

LEGEND



FLANDERS
ENGINEERING & CONTROLS DIVISION
NORTH PLANT FACILITY
8101 BAUMGART RD.
EVANSVILLE, INDIANA 47725
(812) 867-7421

VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

SHEET DESCRIPTION

PROJECT	
00A01	TITLE SHEET & SHEET INDEX
00A02	TITLE SHEET & SHEET INDEX
00A03	TITLE SHEET & SHEET INDEX
00B01	DRAWING STANDARDS & PRACTICES DRAWING #'S/WIRE #'S/WIRING NOTES
00B02	DRAWING STANDARDS & PRACTICES GENERAL WIRING INFORMATION/CABLE NUMBERS
00B03	DRAWING STANDARDS & PRACTICES LEGEND – DEVICE I.D.
00B04	DRAWING STANDARDS & PRACTICES LEGEND – GENERAL
00B05	DRAWING STANDARDS & PRACTICES DIRECTIONAL DESIGNATORS
00C01	MULTI-PASS CAROUSEL HYDRAULIC SCHEMATIC

PDE ENCLOSURE

P/N: ARDV-03-400-0

03A01 TITLE SHEET & SHEET INDEX
03D01 TAGS SCHEDULE
03E01 DOOR LAYOUT
03E02 BOTTOM CUTOUT & ASSEMBLY
03F01 BACK PANEL LAYOUT
03G01 CB(S)/PWS/UPS LAYOUT
03G02 L01TB1 TERMINAL BLOCK/CB(S) LAYOUT
03L01 24VDC POWER DISTRIBUTION
03L02 24VDC POWER DISTRIBUTION
03L03 24VDC POWER DISTRIBUTION

SHEET DESCRIPTION

CLX ENCLOSURE
P/N: ARDV-03-401-00

06A01 TITLE SHEET & SHEET INDEX
06D01 TAGS SCHEDULE
06E01 DOOR LAYOUT
06E02 BOTTOM CUTOUT & ASSEMBLY
06F01 BACK PANEL LAYOUT
06G01 L01TB1/M02TB1 TERMINAL BLOCK M06ETHS1 LAYOUT
06L01 24VDC POWER DISTRIBUTION
06M01 CLX RACK LAYOUT
06M02 SLOT 3 DEVICENET BRIDGE
06M03 SLOT 4 ANALOG OUTPUT MODULE - (EARS) (OPTION)
06M04 SLOT 5 RESOLVER MODULE - (OPTIONAL) MULTIPASS
06M05 SLOT 6 RESOLVER MODULE - ROTARY HEAD
06M06 M06ETHS1 ETHERNET SWITCH CONNECTIONS

DEVICENET I/O MODULES

P/N: ARDV-03-402-00

09A01 TITLE SHEET & SHEET INDEX

09D01 TAGS SCHEDULE

09M01 NODE 15 M01 (MAST) TYPE 1 DIVICENET I/O MODULE 1/2
CONNECTION DIAGRAM

09M02 NODE 15 M01 (MAST) TYPE 1 DIVICENET I/O MODULE 2/2
CONNECTION DIAGRAM

09M03 NODE 35 M04 (ENGINE BOX) TYPE 2 DIVICENET I/O MODULE 1/2
CONNECTION DIAGRAM

09M04 NODE 35 M04 (ENGINE BOX) TYPE 2 DIVICENET I/O MODULE 2/2
CONNECTION DIAGRAM

SHEET DESCRIPTION

09M05	NODE 36 M05 (ENGINE BOX) TYPE 2 DIVICENET I/O MODULE 1/2 CONNECTION DIAGRAM
09M06	NODE 36 M05 (ENGINE BOX) TYPE 2 DIVICENET I/O MODULE 2/2 CONNECTION DIAGRAM
09M07	NODE 9 M06 (ENGINE BOX) TYPE 1 DIVICENET I/O MODULE 1/1 CONNECTION DIAGRAM
09M22	TYPE 1 DEVICENET I/O MODULE TYPICAL PINOUTS
09M23	TYPE 2 DEVICENET I/O MODULE TYPICAL PINOUTS
09M24	EXPANSION DEVICENET I/O MODULE TYPICAL PINOUTS
09M25	SPLITTER CABLES & COMPACT SPLITTER WIRING DIAGRAMS
09M26	FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS WIRING DIAGRAMS [BOM REFERENCE ITEM#'S: 238, 239, 240 & 241]
09M27	FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS [BOM REFERENCE ITEM#'S: 606 & 534] WIRING DIAGRAMS
09M28	FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS [BOM REFERENCE ITEM#'S: 242 & 243] WIRING DIAGRAMS
09M29	FLANDERS PROVIDED DIGITAL SENSORS [BOM REFERENCE ITEM#'S: 244, 245, 246 & 247] WIRING DIAGRAMS

* DEVICENET I/O MODULES ~ CONTINUED ON SHEET A02 *

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
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01
LEGEND
02 REFER TO SHEET 00B04

01
VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM

02
SHEET DESCRIPTION

03 *DEVICENET I/O MODULES ~ CONTINUNED FROM SHT. A01 *

04 09M32 FLANDERS PROVIDED
05 ANALOG & DIGITAL SENSORS
06 [BOM REFERENCE ITEM#S: 240, 244, 245 & 618]
07 WIRING DIAGRAMS
08 09M34 CABLE CONNECTORS
09 2, 3, 4, 6 & 12-PIN ASSEMBLIES

10 OPERATOR CAB PC/HMI

11 P/N: ARDV-03-403-00

12 12A01 TITLE SHEET & SHEET INDEX
12C01 POWER/ETHERNET/DEVICENET/CAN bus
13 CONNECTION DIAGRAM
12D01 TAGS SCHEDULE
12G01 PC/HMI-PWS/UPS/CB/TB & DEVICENET TB LAYOUT
12L01 PC/HMI-24VDC POWER DISTRIBUTIUON
12M01 DEVICENET NETWORK – CONNECTION DIAGRAM

14 OPERATOR CHAIR W/4-KEYPADS

15 P/N: ARDV-03-404-00

16 15A01 TITLE SHEET & SHEET INDEX
15E01 LAYOUT
15E02 LEFT SIDE CONSOLE – JOYSTICK/KEYPADS LAYOUT
15E03 RIGHT SIDE CONSOLE – JOYSTICK/KEYPADS LAYOUT
15E04 DEVICENET NETWORK – CONNECTION DIAGRAM

17 DRILL MODE LIGHT BOX

18 P/N: ARDV-03-406-00

19 18A01 TITLE SHEET & SHEET INDEX
18D01 TAGS SCHEDULE
18E01 ASSEMBLY
18E02 LAYOUT
18E03 CUTOUTS
18F01 PANEL LAYOUT
18L01 24VDC SCHEMATIC
18P01 CABLE CONNECTIONS

01
SHEET DESCRIPTION

02 KIRK KEY BOX
03 P/N: ARDV-04-400-00

04 21A01 TITLE SHEET & SHEET INDEX
05 21D01 TAGS SCHEDULE
06 21E01 ASSEMBLY
07 21E02 CUTOUTS

08 ALL STOP ENCLOSURE – COMMAND CENTER

09 P/N: ARDV-04-401-00

10 ALL STOP PUSHBUTTON STATION – COMMAND CENTER
11 P/N: ARDV-04-402-00
12 24A01 TITLE SHEET & SHEET INDEX
13 24D01 TAGS SCHEDULE
14 24E01 ENCLOSURE ASSEMBLY
15 24E02 PUSHBUTTON STATION ASSEMBLY
16 24F01 ENCLOSURE BACK PANEL LAYOUT
17 24L01 120VAC/24VDC POWER DISTRIBUTION

18 GPS ENCLOSURE

19 P/N: ARDV-04-403-01

20 27A01 TITLE SHEET & SHEET INDEX
21 27D01 TAGS SCHEDULE
22 27E01 DOOR LAYOUT
23 27E02 BOTTOM CUTOUTS & ASSEMBLY
24 27F01 BACK PANEL LAYOUT
25 27G01 BILL OF MATERIAL
26 27L01 24VDC POWER DISTRIBUTION
27 27P01 INTERCONNECTION DIAGRAM

28 HAZTECH ENCLOSURE

29 P/N: ARDV-04-404-01

30 30A01 TITLE SHEET & SHEET INDEX
31 30D01 TAGS SCHEDULE
32 30E01 DOOR LAYOUT
33 30E02 BOTTOM CUTOUTS & ASSEMBLY
34 30F01 BACK PANEL LAYOUT
35 30G01 BILL OF MATERIAL
36 30L01 24VDC POWER DISTRIBUTION
37 30P01 ETHERNET SWITCHES CONNECTIONS
38 30P02 ETHERNET BRIDGEWAY INTERCONNECTIONS DIAGRAM

01
SHEET DESCRIPTION

02 CABLE-HARNESES
03 P/N(S): (See Below)

04 45A01 TITLE SHEET & SHEET INDEX
05 45R01 CABLE-HARNESS ETHERNER
06 (Hazcom Camera)
07 P/N: ARDV-05-800-00
08 45R02 CABLE-HARNESS DEVICENET
09 (TB to Devicenet I/O Module)
10 P/N: ARDV-05-801-00
11 45R03 CABLE-HARNESS DEVICENET
12 (Devicenet I/O Module to Devicenet I/O Module)
13 P/N: ARDV-05-802-00
14 45R04 CABLE-HARNESS POWER
15 (03L02CBx to Type 1 & 2 Devicenet I/O Module)
16 P/N: ARDV-05-803-00
17 45R05 CABLE-HARNESS 5A STROKER
18 (Devicenet I/O Module to Stroker 5A External Filter)
19 P/N: ARDV-05-804-00
20 45R06 CABLE-HARNESS 5A STROKER
21 (Stroker 5A External Filter to Valve)
22 P/N: ARDV-05-805-00
23 45R07 CABLE-HARNESS PWM
24 (Devicenet I/O Module to PWM Valve)
25 P/N: ARDV-05-806-00
26 45R08 CABLE-HARNESS ETHERNET
27 (Straight-Through)
28 P/N: ARDV-05-807-00
29 45R09 CABLE-HARNESS ETHERNET
30 (Cross-Over)
31 P/N: ARDV-05-808-00
32 45R10 CABLE-HARNESS ETHERNET
33 (PoP Power Over Ethernet)
34 P/N: ARDV-05-809-00
35 45R11 CABLE-HARNESS COAX
36 (GPS Receiver to GPS Antenna)
37 P/N: ARDV-05-810-00

38 *CABLE-HARNESES ~ CONTINUNED ON SHT. A03 *



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ENGINEER:
L.D. MOODY

APPROVED BY:

DRAWN BY:
J.C. STITT

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

PROJECT

TITLE SHEET & SHEET INDEX

LOC. CODE
201706

DATE
02/08/19

CONT. ON
03

DRAWING NO.
00

SECTION
A

SUB. SEC.
02

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	FILENAME: 20170600A02.dwg
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201706	00	A	02
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01
02 REFER TO SHEET 00B04
03

VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM

04
SHEET DESCRIPTION

* CABLE-HARNESSES ~ CONTINUED ON SHT. A02 *
 45R12 CABLE-HARNESS SERIAL
 (Camera-Site Perimeter to Input Transmitter Box)
 P/N: ARDV-05-811-00
 45R13 CABLE-HARNESS COAX-VIDEO
 (Camera-Site Perimeter to Input Transmitter Box)
 P/N: ARDV-05-812-00
 45R14 CABLE-HARNESS POWER
 (03L01TBxx to Camera [Bosch] DECK/MAST)
 P/N: ARDV-05-813-00
 45R15 CABLE-HARNESS POWER
 (03L02CBxx to Expansion Devicenet I/O Module)
 P/N: ARDV-05-814-00
 45R16 CABLE-HARNESS DEVICENET
 (Operator Cab to Operator Chair)
 P/N: ARDV-05-815-00
 45R17 CABLE-HARNESS DEVICENET
 (Operator Chair Left Side Joystick/Keypads)
 P/N: ARDV-05-816-00
 45R18 CABLE-HARNESS DEVICENET
 (Operator Chair Right Side Joystick/Keypads)
 P/N: ARDV-05-817-00
 45R19 CABLE-HARNESS RESOLVER XDCR
 (Multipass Straight Connector)
 P/N: ARDV-05-818-00
 45R20 CABLE-HARNESS RESOLVER XDCR
 (Multipass 90° Connector)
 P/N: ARDV-05-819-00

CAMERAS – HAZCAM/DECK/MAST

P/N(S): (See Below)
 51A01 TITLE SHEET & SHEET INDEX
 51E01 CAMERA – HAZCAM W/18" MOUTING BRACKET (DRILL)
 P/N: ARDV-04-405-00
 51E02 CAMERA – HAZCAM W/6" MOUTING BRACKET (DRILL)
 P/N: ARDV-04-405-01
 51E04 CAMERA [IndigoVision]
 DECK W/MOUNTING BRACKET (DRILL)
 P/N: ARDV-04-405-03

05
SHEET DESCRIPTION

51E05 CAMERA [IndigoVision]
 MAST W/MOUNTING BRACKET (DRILL)
 P/N: ARDV-04-405-04
 51E06 CAMERA [Bosch]
 DECK W/MOUNTING BRACKET (DRILL)
 P/N: ARDV-04-405-05
 51E07 CAMERA [Bosch]
 DECK – CONNECTION DIAGRAM (DRILL)
 51E08 CAMERA [Bosch]
 MAST W/MOUNTING BRACKET (DRILL)
 P/N: ARDV-04-405-06
 51E09 CAMERA [Bosch]
 MAST – CONNECTION DIAGRAM (DRILL)

GPS SYSTEM – ON BOARD (Drill)
 P/N: ARDV-04-419-00
 ALL STOP PUSHBUTTON STATION – COMMAND CENTER
 P/N: ARDV-04-402-00
 64A01 TITLE SHEET & SHEET INDEX
 64D01 TAGS SCHEDULE
 64E01 GPS ANTENNA W/MOUNTING BRACKET

06
SHEET DESCRIPTION

FIELD: CHECK LIST, NOTES & SKETCHES
 99A01 TITLE SHEET & SHEET INDEX
 99B01 CHECK LIST – DOCUMENTATION:
 DEVICENET NETWORK DROP(S)
 99B02 CHECK LIST – DOCUMENTATION:
 DEVICENET CABLE(S)
 99B03 CHECK LIST – DOCUMENTATION:
 ARDVARC KIT # & COMPONENT(S) S/N
 99B07 NOTES:
 DESIGN CHANCES, IMPROVEMENTS, ISSUES, OTHER ...
 99B08 NOTES:
 DESIGN CHANCES, IMPROVEMENTS, ISSUES, OTHER ...
 99B10 SKETCHES:
 CONNECTIONS REQ'D (NOT SHOWN).
 BRACKETS (FIELD FABRICATED), IMPROVEMENTS, ISSUES, OTHER ...
 99B11 SKETCHES:
 CONNECTIONS REQ'D (NOT SHOWN).
 BRACKETS (FIELD FABRICATED), IMPROVEMENTS, ISSUES, OTHER ...



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ENGINEER:
 L.D. MOODY

DRAWN BY:
 J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
 VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

PROJECT

TITLE SHEET & SHEET INDEX

LOC. CODE
 201706

DATE
 02/08/19

CONT. ON
 04

DRAWING NO.
 00

SECTION
 A

SUB. SEC.
 03

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	FILENAME:	20170600A02.dwg
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DEVICE ID LEGEND

A	— ASSEMBLY	INST	— INSTRUMENT	RES	— RESISTOR
AM	— AMMETER	INV	— INVERTER	RH	— RHEOSTAT
AN	— ANNUNCIATOR, HORN	IS	— ISOLATION SWITCH	RTD	— RESISTANCE TEMPERATURE DETECTORE
ANT	— ANTENNA	JS	— JOY STICK	S	— SWITCH
BCN	— BEACON	KS	— KEY SWITCH	SB	— SHORTING BLOCK
BRK	— BRAKE	L	— INDUCTOR	SCR	— SILICON CONTROLLED RECTIFIER
C	— CAPACITOR	LCR	— CONTROL RELAY, LATCHING	SN	— SIREN, BUZZER, HORN
CAM	— CAMERA	LED	— LIGHT EMITTING DIODE	SNSR	— SENSOR
CB	— CIRCUIT BREAKER	LGT	— LIGHTING FIXTURE	SOL	— SOLENOID
CF	— COOLING FAN	LPB	— PUSHBUTTON, ILLUMINATED	SS	— SELECTOR SWITCH
CON	— CONNECTOR	LR	— LINE REACTOR	SSR	— SOLID STATE RELAY
CPU	— CENTRAL PROCESSING UNIT	LS	— LIMIT SWITCH	SUP	— SURGE PROTECTIVE DEVICE
CR	— CONTROL RELAY	LSC	— LASER SCANNER	SV	— SOLENOID VALVE
CS	— CAB SIDE	LSS	— SELECTOR SWITCH, ILLUMINATED	SYN	— SYNCHRO OR RESOLVER
CT	— CURRENT TRANSFORMER	LT	— PILOT LIGHT	T	— TRANSFORMER
CTR	— COUNTER	M	— MOTOR STARTER	TACH	— TACHOMETER GENERATOR
D	— DIODE	MCR	— CONTROL RELAY, MASTER	TB	— TERMINAL BLOCK
DE	— DRILL END	MD	— MOTION DETECTOR	TC	— THERMOCOUPLE
DB	— DYNAMIC BRAKE	MON	— MONITOR	TM	— THERMISTOR
DI	— DIN RAIL	MOV	— METAL OXIDE VARISTOR	TR	— TIMER RELAY
DM	— DEMAND METER	MSP	— MOTOR STARTER PROTECTOR	TS	— TEMPERATURE SWITCH
DR	— DRIVE	MTR	— MOTOR	TU	— TRIP UNIT
DS	— DISCONNECT SWITCH	NDE	— NON DRILL END	TWS	— THUMB WHEEL SWITCH
EN	— ENCLOSURE, BOX	NCS	— NON CAB SIDE	UV	— UNDervoltage TRIP UNIT
ENC	— ENCODER	NODE	— DEVICE, DEVICENET NETWORK	VAR	— VARISTOR
ESCR	— RELAY, E-STOP/SAFETY	OL	— OVERLOAD RELAY	VC	— VACUUM CONTACTOR
ESPB	— PUSHBUTTON, EMERGENCY STOP	OP	— OPERATOR PANEL	VCB	— VACUUM CIRCUIT BREAKER
ETHS	— ETHERNET SWITCH	PB	— PUSHBUTTON	VM	— VOLTMETER
FAN	— FAN, BLOWER, VENTILLATOR	PC	— PERSONAL COMPUTER	VX	— VLINX SERVER
FLD	— FIELD	PCB	— PRINTED CIRCUIT BOARD	W	— CABLE, WIRE HARNESS, BUSBAR
FLS	— FLOAT SWITCH	PDB	— POWER DISTRIBUTION BLOCK	WAP	— WIRELESS ACCESS POINT
FS	— FLOW SWITCH	PE	— PHOTOELECTRIC DEVICE	XDCR	— TRANSDUCER
FTS	— FOOT SWITCH	PIC	— PANEL INTERFACE CONNECTOR		
FU	— FUSE	PLC	— PROGRAMMABLE LOGIC CONTROLLER		
GB	— GROUND BAR	PLR	— PHASE LOSS, UNDervoltage, SEQUENCE RELAY		
GEN	— GENERATOR	POT	— POTENTIOMETER		
GFR	— GROUND FAULT RELAY	PS	— PRESSURE SWITCH		
GND	— GROUND	PT	— POTENTIAL TRANSFORMER		
GPS	— GLOBAL POSITION SYSTEM	PWS	— POWER SUPPLY		
HM	— HOUR METER	PX	— PROXIMITY SWITCH		
HMI	— HUMAN-MACHINE INTERFACE	Q	— TRANSISTOR		
HTR	— HEATER	REC	— RECTIFIER		
I/O	— INPUT/OUTPUT DEVICE	RECP	— RECEPTACLE		



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

DRAWING STANDARDS & PRACTICES

LEGEND - DIVICE I.D.

LOC. CODE

DATE

02/08/19

CONT. ON

07

DRAWING NO.

SECTION

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SUB. SEC.

03

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM

FILENAME:	20170600B03.dwg
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DIRECTIONAL DESIGNATORS

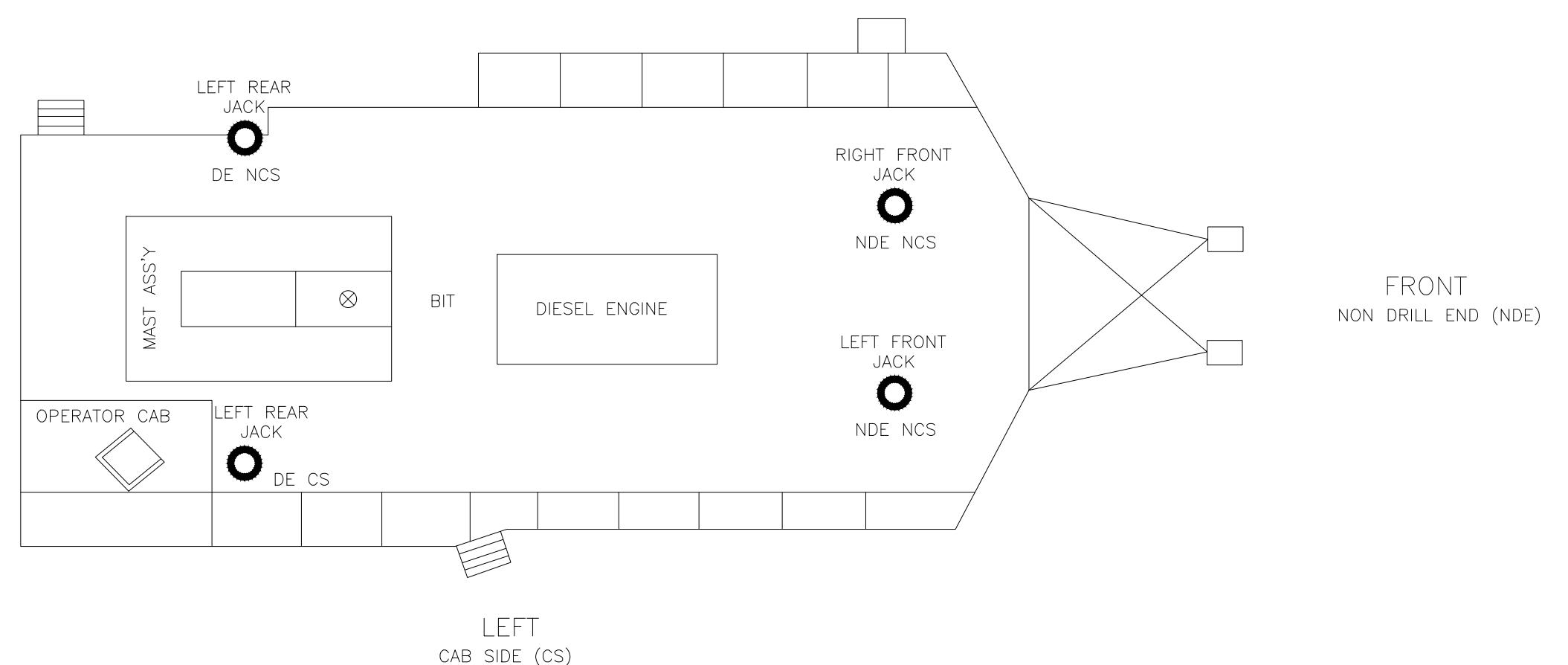
FRONT/BACK LEFT/RIGHT ARE RELATIVE

TO THE LOCATION OF THE OPERATOR CAB AND BIT

EXAMPLE: LEVELING JACKS—LOCATION DESIGNATIONS

RIGHT
NON CAB SIDE (NCS)

BACK
DRILL END (DE)



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DRAWN BY:
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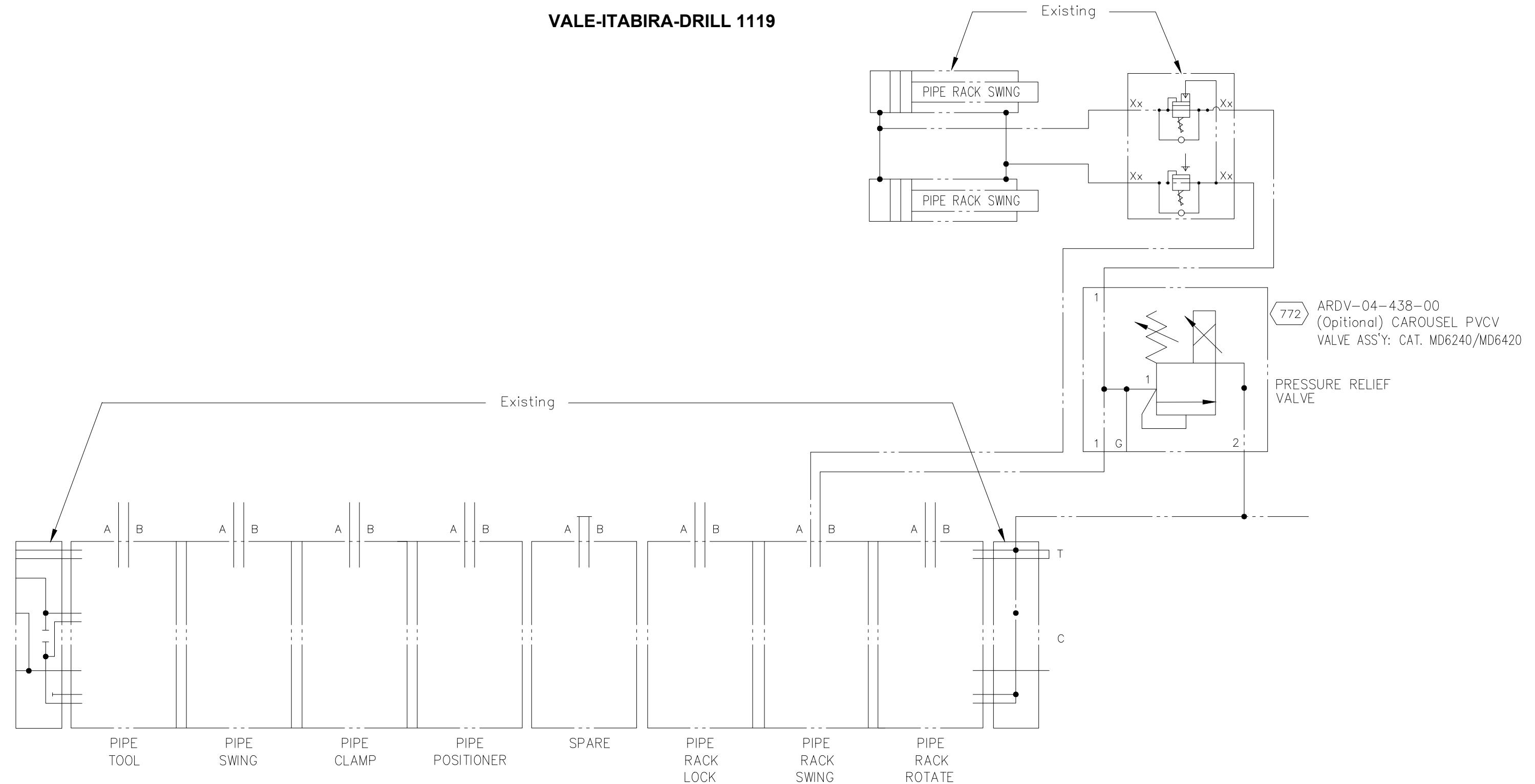
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DRAWING STANDARDS & PRACTICES
DIRECTIONAL DESIGNATORS

LOC. CODE	DATE	CONT. ON
201706	02/08/19	09
DRAWING NO.	SECTION	SUB. SEC.
201706	00	B 05

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

VALE-ITABIRA-DRILL 1119



HYDRAULIC SCHEMATIC / MULTI-PASS CAROUSEL

**INTERNAL VALVE INTERCONNECTIONS
 OMITTED FOR CLARITY**

LEGEND
REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY
APPROVED BY:

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM
PROJECT

FILENAME:
20170600C01.dwg
MULTI-PASS CAROUSEL HYDRAULIC SCHEMATIC

LOC. CODE	DATE	CONT. ON
	02/08/19	FNL
DRAWING NO.	SECTION	SUB. SEC.
201706	00	C 01

VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

PDE ENCLOSURE

P/N: ARDV-03-400-00

SHEET	DESCRIPTION
03A01	TITLE SHEET & INDEX
03D01	TAG SCHEDULE
03E01	DOOR LAYOUT
03E02	BOTTOM CUTOUT & ASSEMBLY
03F01	BACK PANEL LAYOUT
03G01	CB(S)/PWS/UPS LAYOUT
03G02	L01TB1 TERMINAL BLOCK/CB(S) LAYOUT
03L01	24VDC POWER DISTRIBUTION
03L02	24VDC POWER DISTRIBUTION
03L03	24VDC POWER DISTRIBUTION



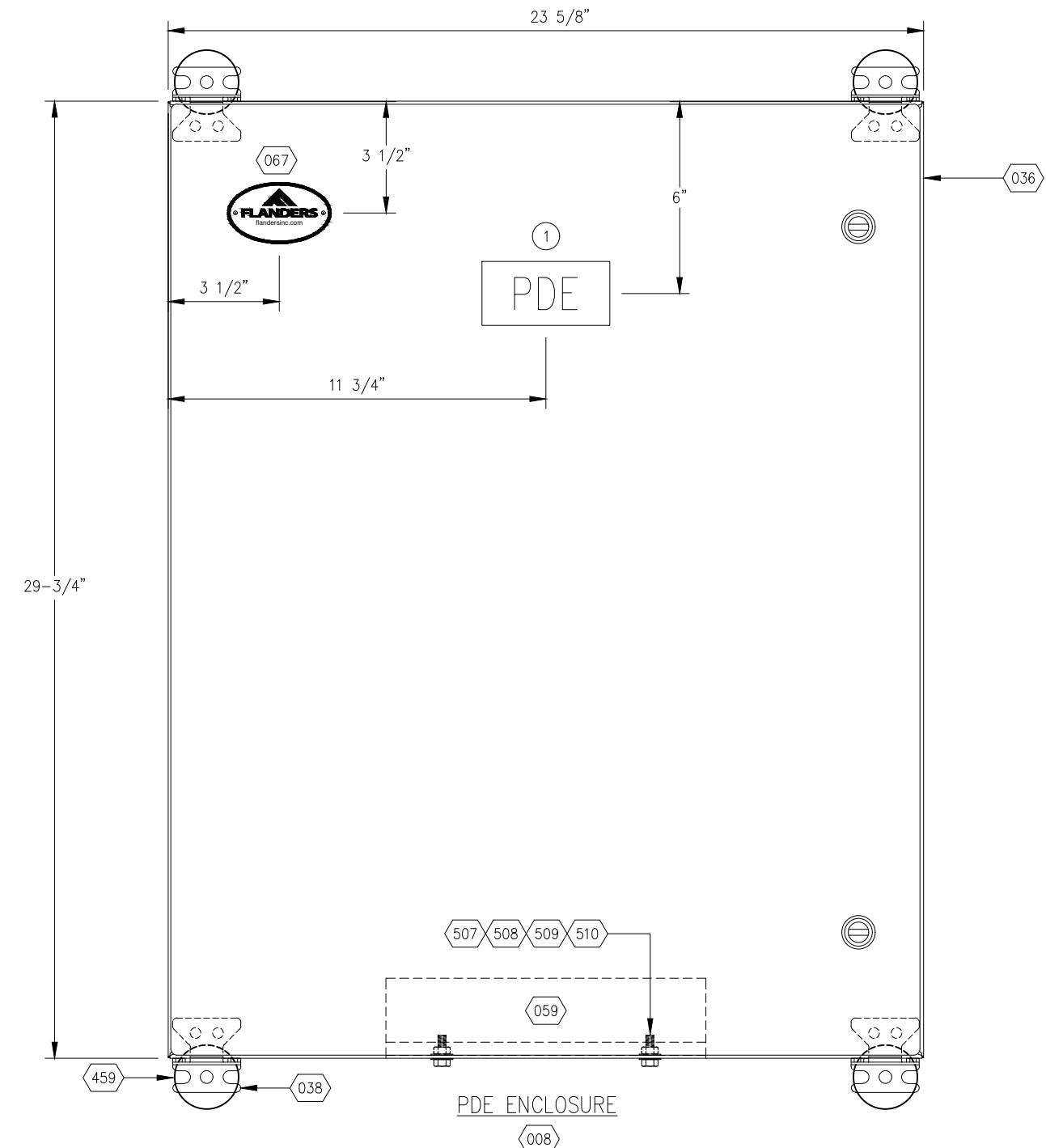
FLANDERS
www.flandersinc.com

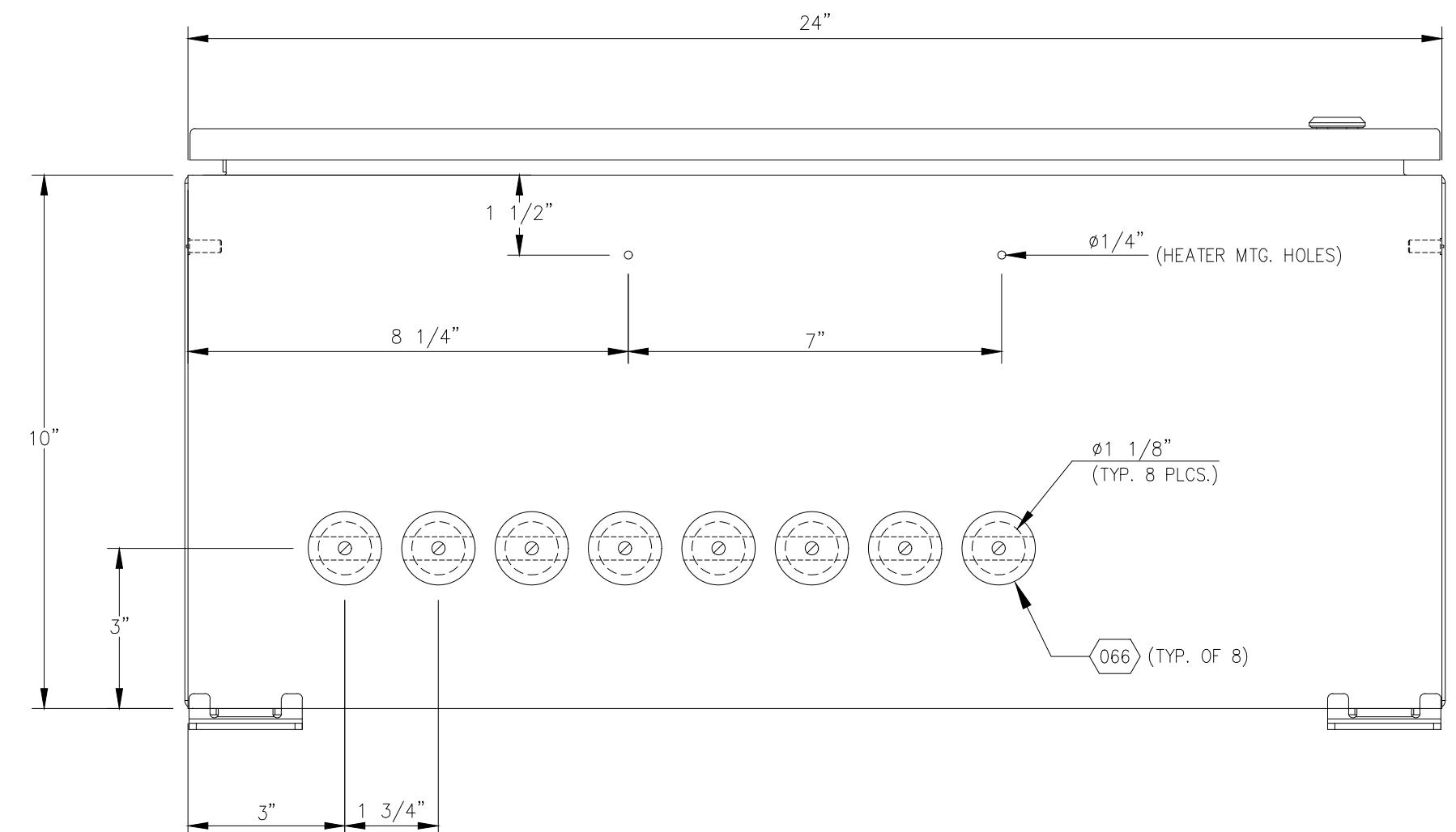
ENGINEER:
L.D. MOOD

DRAWN BY:
J.C. STIT

DRAWING TITLE:
VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM
PDE ENCLOSURE
TITLE SHEET & SHEET INDEX

LOC. CODE	DATE	CONT. ON	
	02/08/19	02	
DRAWING NO.	SECTION	SUB. SEC.	HEET
201706	03	A	01





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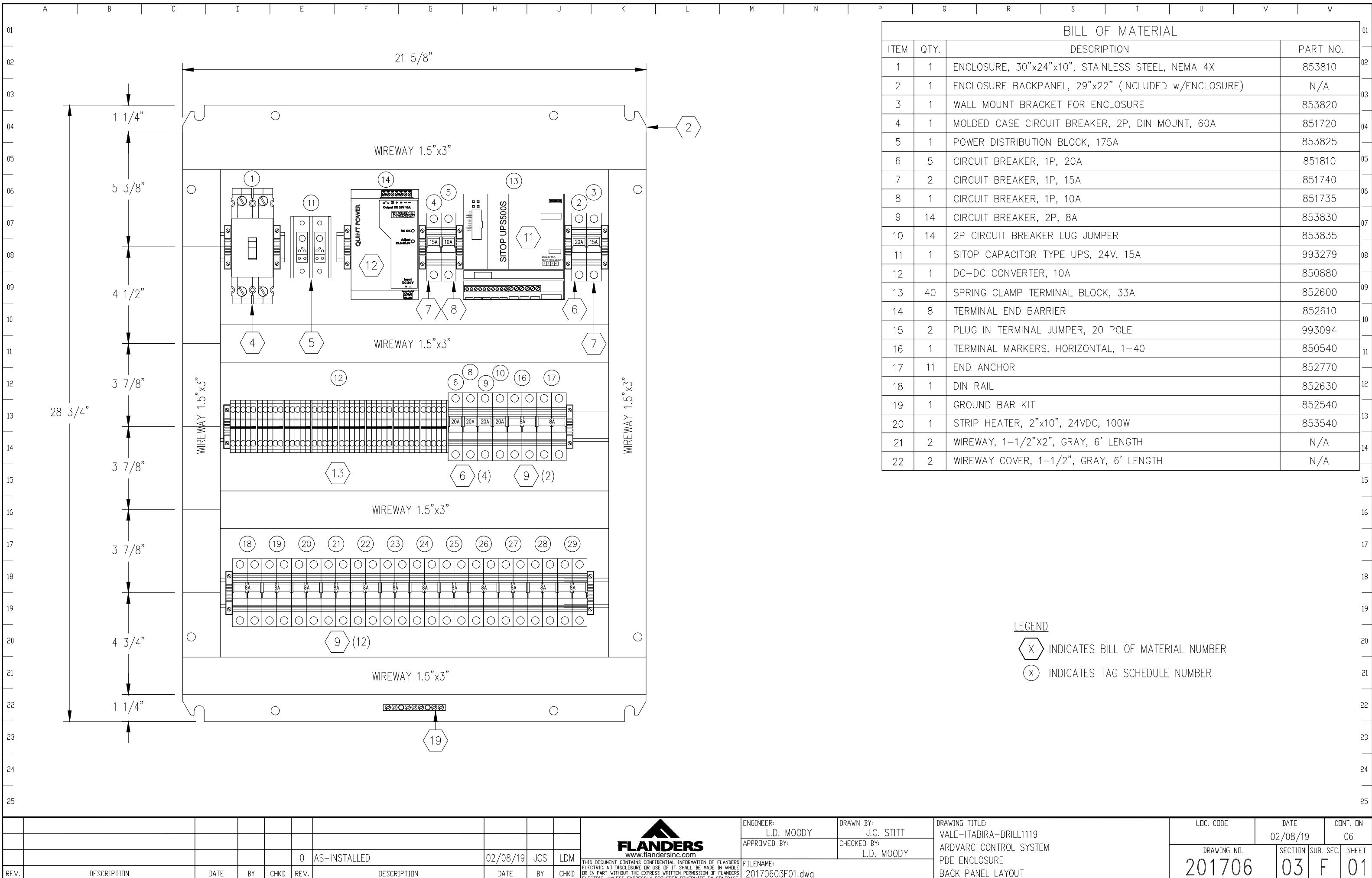
DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
PDE ENCLOSURE
BOTTOM CUTOUT & ASSEMBLY

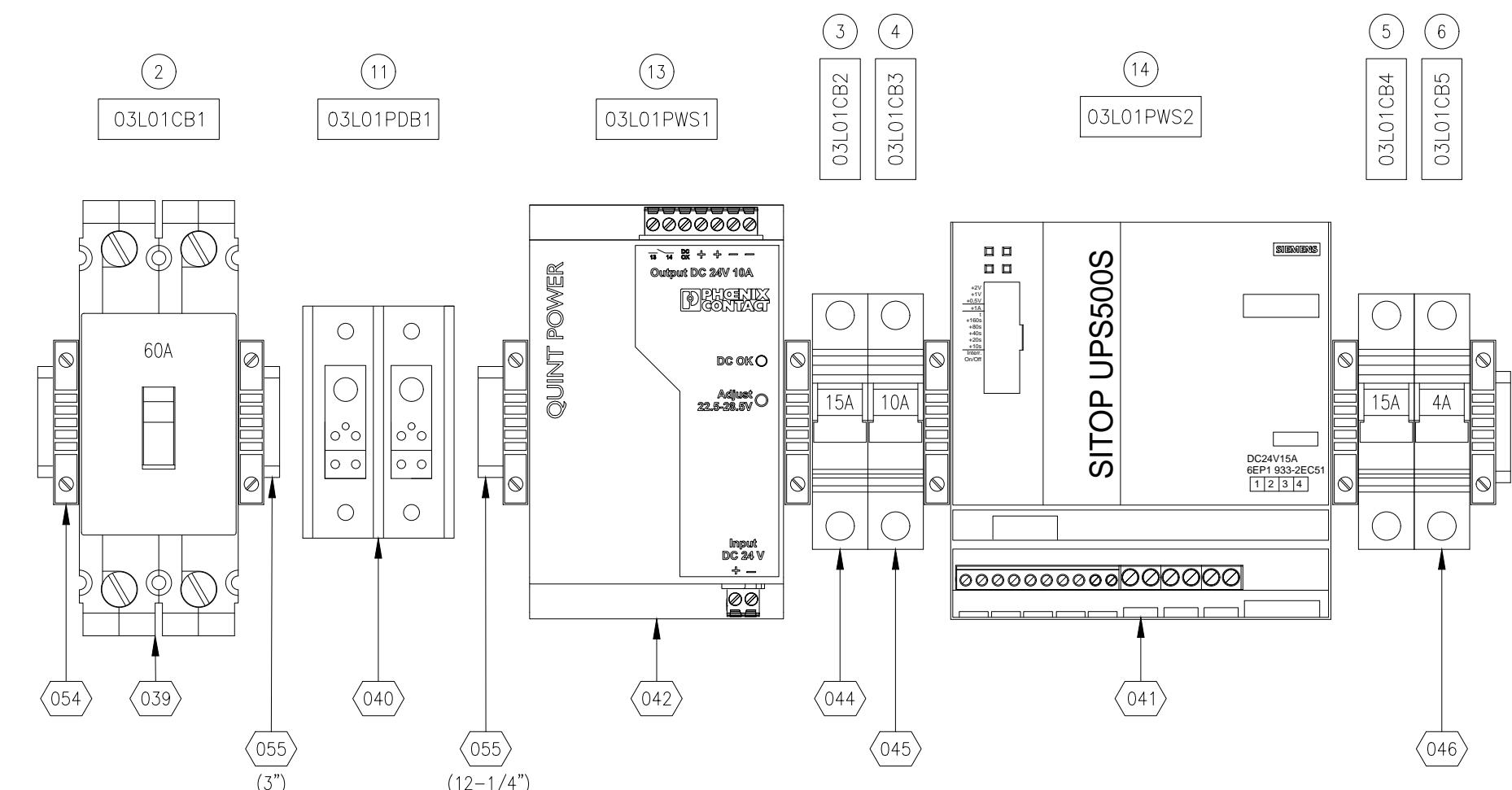
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201706 02/08/19 05

