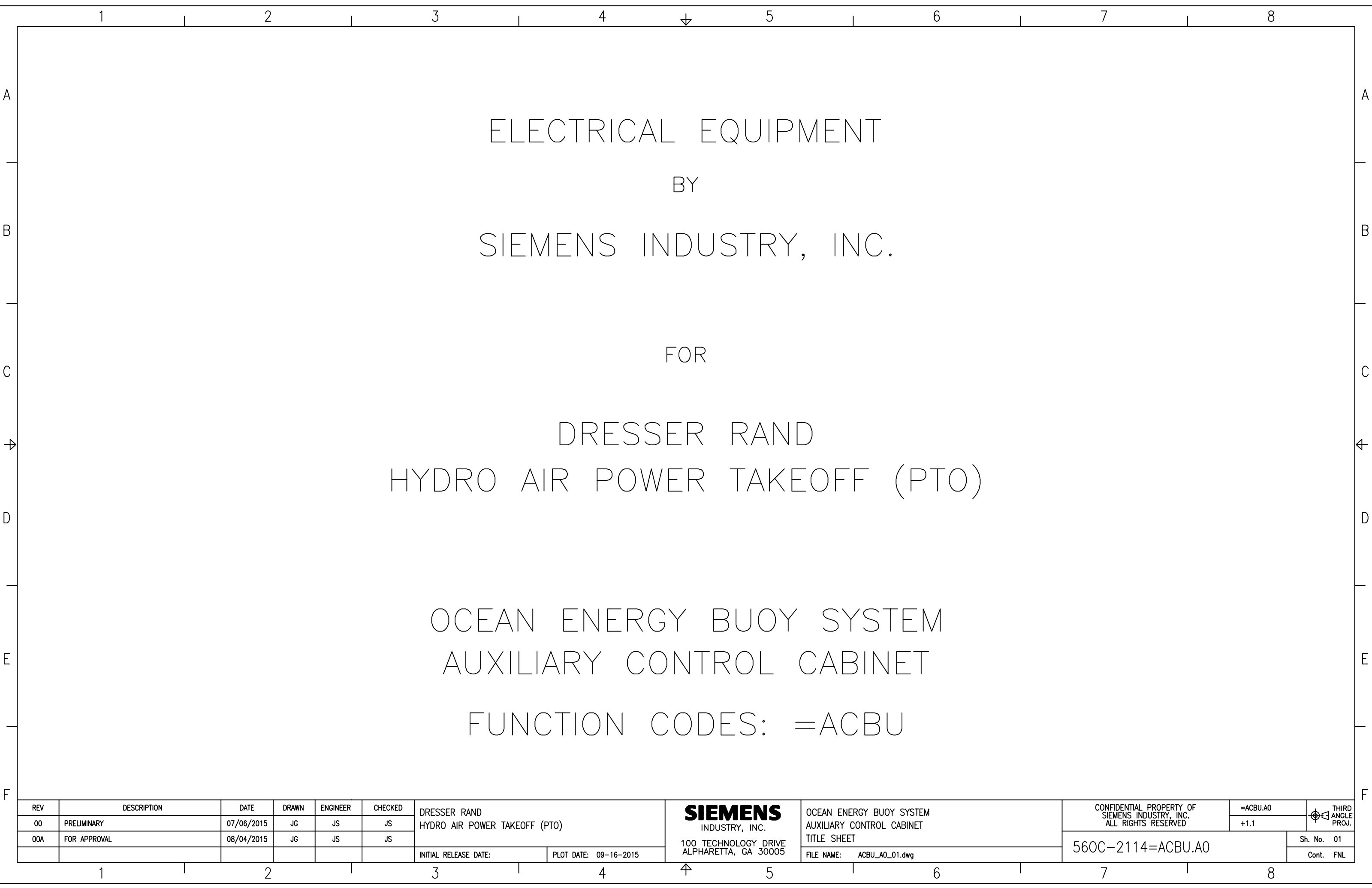


ELECTRICAL EQUIPMENT
 BY
 SIEMENS INDUSTRY, INC.
 FOR
 DRESSER RAND
 HYDRO AIR POWER TAKEOFF (PTO)
 OCEAN ENERGY BUOY SYSTEM
 AUXILIARY CONTROL CABINET
 FUNCTION CODES: =ACBU





REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)	SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET TITLE SHEET FILE NAME: ACBU_A0_01.dwg	CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED	=ACBU.A0 +1.1	THIRD ANGLE PROJ.
00	PRELIMINARY	07/06/2015	JG	JS	JS						
00A	FOR APPROVAL	08/04/2015	JG	JS	JS						
						INITIAL RELEASE DATE:	PLOT DATE: 09-16-2015			560C-2114=ACBU.A0	Sh. No. 01 Cont. FNL

DRAWING INDEX

DRAWING NUMBER	LOCATION	SHEET	DRAWING DESCRIPTION
560C-2071=ACBU.A0	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET TITLE SHEET
560C-2114=ACBU.A1	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DRAWING INDEX
560C-2114=ACBU.A2	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET STANDARD DRAWING PRACTICES
560C-2114=ACBU.A2	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET STANDARD DRAWING PRACTICES
560C-2114=ACBU.A2	+1.1	03	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET STANDARD DRAWING PRACTICES
560C-2114=ACBU.A2	+1.1	04	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET STANDARD DRAWING PRACTICES
560C-2114=ACBU.A3	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET CABINET GENERAL ARRANGEMENT
560C-2114=ACBU.A3	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET CABINET BACK PANEL
560C-2114=ACBU.A5	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET BILL OF MATERIAL
560C-2114=ACBU.A5	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET BILL OF MATERIAL
560C-2114=ACBU.A5	+1.1	03	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET BILL OF MATERIAL
560C-2114=ACBU.E5	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET 120VAC AUXILIARY POWER SUPPLY
560C-2114=ACBU.E8	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET 24VDC INTERNAL POWER SUPPLY
560C-2114=ACBU.E8	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET 24VDC EXTERNAL POWER SUPPLY
560C-2114=ACBU.E9	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET GROUNDING
560C-2114=ACBU.M0	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET S7-1500 PLC RACK LAYOUT
560C-2114=ACBU.M0	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ET 200SP RACK LAYOUT
560C-2114=ACBU.M0	+1.1	03	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ET 200SP RACK LAYOUT
560C-2114=ACBU.M2	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET PROFINET COMMUNICATIONS NETWORK
560C-2114=ACBU.M2	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET PROFINET COMMUNICATIONS NETWORK
560C-2114=ACBU.N1	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL INPUTS < 60V
560C-2114=ACBU.N1	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL INPUTS < 60V
560C-2114=ACBU.N1	+1.1	03	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL INPUTS < 60V
560C-2114=ACBU.N1	+1.1	04	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL INPUTS < 60V
560C-2114=ACBU.N1	+1.1	05	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL INPUTS < 60V
560C-2114=ACBU.N5	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL OUTPUTS < 60V
560C-2114=ACBU.N5	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL OUTPUTS < 60V
560C-2114=ACBU.P1	+1.1	01	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	02	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	03	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	04	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	05	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	06	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	07	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	08	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	09	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	10	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS
560C-2114=ACBU.P1	+1.1	11	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS

A
B
C
D
E
F

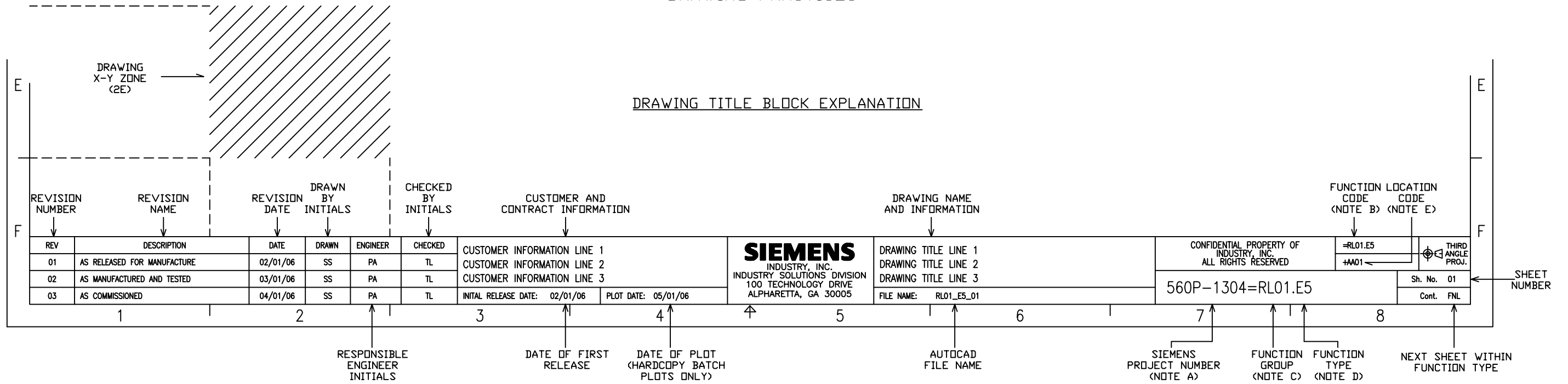
A
B
C
D
E
F

REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)	 OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DRAWING INDEX FILE NAME: ACBU_A1_01.dwg	CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED	=ACBU.A1 +1.1	 THIRD ANGLE PROJ.
00	PRELIMINARY	07/06/2015	JG	JS	JS					
00A	FOR APPROVAL	08/04/2015	JG	JS	JS					
INITIAL RELEASE DATE:						PLOT DATE: 08-04-2015	560C-2114=ACBU.A1		Sh. No. 01	Cont. FNL

1 2 3 4 5 6 7 8

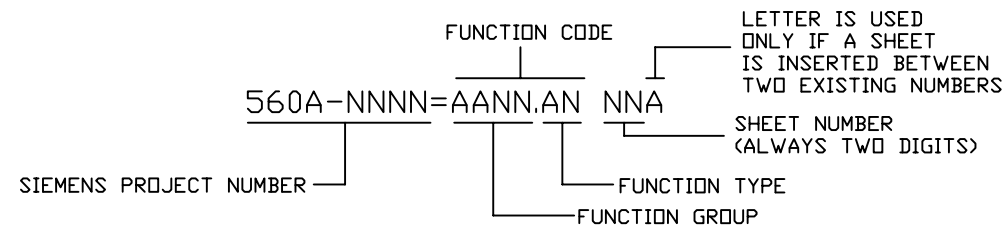
DRAWING PRACTICES

DRAWING TITLE BLOCK EXPLANATION



A. DRAWING NUMBERS

THE DRAWING NUMBER IS FORMED FROM THE SIEMENS PROJECT NUMBER, THE DRAWING TYPE AND THE FUNCTION CODE. THE DRAWING NUMBER APPEARS IN THE BORDER AS FOLLOWS (N=NUMERIC, ALPHA CHARACTER)



EXAMPLE:

560P-1304=RL01.E5 01
SHEET NUMBER

B. FUNCTION CODES

PROJECT SCHEMATIC DRAWINGS ARE TYPICALLY DIVIDED INTO SMALLER SCHEMATIC DRAWING SETS. THESE DRAWING SETS ARE DIVIDED BASED ON FUNCTIONAL ASPECTS OF A PLANT OR ELECTRICAL SYSTEM.

THE FUNCTION CODE IS THE DESIGNATION SYSTEM USED TO IDENTIFY THESE VARIOUS FUNCTIONAL ASPECTS OF A PLANT OR SYSTEM WITHIN THE PROJECT SCHEMATIC SET. THE FUNCTION CODE IS DEFINED AND IDENTIFIED BY THE PRECEDING EQUALS SIGN '='. FUNCTION CODES CONSIST OF FUNCTION GROUPS AND FUNCTION TYPES.

C. FUNCTION GROUPS

THE FUNCTION GROUP IS THE FIRST PART OF THE FUNCTION CODE AND IMMEDIATELY FOLLOWS THE EQUAL SIGN, '='. THE FUNCTION GROUP IS A COMBINATION OF LETTERS AND NUMBERS ASSIGNED TO VARIOUS DIFFERENT TECHNOLOGICAL GROUPS OR FUNCTIONS OF A PLANT OR SYSTEM.

FUNCTION GROUPS ARE UNIQUE AND ARE DEFINED FOR EACH PROJECT. TYPICAL FUNCTION GROUPS CONSIST OF TWO LETTERS FOLLOWED BY TWO NUMBERS BUT MAY INCLUDE MORE OR LESS LETTERS AND NUMBERS DEPENDING ON PROJECT REQUIREMENTS AND DEFINITIONS.

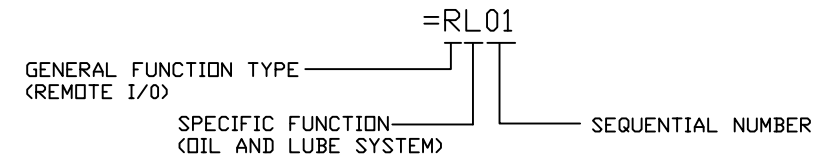
TYPICALLY THE FIRST LETTER OF THE FUNCTION GROUP DEFINES THE GENERAL FUNCTION OR TECHNOLOGY TYPE. FOR EXAMPLE A PLC MAY BE DEFINED AS 'P' OR A REMOTE I/O MAY BE DEFINED AS 'R'.

THE SECOND LETTER TYPICALLY DEFINES THE SPECIFIC FUNCTION. SOME EXAMPLES OF THESE FUNCTIONS MAY BE 'K' FOR PROCESS SECTION OR 'L' FOR OIL AND LUBE AREA.

THE NUMBERS OF THE FUNCTION GROUP ARE SEQUENTIAL NUMBERS WITHIN A COMMON FUNCTION.

EXAMPLE:

(<#1 REMOTE I/O OF THE OIL AND LUBE SYSTEM)



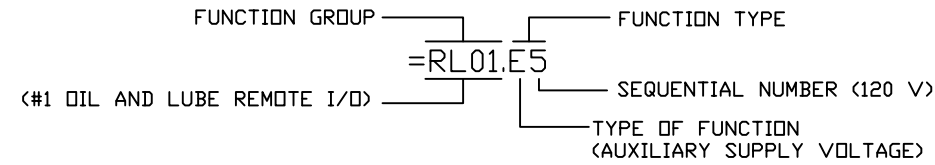
REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET STANDARD DRAWING PRACTICES		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED		=ACBU.A2	THIRD ANGLE PROJ.
00	PRELIMINARY	07/06/2015	JG	JS	JS	INITIAL RELEASE DATE:		PLOT DATE: 08-04-2015		FILE NAME: ACBU_A2_01.dwg		560C-2114=ACBU.A2		+1.1	01
00A	FOR APPROVAL	08/04/2015	JG	JS	JS										02

D. FUNCTION TYPES

THE FUNCTION TYPE IS THE SECOND PART OF THE FUNCTION CODE AND IMMEDIATELY FOLLOWS THE PERIOD, "." FUNCTION TYPES DESCRIBE A SUB SYSTEM OR SUB FUNCTION WITHIN A FUNCTION GROUP. FUNCTION TYPES TYPICALLY CONSIST OF ONE LETTER FOLLOWED BY A NUMBER.

COMMON FUNCTION TYPES ARE LISTED BELOW. ALL FUNCTION TYPES LISTED DO NOT APPEAR IN EVERY SCHEMATIC DRAWING SET. ONLY THOSE FUNCTION TYPES REQUIRED BY THE PROJECT ARE INCLUDED IN EACH DRAWING SET.

EXAMPLE (FULL FUNCTION CODE W/FUNCTION GROUP):
(120V POWER OF THE #1 REMOTE I/O IN THE OIL AND LUBE AREA)



- .A0 PROJECT TITLE SHEET
- .A1 INDEX
- .A2 DRAWING PRACTICES
- .A3 MECHANICAL OUTLINE AND/OR LAYOUT
- .A4 TERMINAL BLOCK REPORT
- .A5 BILL OF MATERIAL PER FUNCTION CODE
- .A6 ENGRAVED NAMEPLATE DATA
- .A7 EXTERNAL WIRING - TO/FROM REPORT
- .A8 BLOCK DIAGRAM, SINGLE LINES
- .A9 WIRING DIAGRAM, THREE LINE DIAGRAM
- .C1 HIGH/MEDIUM VOLTAGE POWER CIRCUITS
- .D1 TRANSFORMERS
- .E0 SUPPLY POWER - GENERAL (VOLTAGE NOT DEFINED)
- .E1 LOW VOLTAGE SWITCHGEAR
- .E2 AUXILIARY SUPPLY VOLTAGE (400/415/460/480V)
- .E3 AUXILIARY SUPPLY VOLTAGE (380V)
- .E4 AUXILIARY SUPPLY VOLTAGE (220/230/240V)
- .E5 AUXILIARY SUPPLY VOLTAGE (120/208V)
- .E6 SYNCHRONIZING VOLTAGE
- .E7 EMERGENCY POWER SUPPLY (UPS)
- .E8 AUXILIARY SUPPLY VOLTAGE (15/24/48/125/250VDC)
- .E9 GROUNDING CIRCUITS

- .F1 MOTOR VENTILATION WITH CONTROL
- .F2 CONVERTER VENTILATION WITH CONTROL
- .F3 OIL PUMPS WITH CONTROL
- .F4 MOTOR CONTROL CIRCUITS WITHIN MOTOR CONTROL CENTERS (MCCs)
- .F5 HEATING CONTROL
- .F6 BRAKES, CLUTCHES AND SOLENOIDS
- .F7 OTHER AUXILIARY OPERATIONS, E.G.: COOLING WATER PUMP
- .G(n) DRIVE CIRCUITS WHERE n=0 THROUGH 8 AS REQUIRED AND DEFINED BY PROJECT. POSSIBLE EXAMPLES: CYCLOCONVERTERS: .G1 = PHASE 1, .G2 = PHASE 2, .G3 = PHASE 3. DC LINK DRIVES: .G0 = RECTIFIER SECTION, .G1 = INVERTER SECTION.
- .G9 EXCITATION, TRANSFORMER OR SYSTEM SUPPLY, CONVERTER EXCITATION WINDING.
- .H1 MOTORS - GENERAL INCLUDING ACCESSORIES: BRAKES, BLOWERS, HEATERS, ETC. MOTORS - STATOR AND ROTOR CIRCUITS.
- .H2 DRIVES EXTERNAL PLC BOARDS.
- .H4 MOTOR PROTECTION PANELS (MPPs)
- .J1 SITOR INTERFACE PHASE L1 FOR CYCLOCONVERTER/SITOR INTERFACE MOTOR 2 FOR DC. ACTUAL VALUE INPUTS FOR PHASE L1.
- .J2 SITOR INTERFACE PHASE L2 FOR CYCLOCONVERTER/SITOR INTERFACE MOTOR 2 FOR DC. ACTUAL VALUE INPUTS FOR PHASE L2.
- .J3 SITOR INTERFACE PHASE L3 FOR CYCLOCONVERTER/SITOR INTERFACE MOTOR 2 FOR DC. ACTUAL VALUE INPUTS FOR PHASE L3.
- .J4 SITOR INTERFACE PHASE L1 - L3 FOR CYCLOCONVERTER. ACTUAL VALUE INPUTS TRANSVECTOR CONTROL.
- .J5 SYNCHRONIZING VOLTAGE AND ADAPTATION
- .J6 SITOR INTERFACE EXCITATION FOR CYCLOVERTER, MOTOR 1 FOR DC.
- .J7 SITOR INTERFACE EXCITATION FOR CYCLOVERTER, MOTOR 2 FOR DC.
- .K1 MECHANICAL INTERLOCKS.
- .M0 CENTRAL CONTROLLER MAIN RACK LAYOUT 9PLC, SIMADYN D, ET200M).
- .M1 DRIVE INTERFACE BOARDS, MICROPROCESSOR BOARDS, PULSE TACHOMETER OR POSITION ENCODER.
- .M2 AUTOMATION AND COMMUNICATION SYSTEM CONNECTION DIAGRAM.
- .M19 DRIVE INTERNAL PLC BOARDS
- .N1 BINARY INPUTS <60V
- .N2 BINARY INPUTS >60V
- .N3 PULSE TACHOMETER OR POSITION ENCODERS
- .N4 L2 TYPE SENSOR FEEDBACK
- .N5 BINARY OUTPUTS <60V
- .N6 BINARY OUTPUTS >60V

- .P1 ANALOG INPUTS
- .P2 ANALOG OUTPUTS
- .R1 CUBICLE FAULT SIGNALING/INTERPOSING RELAY CIRCUITS/ CUBICLE FAULT AND MOTOR CONTROL.
- .R2 INSULATION MONITORING
- .R3 PULPIT SIGNALING/SAFE STOP CIRCUITS
- .R4 E-STOP CIRCUITS
- .S1 MEASURING CIRCUITS (E.G. THICKNESS, WIDTH, PROFILE)
- .S2 SENSOR CIRCUITS (E.G. LOOP SCANNERS, HOT METAL DETECTORS)
- .U1 ANALOG DRIVE CONTROL

REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
STANDARD DRAWING PRACTICES

FILE NAME: ACBU_A2_02.dwg

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=ACBU.A2
+1.1

560C-2114=ACBU.A2

Sh. No. 02
Cont. 03

E. LOCATION CODES

THE LOCATION CODE IS THE DESIGNATION SYSTEM USED TO IDENTIFY THE PHYSICAL LOCATION OF EQUIPMENT OR DEVICES WITHIN A PLANT OR PHYSICAL AREA. THE LOCATION CODE IS DEFINED AND IDENTIFIED BY THE PRECEDING PLUS SIGN "+".

