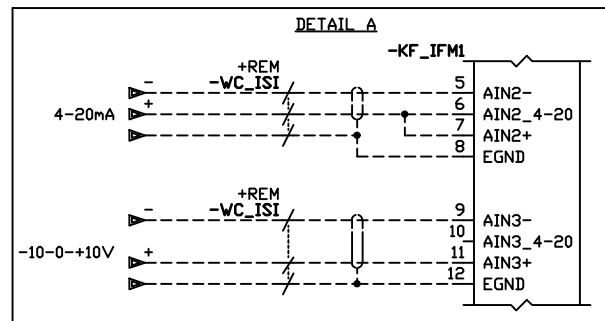
REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJECT: VFD REPLACEMENT PF7000B	CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112	LANG:EN

Rockwell Automation	MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM SPACE HEATER CIRCUITS
	DRAWN BY: J. HAD

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SHEET 0007 OF 0029	VER 01
SIZE A1	10004347082

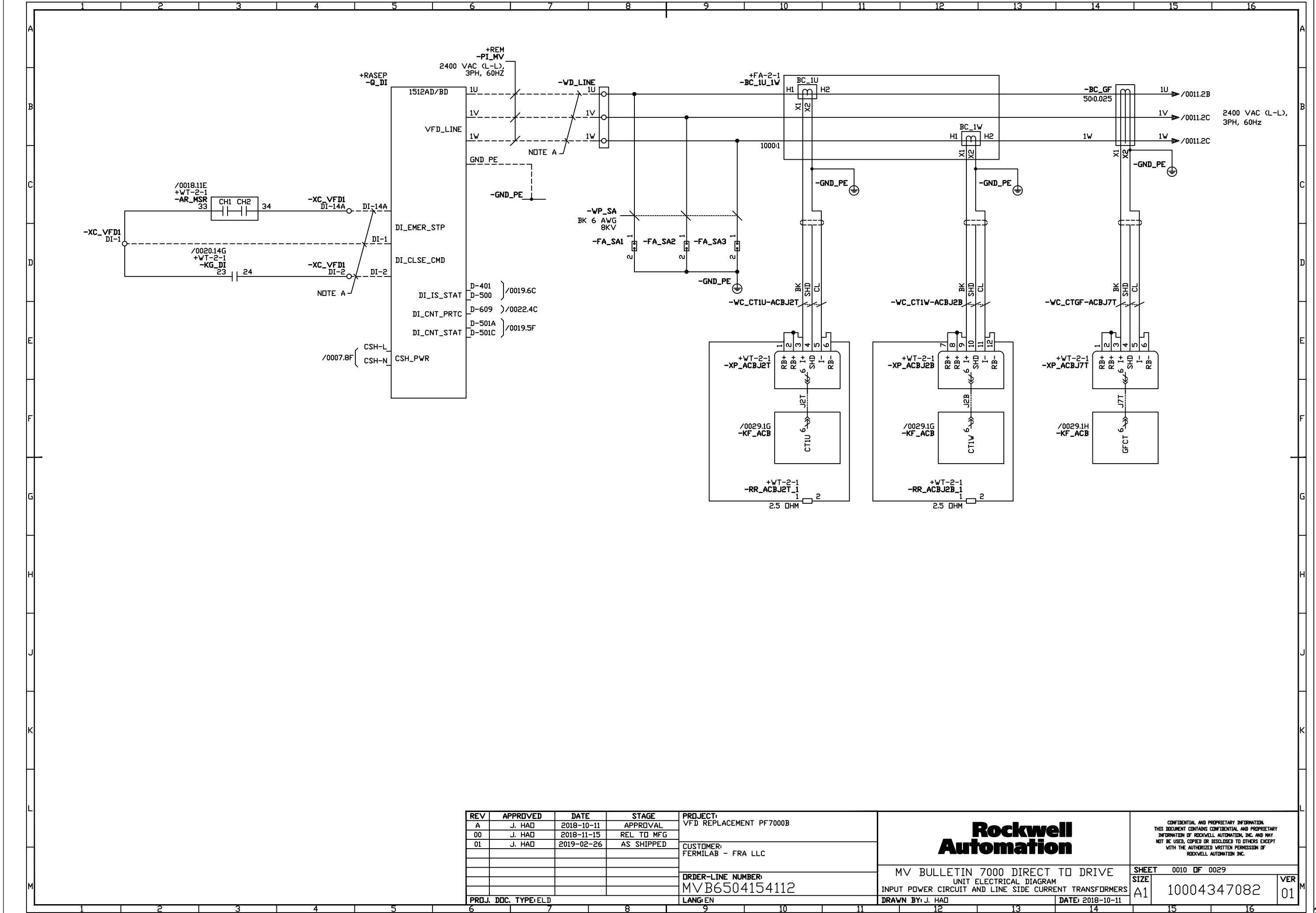




PROJ. DOC. TYPE	ELD
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DATE: 2018-10-11

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01	



REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

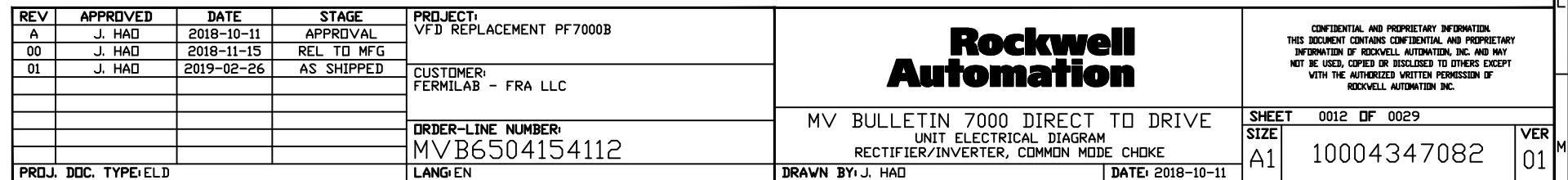
PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC

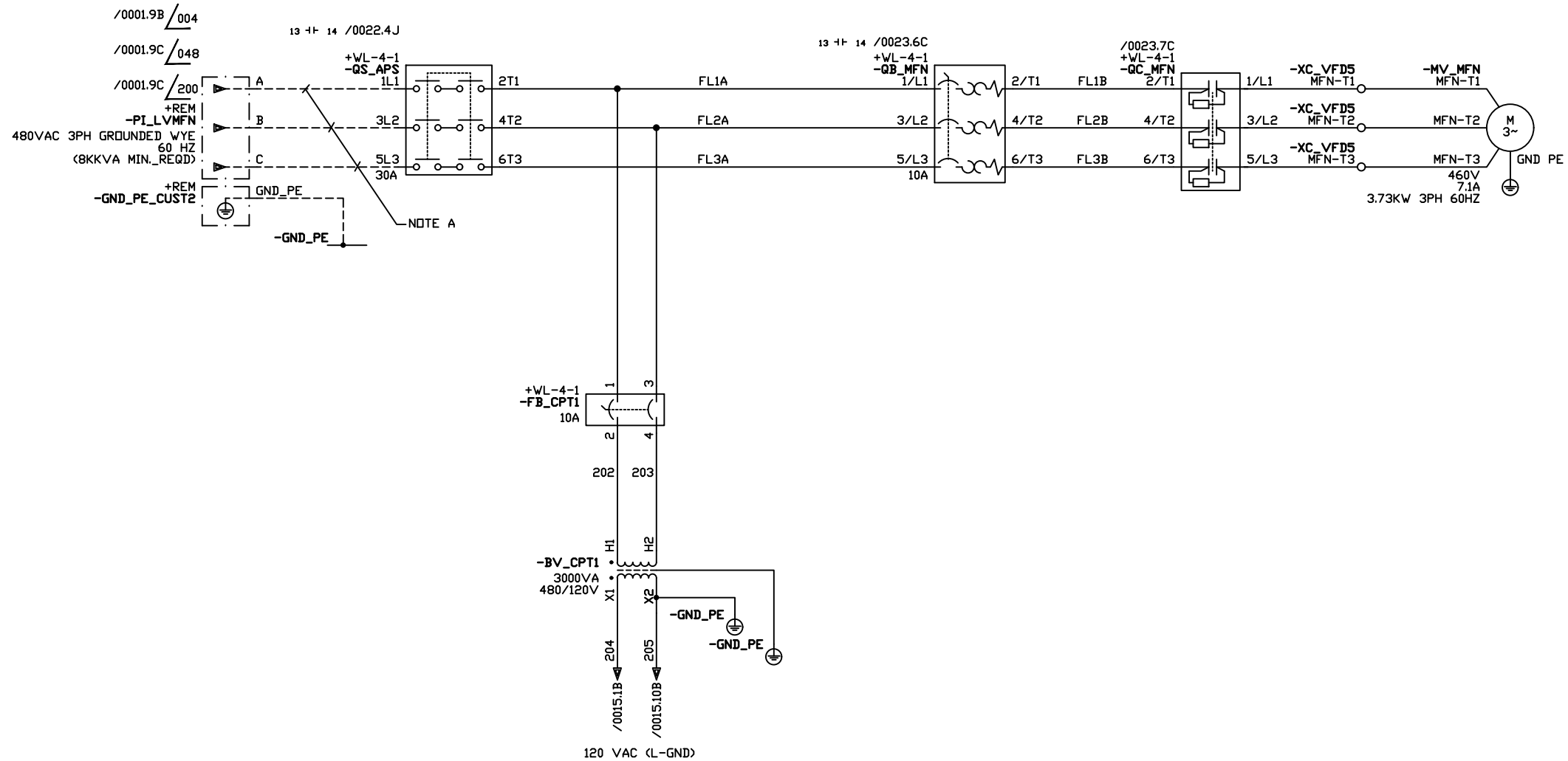
ORDER-LINE NUMBER:	MVB6504154112
PROJ. DOC. TYPE/ELD	LANG/EN

ORDER-LINE NUMBER:	MVB6504154112
PROJ. DOC. TYPE/ELD	LANG/EN

Rockwell Automation	
MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM INPUT POWER CIRCUIT AND LINE SIDE CURRENT TRANSFORMERS	
DRAWN BY: J. HAD	DATE: 2018-10-11

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SHEET 0010 OF 0029	VER 01
SIZE A1	10004347082





REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

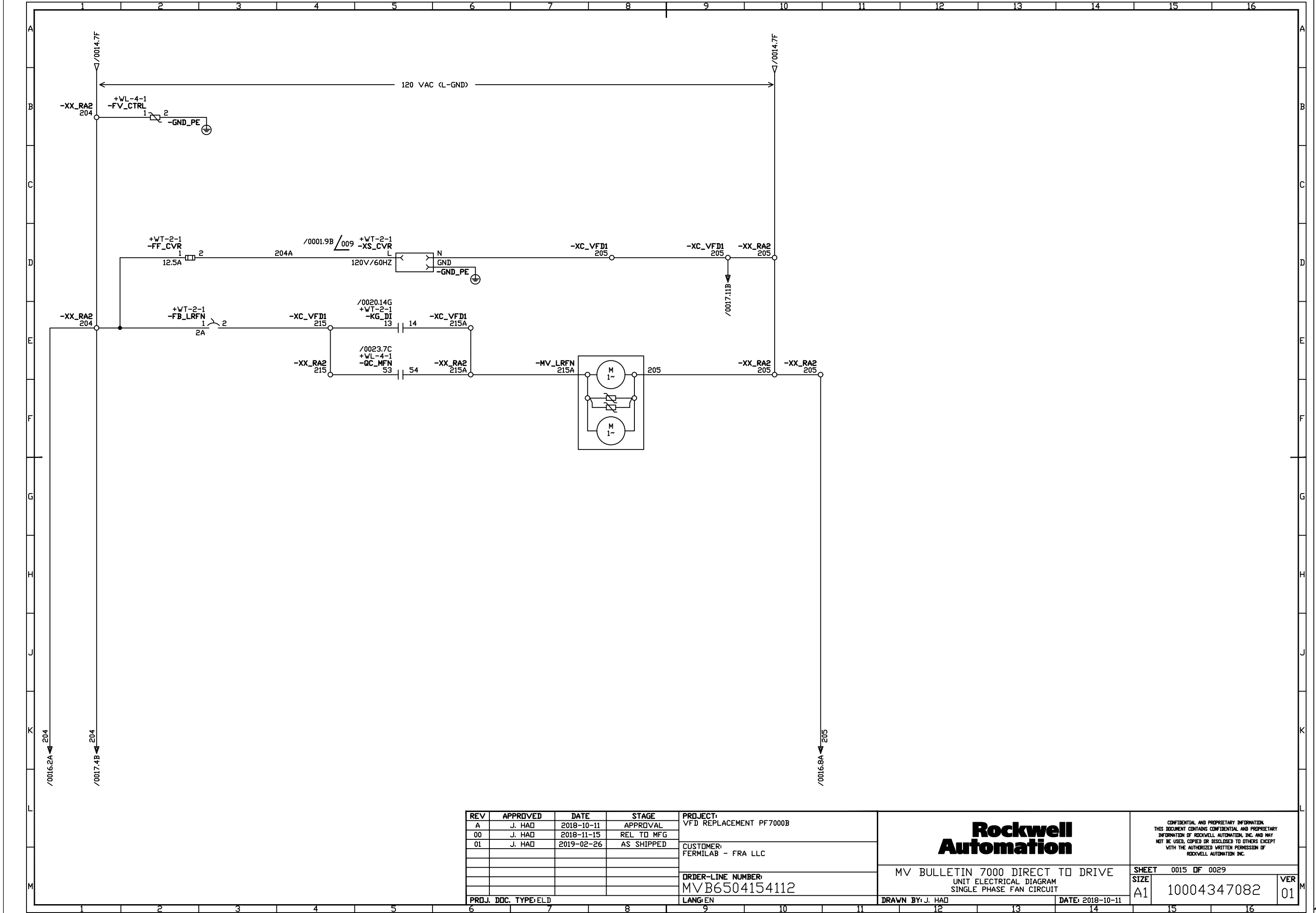
PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:EN	

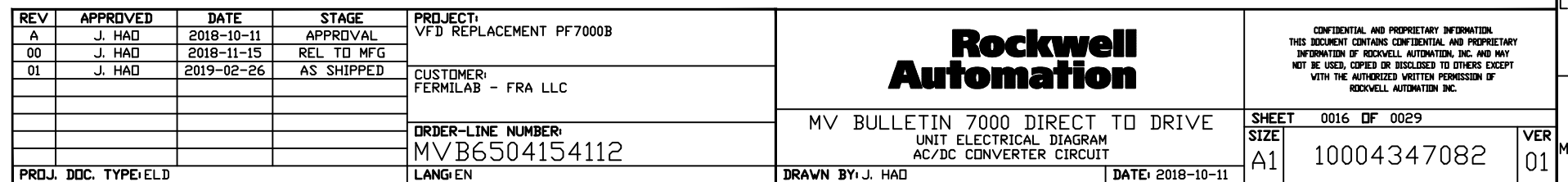
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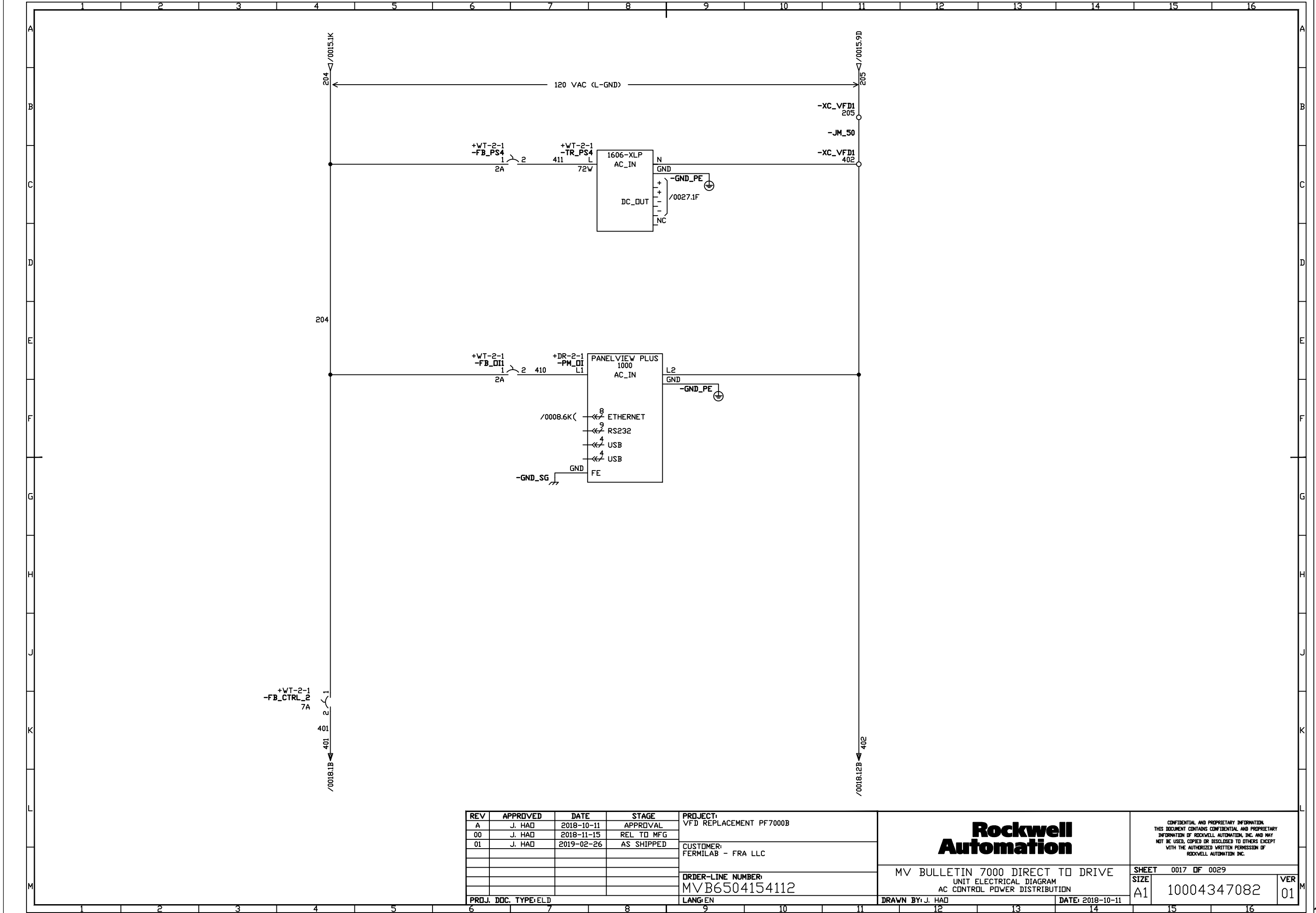
PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:EN	

Rockwell Automation	
MV BULLETIN 7000 DIRECT TO DRIVE UNIT ELECTRICAL DIAGRAM THREE PHASE FAN CIRCUIT	
SHEET	0014 OF 0029
SIZE	A1
VER	01

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SHEET	0014 OF 0029
SIZE	A1
VER	01







REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:	EN

PROJ. DOC. TYPE:	ELD
DRAWN BY:	J. HAD
DATE:	2018-10-11

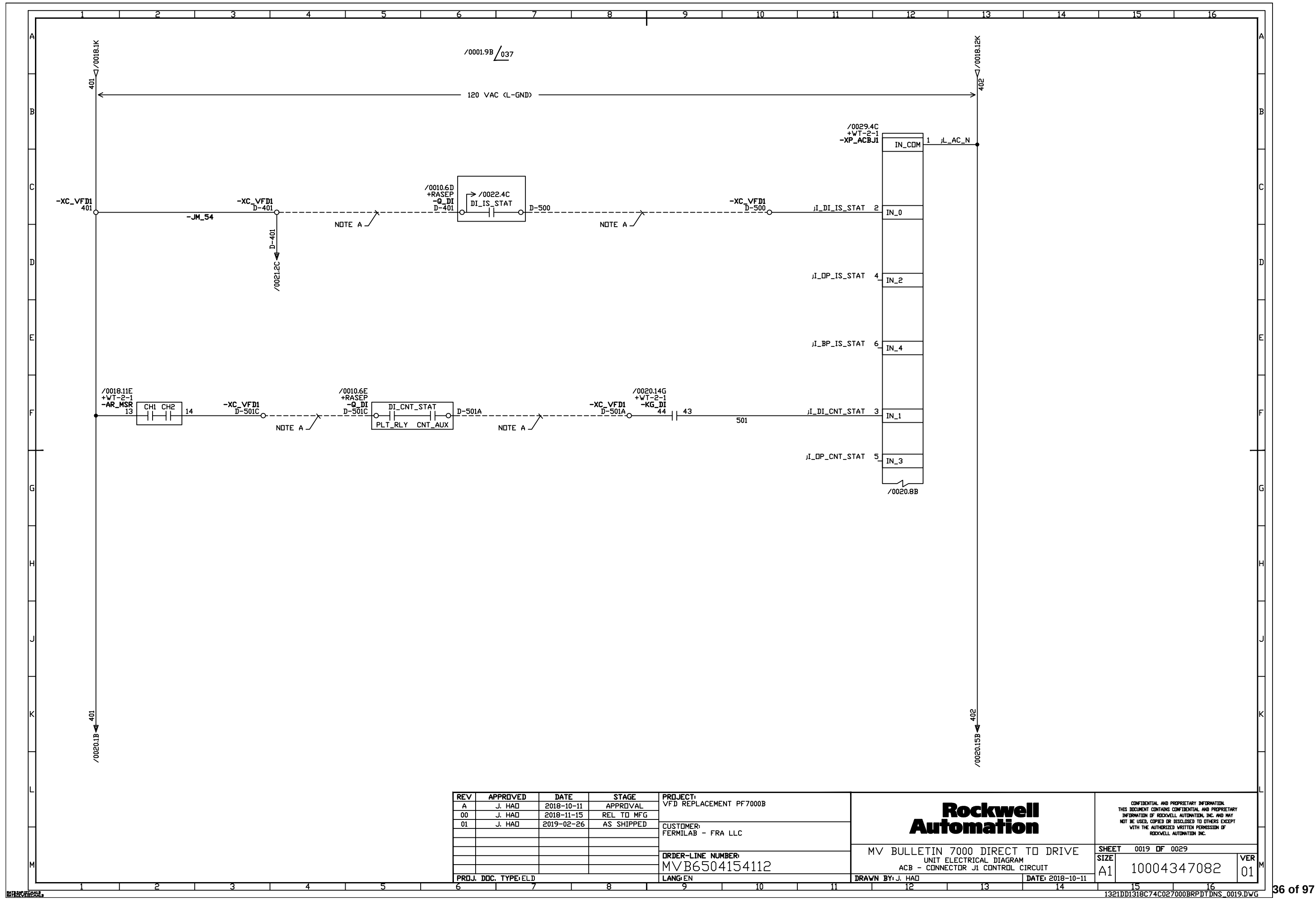
Rockwell Automation

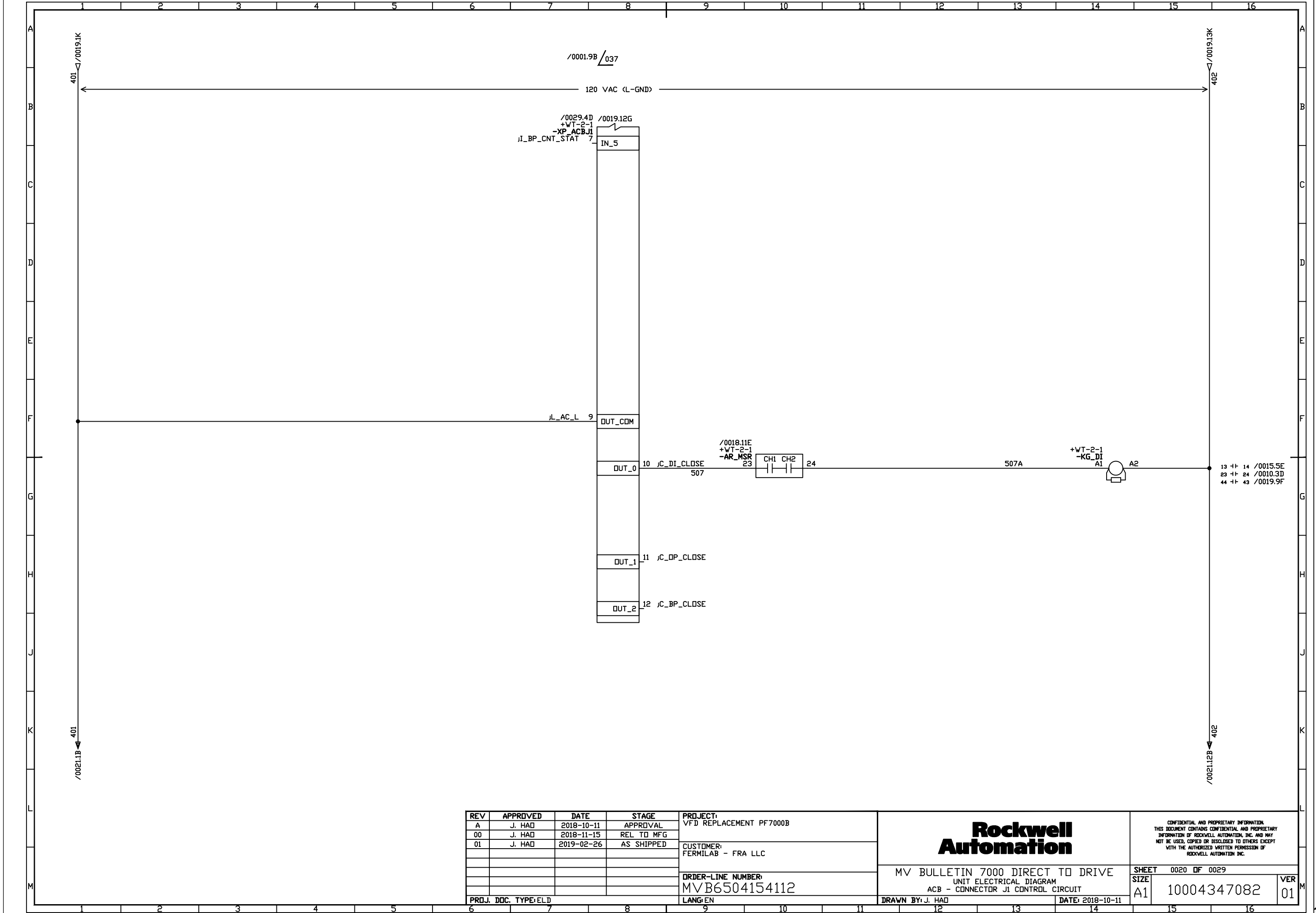
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SHEET	0017	OF	0029
SIZE	A1	VER	01

MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
AC CONTROL POWER DISTRIBUTION

10004347082





REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:EN	

PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:EN	

PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:EN	

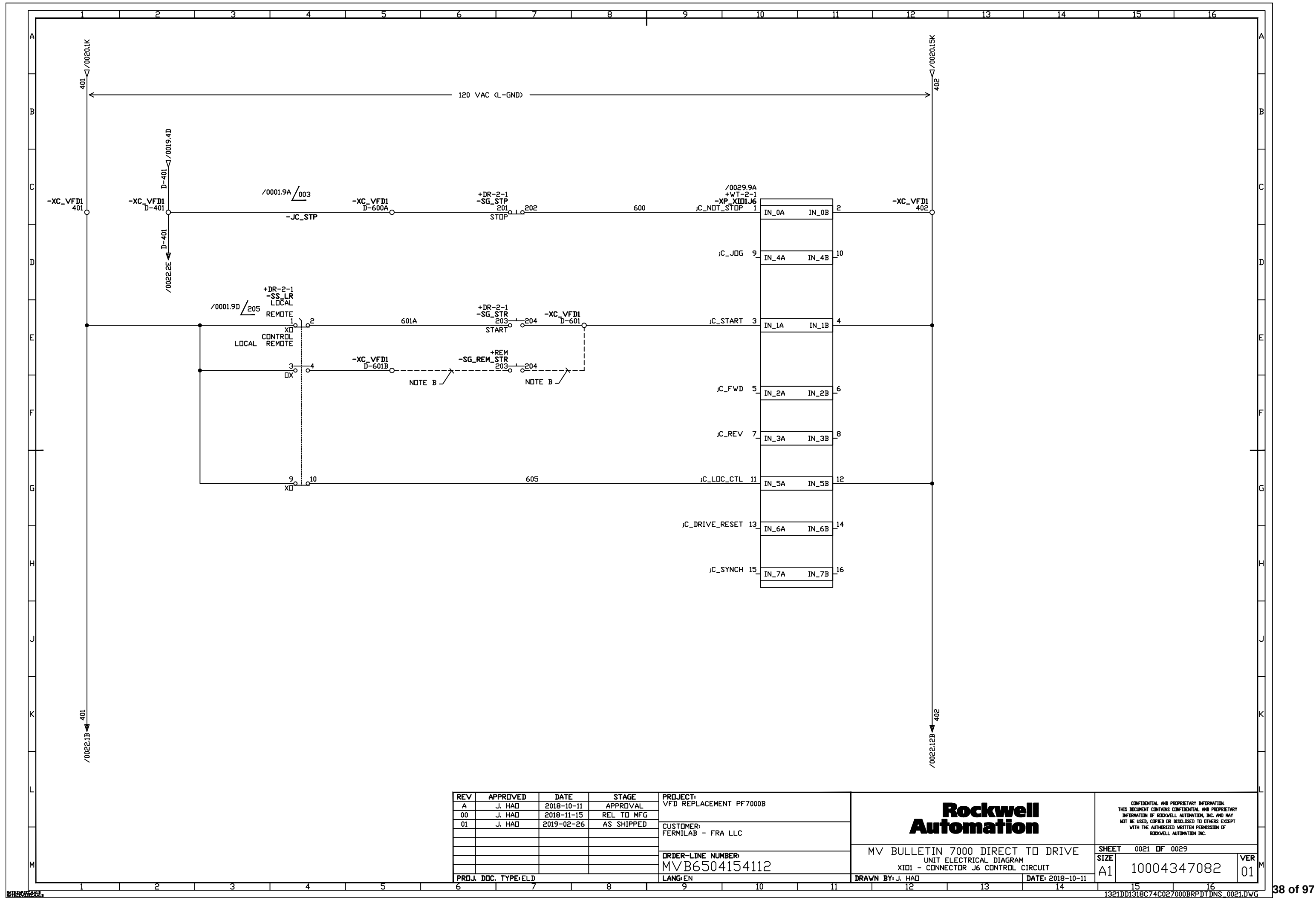
**Rockwell
Automation**

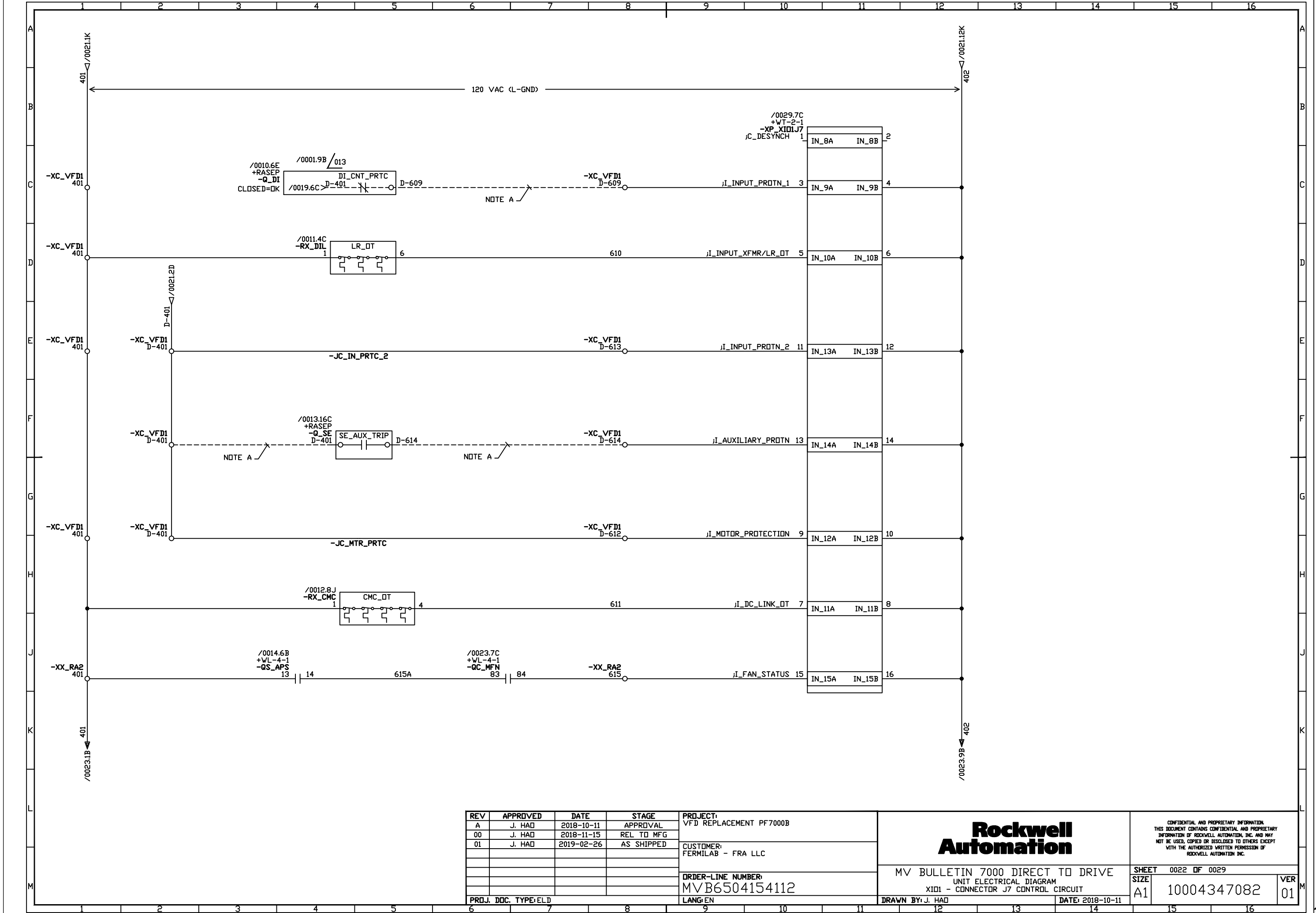
MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
ACB - CONNECTOR J1 CONTROL CIRCUIT