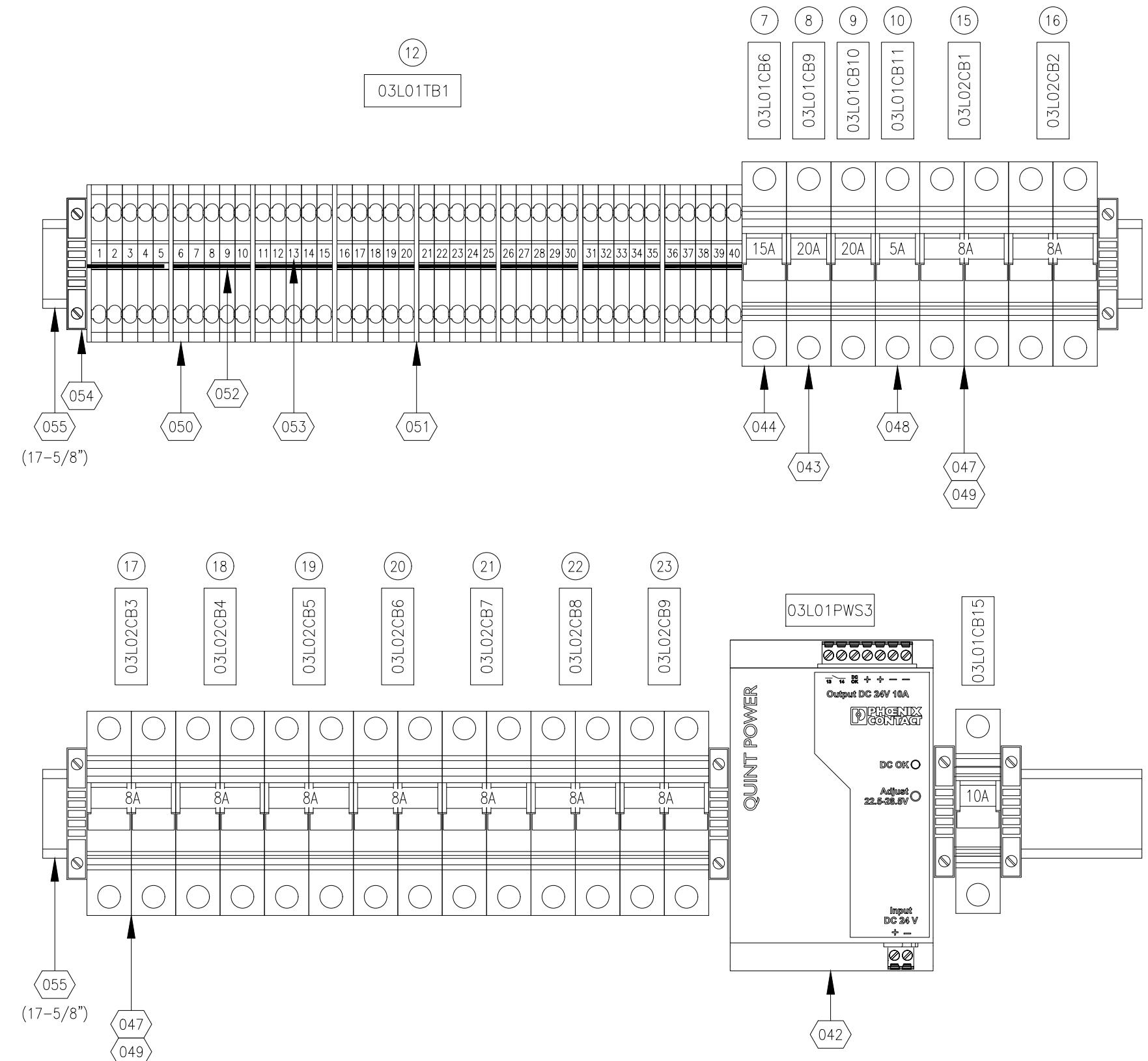
DRAWING NO. SECTION SUB. SEC. SHEET
201706 03 E 02

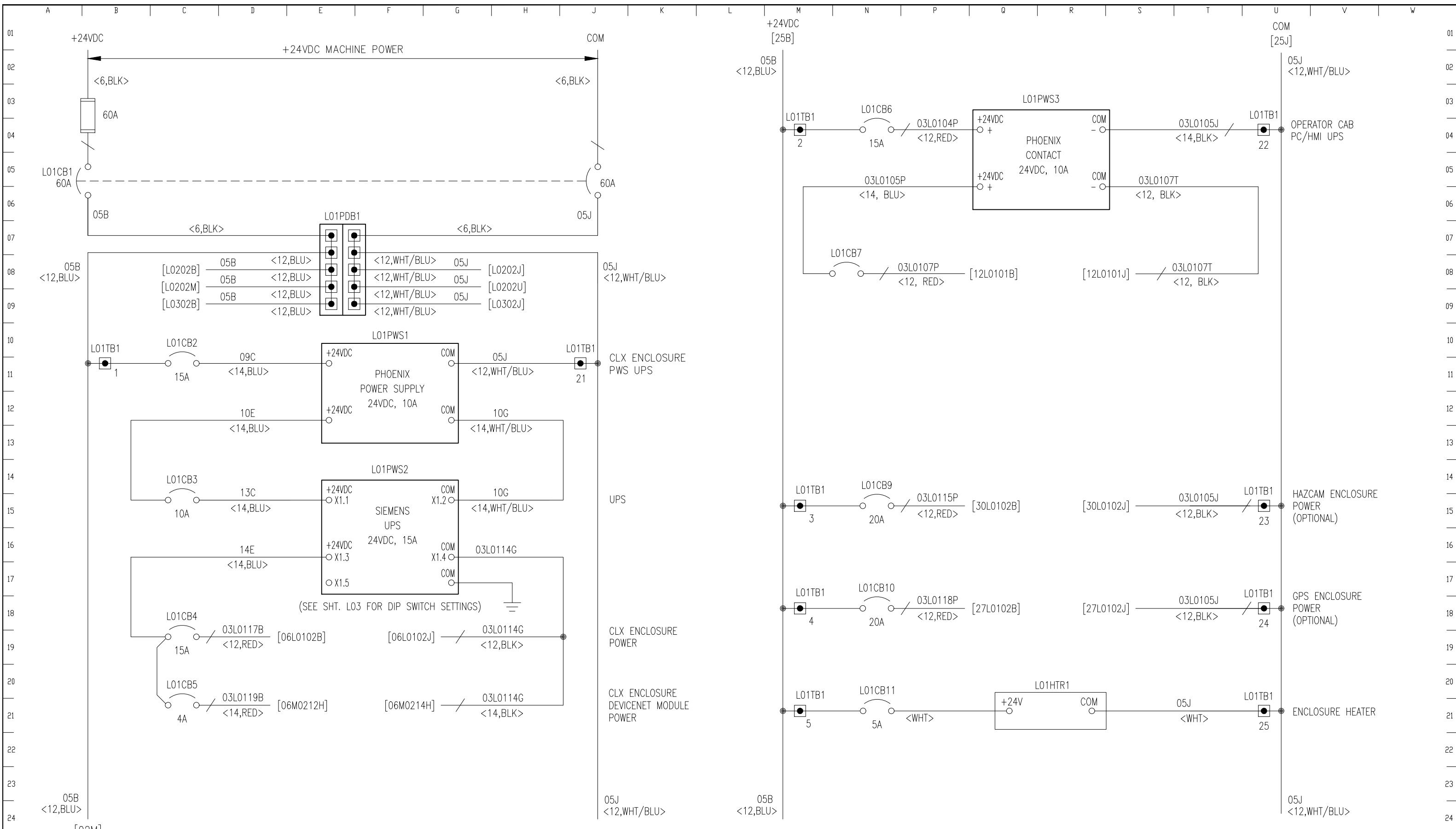
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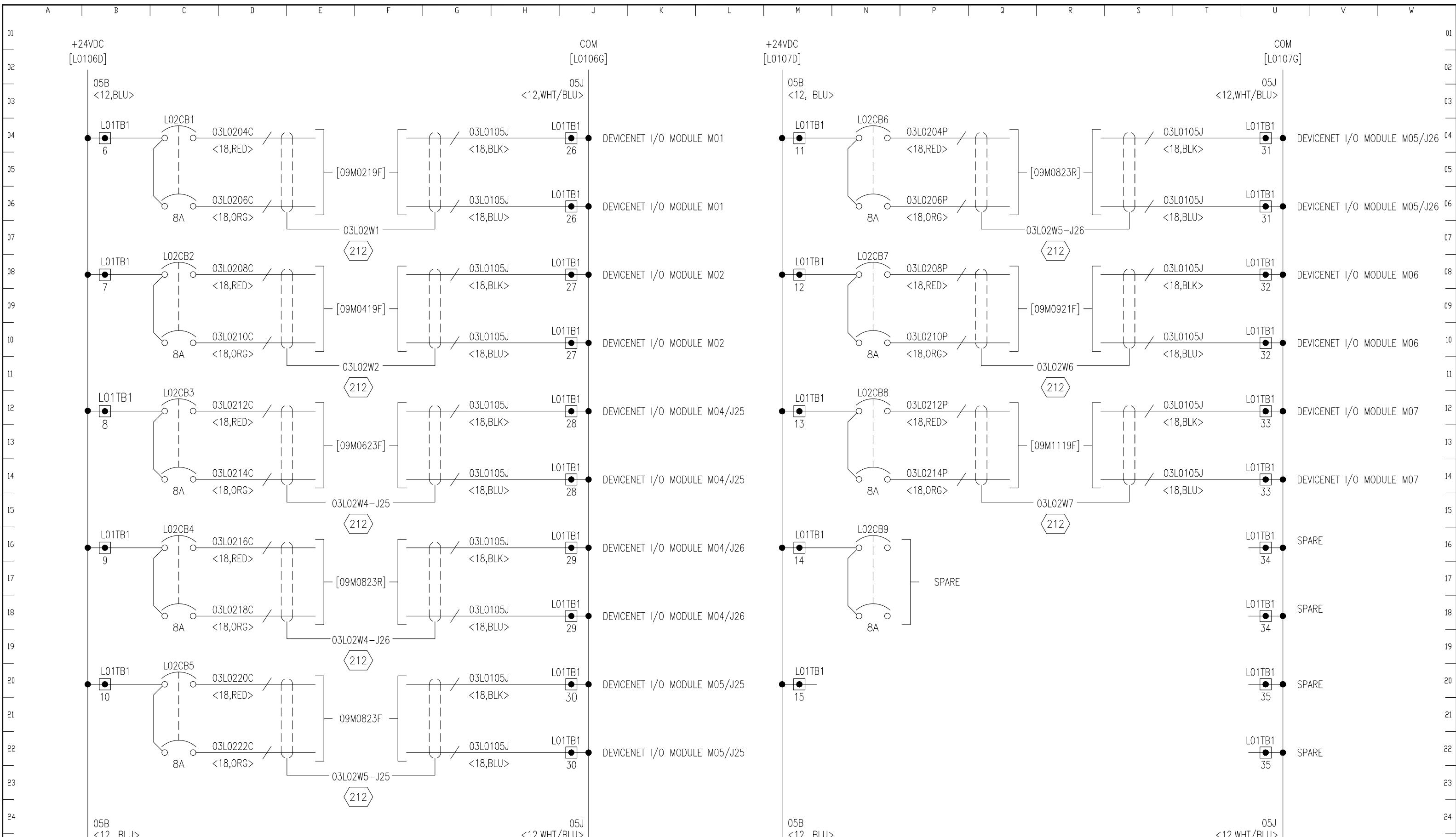
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REV.					FILENAME:			













VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM

CLX ENCLOSURE

P/N: ARDV-03-401-00

SHEET	DESCRIPTION
06A01	TITLE SHEET & SHEET INDEX
06D01	TAGS SCHEDULE
06E01	DOOR LAYOUT
06E02	BOTTOM CUTOUT & ASSEMBLY
06F01	BACK PANEL LAYOUT
06G01	L01TB1/M02TB1 TERMINAL BLOCK M06ETHS1 LAYOUT
06L01	24VDC POWER DISTRIBUTION
06M01	CLX RACK LAYOUT
06M02	SLOT 3 DEVICENET BRIDGE
06M03	SLOT 4 ANALOG OUTPUT MODULE - (EARS) (OPTION)
06M04	SLOT 5 RESOLVER MODULE - (OPTIONAL) MULTIPASS
06M05	SLOT 6 RESOLVER MODULE - ROTARY HEAD
06M05	M06ETHS1 ETHERNET SWITCH CONNECTIONS



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ENGINEER:

L.D. MOODY

DRAWN BY:

J.C. STITT

APPROVED BY:

L.D. MOODY

CHECKED BY:

L.D. MOODY

DRAWING TITLE:

VALE-ITABIRA-DRILL 1119
 ARDVARC CONTROL SYSTEM
 CLX ENCLOSURE
 TITLE SHEET & SHEET INDEX

LOC. CODE

DATE
 02/08/19
 02

DRAWING NO.

SECTION
 06

SUB. SEC.
 A

01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	FILENAME:
				20170606A01.dwg

201706	06	A	01
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TAG SCHEDULE				
TAG NO.	SIZE	TAG COLOR	TEXT COLOR	TAG TEXT
(1)	2" x 4"	WHITE	BLACK	CLX
(2)	1/2" x 1-1/2"	WHITE	BLACK	06L01TB1
(3)	1/2" x 1-3/4"	WHITE	BLACK	06M06ETHS1
(4)	1/2" x 1-1/2"	WHITE	BLACK	06M02TB1
(5)	1/2" x 1-1/2"	WHITE	BLACK	06L01CB1
(6)	1/2" x 1-1/2"	WHITE	BLACK	06L01HTR1
(7)	1/2" x 1-1/2"	WHITE	BLACK	06F01GB1
(8)	NOT USED			
(9)	1/2" x 1-3/4"	WHITE	BLACK	06M06ETHS2

SERIAL NUMBER:
XXX-XXX

P/N: TAG-SST-200



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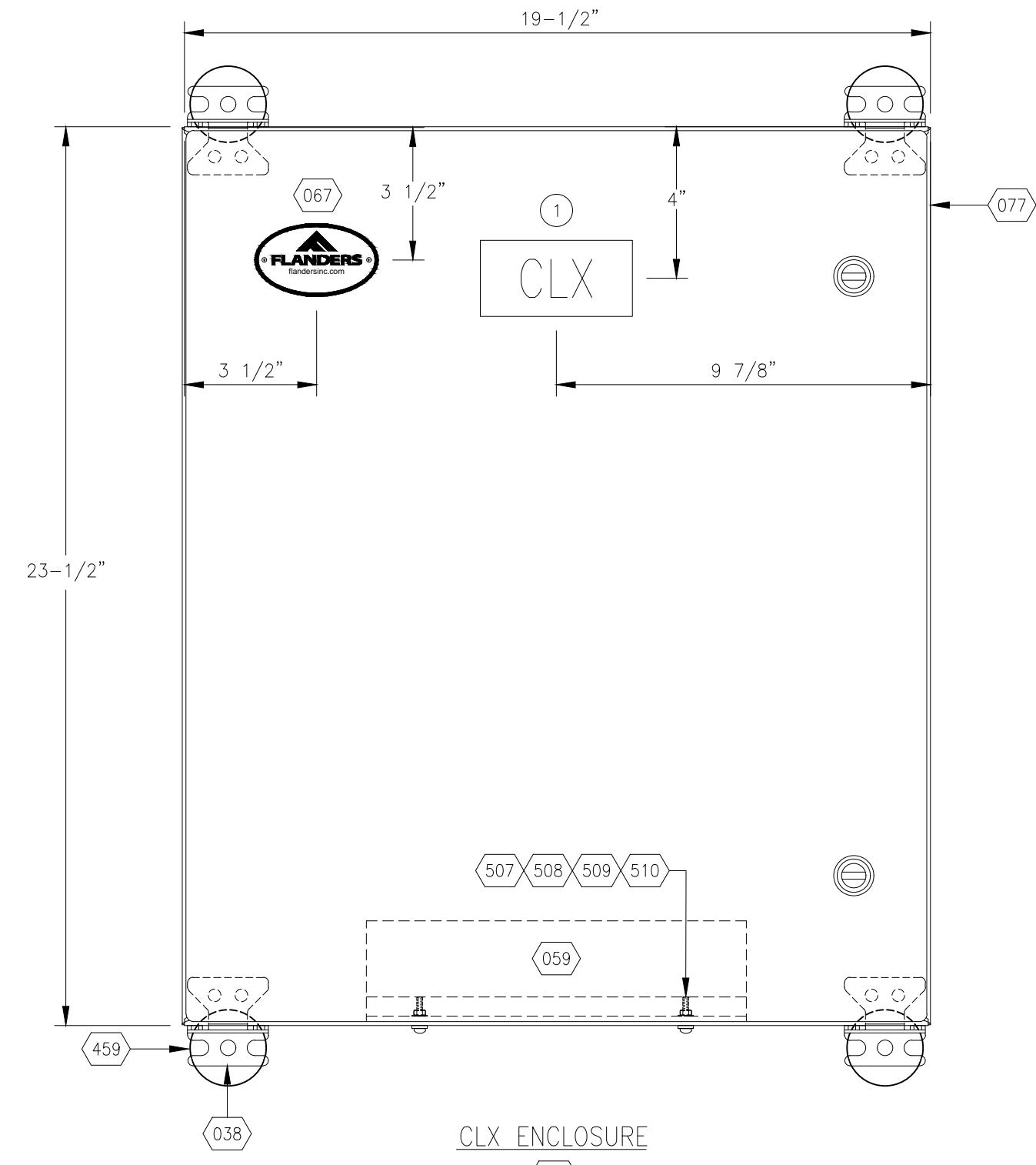
ENGINEER: J. P. MOODY

L.D. MOOD

LANDERS
N WHOLE
LANDERS

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
CLX ENCLOSURE
TAGS SCHEDULE

LOC. CODE	DATE 02/08/19	CONT. ON 03	
DRAWING NO. 201706	SECTION 06	SUB. SEC. D	SHEET 01



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ENGINEER:

L.D. MOODY

DRAWN BY:

J.C. STITT

APPROVED BY:

L.D. MOODY

CHECKED BY:

L.D. MOODY

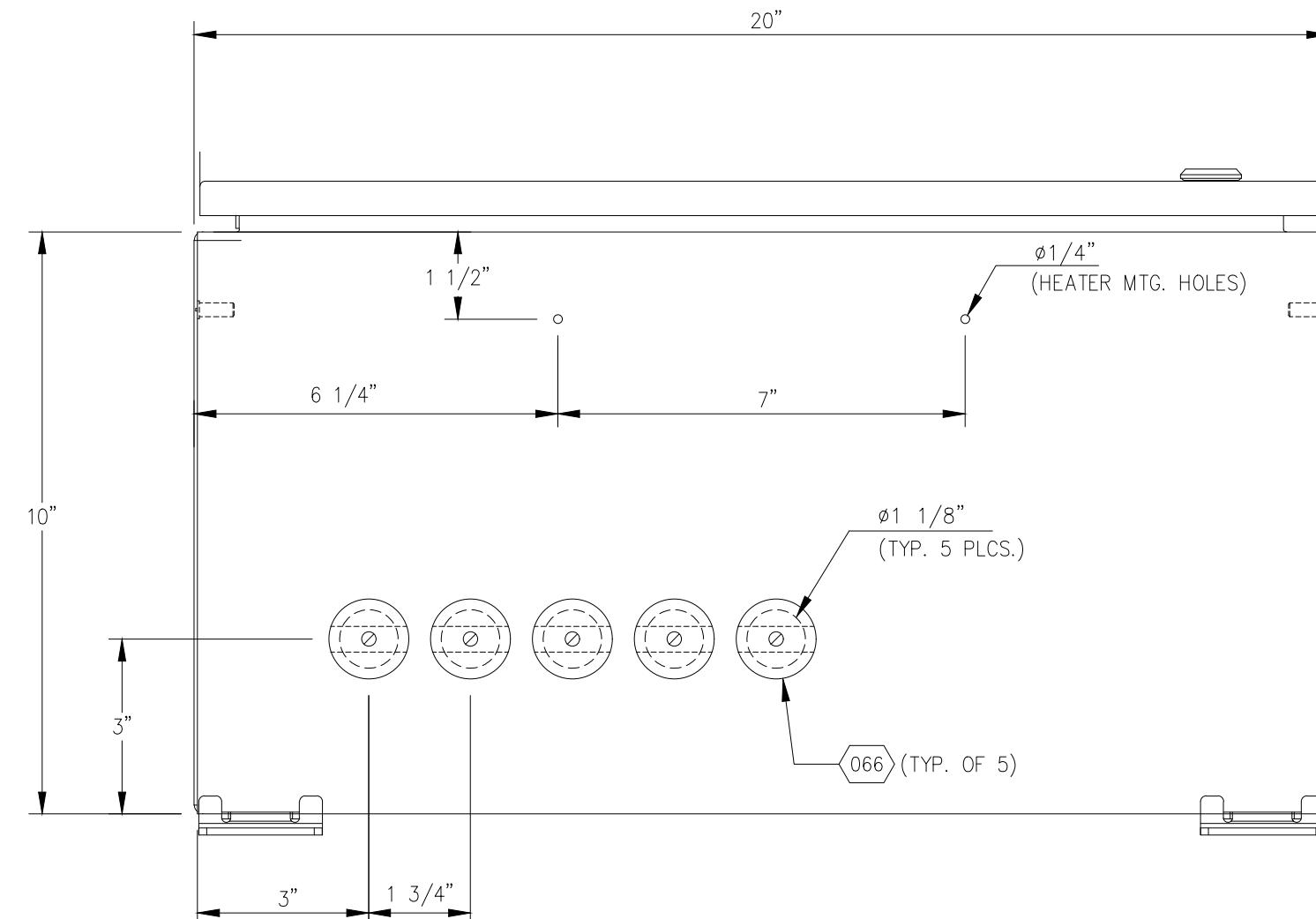
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VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
CLX ENCLOSURE
DOOR LAYOUT

LOC. CODE DATE CONT. ON
201706 02/08/19 04

DRAWING NO. SECTION SUB. SEC. SHEET
201706 06 E 01

				0 AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
REV.					FILENAME:			



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

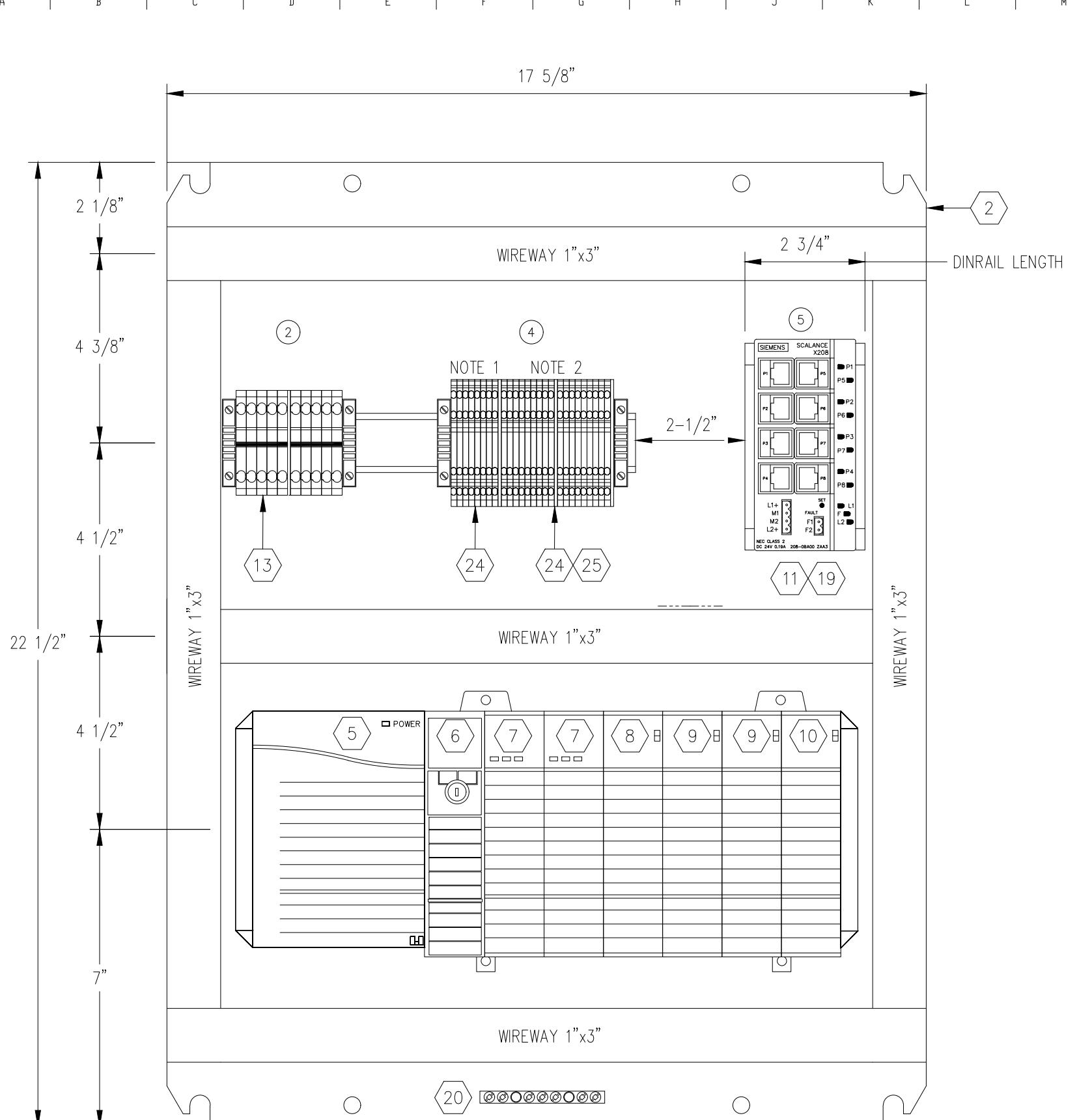
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VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
CLX ENCLOSURE
BOTTOM CUTOUT & ASSEMBLY

LOC. CODE DATE CONT. ON
201706 02/08/19 05

DRAWING NO. SECTION SUB. SEC. SHEET
201706 06 E 02

				0 AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
REV.					FILENAME:			



BILL OF MATERIAL			
ITEM	QTY.	DESCRIPTION	PART NO.
1	1	ENCLOSURE, 24"x20"x10", STAINLESS STEEL, NEMA 4X	853815
2	1	ENCLOSURE BACKPANEL, 22"x18" (INCLUDED w/ENCLOSURE)	N/A
3	1	WALL MOUNT BRACKET FOR ENCLOSURE	853820
4	1	CONTROLLOGIX CHASSIS, 7 SLOT	851980
5	1	CONTROLLOGIX POWER SUPPLY, 24VDC/24VDC, 13A	851110
6	1	CONTROLLOGIX PROCESSOR, LOGIX5561 W/4MB MEMORY	852160
7	2	CONTROLLOGIX ENET/IP 10/100 BRIDGE MODULE	851130
8	1	CONTROLLOGIX DEVICENET BRIDGE	853630
9	2	SLOT FILLER	853850
10	1	RESOLVER MODULE	851600
11	1	SCALANCE X108 ETHERNET SWITCH	851530
12	2	CAT5E ETHERNET NETWORK CABLE, 3' LENGTH	853845
13	10	SPRING CLAMP TERMINAL BLOCK, 33A	852600
14	2	TERMINAL END BARRIER	852610
15	1	PLUG IN TERMINAL JUMPER, 20 POLE	993094
16	1	TERMINAL MARKERS, HORIZONTAL, 1-40	850540
17	4	END ANCHOR	852770
18	1	DIN RAIL	N/A
19	1	S7 DIN RAIL	853840
20	1	GROUND BAR KIT	852540
21	1	STRIP HEATER, 2"x10", 24VDC, 100W	853540
22	2	WIREWAY, 1"x2", GRAY, 6' LENGTH	N/A
23	2	WIREWAY COVER, 1", GRAY, 6' LENGTH	N/A
24	26	SPRING CLAMP TERMINAL BLOCK, 10A (VLINE SERIAL CONN. TERMS.)	991640
25			
26	3	TERMINAL END BARRIER	852270
27	1	TERMINAL MARKERS, HORIZONTAL, 1-40	850540
28			
29			
30			

 INDICATES BILL OF MATERIAL NUMBER

 INDICATES IAC SCHEDULE NUMBER

- NOTES:

 1. TERM 1-8 ALLOCATED FOR DEVICE NET TERMINATIONS IF NEEDED.
 2. TERM 9-27 ALLOCATED FOR ONE TOUCH

The Elanders logo consists of a stylized mountain peak icon above the word "ELANDERS" in a bold, sans-serif font.

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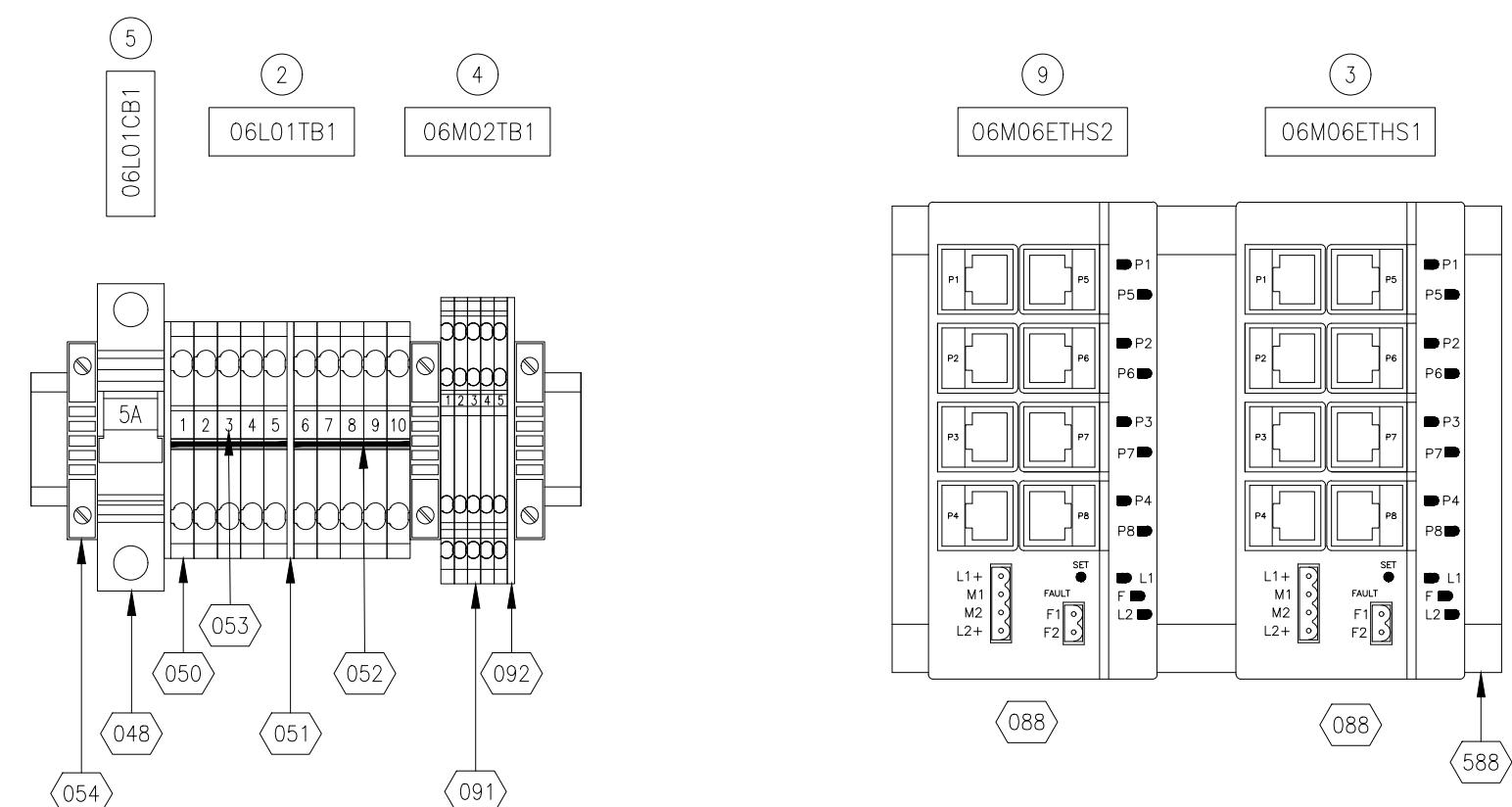
ENGINEER:
L.D.
APPROVED:

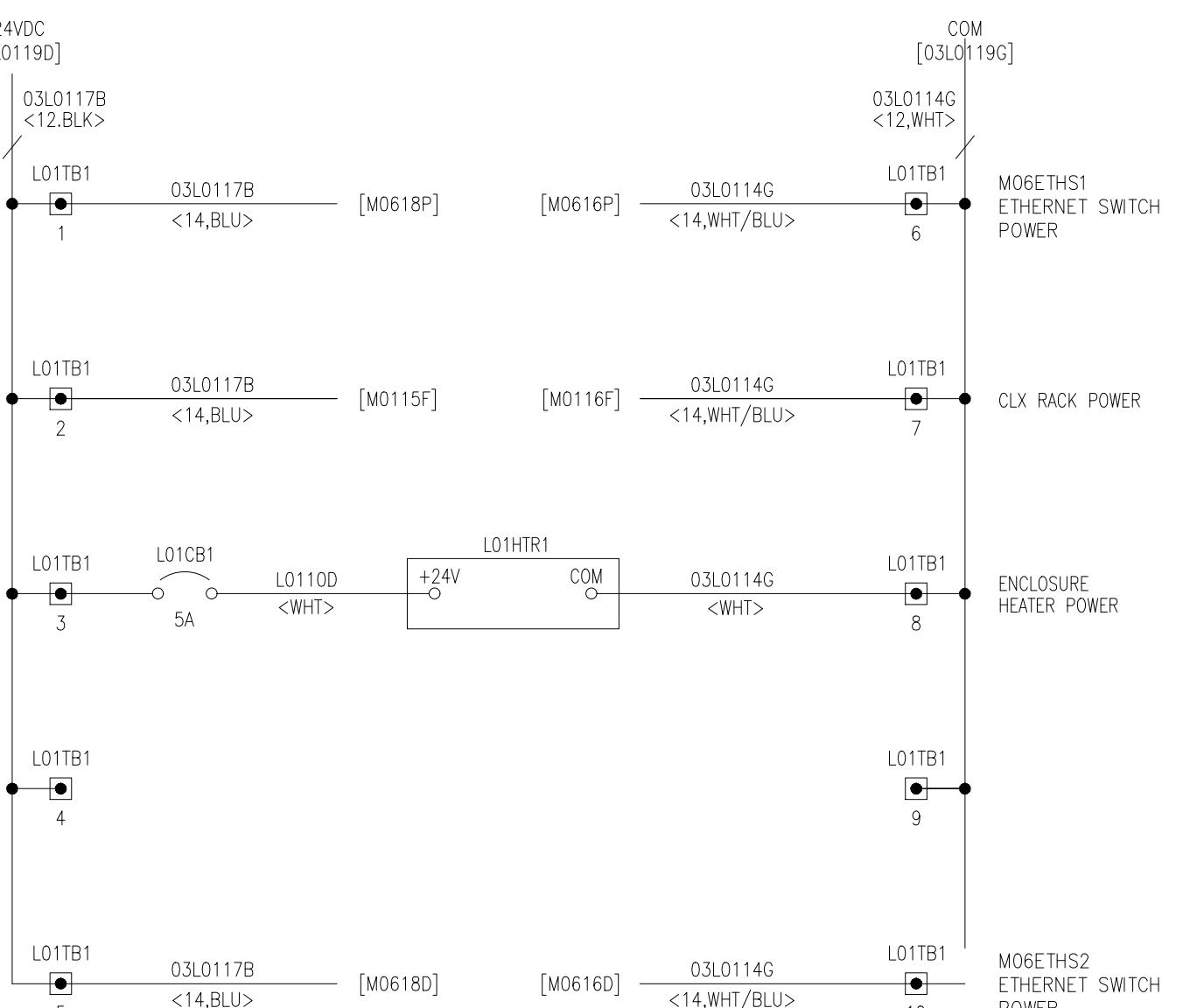
ENGINEER:
L.D.
APPROVED:

ODY	DRA
	CHE

BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119
BY: D.M. MOODY	ARDVARC CONTROL SYSTEM CLX ENCLOSURE BACK PANEL LAYOUT

LOC. CODE	DATE	CONT. ON	
	02/08/19	06	
DRAWING NO.	SECTION	SUB. SEC.	HEET
201706	06	F	01





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ENGINEER:
L.D. MOODY
APPROVED BY:

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

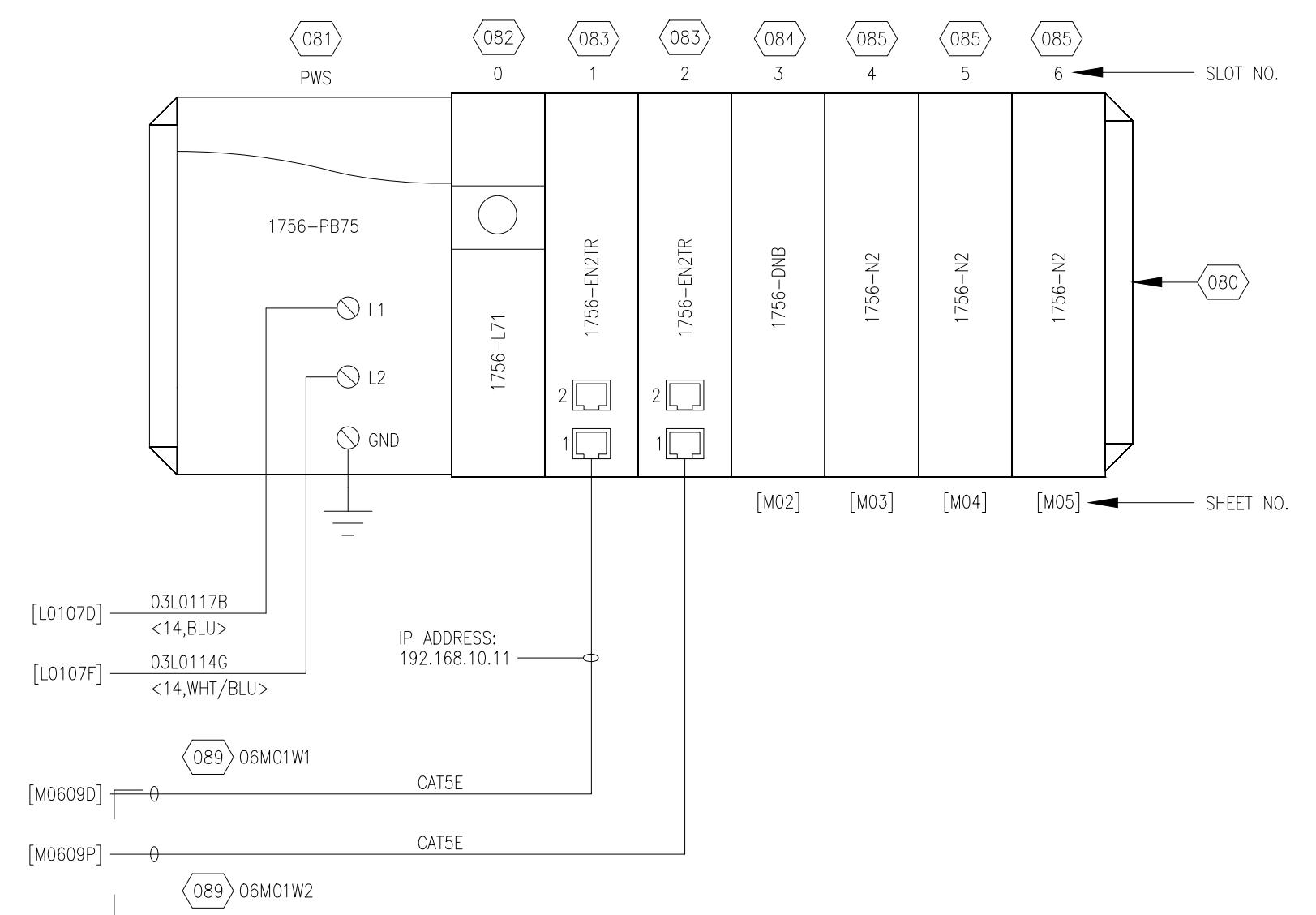
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VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM

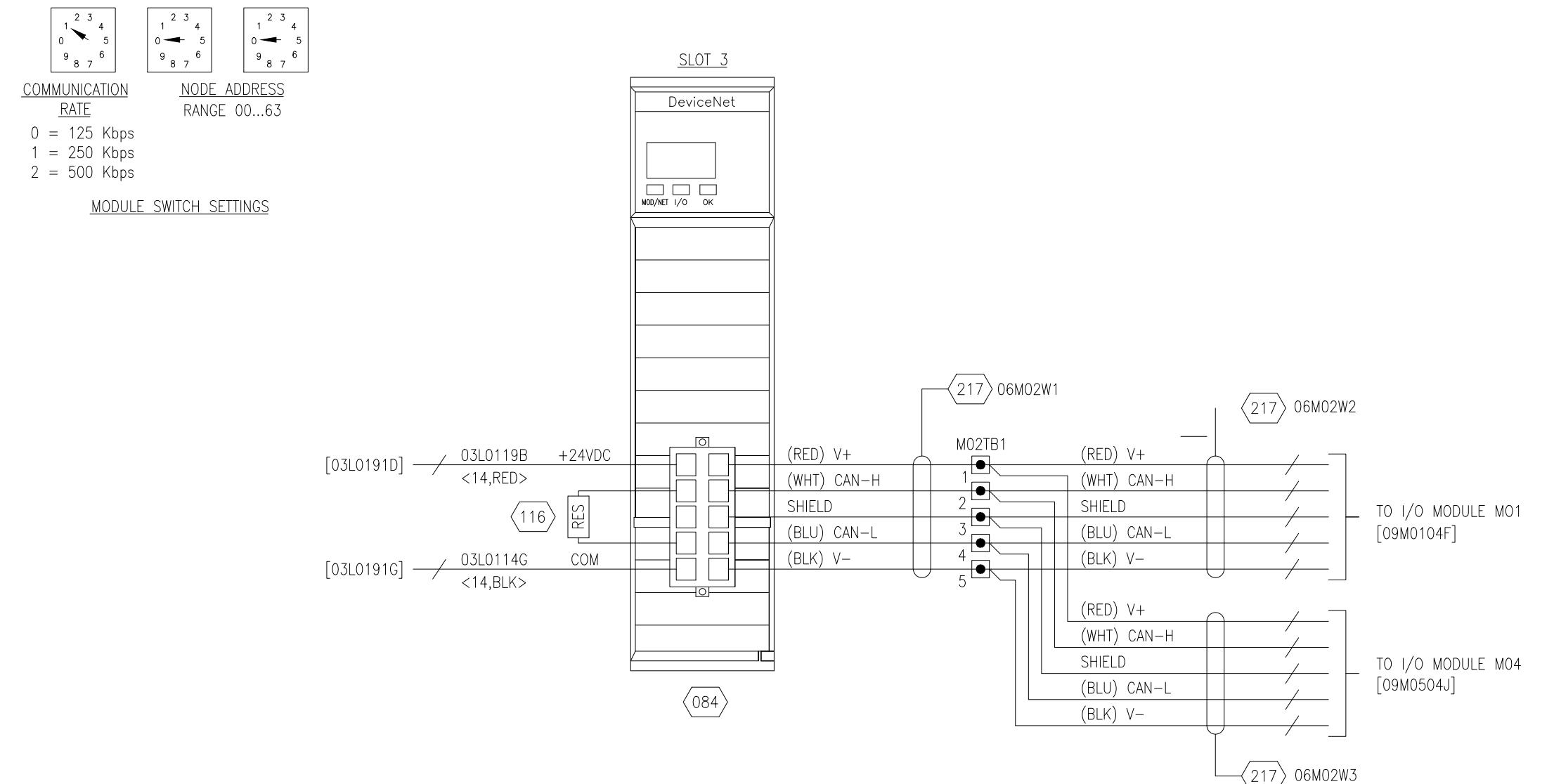
CLX ENCLOSURE
24VDC POWER DISTRIBUTION

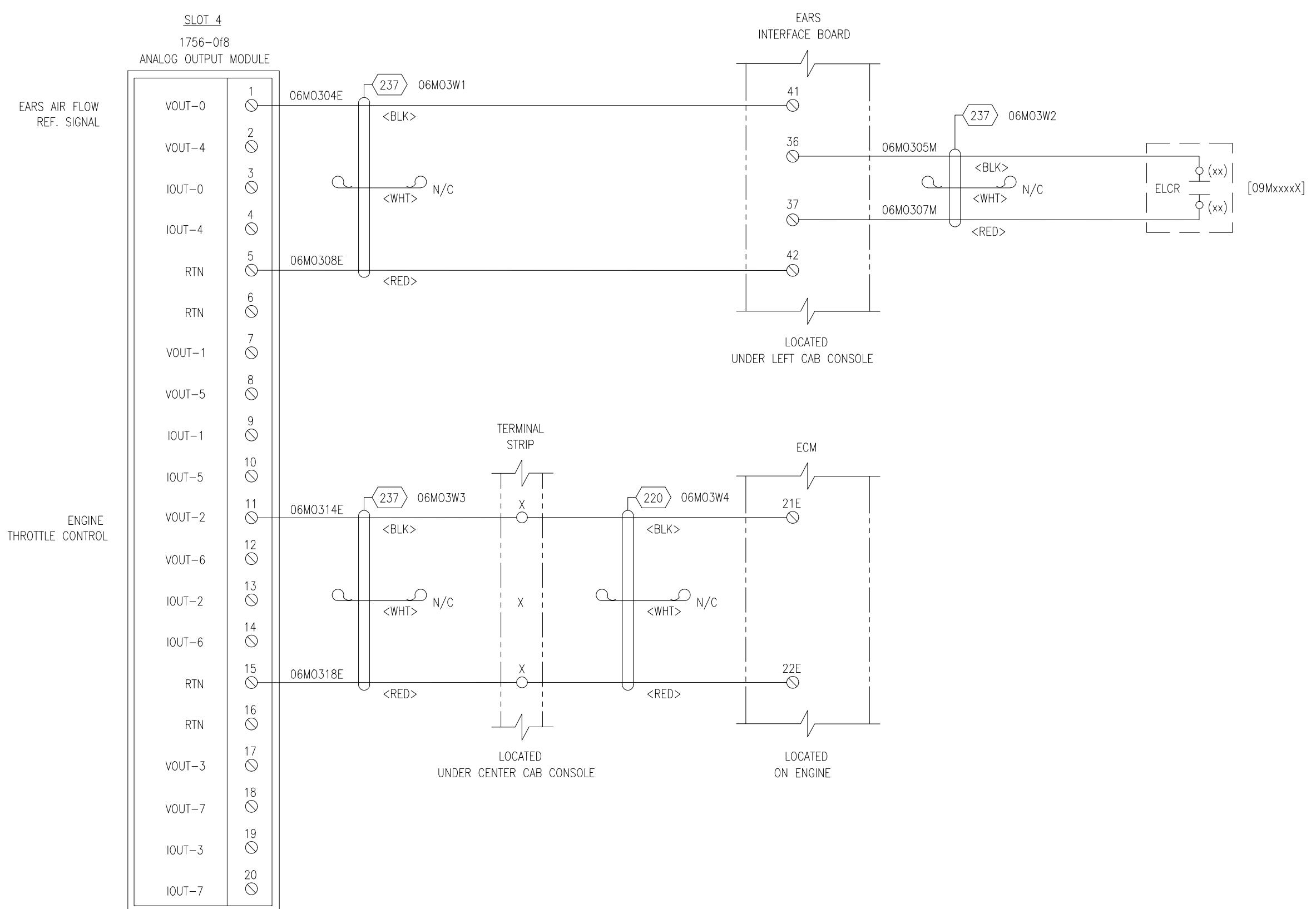
LOC. CODE
201706
DATE
02/08/19
CONT. ON
08

DRAWING NO.
201706
SECTION
06
SUB. SEC.
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SHEET
01

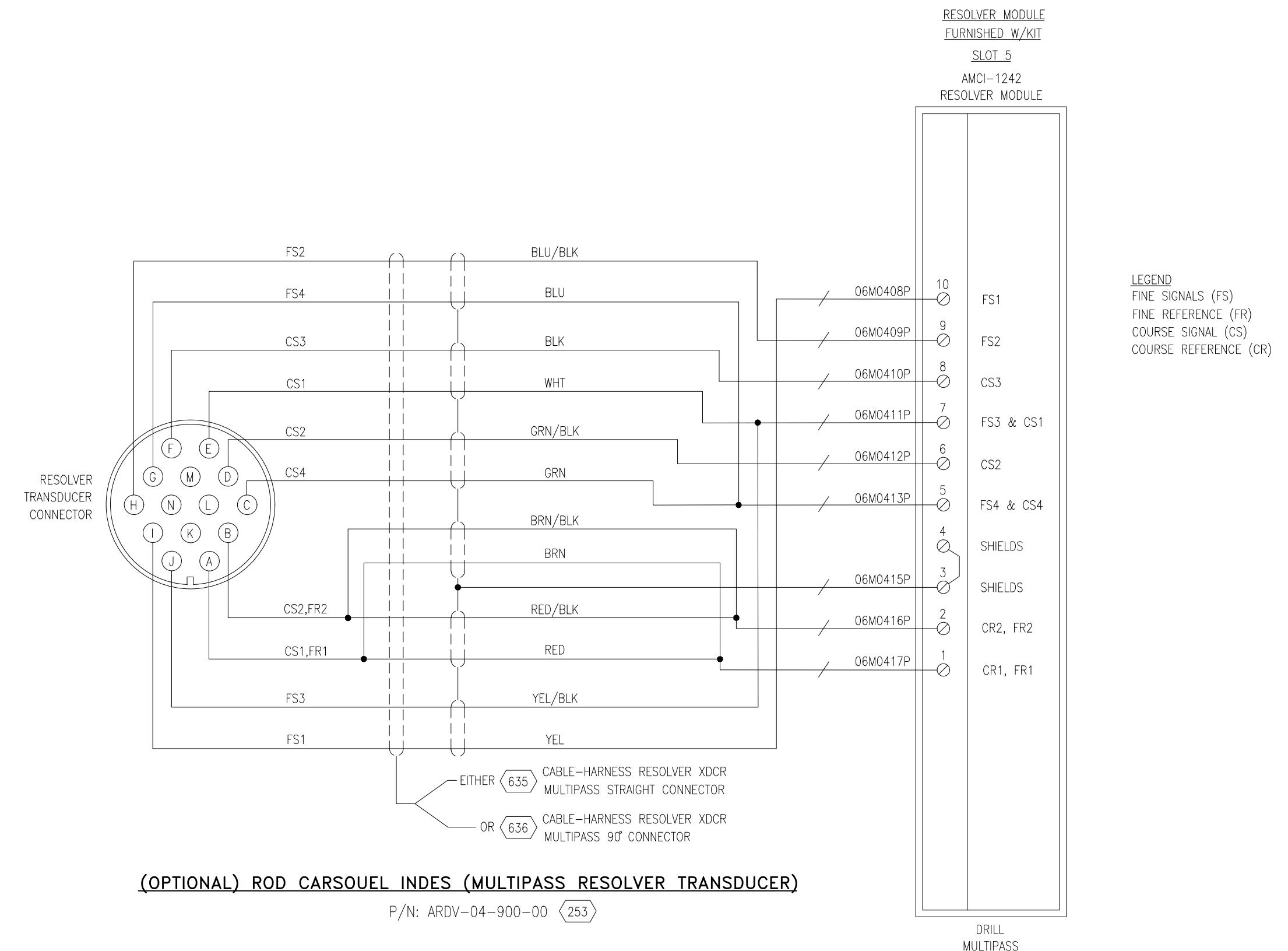
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						0	02/08/19	JCS	LDM