LOCATION CODES ARE UNIQUE AND ARE DEFINED FOR EACH PROJECT. TYPICAL LOCATION CODES CONSIST OF TWO LETTERS FOLLOWED BY TWO NUMBERS BUT MAY INCLUDE MORE OR LESS LETTERS AND NUMBERS DEPENDING ON PROJECT REQUIREMENTS AND DEFINITIONS.

EXAMPLE:

+AA01

F. DEVICE IDENTIFICATION CODES

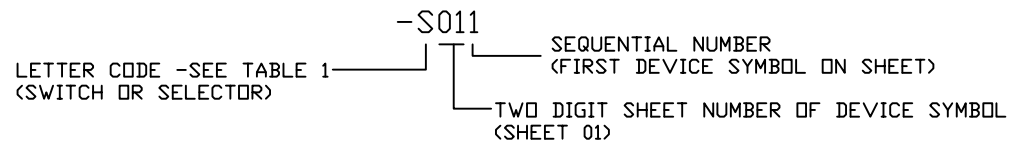
EACH DEVICE WITHIN AN ELECTRICAL SYSTEM IS ASSIGNED A FUNCTION, LOCATION AND DEVICE ID CODE. THE COMBINATION OF THESE THREE CODES UNIQUELY IDENTIFIES EACH ELECTRICAL DEVICE WITHIN THE SCHEMATIC DRAWING SET.

THE DEVICE IDENTIFICATION CODE (DEVICE ID or DID) IS A COMBINATION OF LETTERS AND NUMBERS USED TO IDENTIFY INDIVIDUAL ELECTRICAL DEVICES WITHIN THE SCHEMATIC DRAWING SET. THE DEVICE ID IS DEFINED AND IDENTIFIED BY THE PRECEDING DASH SIGN "-".

THE DEVICE ID CONSISTS OF A LETTER CODE FOLLOWED BY A SERIES OF NUMBERS. THE LETTER CODE IDENTIFIES THE KIND OF DEVICE. TYPICAL LETTER CODES ARE DEFINED IN TABLE 1.

THE STANDARD CONVENTION USED FOR THE SERIES OF NUMBERS IS TO FIRST LIST THE TWO DIGIT SHEET NUMBER OF THE DEVICE SYMBOL FOLLOWED BY A SEQUENTIAL NUMBER. THIS STANDARD CONVENTION MAY BE ALTERED DEPENDING ON PROJECT REQUIREMENTS AND DEFINITIONS.

EXAMPLE:
(STANDARD CONVENTION)



THE DEVICE ID CODE IS PLACED ABOVE THE DRAWING DEVICE SYMBOL AS SHOWN IN THE EXAMPLE BELOW.



THE FUNCTION AND LOCATION CODE OF EACH DEVICE ARE ONLY DISPLAYED IF THEY ARE DIFFERENT FROM THE SHEET THE DEVICE SYMBOL IS ON. IF REQUIRED, THESE FUNCTION AND LOCATION CODES ARE DISPLAYED ABOVE THE DEVICE ID.

TABLE 1

LETTER CODE DESCRIPTIONS FOR DEVICE ID		
LETTER CODE	KIND OF ITEM	EXAMPLES
A	ASSEMBLIES, SUBASSEMBLIES, MODULES.	RACKS, SUBRACKS, COMPUTERS, PCs, PGs
B	TRANSDUCERS, FROM NON-ELECTRICAL QUANTITY TO ELECTRICAL QUANTITY OR VICE-VERSA	THERMOELECTRIC SENSOR, THERMO CELL, PHOTOELECTRIC CELL, PULSE TRANSDUCERS
C	CAPACITORS	
D	BINARY ELEMENTS, DELAY DEVICES, STORAGE DEVICES	DIGITAL I/O MODULES, COUNTER MODULES, DELAY LINES, BISTABLE ELEMENTS, REGISTER, LOGIC ELEMENTS
E	MISCELLANEOUS, GENERAL ELECTRICAL EQUIPMENT	LIGHTING DEVICES, HEATING DEVICES, DEVICES NOT SPECIFIED ELSEWHERE IN THIS TABLE
F	PROTECTIVE DEVICES	FUSE, OVERVOLTAGE DISCHARGE DEVICE, MONITORING MODULES, BUS CONTROL MODULES
G	GENERATORS, POWER SUPPLY	ROTATING GENERATOR, BATTERY, POWER SUPPLY, OSCILLATOR
H	SIGNALING DEVICES	OPTICAL AND ACOUSTIC INDICATORS
K	RELAYS, CONTACTORS	
L	INDUCTORS	INDUCTION COIL, LINE TRAP
M	MOTORS	AC AND DC MOTORS
N	ANALOG REGULATION BLOCKS	AMPLIFIERS, INTEGRATORS, REGULATOR, COMPARATOR, FUNCTION GENERATOR
P	MEASURING EQUIPMENT, TESTING EQUIPMENT	INDICATING, RECORDING AND INTEGRATING MEASURING DEVICES, SIGNAL GENERATOR, CLOCKS, MONITORS
Q	SWITCHING DEVICES, DEVICES FOR POWER CIRCUITS	CIRCUIT BREAKER, DISCONNECTOR
R	RESISTORS	VARIABLE RESISTOR, POTENTIOMETER, SHUNT, HEATING ELEMENTS
S	SWITCHES, SELECTORS	CONTROL SWITCH, PUSHBUTTON, LIMIT SWITCH, SELECTOR SWITCH
T	TRANSFORMERS	
U	ELECTRICAL TRANSDUCERS	VOLTAGE TO FREQUENCY CONVERTOR, ANALOG TO DIGITAL CONVERTERS, CURRENT & VOLTAGE TRANSDUCERS
V	SEMICONDUCTOR DEVICES	ELECTRONIC TUBE, DIODE, TRANSISTOR, THYRISTOR
W	CABLES	
X	CONNECTING DEVICES	PLUGS, SOCKETS, JACKS
Y	ELECTRICALLY OPERATED MECHANICAL DEVICES	BRAKES, COUPLINGS, PRINTERS SOLENOID VALVES, CHART RECORDERS
Z	COMPENSATING EQUIPMENT	RC FILTERS, BANDPASS FILTER

G. TERMINAL DESIGNATIONS

TERMINAL BLOCKS (TB's) ARE IDENTIFIED WITH A SPECIAL DEVICE ID AND TERMINAL NUMBER BASED ON VOLTAGE LEVEL. TABLE 2 SHOWS TYPICAL VOLTAGE LEVELS AND DEVICE ID'S USED.

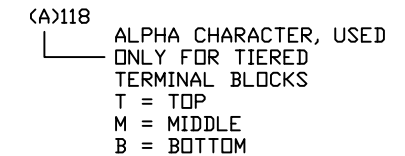
REGARDLESS OF THE SHEET THE TERMINAL BLOCKS APPEAR ON, THEY ARE ALWAYS ASSIGNED A .A4 FUNCTION TYPE. THE .A4 FUNCTION TYPE IS USED EXCLUSIVELY FOR TERMINAL BLOCK IDENTIFICATION.

THE FUNCTION, LOCATION AND DEVICE ID ARE NOT DISPLAYED FOR EVERY TERMINAL BLOCK SYMBOL BUT ONLY AS REQUIRED FOR CLAIRITY. MOST TERMINAL BLOCK POINTS WILL ONLY DISPLAY THE TERMINAL NUMBER.

THE NUMBER APPEARS BELOW OR TO THE RIGHT OF THE TERMINAL BLOCK SYMBOL. AN ALPHA CHARACTER MAY BE ADDED AFTER THE NUMBER TO INDICATED THE TERMINAL POINT OF MULTI-TIERED TERMINAL BLOCKS. (SEE EXAMPLE BELOW)

EXAMPLE:

(CONTROL VOLTAGE LEVEL TERMINAL BLOCK)



EX: T118, M118, B118

TABLE 2

TERMINAL BLOCK VOLTAGE LEVELS			
VOLTAGE LEVEL	DEVICE ID	TERMINAL NUMBER RANGE	FUNCTION
POWER (P) >120V, >20A	-PTB	1-99	POWER DISTRIBUTION
HIGH (H) 50V-120V, <20A	-HTB	101-399	CONTROL VOLTAGES
MEDIUM (M) 15V-50V	-MTB	401-699	BINARY I/O
LOW (L) 0-15V	-LTB	701-999	ANALOG I/O
GENERAL - VARIES	-XT,-TB	VARIES	MISC AS NEEDED
SEE IEEE 518, "LEVEL 1-4"			

REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET STANDARD DRAWING PRACTICES 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005 FILE NAME: ACBU_A2_03.dwg	CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED =ACBU.A2 +1.1	THIRD ANGLE PROJ.
00	PRELIMINARY	07/06/2015	JG	JS	JS				
00A	FOR APPROVAL	08/04/2015	JG	JS	JS				
INITIAL RELEASE DATE:						PLOT DATE: 08-04-2015	560C-2114=ACBU.A2		Sh. No. 03 Cont. 04

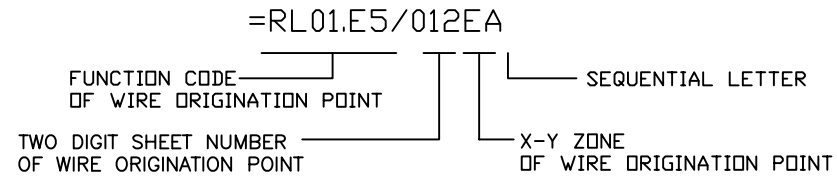
H. WIRE NUMBERS

WIRES REPRESENTING DIFFERENT ELECTRICAL POTENTIAL ARE GIVEN UNIQUE WIRE NUMBERS.

WIRE NUMBERS ARE FORMED FROM THE FUNCTION CODE FOLLOWED BY A SLASH "/", THE TWO DIGIT SHEET NUMBER, THE X-Y ZONE AND A SEQUENTIAL LETTER OF THE POINT WHERE THE WIRE ORIGINATES.

THE SEQUENTIAL LETTERS ALWAYS START WITH "A". FOR CASES WHERE MORE THAN ONE WIRE ORIGINATES IN THE SAME X-Y ZONE, SEQUENTIAL LETTERS ARE GIVEN FROM LEFT TO RIGHT AND TOP TO BOTTOM THROUGH AN X-Y ZONE.

EXAMPLE:



I. WIRE COLOR AND SIZE IDENTIFICATION

WIRE COLOR AND SIZE ARE INDICATED WITH A COLOR CODE AND WIRE GAUGE NUMBER SEPARATED BY A SLASH "/".

THE WIRE COLOR CODES USED CONFORM TO ANSI 232.13 AND ARE FOUND IN TABLE 3.

EXAMPLE:

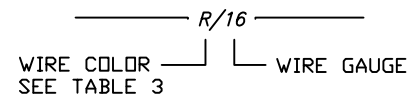


TABLE 3

WIRE COLOR CODES	
WIRE COLOR	DESIGNATION
BLACK	BK
BROWN	BR
RED	R
ORANGE	O
YELLOW	Y
GREEN	G
BLUE	BL
VIOLET	V
GRAY	GY
WHITE	W

THE SELECTION OF COLOR CODING FOR WIRES CONFORMS WITH ANSI/NFPA 79 SECTION 16.1 UNLESS OTHERWISE SPECIFIED. FOR REFERENCE, THESE COLOR CODING CONVENTIONS ARE LISTED BELOW IN TABLE 4.

TABLE 4

WIRE COLOR SELECTION	
EQUIPMENT GROUNDING	
GREEN - (IEC: GREEN W/YELLOW STRIPE)	EQUIPMENT GROUNDING CONDUCTOR (NON-CURRENT CARRYING).
POWER CONDUCTORS	
BLACK	UNGROUND AC AND DC POWER AND CONTROL CONDUCTORS AT "LINE VOLTAGE", E.G. 240, 380, 480, 500, 600V.
AC CONTROL CONDUCTORS	
RED	UNGROUND AC CONTROL CONDUCTORS AT LESS THAN LINE VOLTAGE, E.G. 120 AND 220 VAC.
WHITE OR GRAY	GROUND (CURRENT CARRYING) AC CONTROL CIRCUIT CONDUCTOR, E.G. NEUTRAL LEG OF 120 AND 220 VAC CONTROL CIRCUIT.
DC CONTROL CONDUCTORS	
BLUE	UNGROUND DC CONTROL CONDUCTORS AT LESS THAN LINE VOLTAGE, E.G. 24 AND 105 VDC.
WHITE W/BLUE STRIPE (IEC: LIGHT BLUE)	GROUND (CURRENT CARRYING) DC CIRCUIT CONDUCTORS.
POWERED FROM EXTERNAL SOURCE	
YELLOW	AC OR DC CONTROL CONDUCTORS POWERED FROM AN EXTERNAL SOURCE, BUT GREATER THAN 50V. POSSIBLY ENERGIZED WHEN EQUIPMENT DISCONNECT IS OFF.
WHITE W/YELLOW STRIPE	GROUND (CURRENT CARRYING) AC CONTROL CIRCUIT CONDUCTOR POWERED FROM AN EXTERNAL SOURCE THAT IS GREATER THAN 50V.

J. WIRING CONNECTIONS

WIRING THAT IS INTERNAL TO THE CONTROL EQUIPMENT IS IDENTIFIED BY SOLID LINES "_____".

WIRING THAT IS EXTERNAL TO THE CONTROL EQUIPMENT IS IDENTIFIED BY DASHED LINES "-----".

CABLES ARE IDENTIFIED BY HEAVY SOLID LINES "_____".

CABLES THAT ARE EXTERNAL TO THE CONTROL EQUIPMENT ARE IDENTIFIED BY HEAVY DASHED LINES "-----".

PLUG CONNECTIONS ARE IDENTIFIED BY DASH DOT DASH LINES "- · - · - · -".

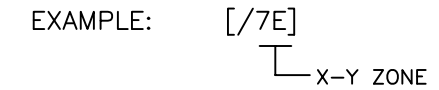
K. CROSS-REFERENCE CODES

A CROSS REFERENCE IS A CODE USED TO LOCATE, WITHIN THE SCHEMATIC DRAWINGS, A WIRE OR DEVICE THAT ENDS IN ONE X-Y ZONE AND CONTINUES IN ANOTHER X-Y ZONE. FOR EXAMPLE, THE CONTACT OF A RELAY MAY BE DRAWN IN A SEPARATE ZONE FROM THE COIL FOR THE RELAY OR WIRES MUST CONTINUE FROM SHEET TO SHEET.

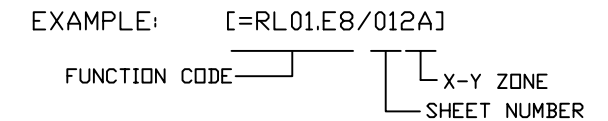
A CROSS REFERENCE CODE IS DEFINED AND IDENTIFIED BY SURROUNDING BRACKETS, "[]".

TWO TYPES OF CROSS REFERENCE CODES ARE USED, SHORT AND LONG.

SHORT: WHEN A CROSS-REFERENCE IS REQUIRED TO A X-Y ZONE ON THE SAME SHEET ONLY THE X-Y ZONE IS SHOWN PRECEDED BY A SLASH "/".

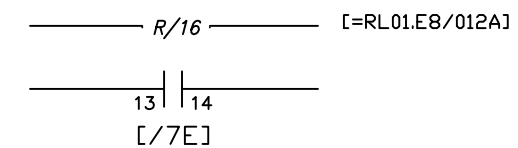


LONG: WHEN A CROSS-REFERENCE IS REQUIRED TO AN X-Y ZONE OF A DIFFERENT SHEET, THE FUNCTION CODE, SHEET AND X-Y ZONE IS SHOWN. THE FUNCTION CODE IS SEPARATED FROM THE SHEET AND X-Y ZONE BY A SLASH "/".



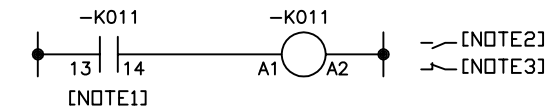
THE CROSS-REFERENCE FOR A WIRE IS PLACED AT THE END OF THE WIRE. THE CROSS-REFERENCE FOR A DEVICE IS PLACED BELOW THE DEVICE SYMBOL. THESE LOCATIONS ARE CONVENTION BUT MAY BE ALTERED FOR REQUIREMENTS OF SPACE ON A SCHEMATIC SHEET.

EXAMPLES:



L. RELAY CONTACT AND COIL CROSS-REFERENCING

A RELAY CONTACT AND COIL ARE SHOWN SCHEMATICALLY AS FOLLOWS:



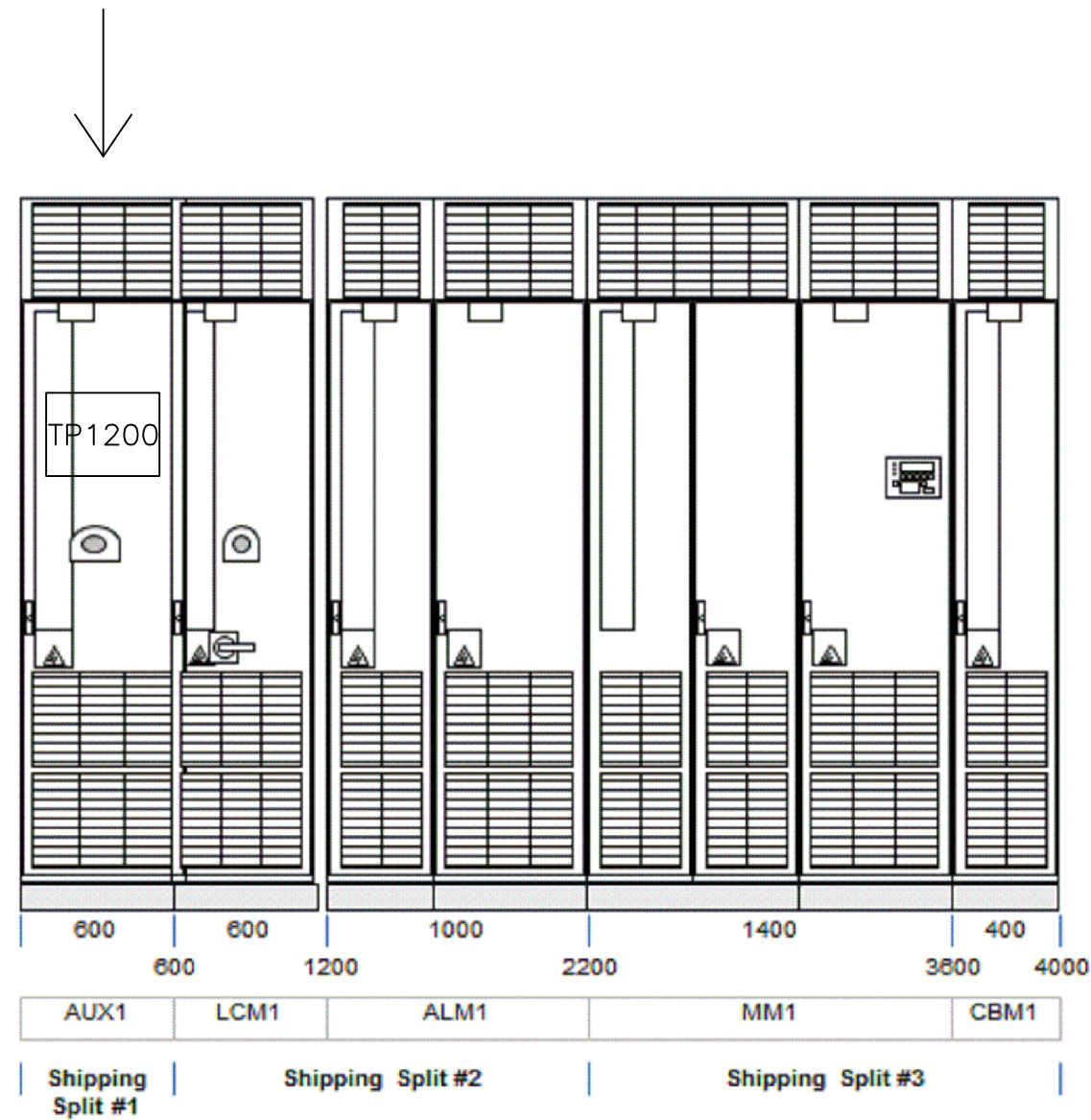
NOTE1: THIS CROSS-REFERENCE INDICATES THE LOCATION OF THE OPERATING COIL FOR THE CONTACT.

NOTE2: THIS CROSS-REFERENCE INDICATES THE LOCATION OF THE NORMALLY OPEN CONTACT FOR THE COIL.

NOTE3: THIS CROSS-REFERENCE INDICATES THE LOCATION OF THE NORMALLY CLOSED CONTACT FOR COIL.