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SHEET	0020	OF	0029
SIZE	A1	VER	01

10004347082





REV	APPROVED	DATE	STAGE
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00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

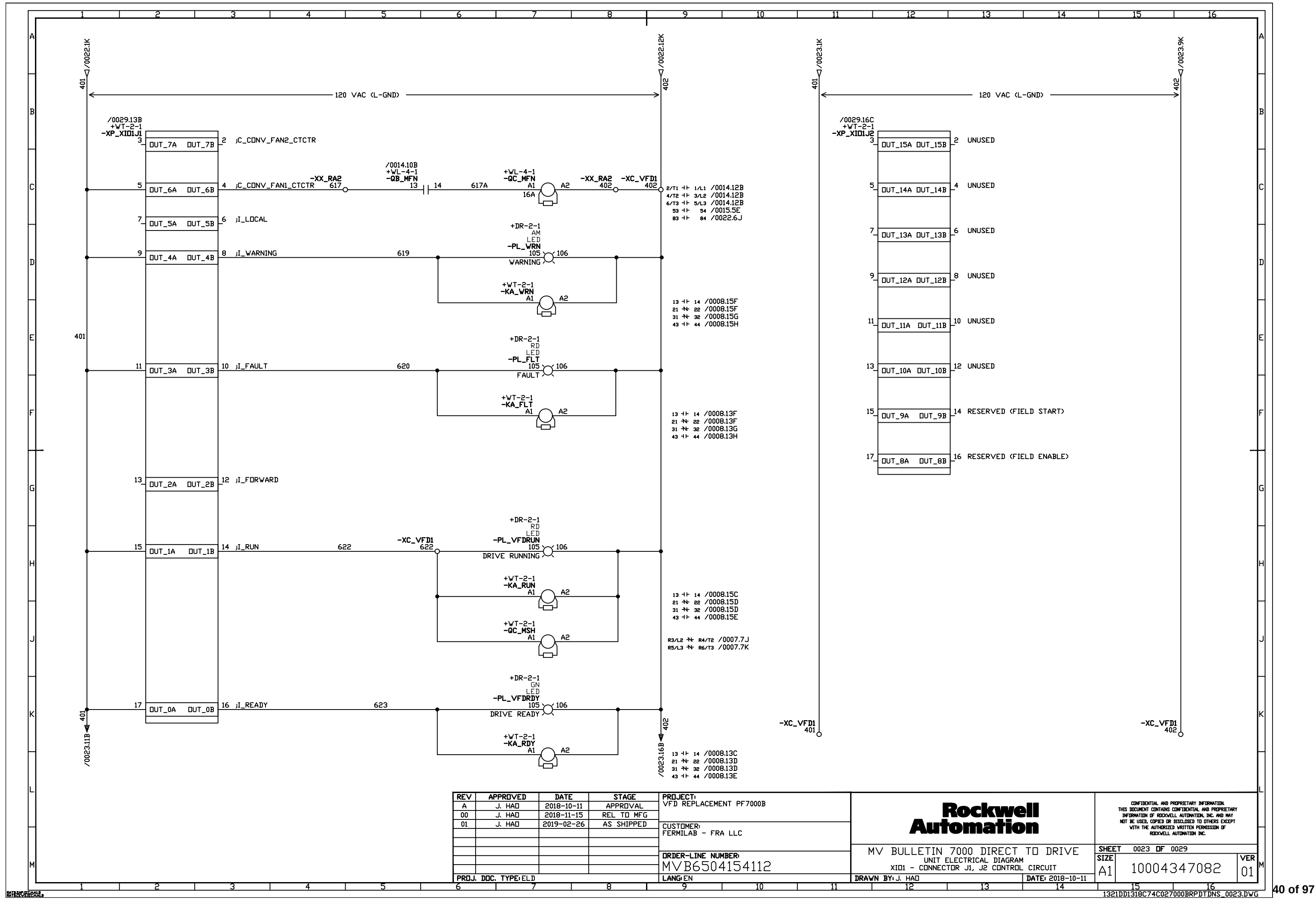
PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:EN	

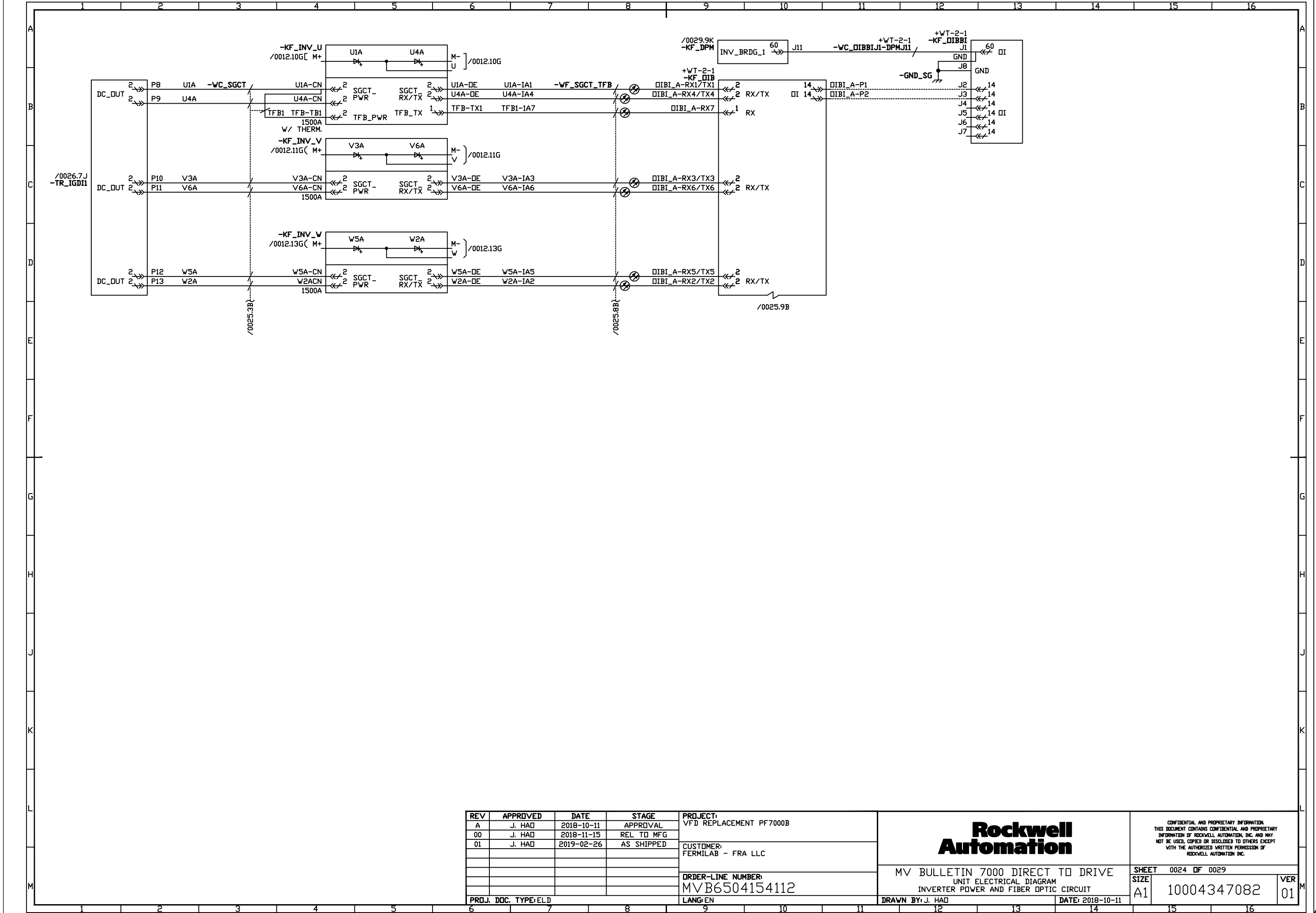
PROJ. DOC. TYPE:ELD	
DRAWN BY: J. HAD	DATE: 2018-10-11

Rockwell Automation

MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
XID1 - CONNECTOR J7 CONTROL CIRCUIT

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SHEET 0022 OF 0029	VER 01
SIZE A1	10004347082





REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJECT:
VFD REPLACEMENT PF7000B

CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

PROJ. DDC. TYPE ELD

LANG EN

**Rockwell
Automation**

MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
INVERTER POWER AND FIBER OPTIC CIRCUIT

DRAWN BY: J. HAD

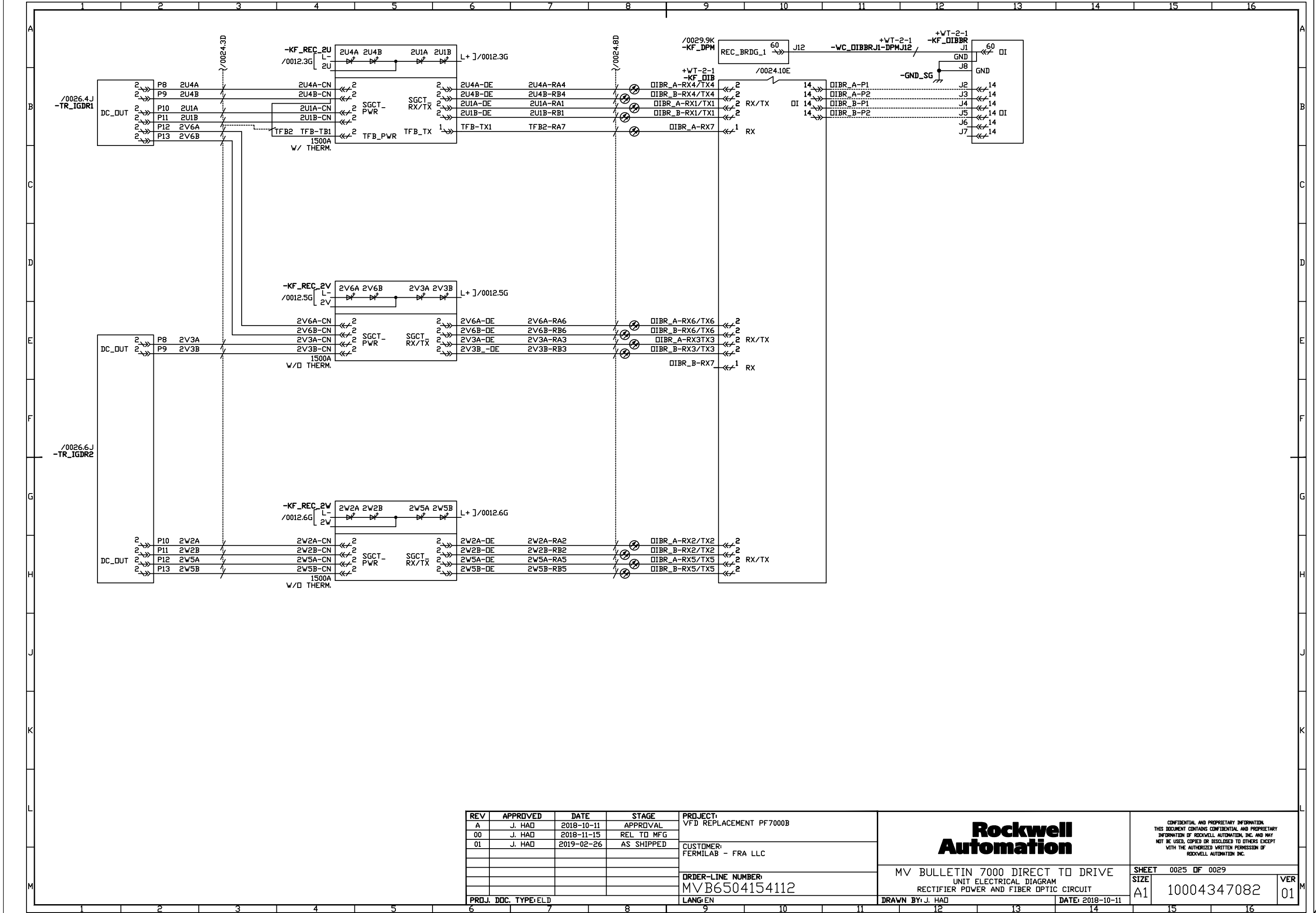
DATE: 2018-10-11

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SHEET 0024 OF 0029

SIZE
A1 10004347082

VER
01



REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJ. DOC. TYPE ELD

PROJECT:
VFD REPLACEMENT PF7000B

CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

LANG: EN

**Rockwell
Automation**

MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
RECTIFIER POWER AND FIBER OPTIC CIRCUIT

DRAWN BY: J. HAD

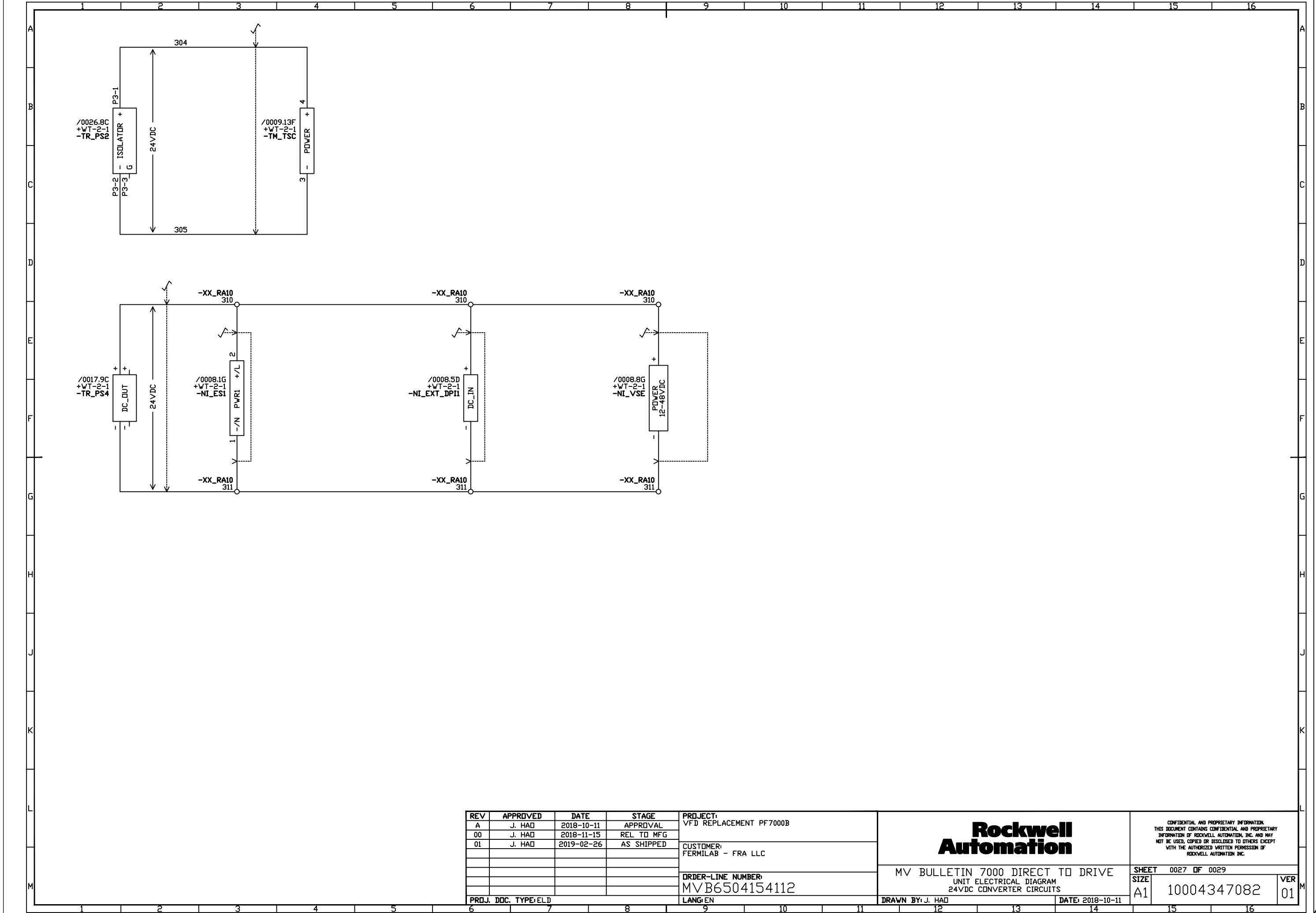
DATE: 2018-10-11

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SHEET 0025 OF 0029

SIZE
A1 10004347082

VER
01



REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-11	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJ. DDC. TYPE ELD

PROJECT:
VFD REPLACEMENT PF7000B

CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

LANG: EN

**Rockwell
Automation**

MV BULLETIN 7000 DIRECT TO DRIVE
UNIT ELECTRICAL DIAGRAM
24VDC CONVERTER CIRCUITS

DRAWN BY: J. HAD

DATE: 2018-10-11

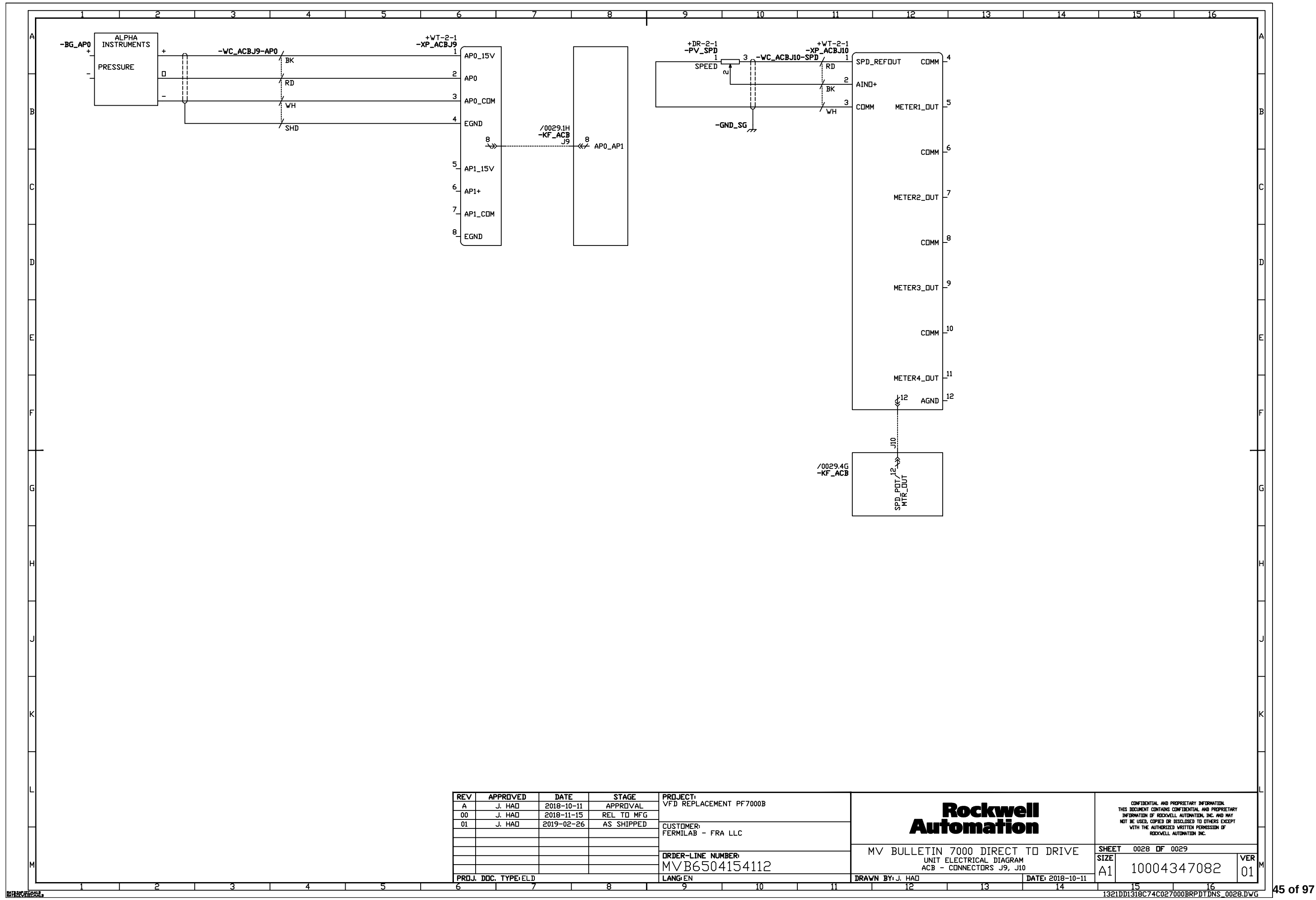
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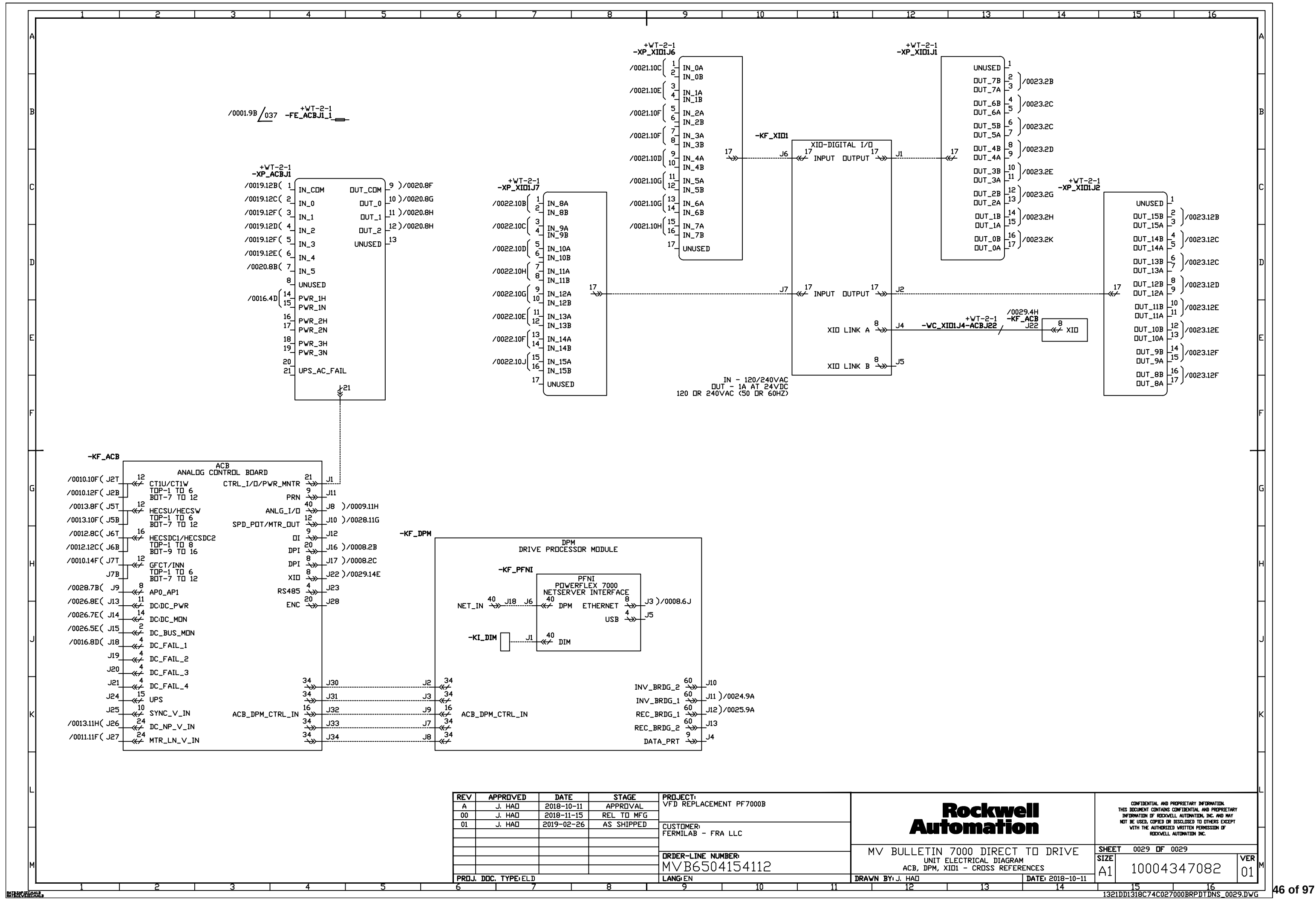
SHEET 0027 OF 0029

SIZE
A1

10004347082

VER
01





	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R		
01	BASE UNIT DATA																01	
02	CATALOG NUMBER		1592MT-CDA														02	
03	UNIT DESCRIPTION		FUSED MAIN														03	
04	SYSTEM VOLTAGE CLASS		5KV														04	
05	OPERATING AMBIENT TEMPERATURE		0 - 35 DEG C														05	
06	CONTROL POWER SOURCE		CONTROL POWER TRANSFORMERS														06	
07																	07	
08	PROTECTION & MONITORING																08	
09	FEEDER PROTECTION RELAY		NONE SELECTED														09	
10	GROUND FAULT CURRENT TRANSF		NONE SELECTED														10	
11	LIGHTNING ARRESTORS		NONE SELECTED														11	
12	SURGE CAPACITOR		NONE SELECTED														12	
13																	13	
14	METERING DEVICES																14	
15	POWER MONITORING RELAYS		POWERMONITOR 5000 + ETHERNET														15	
16	METERING - ANALOG CURRENT		NONE SELECTED														16	
17	AMMETER SCALE RATIO		NONE SELECTED														17	
18	METERING - ANALOG VOLTAGE		NONE SELECTED														18	
19	SHORTING TERMINAL BLOCK		NONE SELECTED														19	
20	TEST TERMINAL BLOCK CURRENT		NONE SELECTED														20	
21	TEST TERMINAL BLOCK VOLTAGE		NONE SELECTED														21	
22	TEST TERMINAL BLOCK MULTI		NONE SELECTED														22	
23	CURRENT TRANSFORMERS		THREE (3) CURRENT TRANSFORMERS														23	
24																	24	
25	COMMUNICATION & ANALOG SIGNALS																25	
26	ISOLATED ANALOG TRANSDUCERS		NONE SELECTED														26	
27	CONTROLLER NETWORK INTERFACES		NONE SELECTED														27	
28	POWER SUPPLY		NONE SELECTED														28	
29	COMM ADAPTERS DEVICENET		NONE SELECTED														29	
30																	30	
31																	31	
32																	32	
33																	33	
34																	34	
35																	35	
36																	36	
37																	37	
38																	38	
39																	39	
40																	40	
41																	41	
RATB.SAP_JCH.D.C RATB.CEWS_JCH.D.C		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	5C950378B71B421A1592X_UNT_SPC_0001.DWG

CONTROL CIRCUIT WIRING			
CONTROL TERMINAL BLOCK TYPE	IEC TERMINAL BLOCKS		
CONTROL CIRCUIT WIRING TYPE	TEW OR MTW TINNED COPPER		
HEAT SHRINK TUBING	NONE SELECTED		
CONTROL CIRCUIT LUGS	NONE SELECTED		
SPACE HEATERS			
CABINET SPACE HEATER	150W AT 120VAC EXT. SOURCE		
CONTROL POTENTIAL TRANSFORMER			
CONTROL CIRCUIT TRANSFORMER	500VA 2400V/120V CPT		
POTENTIAL TRANSFORMERS	(2) 425VA 2400V/120V PTS OPEN DELTA		
POTENTIAL TRANSF INTERWIRING	NONE SELECTED		
MISCELLANEOUS			
DEVICE NAMEPLATES	NONE SELECTED		
THERMAL SCANNING WINDOW	NONE SELECTED		
KEY INTERLOCK SUPPLEMENTARY	KL FLANGE LOCK ON LBS		
UNIT HAS MASTER NAMEPLATE	YES		

REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B
00	J. HAO	2018-11-15	REL TO MFG	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
PROJ. DOC. TYPE: SPC				LANG: EN

		SHEET 0001 OF 0001	
MV BULLETIN 1592M UNIT SPECIFICATION		SIZE	VER
D		10004346898	00

DRAWN BY: J. HAO		DATE: 2018-10-05	
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DRAWING SHEET INDEX

SHEET NO	DESCRIPTION
0001	SHEET INDEX AND NOTES
0002	TERMINAL BLOCK CIRCUIT
0003	AUXILIARY CIRCUITS AND MULTI-FUNCTION RELAYS
0004	MV POWER CIRCUIT
0005	LV CONTROL CIRCUIT
0006	LV CONTROL CIRCUIT
0007	SECONDARY TRANSFORMER CIRCUIT

0006-N29 CROSS REFERENCE: SHEET AND CO-ORDINATE

DR-1-1 PART TYPE-SECTION-ZONE

PR_FPR DEVICE DESIGNATION

NOTE A : E-HOUSE VENDOR TO PROVIDE THE CABLING/WIRING BETWEEN THE UNITS

NOTE B : CUSTOMER TO PROVIDE THE CABLING/WIRING TO THE UNIT.

WIRING LEGEND

	WIRING SUPPLIED AND INSTALLED BY ROCKWELL AUTOMATION.
-----	WIRING SUPPLIED AND INSTALLED BY OTHERS.
-----	WIRING SUPPLIED BY ROCKWELL AUTOMATION TO BE COMPLETED BY OTHERS.

0006-N29 CROSS REFERENCE: SHEET AND CO-ORDINATE

DR-1-1 PART TYPE-SECTION-ZONE

PR_FPR DEVICE DESIGNATION

NOTE A : E-HOUSE VENDOR TO PROVIDE THE CABLING/WIRING BETWEEN THE UNITS

NOTE B : CUSTOMER TO PROVIDE THE CABLING/WIRING TO THE UNIT.

WIRING LEGEND

	WIRING SUPPLIED AND INSTALLED BY ROCKWELL AUTOMATION.
-----	WIRING SUPPLIED AND INSTALLED BY OTHERS.
-----	WIRING SUPPLIED BY ROCKWELL AUTOMATION TO BE COMPLETED BY OTHERS.