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ENGINEER:
L.D. MOODY

APPROVED BY:
L.D. MOODY

DRAWN BY:
J.C. STITT

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM
CLX ENCLOSURE

SLOT 5 RESOLVER MODULE – (OPTIONAL) MULTIPASS

LOC. CODE
02/08/19

DATE
12

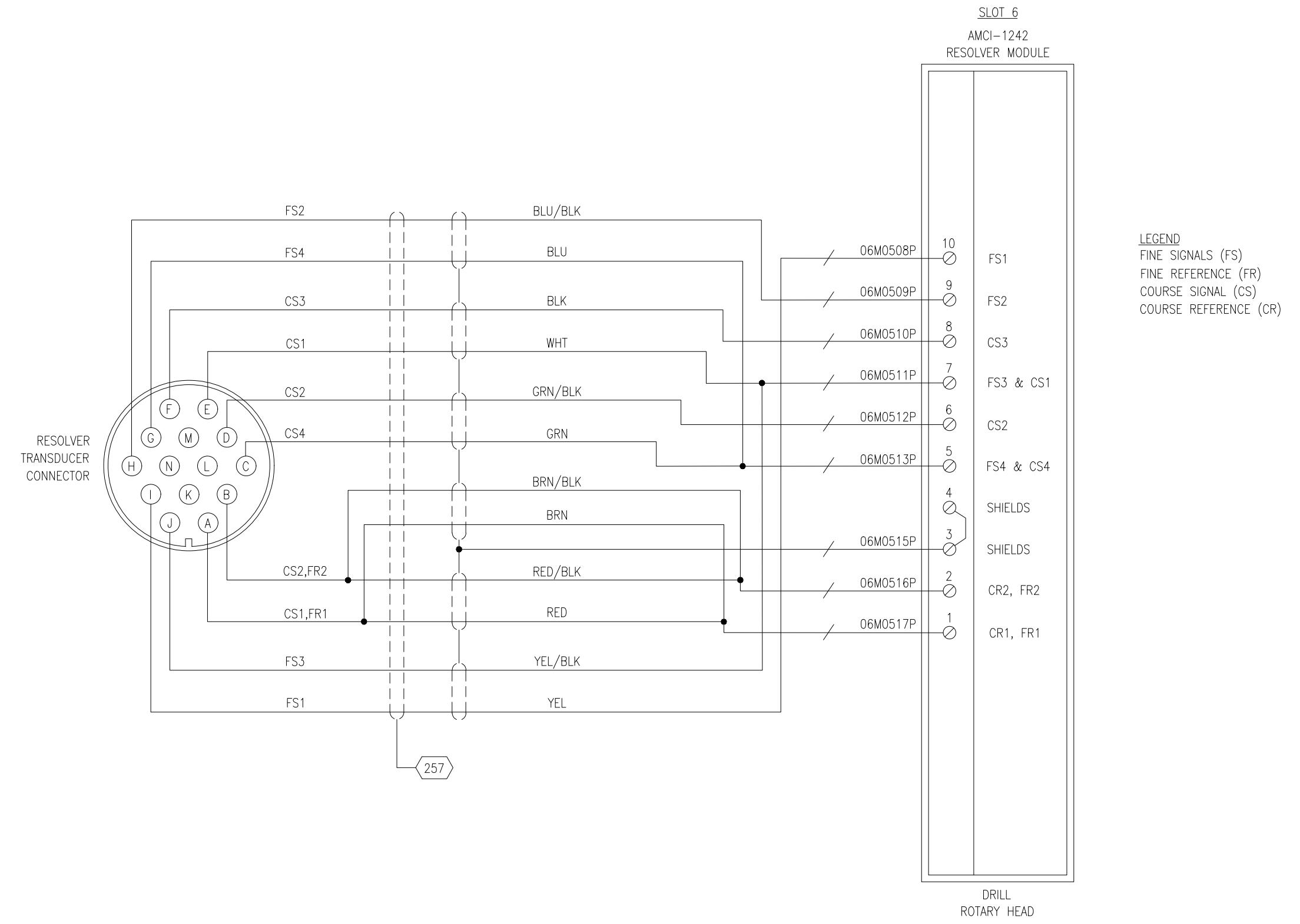
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201706

SECTION
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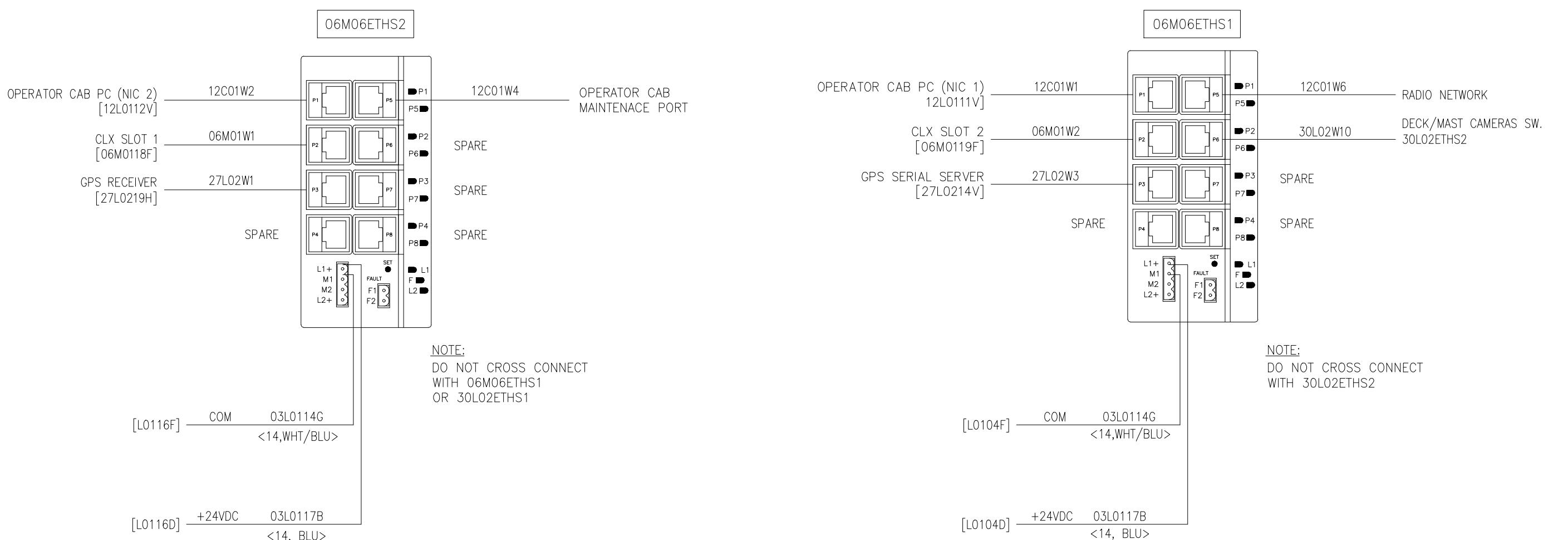
SUB. SEC.
M

HEET
04

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD



									 FLANDERS www.flandersinc.com	ENGINEER: L.D. MOODY	DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119 ARDVARC CONTROL SYSTEM CLX ENCLOSURE SLOT 6 RESOLVER MODULE - ROTARY HEAD	LOC. CODE	DATE		CONT. ON	
								APPROVED BY:	CHECKED BY: L.D. MOODY	02/08/19	13						
				0	AS-INSTALLED	02/08/19	JCS			DRAWING NO.	SECTION		SUB. SEC.	SHEET			
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD	FILENAME: 20170606M05.dwg			201706	06	M	05	



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CLX ENCLOSURE

M06ETHS1 ETHERNET SWITCH CONNECTIONS

LOC. CODE
201706

DATE
02/08/19

CONT. ON
FNL

DRAWING NO.
06

SECTION
M

SUB. SEC.
06

SHEET
06

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

DEVICENET I/O MODULES

P/N: ARDV-03-402-00

SHEET	DESCRIPTION
09A01	TITLE SHEET & SHEET INDEX
09D01	TAGS SCHEDULE
09M01	NODE 28 M01 (CAB BOX EXT.) TYPE 1 DIVICENET I/O MODULE 1/2 CONNECTION DIAGRAM
09M02	NODE 28 M01 (CAB BOX EXT.) TYPE 1 DIVICENET I/O MODULE 2/2 CONNECTION DIAGRAM
09M03	NODE 29 M02 (ENGINE BOX) TYPE 1 DIVICENET I/O MODULE 1/2 CONNECTION DIAGRAM
09M04	NODE 29 M02 (ENGINE BOX) TYPE 1 DIVICENET I/O MODULE 2/2 CONNECTION DIAGRAM
09M05	NODE 39 M04 (CAB) TYPE 2 DIVICENET I/O MODULE 1/2 CONNECTION DIAGRAM
09M06	NODE 39 M04 (CAB) TYPE 2 DIVICENET I/O MODULE 2/2 CONNECTION DIAGRAM
09M07	NODE 40 M05 (ENGINE BOX) TYPE 2 DIVICENET I/O MODULE 1/2 CONNECTION DIAGRAM
09M08	NODE 40 M05 (ENGINE BOX) TYPE 2 DIVICENET I/O MODULE 2/2 CONNECTION DIAGRAM
09M09	NODE 9 M06 (INSIDE THE CAB) EXPANSION DIVICENET I/O MODULE 1/1 CONNECTION DIAGRAM
09M10	NODE 19 M07 (MAST) TYPE 1 DIVICENET I/O MODULE 1/2 CONNECTION DIAGRAM
09M11	NODE 19 M07 (MAST) TYPE 1 DIVICENET I/O MODULE 2/2 CONNECTION DIAGRAM
09M22	TYPE 1 DEVICENET I/O MODULE TYPICAL PINOUTS
09M23	TYPE 2 DEVICENET I/O MODULE TYPICAL PINOUTS
09M24	EXPANSION DEVICENET I/O MODULE TYPICAL PINOUTS
09M25	SPLITTER CABLES & COMPACT SPLITTER WIRING DIAGRAMS
09M26	FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS
09M27	FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS
09M28	FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS
09M29	FLANDERS PROVIDED DIGITAL SENSORS
09M32	ANALOG & DIGITAL SENSORS
09M34	CABLE CONNECTORS

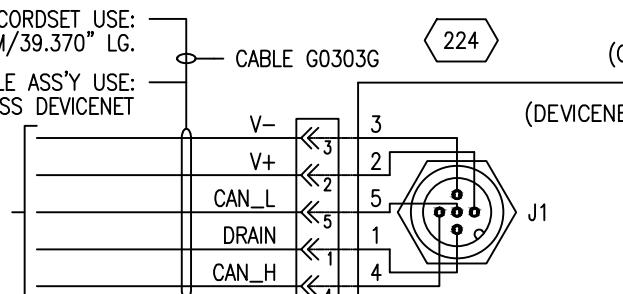
TAGS SCHEDULE					
	TAG NO.	SIZE	TAG COLOR	TEXT COLOR	DESCRIPTION
*	(1)	1/2" x 1-1/4"	WHITE	BLACK	NODE 28
*	(2)	1/2" x 1-1/4"	WHITE	BLACK	NODE 29
*	(3)	1/2" x 1-1/4"	WHITE	BLACK	NODE 39
*	(4)	1/2" x 1-1/4"	WHITE	BLACK	NODE 40
*	(5)	1/2" x 1-1/4"	WHITE	BLACK	NODE 9
*	(6)	1/2" x 1-1/4"	WHITE	BLACK	NODE 19

* TAGS TO BE SHIPPED LOOSE
IN DEVICENET I/O MODULES SHIPPING CONTAINER
FOR FIELD INSTALLATION.
REFER TO SHEETS 09M01 THRU 09M10 FOR LOCATION.

TAGS SCHEDULE					
	TAG NO.	SIZE	TAG COLOR	TEXT COLOR	DESCRIPTION

01 FOR PURCHASED DEVICENET CABLE CORDSET USE:
02 EITHER **(229)** 0.5M/19.685" LG. OR **(230)** 1.0M/39.370" LG.
03 FOR FABRICATED DEVICENET CABLE ASS'Y USE:
04 EITHER **(210)** OR **(211)** CABLE-HARNESS DEVICENET

05 FROM
06 CLX CONTROLLOGIX RACK
07 SLOT 3/DEVICENET MODULE
08 [F0813R]

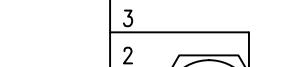
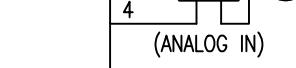
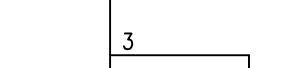
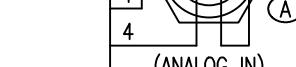


09 **M01**
10 (CAB BOX EXT.)

11 (DEVICENET TYPE 1 I/O MODULE)

12 **NODE 28**

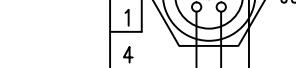
13 SPARE



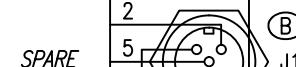
14 SPARE



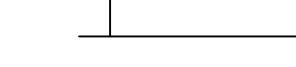
15 SPARE



16 SPARE



17 SPARE



18 SPARE



19 MODULE/DNET STATUS

20 SPARE

21 SPARE

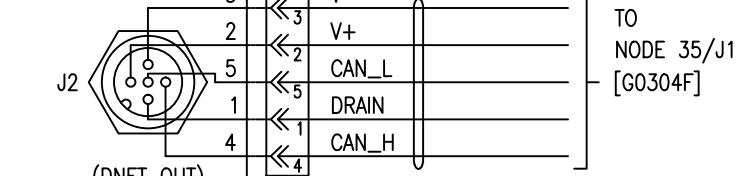
22 SPARE

23 SPARE

24 SPARE

25 SPARE

01 FOR PURCHASED DEVICENET CABLE CORDSET USE:
02 EITHER **(229)** 0.5M/19.685" LG. OR **(230)** 1.0M/39.370" LG.
03 FOR FABRICATED CABLE ASS'Y USE:
04 **(211)** CABLE-HARNESS DEVICENET



05 TO
06 NODE 35/J1
07 [G0304F]

08 SPARE

09 SPARE

10 SPARE

11 SPARE

12 SPARE

13 SPARE

14 SPARE

15 SPARE

16 SPARE

17 SPARE

18 SPARE

19 SPARE

20 SPARE

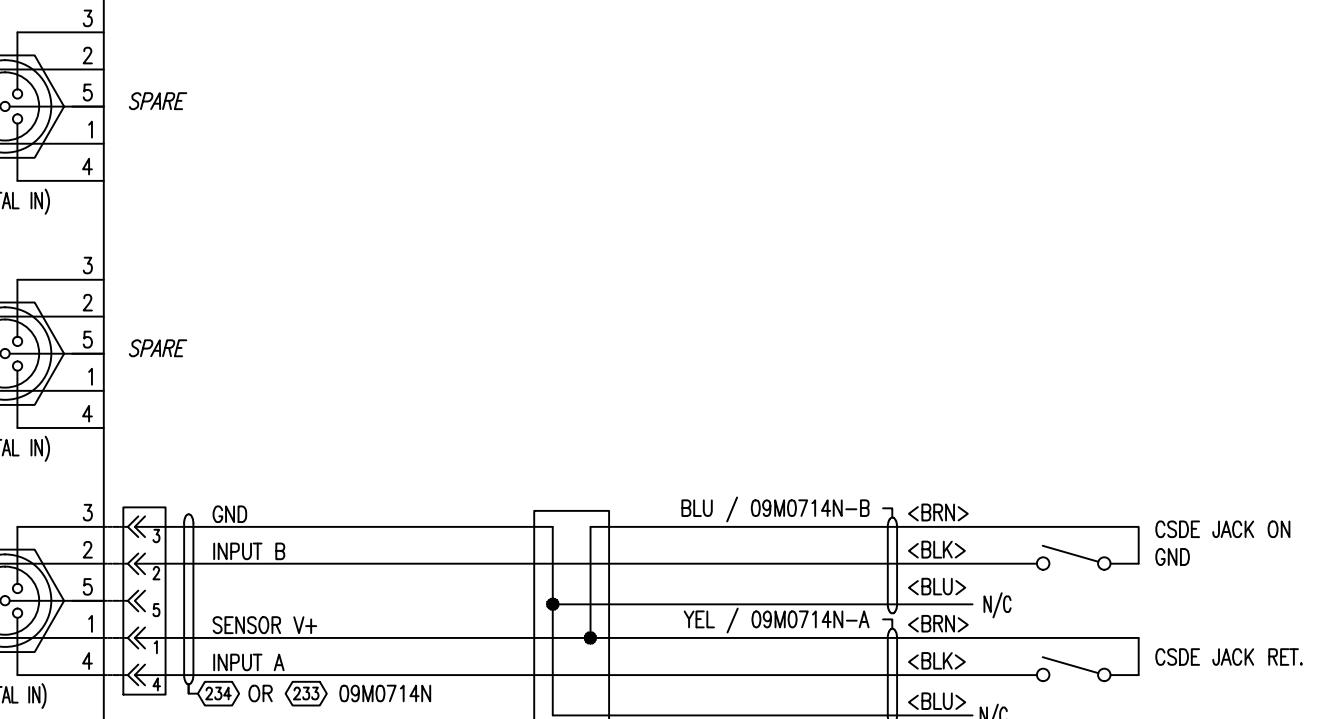
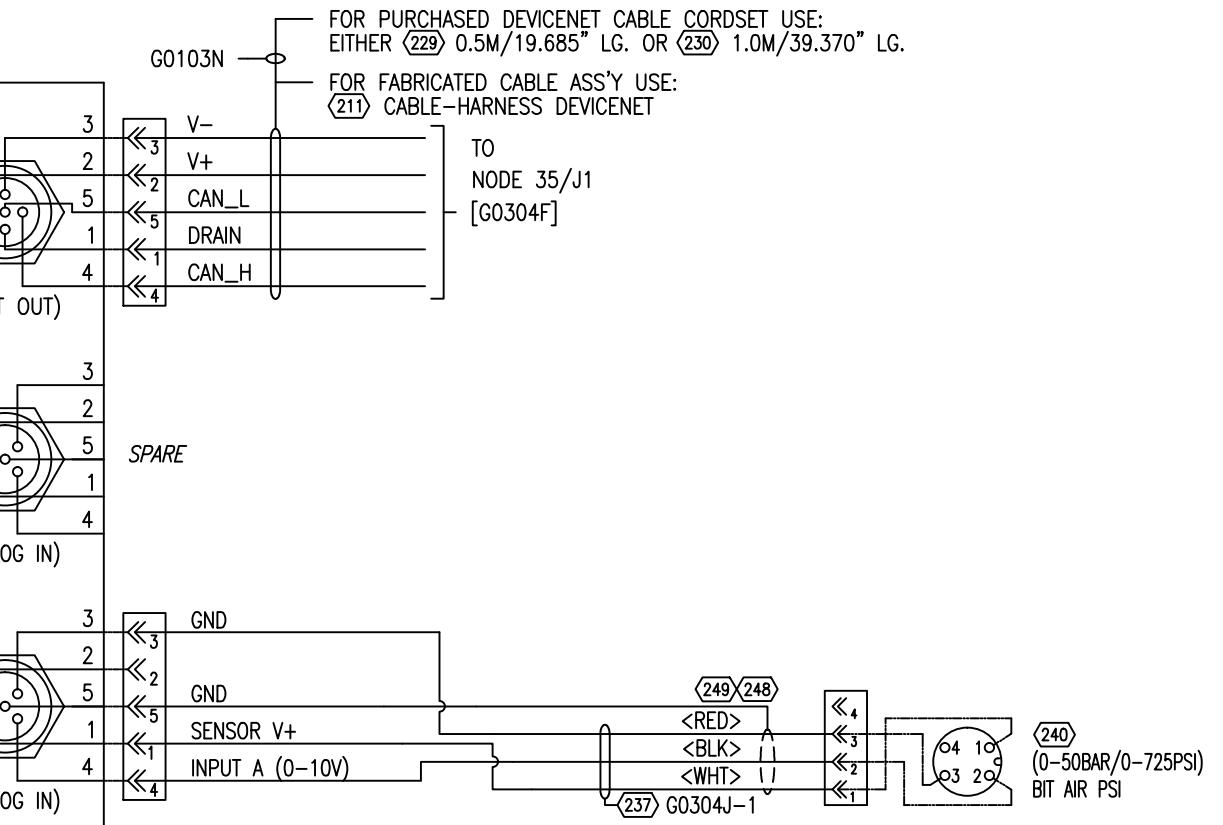
21 SPARE

22 SPARE

23 SPARE

24 SPARE

25 SPARE



26 REFER TO SHT. G11 FOR
27 PINOUTS-DEVICENET TYPE 1 I/O MODULE

28 N/C DENOTES: NOT CONNECTED

29 (B) DENOTES: INPUT or OUTPUT B

30 (A) DENOTES: INPUT or OUTPUT A

31 XXX INDICATES BILL OF MATERIAL NUMBER
32 REFER TO EngineeringBoM-ARDVRC.xlsx



33 ENGINEER:
34 L.D. MOODY
35 APPROVED BY:
36 L.D. MOODY

33 DRAWN BY:
34 J.C. STITT
35 CHECKED BY:
36 L.D. MOODY

33 DRAWING TITLE:
34 VALE-ITABIRA-DRILL1119
35 ARDVAC CONTROL SYSTEM
36 DEVICENET I/O MODULES

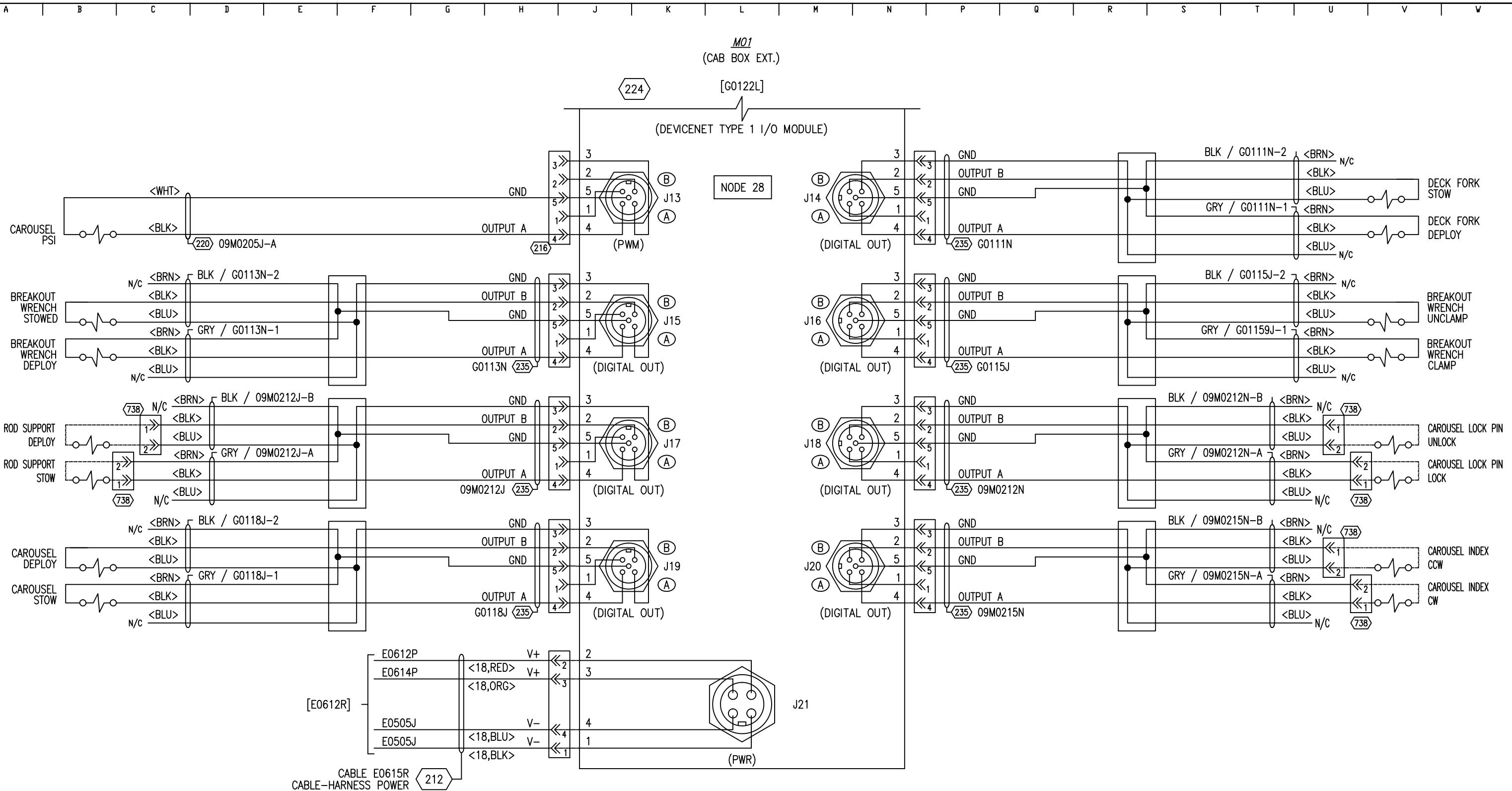
33 LOC. CODE
34 02/08/19
35 04

33 DRAWING NO.
34 201706
35 09
36 M
37 01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	DATE	BY	CHKD

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42 FILENAME:
43 20170609M01.dwg



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

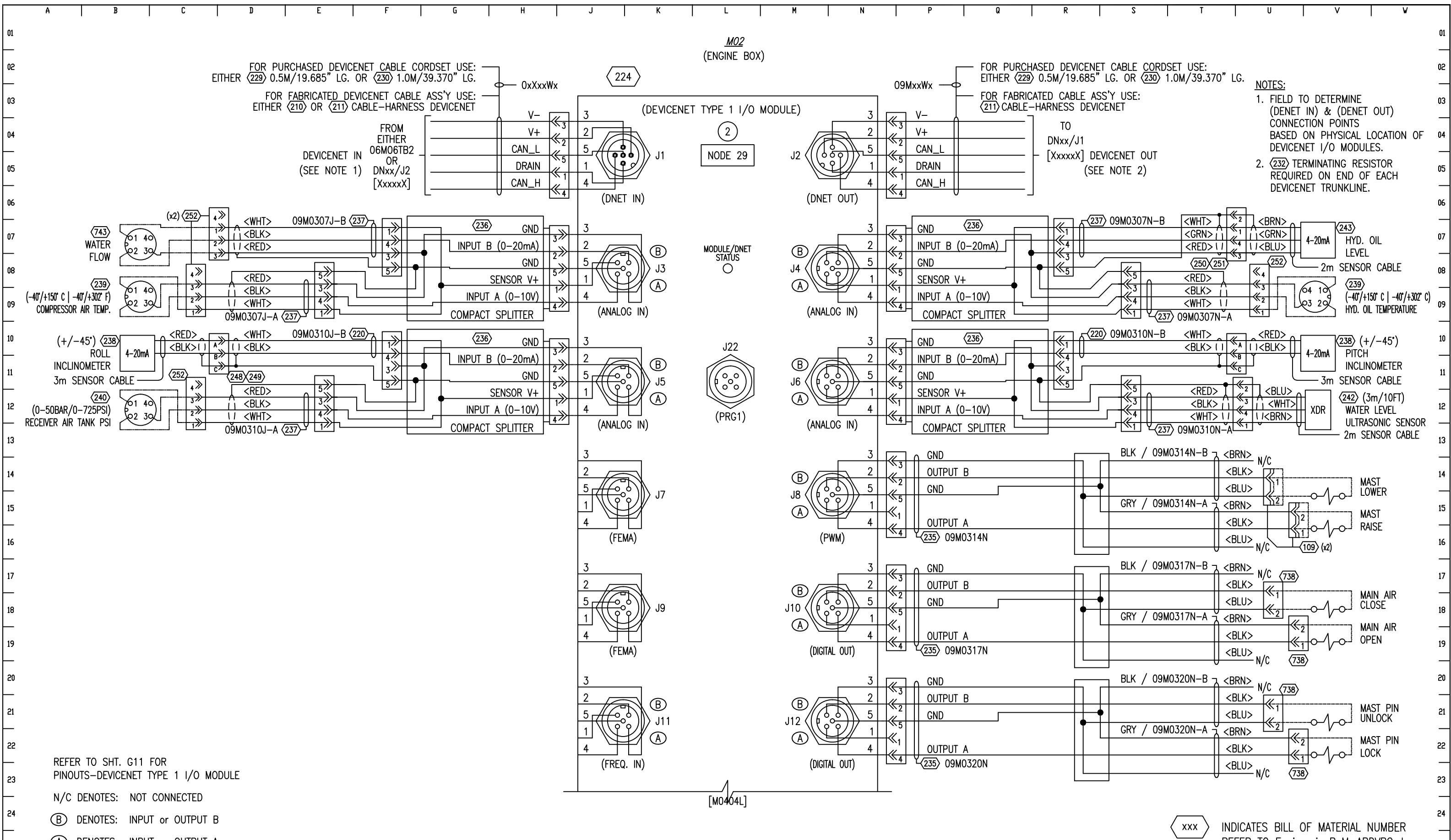
ARDVARC CONTROL SYSTEM

DEVICENET I/O MODULES

NODE 28 M01 (CAB BOX EXT.) CONNECTION DIAGRAM

LOC. CODE DATE CONT. ON
201706 02/08/19 05

DRAWING NO.	SECTION	SUB. SEC.	SHEET
201706	09	M	02



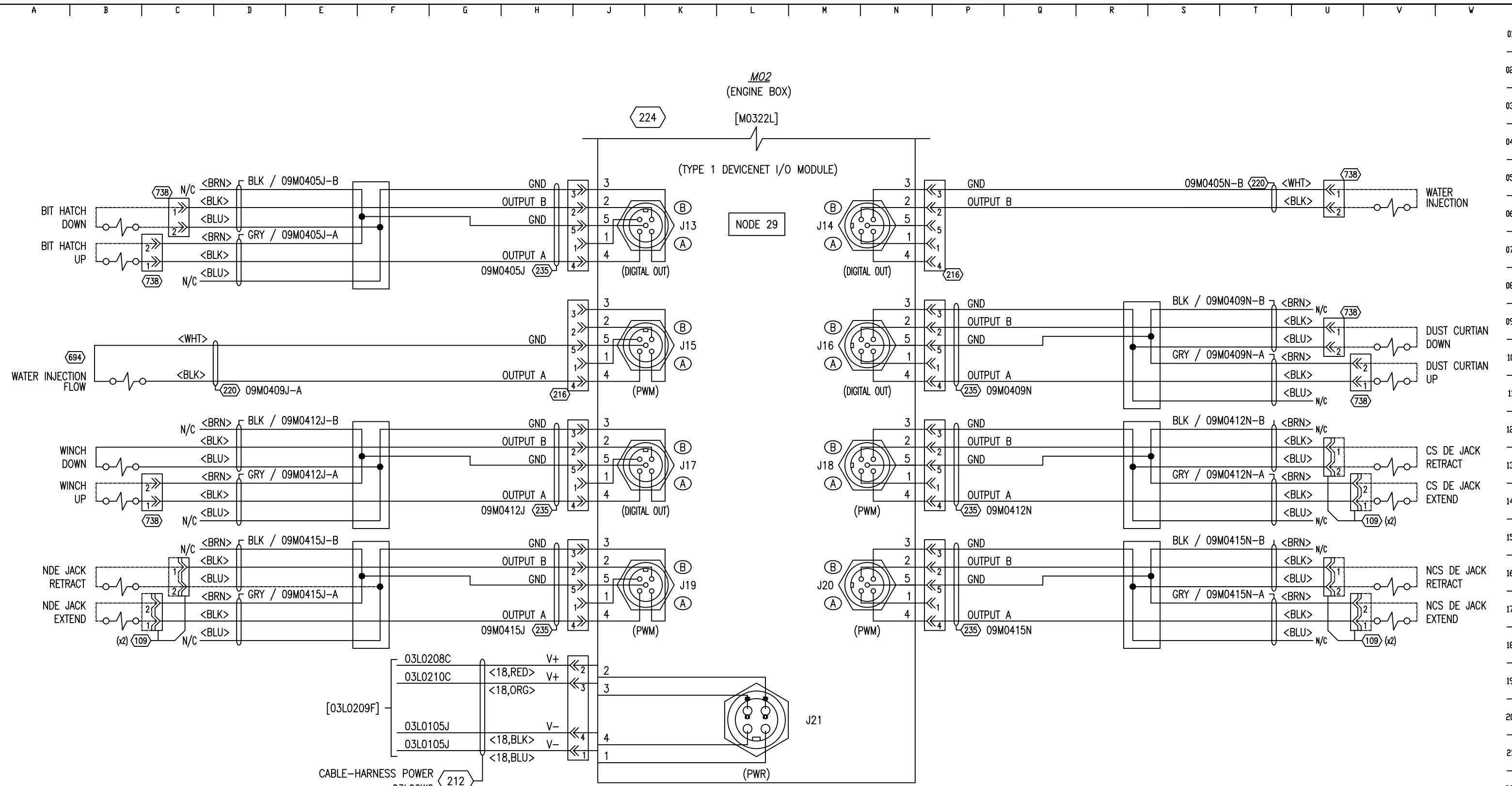
www.flandersinc.com

ENGINEER:	L.D. MOODY
APPROVED BY:	

DRAWN BY:
J.C. ST
CHECKED BY:
L.D. MOO

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM

xxx INDICATES BILL OF MATERIAL NUMBER
REFER TO EngineeringBoM-ARDVRC.xlsm



			0	AS-INSTALLED	02/08/19	JCS	LDM	



www.flandersinc.com

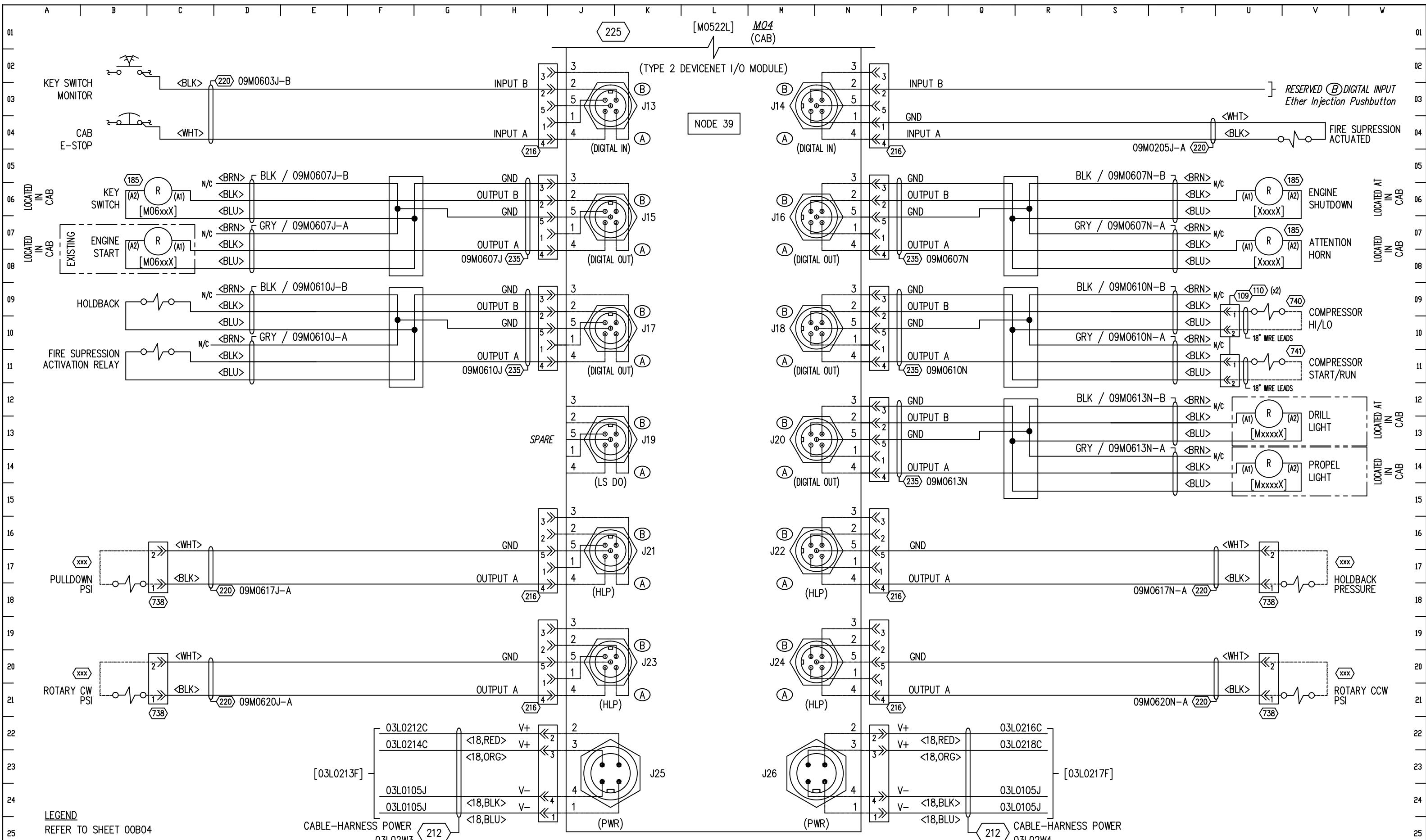
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ENGINEER:
L.D. MOODY
APPROVED BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

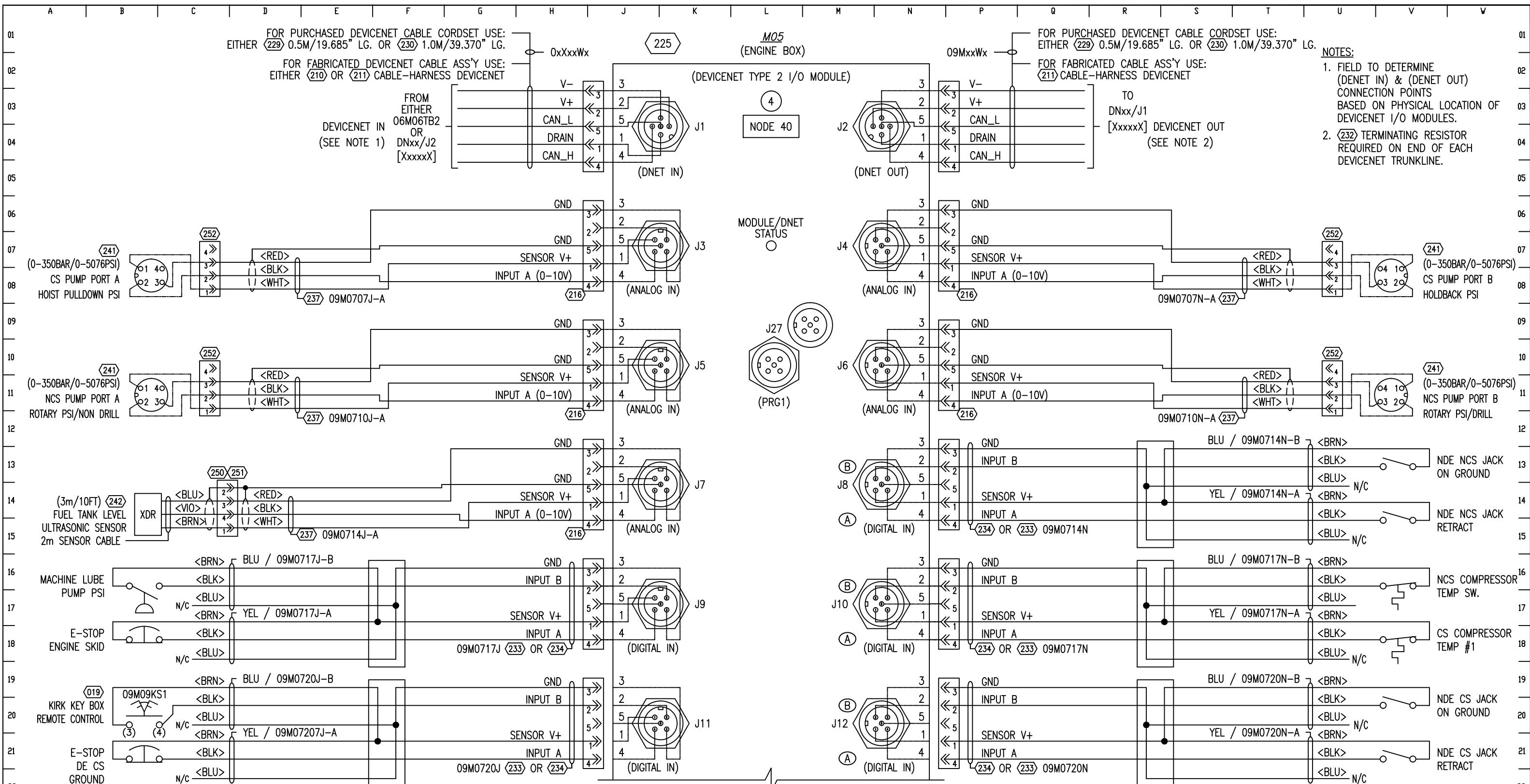
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VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DEVICENET I/O MODULES
FILENAME:
20170609M04.dwg

LOC. CODE
DATE
02/08/19
07

DRAWING NO.
SECTION
SUB. SEC.
SHEET
201706
09
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04



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REFER TO SHT. G11 FOR
PINOUTS-DEVICENET TYPE 1 I/O MODULE

N/C DENOTES: NOT CONNECTED

(B) DENOTES: INPUT or OUTPUT

(A) DENOTES: INPUT or OUTPUT A



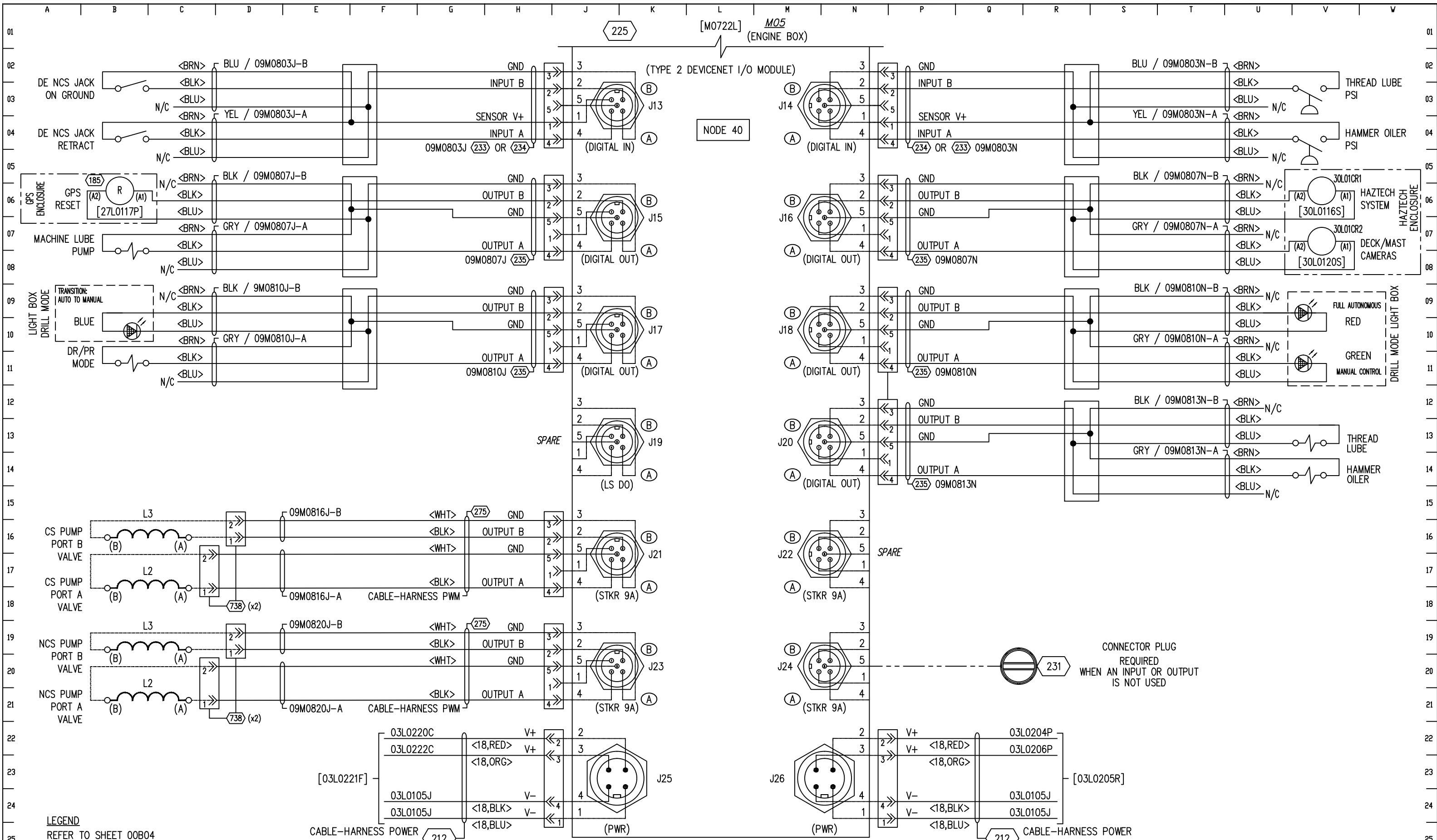
www.mlandersinc.com
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ENGINEER:
L.D. MOODY
APPROVED BY:

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM

 INDICATES BILL OF MATERIAL NUMBER
REFER TO EngineeringBoM-ARDVRC.xlsm



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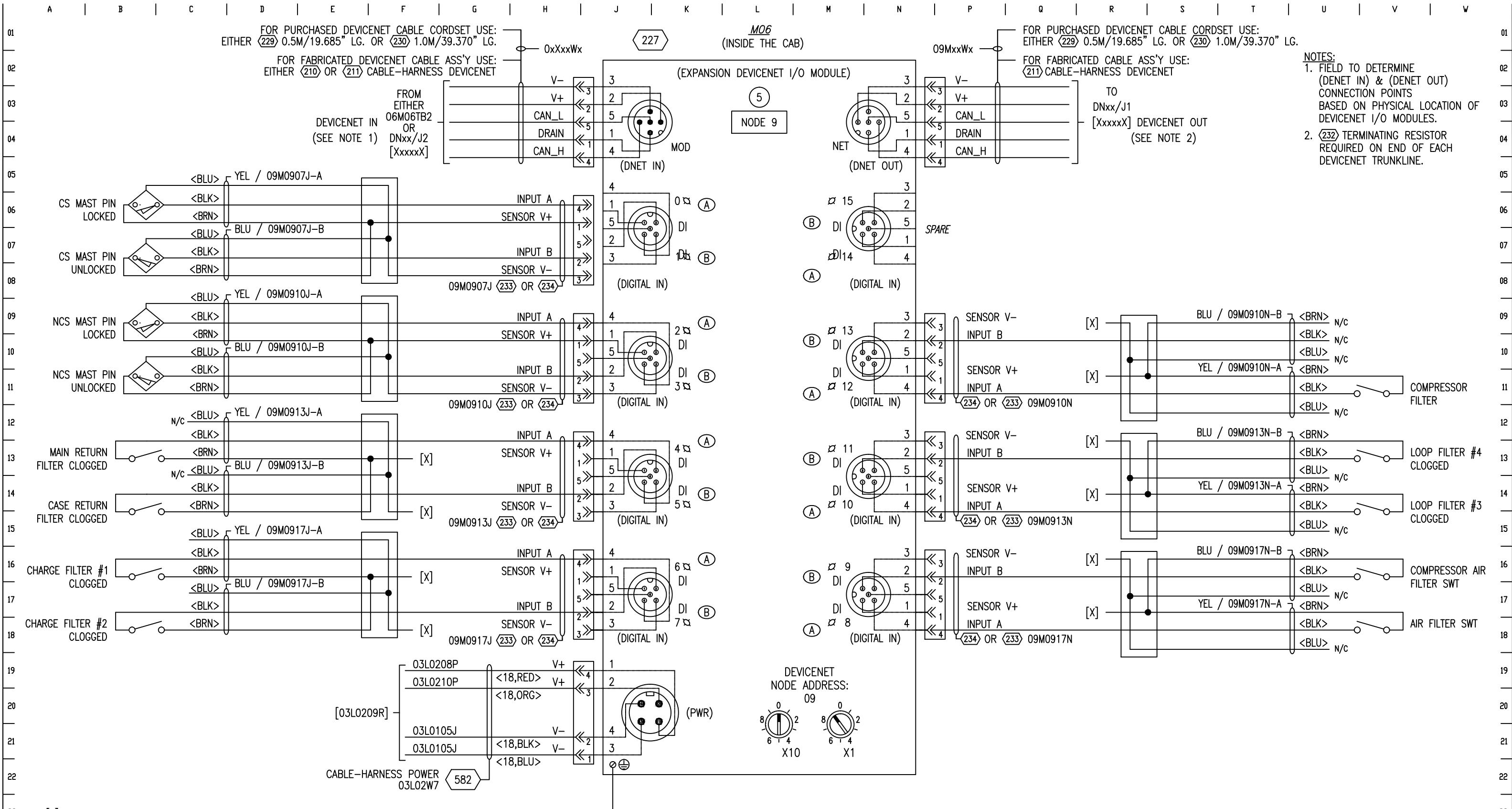
ENGINEER:
L.D. MOODY
APPROVED BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRABR-DRILL1119
ARDVARC CONTROL SYSTEM
DEVICENET I/O MODULES
NODE 40 M05 (ENGINE BOX) CONNECTION DIAGRAM

LOC. CODE
DATE
02/08/19
11

DRAWING NO.
SECTION
SUB. SEC.
SHEET
201706
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08

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE



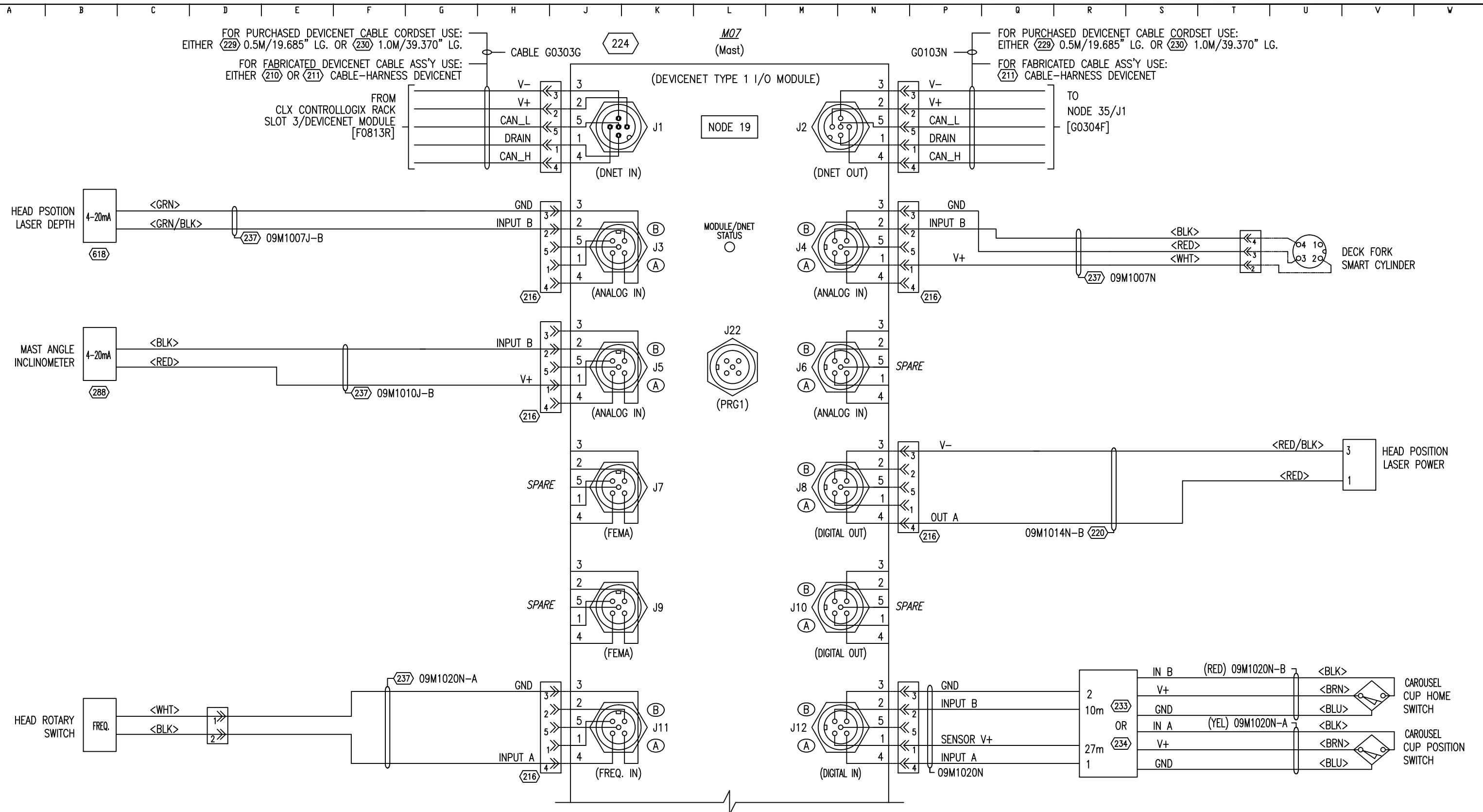
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ENGINEER: L.D. MOODY
APPROVED BY:
DRAWN BY: J.C. STITT
CHECKED BY: L.D. MOODY
FILENAME: 20170609M09.dwg

DRAWING TITLE: VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DEVICENET I/O MODULES
NODE 9 M06 (INSIDE THE CAB) CONNECTION DIAGRAM

LOC. CODE: 201706
DATE: 02/08/19
CONT. ON: 12
DRAWING NO.: 09
SECTION: M
SUB. SEC.: 09
SHEET: 09



xxx INDICATES BILL OF MATERIAL NUMBER
REFER TO EngineeringBoM-ARDVRC.xlsx



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

DEVICENET I/O MODULES

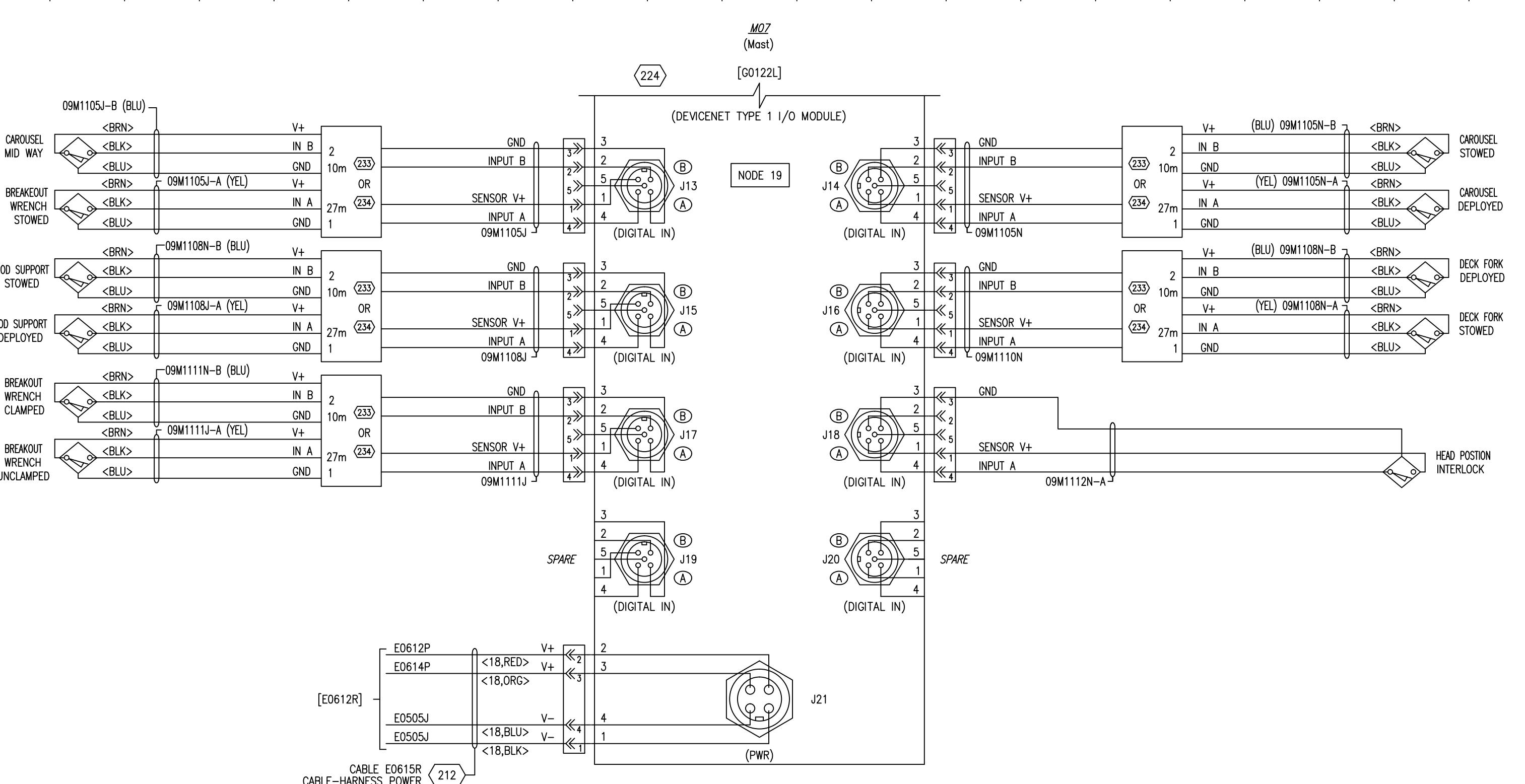
NODE 19 M07 (MAST) CONNECTION DIAGRAM

LOC. CODE
DATE
02/08/19
13

DRAWING NO.
SECTION
SUB. SEC.
SHEET
201706
09
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10

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DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
REV.					20170609M10.dwg			



REFER TO SHT. G11 FOR
PINOUTS—DEVICENET TYPE 1 I/O MODULE

N/C DENOTES: NOT CONNECTED

(B) DENOTES: INPUT or OUTPUT

(A) DENOTES: INPUT or OUTPUT A

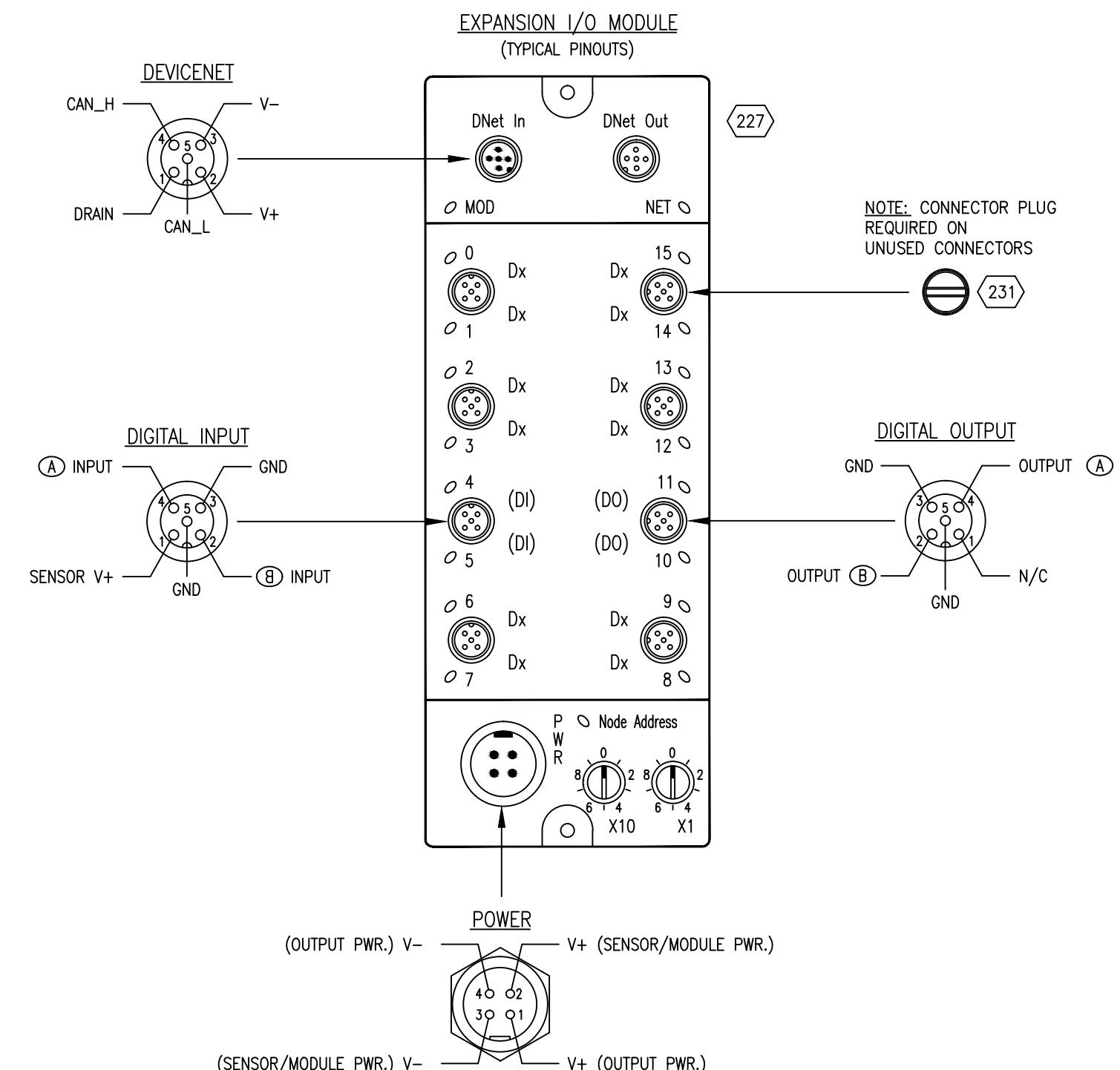


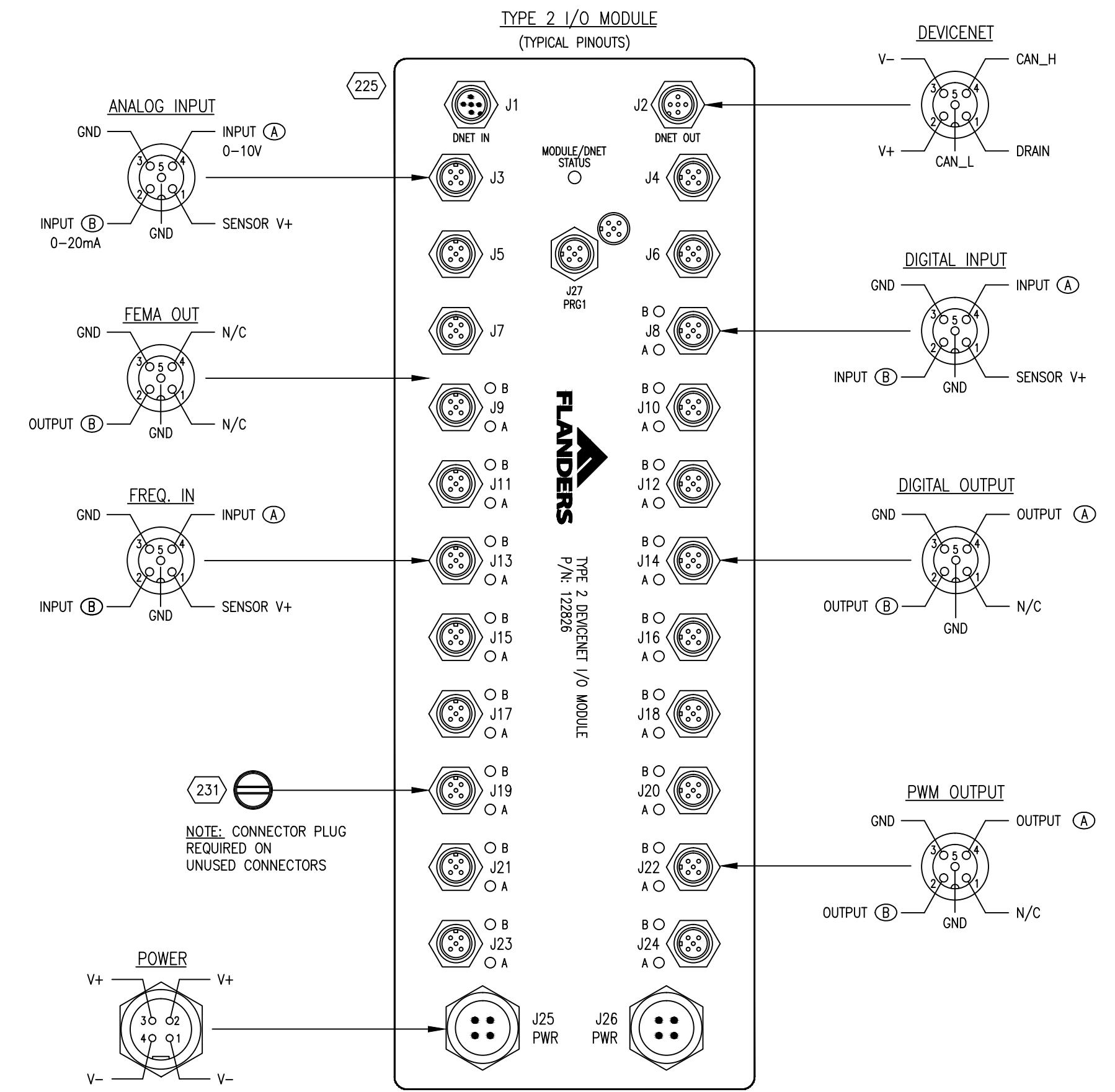
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ENGINEER:	L.D. MOODY
APPROVED BY:	
RS	FILENAME:
LE	20170609M11.dwg
RS	
C.T.	

DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119
CHECKED BY: L.D. MOODY	ARDVARC CONTROL SYSTEM DEVICENET I/O MODULES NODE 19 M07 (MAST) CON

 INDICATES BILL OF MATERIAL NUMBER
REFERS TO EngineeringBoM-ARDVRC.xlsm





REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE
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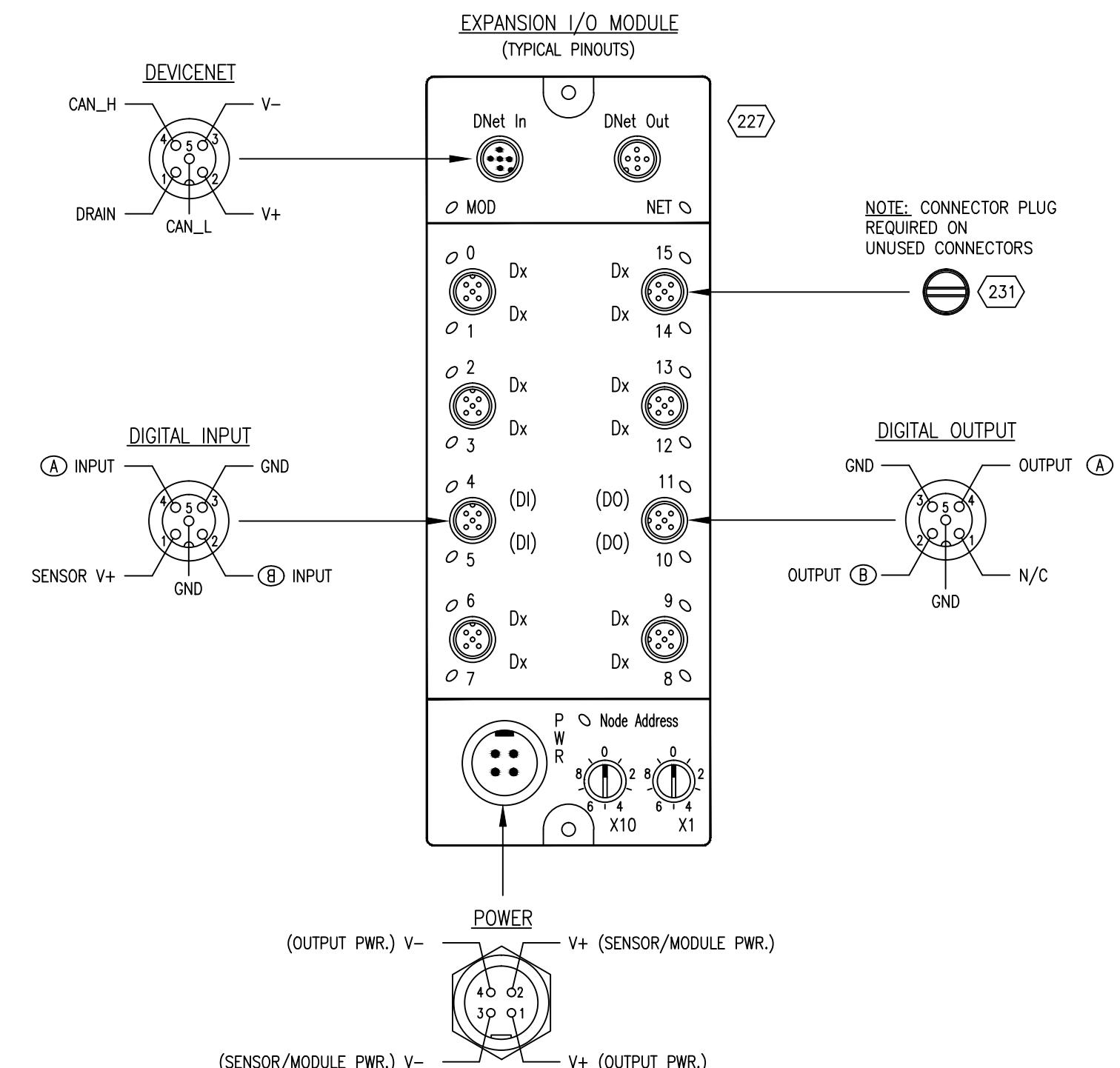
	ENGINEER L
	APPROVE

. MOODY
BY:

	DRAWN BY: J.C.
	CHECKED BY: L.D.

STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119 ARDVARC CONTROL SYSTEM
ODY	

LOC. CODE	DATE 02/08/19	CONT. ON 15	
DRAWING NO. 201706	SECTION 09	SUB. SEC.	SHEET 23



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CHKD

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J. MOODY

J. MOODY

DRAWN BY:
J.C. STIT

DRAWN BY:
J.C. STIT

I D MOOD

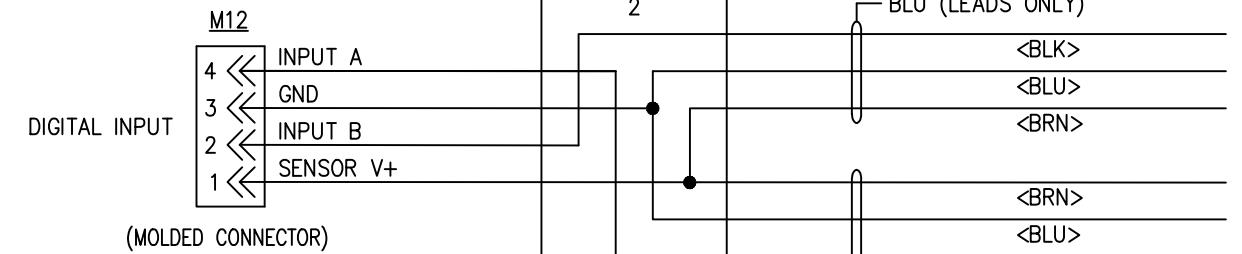
DRAWING TITLE:
VALE-ITABIRA-DRILL1119
APPARATUS CONTROL SYSTEM

ARDVARC CONTROL SYSTEM

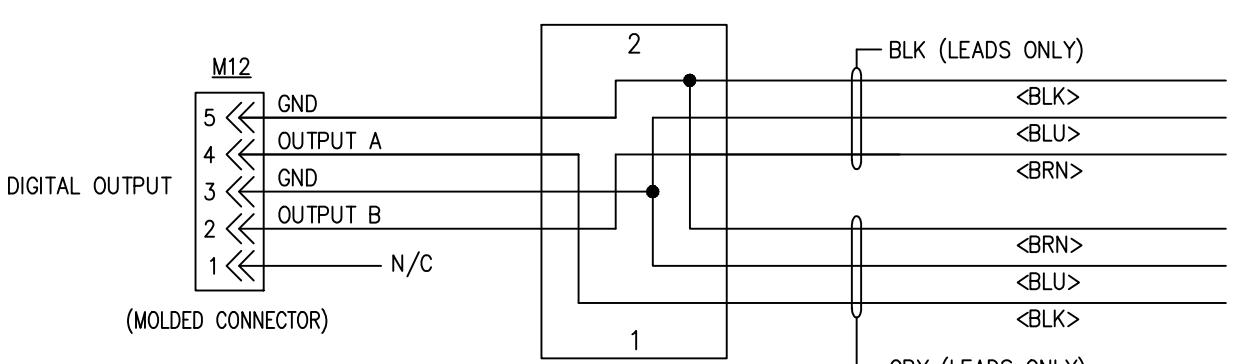
DEVICENET I/O MODULES
EXPANSION DEVICENET I/O M

LOC. CODE	DATE	CONT. ON
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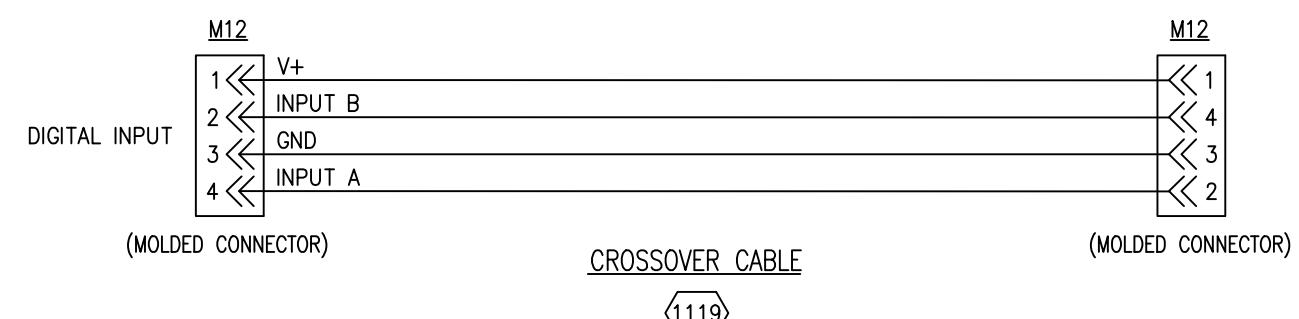
DRAWING NO.	SECTION	SUB. SEC.	SHEET
201706	09	M	24



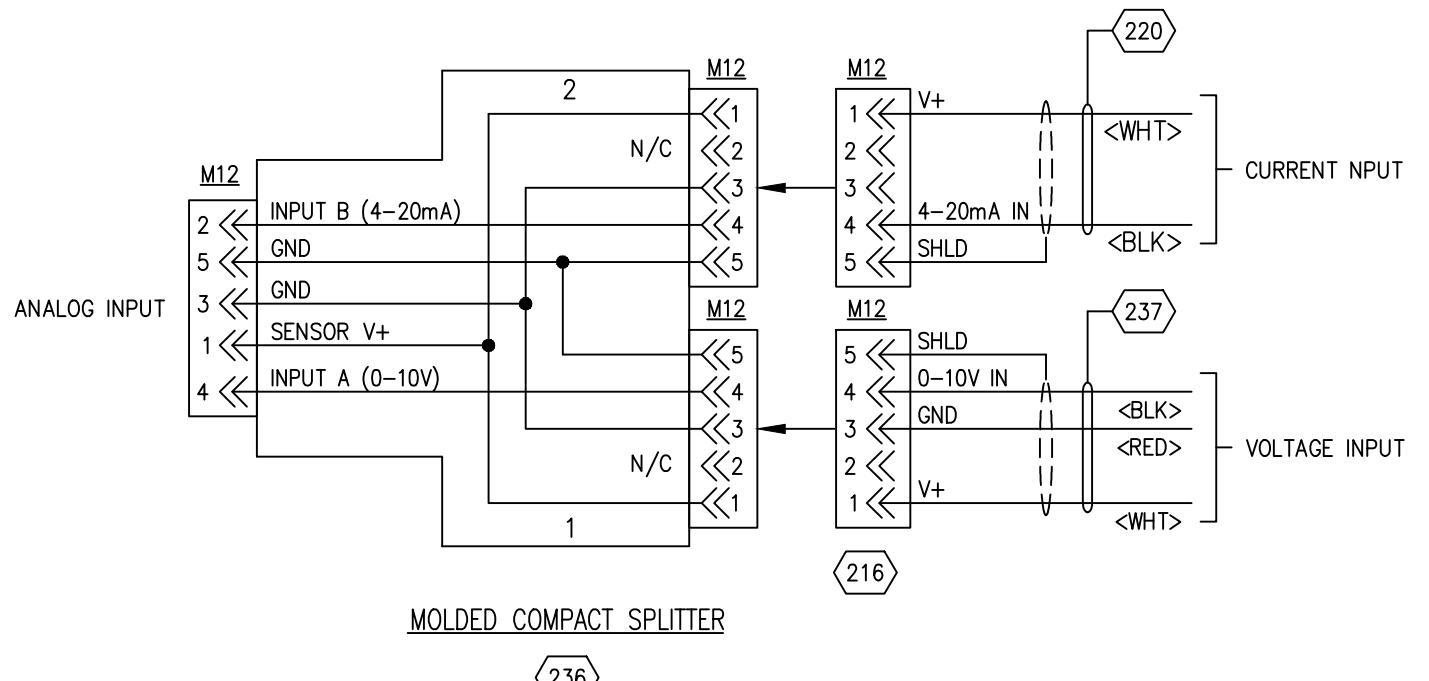
4.4T CABLE SPLITTER
 233 (10m) 234 (27m)



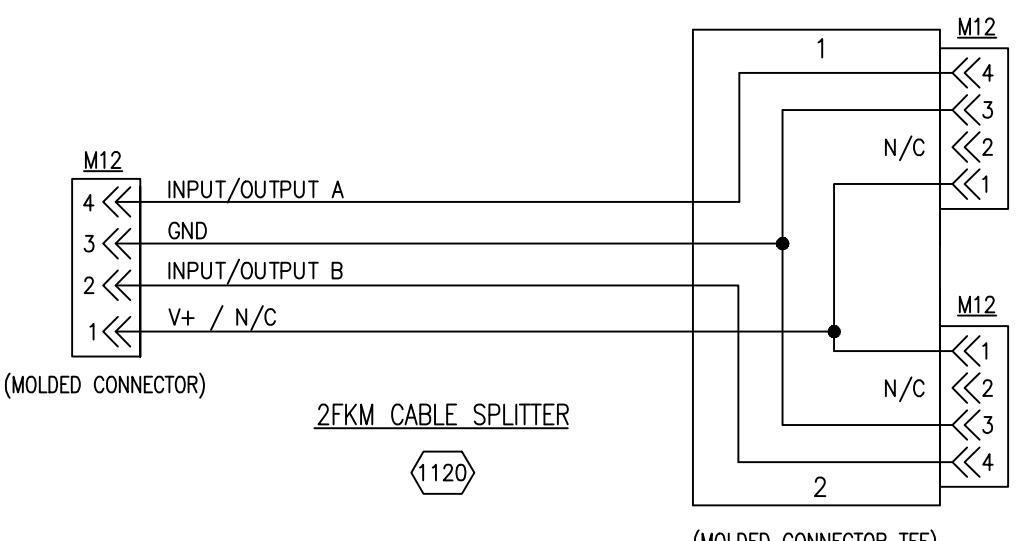
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 235 (10m)



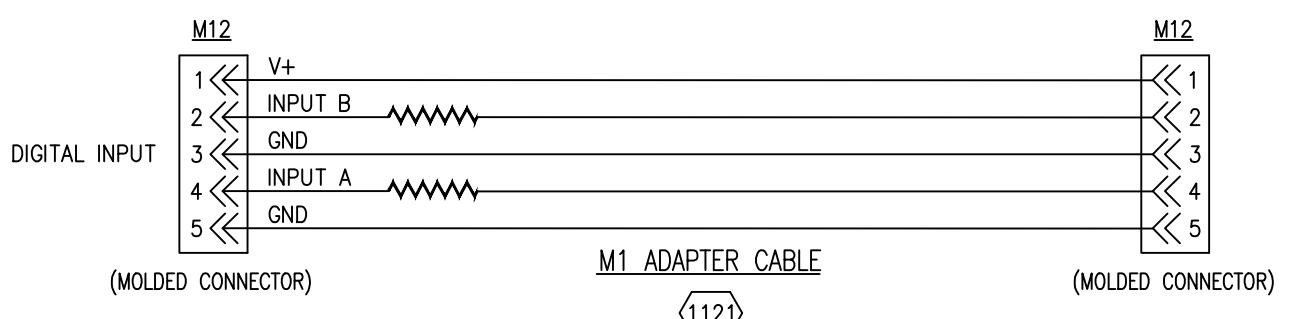
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236



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1121

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ENGINEER:
 L.D. MOODY

DRAWN BY:
 J.C. STITT

APPROVED BY:
 L.D. MOODY

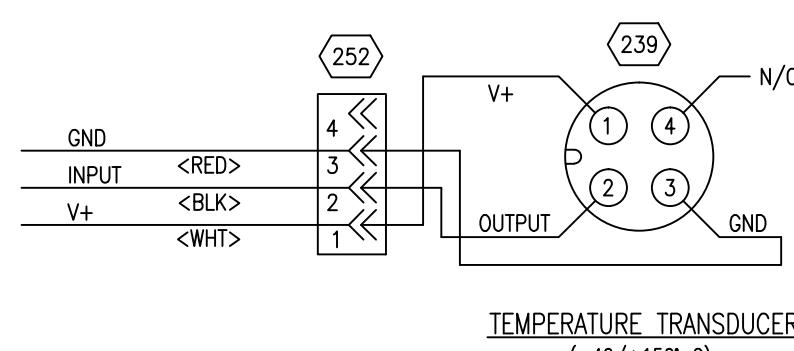
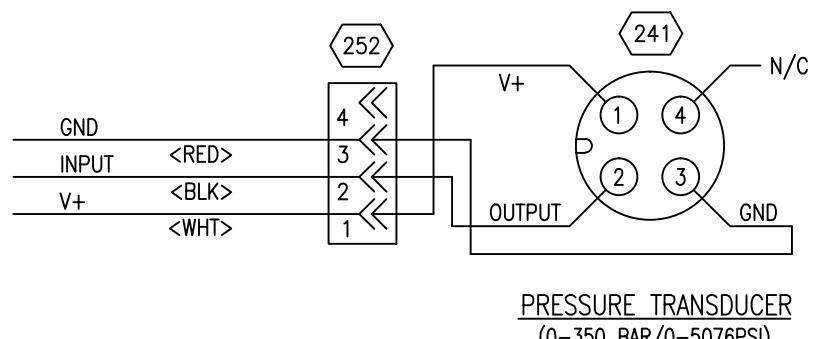
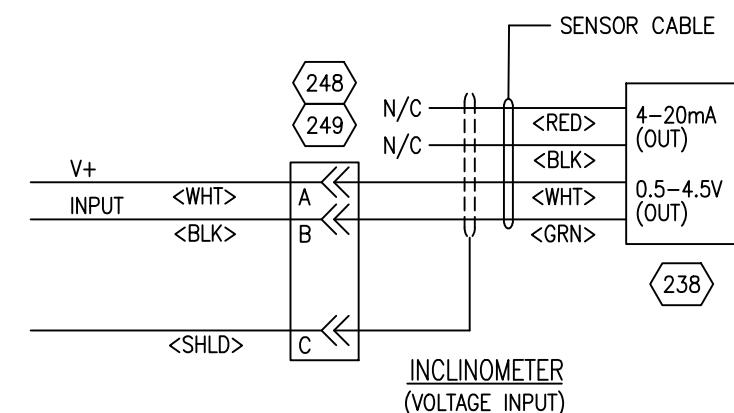
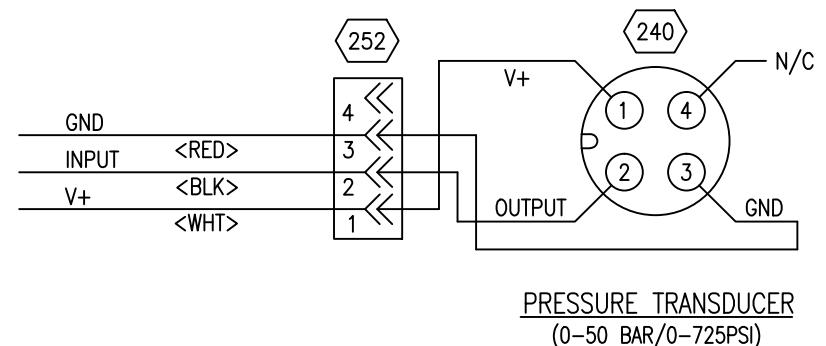
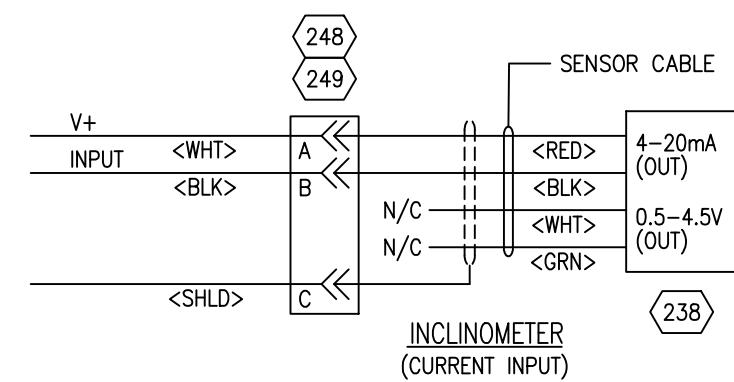
CHECKED BY:
 L.D. MOODY

DRAWING TITLE:
 VALE-ITABIRA-DRILL1119
 ARDVARC CONTROL SYSTEM
 DEVICENET I/O MODULES

SPLITTER CABLES & COMPACT SPLITTER WIRING DIAGRAMS

LOC. CODE DATE CONT. ON
 201706 02/08/19 17

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201706	09	M	25



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:
L.D. MOODY

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM
DEVICENET I/O MODULES

FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS

LOC. CODE
201706

DATE
02/08/19

CONT. ON
18

DRAWING NO.
201706

SECTION
09

SUB. SEC.
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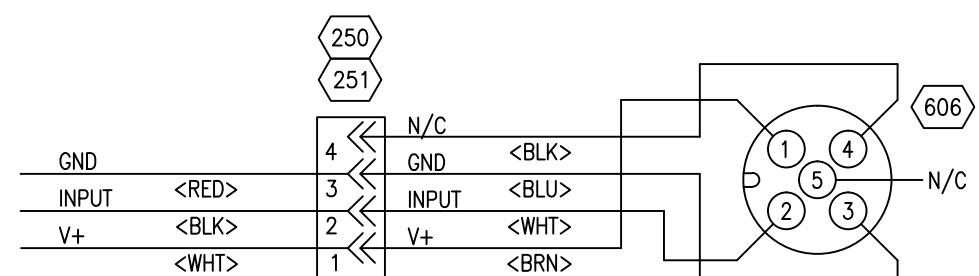
SHEET
26

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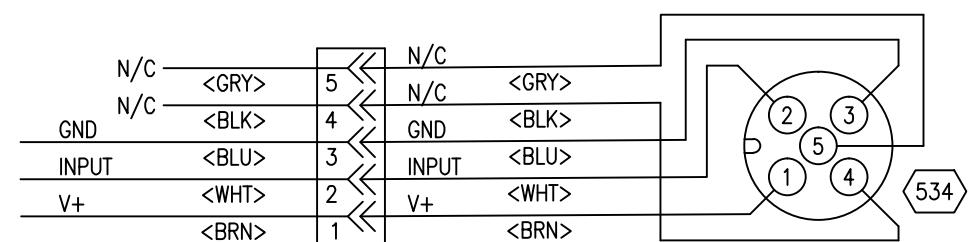
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A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W

01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25



MAST ANGLE TRANSDUCER



MAST PIN TRANSDUCER



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM
DEVICENET I/O MODULES

FLANDERS PROVIDED ANALOG CURRENT & VOLTAGE SENSORS

LOC. CODE
201706

DATE
02/08/19

CONT. ON
19

DRAWING NO.
09

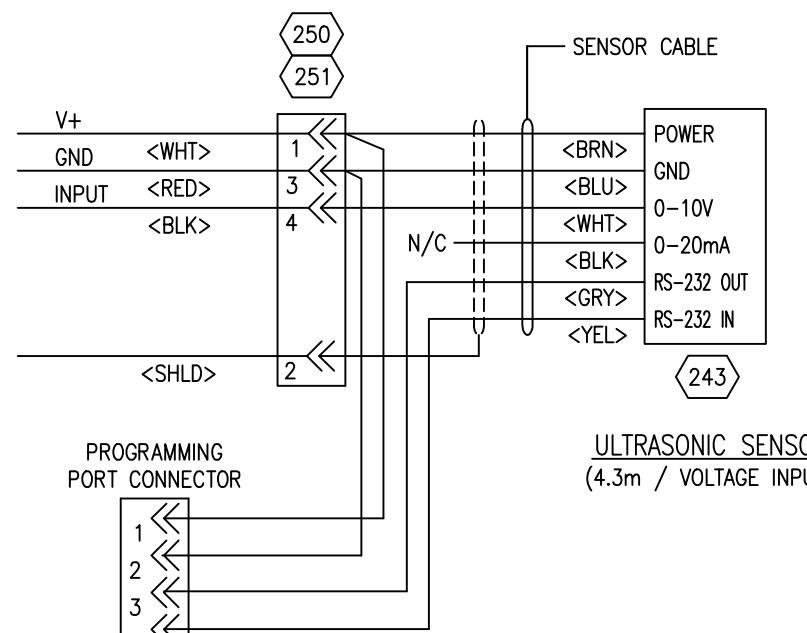
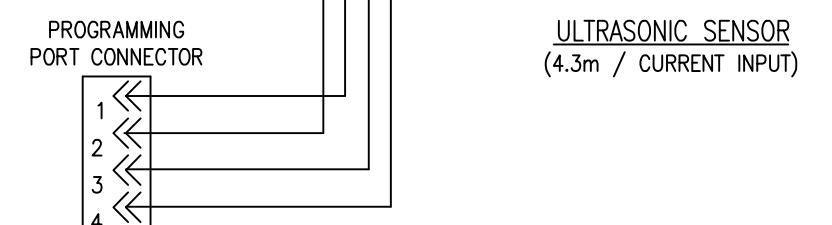
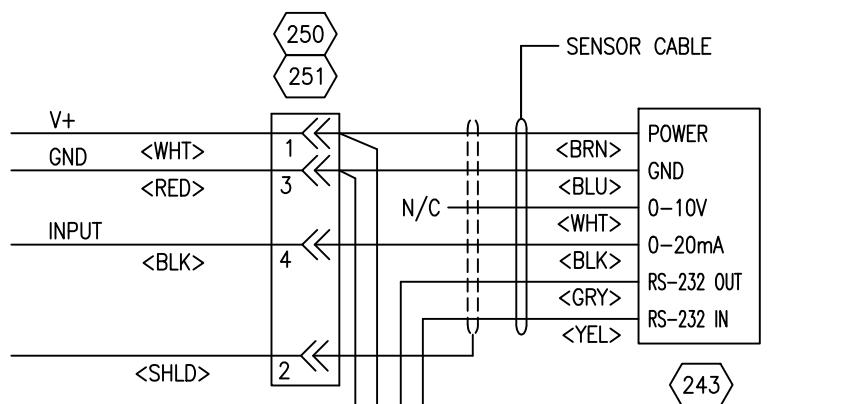
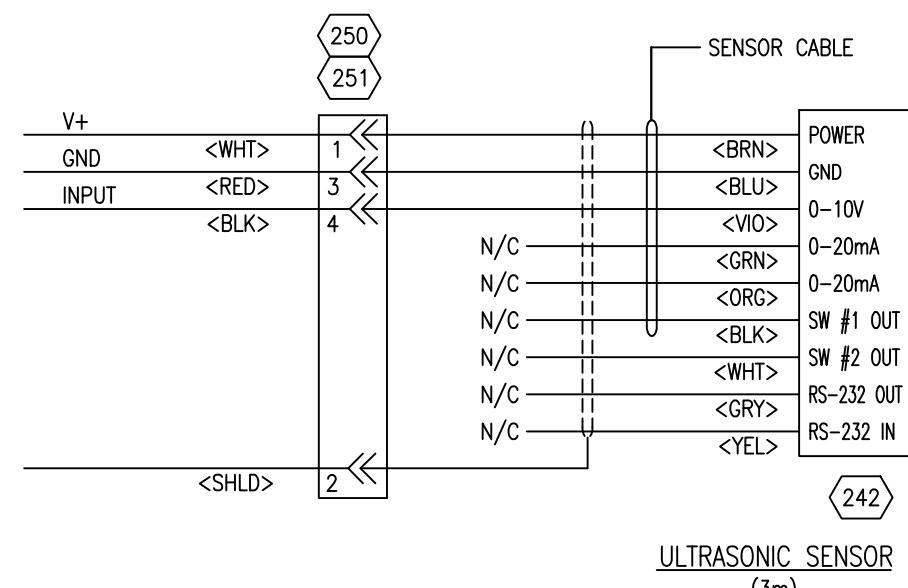
SECTION
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SUB. SEC.
27

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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
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FILENAME: 20170609M27.dwg	DATE 02/08/19	CONT. ON 19



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ENGINEER:
L.D.