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00	PRELIMINARY	07/06/2015	JG	JS	JS						
00A	FOR APPROVAL	08/04/2015	JG	JS	JS						
						INITIAL RELEASE DATE:	PLOT DATE: 08-04-2015	560C-2114=ACBU.A2		Sh. No. 04	Cont. FNL

CABINET ARRANGEMENT



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

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INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

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INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
CABINET GENERAL ARRANGEMENT

FILE NAME: ACBU_A3_01.dwg

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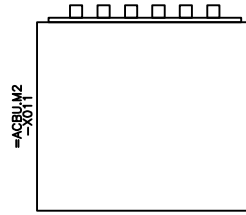
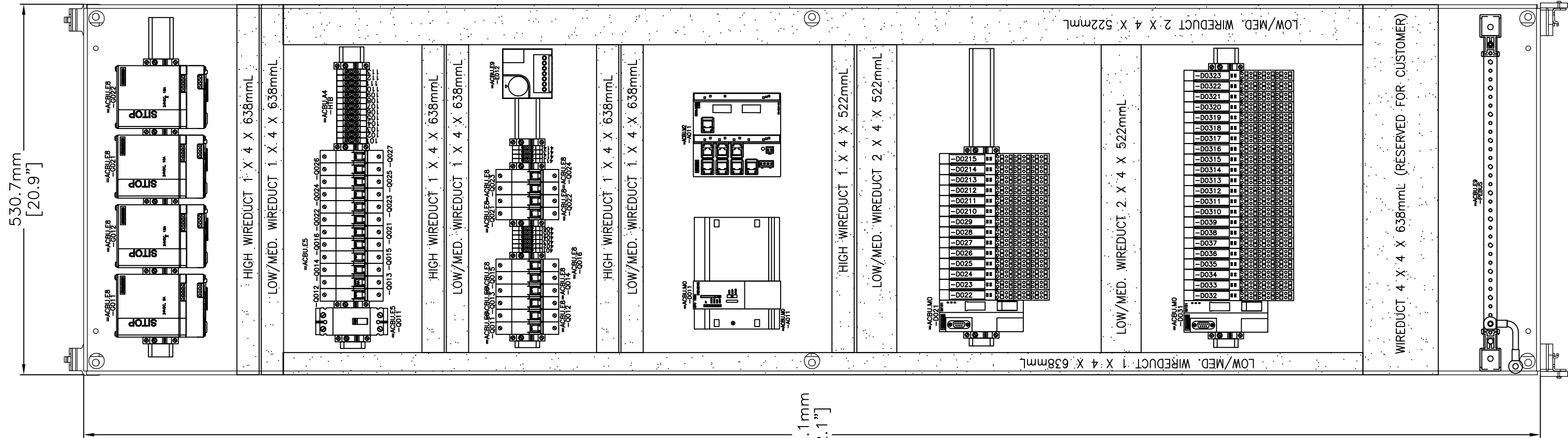
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+1.1

560C-2114=ACBU.A3

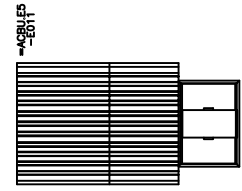
Sh. No. 01
Cont. 02

THIRD ANGLE PROJ.

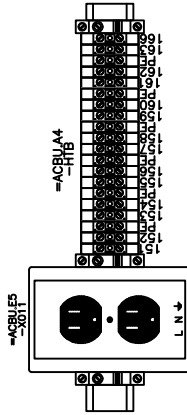
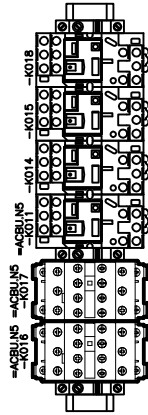
CABINET BACK PANEL ARRANGEMENT



MOUNTED ON SIDE OF CABINET



MOUNTED ON SIDE OF CABINET



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

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OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
CABINET BACK PANEL
FILE NAME: ACBU_A3_02.dwg

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560C-2114=ACBU.A3

=ACBU.A3
+1.1

THIRD ANGLE PROJ.



Sh. No. 02
Cont. FNL

BILL OF MATERIAL

INST	LOC	TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
=ACBU.E5	+1.1	-Q011	1		CED62B100	SIEMENS	BREAKER ED 2P 100A 600V 100KA LD LUG BREAKER ED 2P 100A
=ACBU.E5 =ACBU.E5	+1.1 +1.1	-Q012 -Q013	2		5SJ4106-7HG41	SIEMENS	CIRCUIT BREAKER TYPE 5SJ4, BRANCH CIRCUIT PROTECTOR 1-POLE CIRCUIT BREAKER 6AMPS IEC 440VAC, UL/CSA 480/277VAC, C-TRIP, 10KA
=ACBU.E8 =ACBU.E8	+1.1 +1.1	-Q012 -Q013	2		5SY4101-7	SIEMENS	CIRCUIT BREAKER TYPE 5SY4, SUPPLEMENTARY PROTECTOR 1-POLE CIRCUIT BREAKER 1AMPS IEC 440VAC, UL/CSA 480/277VAC, C-TRIP, 10KA
=ACBU.E8 =ACBU.E8 =ACBU.E8 =ACBU.E8 =ACBU.E8 =ACBU.E8	+1.1 +1.1 +1.1 +1.1 +1.1 +1.1	-Q011 -Q014 -Q015 -Q016 -Q021 -Q023	6		5SY4102-7	SIEMENS	CIRCUIT BREAKER TYPE 5SY4, SUPPLEMENTARY PROTECTOR 1-POLE CIRCUIT BREAKER 2AMPS IEC 440VAC, UL/CSA 480/277VAC, C-TRIP, 10KA
=ACBU.E8 =ACBU.E8	+1.1 +1.1	-Q022 -Q024	2		5SY4106-7	SIEMENS	CIRCUIT BREAKER TYPE 5SY4, SUPPLEMENTARY PROTECTOR 1-POLE CIRCUIT BREAKER 6AMPS IEC 440VAC, UL/CSA 480/277VAC, C-TRIP, 10KA
=ACBU.E5 =ACBU.E5 =ACBU.E5 =ACBU.E5 =ACBU.E5 =ACBU.E5	+1.1 +1.1 +1.1 +1.1 +1.1 +1.1	-Q014 -Q015 -Q021 -Q022 -Q023 -Q024	6		5SY4110-7	SIEMENS	CIRCUIT BREAKER TYPE 5SY4, SUPPLEMENTARY PROTECTOR 1-POLE CIRCUIT BREAKER 10AMPS IEC 440VAC, UL/CSA 480/277VAC, C-TRIP, 10KA
=ACBU.E5 =ACBU.E5 =ACBU.E5 =ACBU.E5	+1.1 +1.1 +1.1 +1.1	-Q016 -Q025 -Q026 -Q027	4		5SY4120-7	SIEMENS	CIRCUIT BREAKER TYPE 5SY4, SUPPLEMENTARY PROTECTOR 1-POLE CIRCUIT BREAKER 20AMPS IEC 440VAC, UL/CSA 480/277VAC, C-TRIP, 10KA
=ACBU.E5	+1.1	-X011	1	*1	5600461	PHOENIX CONTACT	DUPLEX RECEPTACLE, EM-DUO 120/15 120VAC/15A
				*1	CCH-CP12-E7	CORNING	CONNECTOR HOUSING, SC ADAPTER, 12F FIBER OPTIC DUPLEX, 12F, 50um MULTIMODE, OM3/4
=ACBU.N5 =ACBU.N5 =ACBU.N5	+1.1 +1.1 +1.1	-K014 -K015 -K018	3	*1	782XBXM4L-24D	MAGNECRAFT	DPD 20A ICE CUBE RELAY PLUG IN 24VDC
				*1	70-782D81	MAGNECRAFT	SOCKET 10A
				*1	16-1342	MAGNECRAFT	HOLD DOWN CLIP CLIP N/A
=ACBU.N5	+1.1	-K011	1	*1	783XCXM4L-24D	MAGNECRAFT	3POLE PD 15A RELAY PLUG IN 24VDC
				*1	70-783D11-1	MAGNECRAFT	SOCKET 15A
				*1	16-783SC	MAGNECRAFT	HOLD DOWN CLIP CLIP 3POLE DT 15A
=ACBU.N5 =ACBU.N5	+1.1 +1.1	-K016 -K017	2		3RT1024-3KB40	SIEMENS	CONTACTOR, AC-3 5.5 KW/400 V, DC 24 V, 0.7...1.25*US, W. VARISTOR, 3-POLE, SIZE S0, CAGE CLAMP CONNECTION TYPE 3RT10 24VDC
=ACBU.E5	+1.1	-E011	1		3105.360	RITTAL	ENCLOSURE INTERNAL HEATER W/ FAN ACCESSORIES 86-100W, 110-240VAC, 50/60Hz
=ACBU.E9	+1.1	-E012	1		3110.000	RITTAL	ENCLOSURE INTERNAL THERMOSTAT ACCESSORIES +5...+60C
=ACBU.M2	+1.1	-A011	1		6AG1308-2FL10-4AA3	SIEMENS	SCALANCE X308-2 7 X 10/100MBIT/S RJ45 PORTS, 1 X 100 MBIT/S MULTIMODE SC, LED DIAGNOSTICS, FAULT SIGNAL



A
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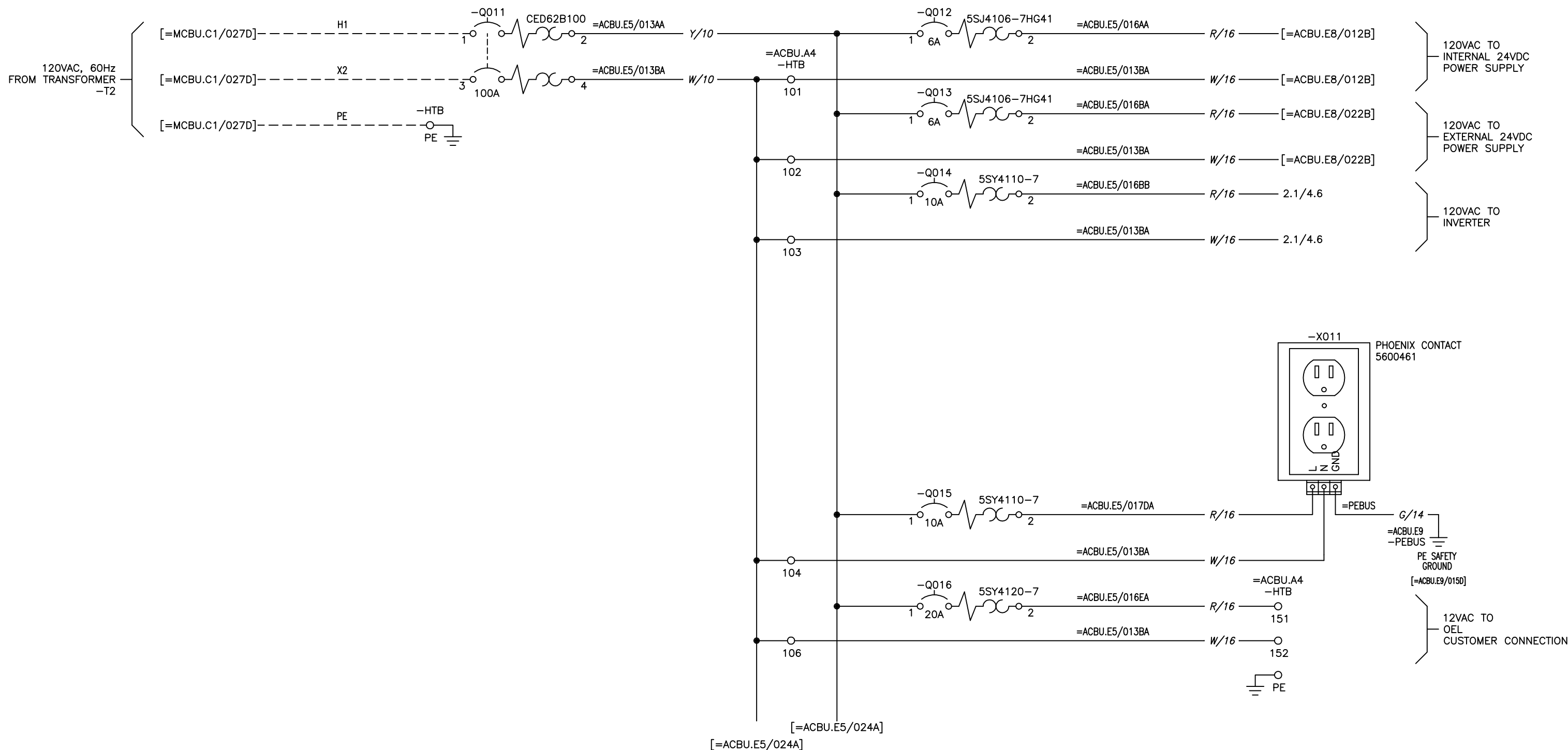
REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)	 OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET BILL OF MATERIAL 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005 FILE NAME: ACBU_A5_01.dwg	CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED	=ACBU.A5 +1.1	 THIRD ANGLE PROJ.
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INITIAL RELEASE DATE:						PLOT DATE: 08-04-2015	560C-2114=ACBU.A5		Sh. No. 01	Cont. 02

BILL OF MATERIAL

INST	LOC	TAGS	QTY	SUB	CATALOG	MFG	DESCRIPTION
=ACBU.M0	+1.1	-A011	1		6ES7590-1AB60-0AA0	SIEMENS	S7-1500 - MOUNTING RAIL, 160MM SIMATIC S7-1500 RAIL
=ACBU.E8	+1.1	-G011	1		6AG1333-3BA10-7AA0	SIEMENS	SIPLUS POWER SUPPLY, PSU200M, 5A 24VDC, 5A IN: 120/230VAC, 47-63Hz; OUT: 24VDC 5A
=ACBU.E8	+1.1	-G021	1		6AG1334-3BA10-7AA0	SIEMENS	SIPLUS POWER SUPPLY, PSU200M, 10A 24VDC, 10A IN: 120/230VAC, 47-63Hz; OUT: 24VDC 10A
=ACBU.A4	+ACBU	-MTB	8		3003347	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UK 2,5 N FEED-THROUGH 24AMPS GRAY, 0.2-2.5MM ² , 30-12 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK
=ACBU.A4	+ACBU	-MTB	2	*1	3003347	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UK 2,5 N FEED-THROUGH 24AMPS GRAY, 0.2-2.5MM ² , 30-12 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK
				*1	2303132	PHOENIX CONTACT	10 POSITION JUMPER, EBL 10-5 ACCESSORY JUMPER GRAY, 24A
=ACBU.A4	+1.1	-HTB	33		3004524	PHOENIX CONTACT	UNIVERSAL TERMINAL BLOCK - UK 6 N FEED-THROUGH 57AMPS GRAY, 0.2-6MM ² , 26-8 AWG CLIPLINE - MODULAR SCREW TERMINAL BLOCK
=ACBU.M2 =ACBU.M2 =ACBU.M2 =ACBU.M2 =ACBU.M2	+ACBU +ACBU +ACBU +ACBU +ACBU	-W011 -W012 -W013 -W014 -W015	5		6XV1 870-3QH20	SIEMENS	ETHERNET CABLE, 2M COMMUNICATION CABLE 22AWG GP 2X2 (PROFINET TYPE A) TP, CAT7 CABLE FOR CONNECTION TO FC OUTLET RJ45
=ACBU.M2 =ACBU.M2	+ACBU +ACBU	-W015 -W016	2		6XV1 873-6AH20	SIEMENS	SIMATIC NET, FIBER OPTIC CABLE COMMUNICATION CABLE 50/125 2-CORE, STANDARD CABLE PREASSEMBLED W/ 2X2 SC CONNECTORS, 2.0M

REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)	 OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET BILL OF MATERIAL 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005 FILE NAME: ACBU_A5_03.dwg	CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED	=ACBU.A5 +1.1	 THIRD ANGLE PROJ.
00	PRELIMINARY	07/06/2015	JG	JS	JS					
00A	FOR APPROVAL	08/04/2015	JG	JS	JS					
INITIAL RELEASE DATE:						PLOT DATE: 08-04-2015		560C-2114=ACBU.A5		Sh. No. 03
										Cont. FNL

AUXILIARY POWER SUPPLY (120VAC)



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
120VAC AUXILIARY POWER SUPPLY

FILE NAME: ACBU_E5_01.dwg

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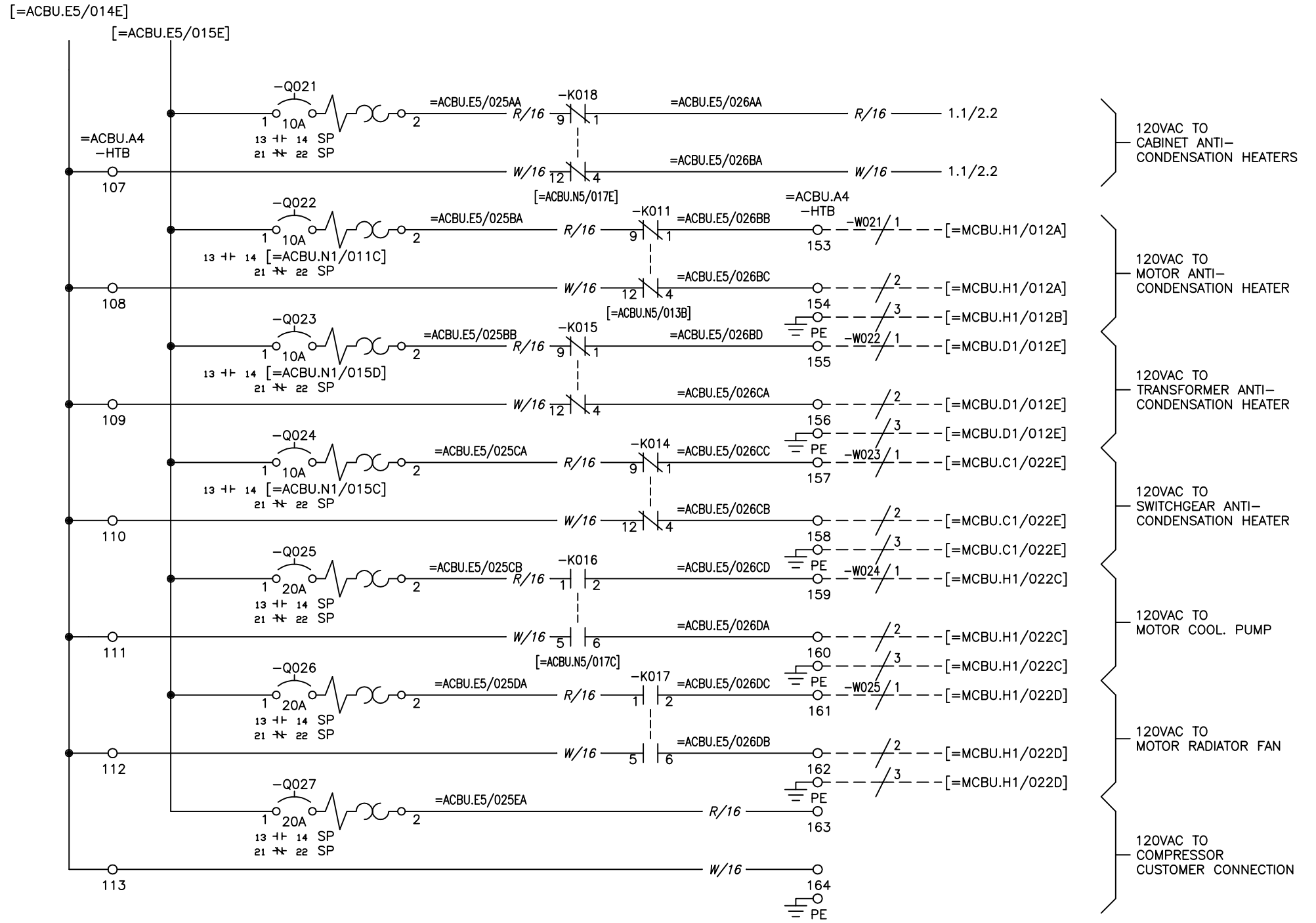
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+1.1

560C-2114=ACBU.E5

Sh. No. 01
Cont. FNL

THIRD ANGLE PROJ.