DEVICE DESIGNATIONS

ID	DESCRIPTION	XREF
BU_MV	BUS - MAIN POWER	0004-Q03
CBL_DISP	CABLE - POWERMONITOR TO DISPLAY MODULE	0003-B31
CBL_ES	CABLE - POWERMONITOR TO ETHERNET SWITCH	0003-B28
CT_PHASE1	TRANSFORMER - CURRENT 3 PHASE #1	0004-P03
CT_PHASE2	TRANSFORMER - CURRENT 3 PHASE #2	0004-P05
CT_PHASE3	TRANSFORMER - CURRENT 3 PHASE #3	0004-Q06
DISP_PM	DISPLAY - POWERMONITOR	0003-E03
FU_CPT1	FUSE - PRIMARY OF CONTROL POWER TRANSFORMER 1	0004-F08
FU_CTRLA	FUSE - PRIMARY CONTROL CIRCUIT	0005-B03
FU_PT1	FUSE- PRIMARY OF POTENTIAL TRANSFORMER 1	0004-H08
FU_PT2	FUSE- PRIMARY OF POTENTIAL TRANSFORMER 2	0004-J08
FU_PWR	FUSE- MEDIUM VOLTAGE POWER	0004-E03
FU_VREF	FUSE- VOLTAGE REFERENCE CIRCUIT	0007-C09
GND_PE	GROUND - EARTH POTENTIAL	0004-R08
HTR_CSH1	SPACE HEATER/HEATER ELEMENT - CABINET	0006-G06
HTR_CSH2	SPACE HEATER/HEATER ELEMENT - CABINET	0006-G11
LBS_M	SWITCH - LOAD BREAK, MAIN	0004-D03
NI_ES	NETWORK INTERFACE - ETHERNET SWITCH	0003-E09
PI_MV_PWR_IN	CUSTOMER MEDIUM VOLTAGE SUPPLY	0004-B03
PR_PM	RELAY - PROTECTION, POWERMONITOR	0003-B03
PWS_DISP_PM	POWER SUPPLY - DISPLAY MODULE FOR POWERMONITOR	0005-H14
Q_DI	CONTROLLER - DRIVE INPUT	0006-P26
T_CPT1	TRANSFORMER - VOLTAGE, CONTROL POWER	0004-F10
T_PT1	TRANSFORMER - VOLTAGE, POTENTIAL	0004-H10
T_PT2	TRANSFORMER - VOLTAGE, POTENTIAL	0004-J10
TAS_CSH1	TEMPERATURE ACTUATED SWITCH - CABINET SPACE HEATER 1	0006-E06
TAS_CSH2	TEMPERATURE ACTUATED SWITCH - CABINET SPACE HEATER 2	0006-E11
TB_C	TERMINAL BLOCK - CUSTOMER	0002-A01

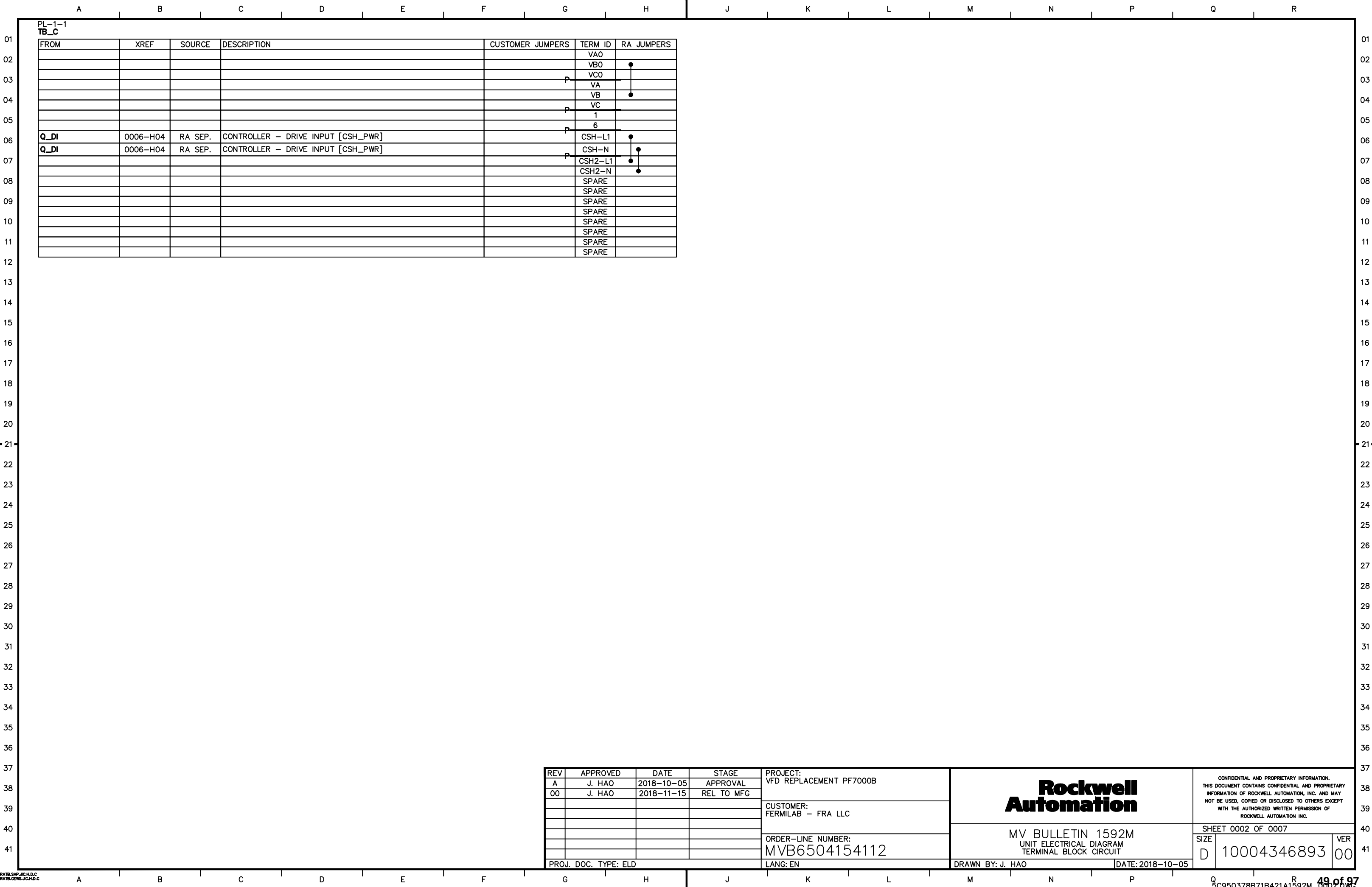
ADDITIONAL COMPONENTS AND FEATURES

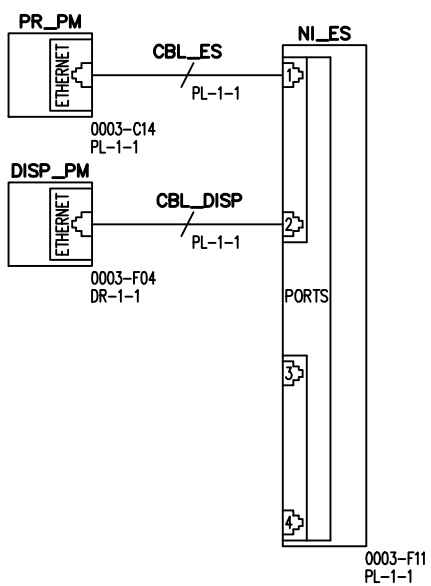
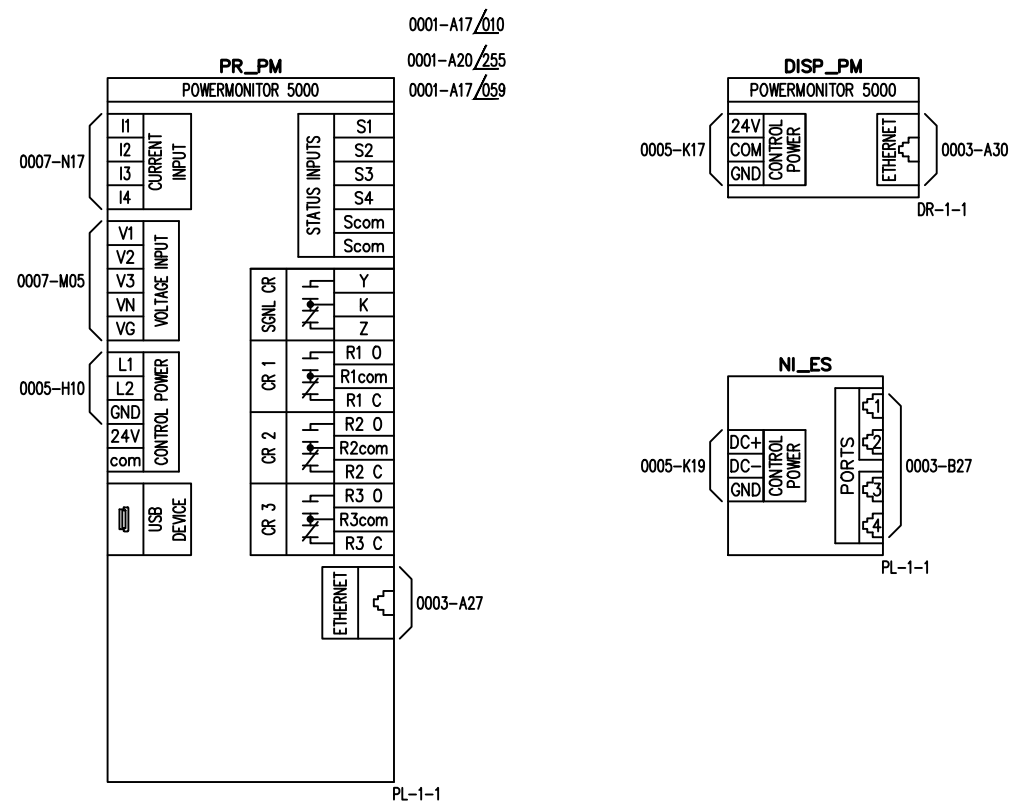
ID	DESCRIPTION
W_CTRL_TEW	WIRE - LOW VOLTAGE CONTROL WIRE TYPE - TEW (MTW) COPPER
WL_DRLK_1	WARNING LABEL - DOOR SECTION 1
WL_DRLK_2	WARNING LABEL - DOOR SECTION 2
WL_FALK_1	WARNING LABEL - FINAL ASSEMBLY SECTION 1
WL_FALK_2	WARNING LABEL - FINAL ASSEMBLY SECTION 2
WL_PLLK_1	WARNING LABEL - PANEL SECTION 1

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.			
A	J. HAO	2018-10-05	APPROVAL						
00	J. HAO	2018-11-15	REL TO MFG						
				CUSTOMER: FERMILAB - FRA LLC	MV BULLETIN 1592M UNIT ELECTRICAL DIAGRAM SHEET INDEX AND NOTES	SIZE	D	10004346893	VER 00
PROJ. DOC. TYPE: ELD				LANG: EN	DRAWN BY: J. HAO	DATE: 2018-10-05			

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REV	APPROVED	DATE	STAGE
A	J. HAO	2018-10-05	APPROVAL
00	J. HAO	2018-11-15	REL TO MFG
PROJ. DOC. TYPE: ELD			

PROJECT:	VFD REPLACEMENT PF7000B
----------	-------------------------

CUSTOMER:
FERMILAB — FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

LANG: EN

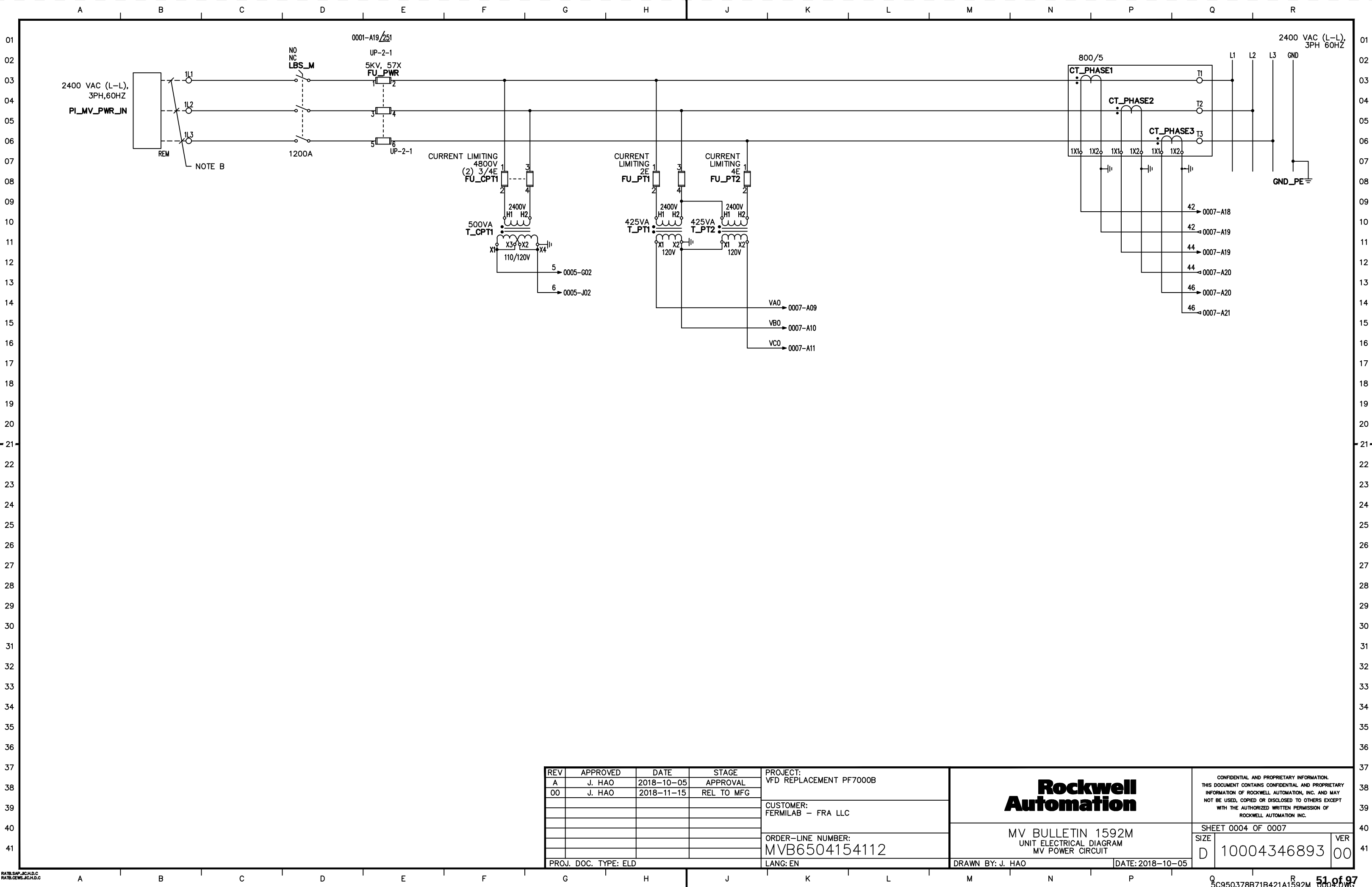


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SHEET 0003 OF 0007

SIZE		VER
D	10004346893	00

D		00
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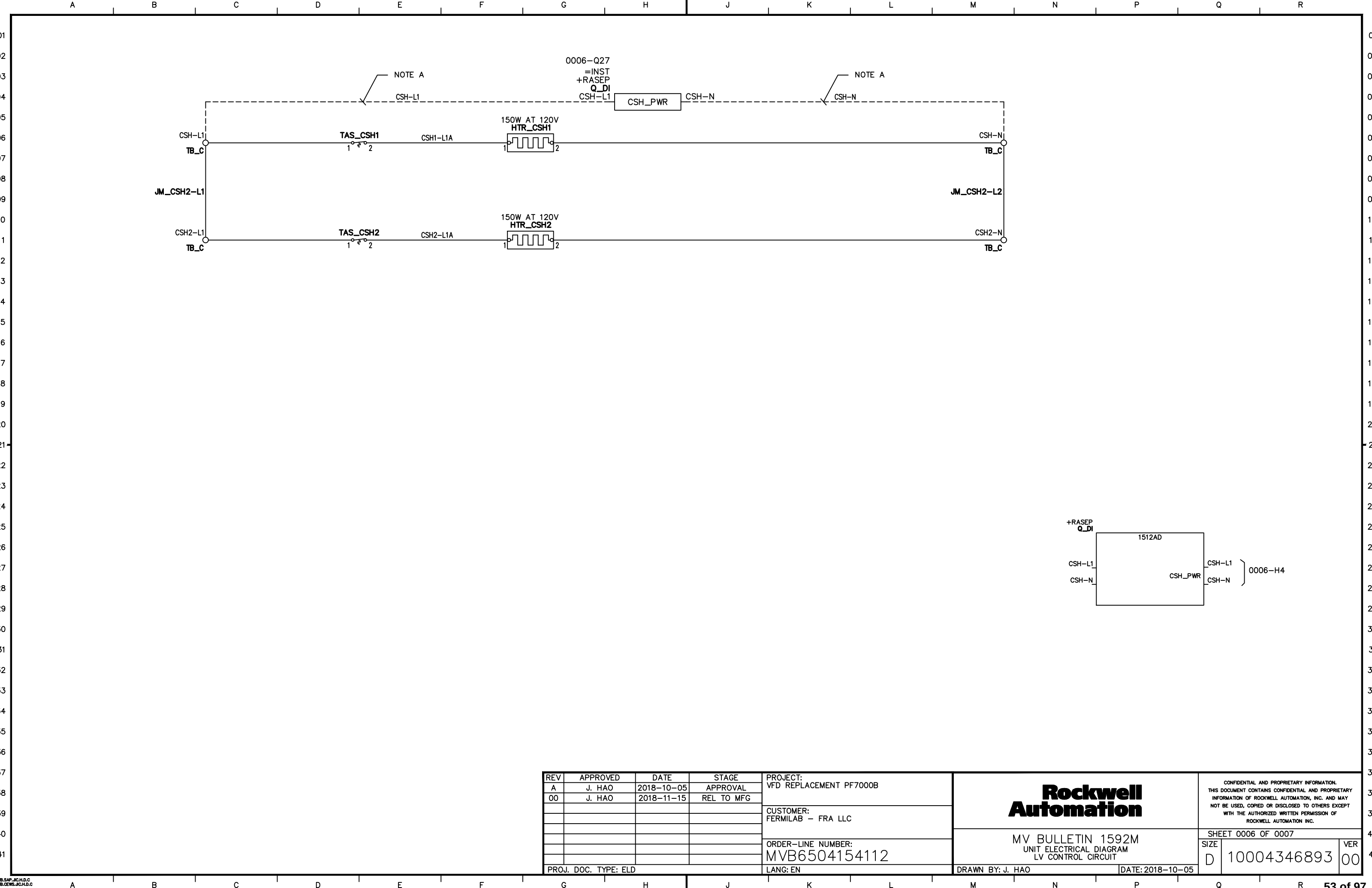


RATB.SAP_JCH.D.C
RATB.GEWS_JCH.D.C

REV	APPROVED	DATE	STAGE
A	J. HAO	2018-10-05	APPROVAL
00	J. HAO	2018-11-15	REL TO MFG
PROJ. DOC. TYPE: ELD			

PROJECT: VFD REPLACEMENT PF7000B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG: EN

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	SHEET 0004 OF 0007	
MV BULLETIN 1592M UNIT ELECTRICAL DIAGRAM MV POWER CIRCUIT	SIZE D 10004346893	VER 00
DRAWN BY: J. HAO	DATE: 2018-10-05	



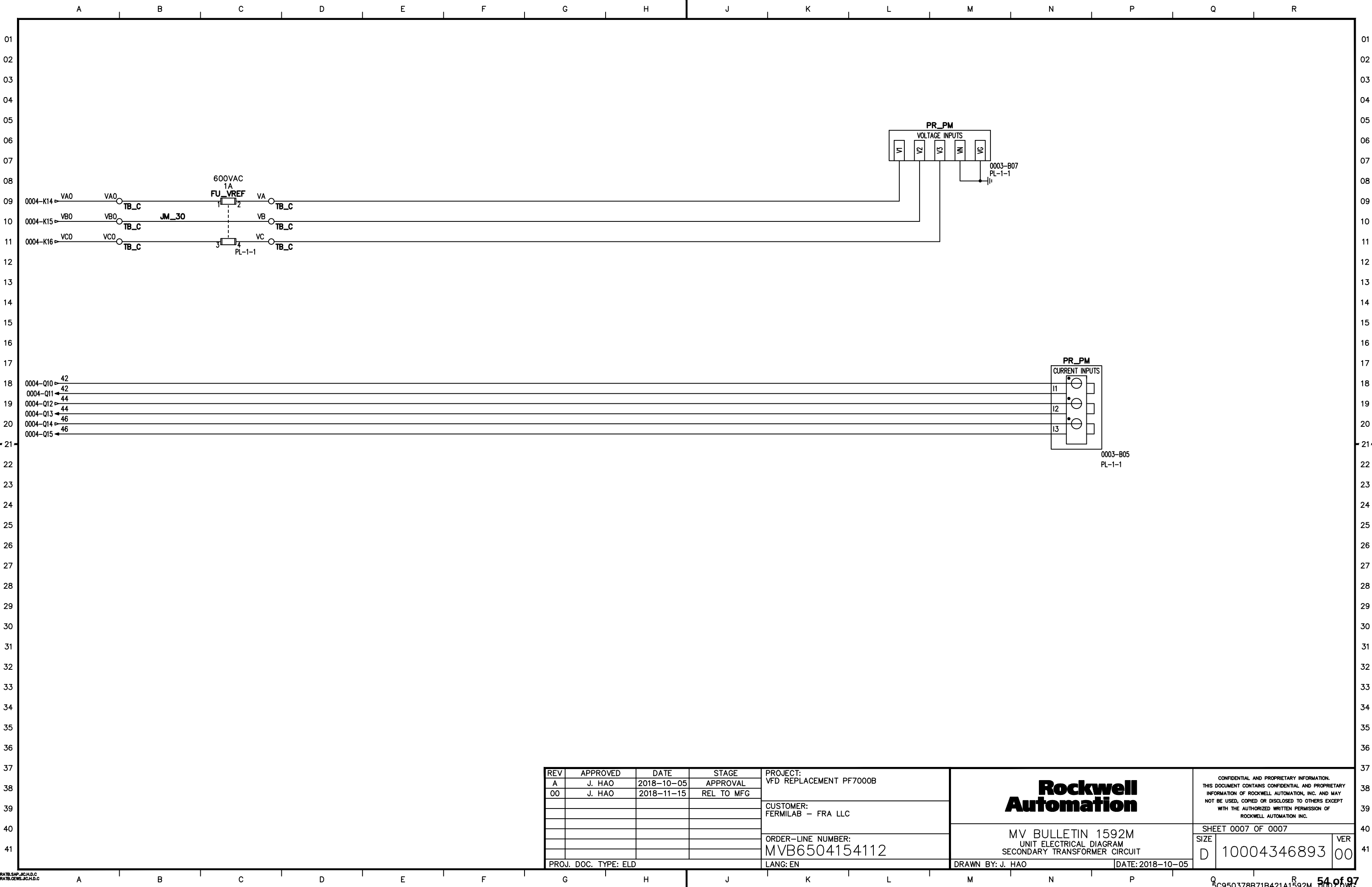
RATB.SAP.JCH.D.C
RATB.CEWS.JCH.D.C

REV	APPROVED	DATE	STAGE
A	J. HAO	2018-10-05	APPROVAL
00	J. HAO	2018-11-15	REL TO MFG
PROJ. DOC. TYPE: ELD			

PROJECT: VFD REPLACEMENT PF7000B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG: EN

Rockwell Automation MV BULLETIN 1592M UNIT ELECTRICAL DIAGRAM LV CONTROL CIRCUIT		SHEET 0006 OF 0007	
		SIZE D	VER 00

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3C950378B71B421A1592M_0006.DWG	53 of 97



REV	APPROVED	DATE	STAGE	PROJECT:	Rockwell Automation		
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B			
00	J. HAO	2018-11-15	REL TO MFG	CUSTOMER:	MV BULLETIN 1592M UNIT ELECTRICAL DIAGRAM SECONDARY TRANSFORMER CIRCUIT		
				FERMILAB - FRA LLC			
				ORDER-LINE NUMBER:	SHEET 0007 OF 0007		
				MVB6504154112			
PROJ. DOC. TYPE: ELD				LANG: EN	DRAWN BY: J. HAO		DATE: 2018-10-05
					SIZE	10004346893	VER
					D		00

BASE UNIT DATA

CATALOG NUMBER	1512AD-CDA
UNIT DESCRIPTION	1512AD
CONTROLLER SIZE	600A NOMINAL
SYSTEM VOLTAGE CLASS	5KV
CONTACTOR CONTROL TYPE	INTELLIVAC
OPERATING AMBIENT TEMPERATURE	0 - 35 DEG C
CONTROL POWER SOURCE	CONTROL POWER TRANSFORMERS
ENCLOSURE TYPE	1/IP21(G)

PROTECTION & MONITORING

MOTOR PROTECTION RELAY	NONE SELECTED
FEEDER PROTECTION RELAY	857-3C6AEL WITH ETHERNET AND RTD SCANNER 857-RAD
OVERLOAD RELAY	NONE SELECTED
GROUND FAULT RELAY	NONE SELECTED
GROUND FAULT CURRENT TRANSF	NONE SELECTED
LOCKOUT RELAYS	NONE SELECTED

DOOR MOUNTED PILOT DEVICES

LENS COLOR - OFF	GREEN
LENS COLOR - ON	RED

METERING DEVICES

METERING - ANALOG CURRENT	NONE SELECTED
METERING - ANALOG VOLTAGE	NONE SELECTED
METERING - ANALOG TIME	NONE SELECTED
METERING - ANALOG COUNTER	NONE SELECTED
SHORTING TERMINAL BLOCK	NONE SELECTED
TEST TERMINAL BLOCK CURRENT	NONE SELECTED
TEST TERMINAL BLOCK VOLTAGE	NONE SELECTED
TEST TERMINAL BLOCK MULTI	NONE SELECTED

COMMUNICATION & ANALOG SIGNALS

ISOLATED ANALOG TRANSDUCERS	NONE SELECTED
CONTROLLER NETWORK INTERFACES	NONE SELECTED

CONTROL CIRCUIT WIRING

CONTROL TERMINAL BLOCK TYPE	IEC TERMINAL BLOCKS
CONTROL CIRCUIT WIRING TYPE	TEW OR MTW TINNED COPPER
HEAT SHRINK TUBING	NONE SELECTED
CONTROL CIRCUIT LUGS	NONE SELECTED

SPACE HEATERS

MOTOR SPACE HEATER CIRCUIT	NONE SELECTED
CABINET SPACE HEATER	150W AT 120VAC EXT. SOURCE

CONTROL, POTENTIAL TRANSFORMER

CONTROL CIRCUIT TRANSFORMER	1000VA 2400V/120V CPT
POTENTIAL TRANSFORMERS	NONE SELECTED
POTENTIAL TRANSF INTERWIRING	NONE SELECTED

MISCELLANEOUS

DEVICE NAMEPLATES	NONE SELECTED
HIGH ALTITUDE OPTION	1001-2000 M (3300-6600 FT)
POWER CELL DOOR VENTED	NONE SELECTED
INPUT IMPEDANCE OPTION	LINE REACTOR
KEY INTERLOCK POWER CELL DOOR	NONE SELECTED
KEY INTERLOCK SUPPLEMENTARY	LOCK 'OFF'
UNIT HAS MASTER NAMEPLATE	NONE SELECTED
DRIVE FUNCTIONAL SAFETY	NONE SELECTED

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.		
A	J. HAD	2018-10-05	APPROVAL					
00	J. HAD	2018-11-15	REL TO MFG					
01	J. HAD	2019-02-22	AS SHIPPED					
				CUSTOMER: FERMILAB - FRA LLC				
				ORDER-LINE NUMBER: MVB6504154112	MV BULLETIN 1512AD UNIT SPECIFICATION	SHEET	0001 OF 0001	
						SIZE		VER
						A1	10004346957	01
PROJ. DOC. TYPE:SPC				LANG:EN	DRAWN BY: J. HAD	DATE: 2018-10-05		

DRAWING SHEET INDEX

SHEET NO	DESCRIPTION
0001	DRAWING SHEET INDEX, FOOTNOTES
0002	DEVICE DESIGNATIONS
0003	TERMINAL STRIP REPORT, AUXILIARY CIRCUITS
0004	MV POWER CIRCUIT
0005	LV CONTROL CIRCUIT
0006	LV CONTROL CIRCUIT
0007	SECONDARY TRANSFORMER CIRCUIT
0008	MULTI-FUNCTION DEVICES - CROSS REFERENCE

FOOTNOTES

NOTE	DESCRIPTION
004	EXTERNAL SUPPLY MUST HAVE BRANCH CIRCUIT PROTECTION.
010	REFER TO USERS MANUAL FOR WIRING INFORMATION.
031	FOR CUSTOMER USE.
059	TO BE PROGRAMMED BY THE CUSTOMER BEFORE START UP.
200	DANGER: MORE THAN ONE LIVE CIRCUIT BEHIND THIS DOOR. DE-ENERGIZE POWER LOCATED AT ____ BEFORE SERVICING. FAILURE TO DE-ENERGIZE POWER CAN RESULT IN SEVERE INJURY OR DEATH.
202	DANGER: WHEN REPLACING LINE FUSES, BE CERTAIN TO REPLACE WITH SAME CLASS, TYPE AND RATING FUSE. FAILURE TO REPLACE WITH FUSE ORIGINALLY SPECIFIED CAN RESULT IN EXPLOSIVE DAMAGE AND SEVERE INJURY.
207	CAUTION: DO NOT PUT DEVICE IN SERVICE UNTIL ALL PARAMETERS HAVE BEEN PROGRAMMED. FAILURE TO PROGRAM CAN RESULT IN DAMAGE TO EQUIPMENT. INSTANTANEOUS TRIP ELEMENTS MUST NOT BE USED, OR MUST BE BLOCKED. EARTH FAULT RELAYS MUST BE BLOCKED ABOVE CONTACTOR INTERRUPTING RATING, OR HAVE A SUITABLE DELAY FOR THE APPLIED POWER FUSE. REMOVE THIS LABEL AFTER COMMISSIONING.

ADDITIONAL COMPONENTS AND FEATURES

ID	DESCRIPTION
-PN_DRLK_1	WARNING LABEL - DOOR SECTION 1
-PN_FALK_1	WARNING LABEL - FINAL ASSEMBLY SECTION 1
-PN_PLLK_1	WARNING LABEL - PANEL SECTION 1
-VW_CTRL_TEW	WIRE - LOW VOLTAGE CONTROL WIRE TYPE - TEW (MTW) COPPER
-XP_DI	CONNECTOR + CABLE ASSEMBLY - DRIVE INPUT CONTACTOR

/0050.4D CROSS REFERENCE: SHEET AND CO-ORDINATE

+WT-1-1 PART TYPE-SECTION-ZONE

-KG_DI DEVICE DESIGNATION

NOTE A : E-HOUSE VENDOR TO PROVIDE THE
CABLING/WIRING BETWEEN THE UNITS

NOTE B : CUSTOMER TO PROVIDE THE CABLING/WIRING
TO THE UNIT.

WIRING LEGEND

_____	WIRING SUPPLIED AND INSTALLED BY ROCKWELL AUTOMATION.
-----	WIRING SUPPLIED AND INSTALLED BY OTHERS.
-----	WIRING SUPPLIED BY ROCKWELL AUTOMATION TO BE COMPLETED BY OTHERS.