	APPROVED BY
ANDERS	ETI FNAME:

WHOLE
LANDERS
CONTRACT. 20170609M

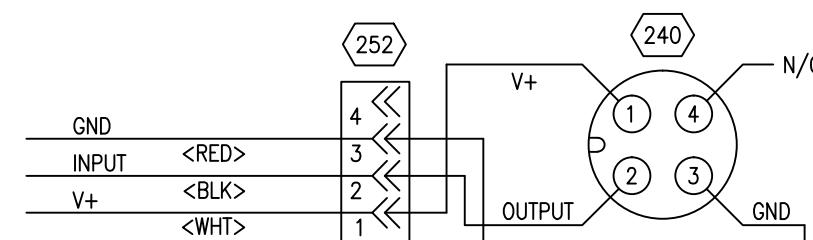
	DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119
ODY	DRAWN BY: J.C. STITT	
	DRAWN BY: J.C. STITT	

CHECKED BY: L.D. MOODY	ARDVARC CONTROL SYSTEM DEVICENET I/O MODULES
---------------------------	---

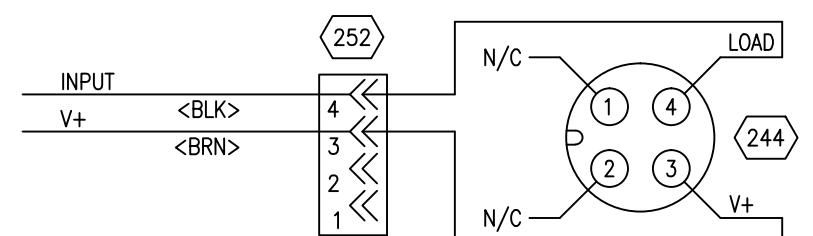
dwg FLANDERS PROVIDED ANALOG

CURRENT & VOLTAGE SENSORS

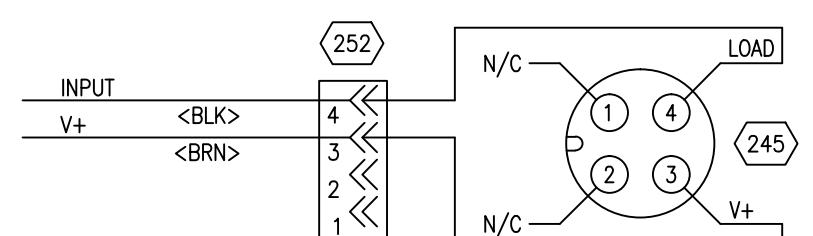
LOC. CODE	DATE 02/08/19	CONT. ON 20	
DRAWING NO. 201706	SECTION 09	SUB. SEC. M	SHEET 28



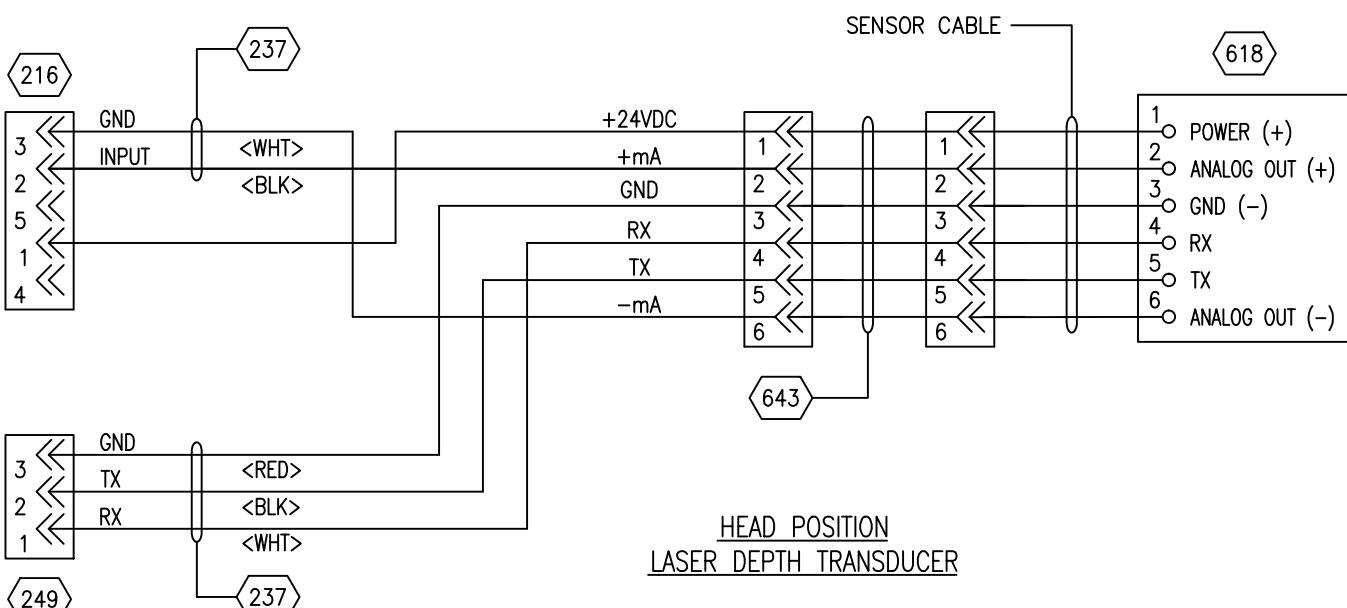
PRESSURE TRANSDUCER
(0-50 BAR/0-725PSI)



POSITION SENSOR



POSITION SENSORS



HEAD POSITION

VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM
OPERATOR CAB PC/HMI

P/N: ARDV-03-403-00

SHEET	DESCRIPTION
12A01	TITLE SHEET & SHEET INDEX
12C01	POWER/ETHERNET/DEVICENET/CAN bus CONNECTION DIAGRAM
12D01	TAGS SCHEDULE
12G01	PC/HMI-PWS/UPS/CB/TB & DEVICENET TB LAYOUT
12L01	PC/HMI-24VDC POWER DISTRIBUTION
12M01	DEVICENET NETWORK – CONNECTION DIAGRAM



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02/08/19

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DATE

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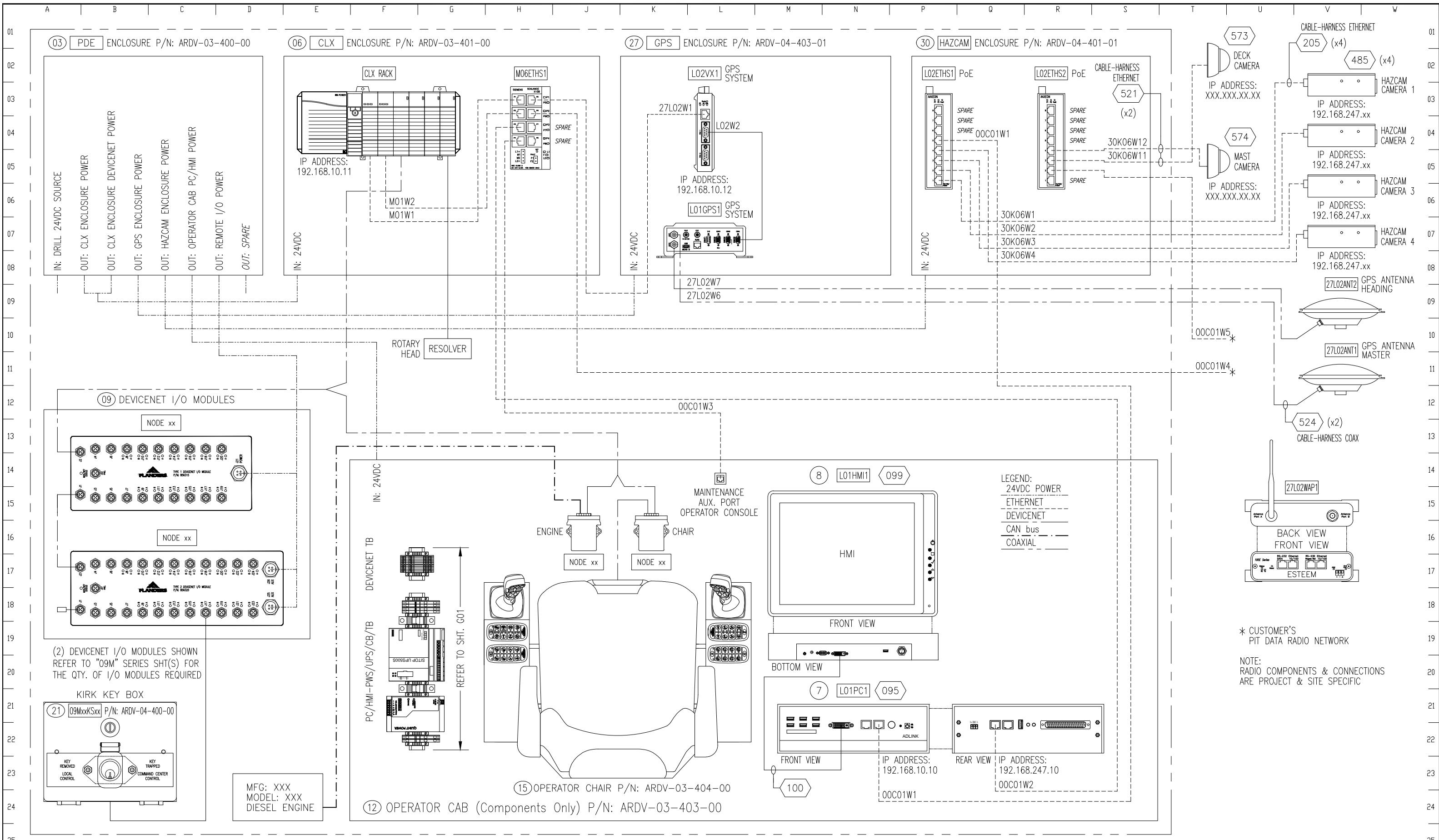
DESCRIPTION

DATE

BY

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ENGINEER: L.D. MOODY DRAWN BY: J.C. STITT
APPROVED BY: CHECKED BY: L.D. MOODY
DRAWING TITLE: VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
OPERATOR CAB PC/HMI
POWER/ETHERNET/DEVICENET/CAN bus CONNECTION DIAGRAM

LOC. CODE DATE CONT. ON
201706 02/08/19 03
DRAWING NO. SECTION SUB. SEC. SHEET
201706 12 C 01

TAG SCHEDULE				
TAG NO.	SIZE	TAG COLOR	TEXT COLOR	TAG TEXT
(1)	1/2" x 1-1/2"	WHITE	BLACK	12L01TB1
(2)	1/2" x 1-1/2"	WHITE	BLACK	12L01TB2
(3)	1/2" x 1-1/2"	WHITE	BLACK	12L01PWS1
(4)	1/2" x 1-1/2"	WHITE	BLACK	12L01PWS2
(5)	1/2" x 1-1/2"	WHITE	BLACK	12L01CB1
(6)	1/2" x 1-1/2"	WHITE	BLACK	12L01CB2
(7)	1/2" x 1-1/2"	WHITE	BLACK	12L01PC1
(8)	1/2" x 1-1/2"	WHITE	BLACK	12L01HMI1
(9)	1/2" x 1-1/2"	WHITE	BLACK	12M01TB1
(10)	1/2" x 1-1/2"	WHITE	BLACK	12L01GB1
(11)	1/2" x 1-1/2"	WHITE	BLACK	NODE 5
(12)	1/2" x 1-1/2"	WHITE	BLACK	NODE 6

SERIAL NUMBER:
XXX-XXX

FLANDERS P/N: TAG-SST-200



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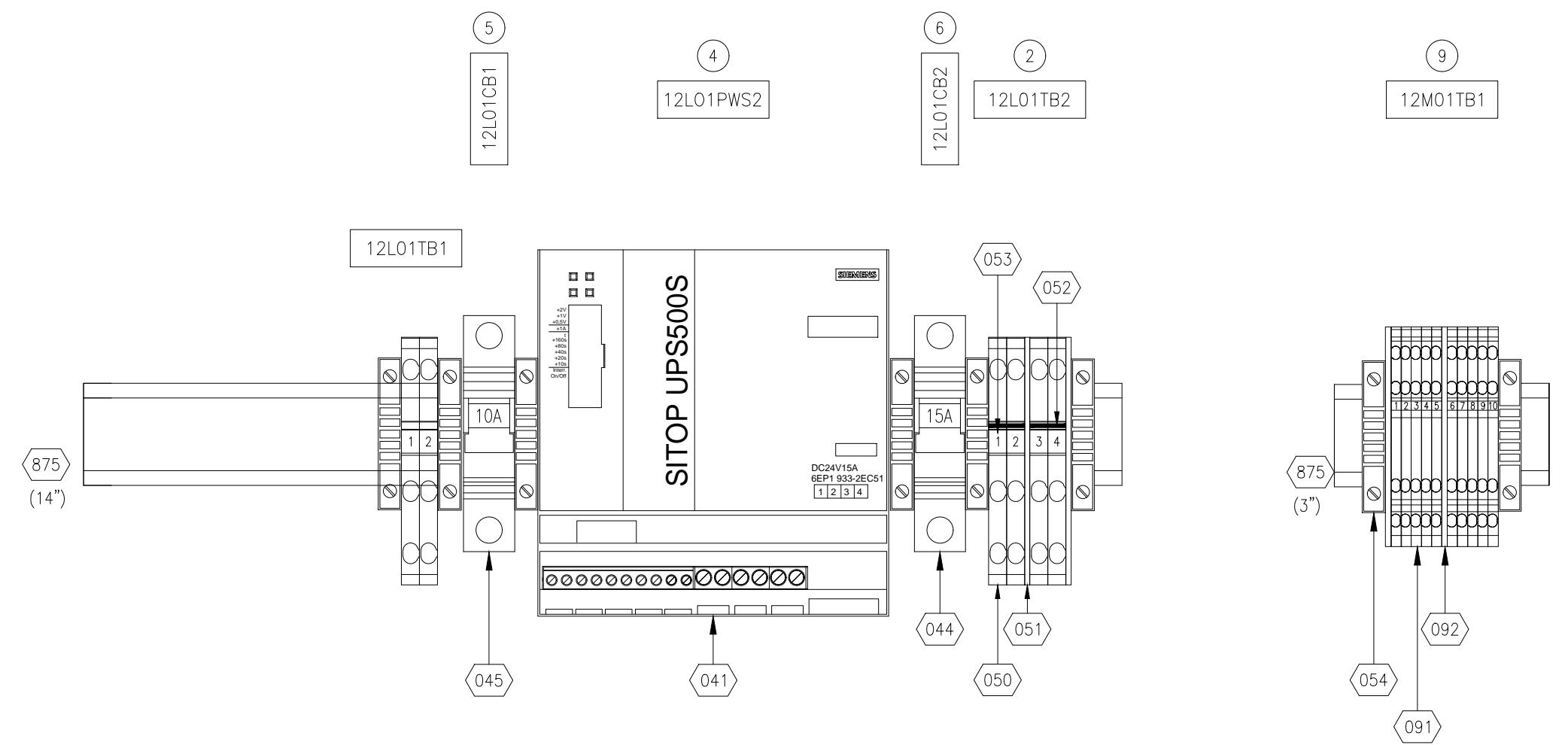
ENGINEER:
L.D. MOOD

ENGINEER:
L.D. MOOD

ANDERS WHOLE ANDERS FILENAME: 20170612D01

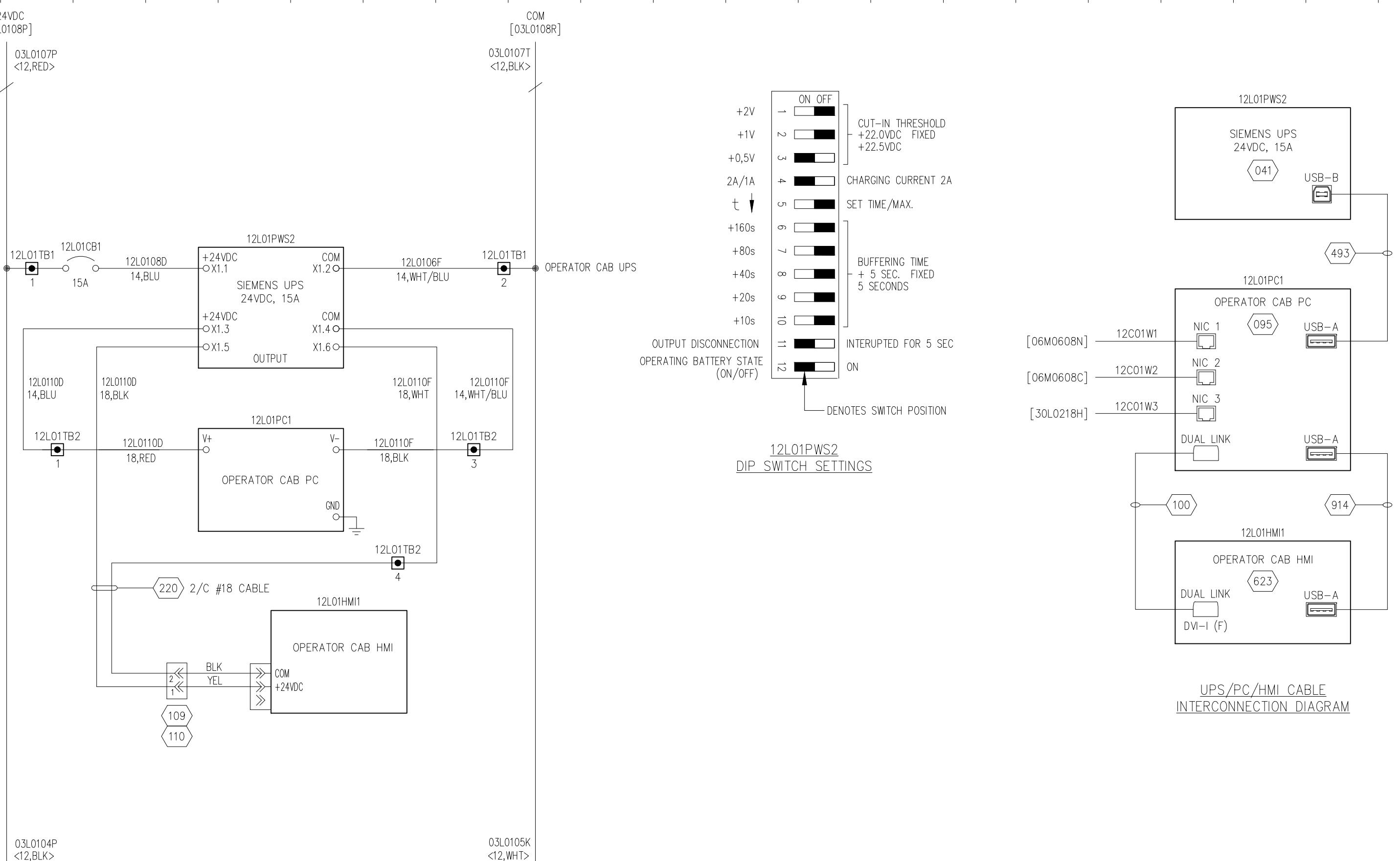
DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
OPERATOR CAB PC/HMI
TAGS SCHEDULE

LOC. CODE	DATE 02/08/19	CONT. ON 03	
DRAWING NO. 201706	SECTION 12	SUB. SEC. D	SHEET 01



PC/HMI UPS

DEVICENET TB LAYOUT



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRÁ-DRILL1119

ARDVARC CONTROL SYSTEM

OPERATOR CAB PC/HMI

PC/HMI-24VDC POWER DISTRIBUTION

LOC. CODE

DATE

CONT. ON

02/08/19

05

DRAWING NO.

SECTION

SUB. SEC.

SHEET

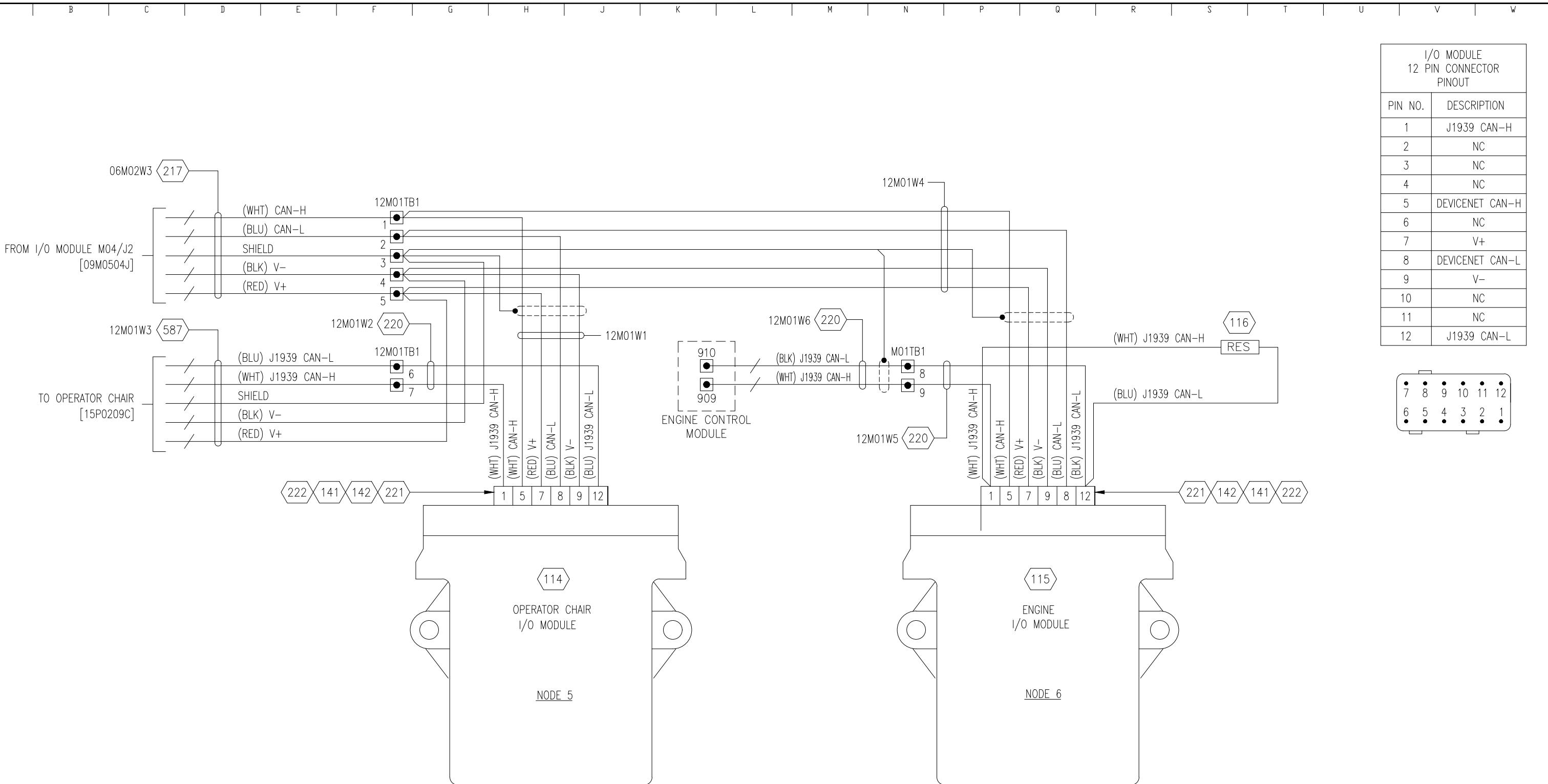
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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	DATE	BY	CHKD
						0	02/08/19	JCS	LDM



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

OPERATOR CAB PC/HMI

DEVICENET NETWORK - CONNECTION DIAGRAM

LOC. CODE
DATE
02/08/19
CONT. ON
FNL

DRAWING NO.
SECTION
SUB. SEC.
SHEET
201706 12 M 01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE

0 AS-INSTALLED	02/08/19	JCS	LDM	FILENAME: 20170612M01.dwg
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VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM

OPERATOR CHAIR W/4-KEYPADS

P/N: ARDV-03-404-00

SHEET	DESCRIPTION
15A01	TITLE SHEET & SHEET INDEX
15E01	LAYOUT
15E02	LEFT SIDE CONSOLE – JOYSTICK/KEYPADS LAYOUT
15E03	RIGHT SIDE CONSOLE – JOYSTICK/KEYPADS LAYOUT
15E04	DEVICENET NETWORK – CONNECTION DIAGRAM



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J.C. STITT

APPROVED BY:

L.D. MOODY

CHECKED BY:

L.D. MOODY

DRAWING TITLE:

VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

OPERATOR CHAIR W/4-KEYPADS

TITLE SHEET & SHEET INDEX

LOC. CODE

201706

DATE

02/08/19

CONT. ON

02

DRAWING NO.

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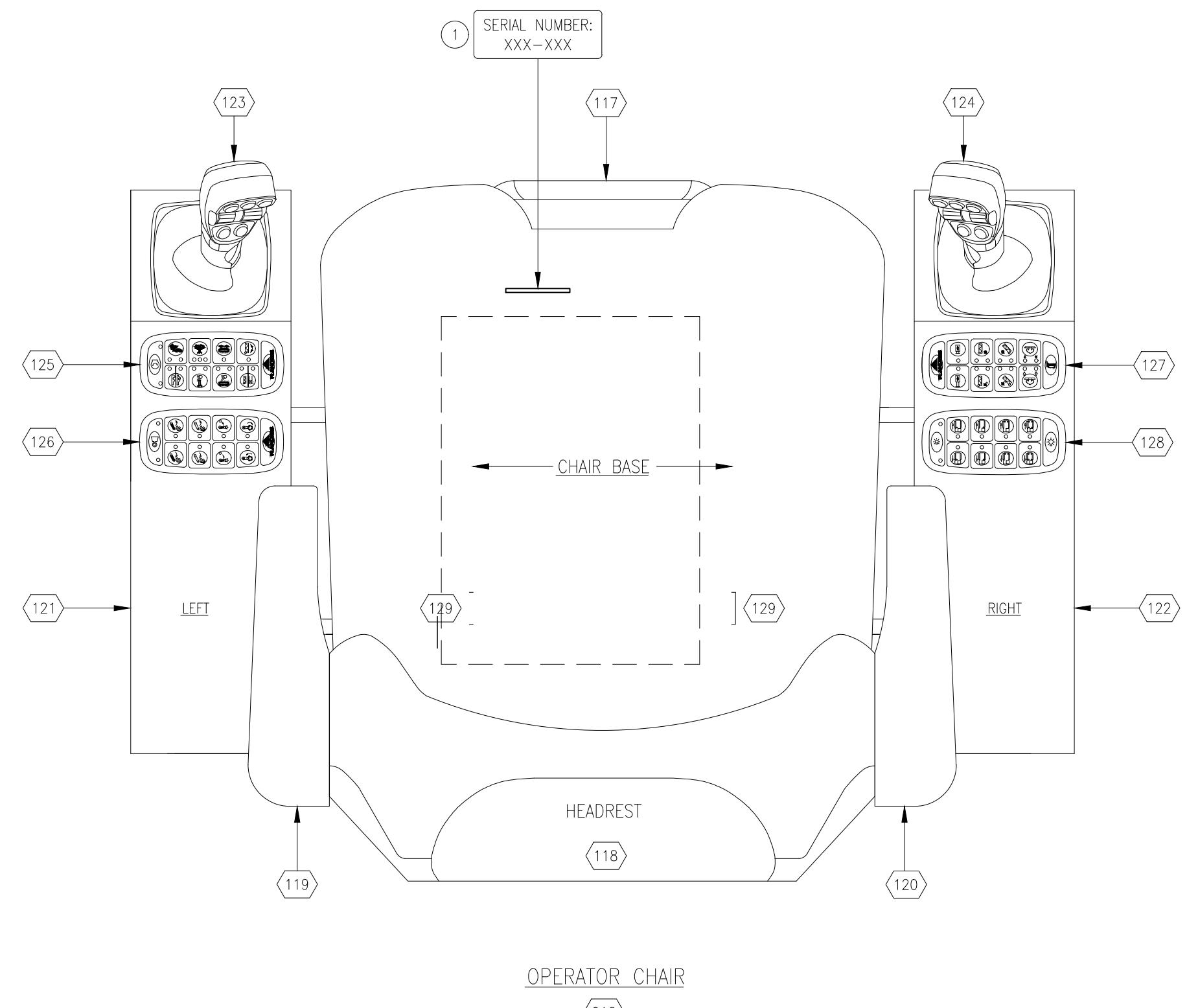
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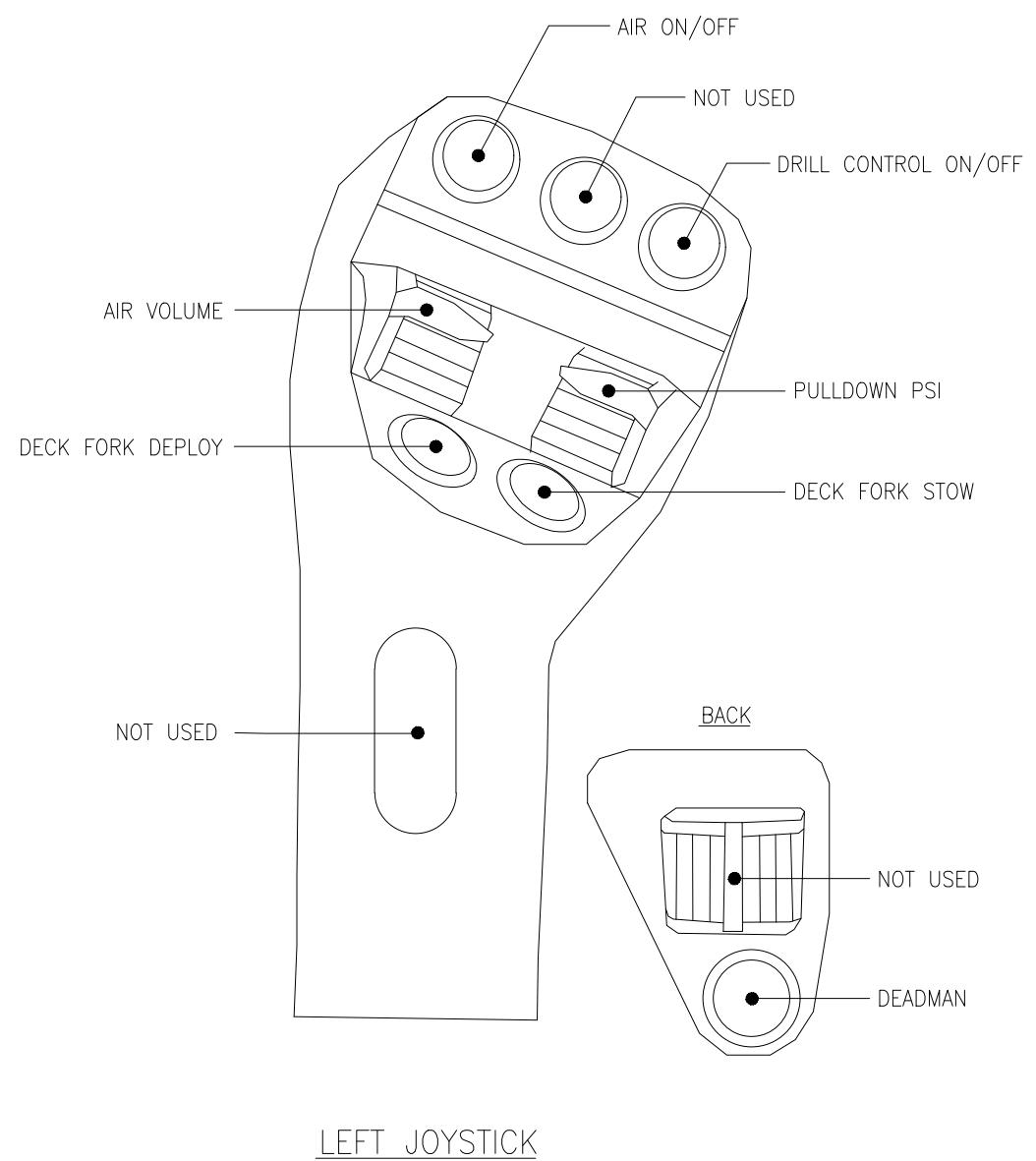
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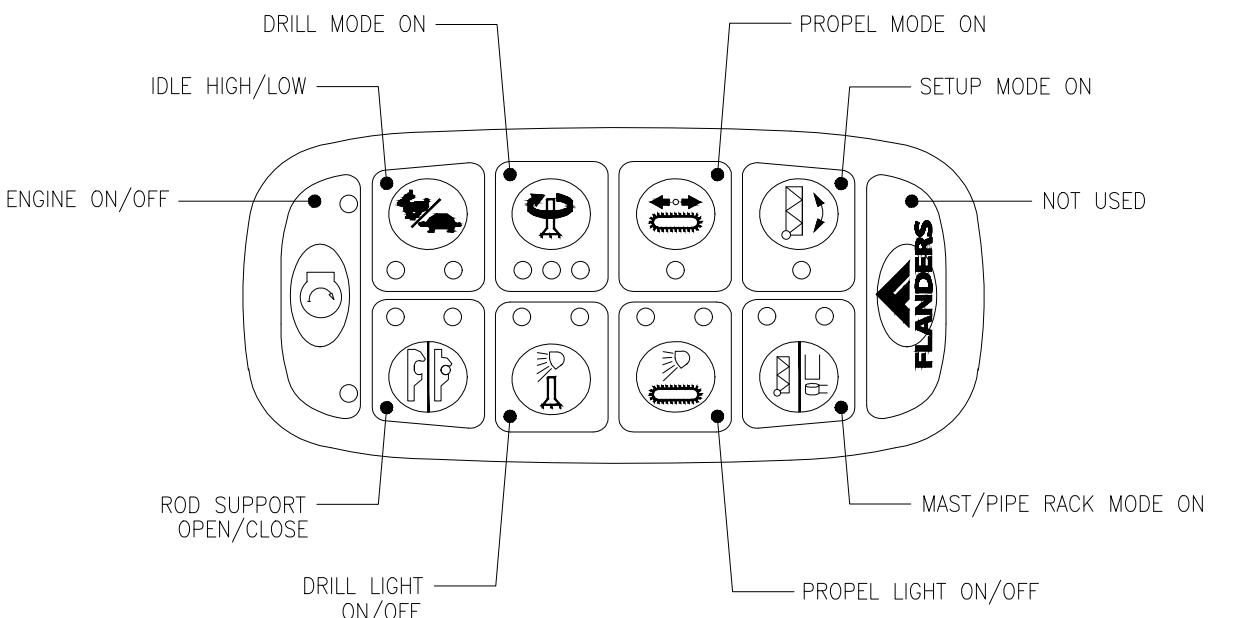
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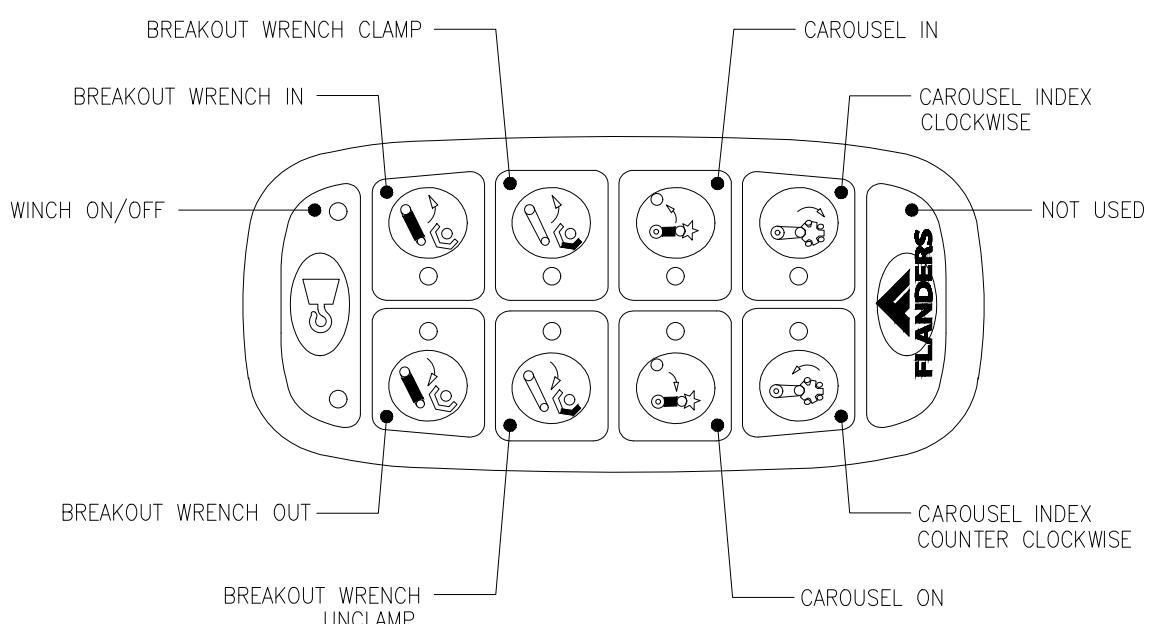
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									APPROVED BY: 		CHECKED BY: L.D. MOODY	ARDVARC CONTROL SYSTEM				
				0	AS-INSTALLED	02/08/19	JCS	LDM	OPERATOR CHAIR W/4-KEYPADS							
									THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF FLANDERS ELECTRICAL DISCLOSURE OR USE OF IT SHALL BE MADE IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF FLANDERS		FILENAME: 20170615F01.dwg	LAYOUT	DRAWING NO. 201706	SECTION 15	SUB. SEC. E	SHEET 01
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD							



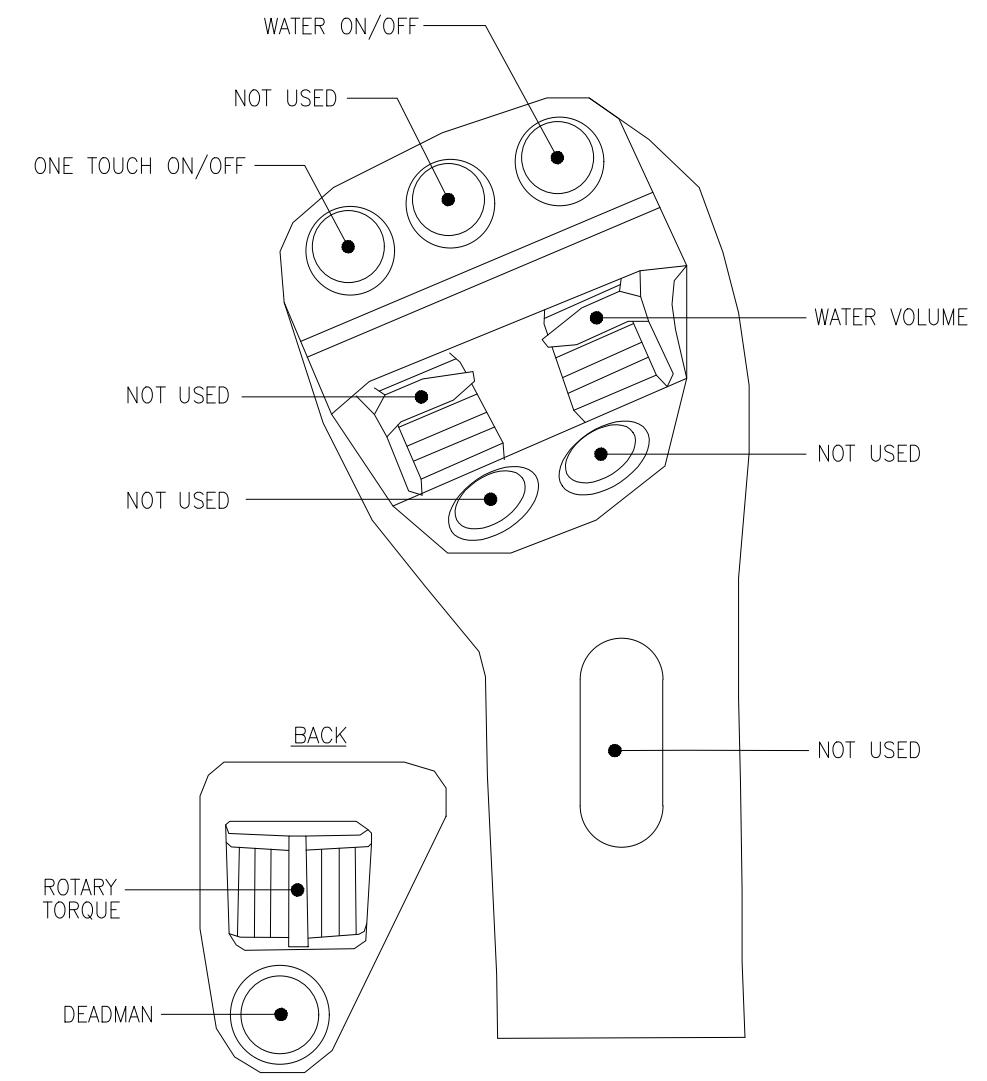
LEFT JOYSTICK



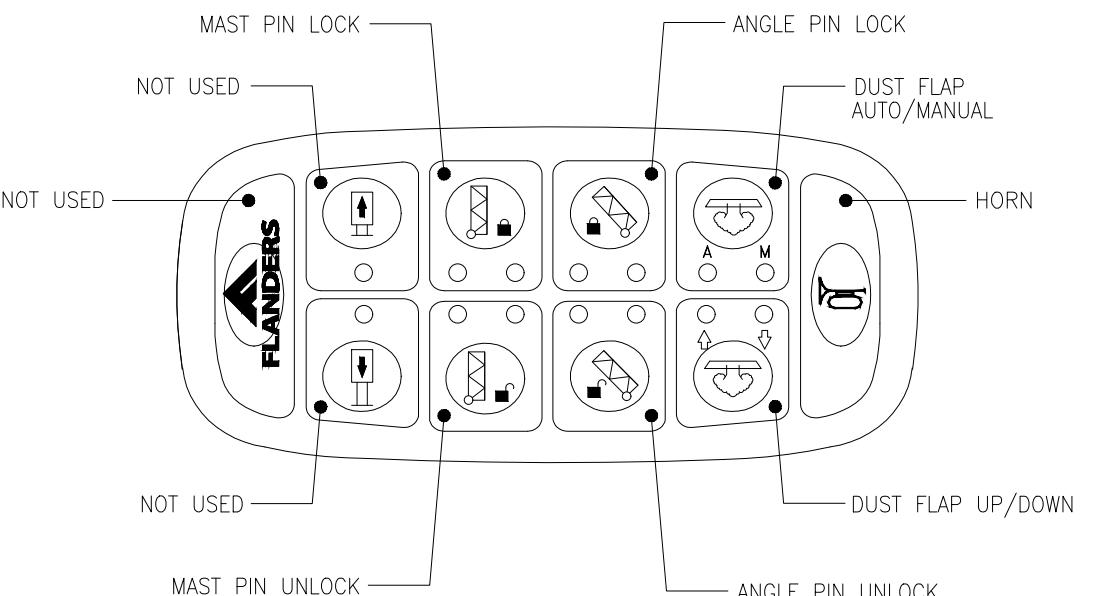
UPPER LEFT KEYPAD



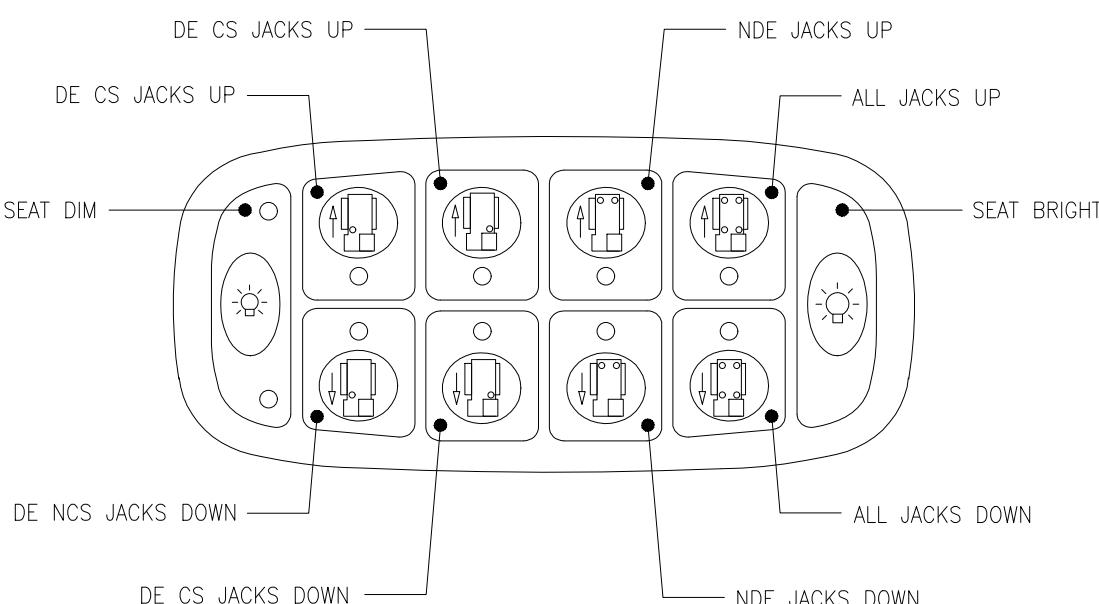
LOWER LEFT KEYPAD



RIGHT JOYSTICK



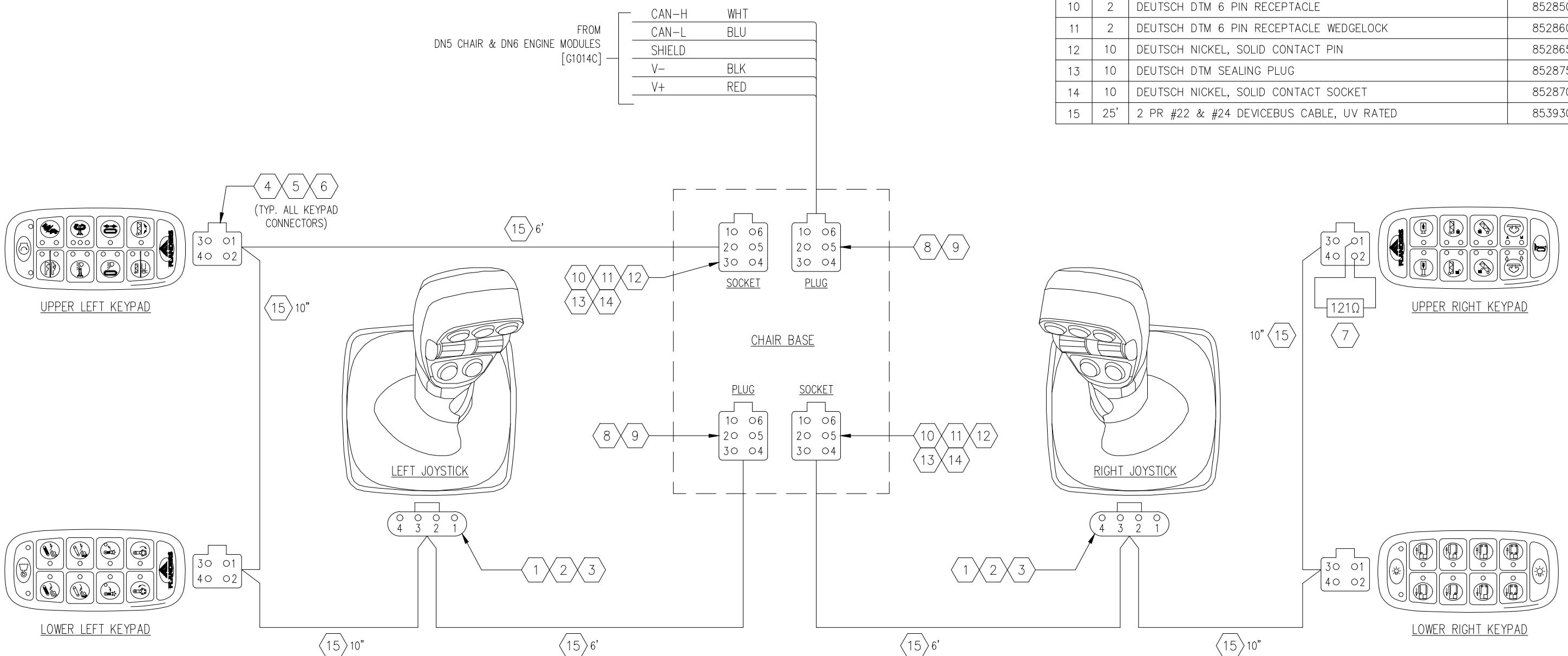
UPPER RIGHT KEYPAD



LOWER RIGHT KEYPAD

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
01 CONNECTOR PINOUTS																				
02 DESCRIPTION	WIRE COLOR	KEYPAD 4 PIN	BASE 6 PIN	JOYSTICK 4 PIN																
03 CAN-L	BLU	1	1	4																
04 CAN-H	WHT	2	2	3																
05 V-	BLK	3	3	2																
06 V+	RED	4	4	1																
07 SHIELD	BARE		5																	
08			6																	

BILL OF MATERIAL		
ITEM	QTY.	DESCRIPTION
1	2	4 PIN PLUG CONNECTOR
2	10	PLUG CONNECTOR RECEPTACLE CONTACT
3	10	PLUG CONNECTOR WIRE SEAL
4	4	DEUTSCH DT 4 PIN PLUG
5	4	DEUTSCH DT 4 PIN WEDGELOCK
6	30	DEUTSCH NICKEL, SOLID CONTACT SOCKET
7	1	DEVICENET 121 OHM RESISTOR
8	2	DEUTSCH DTM 6 PIN PLUG
9	2	DEUTSCH DTM 6 PIN PLUG WEDGELOCK
10	2	DEUTSCH DTM 6 PIN RECEPTACLE
11	2	DEUTSCH DTM 6 PIN RECEPTACLE WEDGELOCK
12	10	DEUTSCH NICKEL, SOLID CONTACT PIN
13	10	DEUTSCH DTM SEALING PLUG
14	10	DEUTSCH NICKEL, SOLID CONTACT SOCKET
15	25'	2 PR #22 & #24 DEVICEBUS CABLE, UV RATED



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
OPERATOR CHAIR W/4-KEYPADS
DEVICENET NETWORK - CONNECTION DIAGRAM

LOC. CODE DATE CONT. ON
201706 02/08/19 FNL

DRAWING NO. SECTION SUB. SEC. SHEET
201706 15 E 04

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM										

DESCRIPTION DATE BY CHKD REV.
20170615E04.dwg

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25																				25

TAG SCHEDULE				
TAG NO.	SIZE	TAG COLOR	TEXT COLOR	TAG TEXT
(1)	1" x 4"	WHITE	BLACK	DRILL MODE
(2)	1/2" x 1-1/2"	WHITE	BLACK	18L01TB1
(3)	1/2" x 1-1/2"	WHITE	BLACK	18L01TB2
(4)	1/2" x 1-1/2"	WHITE	BLACK	18L01TB3
(5)	1/2" x 1-1/2"	WHITE	BLACK	18L01TB4

P/N: TAG-SST-200

(6) SERIAL NUMBER:
XXX-XXX 1/4

(7) SERIAL NUMBER:
XXX-XXX 2/4

(8) SERIAL NUMBER:
XXX-XXX 3/4

(9) SERIAL NUMBER:
XXX-XXX 4/4



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DRILL MODE LIGHT BOX
TAG SCHEDULE

LOC. CODE
02/08/19
DATE
03

DRAWING NO.
201706
SECTION
18
SUB. SEC.
D
SHEET
01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

This technical drawing provides four views of the Drill Mode Light Enclosure:

- Front View:** Shows the top edge with a width of 7 3/4", a central panel labeled "DRILL MODE" with three indicator lights (147 RED, 148 BLUE, 149 GREEN), and a vertical slot on the right side.
- Left Side View:** Shows the side profile with a height of 7 3/4" and a width of 4".
- Back View:** Shows mounting holes (150, 151) and two circular components (150, 151).
- Bottom View:** Shows the base with a height of 4" and two small rectangular cutouts.