AUXILIARY POWER SUPPLY (120VAC)



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: _____ PLOT DATE: 08-04-2015

SIEMENS
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ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
120VAC AUXILIARY POWER SUPPLY

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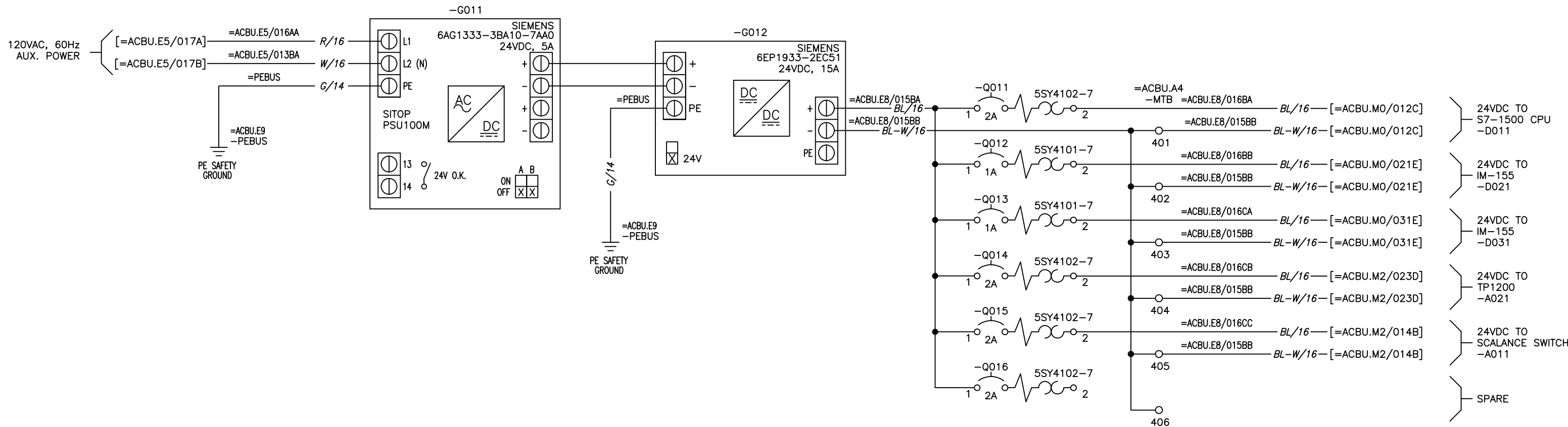
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+1.1

560C-2114=ACBU.E5

Sh. No. 02
Cont. FNL

24VDC INTERNAL POWER SUPPLY



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 09-16-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
24VDC INTERNAL POWER SUPPLY

FILE NAME: ACBU_E8_01.dwg

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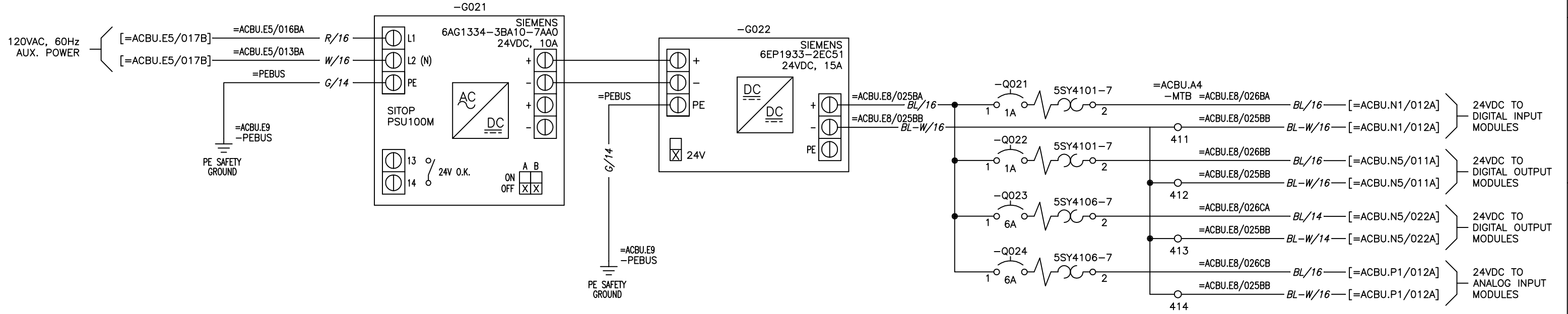
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+1.1

560C-2114=ACBU.E8

Sh. No. 01
Cont. 02

THIRD ANGLE PROJ.

24VDC EXTERNAL POWER SUPPLY



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 09-16-2015

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100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
24VDC EXTERNAL POWER SUPPLY
FILE NAME: ACBU_E8_02.dwg

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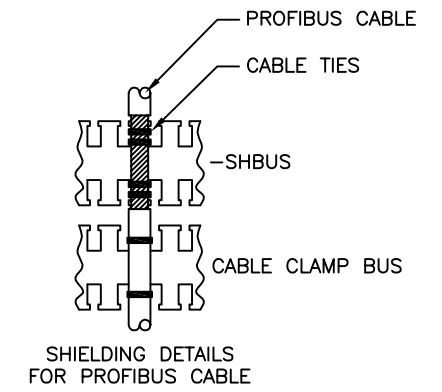
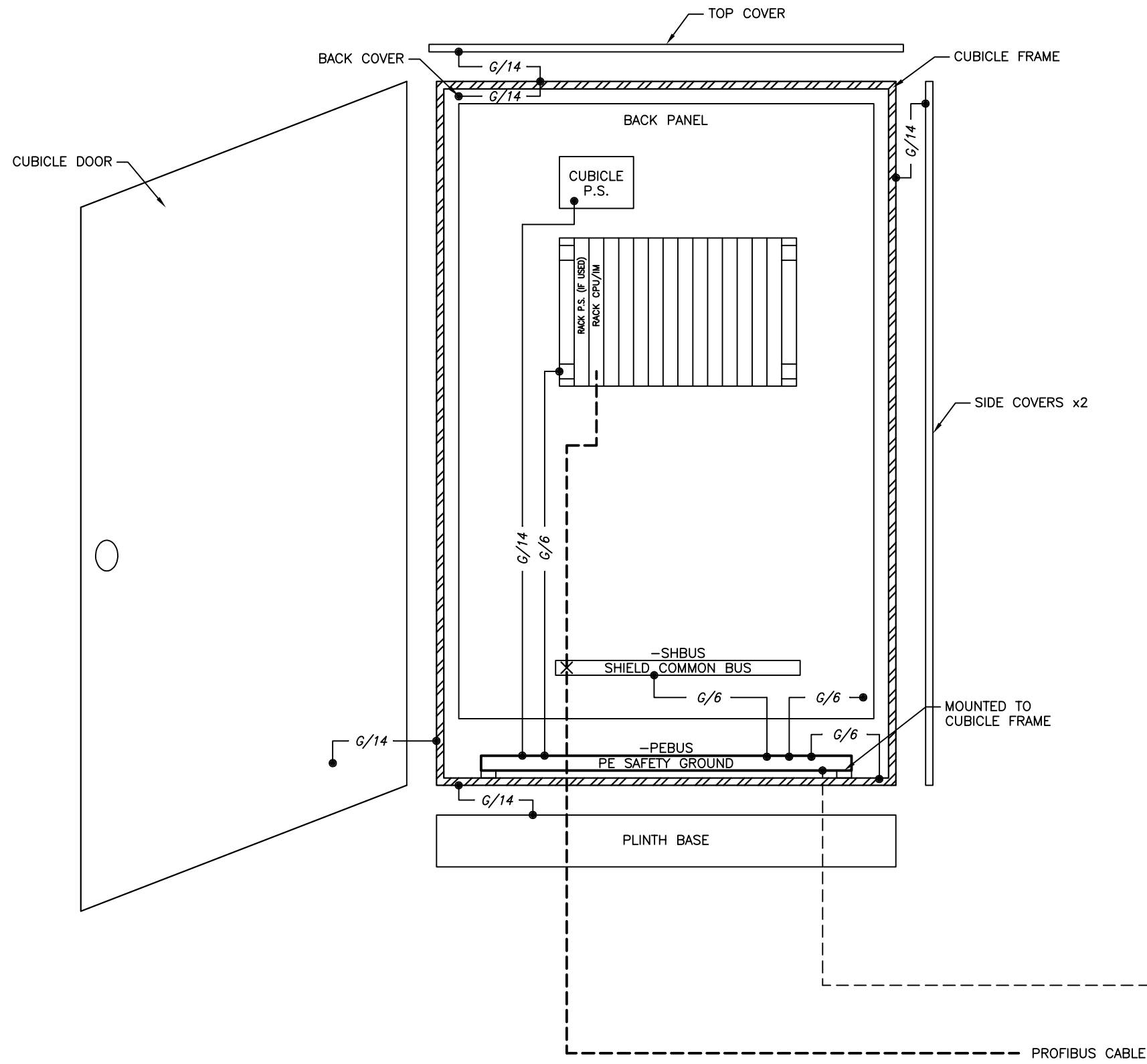
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+1.1

560C-2114=ACBU.E8

Sh. No. 02
Cont. FNL

THIRD ANGLE PROJ.

TYPICAL CUBICLE GROUND



● = GROUNDING POINT
 X = SHIELDING POINT FOR PROFIBUS CABLE

+REMOTE
 CUSTOMER GROUND CONNECTION TO PE GROUND POINT
 MINIMUM 1/0 CABLE

REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
 HYDRO AIR POWER TAKEOFF (PTO)
 INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
 INDUSTRY, INC.
 100 TECHNOLOGY DRIVE
 ALPHARETTA, GA 30005

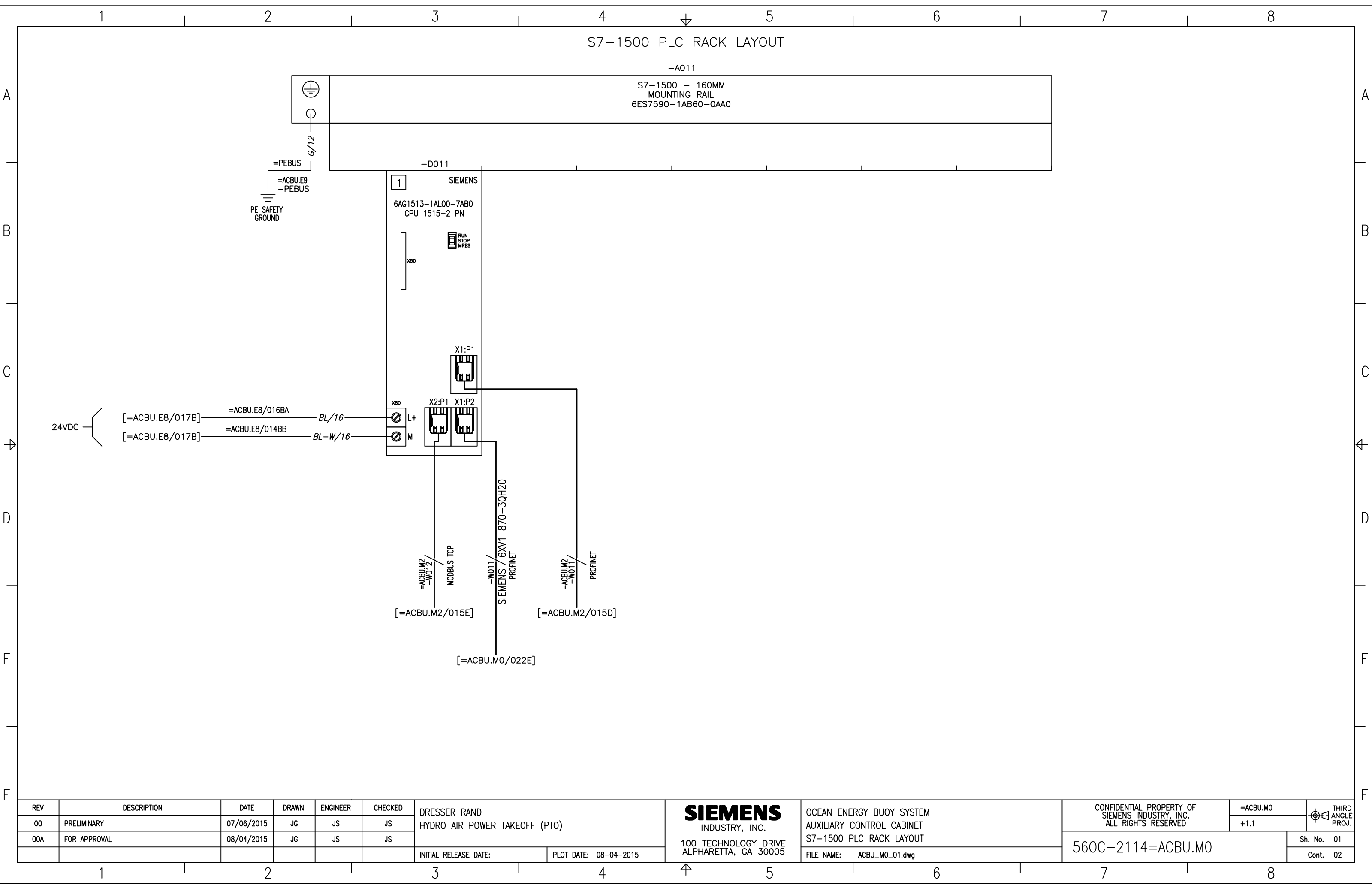
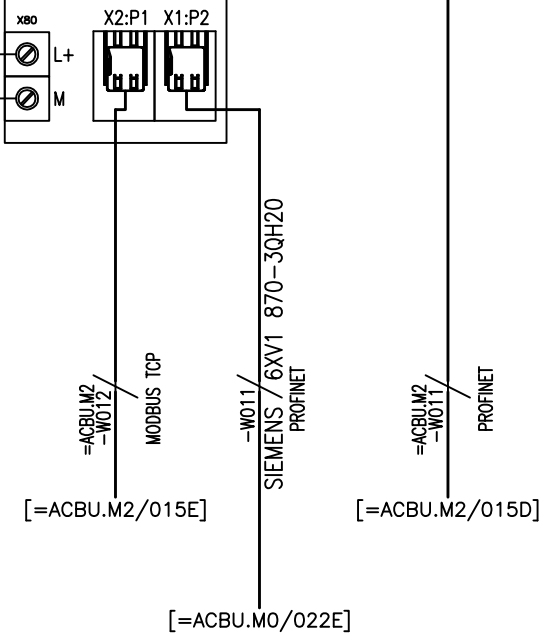
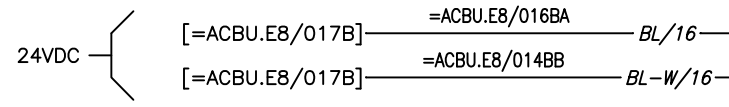
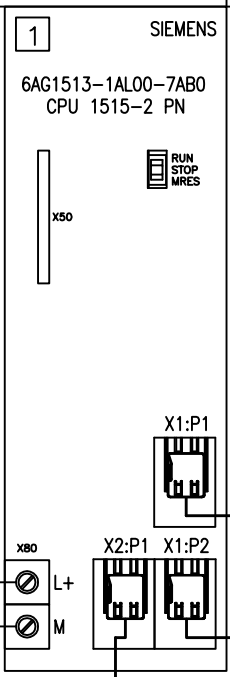
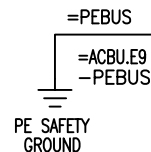
OCEAN ENERGY BUOY SYSTEM
 AUXILIARY CONTROL CABINET
 GROUNDING
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S7-1500 PLC RACK LAYOUT

-A011

S7-1500 - 160MM
MOUNTING RAIL
6ES7590-1AB60-0AA0



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
S7-1500 PLC RACK LAYOUT

FILE NAME: ACBU_MO_01.dwg

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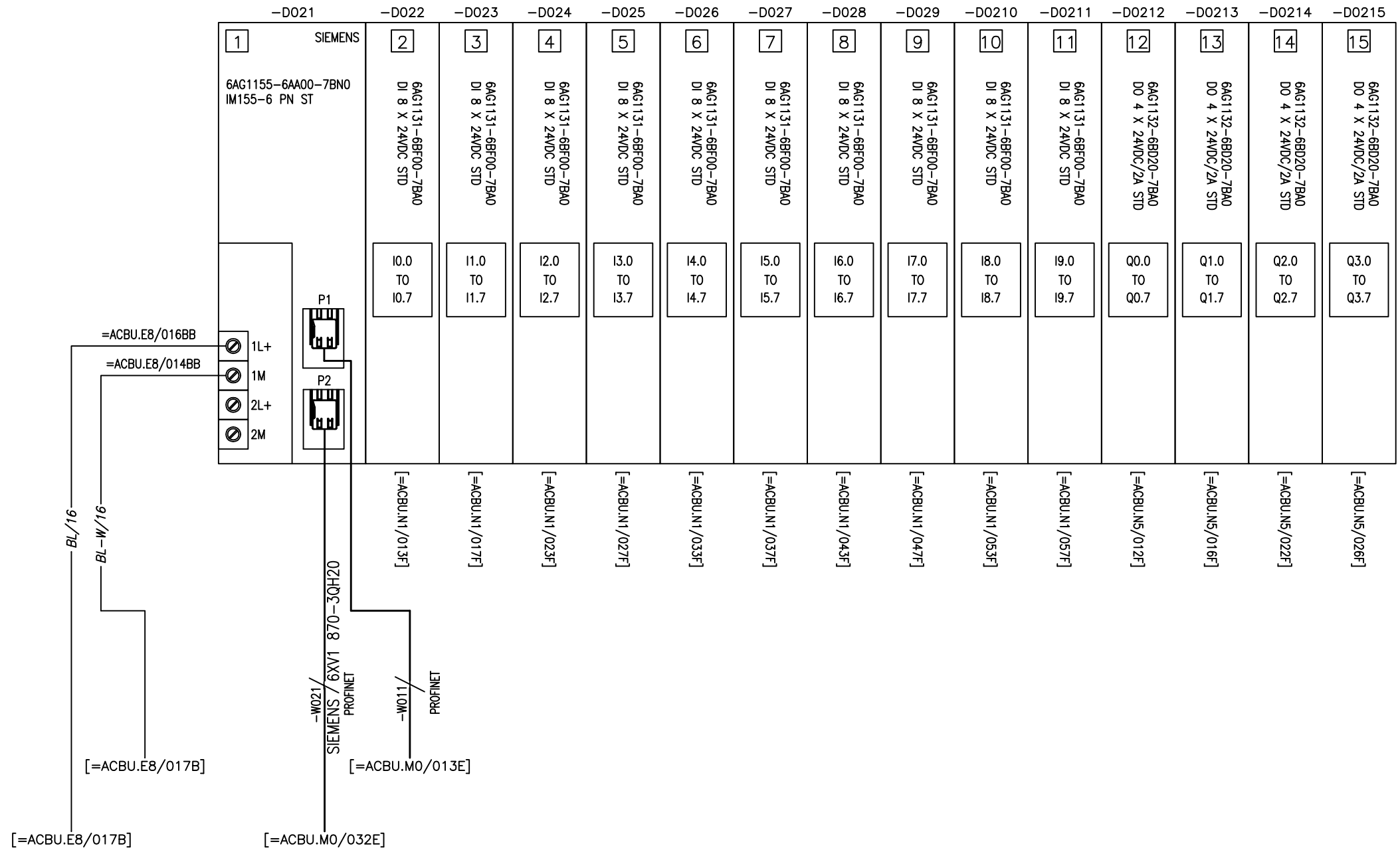
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Sh. No. 01
Cont. 02

THIRD ANGLE PROJ.