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A	J. HAD	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B				
00	J. HAD	2018-11-15	REL TO MFG					
01	J. HAD	2019-02-22	AS SHIPPED	CUSTOMER:				
				FERMILAB - FRA LLC				
				ORDER-LINE NUMBER:	MV BULLETIN 1512AD UNIT ELECTRICAL DIAGRAM DRAWING SHEET INDEX, FOOTNOTES	SHEET 0001 OF 0008 SIZE A1 10004346953 VER 01		
				MVB6504154112				
PROJ. DOC. TYPE:ELD				LANG:EN	DRAWN BY: J. HAD	DATE: 2018-10-05		

DEVICE DESIGNATIONS

ID	DESCRIPTION	XREF
-AR_FPR	RELAY - PROTECTION, FEEDER	/0008.9B
-AR_FPR_RTD	RELAY - PROTECTION RTD, FEEDER	/0008.8H
-BC_PHASE	TRANSFORMER - CURRENT 3 PHASE	/0004.13B
-BH_CSHI	TEMPERATURE ACTUATED SWITCH - CABINET SPACE HEATER 1	/0003.11B
-BH_RTD	RESISTANCE TEMPERATURE DETECTOR	/0008.14B
-BV_CPT1	TRANSFORMER - VOLTAGE, CONTROL POWER	/0004.7E
-EH_CSHI	SPACE HEATER/HEATER ELEMENT - CABINET	/0003.14B
-FF_CPT1	FUSE - PRIMARY OF CONTROL POWER TRANSFORMER 1	/0004.7D
-FF_CTRLA	FUSE - PRIMARY CONTROL CIRCUIT	/0005.3D
-FF_IVDI	FUSE - PRIMARY OF DRIVE INPUT CONTACTOR INTELLIVAC MODULE	/0005.8D
-FF_PWR	FUSE- MEDIUM VOLTAGE POWER	/0004.5B
-GND_PE	GROUND - EARTH POTENTIAL	/0004.3B
-KA_PRTC	RELAY - AUXILIARY, PROTECTION RELAY	/0006.14B
-KC_DI	RELAY - CLOSING, DRIVE INPUT CONTACTOR	/0005.12C
-KI_IVDI	INTELLIVAC - DRIVE INPUT CONTACTOR	/0005.9D
-PL_OFF_DI	PILOT LIGHT - DRIVE INPUT CONTACTOR OFF	/0005.12K
-PL_ON_DI	PILOT LIGHT - DRIVE INPUT CONTACTOR ON	/0005.12H
-Q_LBS	CONTROLLER - LOAD BREAK SWITCH	/0004.15J
-Q_TX	CONTROLLER - TRANSFORMER FEEDER	/0004.12J
-Q_VFD	CONTROLLER - VARIABLE FREQUENCY DRIVE	/0004.15B
-QC_DI	CONTACTOR - DRIVE INPUT	/0005.12F
-QS_DI	ISOLATION SWITCH - DRIVE INPUT	/0004.4B
-SS_NDT	SWITCH - SELECTOR, NORMAL-OFF-TEST	/0005.14C
-WB_MP	BUS - MAIN POWER	/0004.4B
-WF_PR-RTD	CABLE - FIBER OPTIC, PROTECTION RELAY TO RTD MODULE	/0008.8H
-WF_RTD-PR	CABLE - FIBER OPTIC, RTD MODULE TO PROTECTION RELAY	/0008.8H
-WP_BC_PHASE	CABLE - POWER, CONTACTOR TO CURRENT TRANSFORMER ASSEMBLY	/0004.11B
-XC_DI	TERMINAL BLOCK ASSEMBLY - CUSTOMER	/0003.1A
-XS_TSR	CONNECTOR - TEST SUPPLY RECEPTACLE	/0005.10C

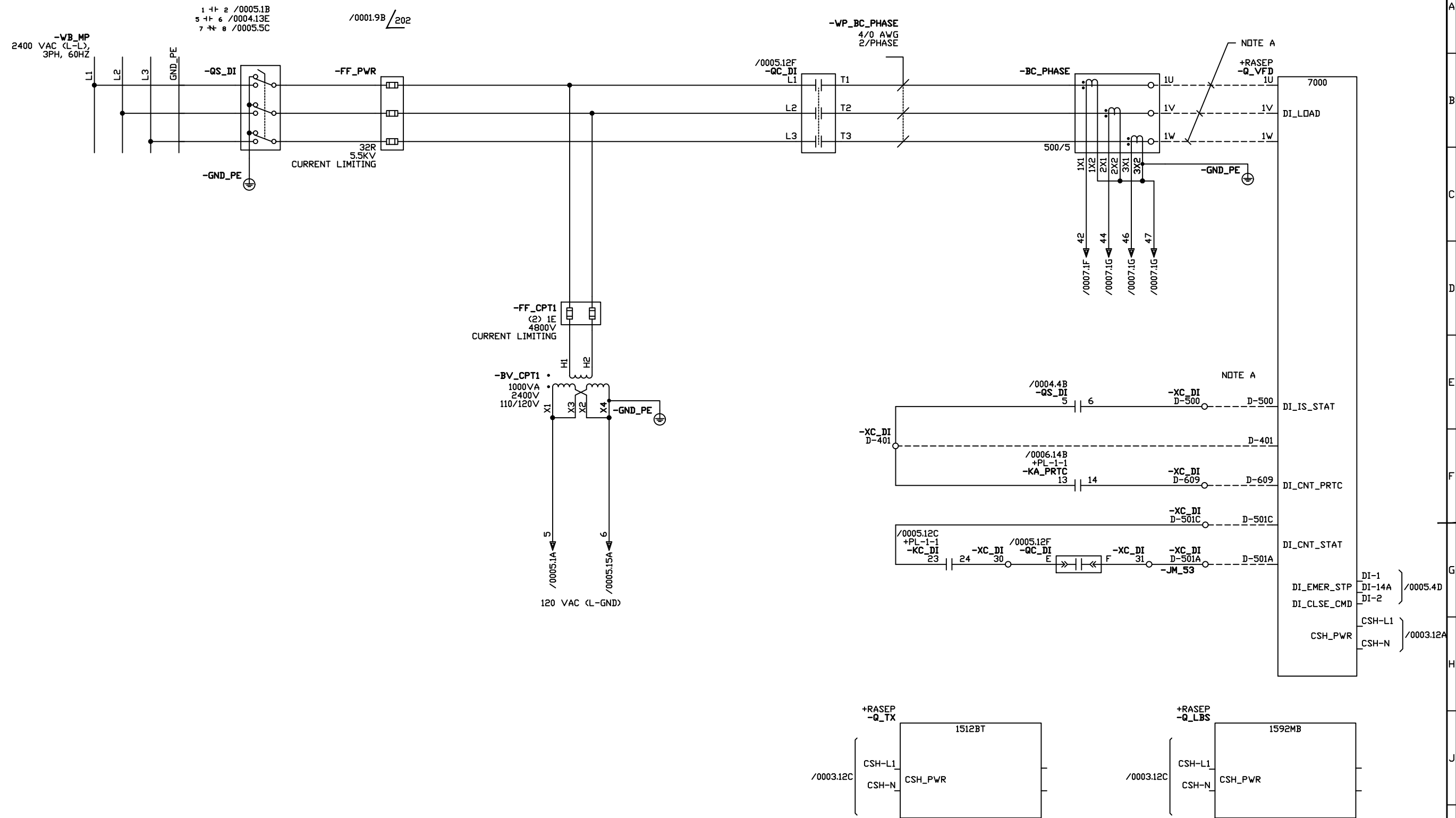
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A	J. HAD	2018-10-05	APPROVAL						
00	J. HAD	2018-11-15	REL TO MFG						
01	J. HAD	2019-02-22	AS SHIPPED	CUSTOMER: FERMILAB - FRA LLC		MV BULLETIN 1512AD UNIT ELECTRICAL DIAGRAM DEVICE DESIGNATIONS	SHEET	0002 OF 0008	VER 01
				ORDER-LINE NUMBER: MVB6504154112					
PRDJ. DOC. TYPE:ELD				LANG:EN	DRAWN BY: J. HAD	DATE: 2018-10-05	SIZE A1	10004346953	

Rockwell Automation

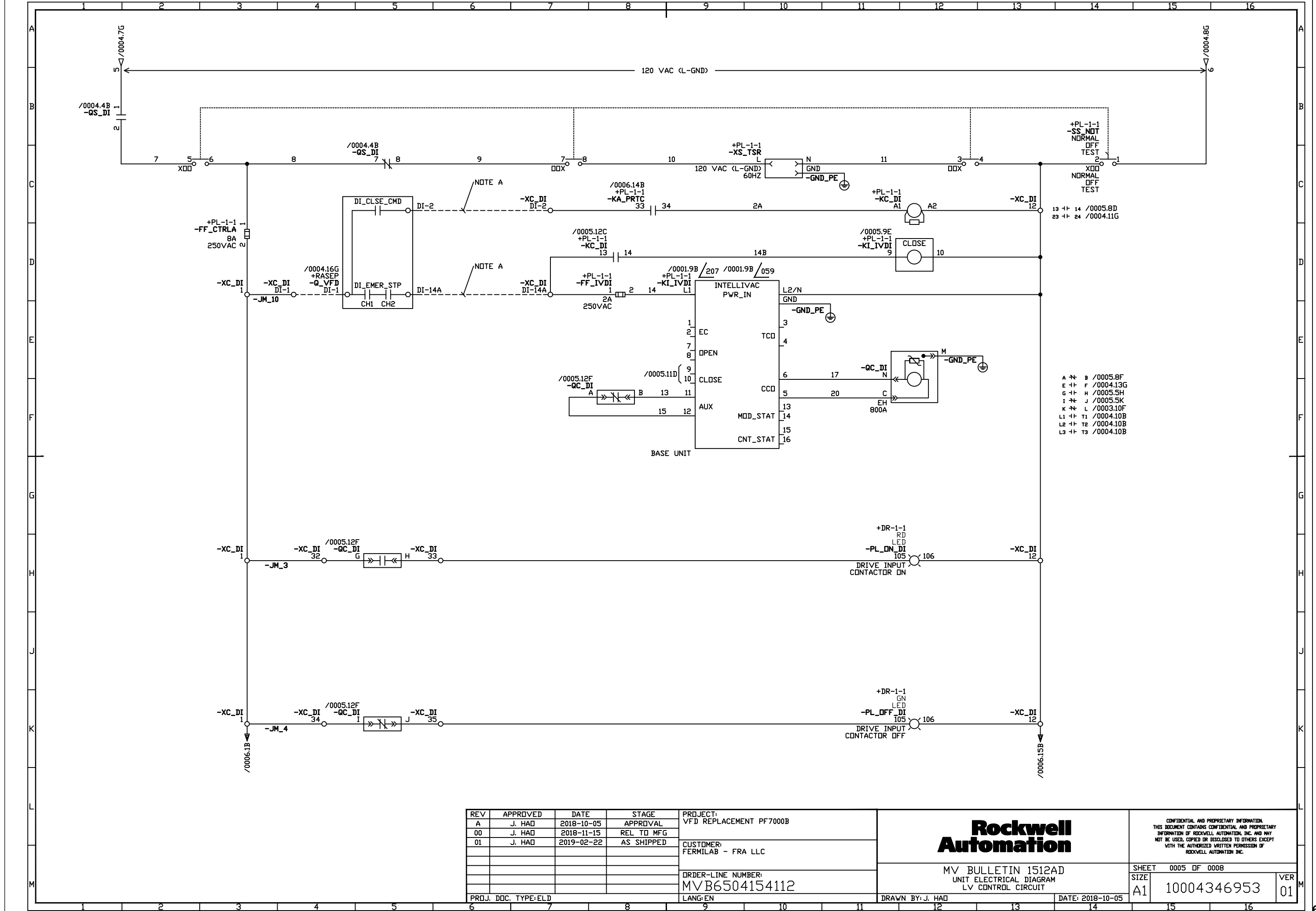
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MV BULLETIN 1512AD
UNIT ELECTRICAL DIAGRAM
DEVICE DESIGNATIONS

SHEET 0002 OF 0008	
SIZE	10004346953
A1	



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A	J. HAD	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B				
0	J. HAD	2018-11-15	REL TO MFG					
01	J. HAD	2019-02-22	AS SHIPPED	CUSTOMER:				
				FERMILAB - FRA LLC				
				ORDER-LINE NUMBER:	MV BULLETIN 1512AD UNIT ELECTRICAL DIAGRAM MV POWER CIRCUIT	SHEET 0004 OF 0008		
				MVB6504154112		SIZE	10004346953	VER 01
				LANG: EN		A1		
				DRAWN BY: J. HAD		DATE: 2018-10-05		
				PROJ. DOC. TYPE: ELD				



REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-05	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
01	J. HAD	2019-02-22	AS SHIPPED

PROJECT: VFD REPLACEMENT PF7000B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
PROJ. DOC. TYPE:ELD

LANG:EN

**Rockwell
Automation**

MV BULLETIN 1512AD
UNIT ELECTRICAL DIAGRAM
LV CONTROL CIRCUIT

DRAWN BY: J. HAD

DATE: 2018-10-05

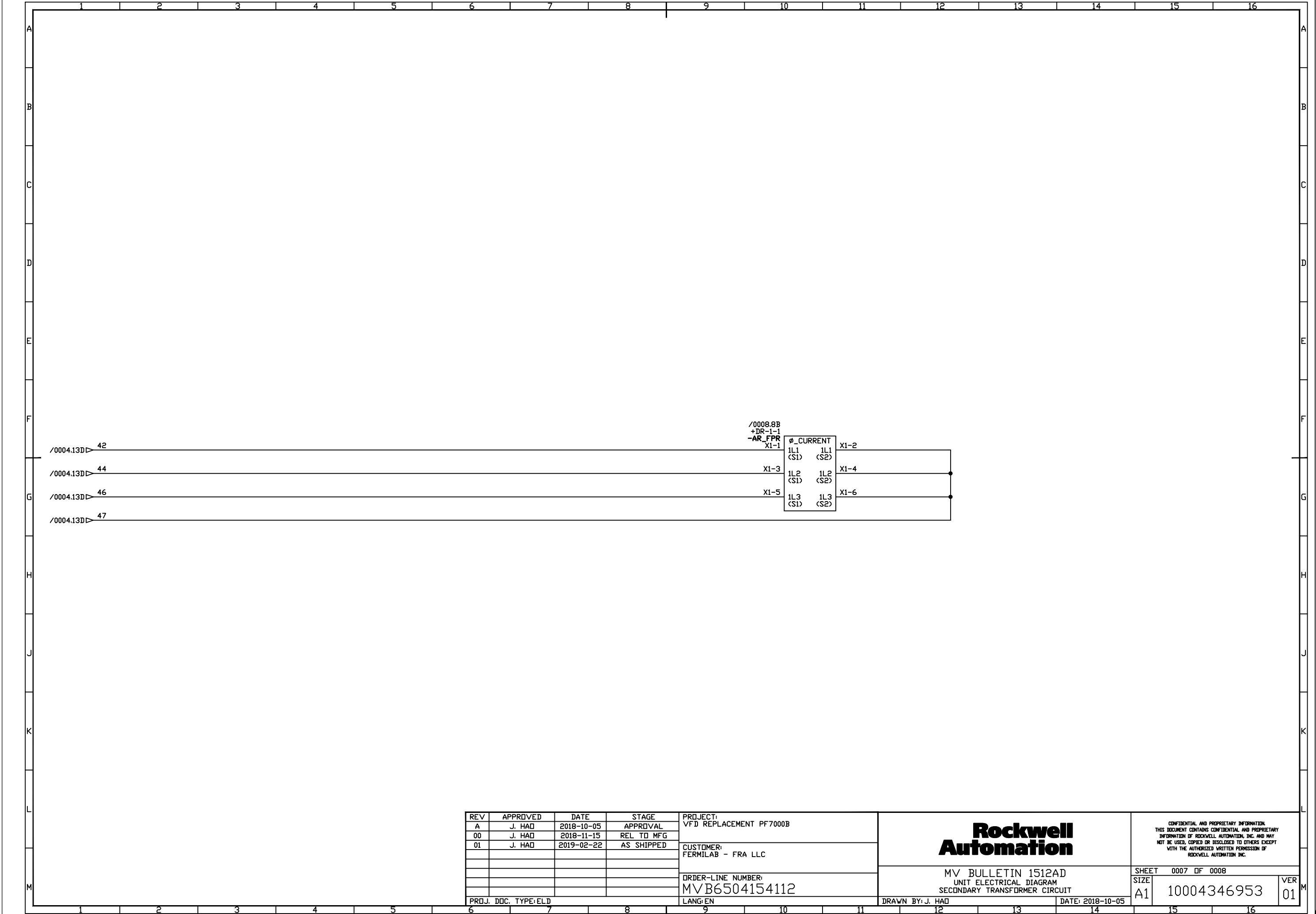
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SHEET 0005 OF 0008

SIZE
A1 10004346953

VER
01





REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.		
A	J. HAD	2018-10-05	APPROVAL					
00	J. HAD	2018-11-15	REL TO MFG					
01	J. HAD	2019-02-22	AS SHIPPED					
				CUSTOMER: FERMILAB - FRA LLC				
				ORDER-LINE NUMBER: MVB6504154112	MV BULLETIN 1512AD UNIT ELECTRICAL DIAGRAM SECONDARY TRANSFORMER CIRCUIT	SHEET 0007 OF 0008		
						SIZE A1	10004346953	VER 01
PROJ. DDC TYPE:ELD				LANG:EN	DRAWN BY: J. HAD	DATE: 2018-10-05		

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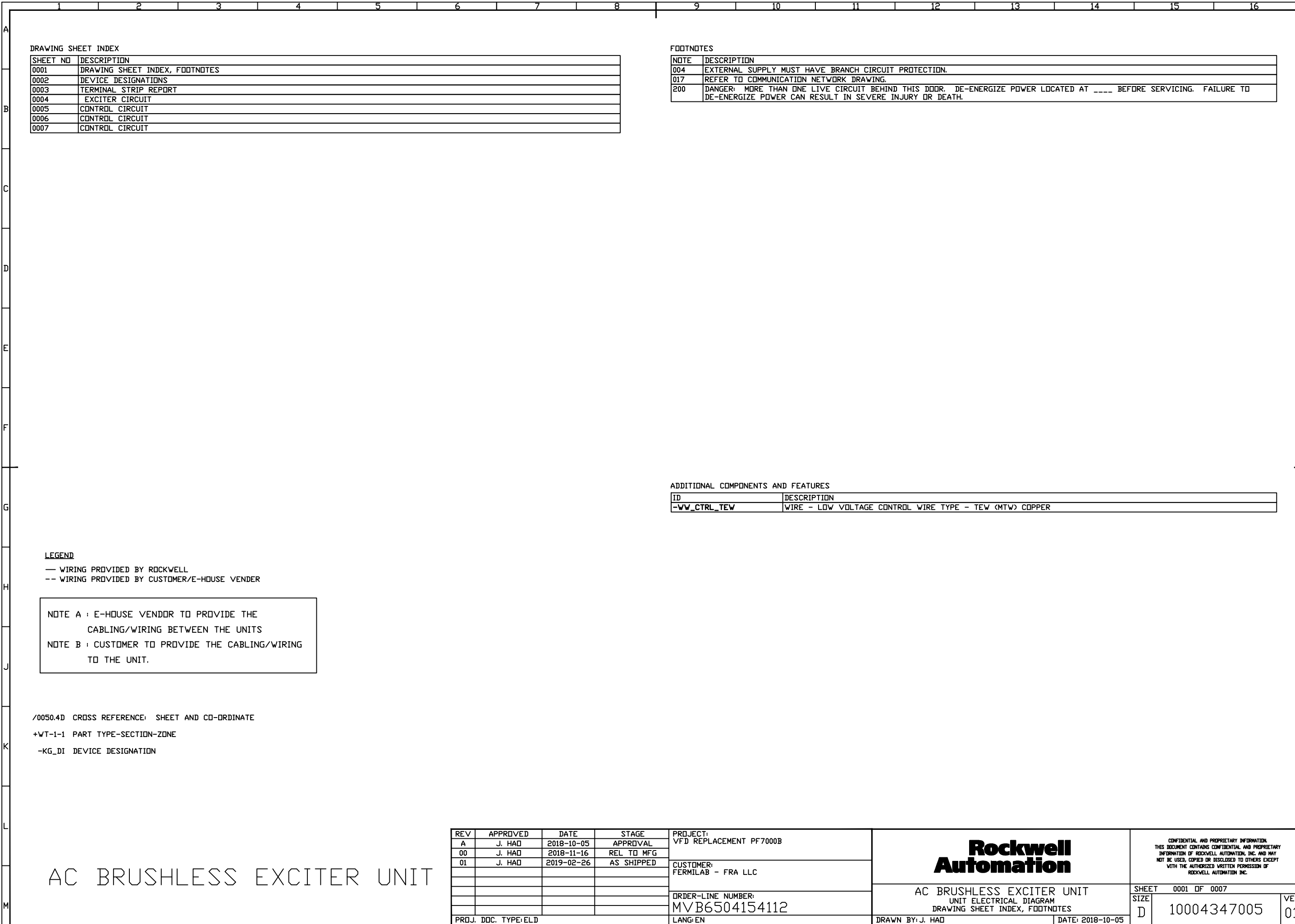
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AC BRUSHLESS EXCITER UNIT

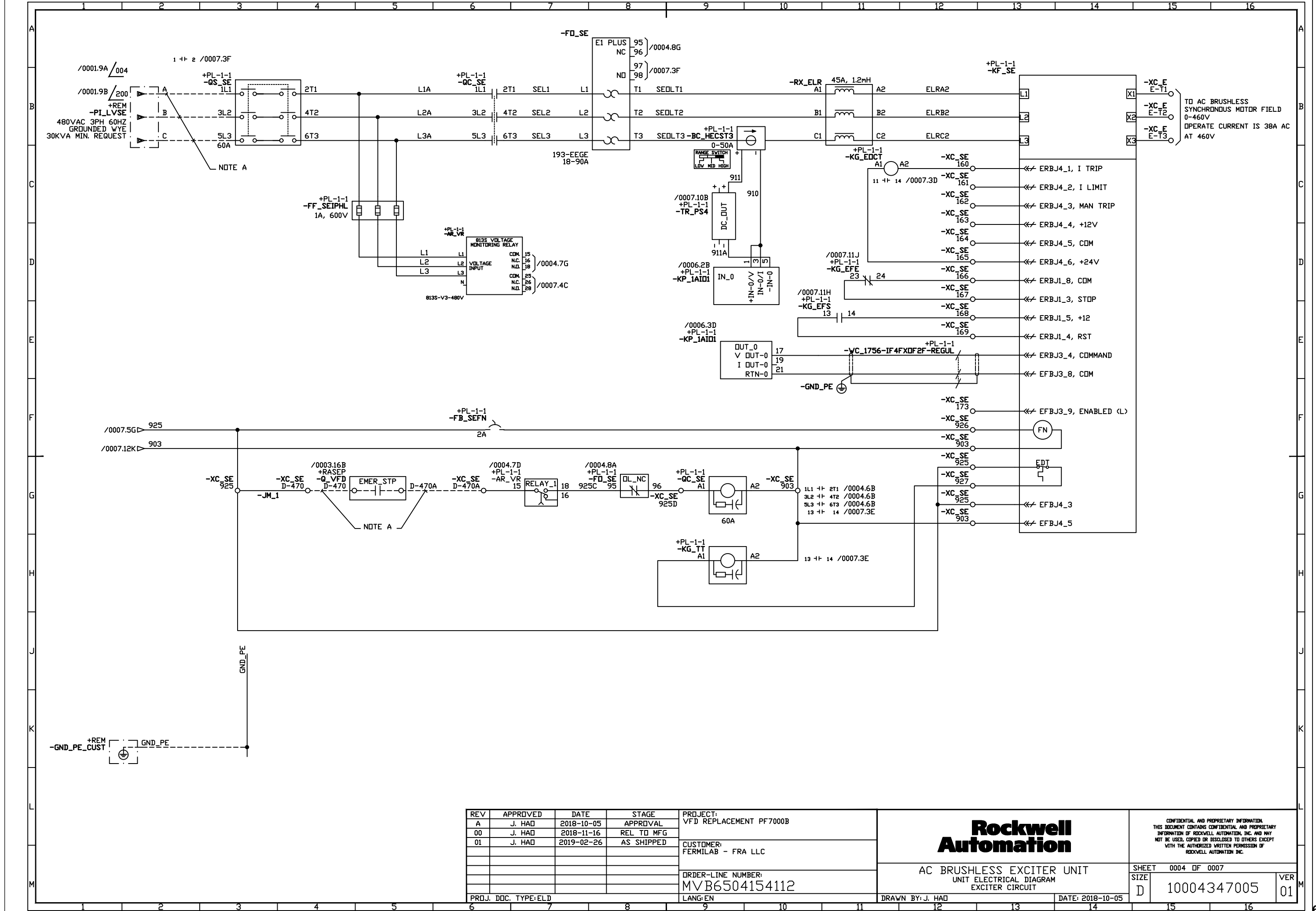
65 of 97

DEVICE DESIGNATIONS															
ID	DESCRIPTION	XREF	RA PART NUMBER												
-AR_VR	RELAY - PROTECTION, VOLTAGE MONITORING	/0004.6D	PN-65472												
-BC_HECST3	TRANSFORMER - CURRENT, HALL EFFECT ASSEMBLY	/0004.9C	PN-412753												
-FB_PID	CIRCUIT BREAKER - MINIATURE, PRIMARY OF POINT I/O CIRCUIT	/0007.1B	PN-D165413												
-FB_SEFN	CIRCUIT BREAKER - MINIATURE, PRIMARY OF STATIC EXCITER FAN	/0004.6F	PN-D165409												
-FF_SEIPHL	FUSE - PRIMARY OF PHASE MONITOR	/0004.5C	80181-243-66												
-FD_SE	RELAY - OVERLOAD	/0004.8B	PN-29763												
-GND_PE	GROUND - EARTH POTENTIAL	/0004.3J	--												
-GND_PE_CUST	GROUND - EARTH POTENTIAL, CUSTOMER	/0004.2K	REMOTE												
-KF_SE	ELECTRONIC ASSEMBLY - STATIC EXCITER	/0004.13B	PN-525277												
-KG_EFE	RELAY - CONTROL, EXCITER FIELD ENABLE	/0007.11J	81014-037-51												
-KG_EFS	RELAY - CONTROL, EXCITER FIELD START	/0007.11H	81014-037-51												
-KG_EDCT	RELAY - CONTROL, EXCITER OVERCURRENT TRIP	/0004.11C	700-HA32Z24 D												
-KG_TT	RELAY - CONTROL, TEMPERATURE TRIP	/0004.9H	81014-037-51												
-KP_1AIO1	PROGRAMMABLE LOGIC CONTROLLER - ANALOG INPUT/OUT MODULE 1 CHASSIS 1	/0006.3B	1756-IF4FXDF2F B												
-KP_1ATB	PROGRAMMABLE LOGIC CONTROLLER - ANALOG INPUT/OUT MODULE 1 CHASSIS 1 TERMINAL BLOCK	/0006.3B	1756-TBCH A												
-KP_1CHASSIS	PROGRAMMABLE LOGIC CONTROLLER - PLC CHASSIS 1	/0005.1A	1756-A7 B												
-KP_1ENADPTR1	PROGRAMMABLE LOGIC CONTROLLER - ETHERNET/IP ADAPTER 1 CHASSIS 1	/0005.8B	1756-ENBT A												
-KP_1FLRSL5	PROGRAMMABLE LOGIC CONTROLLER - SLOT 5 FILLER CHASSIS 1	/0006.5B	1756-N2 B												
-KP_1FLRSL6	PROGRAMMABLE LOGIC CONTROLLER - SLOT 6 FILLER CHASSIS 1	/0006.7B	1756-N2 B												
-KP_1I1	PROGRAMMABLE LOGIC CONTROLLER - INPUT MODULE 1 CHASSIS 1	/0005.10B	1756-1A16 A												
-KP_1ITB	PROGRAMMABLE LOGIC CONTROLLER - INPUT MODULE 1 CHASSIS 1 TERMINAL BLOCK	/0005.10B	1756-TBNH A												
-KP_1OI	PROGRAMMABLE LOGIC CONTROLLER - OUTPUT MODULE 1 CHASSIS 1	/0005.12B	1756-DW16I A												
-KP_1OTB	PROGRAMMABLE LOGIC CONTROLLER - OUTPUT MODULE 1 CHASSIS 1 TERMINAL BLOCK	/0005.12B	1756-TBCH A												
-KP_1PRDC	PROGRAMMABLE LOGIC CONTROLLER - PROCESSOR CHASSIS 1	/0005.5B	PN-114304												
-KP_1PWRSPLY	PROGRAMMABLE LOGIC CONTROLLER - POWER SUPPLY CHASSIS 1	/0005.3B	1756-PA75 B												
-PI_LVSE	PRESENTING INFORMATION - CUSTOMER LOW VOLTAGE SUPPLY FOR STATIC EXCITER	/0004.2B	REMOTE												
-PL_ED	PILOT LIGHT - EXCITER ON	/0007.10K	80181-037-55												
-PL_EPD	PILOT LIGHT - EXCITER POWER ON	/0007.10J	80181-037-55												
-Q_VFD	CONTROLLER - VARIABLE FREQUENCY DRIVE	/0003.14A	REMOTE												
-QC_SE	CONTACTOR - STATIC EXCITER POWER	/0004.9G	100-C60D10 B												
-QS_SE	SWITCH - DISCONNECT AUXILIARY POWER SOURCE	/0004.3B	PN-25033												
-RX_ELR	REACTOR - EXCITER LINE	/0004.10B	1321-3R45-C A												
-TR_PS4	CONVERTER - 100-240VAC/24-28VDC	/0007.10B	1606-XLP30E A												
-WC_1756-IF4FXDF2F-REGU	CABLE -CURRENT ANALOG INPUT MODULE TO EXCITER REGULATOR BOARD	/0004.12E	--												
-WW_CTRL_TEW	WIRE - LOW VOLTAGE CONTROL WIRE TYPE - TEW (MTW) COPPER	/0001.9G	--												
-XC_E	TERMINAL BLOCK - EXCITER FIELD	/0003.1H	81014-057-72												
-XC_SE	TERMINAL BLOCK - CUSTOMER, EXCITER	/0003.1A	80178-240-70												

REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAD	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B
00	J. HAD	2018-11-16	REL TO MFG	
01	J. HAD	2019-02-26	AS SHIPPED	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
PROJ. DDC, TYPE:ELD				LANG:EN

Rockwell Automation		SHEET 0002 OF 0007	
		SIZE D	10004347005
AC BRUSHLESS EXCITER UNIT UNIT ELECTRICAL DIAGRAM DEVICE DESIGNATIONS		DRAWN BY: J. HAD	DATE: 2018-10-05

VER 01



REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-05	APPROVAL
00	J. HAD	2018-11-16	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

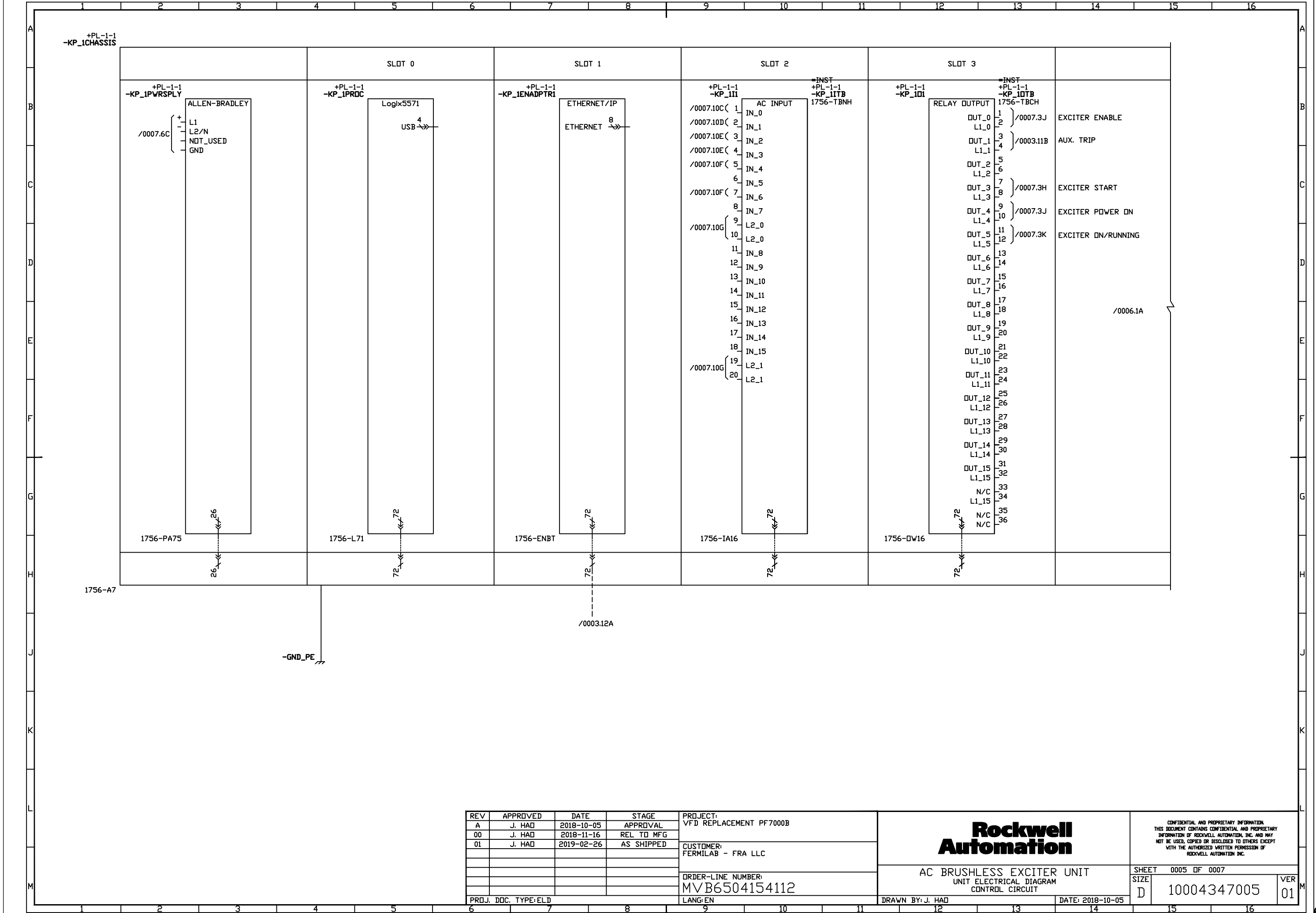
PROJECT:	VFD REPLACEMENT PF7000B
CUSTOMER:	FERMILAB - FRA LLC

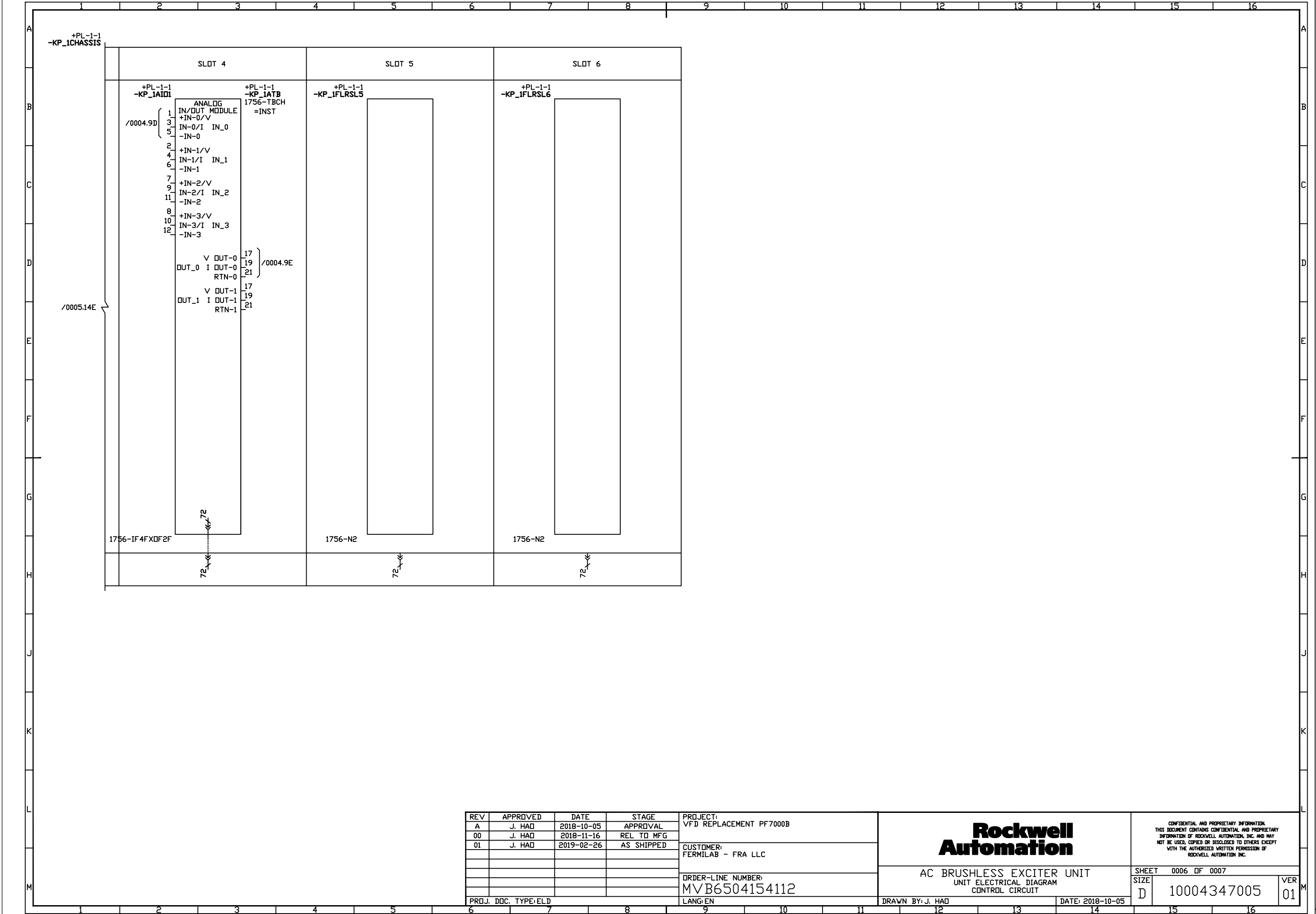
ORDER-LINE NUMBER:	MVB6504154112
PROJ. DOC. TYPE/ELD	

LANG:EN	
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Rockwell Automation	
AC BRUSHLESS EXCITER UNIT UNIT ELECTRICAL DIAGRAM EXCITER CIRCUIT	
DRAWN BY: J. HAD	DATE: 2018-10-05

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SHEET 0004 OF 0007	VER 01
SIZE D	10004347005





REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-05	APPROVAL
00	J. HAD	2018-11-16	REL TO MFG
01	J. HAD	2019-02-26	AS SHIPPED

PROJECT:
VFD REPLACEMENT PF7000B

CUSTOMER:
FERMILAB - FRA LLC

ORDER-LINE NUMBER:
MVB6504154112

PROJ. DOC. TYPE:ELD

LANG:EN

**Rockwell
Automation**

AC BRUSHLESS EXCITER UNIT
UNIT ELECTRICAL DIAGRAM
CONTROL CIRCUIT

DRAWN BY: J. HAD

DATE: 2018-10-05

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SHEET 0006 OF 0007

SIZE

10004347005

VER

01

SPACE HEATERS

MOTOR SPACE HEATER CIRCUIT	NONE SELECTED
CABINET SPACE HEATER	150W AT 120VAC EXT. SOURCE

CONTROL POTENTIAL TRANSFORMER

CONTROL CIRCUIT TRANSFORMER	1000VA CPT
POTENTIAL TRANSFORMERS	NONE SELECTED
POTENTIAL TRANSF INTERWIRING	NONE SELECTED

MISCELLANEOUS

DEVICE NAMEPLATES	NONE SELECTED
HIGH ALTITUDE OPTION	1001-2000 M (3300-6600 FT)
POWER CELL DOOR VENTED	NONE SELECTED
THERMAL SCANNING WINDOW	NONE SELECTED
KEY INTERLOCK SUPPLEMENTARY	NONE SELECTED
UNIT HAS MASTER NAMEPLATE	NO

CONTROL TERMINAL BLOCK TYPE	IEC TERMINAL BLOCKS
CONTROL CIRCUIT WIRING TYPE	TEW OR MTW TINNED COPPER
HEAT SHRINK TUBING	NONE SELECTED
CONTROL CIRCUIT LUGS	NONE SELECTED

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DRAWING SHEET INDEX

SHEET NO	DESCRIPTION
0001	SHEET INDEX AND NOTES
0002	DEVICE DESIGNATIONS
0003	TERMINAL BLOCK CIRCUIT
0004	MV POWER CIRCUIT
0005	LV CONTROL CIRCUIT
0006	LV CONTROL CIRCUIT
0007	SECONDARY TRANSFORMER CIRCUIT

FOOTNOTES

NOTE	DESCRIPTION
004	EXTERNAL SUPPLY MUST HAVE BRANCH CIRCUIT PROTECTION.
059	TO BE PROGRAMMED BY THE CUSTOMER BEFORE START UP.
250	DANGER: MORE THAN ONE LIVE CIRCUIT BEHIND THIS DOOR. DE-ENERGIZE POWER LOCATED AT _____ BEFORE SERVICING. FAILURE TO DE-ENERGIZE POWER CAN RESULT IN SEVERE INJURY OR DEATH.
251	DANGER: WHEN REPLACING LINE FUSES, BE CERTAIN TO REPLACE WITH SAME CLASS, TYPE AND RATING FUSE. FAILURE TO REPLACE WITH FUSE ORIGINALLY SPECIFIED CAN RESULT IN EXPLOSIVE DAMAGE AND SEVERE INJURY.