DRILL MODE LIGHT STATUS LEGEND:

1. RED - FULL AUTONOMOUS CONTROL
2. BLUE - MANUAL CONTROL
3. GREEN - TRANSITION

DRILL MODE LIGHT ENCLOSURE
014

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	AS-INSTALLED	02/18/19	JCS	LDM					

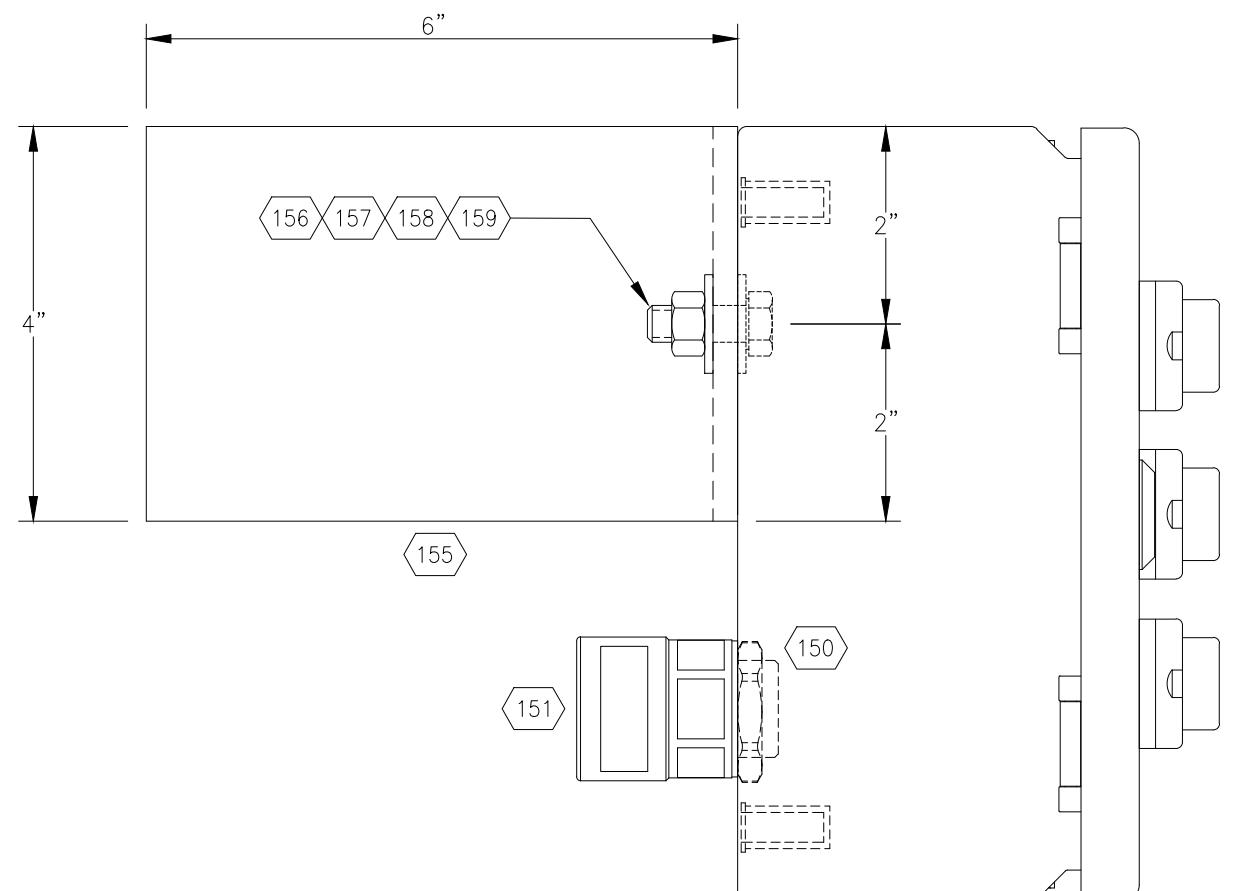
ENGINEER: L.D. MOODY DRAWN BY: J.C. STITT
APPROVED BY: CHECKED BY: L.D. MOODY

DRAWING TITLE: VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DRILL MODE LIGHT BOX ASSEMBLY

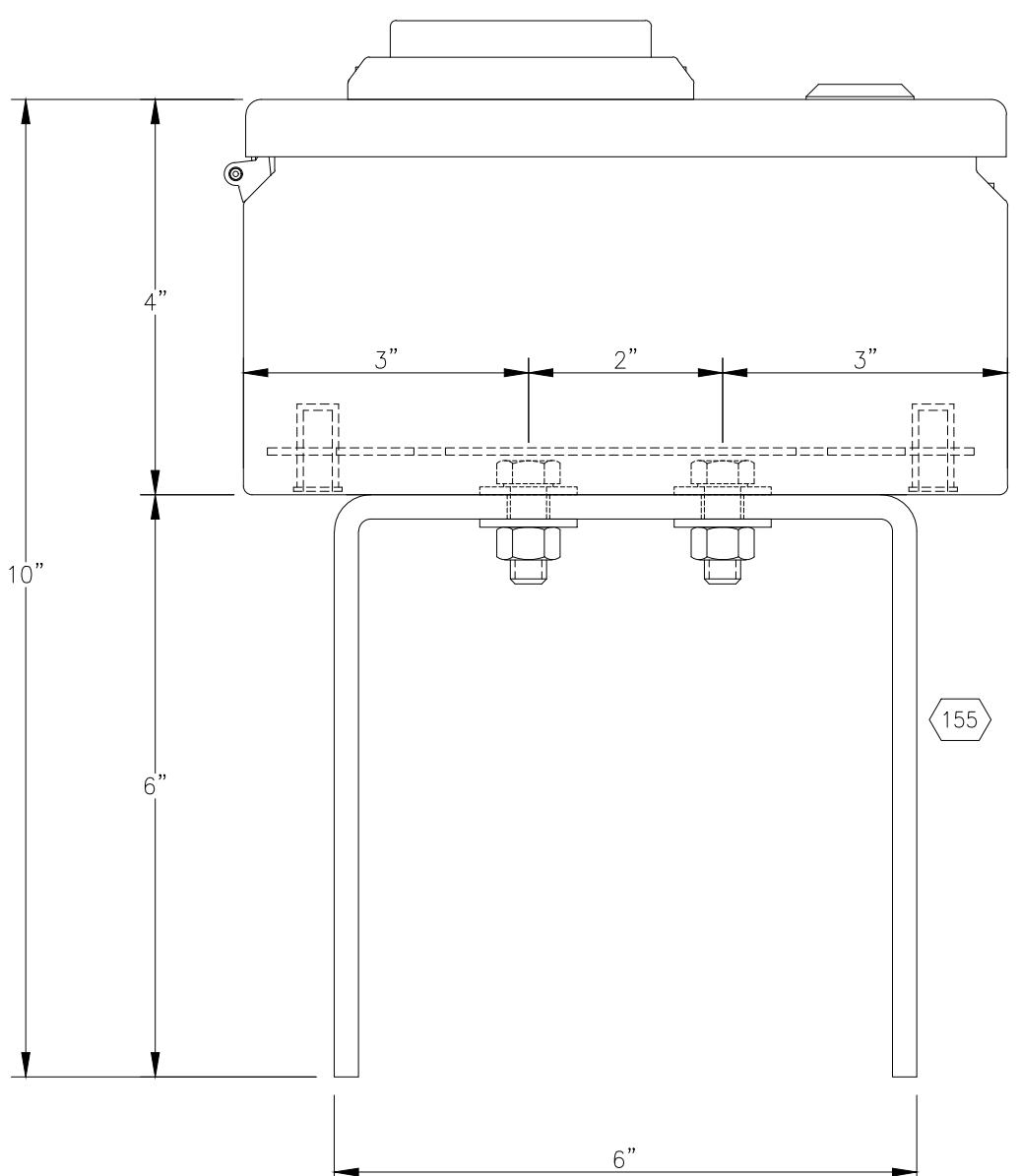
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LOC. CODE DATE CONT. ON
02/18/19 04

DRAWING NO. SECTION SUB. SEC. SHEET
201706 18 E 01



SIDE VIEW



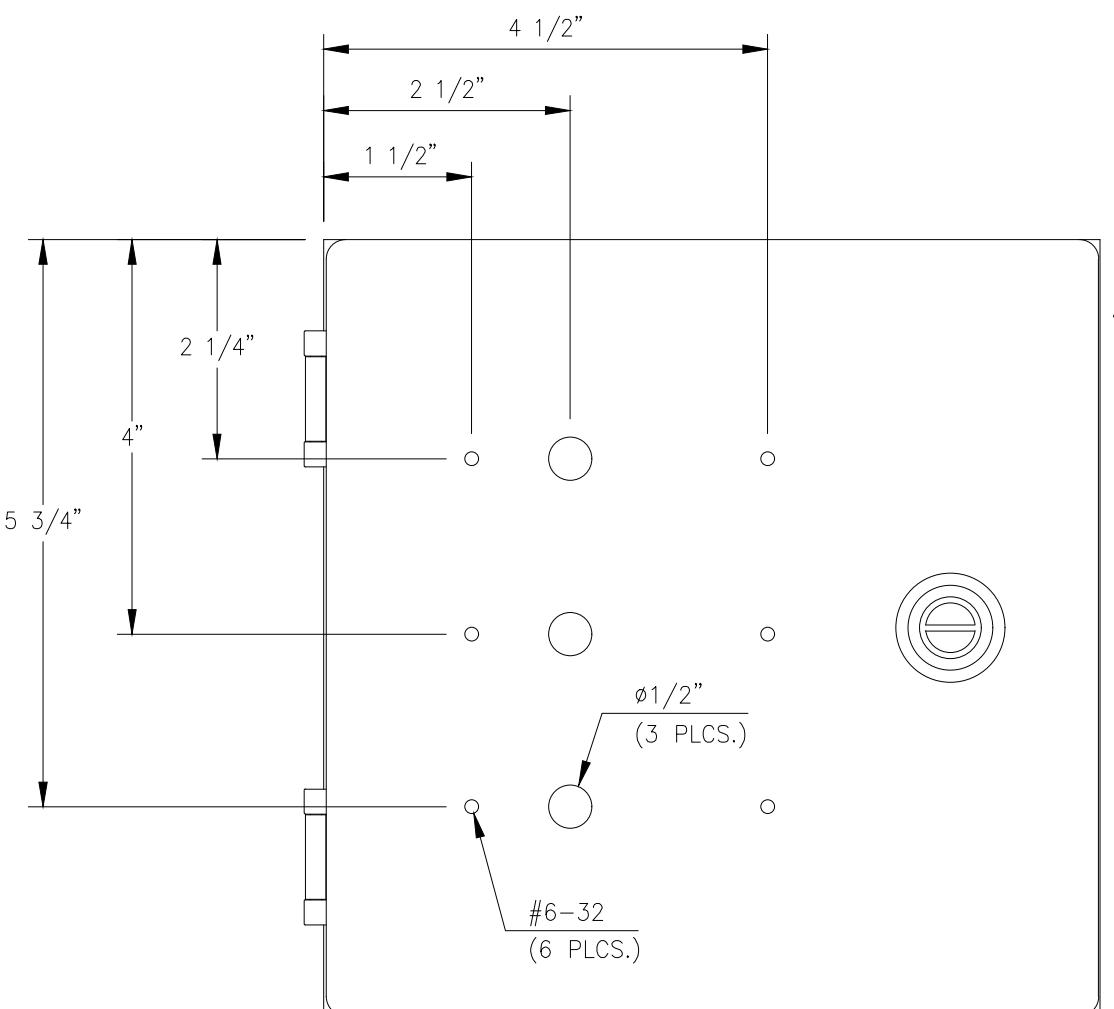
TOP VIEW

DRILL MODE LIGHT ENCLOSURES MOUNTING BRACKET

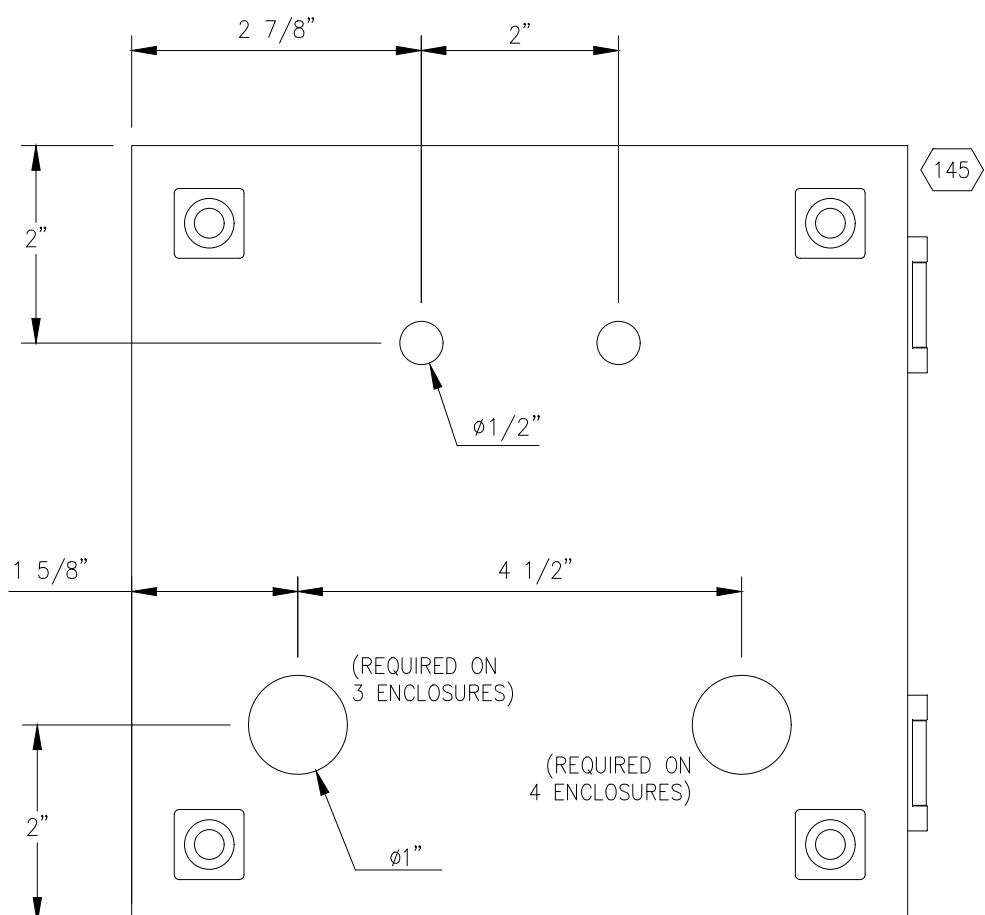


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FRONT VIEW



BACK VIEW

ENCLOSURE CUTOUT DETAIL



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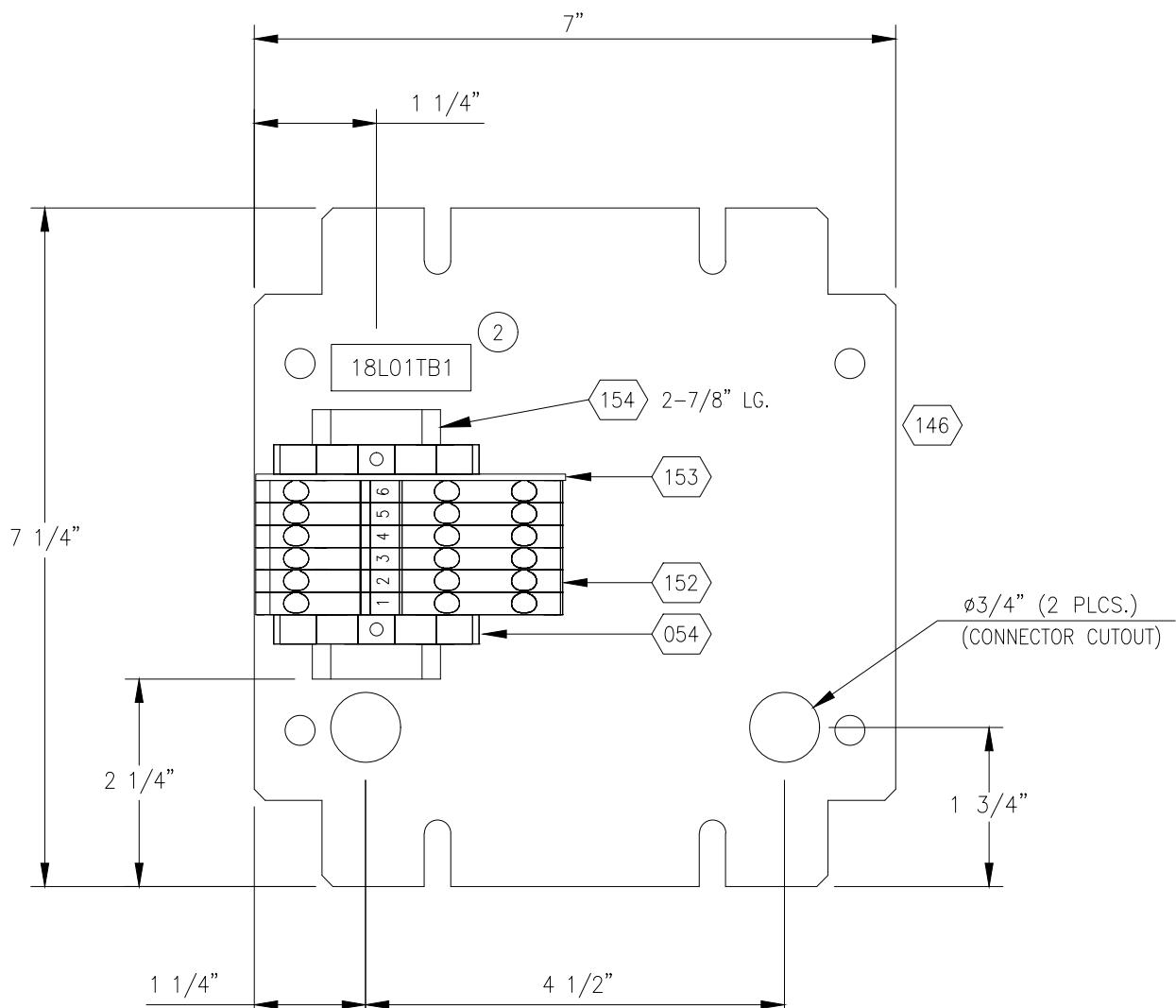
ENGINEER:
L.D. MOODY
APPROVED BY:

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DRILL MODE LIGHT BOX
CUTOUTS

LOC. CODE
DATE
02/08/19
06
DRAWING NO.
SECTION
SUB. SEC.
SHEET
201706
18
E
03

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						DESCRIPTION	DATE	BY	CHKD



BACK PANEL LAYOUT



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J.C. STITT

APPROVED BY:

CHECKED BY:

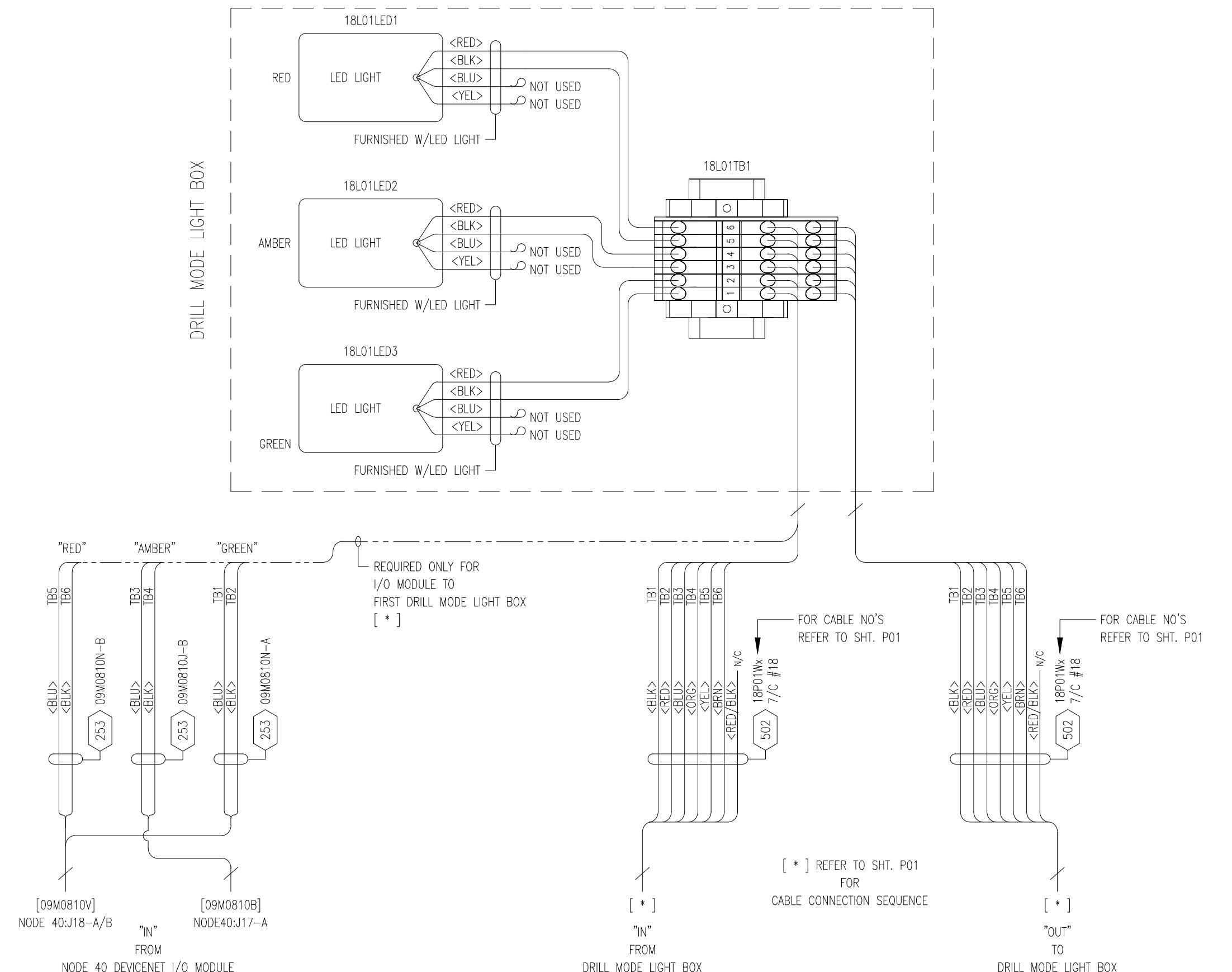
L.D. MOODY

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VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
DRILL MODE LIGHT BOX
PANEL LAYOUT

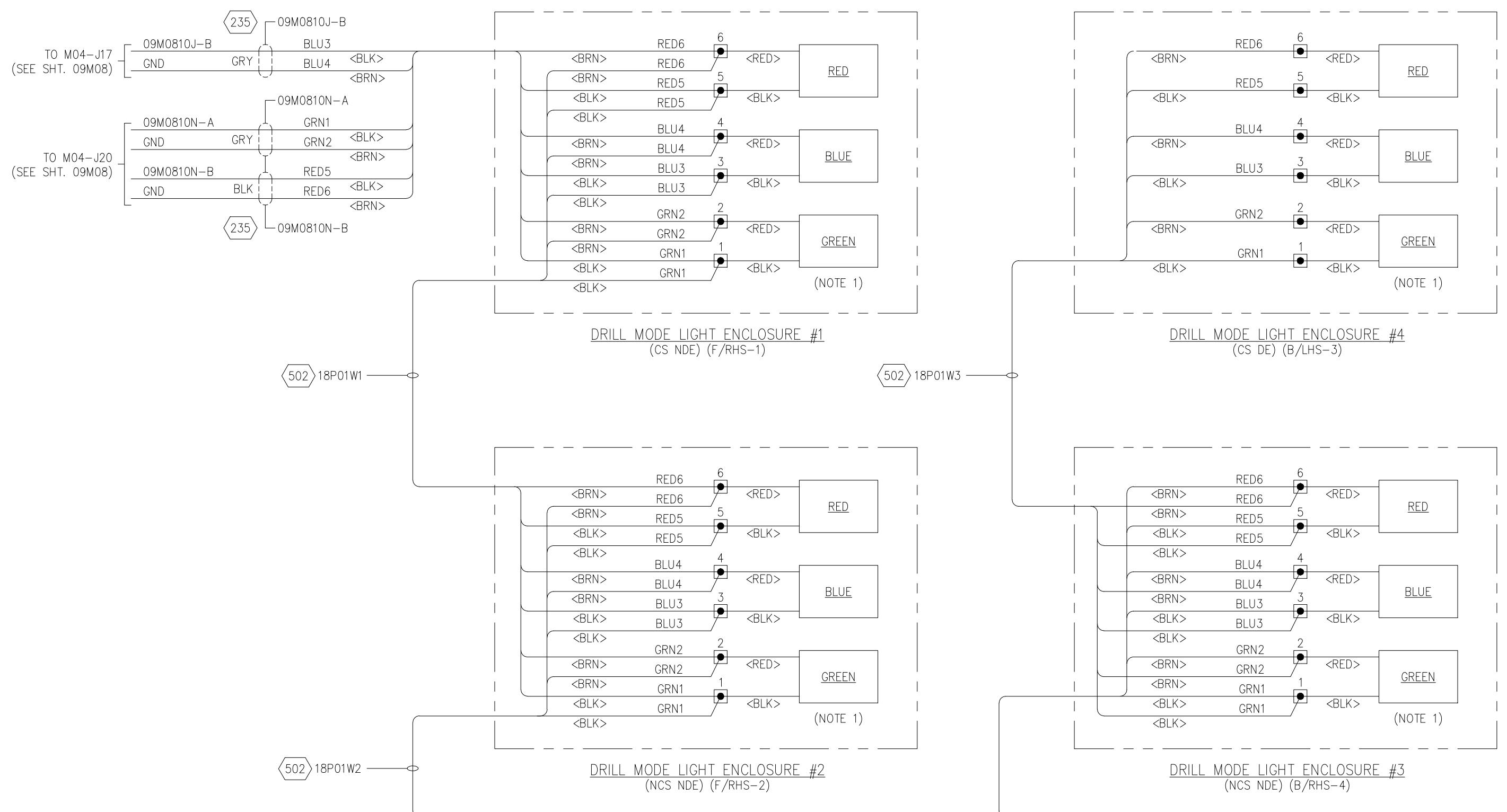
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201706 02/08/19 07

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NOTES:

- NOTES: 1. STROBE LIGHTS BLU/YEL WIRES NOT USED

VALE-ITABIRA-DRILL 1119

ARDVARC CONTROL SYSTEM

KIRK KEY BOX

P/N: ARDV-04-400-00

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21E01	ASSEMBLY
21E02	CUTOUTS

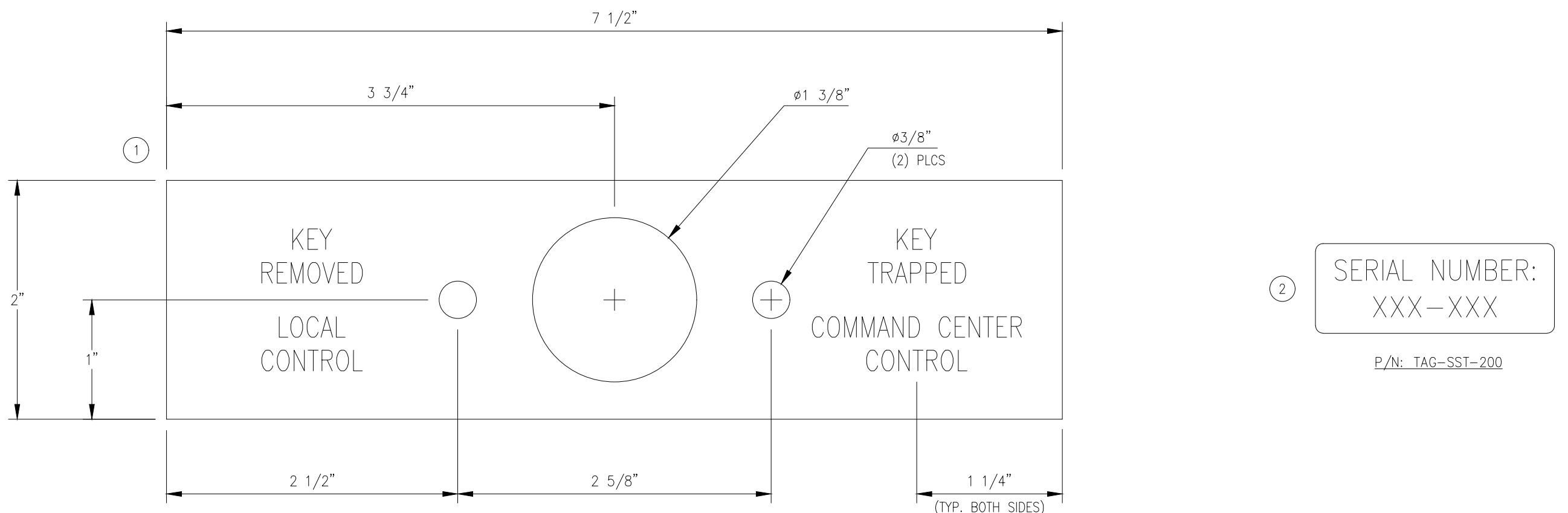


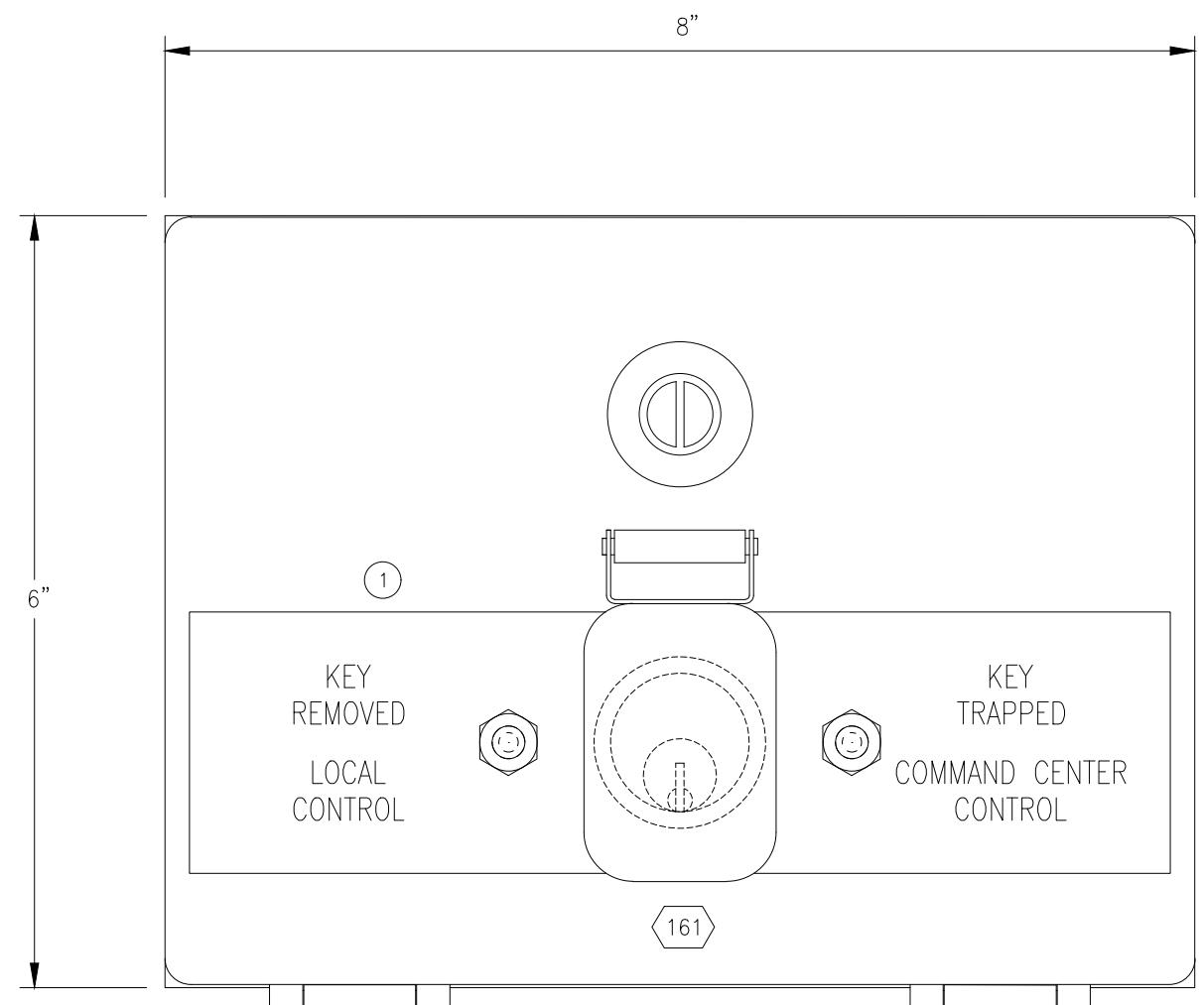
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ENGINEER:	DRAWN BY:
L.D. MOODY	J.C. STITT

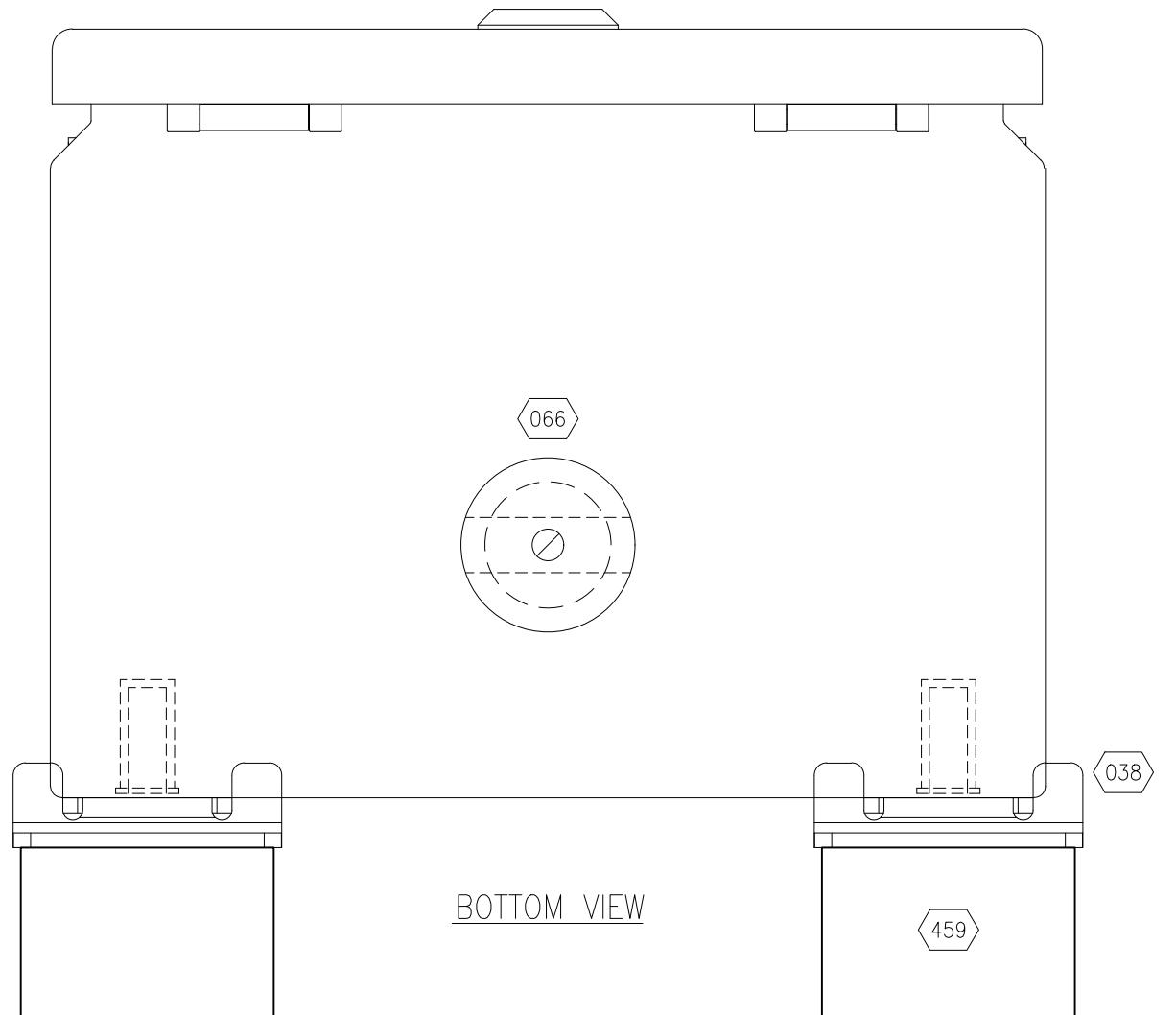
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VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM
KIRK KEY BOX
TITLE SHEET & SHEET INDEX

LOC. CODE	DATE 02/08/19	CONT. ON 02	
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FRONT VIEW



BOTTOM VIEW

KIRK KEY ENCLOSURE

019



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ENGINEER:
L.D. MOODY

APPROVED BY:

DRAWN BY:
J.C. STITT

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

KIRK KEY BOX

ASSEMBLY

LOC. CODE
201706

DATE
02/08/19

CONT. ON
04

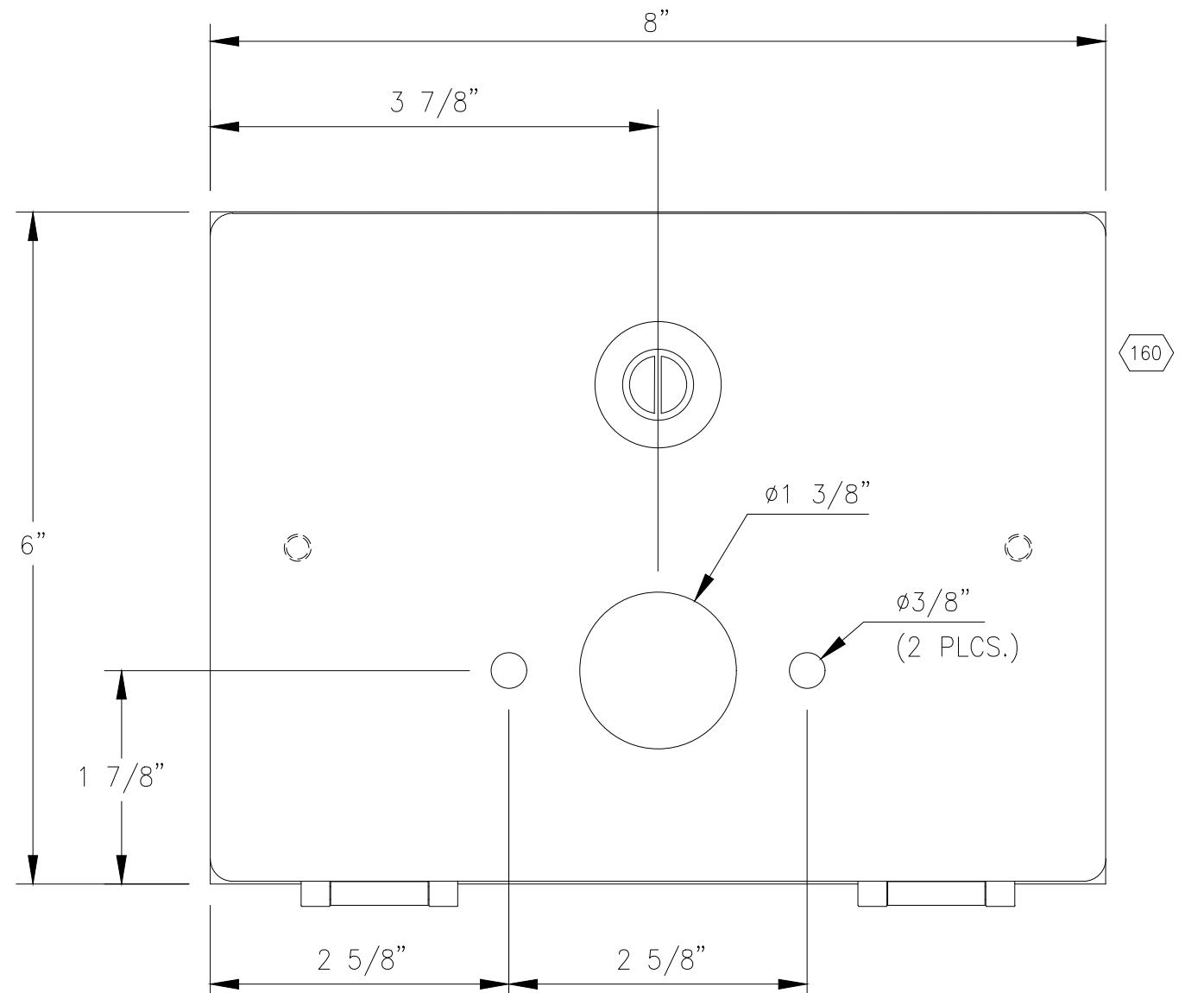
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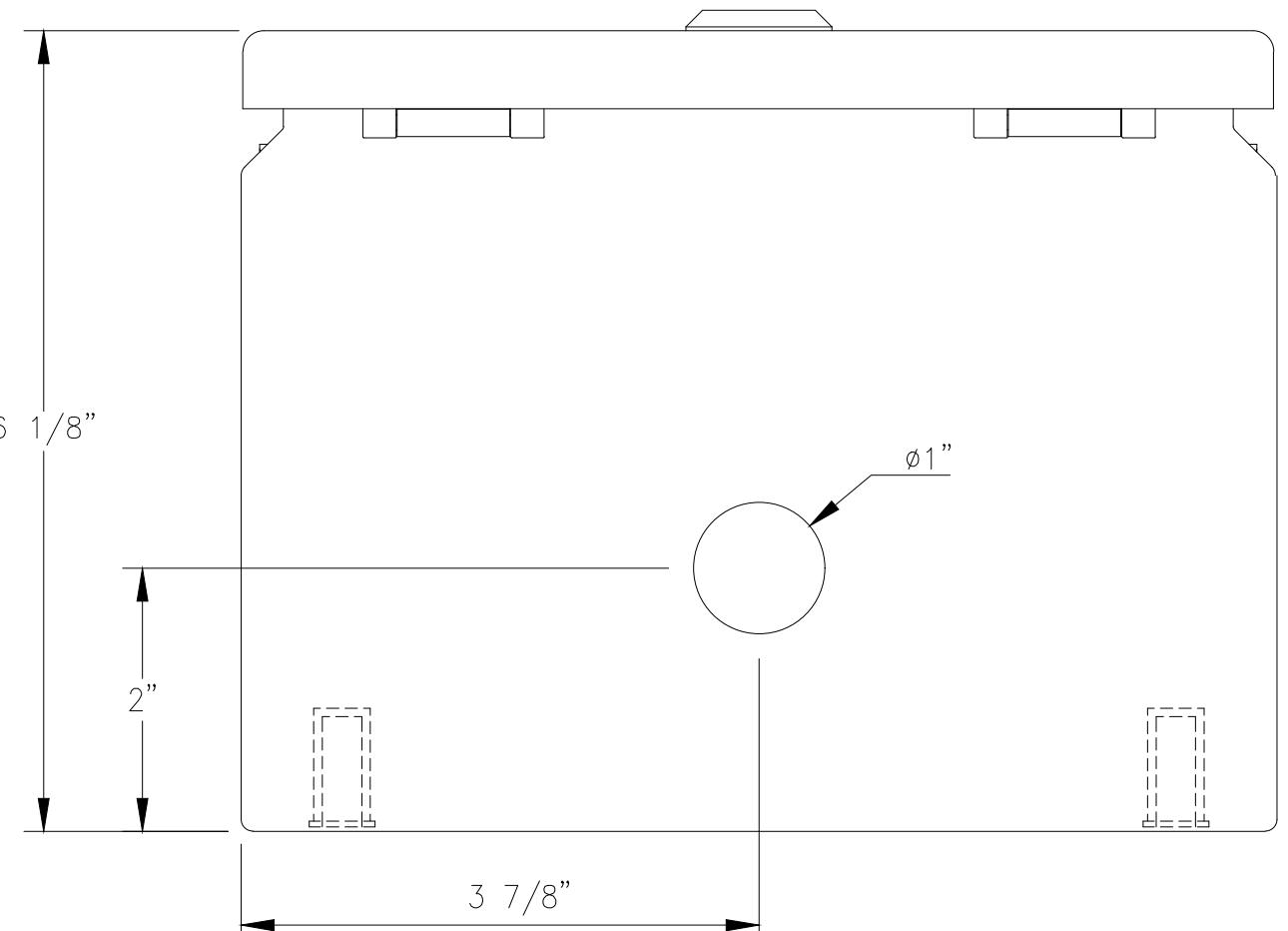
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										APPROVED BY: L.D. MOODY	CHECKED BY: L.D. MOODY	ARDVARC CONTROL SYSTEM	DRAWING NO. 21	SECTION E	SUB. SEC. 01