ET 200SP RACK LAYOUT



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ET 200SP RACK LAYOUT

FILE NAME: ACBU_M0_02.dwg

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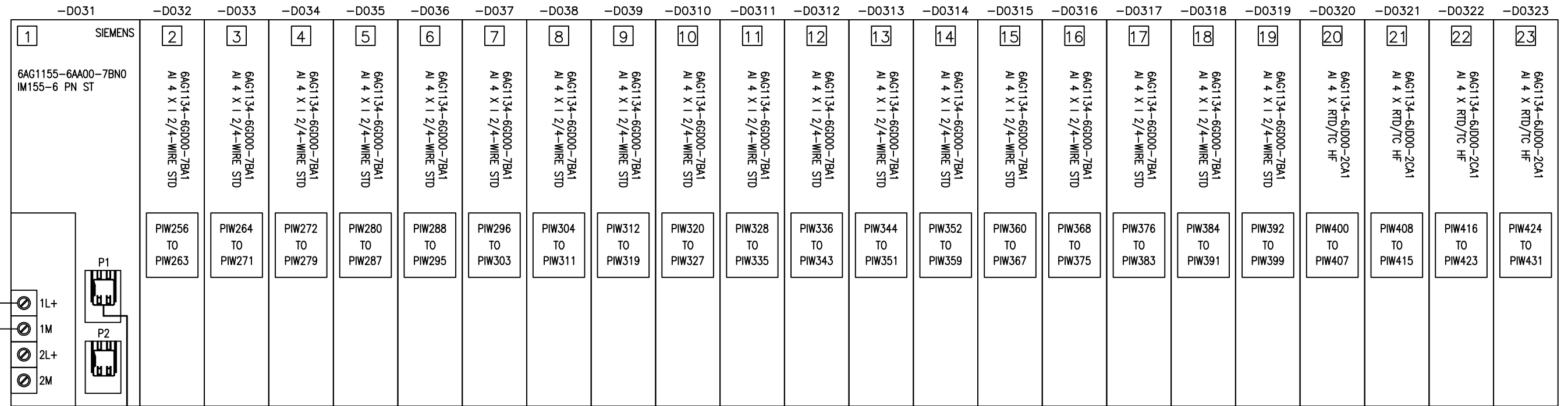
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Sh. No. 02
Cont. 03

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ET 200SP RACK LAYOUT



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015



OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ET 200SP RACK LAYOUT

FILE NAME: ACBU_M0_03.dwg

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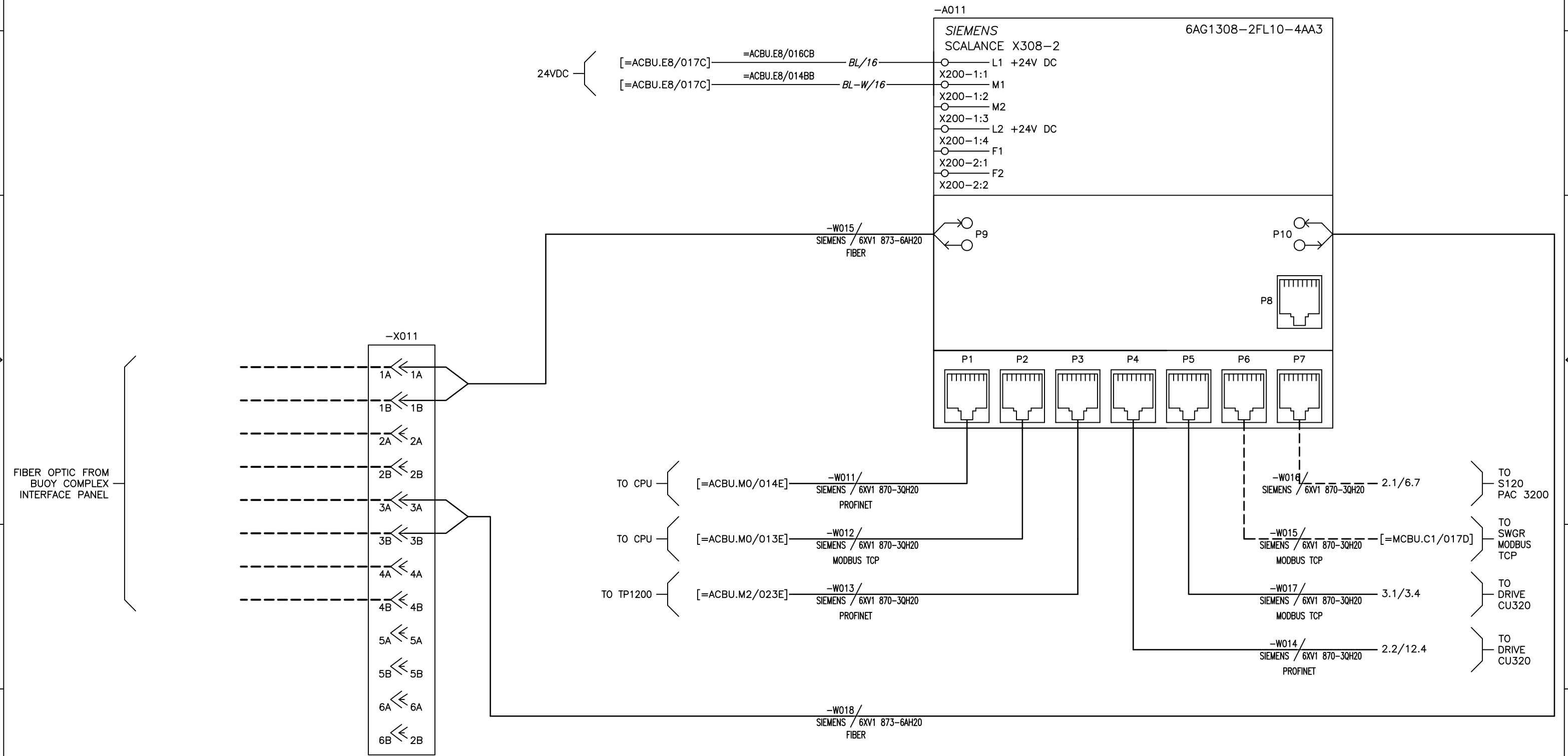
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560C-2114=ACBU.M0

Sh. No. 03
Cont. FNL



PROFINET COMMUNICATIONS NETWORK



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
PROFINET COMMUNICATIONS NETWORK

FILE NAME: ACBU_M2_01.dwg

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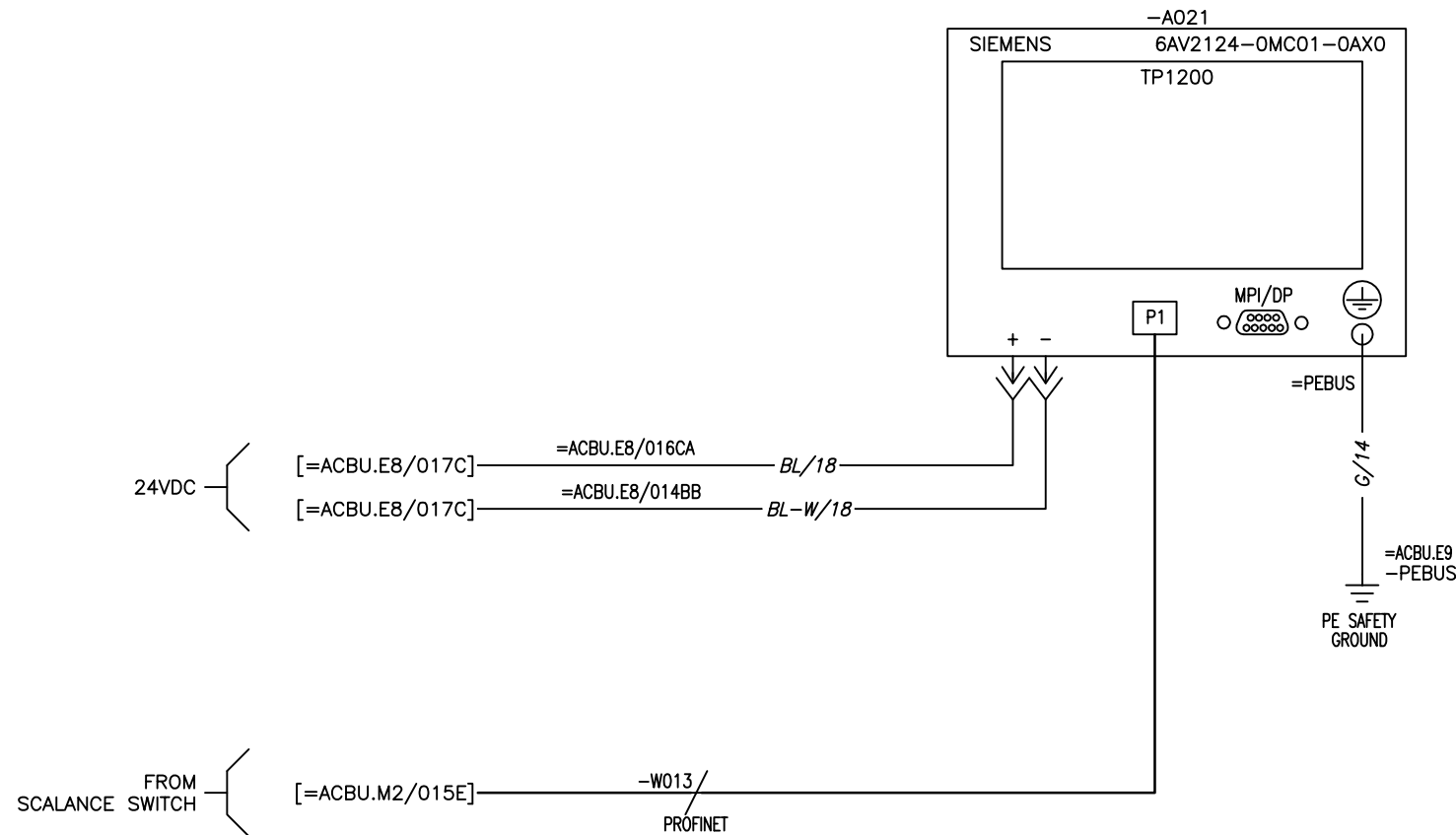
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560C-2114=ACBU.M2

Sh. No. 01
Cont. 02

THIRD ANGLE PROJ.

PROFINET COMMUNICATIONS NETWORK



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
PROFINET COMMUNICATIONS NETWORK

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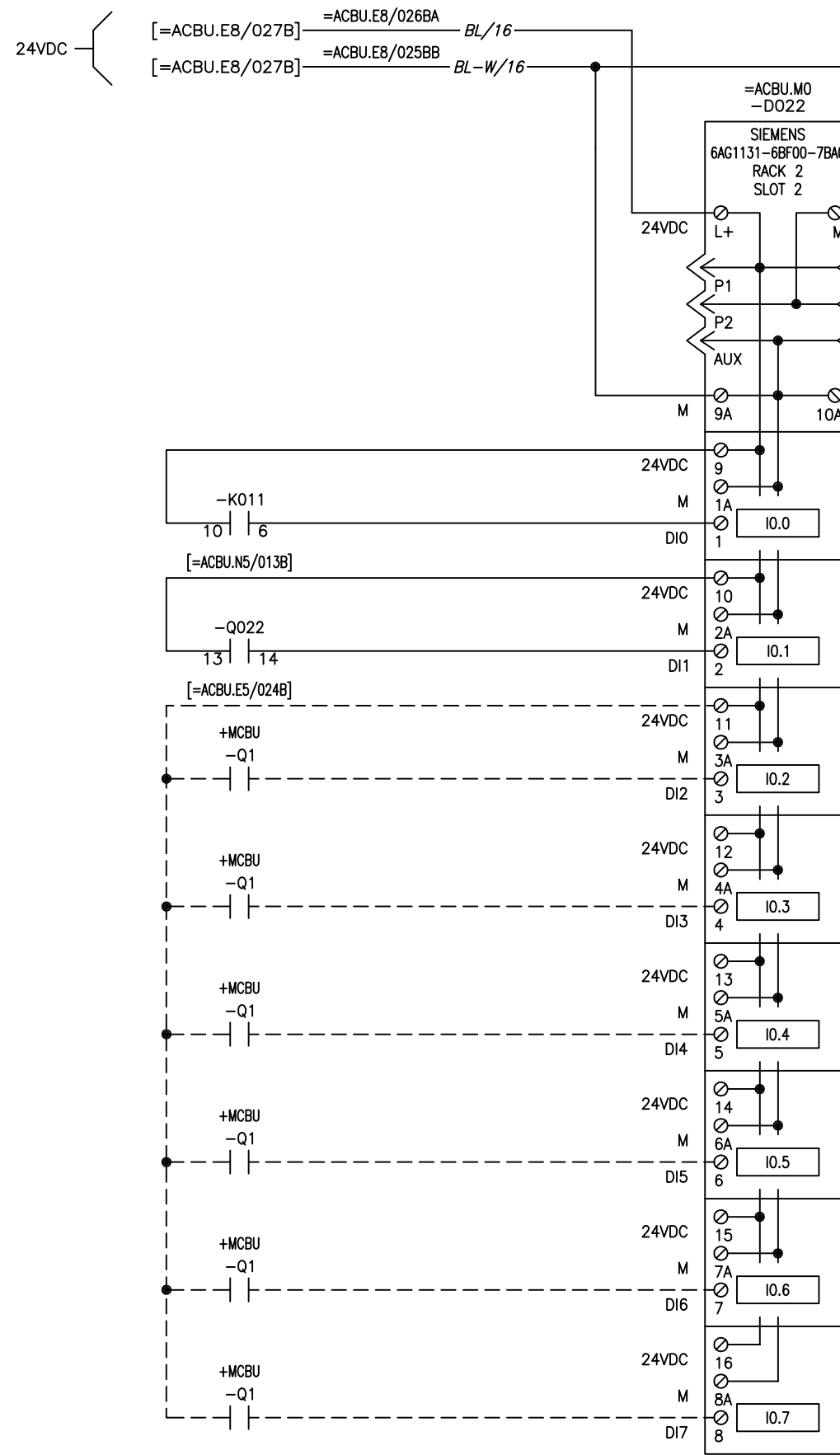
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+1.1

560C-2114=ACBU.M2

Sh. No. 02
Cont. FNL





MOTOR SPACE HEATER ON FEEDBACK

MOTOR SPACE HEATER BREAKER NOT TRIPPED

SWITCHGEAR BREAKER CLOSED

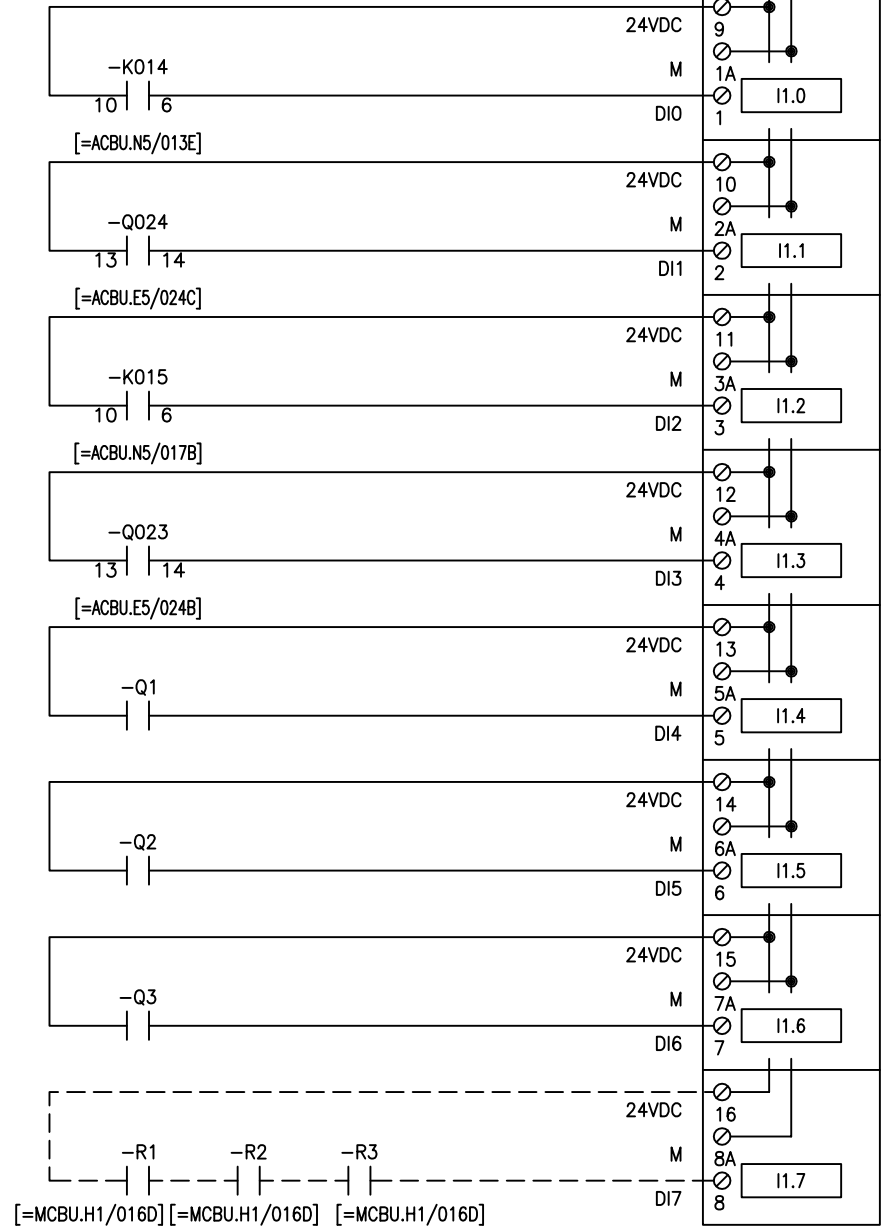
SWITCHGEAR BREAKER OPENED

SWITCHGEAR BREAKER RACKED IN

SWITCHGEAR BREAKER RACKED IN TEST POSITION

SWITCHGEAR BREAKER RACKED OUT

SWITCHGEAR BREAKER CHARGING SPRING OK



SWITCHGEAR SPACE HEATER ON FEEDBACK

SWITCHGEAR SPACE HEATER NOT TRIPPED

TRANSFORMER SPACE HEATER ON FEEDBACK

TRANSFORMER SPACE HEATER BREAKER NOT TRIPPED

"M" CONTACTOR 3.2/1

"M.DB" CONTACTOR 3.2/1

"X.DB" CONTACTOR 3.2/1

DB RESISTOR NOT OVERTEMP

REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

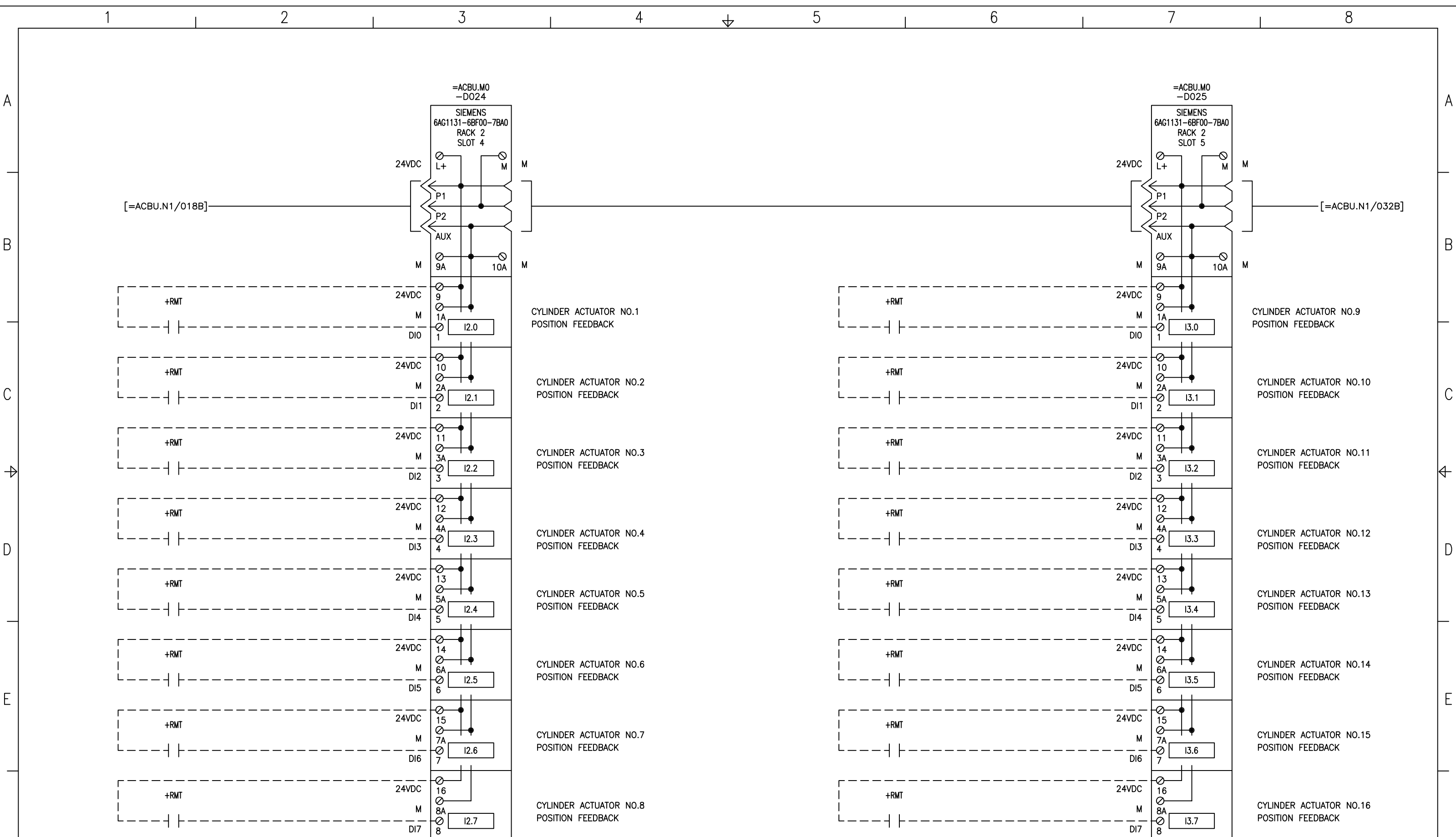
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AUXILIARY CONTROL CABINET
DIGITAL INPUTS < 60V
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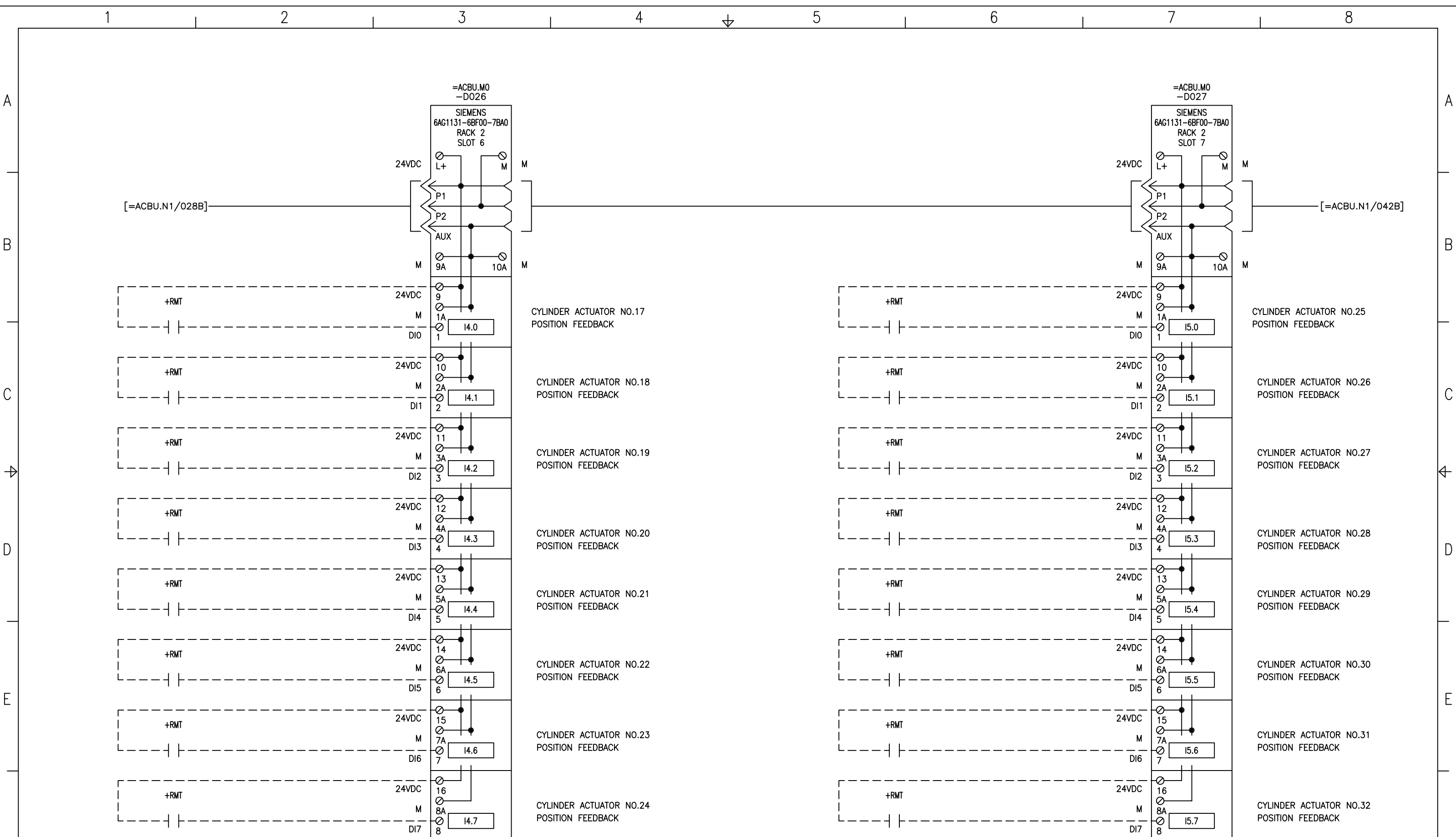
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Sh. No. 01
Cont. 02