NOTE A : E-HOUSE VENDOR TO PROVIDE THE
CABLING/WIRING BETWEEN THE UNITS

NOTE B : CUSTOMER TO PROVIDE THE CABLING/WIRING
TO THE UNIT.

WIRING LEGEND

	WIRING SUPPLIED AND INSTALLED BY ROCKWELL AUTOMATION.
-----	WIRING SUPPLIED AND INSTALLED BY OTHERS.
-----	WIRING SUPPLIED BY ROCKWELL AUTOMATION TO BE COMPLETED BY OTHERS.

0006-N29 CROSS REFERENCE: SHEET AND CO-ORDINATE

DR-1-1 PART TYPE-SECTION-ZONE

PR_FPR DEVICE DESIGNATION

REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B
00	J. HAO	2018-11-16	REL TO MFG	
01	J. HAO	2019-03-18	AS SHIPPED	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
				LANG: EN
				PROJ. DOC. TYPE: ELD

PROJECT:		VFD REPLACEMENT PF7000B	
CUSTOMER:		FERMILAB - FRA LLC	
ORDER-LINE NUMBER:		MVB6504154112	
LANG: EN		DRAWN BY: J. HAO	
		DATE: 2018-10-05	

Rockwell
Automation

MV BULLETIN 1512BT
UNIT ELECTRICAL DIAGRAM
SHEET INDEX AND NOTES

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SHEET 0001 OF 0007

SIZE
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ECB1512B_0001.DWG

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DEVICE DESIGNATIONS

ID	DESCRIPTION	XREF
BU_MV	BUS – MAIN POWER	0004–A03
CAP_IV_M	CAPACITOR – TIME DELAY UNDERVOLTAGE (IV_M)	0005–D29
CBL_CT_PHASE	CABLE – POWER, CONTACTOR TO CURRENT TRANSFORMER ASSEMBLY	0004–L03
CN_TEST	CONNECTOR – TEST SUPPLY RECEPTACLE	0005–H08
–CT_PHASE	?	0004–N03
FU_CPT1	FUSE – PRIMARY OF CONTROL POWER TRANSFORMER 1	0004–F08
FU_CTRLA	FUSE – PRIMARY CONTROL CIRCUIT	0005–B09
FU_IV_M	FUSE – PRIMARY OF MAIN CONTACTOR INTELLIVAC MODULE	0005–D27
–FU_PWR	?	0004–C03
GND_PE	GROUND – EARTH POTENTIAL	0004–A10
HTR_CSH1	SPACE HEATER/HEATER ELEMENT – CABINET	0006–G31
IS_M	ISOLATION SWITCH – MAIN	0004–B03
IV_M	INTELLIVAC – MAIN CONTACTOR	0005–F26
JC_ESTP	JUMPER CUSTOMER – REMOTE EMERGENCY STOP	0005–C16
JC_STP	JUMPER CUSTOMER – REMOTE STOP	0005–K16
LT_OFF	PILOT LIGHT – OFF	0006–N17
LT_ON	PILOT LIGHT – ON	0006–N13
MV_TX	MEDIUM VOLTAGE – TRANSFORMER	0004–R03
MVC_M	MEDIUM VOLTAGE CONTACTOR – MAIN	0004–K03
OL_592	RELAY – OVERLOAD, ELECTROMECHANICAL	0007–D18
PB_OFF	PUSHBUTTON – OFF	0005–N16
PB_OFF	PUSHBUTTON – OFF	0005–J16
Q_DI	CONTROLLER – DRIVE INPUT	0004–P26
SS_NOT	SWITCH – SELECTOR, NORMAL–OFF–TEST	0005–N06
T_CPT1	TRANSFORMER – VOLTAGE, CONTROL POWER	0004–F10
TAS_CSH1	TEMPERATURE ACTUATED SWITCH – CABINET SPACE HEATER 1	0006–E31
TB_C	TERMINAL BLOCK – CUSTOMER	0003–A01

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF7000B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.			
A	J. HAO	2018–10–05	APPROVAL						
00	J. HAO	2018–11–16	REL TO MFG						
01	J. HAO	2019–03–18	AS SHIPPED						
				CUSTOMER: FERMILAB – FRA LLC					
				ORDER–LINE NUMBER: MVB6504154112					
PROJ. DOC. TYPE: ELD				LANG: EN	DRAWN BY: J. HAO	DATE: 2018–10–05	SIZE D	10004385893	VER 01

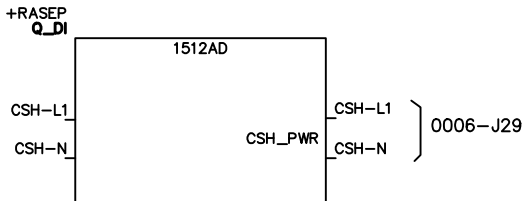
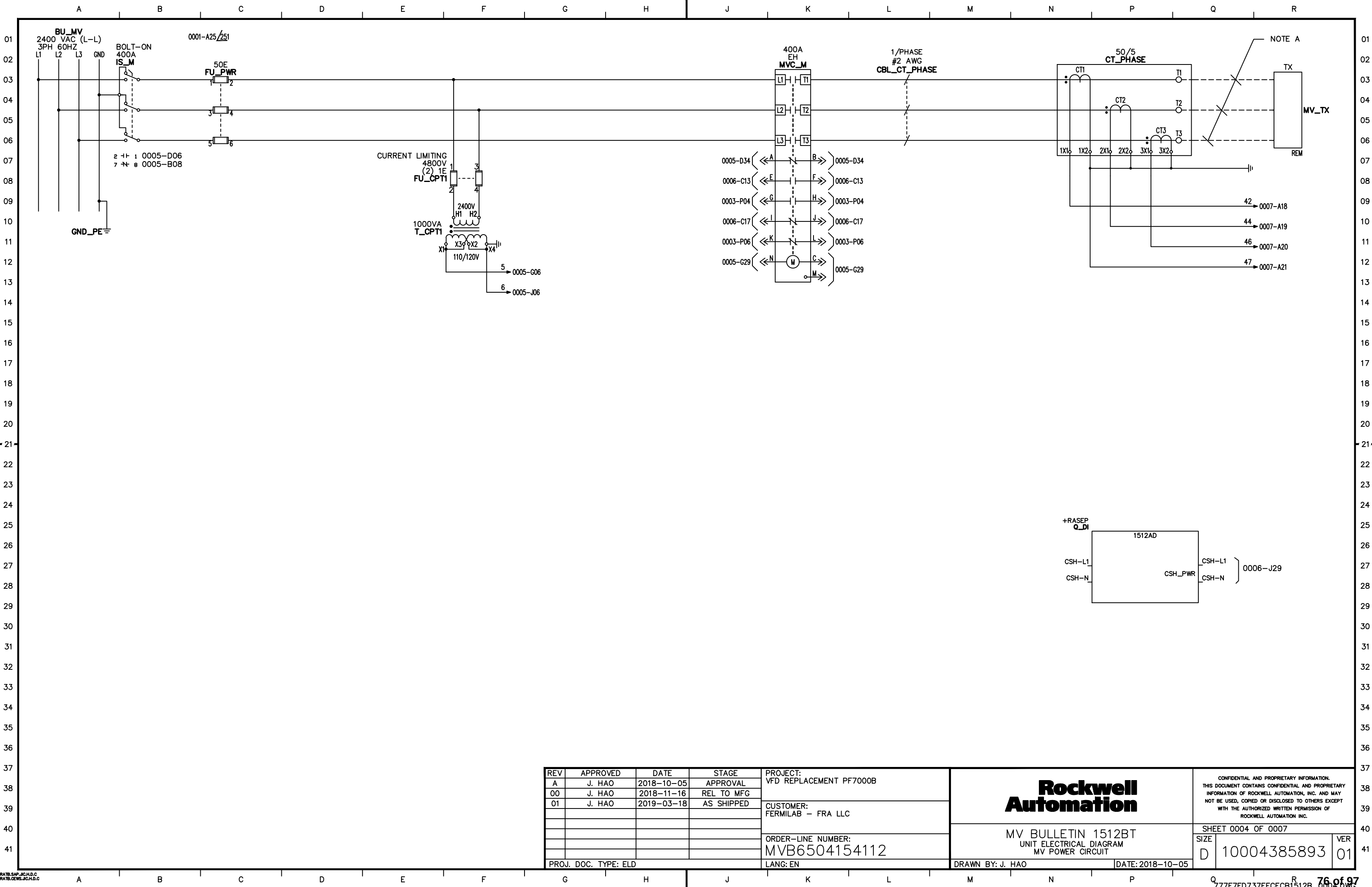
RATB.SAP_JCH.D.C
RATB.GEWS_JCH.D.C

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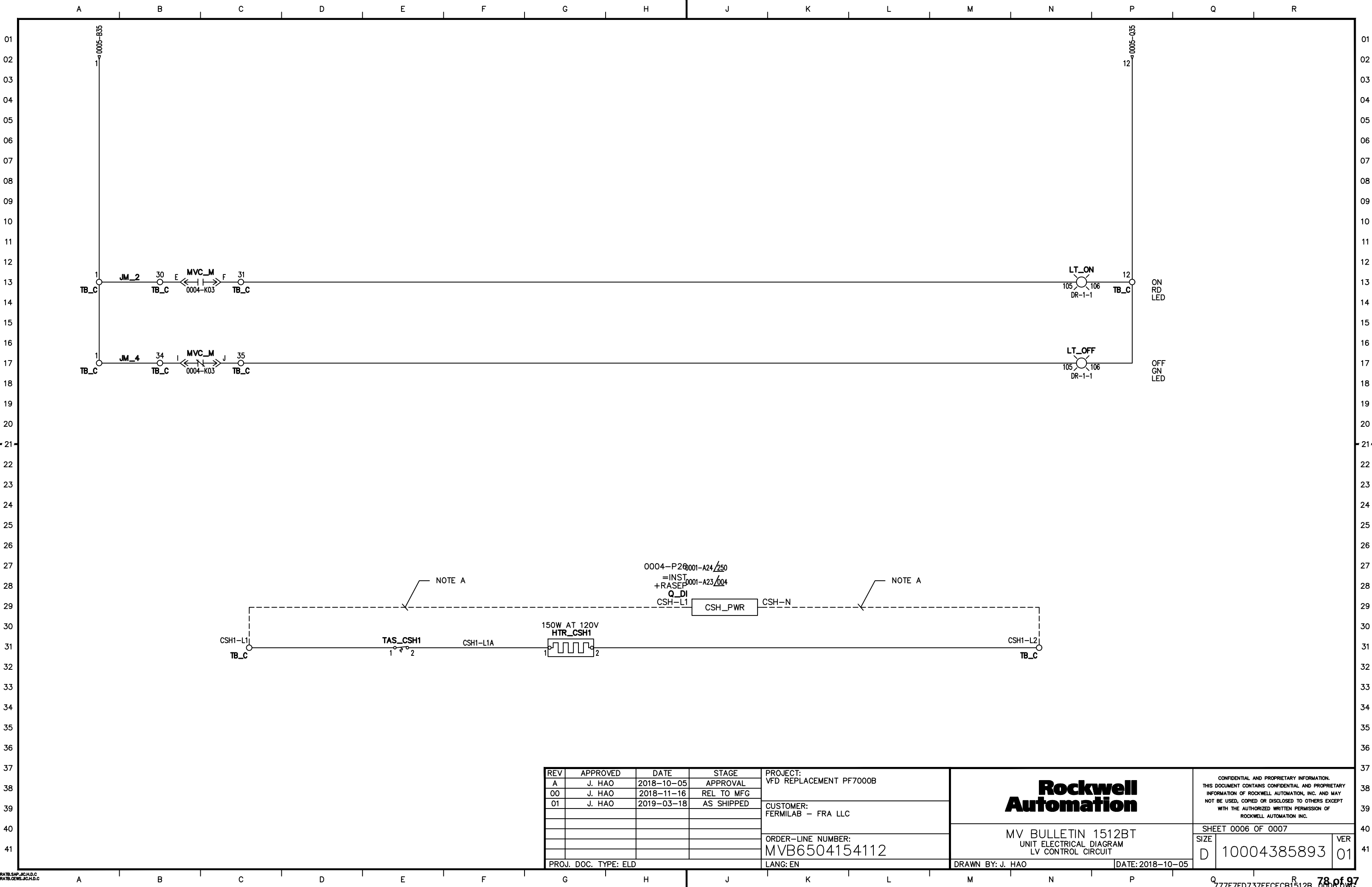
777F7FD737EFC ECB1512B_0002.DWG

74 of 97

[illegible]



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A	J. HAO	2018-10-05	APPROVAL	VFD REPLACEMENT PF7000B						
00	J. HAO	2018-11-16	REL TO MFG	CUSTOMER: FERMILAB - FRA LLC	MV BULLETIN 1512BT UNIT ELECTRICAL DIAGRAM MV POWER CIRCUIT			SHEET 0004 OF 0007		
01	J. HAO	2019-03-18	AS SHIPPED							
				ORDER-LINE NUMBER: MVB6504154112	SIZE D 10004385893			VER 01		
				LANG: EN						
PROJ. DOC. TYPE: ELD				DRAWN BY: J. HAO	DATE: 2018-10-05					



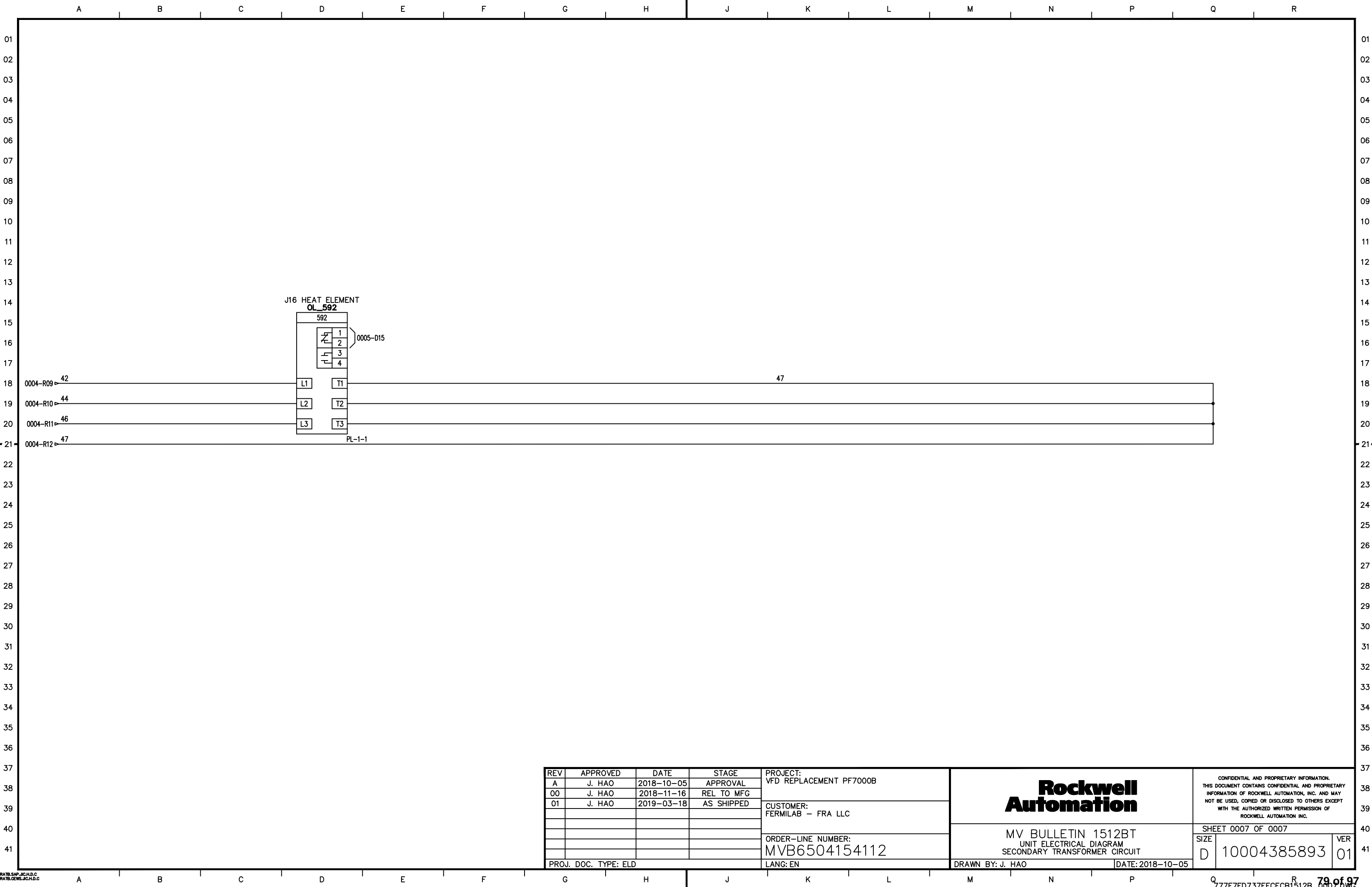
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RATB.CEWS.JCH.D.C

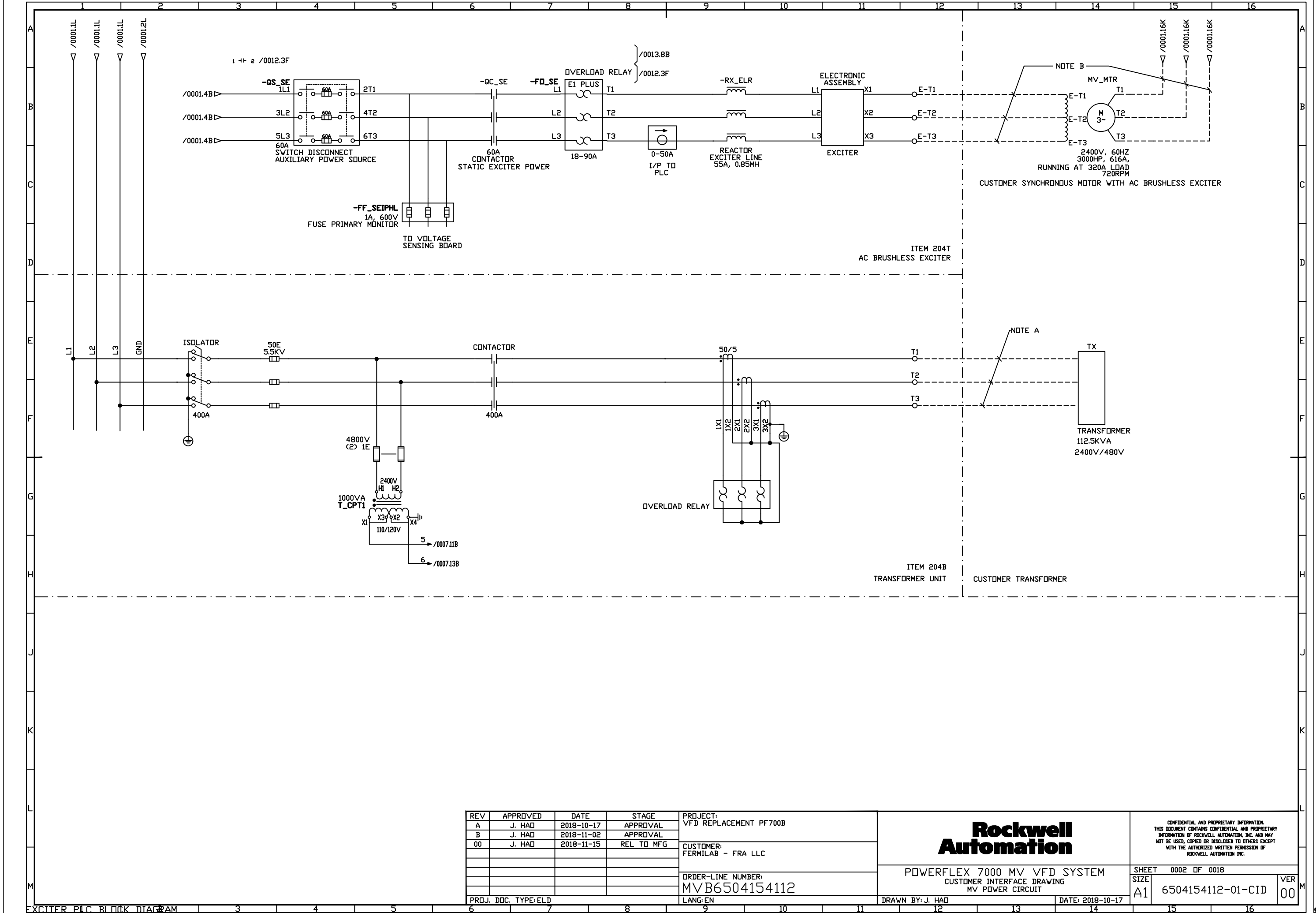
REV	APPROVED	DATE	STAGE
A	J. HAO	2018-10-05	APPROVAL
00	J. HAO	2018-11-16	REL TO MFG
01	J. HAO	2019-03-18	AS SHIPPED
PROJ. DOC. TYPE: ELD			

PROJECT: VFD REPLACEMENT PF7000B
CUSTOMER: FERMILAB – FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG: EN

Rockwell Automation MV BULLETIN 1512BT UNIT ELECTRICAL DIAGRAM LV CONTROL CIRCUIT		SHEET 0006 OF 0007	
		SIZE D	VER 01

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777F7FD737EFCECB1512B_0006.DWG			





REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-17	APPROVAL
B	J. HAD	2018-11-02	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG

PROJECT: VFD REPLACEMENT PF700B	CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112	LANG:EN

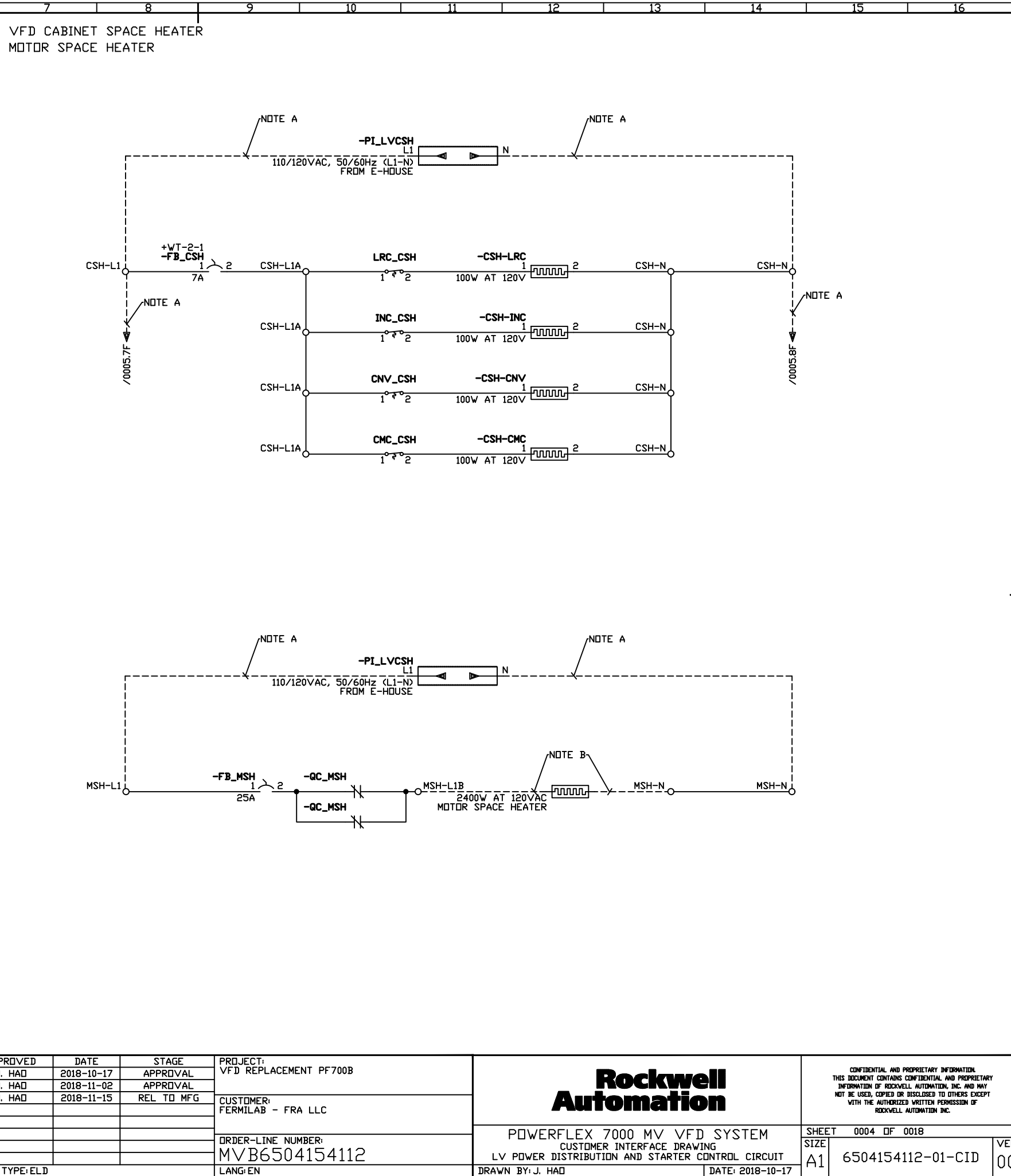
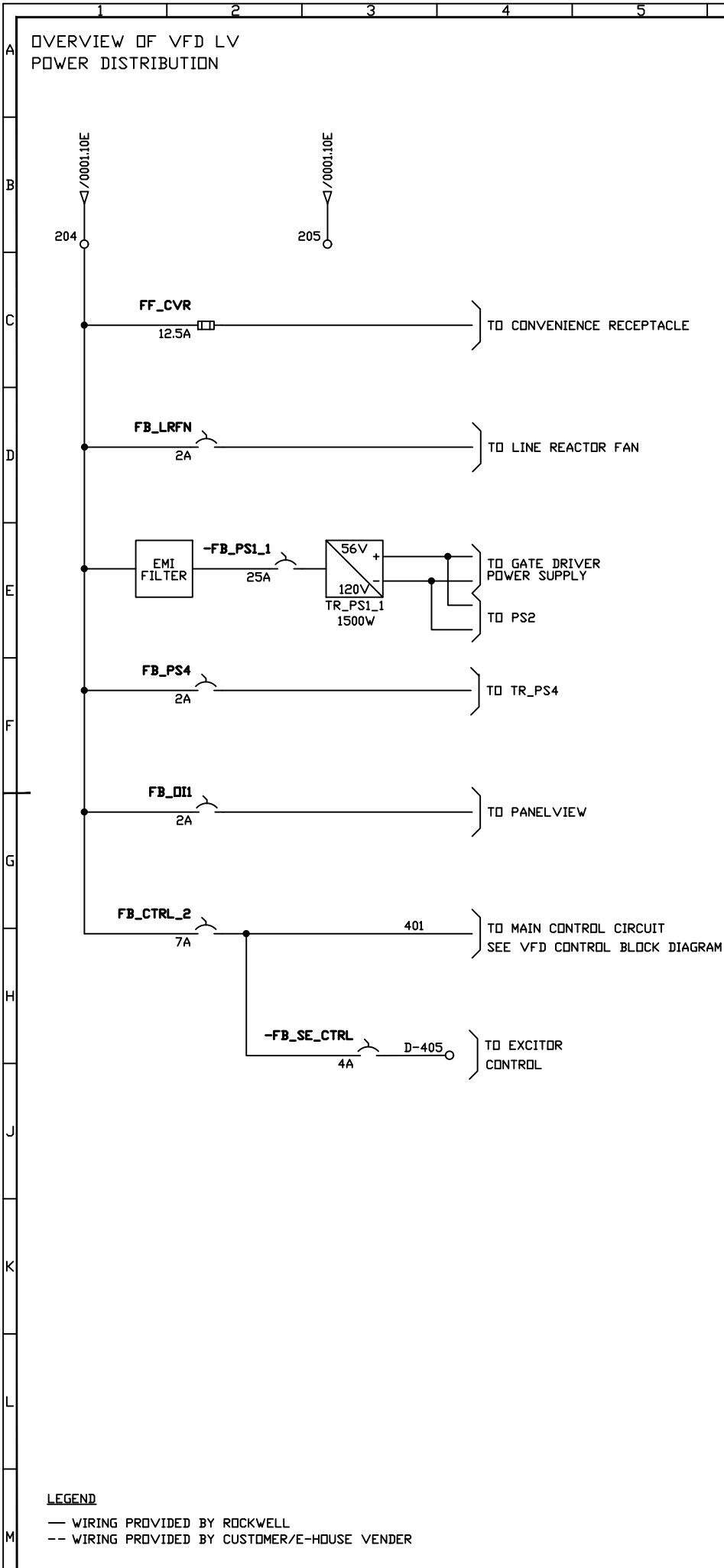
Rockwell Automation	POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING MV POWER CIRCUIT
	DRAWN BY: J. HAD DATE: 2018-10-17

CONFIDENTIAL AND PROPRIETARY INFORMATION THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION, INC.	
SHEET 0002 OF 0018	VER 00
SIZE A1	6504154112-01-CID