FRONT VIEW



BOTTOM VIEW



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J.C. STITT

APPROVED BY:

L.D. MOODY

CHECKED BY:

L.D. MOODY

DRAWING TITLE:

VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
KIRK KEY BOX
CUTOUTS

LOC. CODE

DATE
02/08/19

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FNL

DRAWING NO.
201706

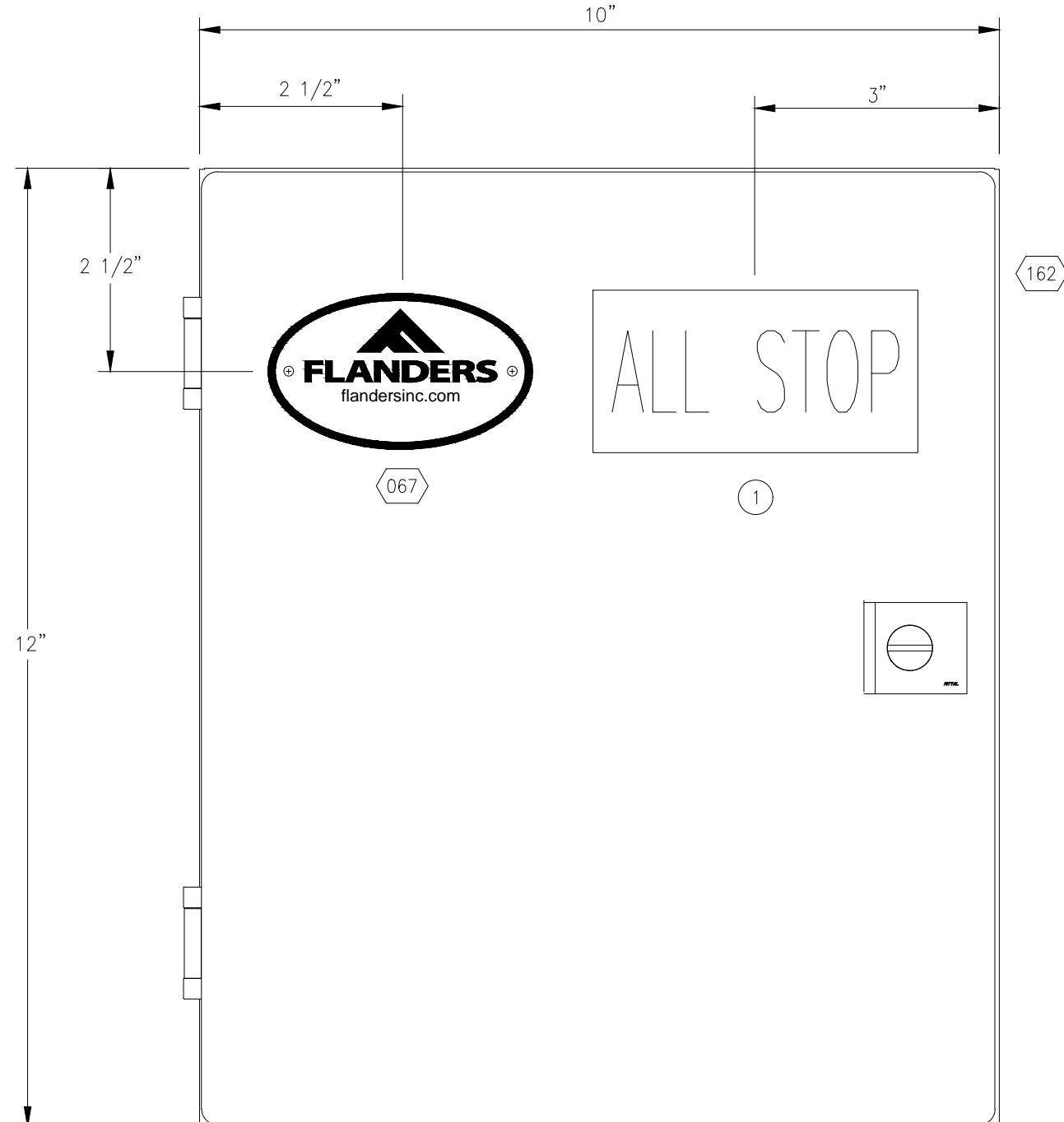
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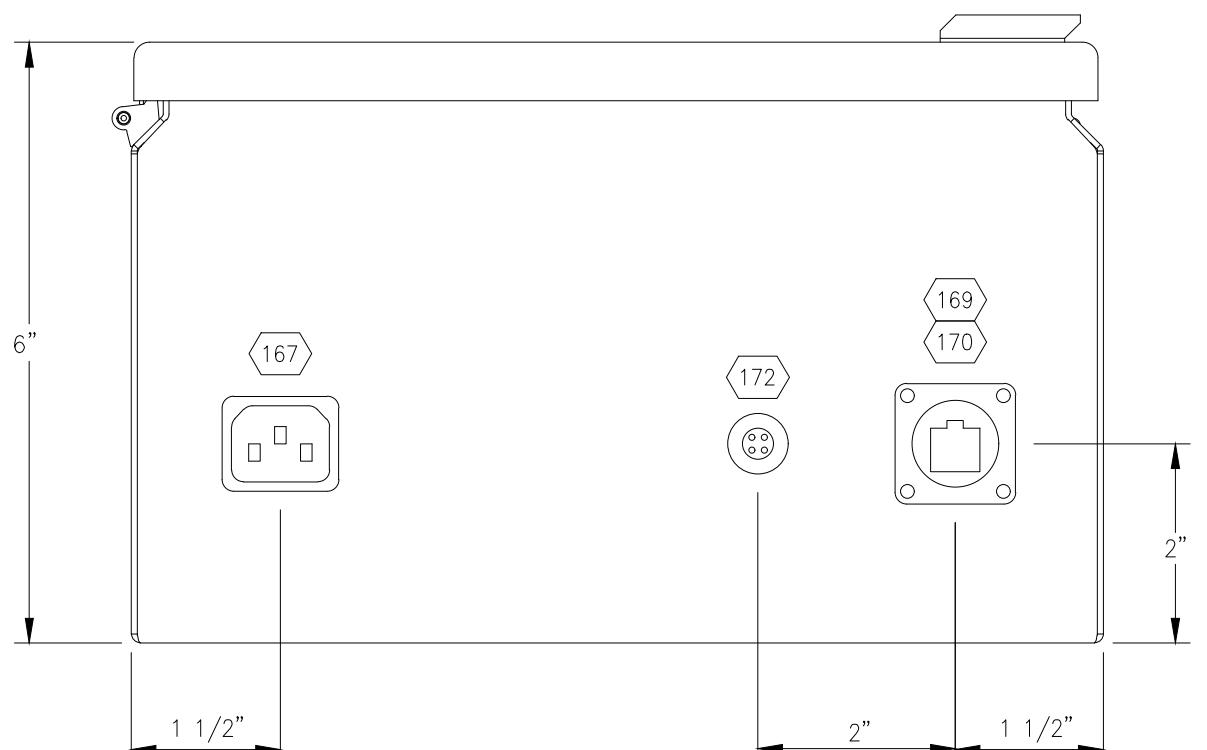
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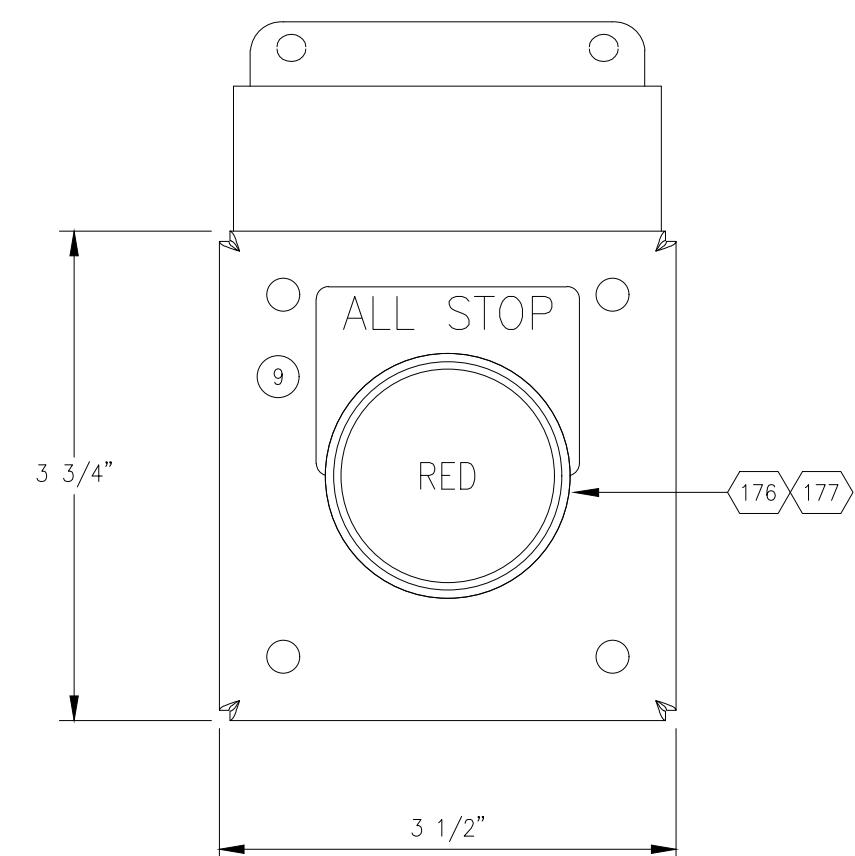
FRONT VIEW



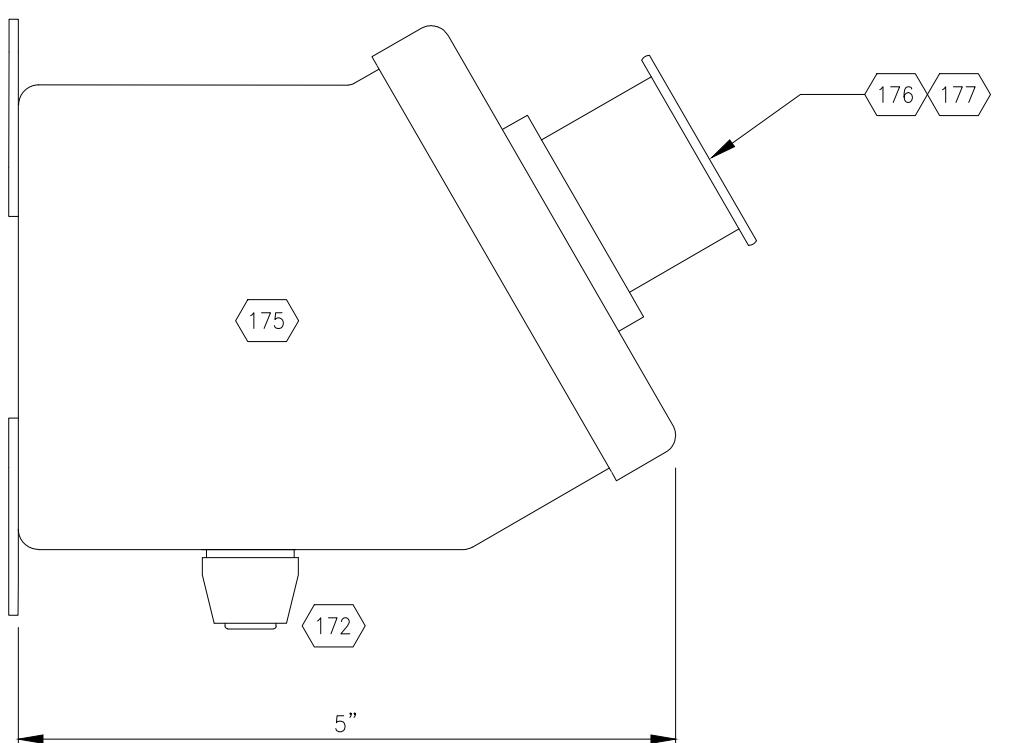
BOTTOM VIEW

ALL STOP ENCLOSURE

020



FRONT VIEW



SIDE VIEW

ALL STOP PUSHBUTTON STATION

021



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DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

ALL STOP ENCLOSURE & PB. STA. - COMMAND CENTER
PUSHBUTTON STATION ASSEMBLY

LOC. CODE
201706

DATE
02/08/19

CONT. ON
05

DRAWING NO.
24

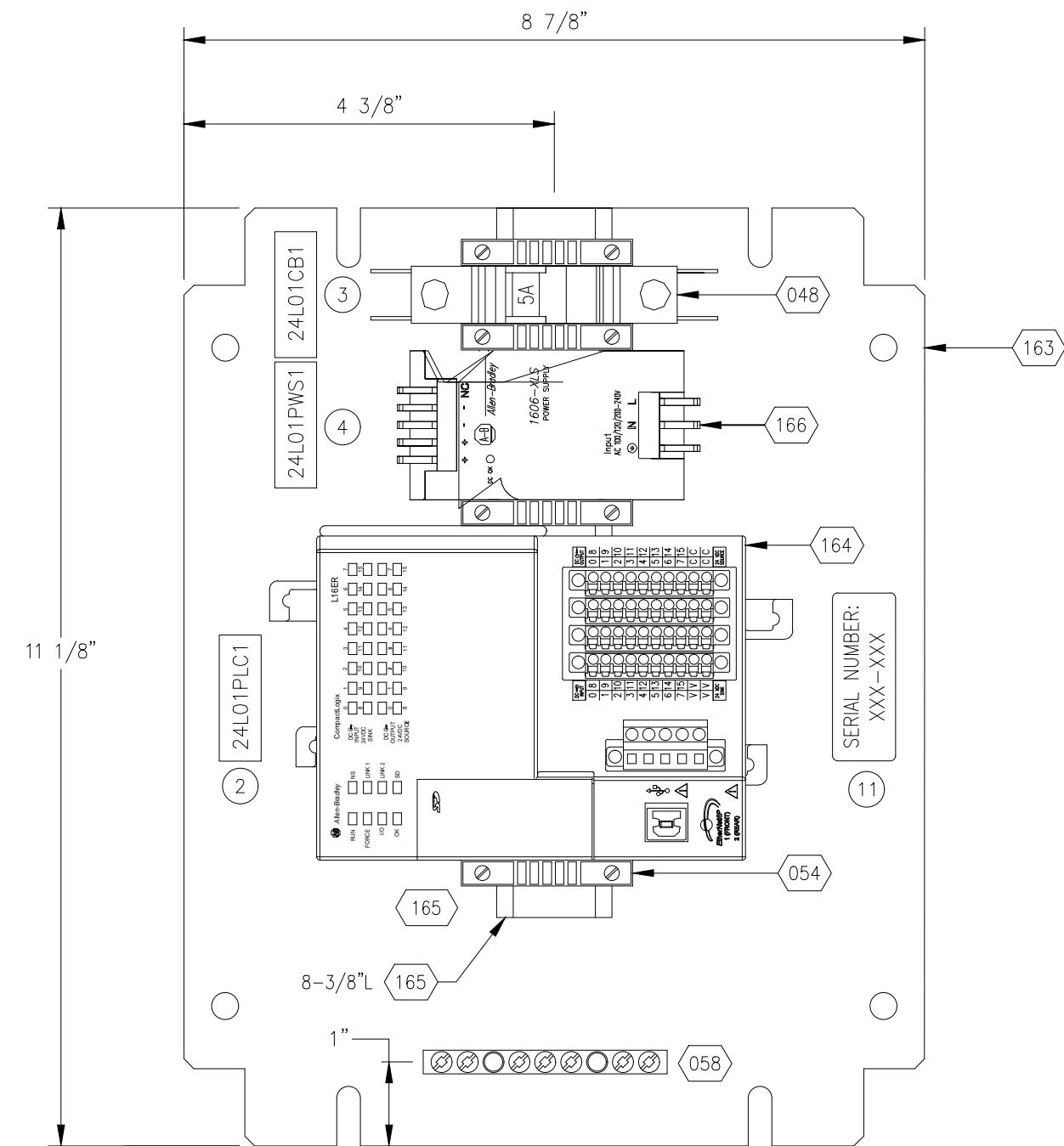
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BACK PANEL LAYOUT



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ENGINEER:
L.D. MOODY

APPROVED BY:

DRAWN BY:
J.C. STITT

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

ALL STOP ENCLOSURE & PB. STA. - COMMAND CENTER
ENCLOSURE BACK PANEL LAYOUT

LOC. CODE

DATE

02/08/19

CONT. ON

06

DRAWING NO.

201706

SECTION

24

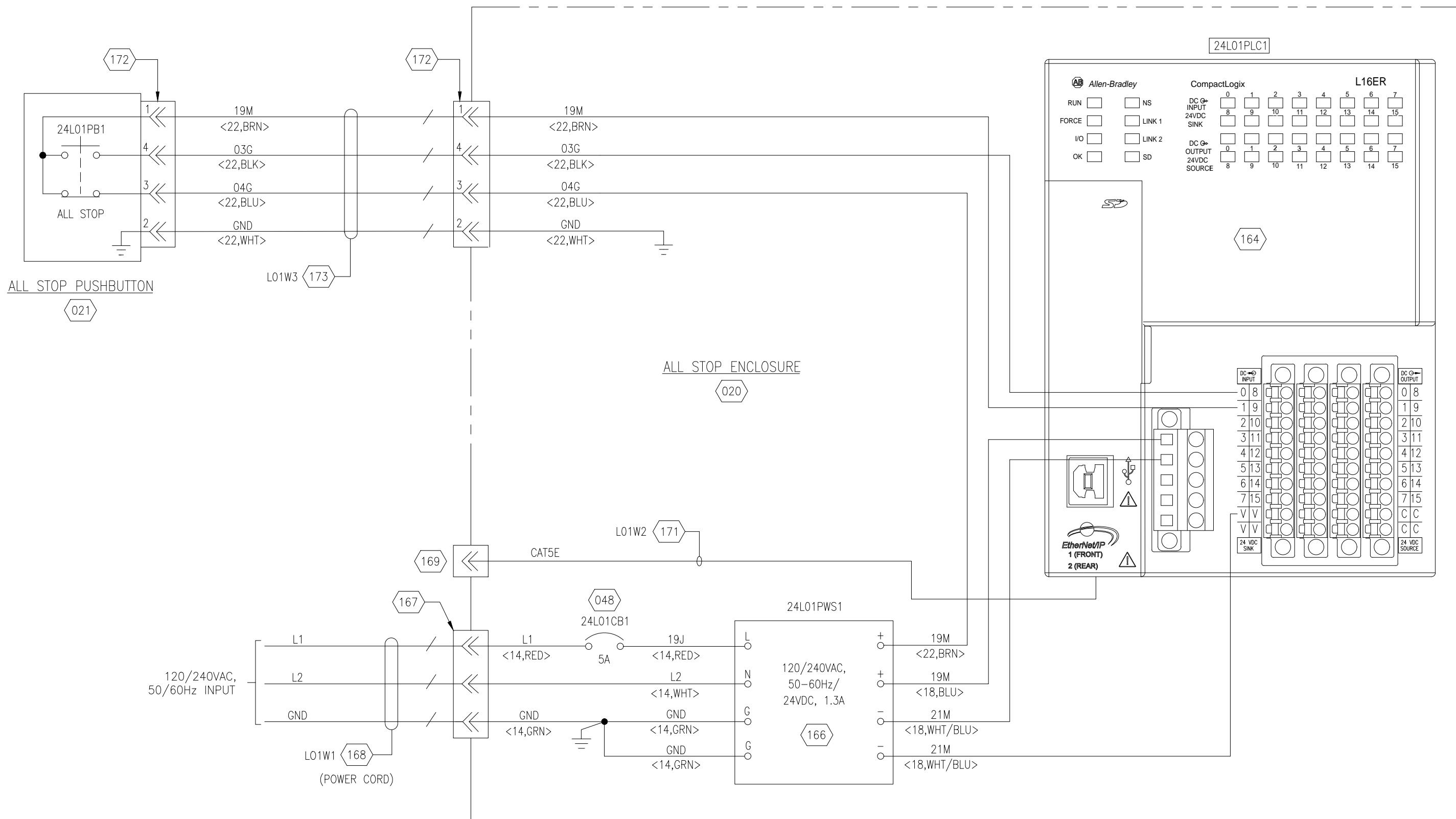
SUB. SEC.

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L.D. MOODY
APPROVED BY:
L.D. MOODY

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
ALL STOP ENCLOSURE & PB. STA. - COMMAND CENTER
120VAC/24VDC POWER DISTRIBUTION

LOC. CODE: 201706
DATE: 02/08/19
CONT. ON: FNL
DRAWING NO.: 24
SECTION: L
SUB. SEC.: 01
SHEET: 01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
0	AS-INSTALLED	02/08/19	JCS	LDM					

TAG SCHEDULE				
TAG NO.	SIZE	TAG COLOR	TEXT COLOR	TAG TEXT
(1)	2" x 4"	WHITE	BLACK	GPS
(2)	1/2" x 1-1/2"	WHITE	BLACK	27L01PWS1
(3)	1/2" x 1-1/2"	WHITE	BLACK	27L01CB1
(4)	1/2" x 1-1/2"	WHITE	BLACK	27L01CB2
(5)	1/2" x 1-1/2"	WHITE	BLACK	27L01TB1
(6)	1/2" x 1-1/2"	WHITE	BLACK	27L01GPS1
(7)	NOT USED			
(8)	1/2" x 1-1/2"	WHITE	BLACK	27L02VX1
(9)	NOT USED			
(10)	1/2" x 1-1/2"	WHITE	BLACK	27L01CR1
(11)	1/2" x 1-1/2"	WHITE	BLACK	27L01CB3
(12)	1/2" x 1-1/2"	WHITE	BLACK	27F01GB1
(13)	1/2" x 1-1/2"	WHITE	BLACK	27L01HTR1

(14) SERIAL NUMBER:
XXX-XXX

P/N: TAG-SST-200



(16) GPS
HEADING
NDE CS
27L02ANT2

P/N: BLANKSS2.5 X 4



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

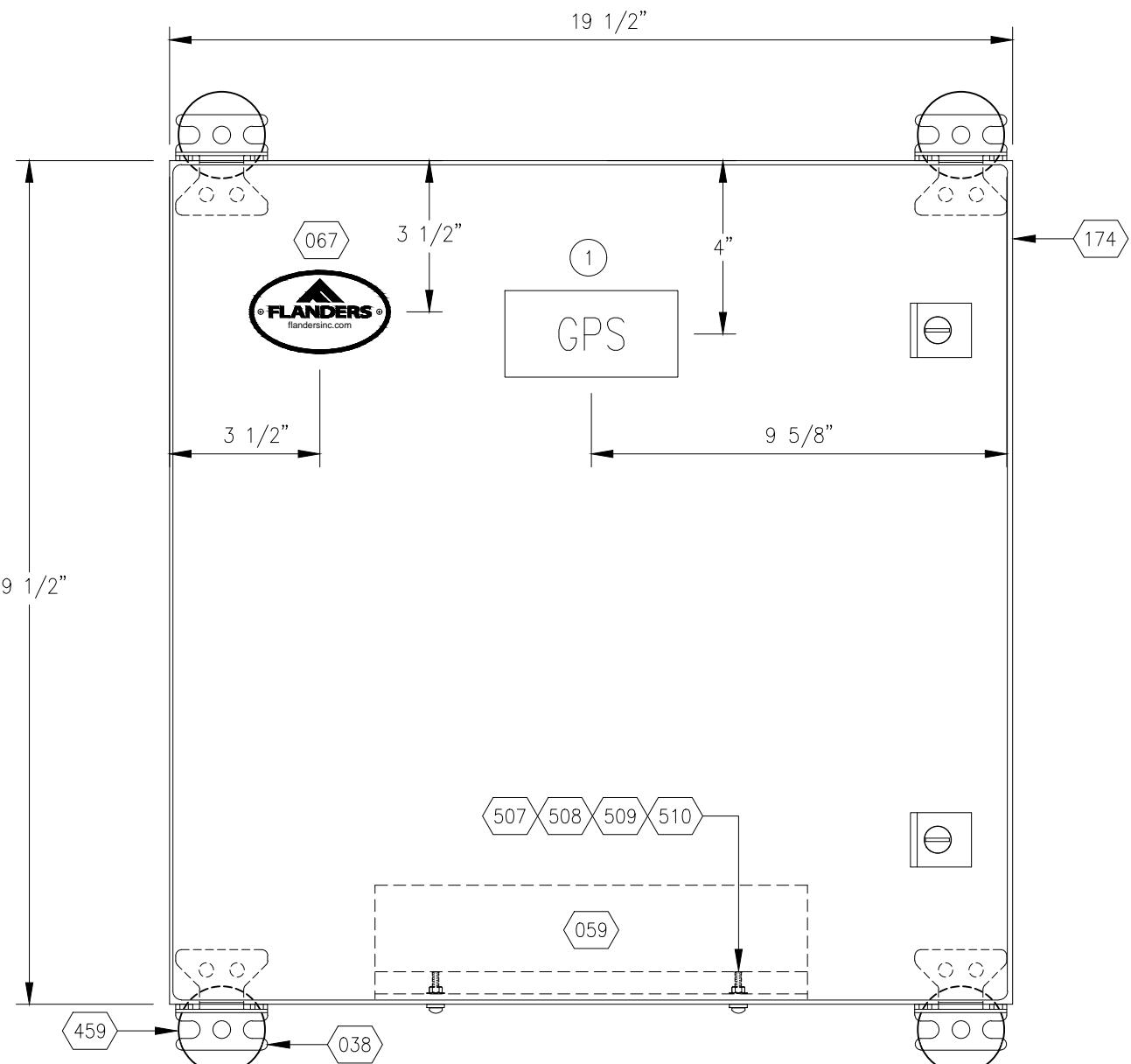
DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
GPS ENCLOSURE
TAG SCHEDULE

LOC. CODE DATE
02/08/19 03

DRAWING NO. SECTION SUB. SEC. SHEET
201706 27 D 01

				0 AS-INSTALLED	02/08/19	JCS	LDM	

REV. DESCRIPTION DATE BY CHKD REV. DESCRIPTION DATE BY CHKD



GPS ENCLOSURE

⟨022⟩



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

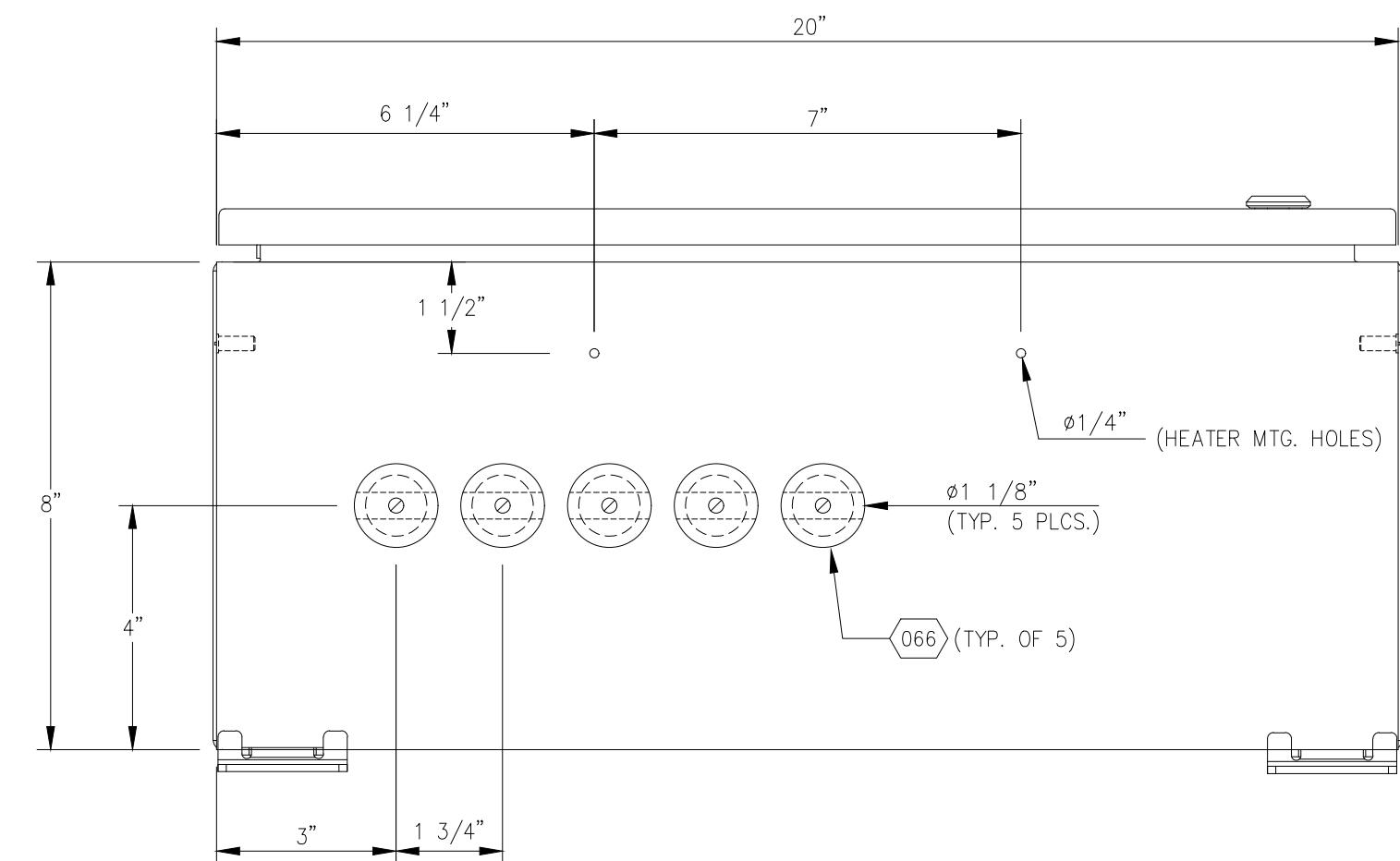
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VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
GPS ENCLOSURE
DOOR LAYOUT

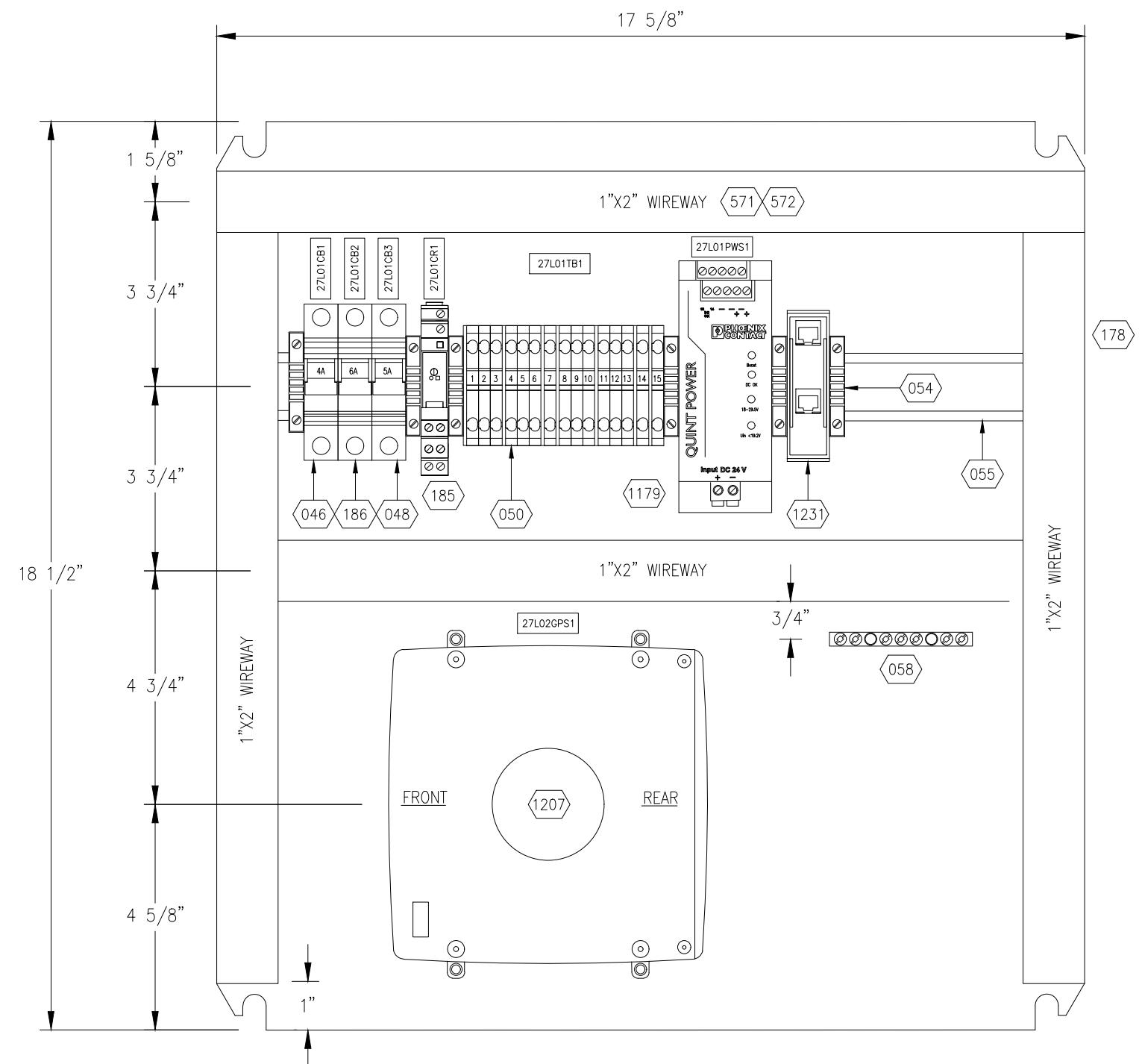
LOC. CODE DATE CONT. ON
201706 02/08/19 04

DRAWING NO. SECTION SUB. SEC. SHEET
27 E 01

				0 AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
REV.					FILENAME:			





BACK PANEL LAYOUT



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ENGINEER:
L.D. MOODY

APPROVED BY:

DRAWN BY:
J.C. STITT

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
GPS ENCLOSURE
BACK PANEL LAYOUT

LOC. CODE DATE CONT. ON
201706 02/08/19 06

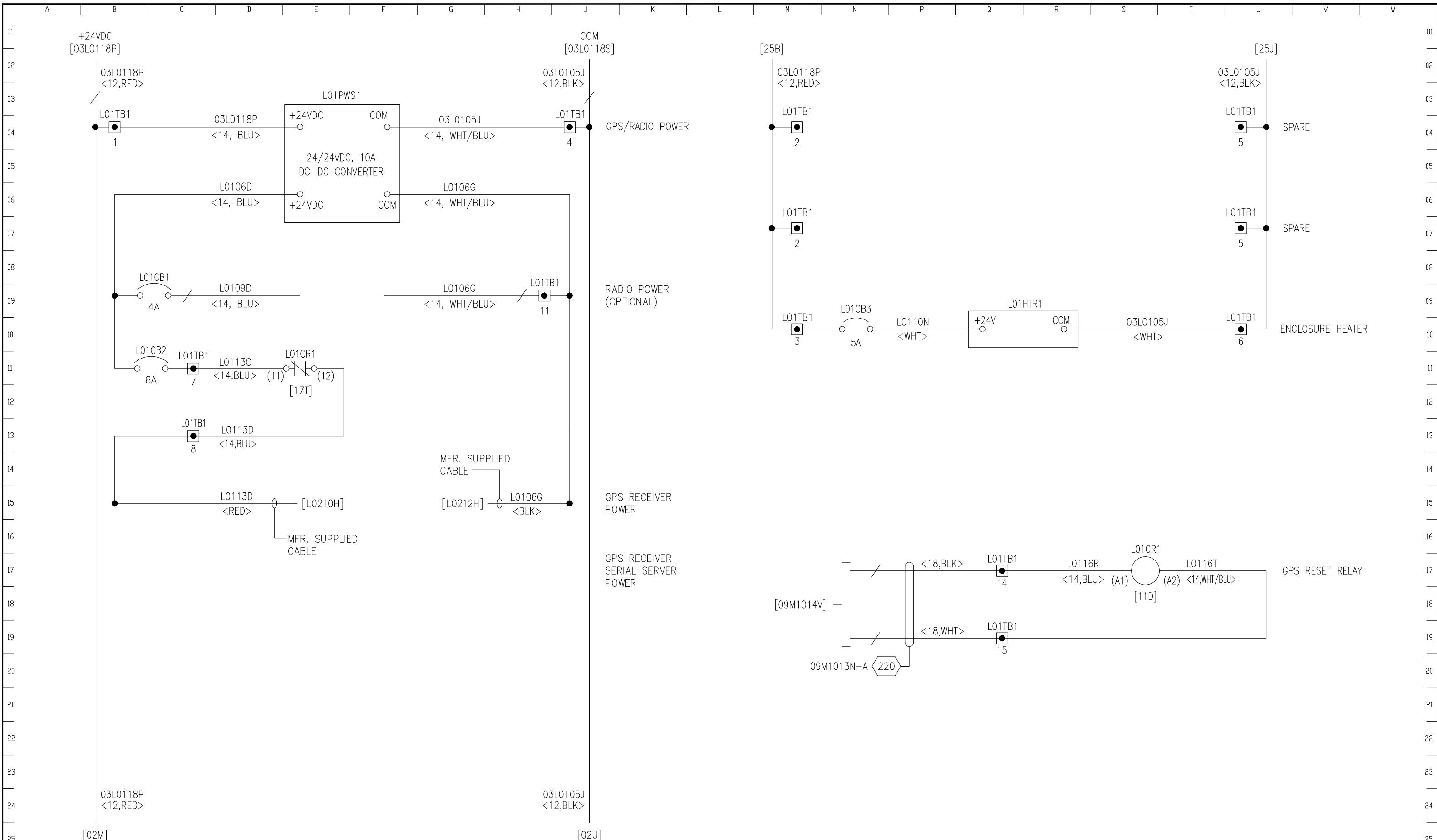
DRAWING NO. SECTION SUB. SEC. SHEET
27 F 01

			0	AS-INSTALLED	02/08/19	JCS	LDM

REV. DESCRIPTION DATE BY CHKD REV. DESCRIPTION DATE BY CHKD



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ENGINEER:
L.D. MOODY
APPROVED BY:
L.D. MOODY

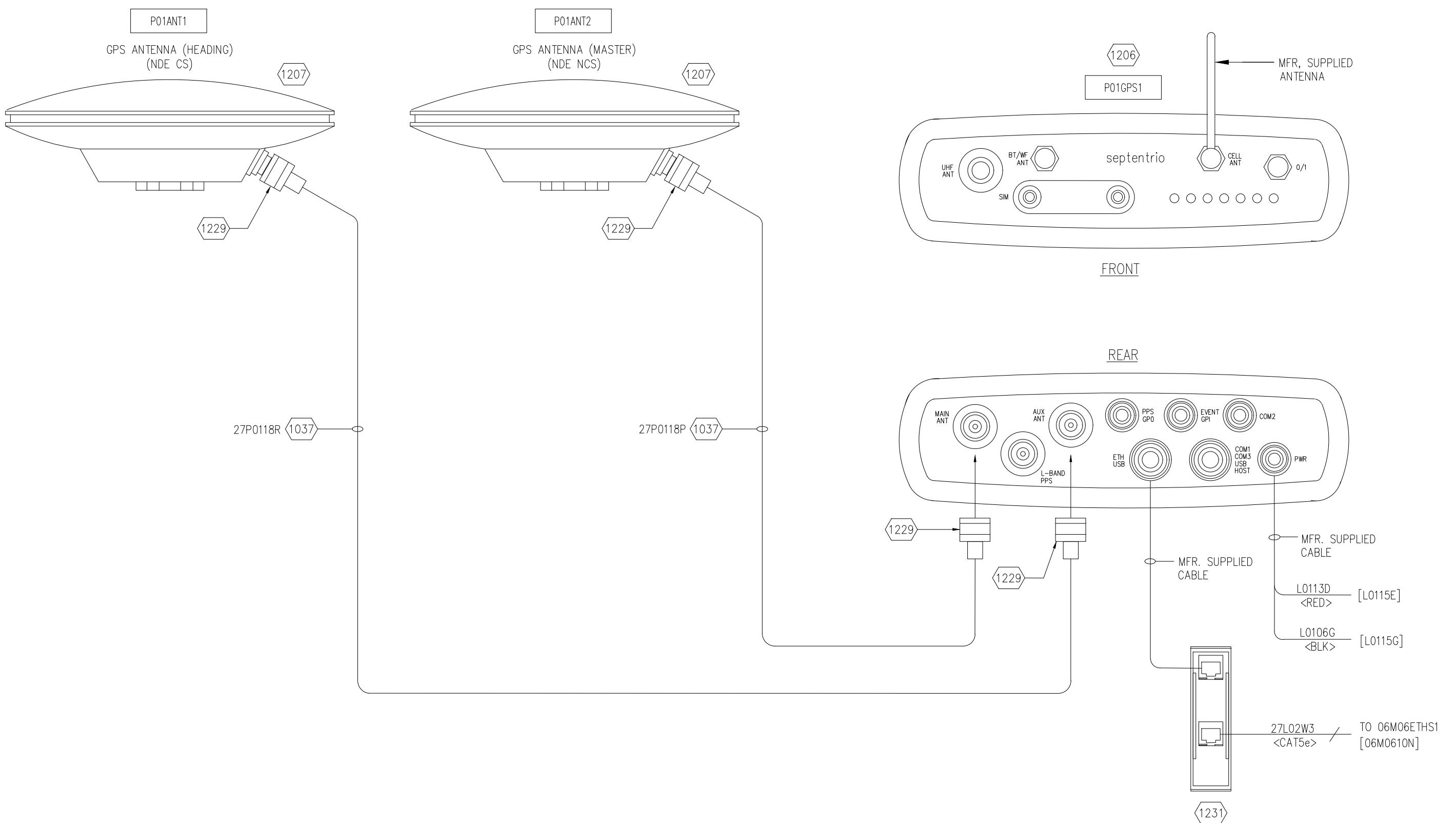
DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
GPS ENCLOSURE
24VDC POWER DISTRIBUTION

FILENAME:
20170627L01.dwg

LOC. CODE	DATE	CONT. ON
	02/08/19	08
DRAWING NO.	SECTION	SUB. SEC.
201706	27	L 01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	DATE	BY	CHKD
						02/08/19	JCS	LDM	



TAG SCHEDULE				
TAG NO.	SIZE	TAG COLOR	TEXT COLOR	TAG TEXT
(1)	2" x 4"	WHITE	BLACK	HAZTECH
(2)	1/2" x 1-1/2"	WHITE	BLACK	30L01TB1
(3)	1/2" x 1-1/2"	WHITE	BLACK	30L01CB1
(4)	1/2" x 1-1/2"	WHITE	BLACK	30L01CB2
(5)	1/2" x 1-1/2"	WHITE	BLACK	30L01CB3
(6)	1/2" x 1-1/2"	WHITE	BLACK	30L01CB4
(7)	1/2" x 1-1/2"	WHITE	BLACK	30L01PWS1
(8)	1/2" x 1-1/2"	WHITE	BLACK	30P01ETHS1
(9)	1/2" x 1-1/2"	WHITE	BLACK	30L01CR1
(10)	1/2" x 1-1/2"	WHITE	BLACK	30P02BW1

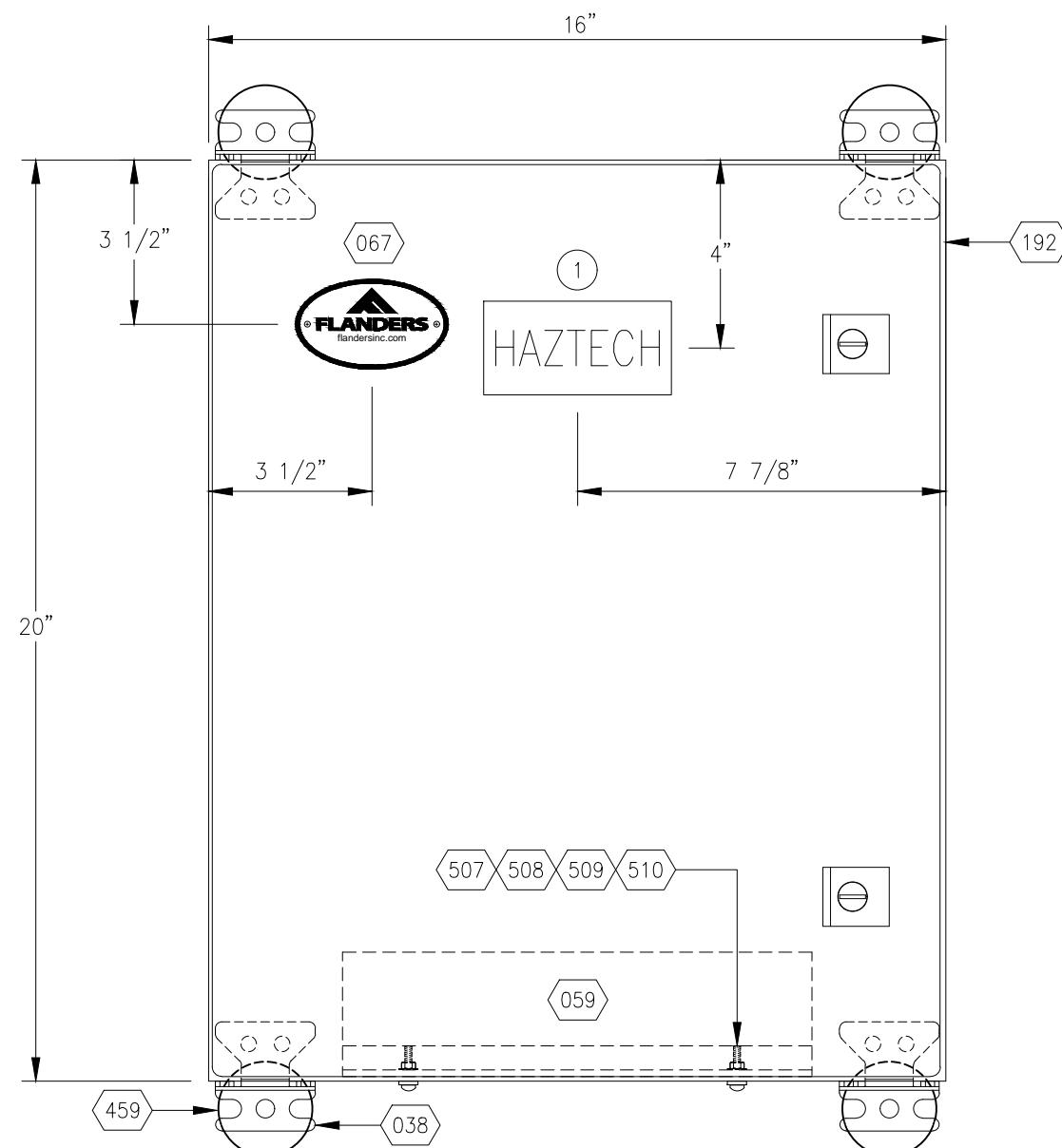
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	ENGINEER: L.D. MOODY
	APPROVED BY:
NDERS WHOLE NDERS	FILENAME: 20170630D01.dwg