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL INPUTS < 60V FILE NAME: ACBU_N1_02.dwg		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED		=ACBU.N1 +1.1		THIRD ANGLE PROJ.
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS	INITIAL RELEASE DATE:		PLOT DATE: 08-04-2015				560C-2114=ACBU.N1				Cont. 03



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
DIGITAL INPUTS < 60V

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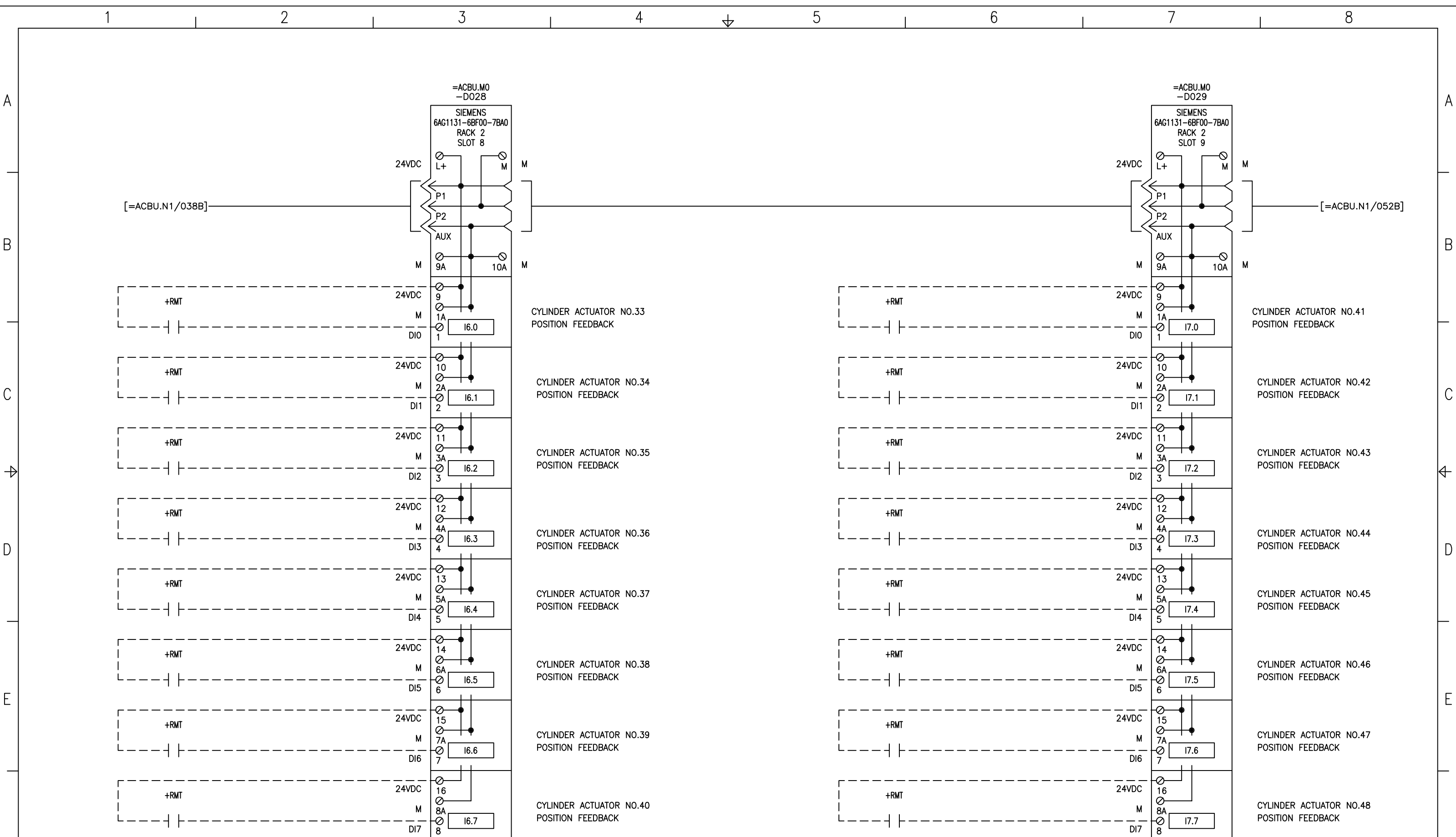
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=ACBU.N1
+1.1

560C-2114=ACBU.N1

Sh. No. 03
Cont. 04

THIRD ANGLE PROJ.



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
DIGITAL INPUTS < 60V

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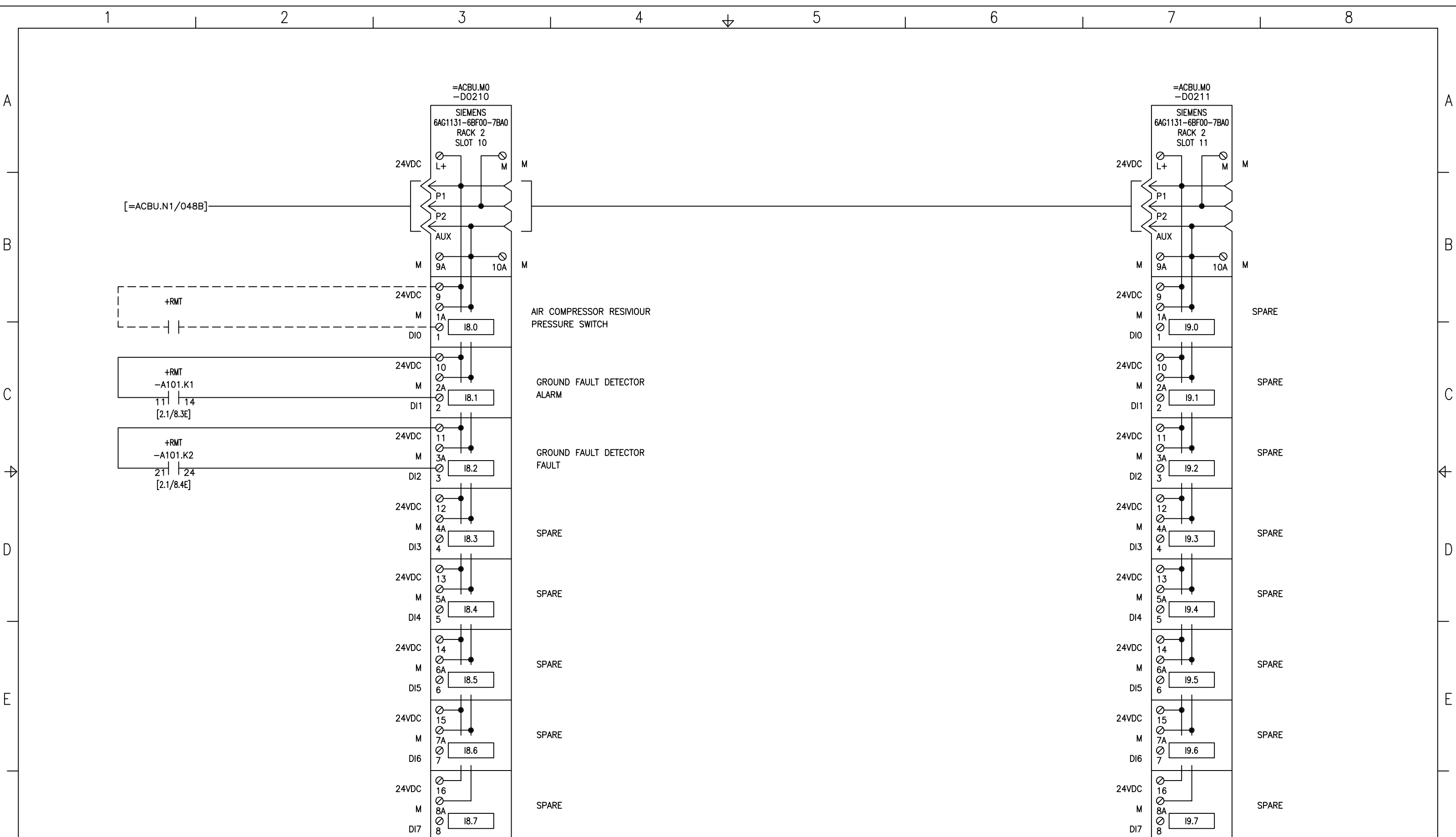
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560C-2114=ACBU.N1

Sh. No. 04
Cont. 05

THIRD ANGLE PROJ.



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
DIGITAL INPUTS < 60V

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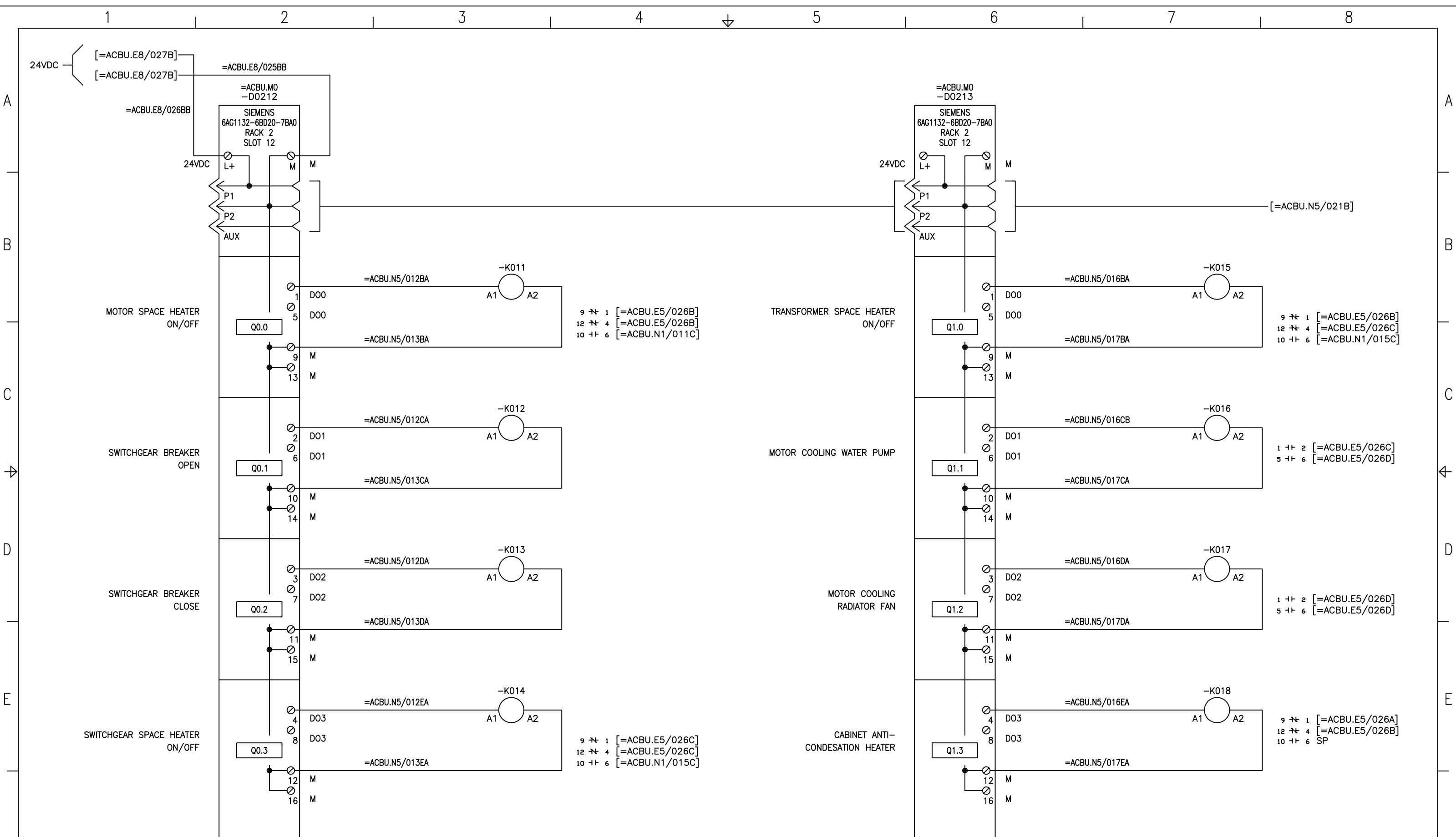
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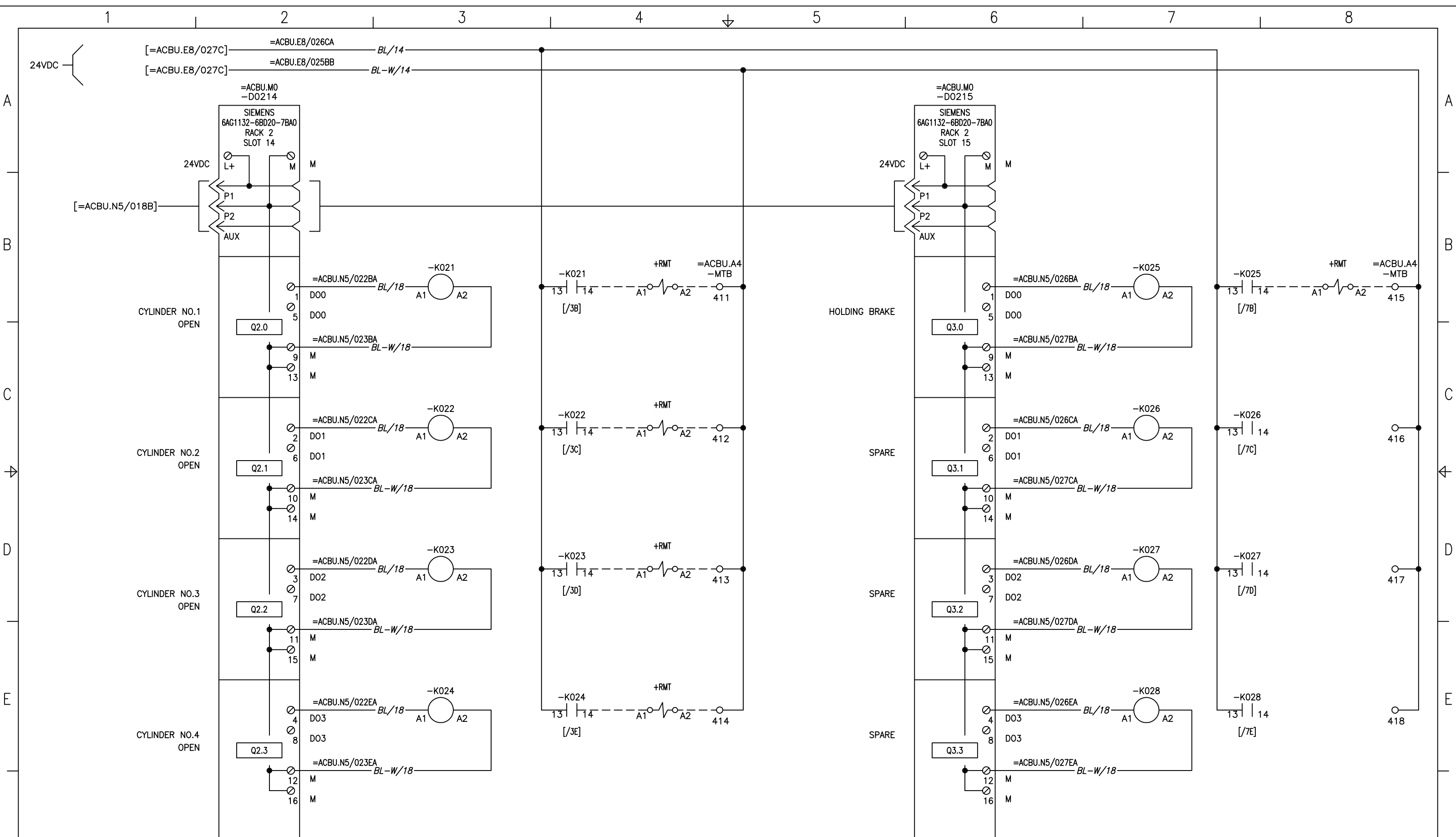
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Sh. No. 05
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)	SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005	OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET DIGITAL OUTPUTS < 60V FILE NAME: ACBU_N5_01.dwg	CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED	=ACBU.N5 +1.1	THIRD ANGLE PROJ.
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS	INITIAL RELEASE DATE:	PLOT DATE: 08-04-2015				Cont. 02



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.
100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
DIGITAL OUTPUTS < 60V