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J	
K	
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DATA SHEET: ANALYSIS																6504154112_01_CID_0003.DWG															
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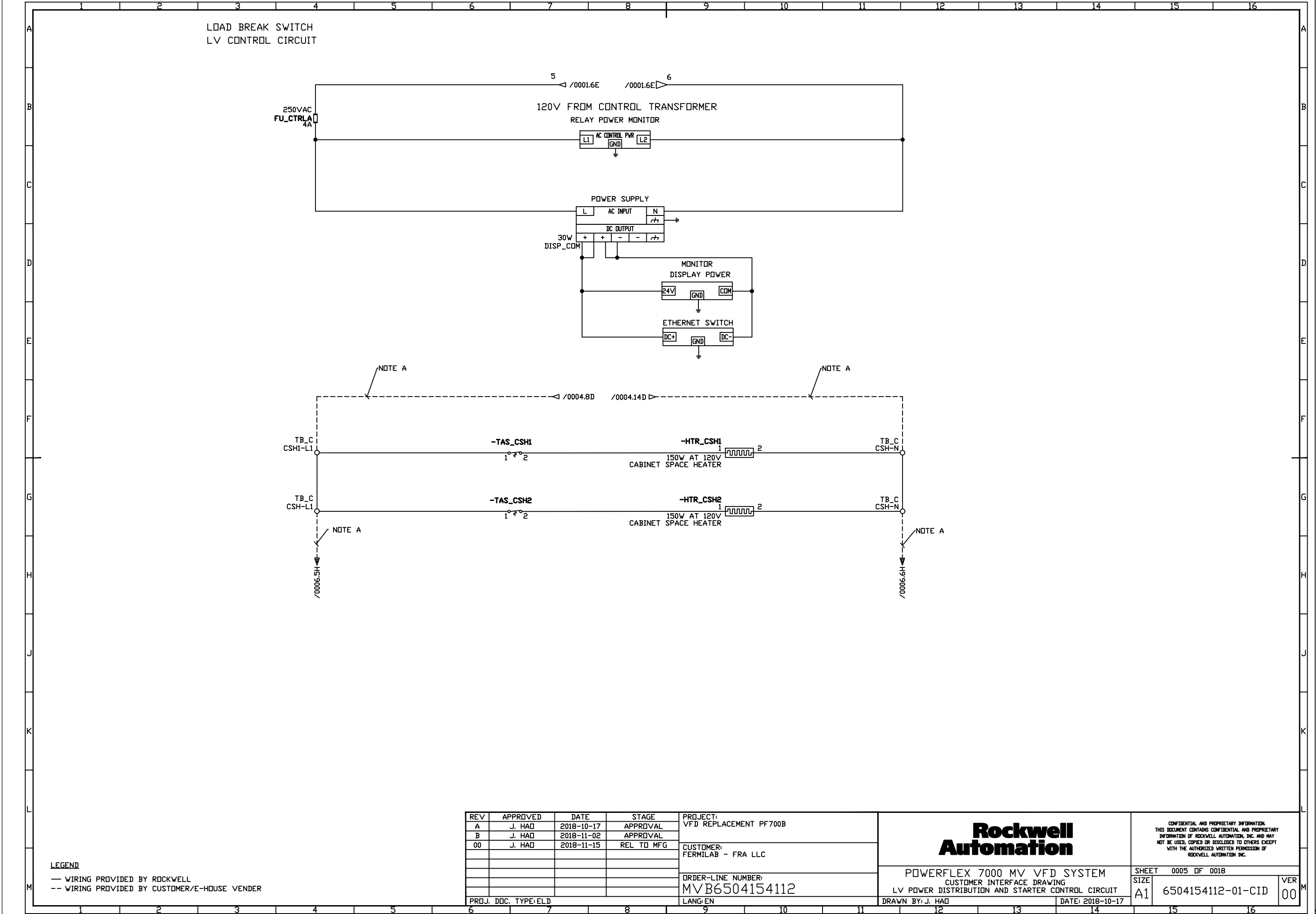


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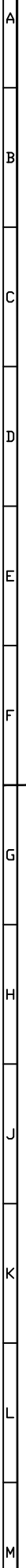
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-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDER

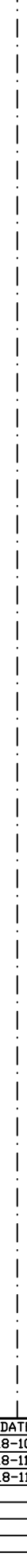
REV	APPROVED	DATE	STAGE	PROJECT:	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.			
A	J. HAD	2018-10-17	APPROVAL	VFD REPLACEMENT PF700B					
B	J. HAD	2018-11-02	APPROVAL	CUSTOMER: FERMILAB - FRA LLC					
00	J. HAD	2018-11-15	REL TO MFG						
				ORDER-LINE NUMBER: MVB6504154112	POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING LV POWER DISTRIBUTION AND STARTER CONTROL CIRCUIT	SHEET 0004 OF 0018	SIZE A1	6504154112-01-CID	VER 00
PROJ. DOC. TYPE: ELD				LANG: EN	DRAWN BY: J. HAD	DATE: 2018-10-17			



A	
B	
C	
D	
E	
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J	
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M	



DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK	INITIALS
8-10					
8-11					
8-12					



M

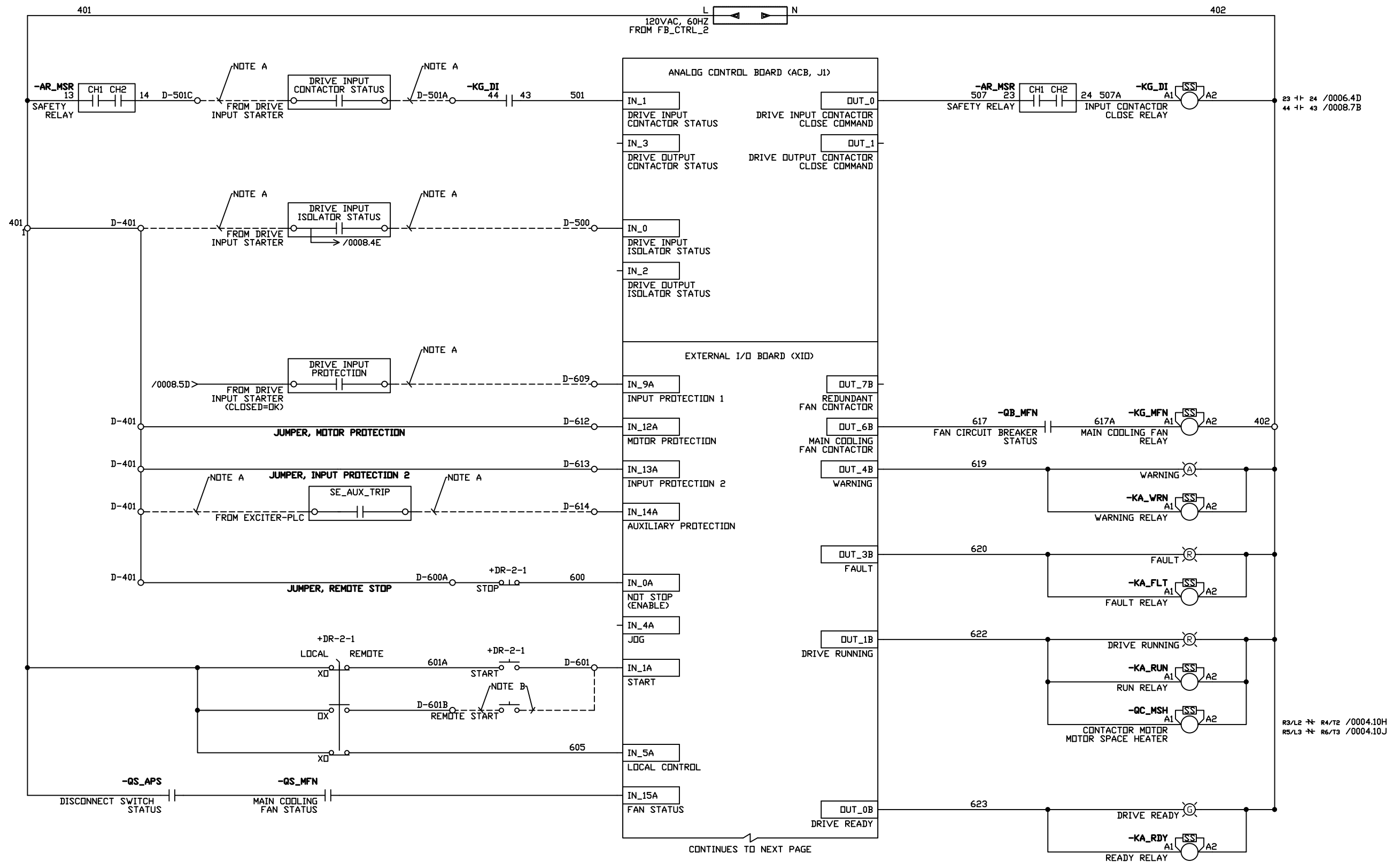
PROJECT: VFD REPLACEMENT PF700B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG: EN

LANG: EN

DRAWN BY: J. HAD

ER M

VFD LV CONTROL BLOCK DIAGRAM

[illegible]

PROJECT:	VFD REPLACEMENT PF700B
CUSTOMER:	FERMILAB - FRA LLC

ORDER-LINE NUMBER:	MVB6504154112
--------------------	---------------

LANG: EN

Rockwell Automation

POWERFLEX 7000 MV VFD SYSTEM
CUSTOMER INTERFACE DRAWING
VFD CONTROL BLOCK DIAGRAM

DRAWN BY: J. HAD

DATE: 2018-10-17

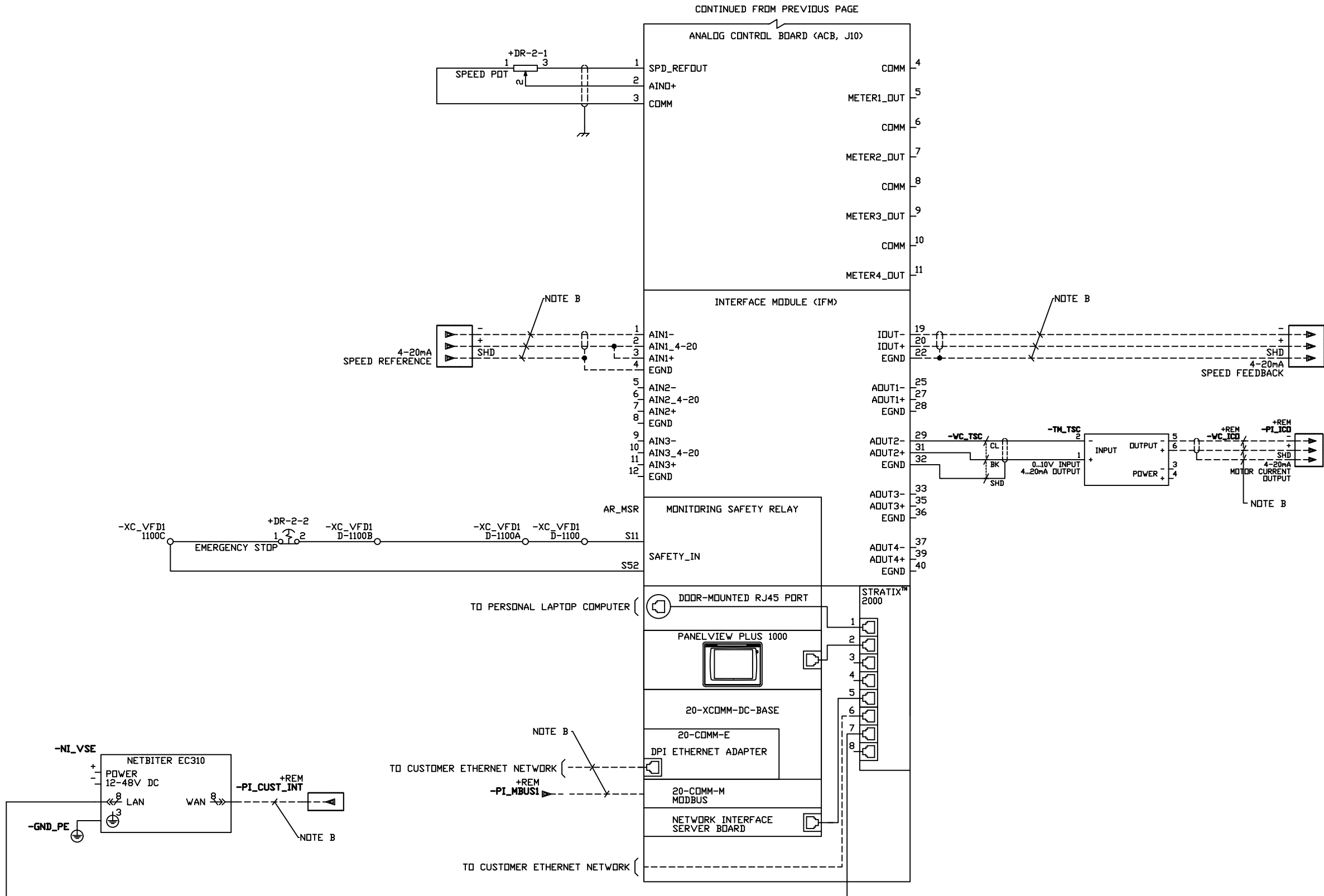
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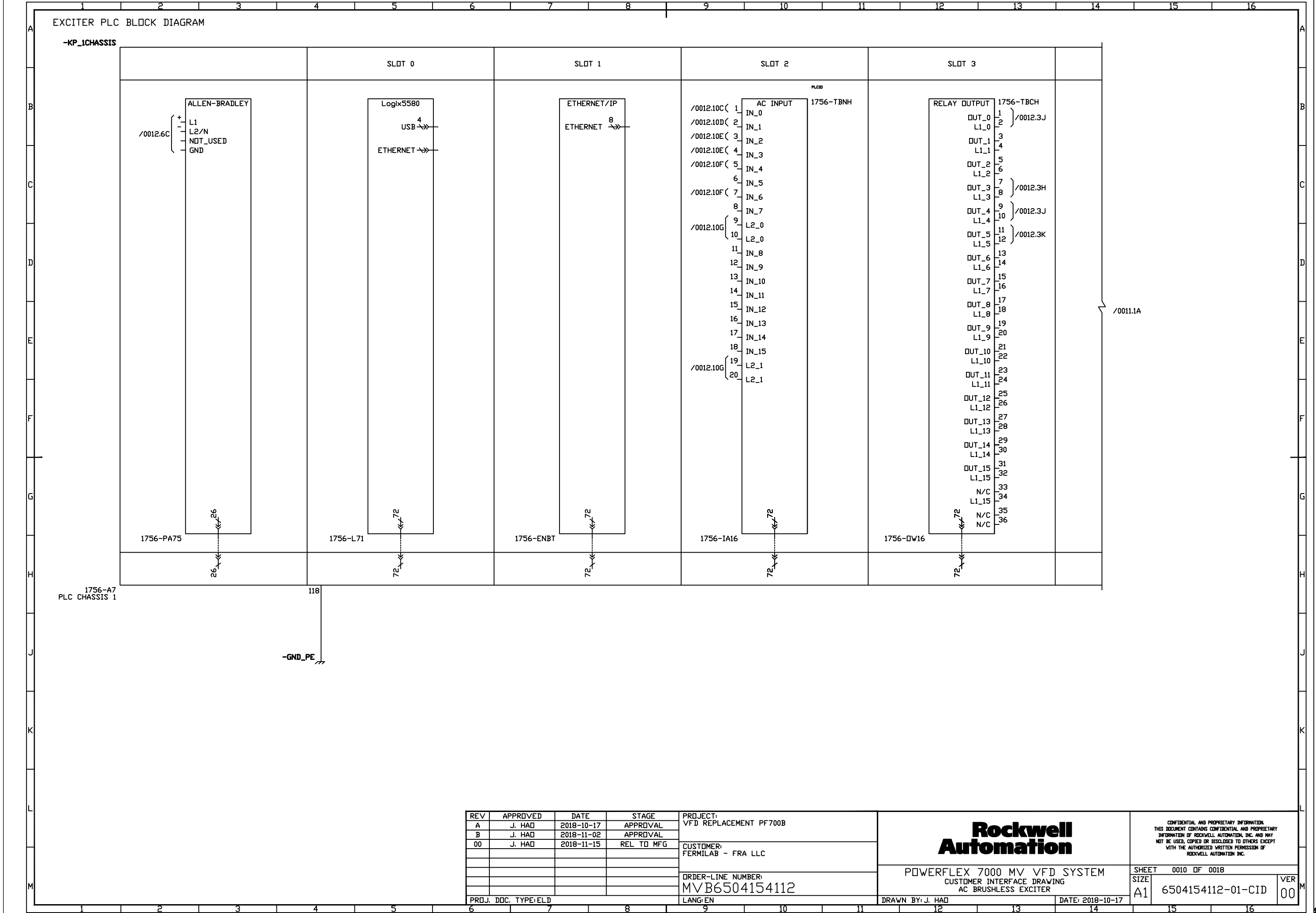
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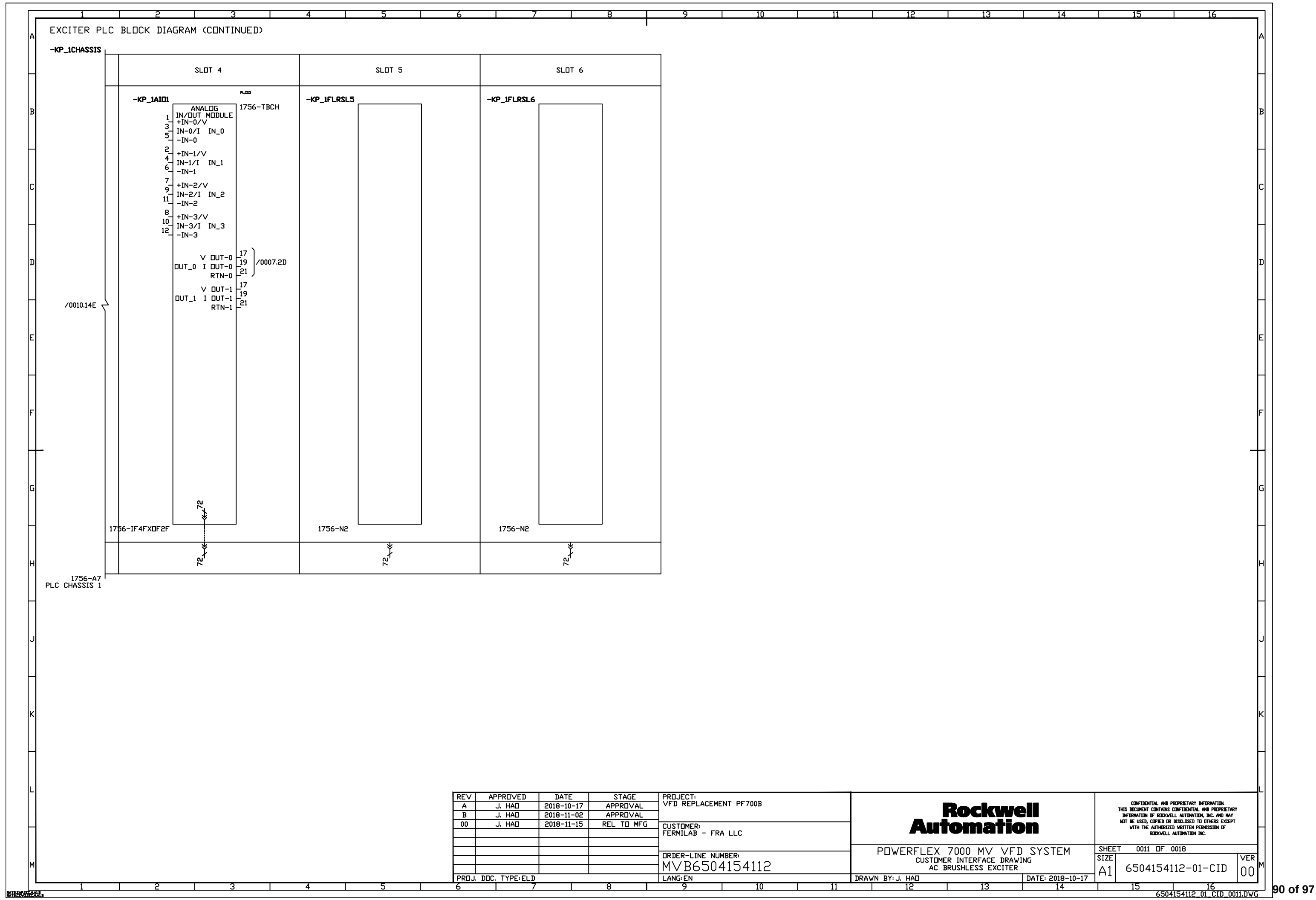
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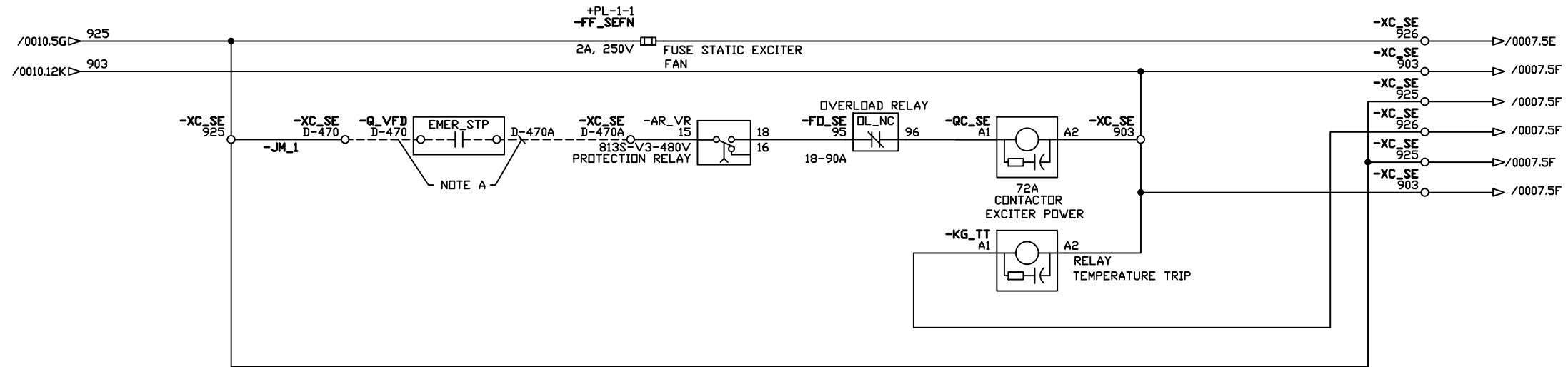
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VFD LV CONTROL BLOCK DIAGRAM (CONTINUED)









PROJECT: VFD REPLACEMENT PF700B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG: EN

DATE: 2018-10-17

ER M

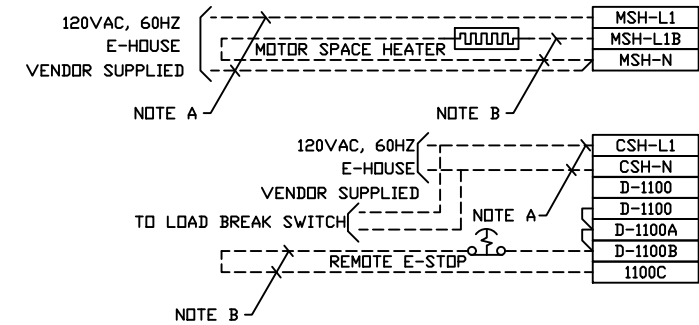
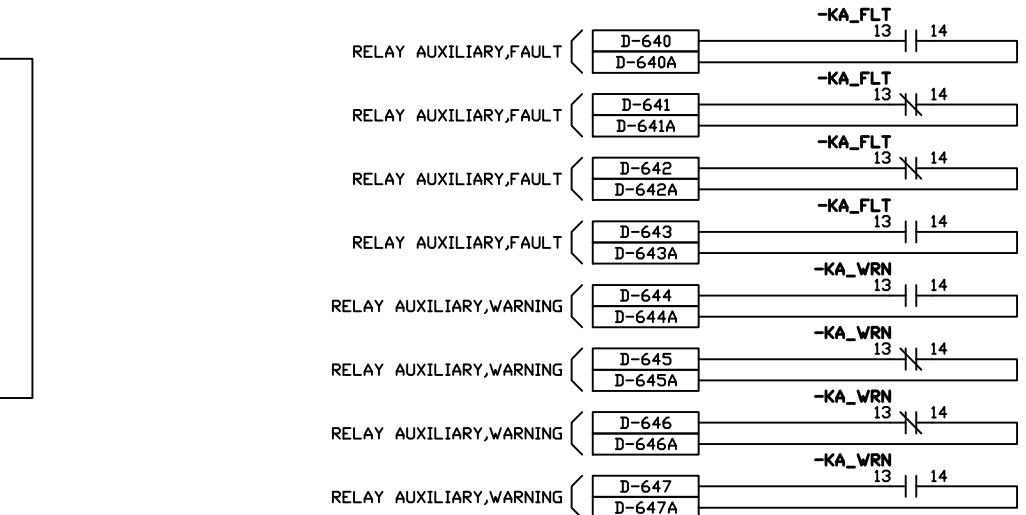
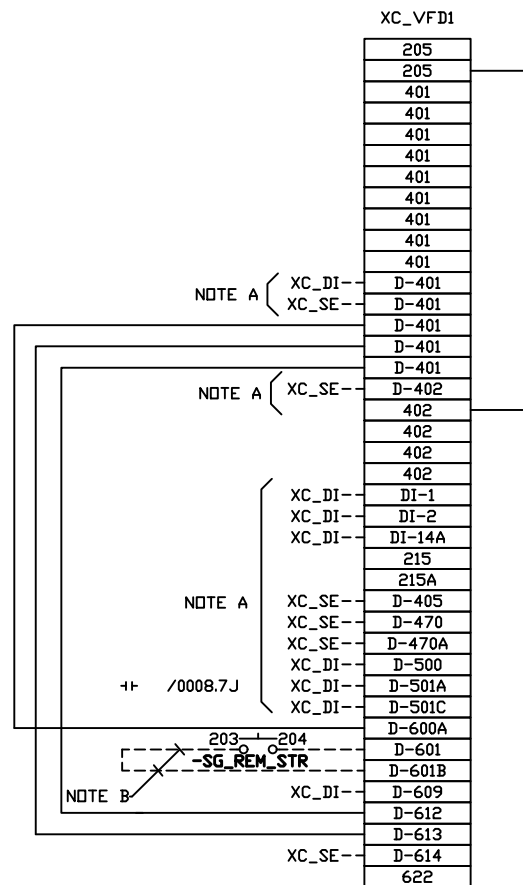
RATR-SAPTECHALB
RATR-CEVSTECHALB

Figure 10: TB_C Pin Connections

Pin Label	Connection
VA0	
VB0	
VC0	
VA	
VB	
VC	
1	
6	120VAC, 60HZ FROM VFD
CSH-L1	120VAC, 60HZ FROM VFD
CSH-N	120VAC, 60HZ DI STARTER
CSH-N	120VAC, 60HZ DI STARTER
SPARE	NOTE A
SPARE	NOTE A
SPARE	NOTE A
SPARE	NOTE A

ITEM 202		XC_DI
		1
		1
		1
		1
XC_VFD--		DI-1
XC_VFD--		DI-14A
XC_VFD--		DI-2
		12
		12
		12
		30
		31
XC_VFD--		D-501A
		32
		33
		34
		35
		36
		DI-36
		37
		DI-37
XC_VFD--		D-401
XC_VFD--		D-500
XC_VFD--		D-501C
XC_VFD--		D-609
120VAC, 60HZ		CSH-L1
FROM LBS		CSH-N
		SPARE
120VAC, 60HZ		SPARE
TO TRANSFORMER		SPARE
FEEEDER		SPARE
		SPARE

ITEM 101



ITEM 204(T)		XC_SE	
		160	
		161	
		162	
		163	
		164	
		165	
		166	
		167	
		168	
		169	
		173	
NOTE A	{	XC_VFD	D-402
		XC_VFD	D-405
		XC_VFD	D-470
		XC_VFD	D-470A
		XC_VFD	D-401
		XC_VFD	D-614
		902	
		902	
		902	
		902	
		903	
		903	
		903	
		903	
		925	
		925	
		925	
		925	
		925D	
		926	
		944	
		920	
		921	
		922	
		923	
		924	

Diagram of the XC_C terminal block:

- Terminals 1 through 36 are numbered sequentially.
- Terminal 37 is the last numbered terminal.
- Below terminal 37 are two common terminals labeled CSH-L1 and CSH-N.
- A bracket groups terminals 37, CSH-L1, and CSH-N, with a line pointing to the text: 120VAC, 60HZ FROM DI STARTER.
- NOTE A points to the bracketed group.

REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-17	APPROVAL
B	J. HAD	2018-11-02	APPROVAL
00	J. HAD	2018-11-15	REL TO MFG
PRJ.	DOC.	TYPE	ELD

ORDER-LINE NUMBER:
MVB6504154112

LANG: EN

Rockwell Automation

POWERFLEX 7000 MV VFD SYSTEM
CUSTOMER INTERFACE DRAWING
TERMINAL BLOCK LAYOUT

DRAWN BY: J. HAD

DATE: 2018-10-17

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SHEET	0014	OF	0018
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SIZE	
A1	6504154112-01-CID

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00

ELEVATION, CABLING, AND CONDUIT DETAILS

FOOTNOTES	
NOTE	DESCRIPTION
108	CONTROL WIRE CONDUIT OPENING, 3.94 [100] X 4.73 [120]
118	FAN POWER OPENING, 1.63 [41.3] DIA.
119	FAN HOODS ARE REMOVED AND SHIPPED SEPARATELY. CUSTOMER MUST INSTALL
122	27.5 [700] CLEARANCE REQUIRED FOR FAN MAINTENANCE
130	LOAD CABLE CONDUIT OPENING, 11.81 [300] X 12.80 [325]
132	LINE CABLE CONDUIT OPENING, 11.81 [300] X 12.80 [325]
133	LINE CABLE CONDUIT OPENING, 10.97 [279] X 9.79 [249]

NAMEPLATE SCHEDULE		
SERIES NUMBER	UNIT NAMEPLATE	MASTER NAMEPLATE
6504154112-101	--	--
6504154112-201	--	--
6504154112-202	--	--
6504154112-204	--	--

NAME PLATE INFORMATION:

ITEM 101:

VF-RLS01-01 VFD
FOR FN-RLS01-01
AMERICAN-DAVIDSON FAN

ITEM 201:

MAIN LOAD BREAK SW
FOR VFD
ENCLOSURE MCC

ITEM 202:

VFD VF-RLS01-01
INPUT ISOLATOR
AND CONTACTOR

ITEM 204T:

EXCITER CONTROL FOR
AMERICA-DAVIDSON FAN
SYNCHRONOUS MOTOR

ITEM 204B:

FEEDER FOR 480V
DISTRIBUTION TX
FOR VFD ENCLOSURE

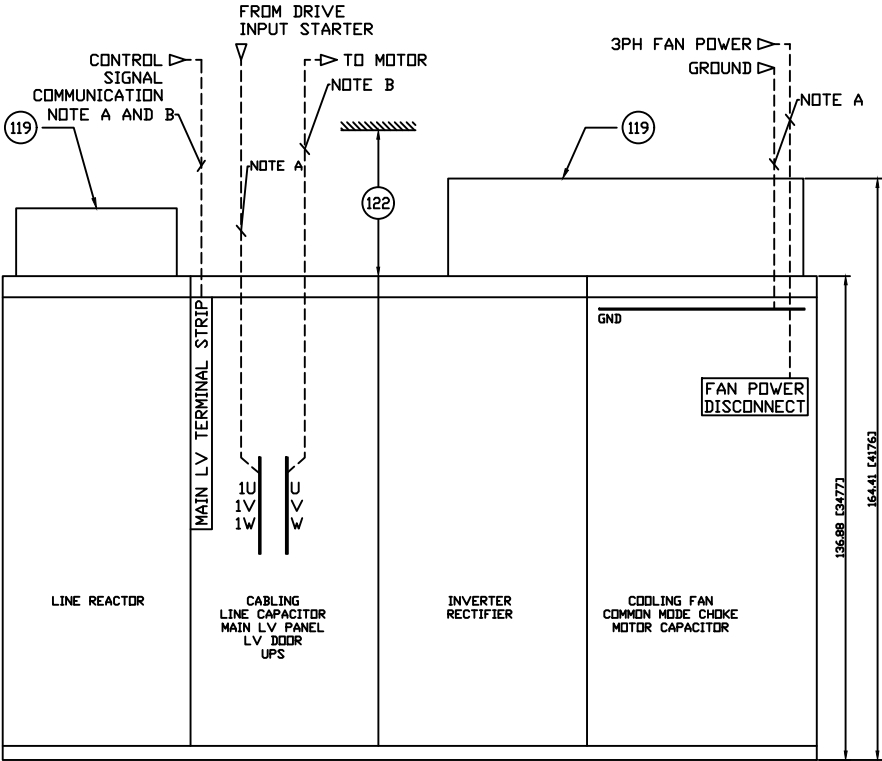
NOTE:

TERMINAL LOCATIONS SHOWN
REFLECT THEIR ACTUAL PHYSICAL
LOCATIONS.

LEGEND

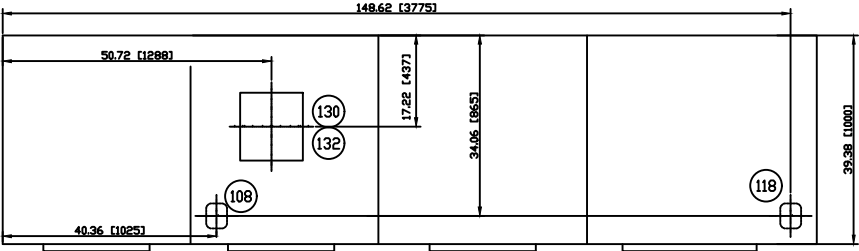
SS SHIPPING SPLIT
— WIRING PROVIDED BY ROCKWELL
-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDER

VFD CABLING DETAILS
6504154112-101

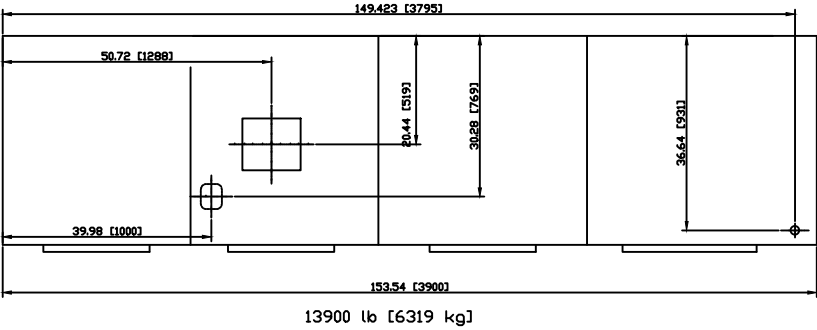


101

ROOF PLAN

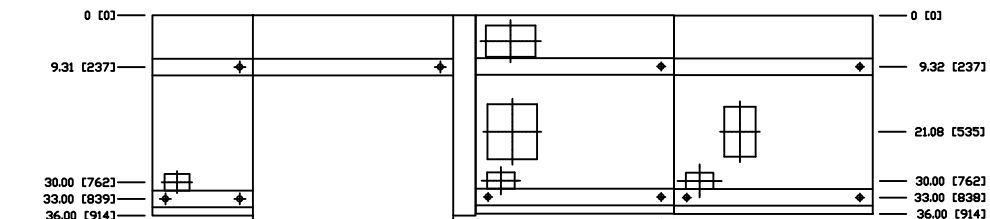
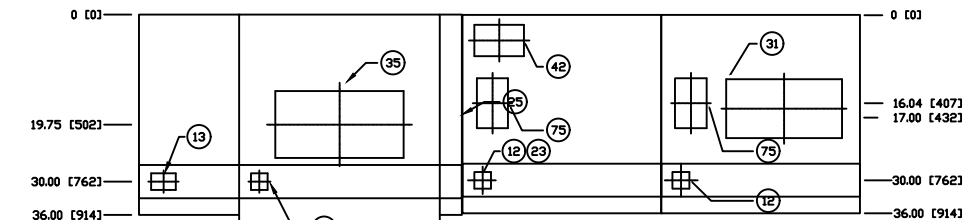
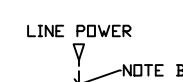


FLOOR PLAN



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A	J. HAD	2018-10-17	APPROVAL	VFD REPLACEMENT PF700B		
B	J. HAD	2018-11-02	APPROVAL			
00	J. HAD	2018-11-15	REL TO MFG	CUSTOMER: FERMILAB - FRA LLC		
				ORDER-LINE NUMBER: MVB6504154112	POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING ELEVATION, CABLING, CONDUIT DETAILS	SHEET 0015 OF 0018 SIZE A1 6504154112-01-CID 00
				PROJ. DOC. TYPE:ELD		
				LANG:EN	DRAWN BY: J. HAD	DATE: 2018-10-17

6504154112-204



PROJ. DOC. TYPE: ELD

CUSTOMER:	FERMILAB - FRA LLC
-----------	--------------------

LANG: EN

LANG: EN

POWERFLEX 7000 MV VFD SYSTEM
CUSTOMER INTERFACE DRAWING
LINE-UP ELEVATION AND KEY INTERLOCK DETAILS

DRAWN BY: J. HAD

SIZE	
A1	6504154112-01-CID

	111
--	-----

6504154112_01_CID_0016.DWG

LINE-UP ELEVATION VIEW AND KEY INTERLOCKING

KEY INTERLOCK DESCRIPTION:

TO GAIN ACCESS TO THE DRIVE MEDIUM VOLTAGE SECTIONS

- 1) IF THE DRIVE IS RUNNING THE MOTOR, FIRST STOP THE MOTOR.
- 2) OPEN THE INPUT CONTACTOR BY PRESSING THE E-STOP LOCATED AT THE DRIVE LV DOOR.
- 3) OPEN THE DRIVE INPUT ISOLATOR. LOCK IT OPEN AND REMOVE KEY KA.
- 4) INSERT KEY KA INTO THE TRANSFER BLOCK LOCATED ON THE INSIDE OF THE DRIVE LV DOOR. TURN THIS KEY TO REMOVE THE KB KEYS.
- 5) USE THE KB KEYS TO UNLOCK THE LINE REACTOR AND CONVERTER SECTIONS.
- 6) TO RESTORE EQUIPMENT TO ORIGINAL SERVICE POSITION, REVERSE THE ABOVE STEPS.

KA AND KB ARE GENERAL DESIGNATIONS ONLY. REFER TO THE CHART BELOW FOR THE ACTUAL KEY/LOCK ENGRAVING.

SERIES NUMBER	KA	KB	KB	KB
6504154112-101	K1	K2	K2	K2
6504154112-202	K1			

DRIVE LV DOOR (SEE DETAIL A)

DRIVE LV DOOR (SEE DETAIL A)

K1/K2/K2 TRANSFER BLOCK (INSIDE OF LV DOOR)

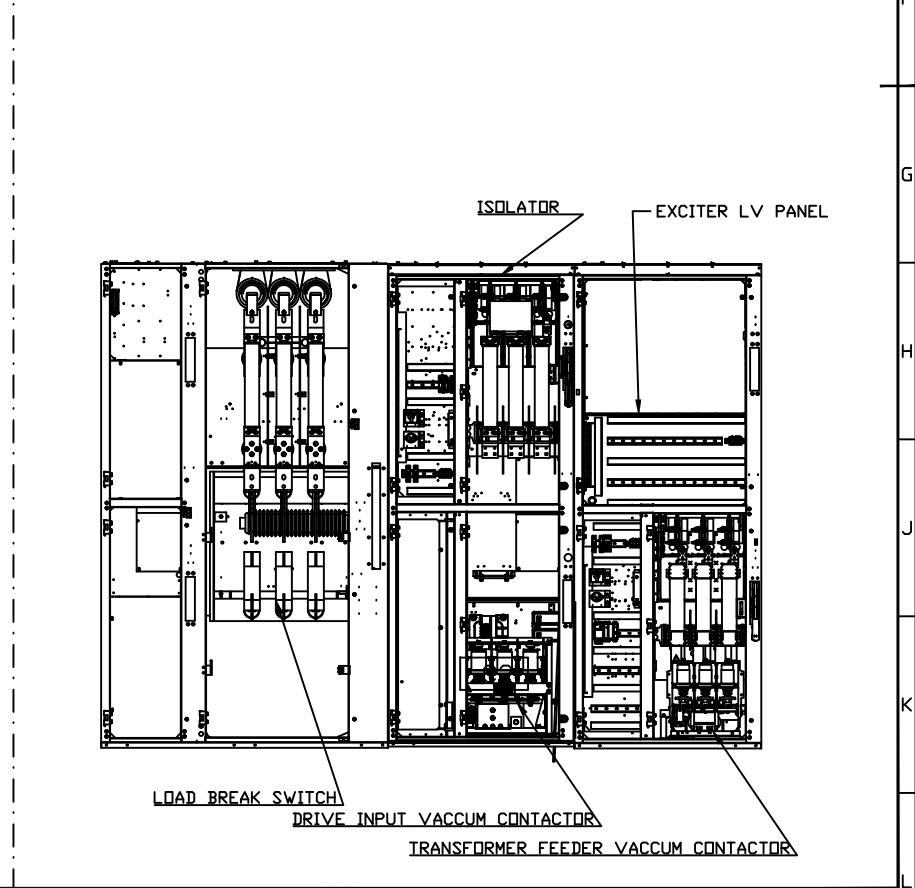
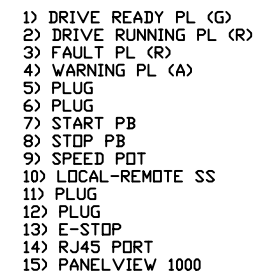
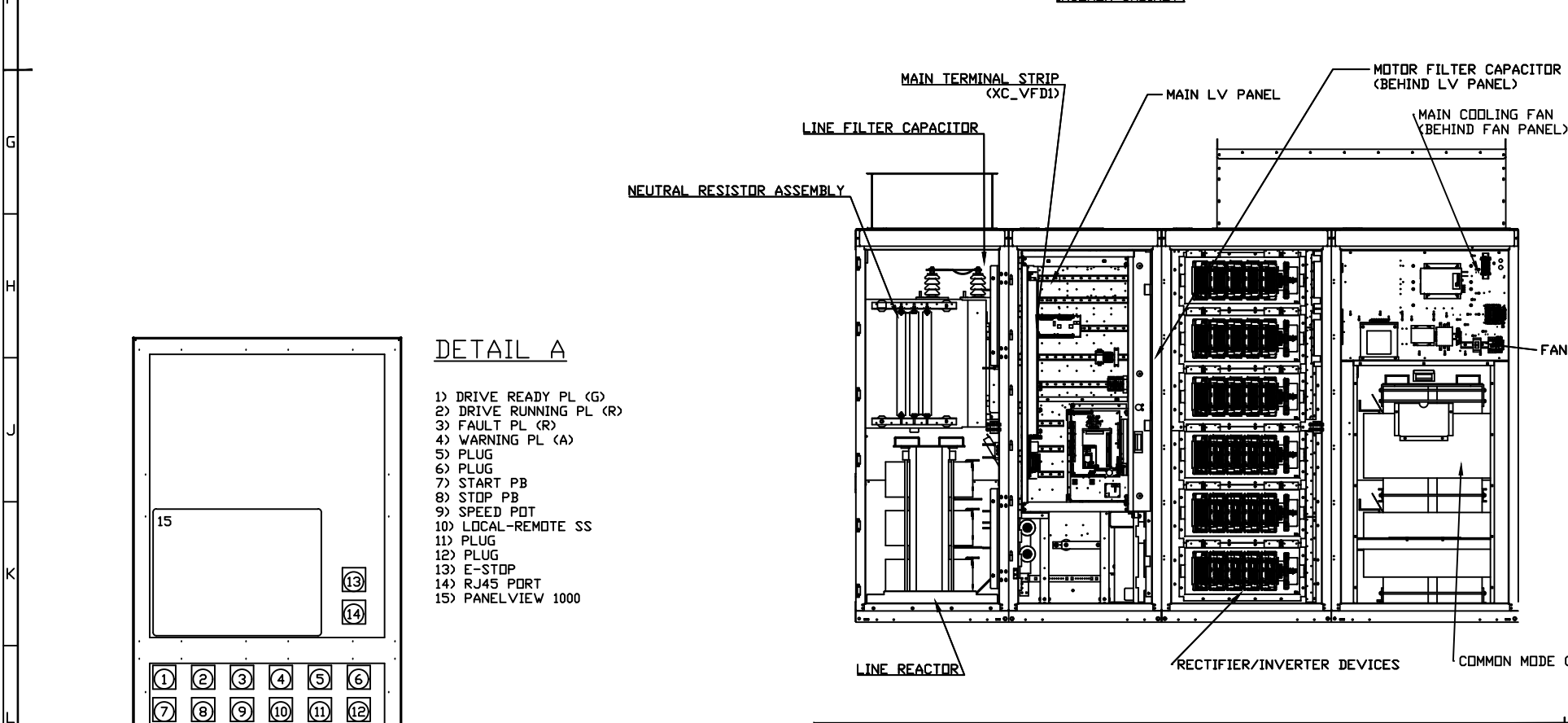
LINE REACTOR CABINET

INCOMER CABINET

CONVERTER CABINET

COMMON MODE CHOKE CABINET

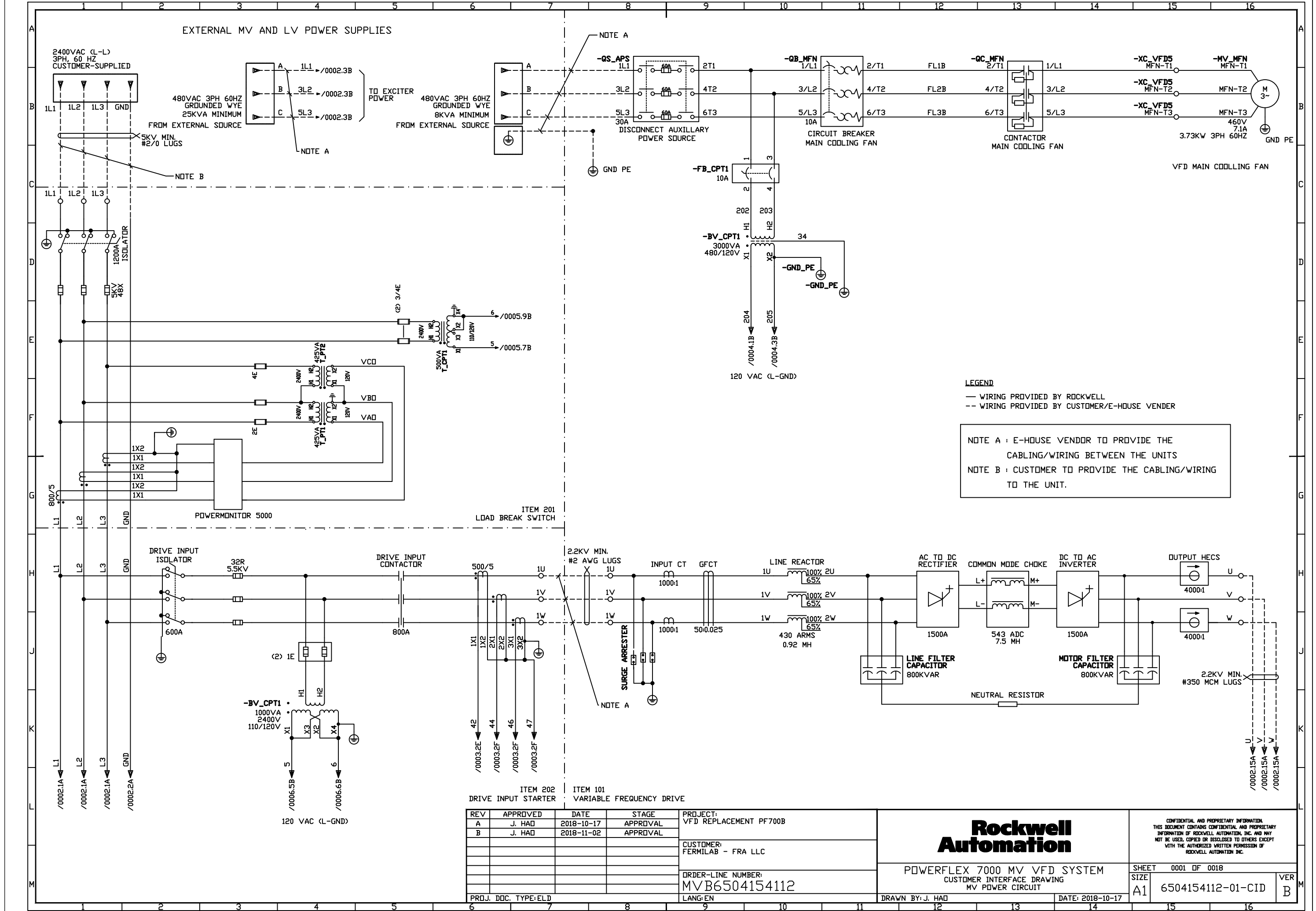
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6504154112-202	K1			

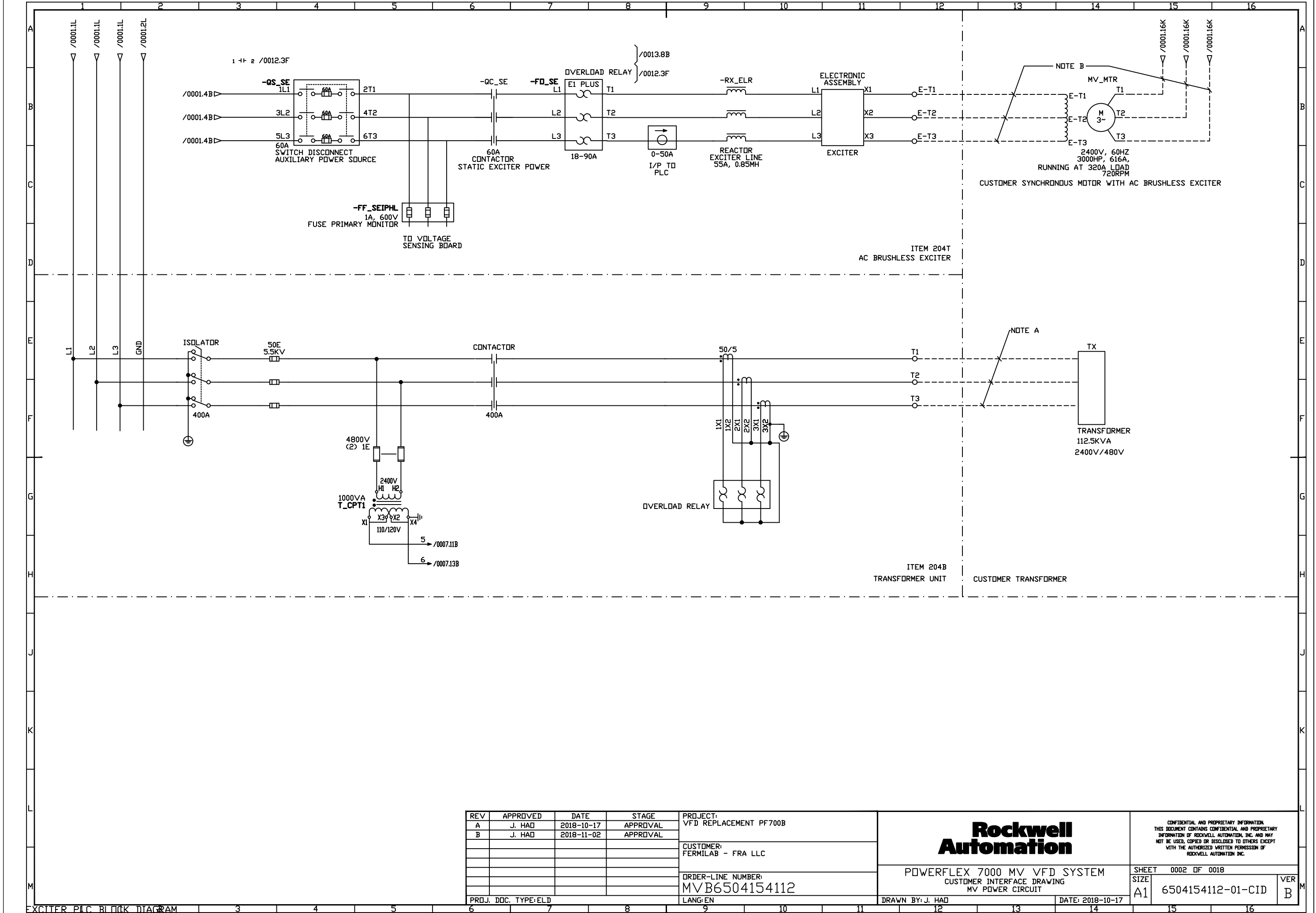


PROJECT:	VFD REPLACEMENT PF700B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB650415411
LANG:EN	

ER M

[illegible]





REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-17	APPROVAL
B	J. HAD	2018-11-02	APPROVAL

PROJECT:	VFD REPLACEMENT PF700B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
PROJ. DOC. TYPE/ELD	LANG/EN

PROJECT:	VFD REPLACEMENT PF700B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
PROJ. DOC. TYPE/ELD	LANG/EN

POWERFLEX 7000 MV VFD SYSTEM
CUSTOMER INTERFACE DRAWING
MV POWER CIRCUIT

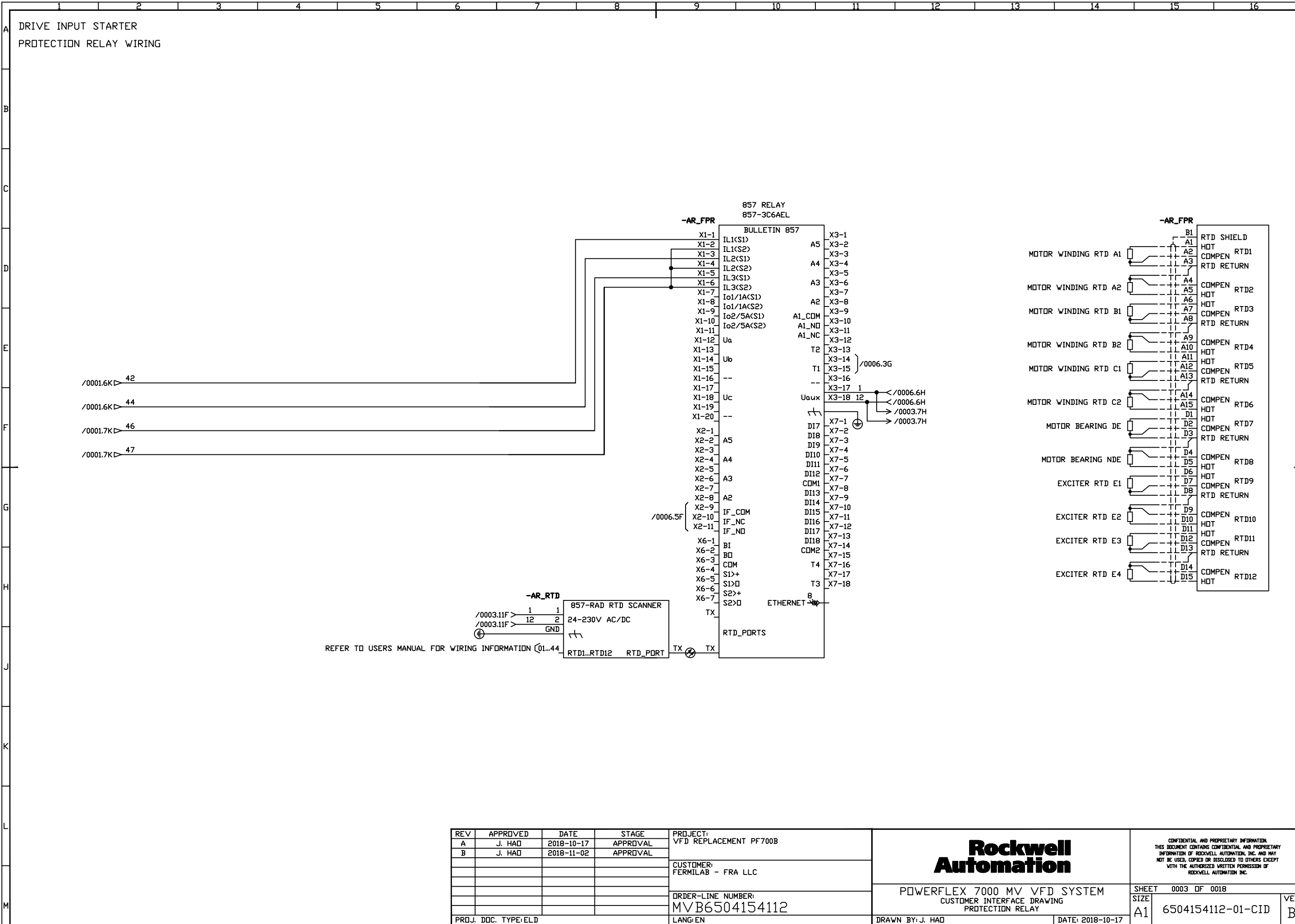
SHEET	0002 OF 0018
SIZE	A1
6504154112-01-CID	VER B

Rockwell
Automation

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ROCKWELL AUTOMATION, INC.

DRAWN BY: J. HAD

DATE: 2018-10-17

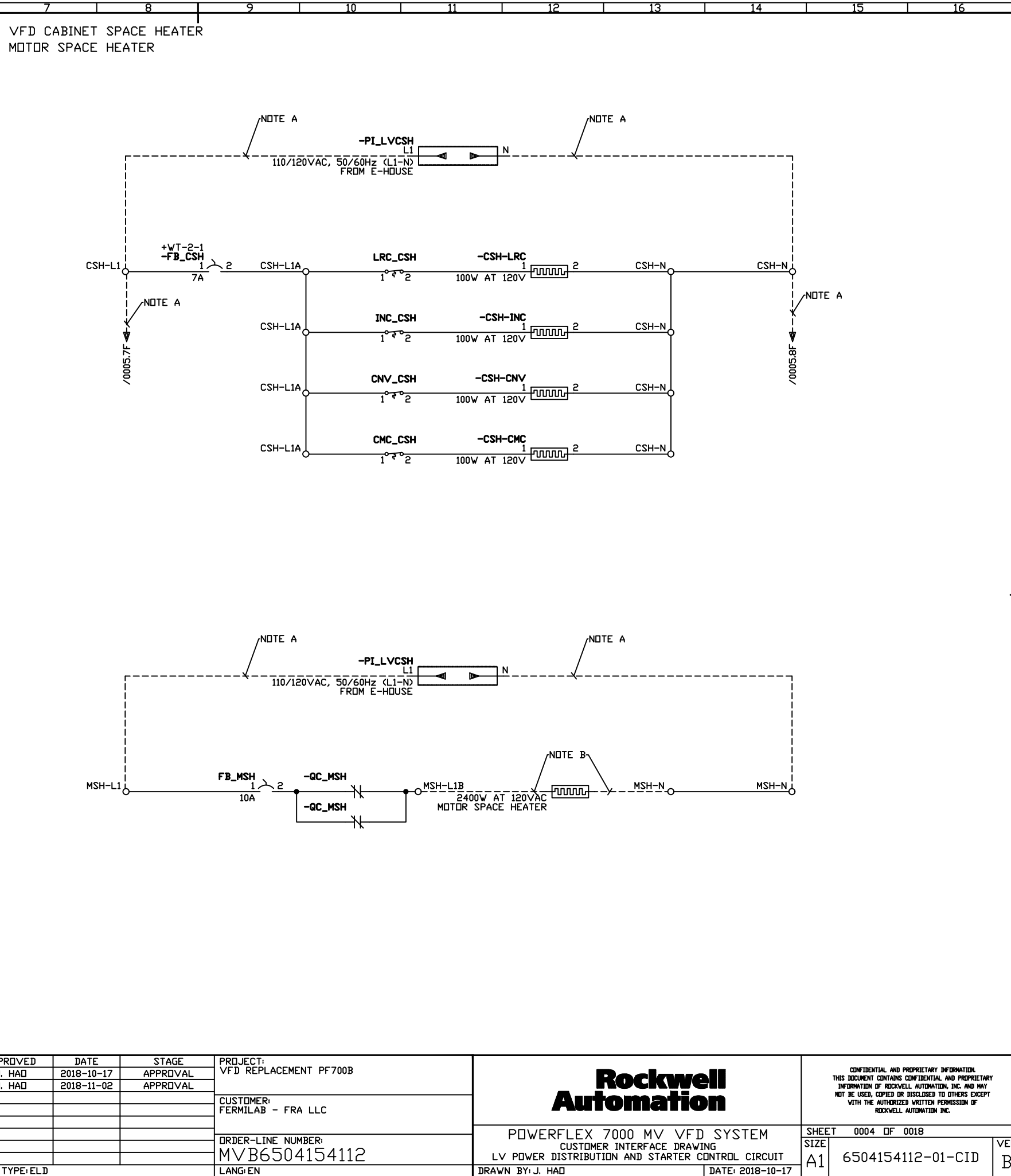
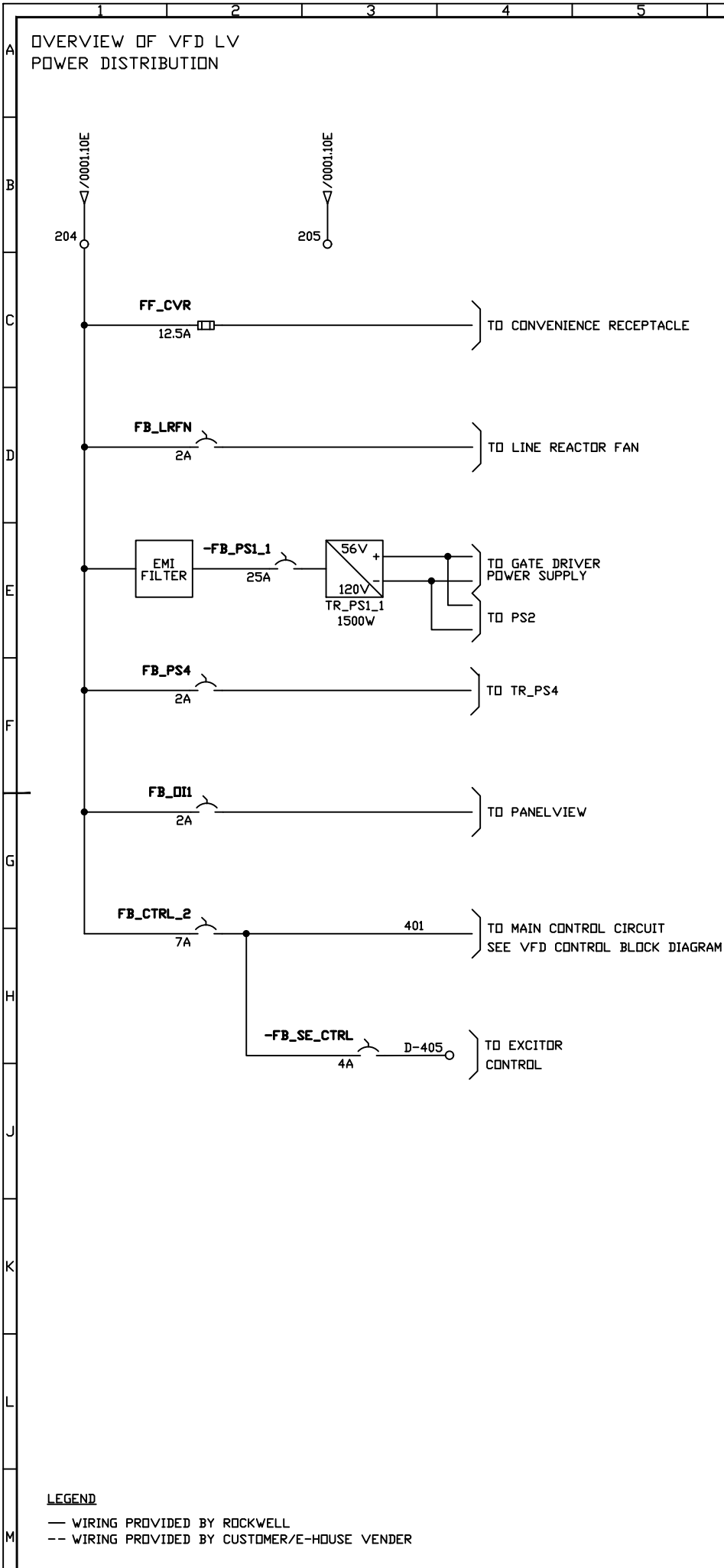


REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-17	APPROVAL
B	J. HAD	2018-11-02	APPROVAL

PROJECT: VFD REPLACEMENT PF700B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG:EN

Rockwell Automation POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING PROTECTION RELAY	
DRAWN BY: J. HAD	DATE: 2018-10-17

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SHEET 0003 OF 0018	VER B
SIZE A1	6504154112-01-CID

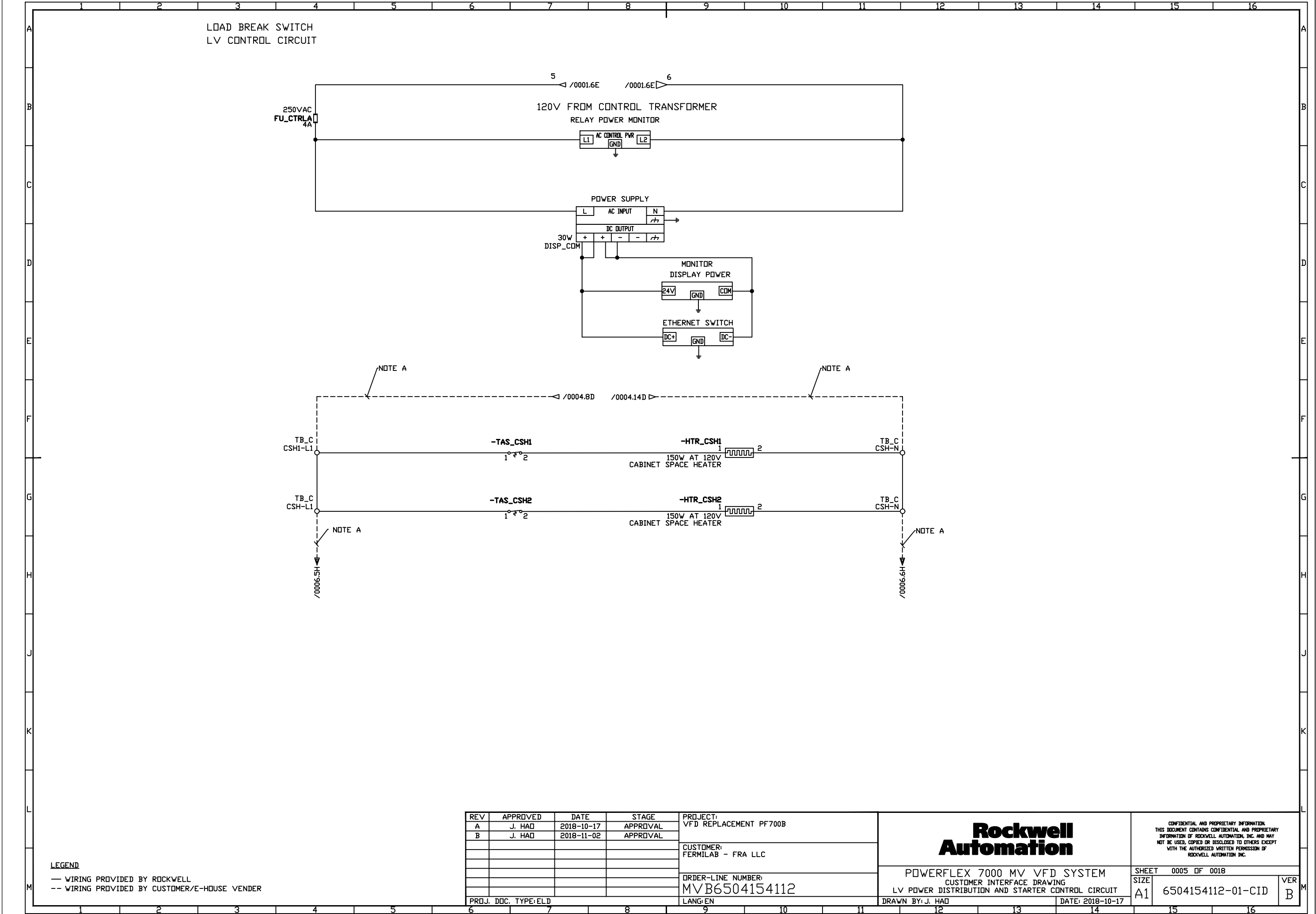


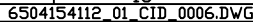
LEGEND

— WIRING PROVIDED BY ROCKWELL

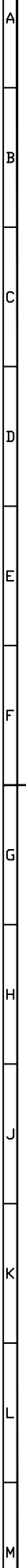
-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDER

REV	APPROVED	DATE	STAGE	PROJECT:	Rockwell Automation		CONFIDENTIAL AND PROPRIETARY INFORMATION THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.	
A	J. HAD	2018-10-17	APPROVAL	VFD REPLACEMENT PF700B				
B	J. HAD	2018-11-02	APPROVAL		CUSTOMER: FERMILAB - FRA LLC		SHEET 0004 OF 0018	
				CUSTOMER: FERMILAB - FRA LLC	POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING LV POWER DISTRIBUTION AND STARTER CONTROL CIRCUIT		SIZE A1 6504154112-01-CID	
				ORDER-LINE NUMBER: MVB6504154112	DRAWN BY: J. HAD		DATE: 2018-10-17	
				PROJ. DOC. TYPE: ELD	LANG: EN		VER B	

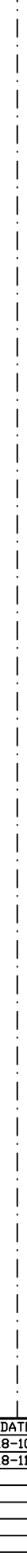




A	
B	
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D	
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J	
K	
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	DATE	TIME	LOCATION	REMARKS
	8-10			
	8-11			



M

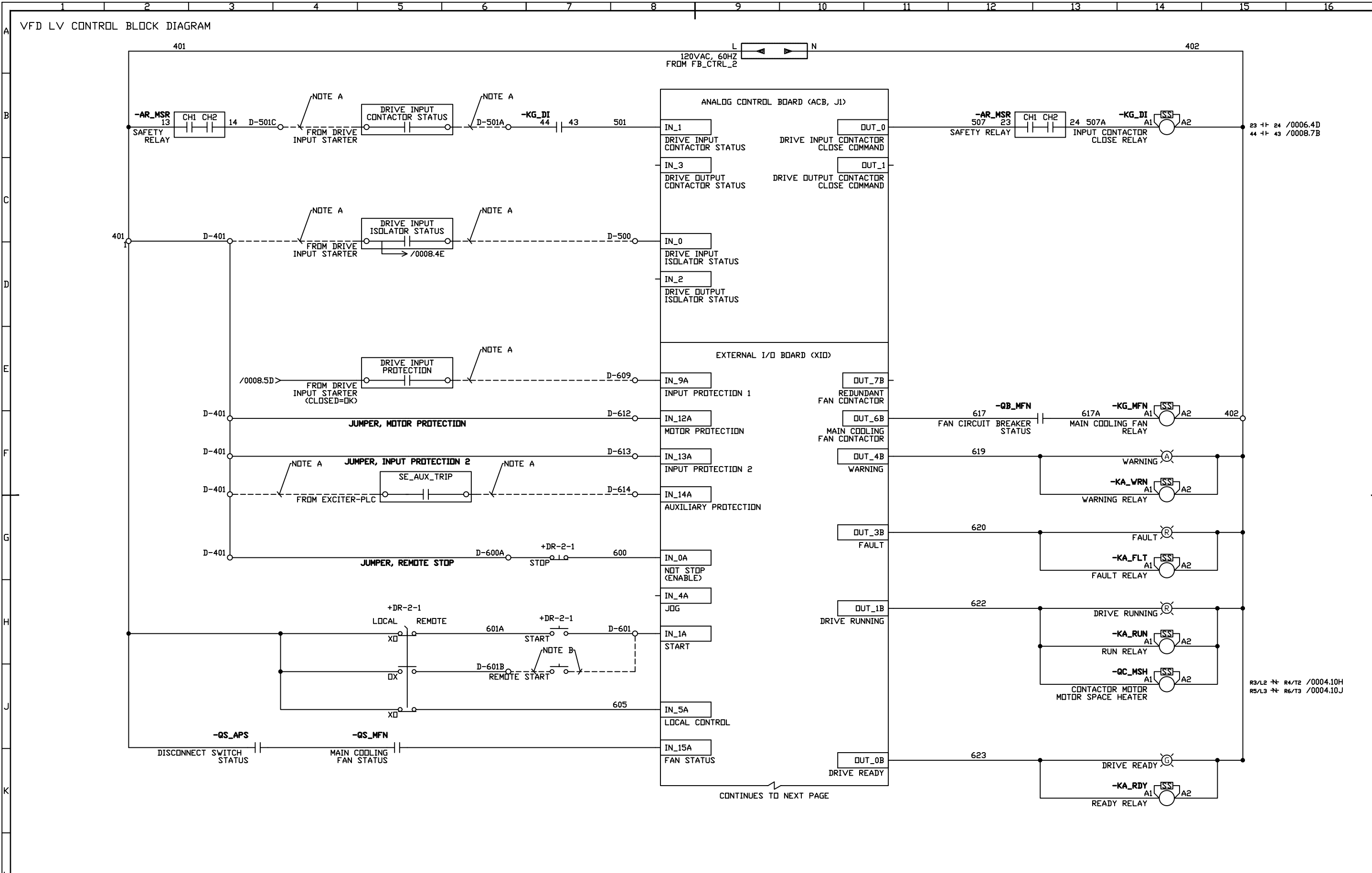
REV	APPROVED	DATE	STAGE
A	J. HAD	2018-10-17	APPROVAL
B	J. HAD	2018-11-02	APPROVAL
PROJ. DOC. TYPE: ELD			

PROJECT:	VFD REPLACEMENT PF700B
CUSTOMER:	FERMILAB - FRA LLC
ORDER-LINE NUMBER:	MVB6504154112
LANG:	EN

Rockwell Automation	
POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING LV POWER DISTRIBUTION AND STARTER CONTROL CIRCUIT	
DRAWN BY: J. HAO	DATE: 2018-10-17

[illegible]

	L
VER B	M



LEGEND

— WIRING PROVIDED BY ROCKWELL

-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDER

REV	APPROVED	DATE	STAGE	PROJECT:
A	J. HAD	2018-10-17	APPROVAL	VFD REPLACEMENT PF700B
B	J. HAD	2018-11-02	APPROVAL	
				CUSTOMER:
				FERMILAB - FRA LLC
				ORDER-LINE NUMBER:
				MVB6504154112
				LANG:EN
PROJ. DOC. TYPE:ELD				DRAWN BY: J. HAD
				DATE: 2018-10-17

Rockwell Automation

POWERFLEX 7000 MV VFD SYSTEM

CUSTOMER INTERFACE DRAWING

VFD CONTROL BLOCK DIAGRAM

SHEET 0008 OF 0018

SIZE A1

6504154112-01-CID

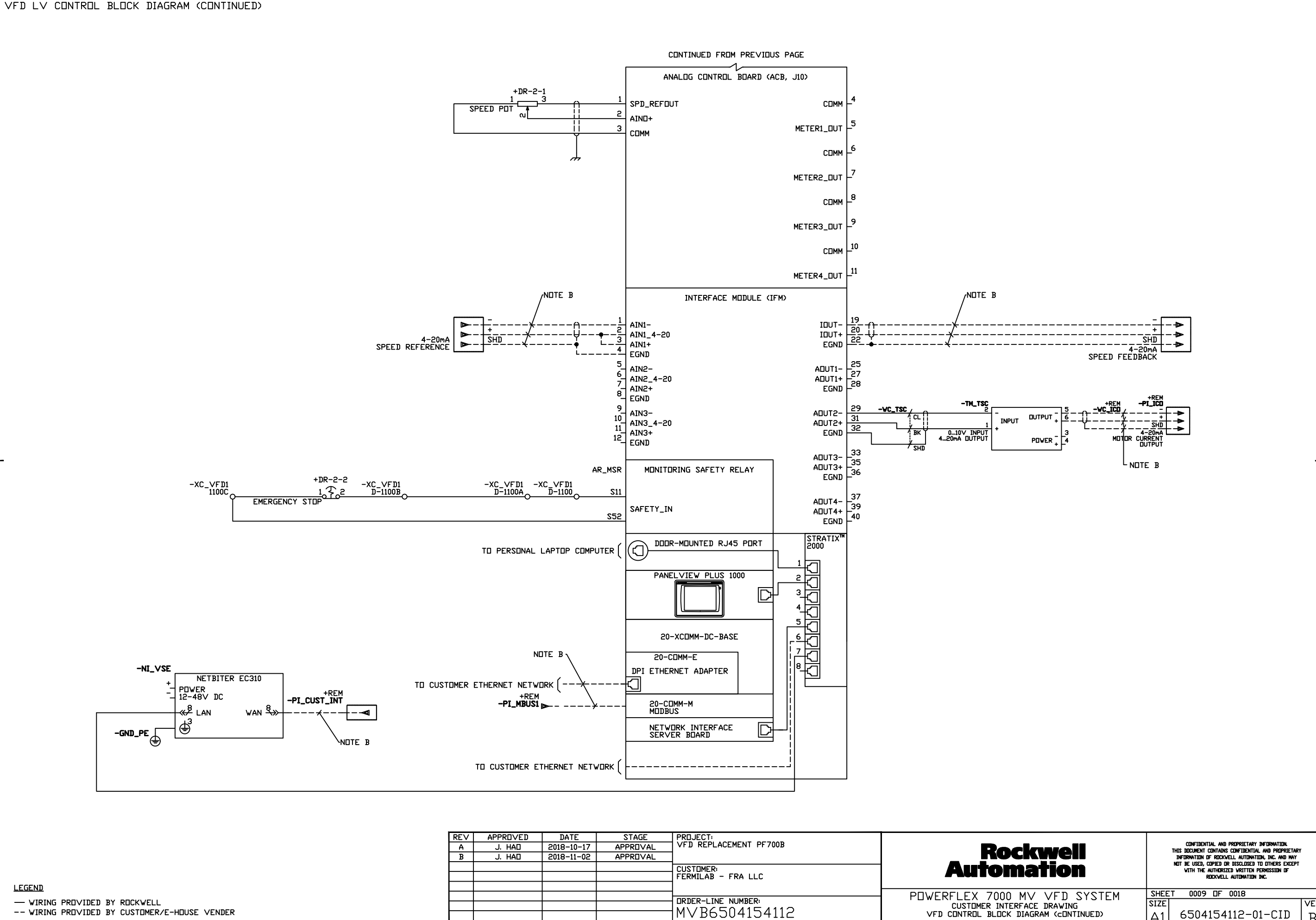
VER B

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6504154112_01_CID_0008.DWG

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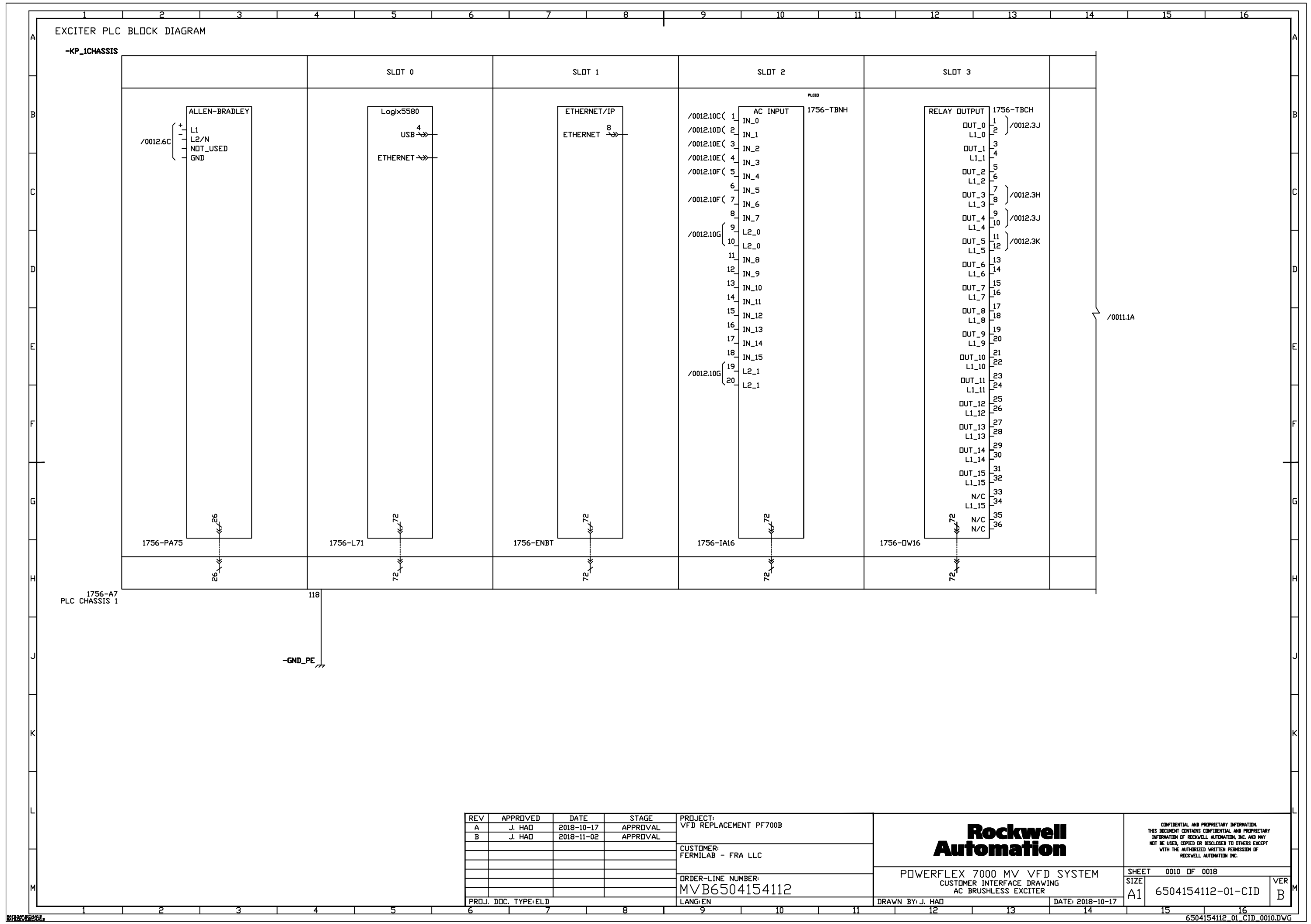


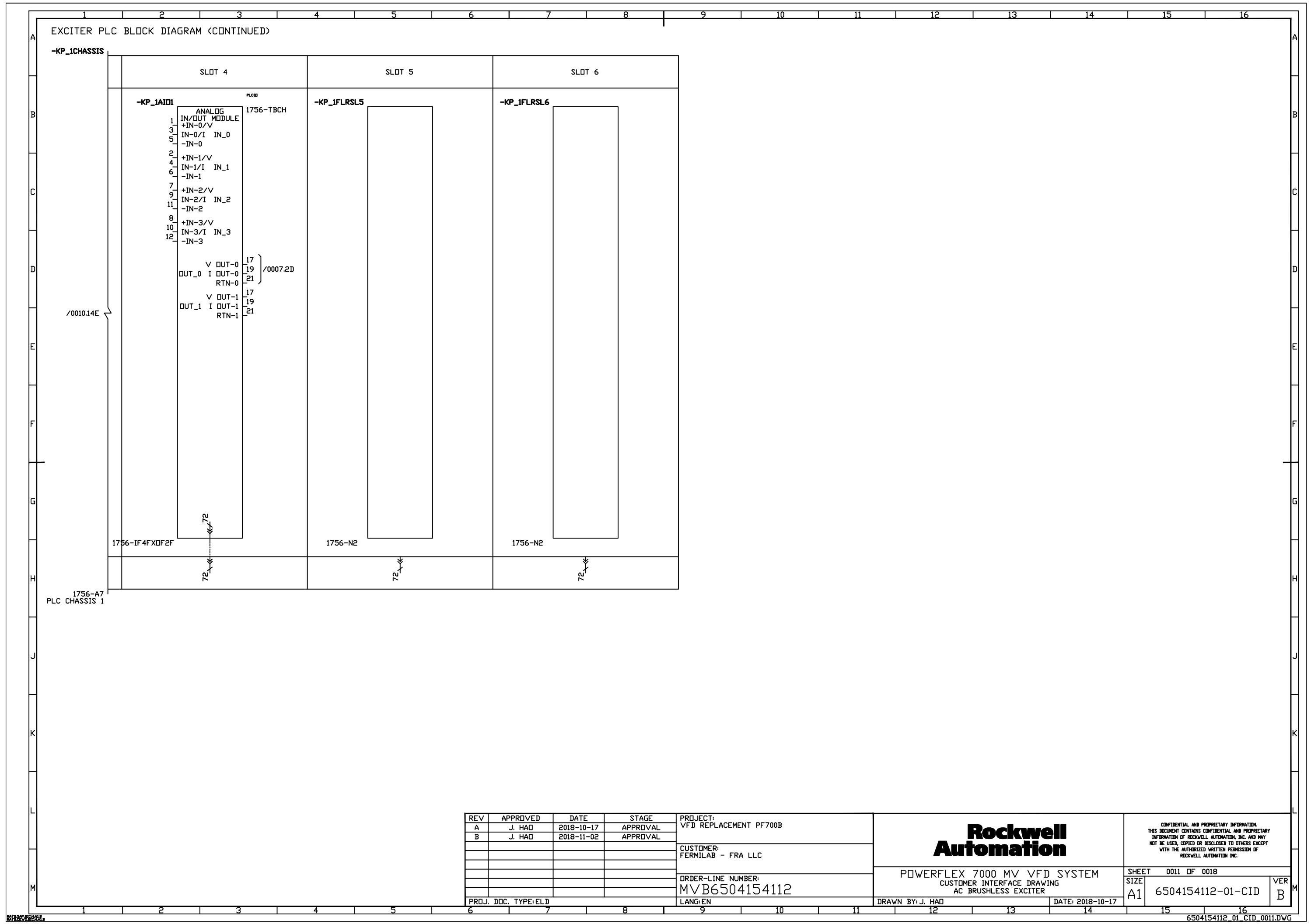
PROJECT: VFD REPLACEMENT PF700B
CUSTOMER: FERMILAB - FRA LLC
ORDER-LINE NUMBER: MVB6504154112
LANG:EN

LANG: EN

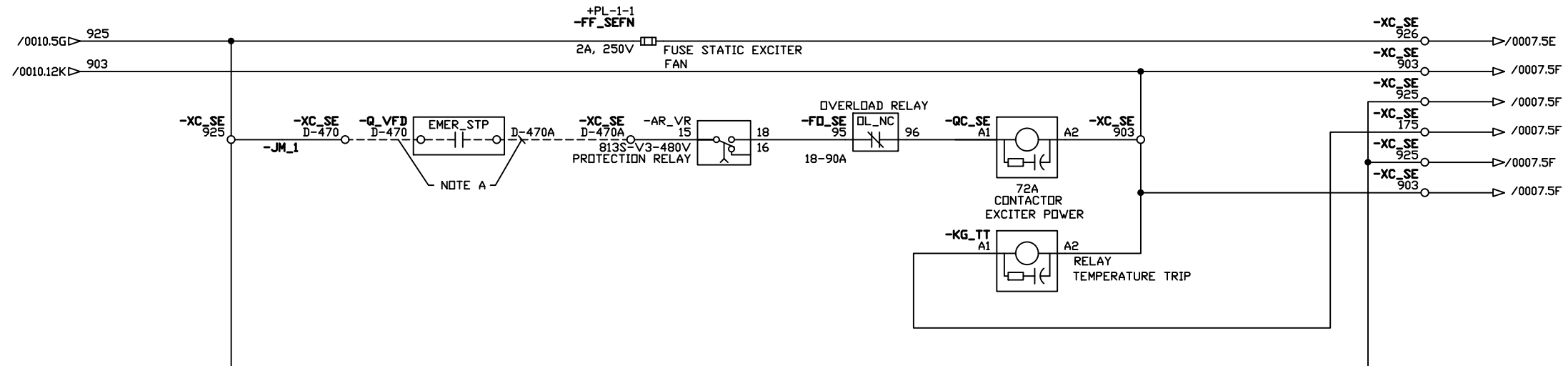
DATE: 2018-10-17

ER
RRATR-SAP IECHALB
RATR-PCUECHALB





EXCITER CONTROL CIRCUIT



LEGEND

— WIRING PROVIDED BY ROCKWELL
-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDER

REV	APPROVED	DATE	STAGE	PROJECT: VFD REPLACEMENT PF700B	Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION INC.				
A	J. HAO	2018-10-17	APPROVAL							
B	J. HAO	2018-11-02	APPROVAL							
				CUSTOMER: FERMILAB - FRA LLC						
				ORDER-LINE NUMBER: MVB6504154112	POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING AC BRUSHLESS EXCITER	SHEET 0013 OF 0018				
						SIZE A1	6504154112-01-CID		VER B	
PROJ. DOC. TYPE:ELD				LANG:EN	DRAWN BY: J. HAO	DATE: 2018-10-17				

Rockwell Automation

POWERFLEX 7000 MV VFD SYSTEM
CUSTOMER INTERFACE DRAWING
AC BRUSHLESS EXCITER

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SHEET 0013 OF 0018	
SIZE	VE
A1	6504154112-01-CID

		TB_C
		VA0
		VB0
		VCO
		VA
		VB
		VC
		1
		6
120VAC, 60HZ	FROM VFD	CSH-L1
120VAC, 60HZ		CSH-N
TO DI STARTER		CSH-L1
		CSH-N
		SPARE
		SPARE
		SPARE

NOTE A

ITEM 202		XC_DI
		1
		1
		1
		1
XC_VFD--	DI-1	
XC_VFD--	DI-14A	
XC_VFD--	DI-2	
	12	
	12	
	12	
	30	
	31	
XC_VFD--	D-501A	
	32	
	33	
	34	
	35	
	36	
	DI-36	
	37	
	DI-37	
XC_VFD--	D-401	
XC_VFD--	D-500	
XC_VFD--	D-501C	
XC_VFD--	D-609	
120VAC, 60HZ	CSH-L1	
FROM LBS	CSH-N	
	SPARE	
120VAC, 60HZ	SPARE	
TO TRANSFORMER	SPARE	
FEEDER	SPARE	
	SPARE	

[illegible]

ITEM 204(T)		XC_SE	
		160	
		161	
		162	
		163	
		164	
		165	
		166	
		167	
		168	
		169	
		173	
		175	
NOTE A	{	XC_VFD--	D-402
		XC_VFD--	D-405
		XC_VFD--	D-470
		XC_VFD--	D-470A
		XC_VFD--	D-401
		XC_VFD--	D-614
		902	
		902	
		902	
		902	
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		903	
		903	
		903	
		903	
		925	
		925	
		925	
		925	
		925D	
		926	
		944	
		920	
		921	
		922	
		923	
		924	

Diagram of the XC_C terminal block showing 37 terminals. The terminals are labeled as follows:

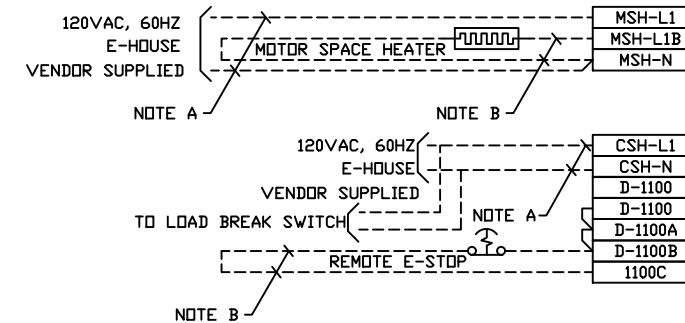
- 1
- 1
- 1
- 1A
- 1B
- 2
- 2
- 3
- 12
- 12
- 12
- 14
- 30
- 31
- 32
- 33
- 34
- 35
- 36
- 37
- CSH-L1
- CSH-N

NOTE A: 120VAC, 60HZ FROM DI STARTER is connected to terminals CSH-L1 and CSH-N.

The diagram shows the timing relationship between the 622 pin and several relay auxiliary signals. Each signal is represented by a horizontal bar indicating its active period. The signals are:

- RELAY AUXILIARY, READY**: Active from 622 pin output 13 to 14. The corresponding digital output is **-KA_RBY** (21).
- RELAY AUXILIARY, READY**: Active from 622 pin output 21 to 22. The corresponding digital output is **-KA_RBY** (31).
- RELAY AUXILIARY, READY**: Active from 622 pin output 31 to 32. The corresponding digital output is **-KA_RBY** (43).
- RELAY AUXILIARY, RUN**: Active from 622 pin output 43 to 44. The corresponding digital output is **-KA_RUN** (13).
- RELAY AUXILIARY, RUN**: Active from 622 pin output 13 to 14. The corresponding digital output is **-KA_RUN** (21).
- RELAY AUXILIARY, RUN**: Active from 622 pin output 21 to 22. The corresponding digital output is **-KA_RUN** (31).
- RELAY AUXILIARY, RUN**: Active from 622 pin output 31 to 32. The corresponding digital output is **-KA_RUN** (43).

RELAY	AUXILIARY	FAULT	13	14
	D-640		-KA_FLT	
	D-640A			
RELAY	AUXILIARY	FAULT	13	14
	D-641		-KA_FLT	
	D-641A			
RELAY	AUXILIARY	FAULT	13	14
	D-642		-KA_FLT	
	D-642A			
RELAY	AUXILIARY	FAULT	13	14
	D-643		-KA_FLT	
	D-643A			
RELAY	AUXILIARY	WARNING	13	14
	D-644		-KA_WRN	
	D-644A			
RELAY	AUXILIARY	WARNING	13	14
	D-645		-KA_WRN	
	D-645A			
RELAY	AUXILIARY	WARNING	13	14
	D-646		-KA_WRN	
	D-646A			
RELAY	AUXILIARY	WARNING	13	14
	D-647		-KA_WRN	
	D-647A			



CUSTOMER SIDE ROCKWELL SIDE

XC_DI — —

DESTINATION TERMINAL NUMBER

— WIRING PROVIDED BY ROCKWELL
-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDOR

LANG: EN

DRAWN BY: J. HAD

ER
D

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ELEVATION, CABLING, AND CONDUIT DETAILS

FOOTNOTES	
NOTE	DESCRIPTION
108	CONTROL WIRE CONDUIT OPENING, 3.94 [100] X 4.73 [120]
118	FAN POWER OPENING, 1.63 [41.3] DIA.
119	FAN HOODS ARE REMOVED AND SHIPPED SEPARATELY. CUSTOMER MUST INSTALL
122	27.5 [700] CLEARANCE REQUIRED FOR FAN MAINTENANCE
130	LOAD CABLE CONDUIT OPENING, 11.81 [300] X 12.80 [325]
132	LINE CABLE CONDUIT OPENING, 11.81 [300] X 12.80 [325]
133	LINE CABLE CONDUIT OPENING, 10.97 [279] X 9.79 [249]

NAMEPLATE SCHEDULE		
SERIES NUMBER	UNIT NAMEPLATE	MASTER NAMEPLATE
6504154112-101	--	--
6504154112-201	--	--
6504154112-202	--	--
6504154112-204	--	--

NAME PLATE INFORMATION:

ITEM 101:

VF-RLS01-01 VFD
FOR FN-RLS01-01
AMERICAN-DAVIDSON FAN

ITEM 201:

MAIN LOAD BREAK SW
FOR VFD
ENCLOSURE MCC

ITEM 202:

VFD VF-RLS01-01
INPUT ISOLATOR
AND CONTACTOR

ITEM 204T:

EXCITER CONTROL FOR
AMERICA-DAVIDSON FAN
SYNCHRONOUS MOTOR

ITEM 204B:

FEEDER FOR 480V
DISTRIBUTION TX
FOR VFD ENCLOSURE

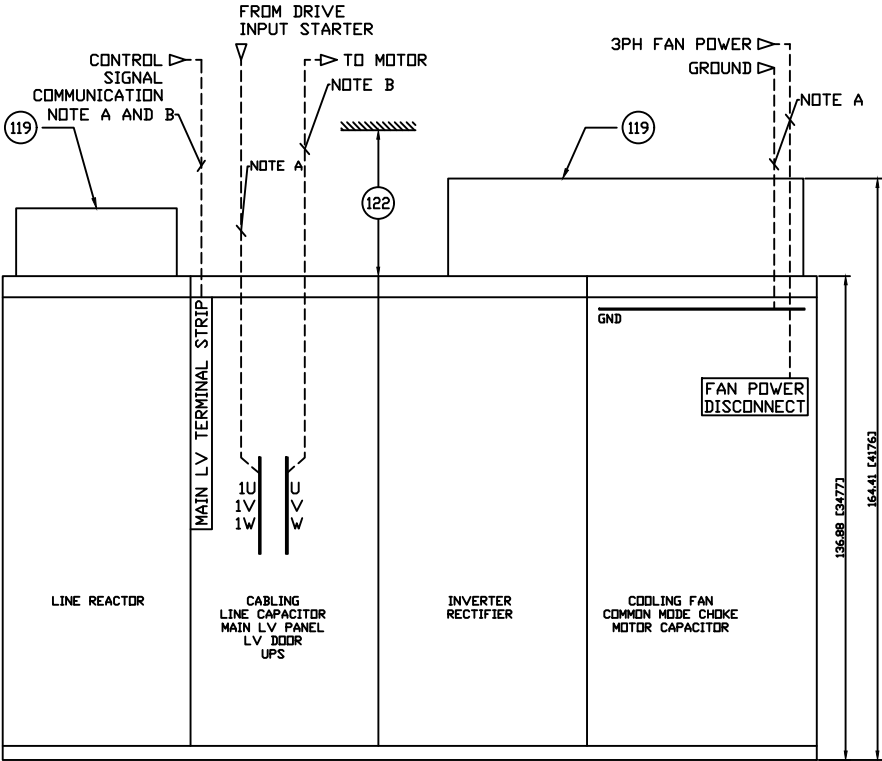
NOTE:

TERMINAL LOCATIONS SHOWN
REFLECT THEIR ACTUAL PHYSICAL
LOCATIONS.

LEGEND

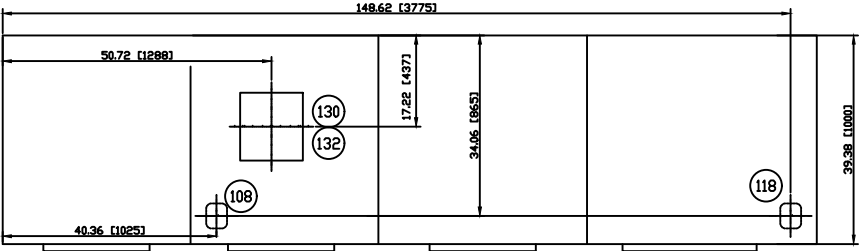
- SS SHIPPING SPLIT
— WIRING PROVIDED BY ROCKWELL
-- WIRING PROVIDED BY CUSTOMER/E-HOUSE VENDER

VFD CABLING DETAILS
6504154112-101

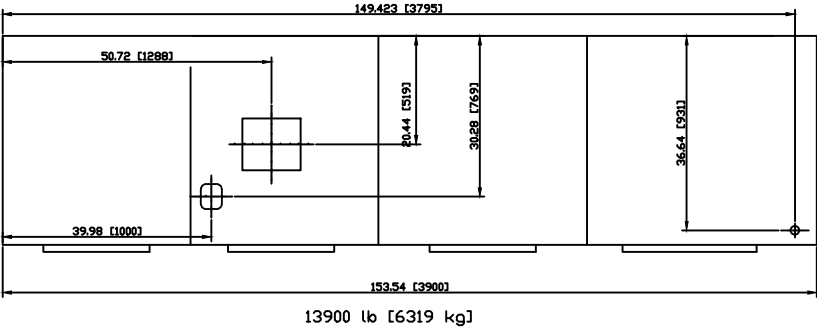


101

ROOF PLAN



FLOOR PLAN



13900 lb [6319 kg]

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A	J. HAD	2018-10-17	APPROVAL	VFD REPLACEMENT PF700B		
B	J. HAD	2018-11-02	APPROVAL		POWERFLEX 7000 MV VFD SYSTEM CUSTOMER INTERFACE DRAWING ELEVATION, CABLING, CONDUIT DETAILS	SHEET 0015 OF 0018
				CUSTOMER: FERMILAB - FRA LLC		
				ORDER-LINE NUMBER: MVB6504154112	SIZE A1	6504154112-01-CID
				PROJ. DOC. TYPE: ELD		
				LANG: EN	DRAWN BY: J. HAD	VER B
					DATE: 2018-10-17	

NOTE	DESCRIPTION
12	CONTROL WIRE CONDUIT OPENING, 3.00 [76] X 3.00 [76]
31	LINE CABLE CONDUIT OPENING, 10.68 [271] X 21.00 [533]
75	LOAD CABLE CONDUIT OPENING, 5.68 [144] X 9.00 [229]

ER	M
R	

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

C

- D

E

--	--

11

- J

M

1

M

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1003

M

1

1

1003

M

M

M