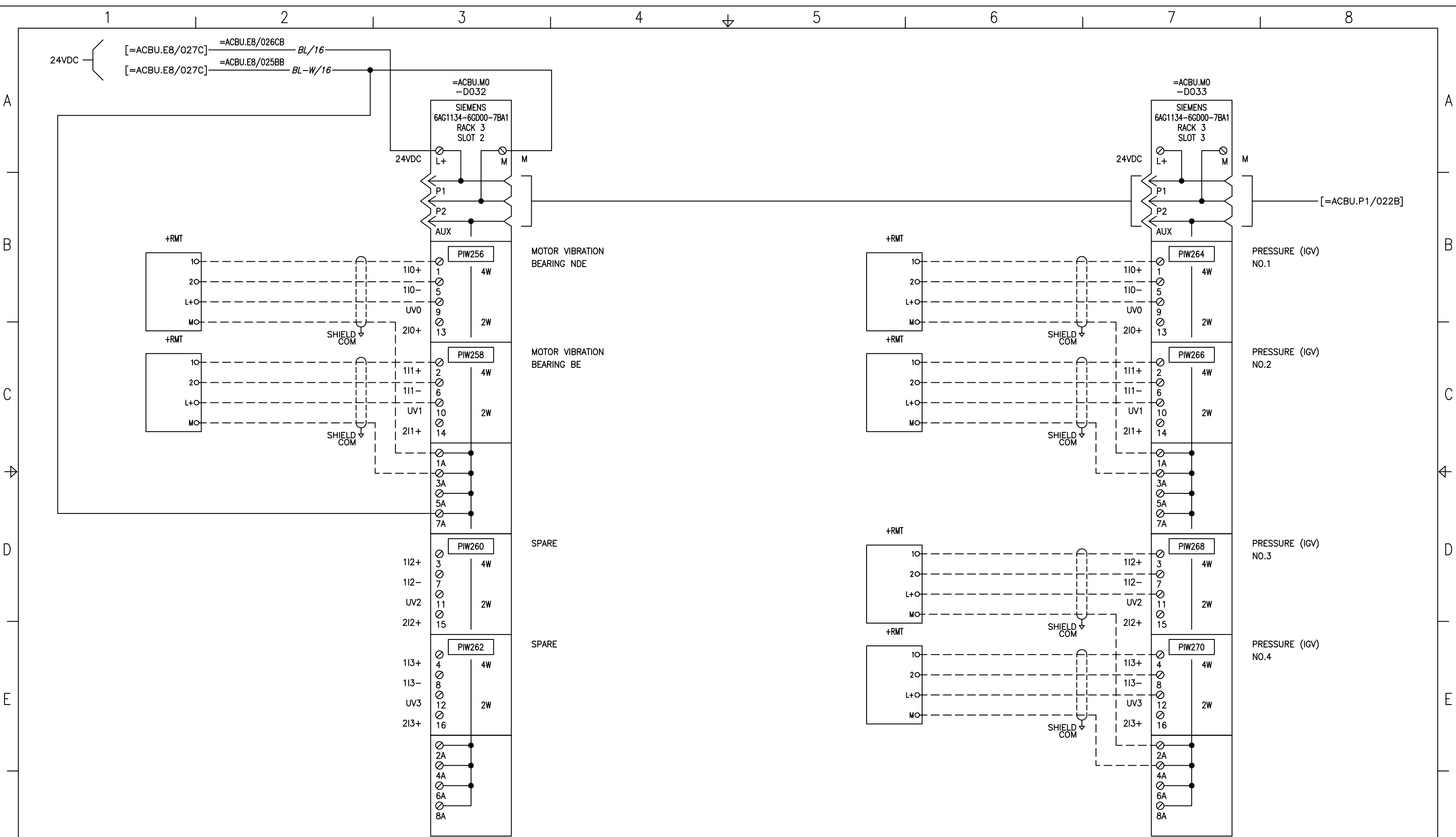
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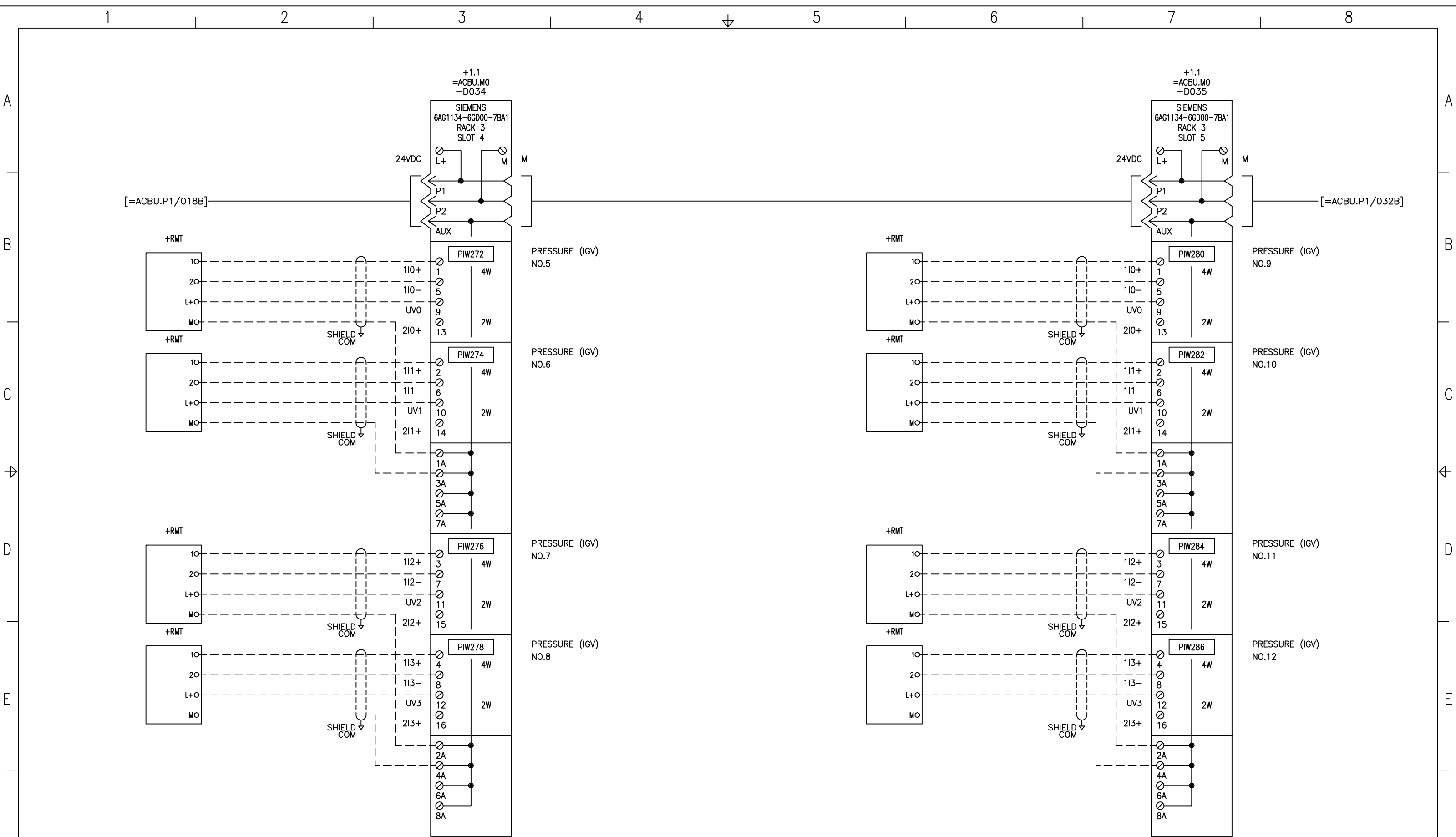
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Sh. No. 02
Cont. FNL



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS FILE NAME: ACBU_P1_01.dwg		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED		=ACBU.P1 +1.1		THIRD ANGLE PROJ.
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS	INITIAL RELEASE DATE:		PLOT DATE: 08-04-2015				560C-2114=ACBU.P1				Cont. 02



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ANALOG INPUTS

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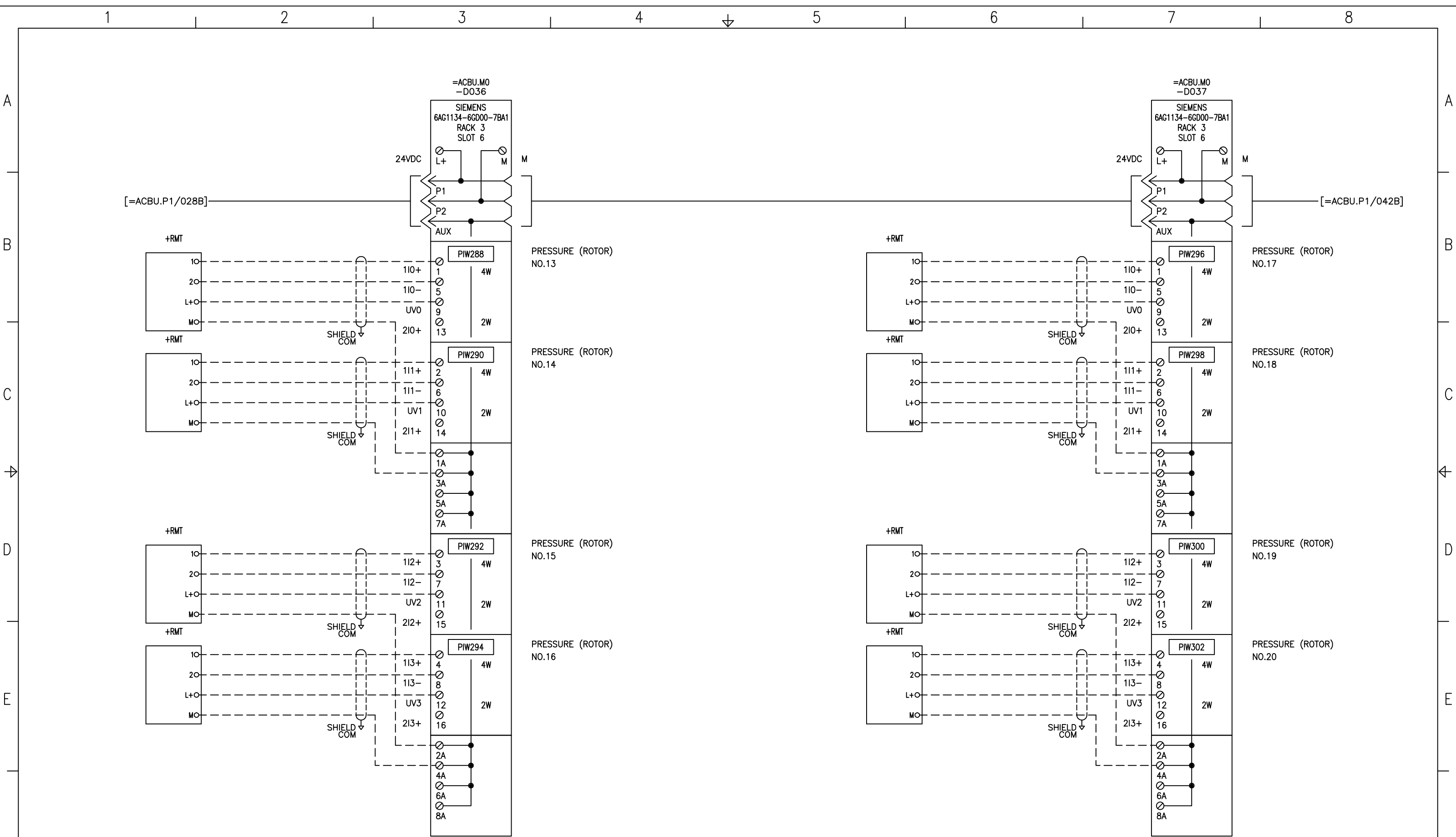
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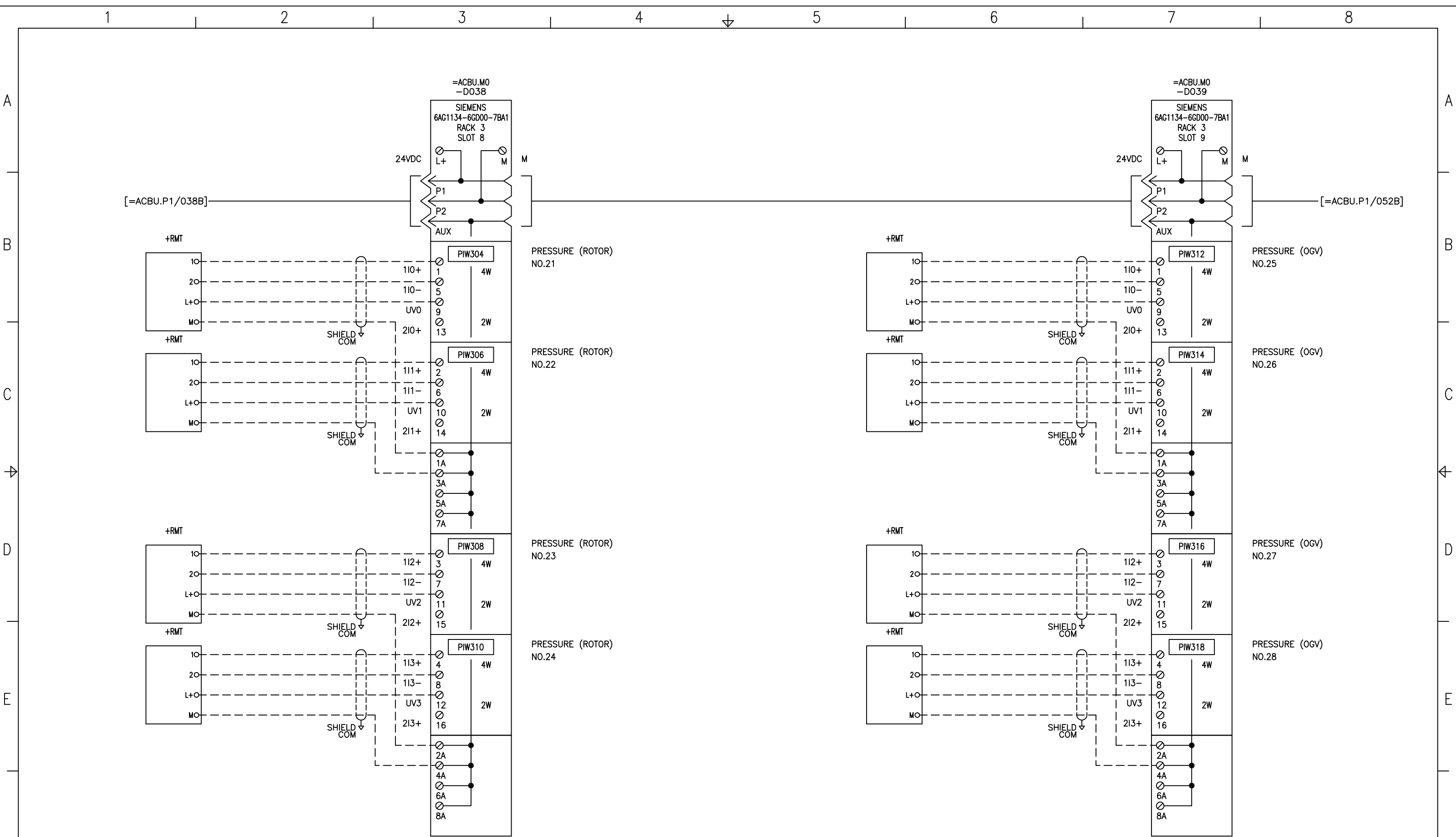
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THIRD ANGLE PROJ.

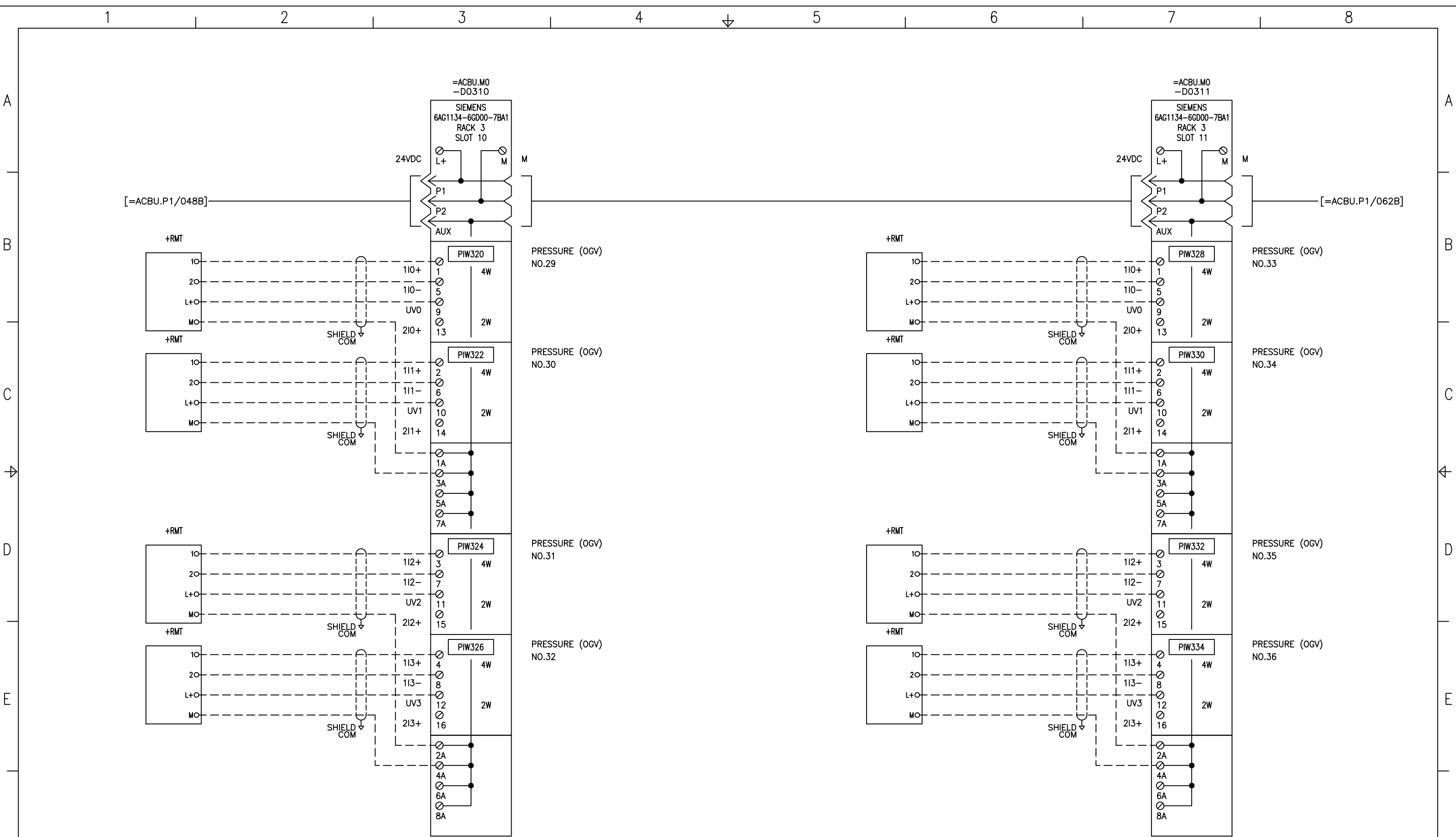
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS FILE NAME: ACBU_P1_04.dwg		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED =ACBU.P1 +1.1		THIRD ANGLE PROJ. Sh. No. 04 Cont. 05	
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
00	PRELIMINARY	07/06/2015	JG	JS	JS
00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ANALOG INPUTS

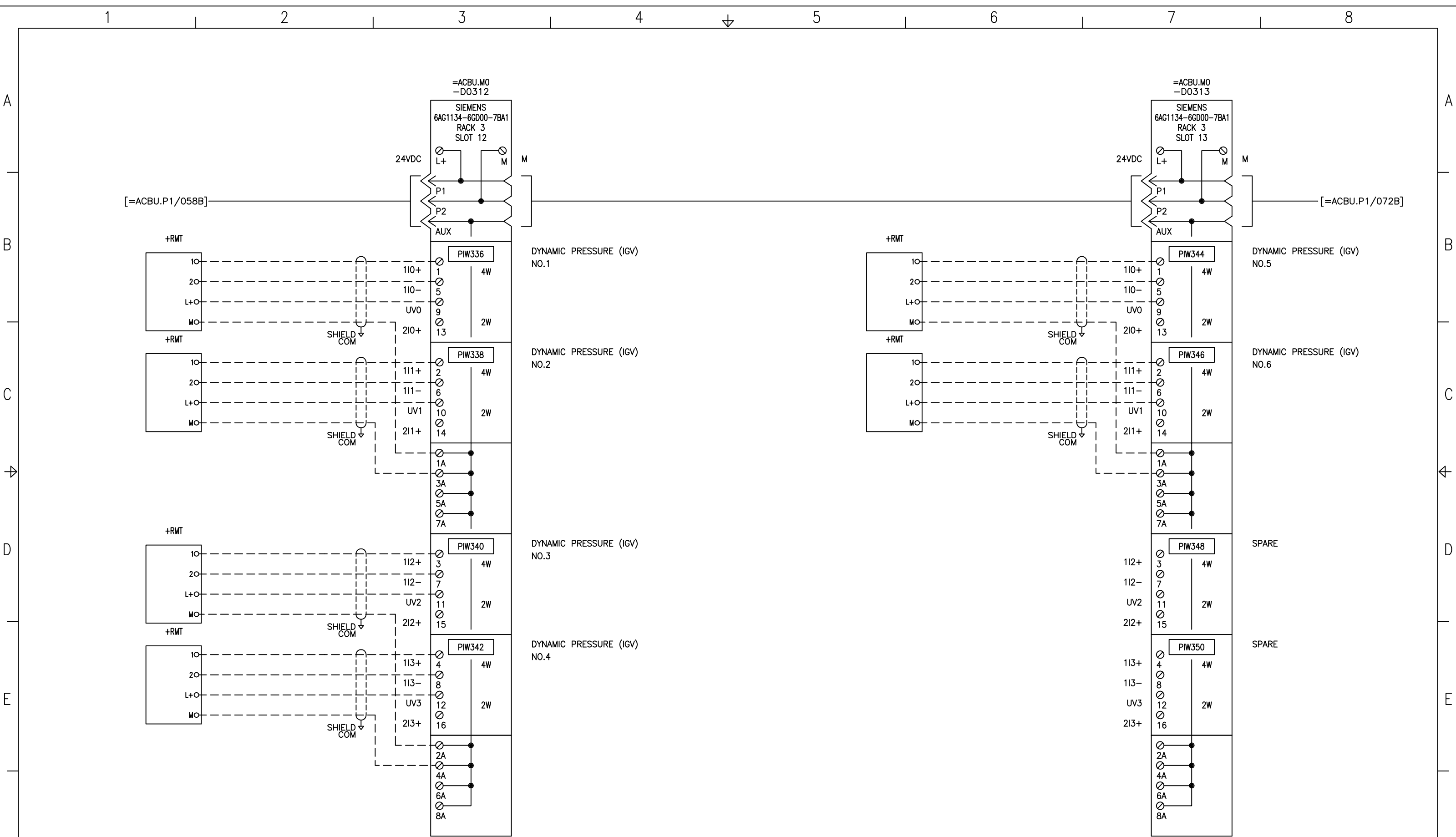
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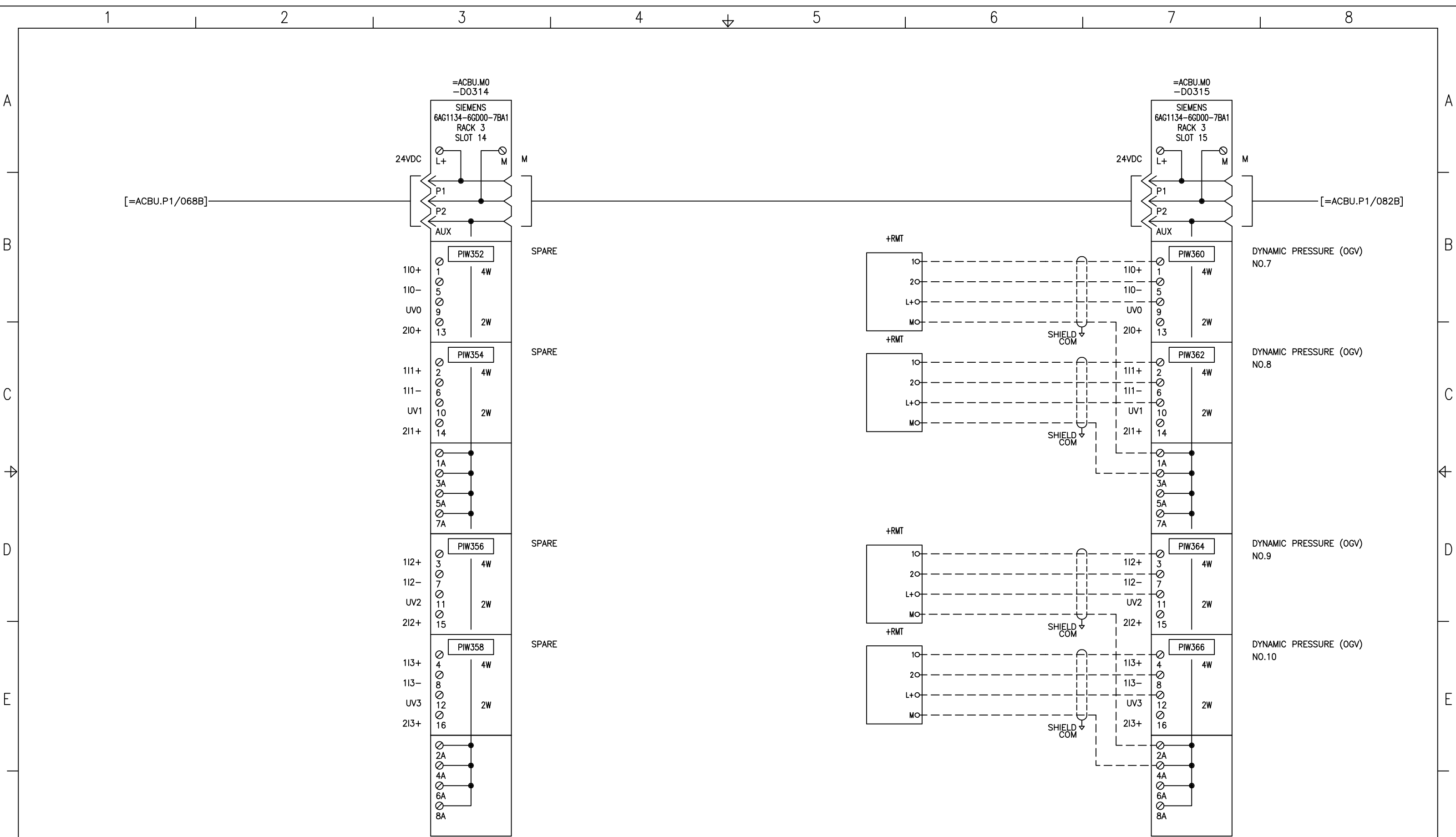
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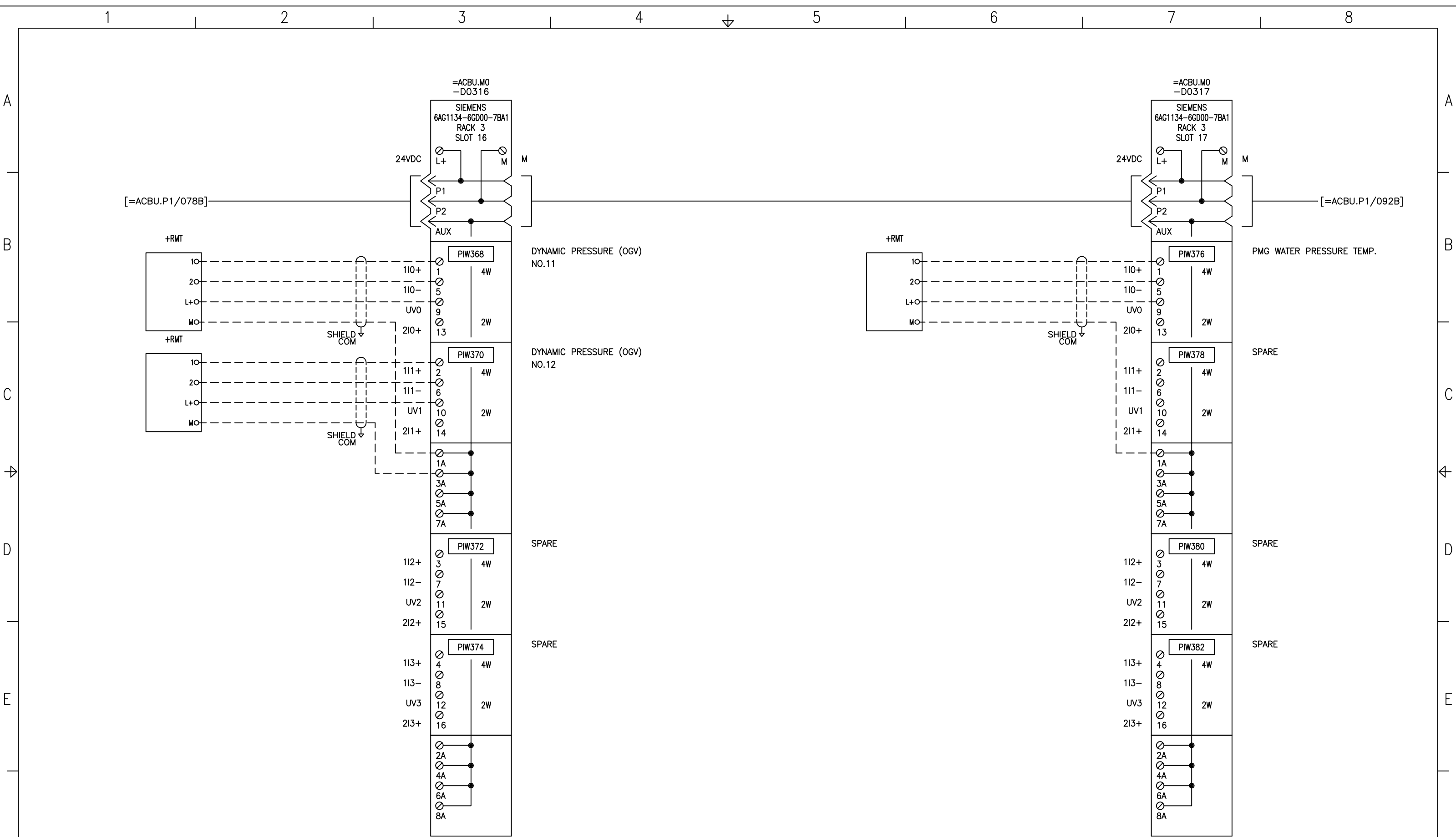
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS FILE NAME: ACBU_P1_06.dwg		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED		=ACBU.P1 +1.1		THIRD ANGLE PROJ.		
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS													
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS FILE NAME: ACBU_P1_07.dwg		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED		=ACBU.P1 +1.1		THIRD ANGLE PROJ.
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS	INITIAL RELEASE DATE:		PLOT DATE: 08-04-2015				560C-2114=ACBU.P1				Cont. 08



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ANALOG INPUTS

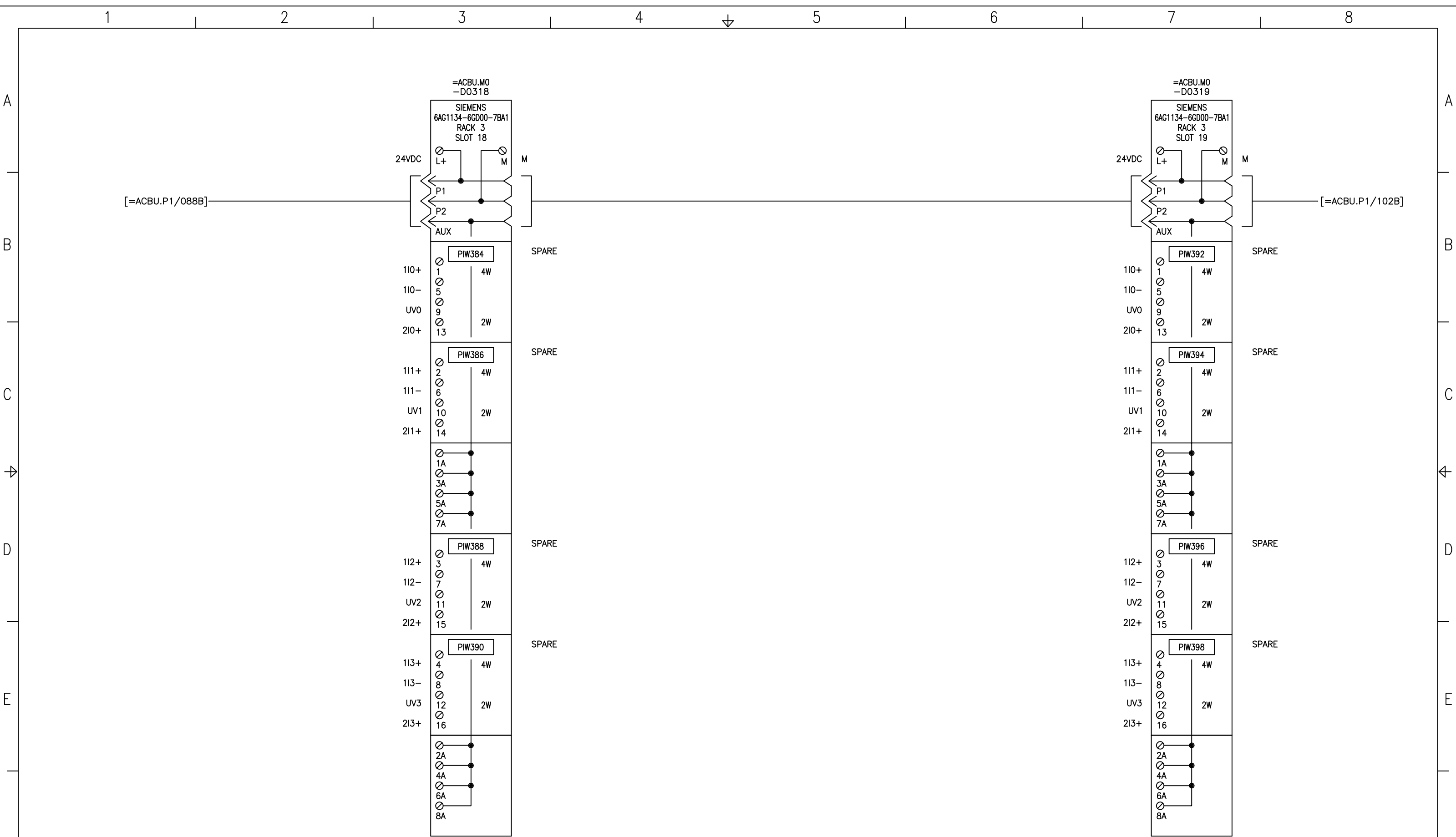
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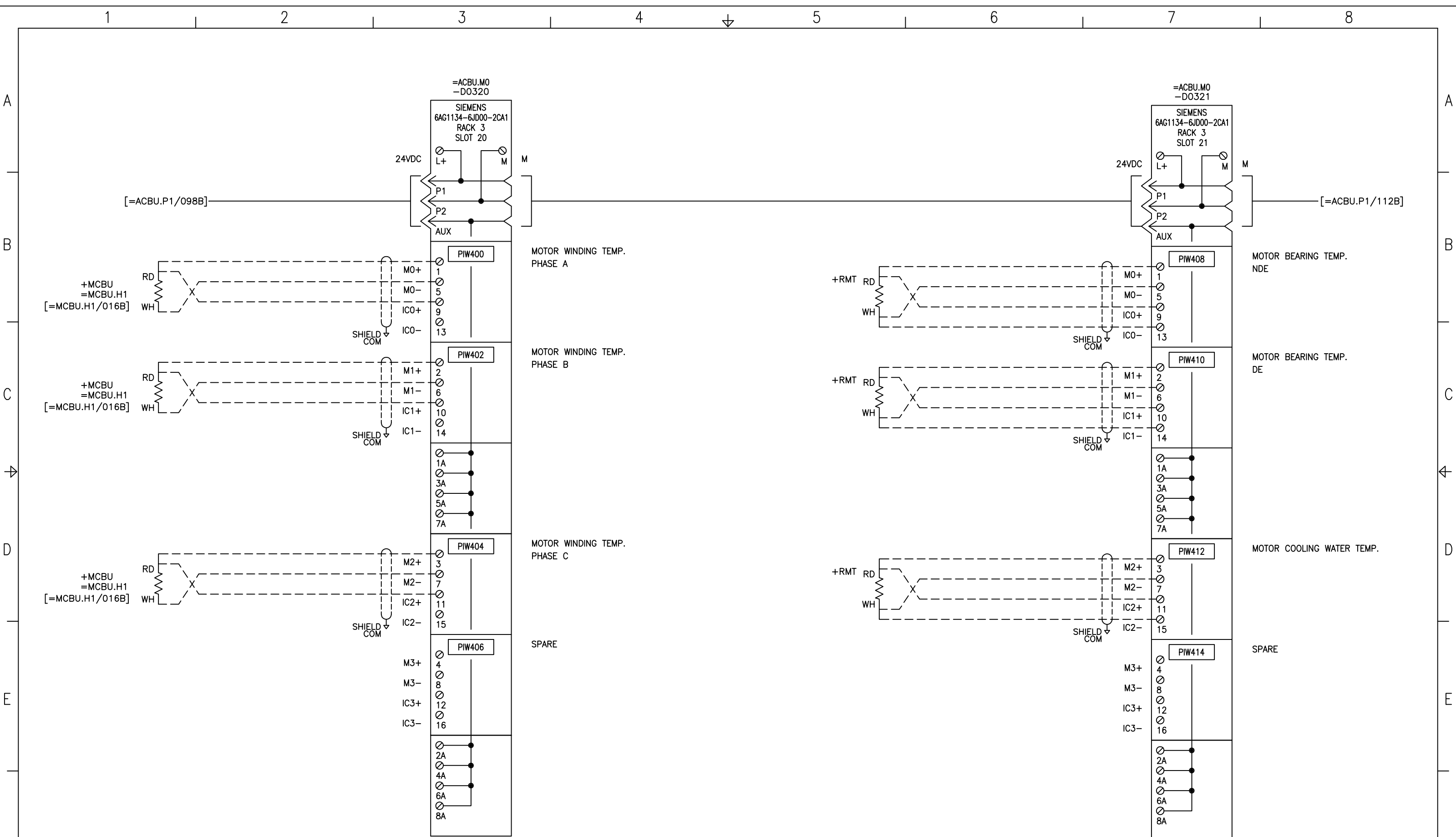
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED	DRESSER RAND HYDRO AIR POWER TAKEOFF (PTO)		SIEMENS INDUSTRY, INC. 100 TECHNOLOGY DRIVE ALPHARETTA, GA 30005		OCEAN ENERGY BUOY SYSTEM AUXILIARY CONTROL CABINET ANALOG INPUTS FILE NAME: ACBU_P1_09.dwg		CONFIDENTIAL PROPERTY OF SIEMENS INDUSTRY, INC. ALL RIGHTS RESERVED		=ACBU.P1 +1.1	THIRD ANGLE PROJ.
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REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ANALOG INPUTS

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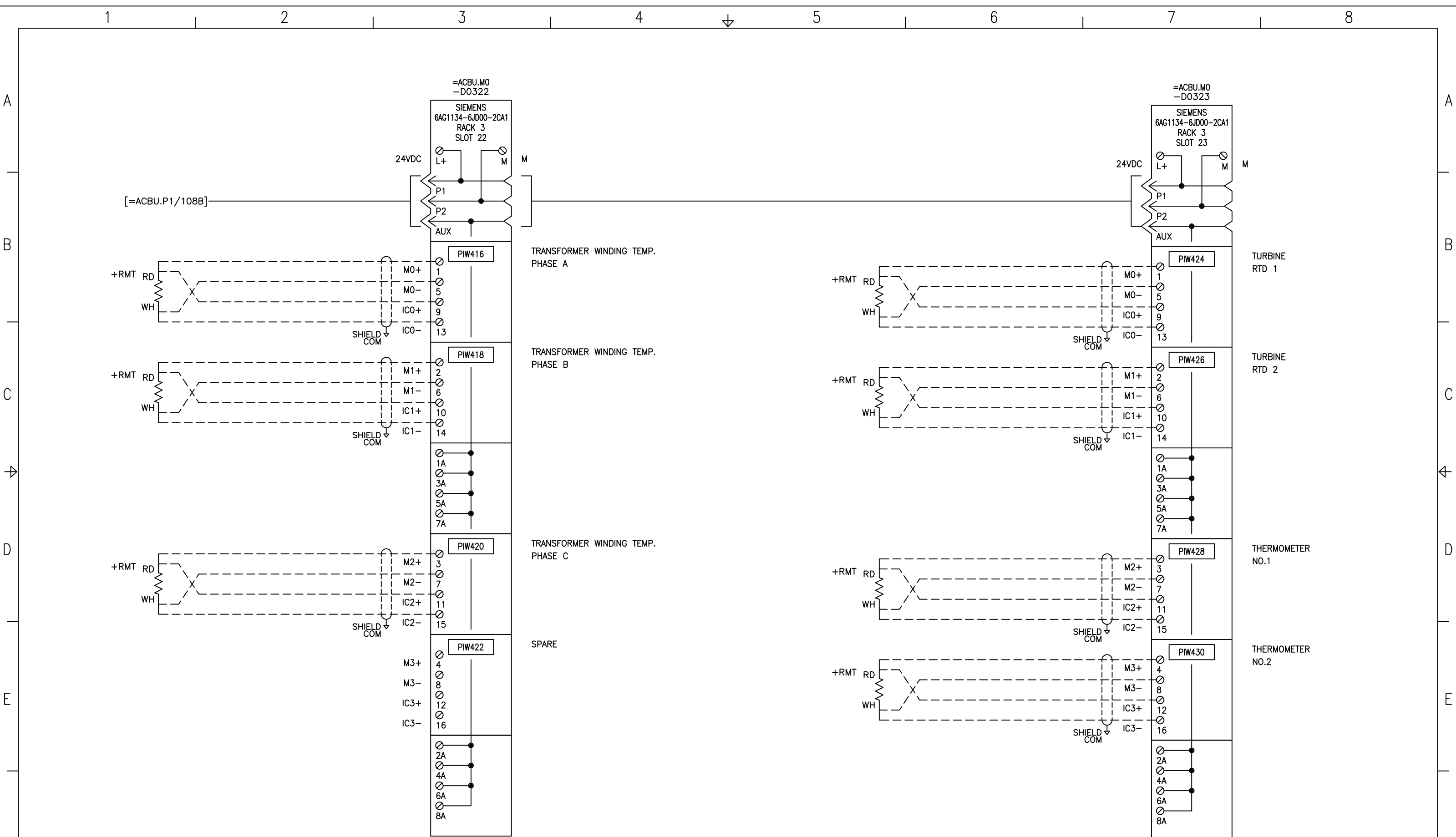
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560C-2114=ACBU.P1

Sh. No. 10
Cont. 11

THIRD ANGLE PROJ.



REV	DESCRIPTION	DATE	DRAWN	ENGINEER	CHECKED
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00A	FOR APPROVAL	08/04/2015	JG	JS	JS

DRESSER RAND
HYDRO AIR POWER TAKEOFF (PTO)

INITIAL RELEASE DATE: PLOT DATE: 08-04-2015

SIEMENS
INDUSTRY, INC.

100 TECHNOLOGY DRIVE
ALPHARETTA, GA 30005

OCEAN ENERGY BUOY SYSTEM
AUXILIARY CONTROL CABINET
ANALOG INPUTS

FILE NAME: ACBU_P1_11.dwg

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Sh. No. 11
Cont. FNL