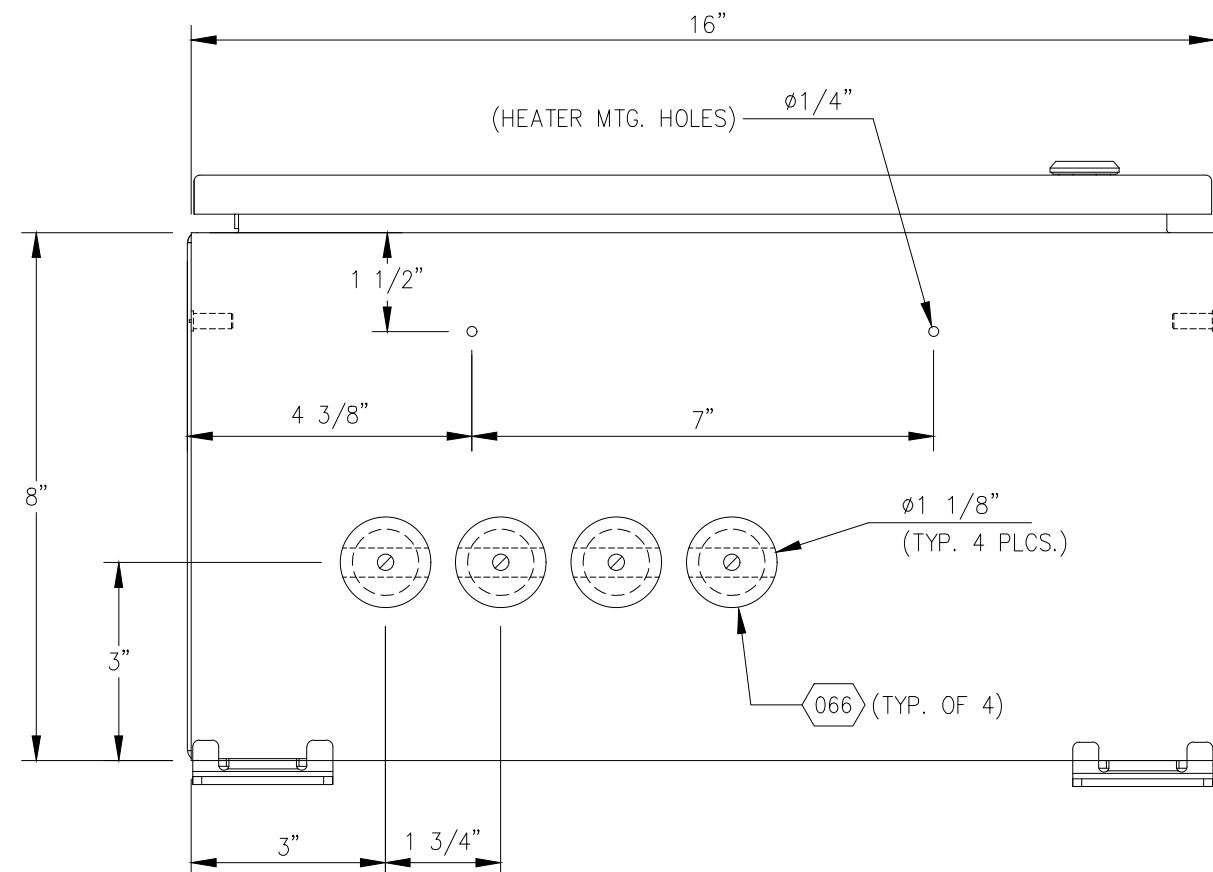
DRAWING TITLE:
VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM
HAZTECH ENCLOSURE
TACS SCHEDULE

LOC. CODE	DATE	CONT. ON	
	02/08/19	03	
DRAWING NO.	SECTION	SUB. SEC.	SHEET
201706	30	D	01



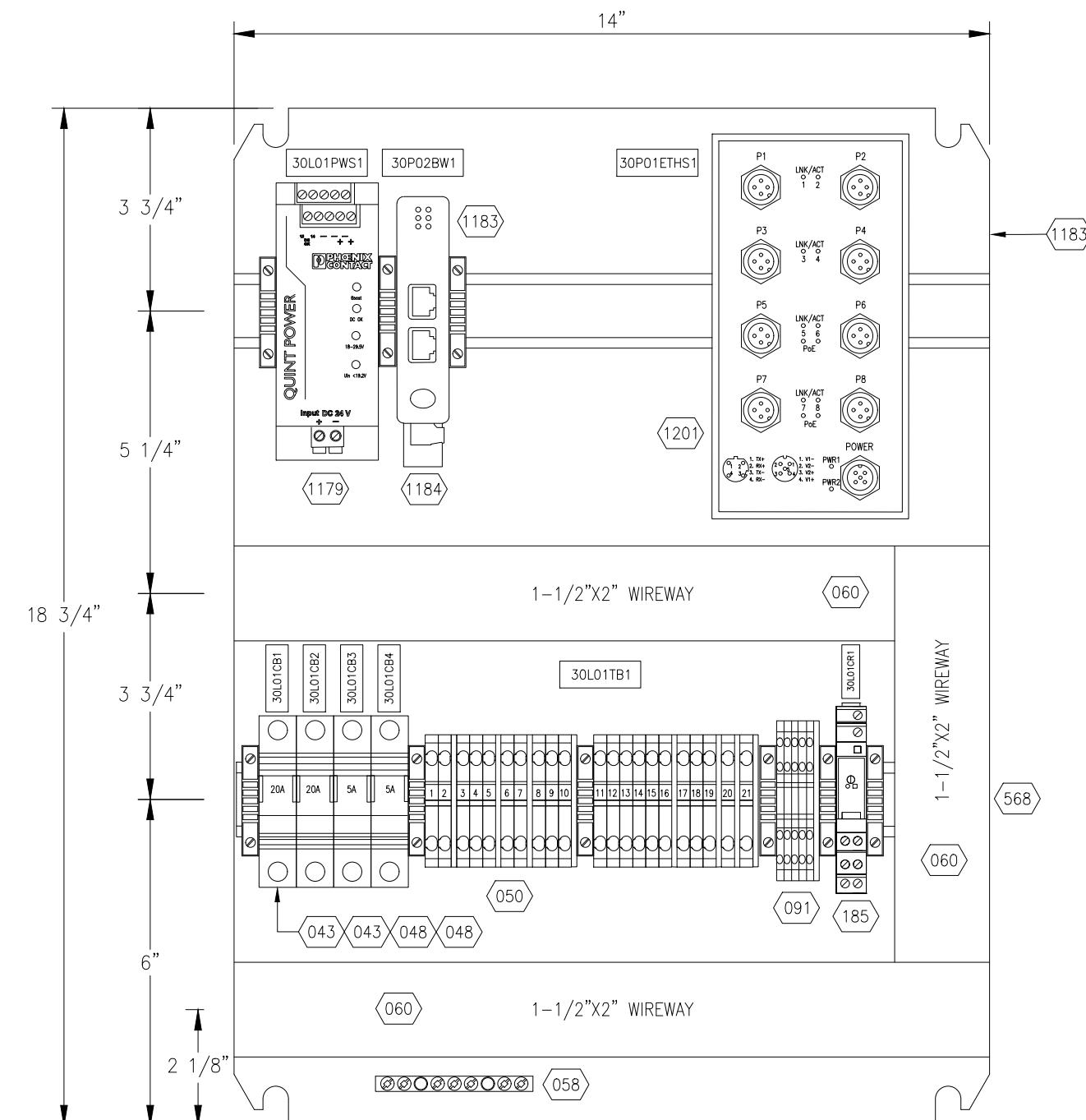
HAZTECH ENCLOSURE

023



A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W
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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	DATE	JCS	LDM	FLANDERS	www.flandersinc.com	ENGINEER: L.D. MOODY	DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119 ARDVARC CONTROL SYSTEM HAZTECH ENCLOSURE BOTTOM CUTOUTS & ASSEMBLY	LOC. CODE	DATE 02/08/19	CONT. ON 05
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD	THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION OF FLANDERS. ELECTRIC. NO DISCLOSURE OR USE OF IT SHALL BE MADE IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF FLANDERS ELECTRIC, UNLESS EXPRESSLY PROVIDED OTHERWISE BY CONTRACT.	APPROVED BY: L.D. MOODY	CHECKED BY: L.D. MOODY	FILENAME: 20170630E02.dwg	DRAWING NO. 201706	SECTION 30	SUB. SEC. E	HEET 02



BACK PANEL LAYOUT



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ENGINEER:
L.D. MOODY
APPROVED BY:

DRAWN BY:	J.C. STITT
CHECKED BY:	L.D. MOODY

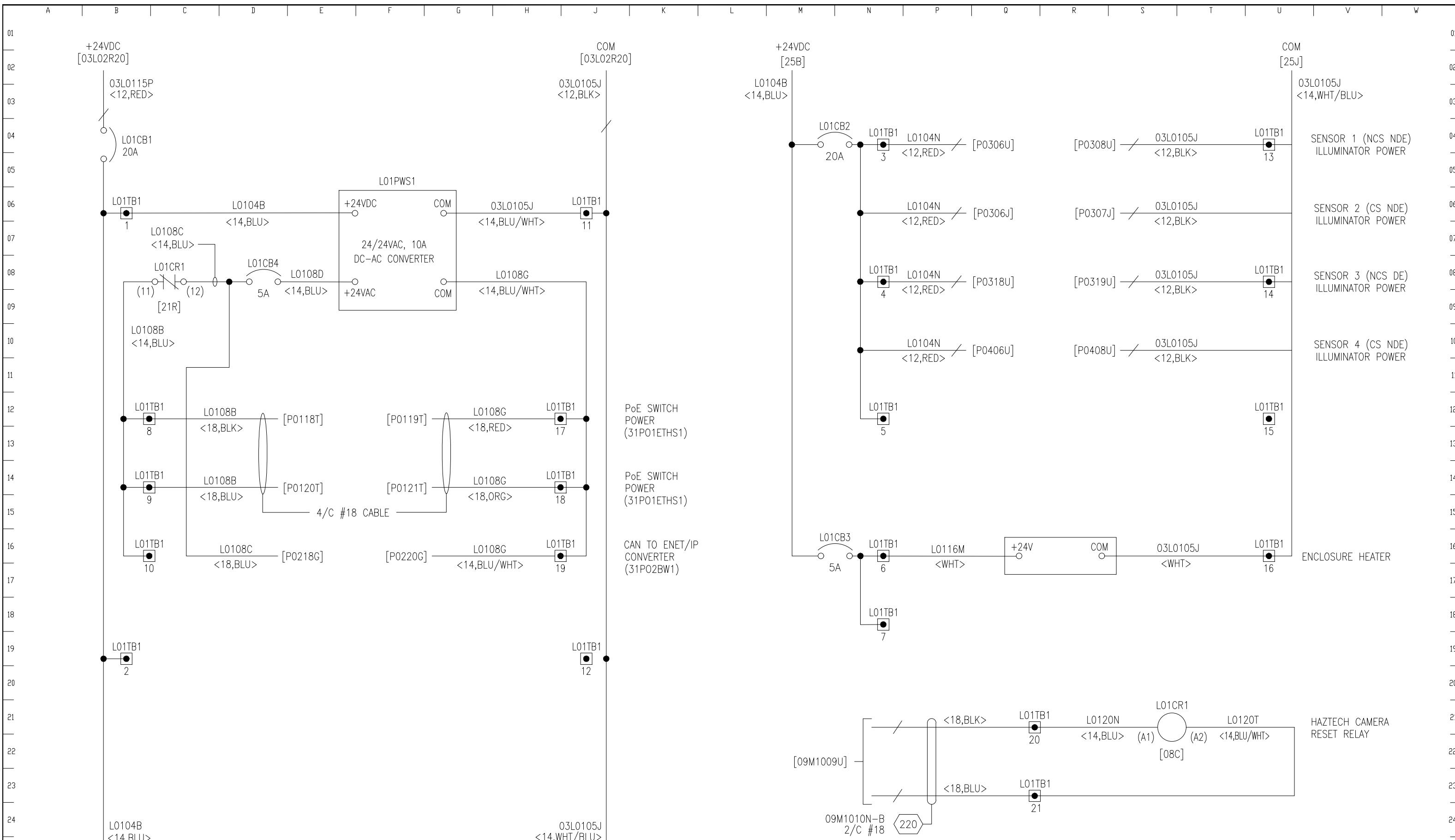
DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
HAZTECH ENCLOSURE
BACK PANEL LAYOUT

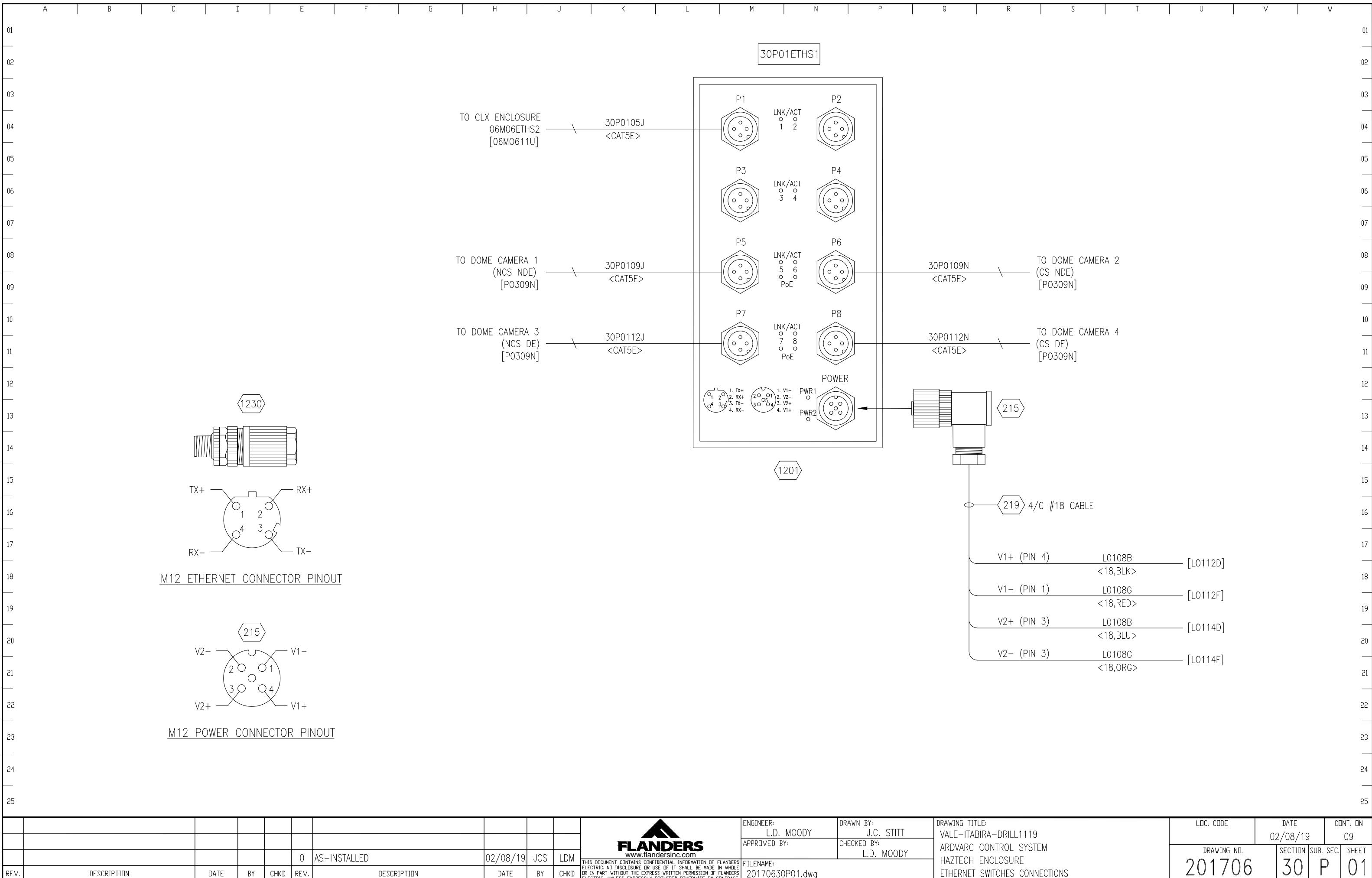
LOC. CODE	DATE 02/08/19	CONT. ON 06	
DRAWING NO. 201706	SECTION 30	SUB. SEC. F	SHEET 01



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www.flandersinc.com

ENGINEER: L.D. MOODY	DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119 ARDVARC CONTROL SYSTEM HAZTECH ENCLOSURE BILL OF MATERIAL	LOC. CODE	DATE 02/08/19	CONT. ON 07
APPROVED BY: L.D. MOODY	CHECKED BY: L.D. MOODY		DRAWING NO.	SECTION	SUB. SEC.
ERS ERS ERS	FILENAME: 20170630G01.dwg		201706	30	G 01





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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

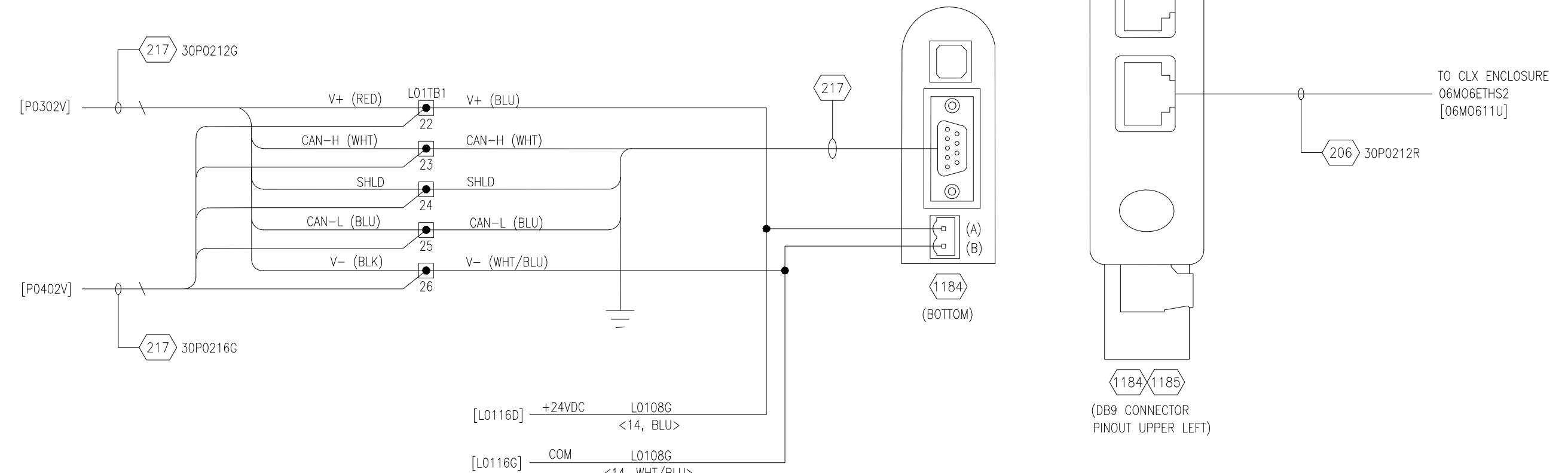
DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
HAZTECH ENCLOSURE
ETHERNET SWITCHES CONNECTIONS

LOC. CODE DATE
201706 02/08/19 09

DRAWING NO. SECTION SUB. SEC. SHEET
201706 30 P 01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

DB9 CONNECTOR PINOUT			
DB9 PIN	DB9 TERMINAL	DESC.	L01TB1
1	1	N/A	N/A
2	2	CAN_L	25
3	3	CAN_GND	N/A
4	4	N/A	N/A
5	5	SHIELD	5
6	6	CAN_GND	N/A
7	7	CAN_H	23
8	8	N/A	N/A
9	9	N/A	N/A
GND	SHLD	N/A	N/A



CAN TO ENET/IP CONVERTER



FLANDERS
www.flandersinc.com

ENGINEER:
L. D. MOODY

L.D. MOODY
APPROVED BY:

DRAWING TITLE:

VALE-IIABIRA-DRILL1119
ARDVARC CONTROL SYSTEM

HAZTECH ENCLOSURE
ETHERNET BRIDGEWAY INTERCONNECTIONS DIAGRAM

LOC. CODE	DATE	CONT. ON
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	02/08/19	FNL
DRAWING NO.	SECTION	SUR SEC SHEET

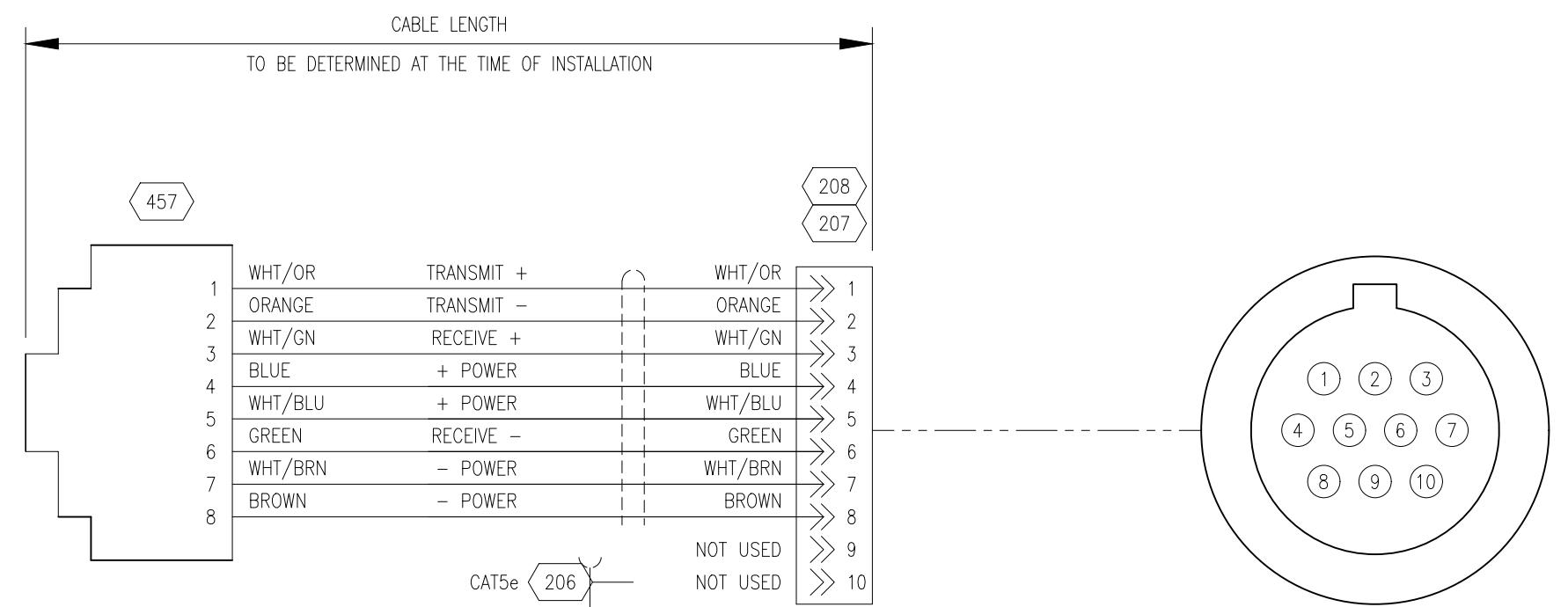
DRAWING NO. SECTION SUB. SEC. SHEET
201706 30 P 02

				0	AS-INSTALLED	02/08/19
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION

VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM
CABLE-HARNESSES
P/N: (See Below)

SHEET	DESCRIPTION	P/N:
45A01	TITLE SHEET & SHEET INDEX	
45R01	CABLE-HARNESS ETHERNET (Hazcam Camera)	ARDV-05-800-00
45R02	CABLE-HARNESS DEVICENET (TB to Devicenet I/O Module)	ARDV-05-801-00
45R03	CABLE-HARNESS DEVICENET (Devicenet I/O Module to Devicenet I/O Module)	ARDV-05-802-00
45R04	CABLE-HARNESS POWER (03L02CBx to Type 1 & 2 Devicenet I/O Modules)	ARDV-05-803-00
45R05	CABLE-HARNESS STROKER 5A (Devicenet I/O Module to Stroker 5A External Filter)	ARDV-05-804-00
45R06	CABLE-HARNESS STROKER 5A (Stroker 5A External Filter to Valve)	ARDV-05-805-00
45R07	CABLE-HARNESS PWM (Devicenet I/O Module to PWM Vavle)	ARDV-05-806-00
45R08	CABLE-HARNESS ETHERNET CAT5e (Straight-Through)	ARDV-05-807-00
45R09	CABLE-HARNESS ETHERNET CAT5e (Cross-Over)	ARDV-05-808-00
45R10	CABLE-HARNESS ETHERNET CAT5e (PoE Power Over Ethernet)	ARDV-05-809-00
45R11	CABLE-HARNESS COAX (GPS Receiver to GPS Antenna)	ARDV-05-810-00
45R12	CABLE-HARNESS SERIAL (Camera-Site Perimeter to Input Transmitter Box)	ARDV-05-811-00
45R13	CABLE-HARNESS COAX-VIDEO (Camera-Site Perimeter to Input Transmitter Box)	ARDV-05-812-00
45R14	CABLE-HARNESS POWER (30L01TBxx to Camera [Bosch] DECK/MAST)	ARDV-05-813-00
45R15	CABLE-HARNESS POWER (03L02CBx to Expansion Devicenet I/O Module)	ARDV-05-814-00
45R16	CABLE-HARNESS DEVICENET (Operator Cab to Operator Chair)	ARDV-05-815-00
45R17	CABLE-HARNESS DEVICENET (Operator Chair Left Side Joystick/Keypads)	ARDV-05-816-00
45R18	CABLE-HARNESS DEVICENET (Operator Chair Right Side Joystick/Keypads)	ARDV-05-817-00
45R19	CABLE-HARNESS RESOLVER XDCR (Multpass Straight Connector)	ARDV-05-818-00
45R20	CABLE-HARNESS RESOLVER XDCR (Multpass 90' Connector)	ARDV-05-819-00

								 FLANDERS www.flandersinc.com	ENGINEER: L.D. MOODY	DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL 1119 ARDVARC CONTROL SYSTEM CABLE-HARNESSES TITLE SHEET & SHEET INDEX	LOC. CODE	DATE	CONT. ON	
									APPROVED BY:	CHECKED BY: L.D. MOODY		02/08/19	02		
			0	AS-INSTALLED	02/08/19	JCS	LDM		FILENAME:	20170645A01.dwg		DRAWING NO.	SECTION	SUB. SEC.	HEET
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD			201706	45	A	01



CABLE-HARNESS ETHERNET
(Hazcam Camera)

P/N: ARDV-05-800-00 205

HAZCAM CAMERA
WEATHERPROOF
10 PIN CONNECTOR
PINOUT

LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS ETHERNET (Hazcam Camera)

LOC. CODE
201706

DATE
02/08/19

CONT. ON
03

DRAWING NO.
45

SECTION
R

SUB. SEC.
01

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W

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DEVICENET NETWORK
06M06TB2

DEVICENET I/O MODULE
NODE xx/J2
(DNET IN)

CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

<BLK>

<RED>

<BLU>

<SHIELD>

<WHT>

06M02Wx (2PR #22/#24) 217

V- 3
V+ 2
CAN_L 5
DRAIN 1
CAN_H 4

215

CABLE-HARNESS DEVICENET
(TB To Devicenet I/O Module)
P/N: ARDV-05-801-00 210

LEGEND

REFERS TO SHEET 06B04

LEGEND

LEGEND

A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W

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CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

DEVICENET I/O MODULE
NODE xx/J2
(DNET OUT)

V-
V+
CAN_L
DRAIN
CAN_H

DEVICENET I/O MODULE
NODE xx/J1
(DNET IN)

V-
V+
CAN_L
DRAIN
CAN_H

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<RED>
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<SHIELD>
<WHT>

09MxxWx
(2PR #22/#24)

CABLE-HARNESS DEVICENET
(Devicenet I/O Module To Devicenet I/O Module)
P/N: ARDV-05-802-00

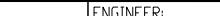
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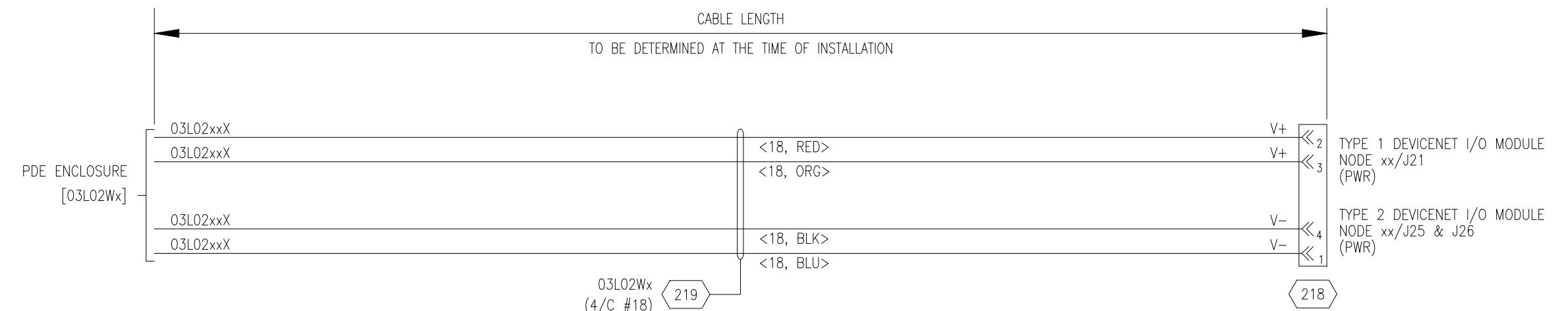
LEGEND

REFERS TO SHEET 000004

LEGEND

LEGEND

									 FLANDERS www.flandersinc.com	ENGINEER: L.D. MOODY	DRAWN BY: J.C. STITT	DRAWING TITLE: VALE-ITABIRA-DRILL1119 ARDVARC CONTROL SYSTEM CABLE-HARNESSES CABLE-HARNESS DEVICENET (Devicenet I/O Module to Devicenet I/O Module)	LOC. CODE	DATE	CONT. ON
								APPROVED BY:		CHECKED BY: L.D. MOODY	02/08/19		05		
				0	AS-INSTALLED	02/08/19	JCS	LDM		FILENAME: 20170645R03.dwg	DRAWING NO.		SECTION	SUB. SEC.	SHEET
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD	201706	45	R	03		



CABLE-HARNESS POWER
(03L02CBx To Type 1 & 2 Devicenet I/O Modules)

P/N: ARDV-05-803-00 212

LEGEND
REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS POWER (03L02CBx to Type 1 & 2 Devicenet I/O Modules)

LOC. CODE
02/08/19
06

DRAWING NO.
201706

SECTION
45

SUB. SEC.
R

HEET
04

			0	AS-INSTALLED	02/08/19	JCS	LDM	

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD

FILENAME: 20170645R04.dwg	DATE 02/08/19	CONT. ON 06

A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W

0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24

DEVICENET I/O MODULE
NODE xx/Jx
(PWM OUT)

CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

STROKER 5A EXTERNAL FILTER
MxxS5FLx/Jx
(IN)

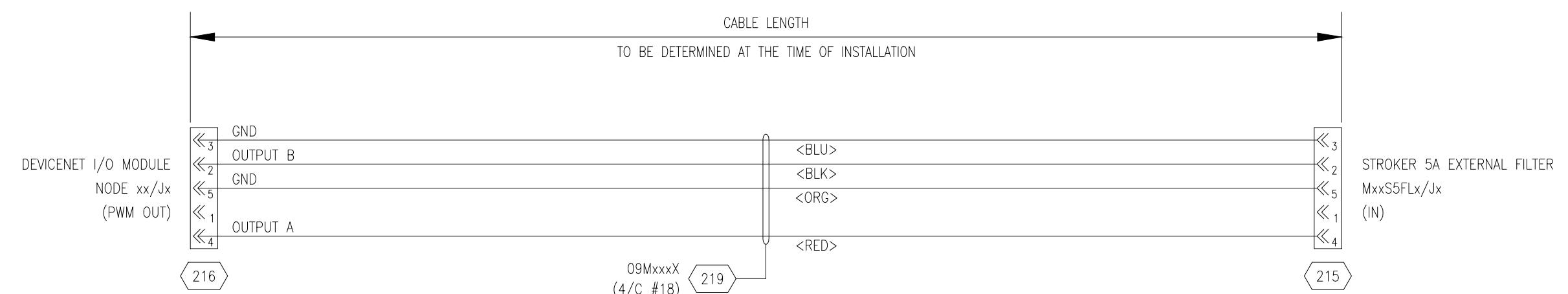
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<3>
OUTPUT B
<2>
GND
<5>
<1>
OUTPUT A
<4>

<BLU>
<BLK>
<ORG>
<RED>

09MxxxX
(4/C #18)

<216> <219> <215>

CABLE-HARNESS STROKER 5A
(Devicenet I/O Module To Stroker 5A External Filter)
P/N: ARDV-05-804-00 <213>

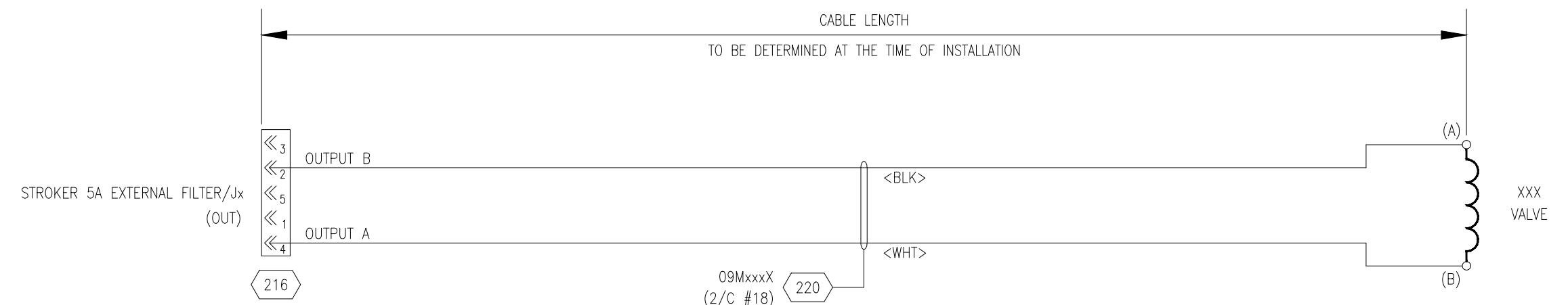


CABLE-HARNESS STROKER 5A

P/N: ARDV-05-804-00 < 213 >

LEGEND

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LEGEND

REFER TO SHEET 00B04



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OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF FLANDERS
ELECTRIC, UNLESS EXPRESSLY PROVIDED OTHERWISE BY CONTRACT.

ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS STROKER 5A (Stroker 5A External Filter to Valve)

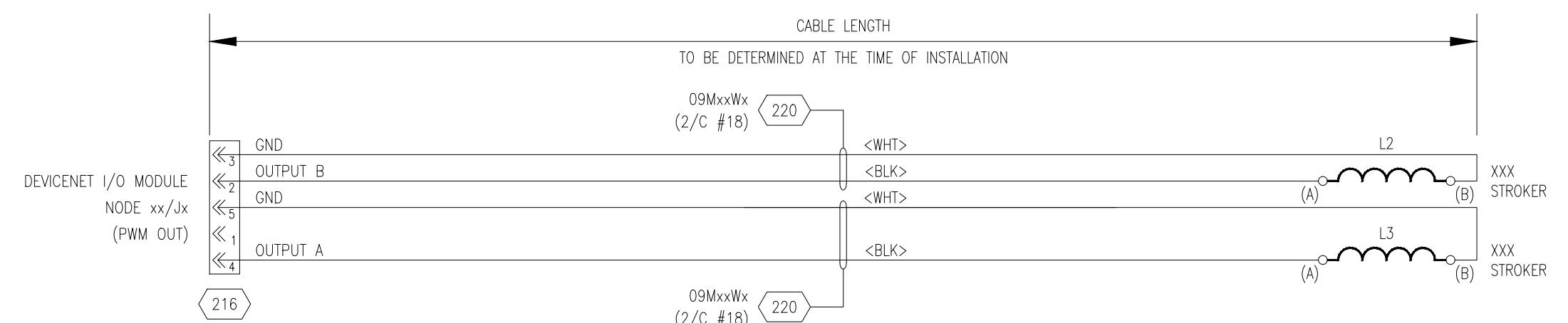
LOC. CODE
DATE
02/08/19
08

DRAWING NO.
SECTION
SUB. SEC.

201706
45 R 06

			0	AS-INSTALLED	02/08/19	JCS	LDM

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD	FILENAME:	20170645R06.dwg
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CABLE-HARNESS PWM

P/N: ARDV-05-806-00 275

LEGEND

REFER TO SHEET 00B04

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CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

Pin	Color	Function
1	WHT/OR	TRANSMIT +
2	ORANGE	TRANSMIT -
3	WHT/GN	RECEIVE +
4	BLUE	Unused
5	WHT/BLU	Unused
6	GREEN	RECEIVE -
7	WHT/BRN	Unused
8	BROWN	Unused

CAT5e 206

CABLE-HARNESS ETHERNET CAT5e
(Straight-Through)
P/N: ARDV-05-807-00 521

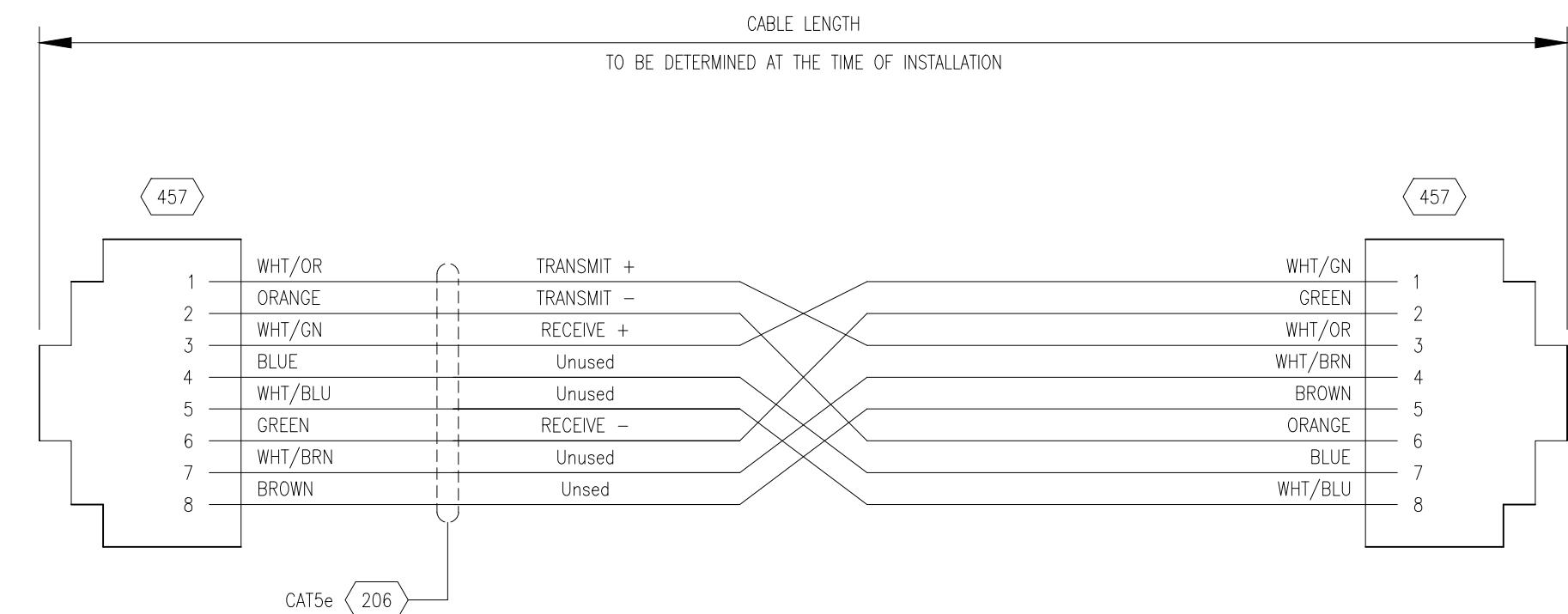
LEGEND
REFER TO SHEET 00B04

LEGEND

LEGEND

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CABLE-HARNESS ETHERNET CAT5e

(Cross-OVER)

P/N: ARDV-05-808-00 522

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LEGEND

CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

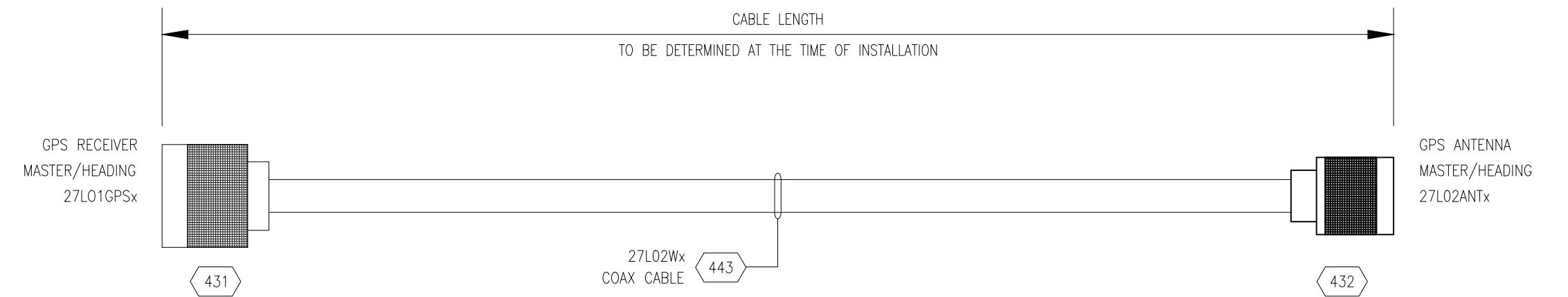
Pin Number	Color/Code	Function
1	WHT/GN	TRANSMIT +
2	GREEN	TRANSMIT -
3	WHT/OR	RECEIVE +
4	BLUE	+VDC
5	WHT/BLU	+VDC
6	ORANGE	RECEIVE -
7	WHT/BRN	-VDC
8	BROWN	-VDC

CAT5e 206

CABLE-HARNESS ETHERNET CAT5e
(PoE Power Over Ethernet)
P/N: ARDV-05-809-00 523

LEGEND

LEGEND



CABLE-HARNESS COAX
(GPS Receiver to GPS Antenna)
P/N: ARDV-05-810-00 524

LEGEND

REFER TO SHEET 00B04



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OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF FLANDERS
ELECTRIC, UNLESS EXPRESSLY PROVIDED OTHERWISE BY CONTRACT.

ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS COAX (GPS Receiver to GPS Antenna)

LOC. CODE
02/08/19

DATE
12

DRAWING NO.
201706

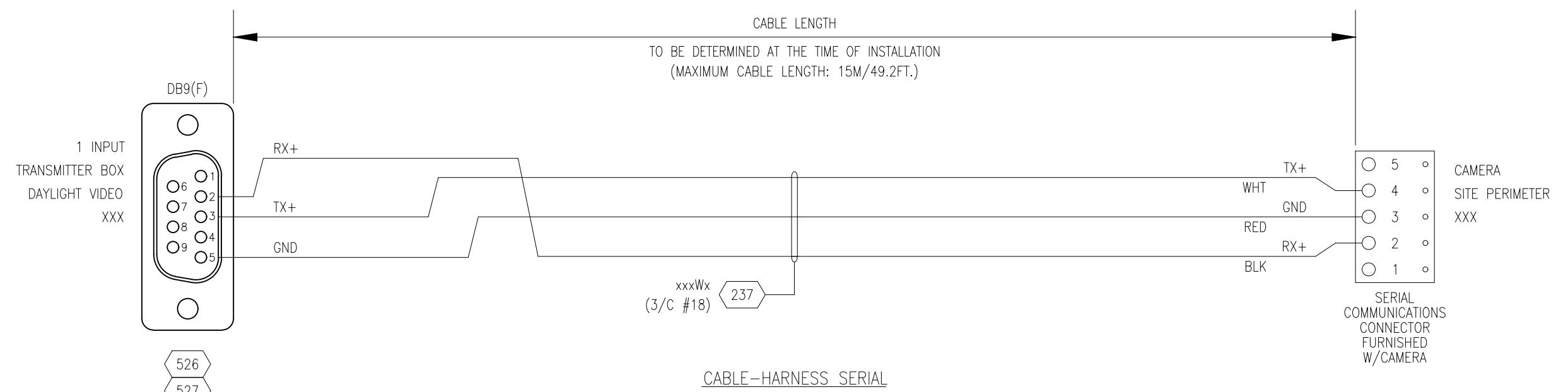
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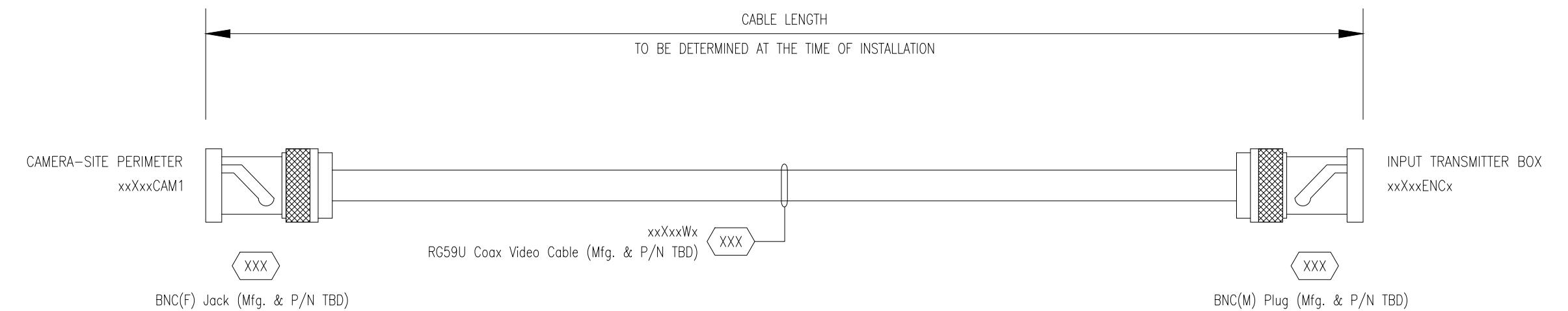
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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY

FILENAME:
20170645R11.dwg



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REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
CABLE-HARNESSES
CABLE-HARNESS COAX-VIDEO (Camera-Site Perimeter to Input Transmitter Box)

LOC. CODE
02/08/19
14

DRAWING NO.
201706
SECTION
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SUB. SEC.
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SHEET
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			0	AS-INSTALLED	02/08/19	JCS	LDM	

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD	FILENAME:	20170645R13.dwg
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CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

<18AWG, 4/C>
219

577 <18,RED> <18,ORG>

FERRULE-TWIN (x2)

250 251

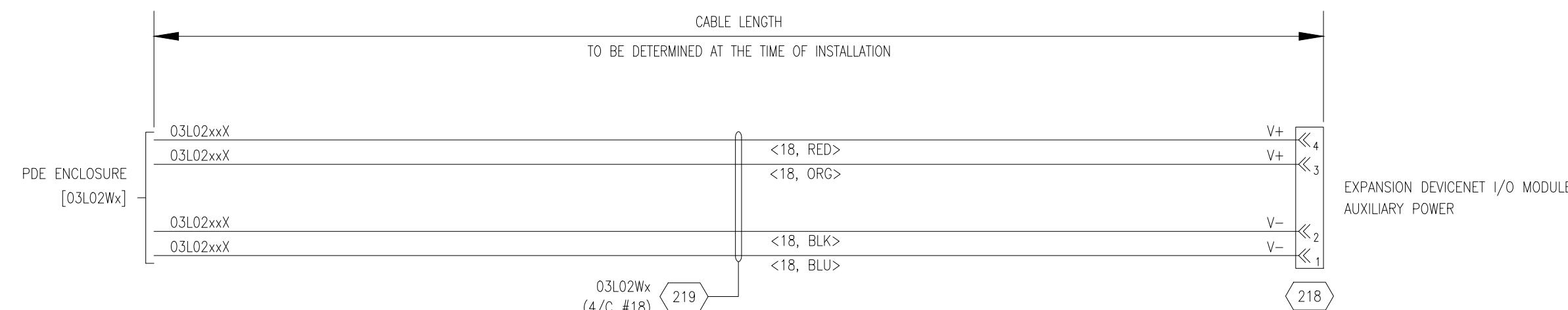
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577

CABLE-HARNESS POWER
(30L01TBxx To Camera [Bosch] DECK/MAST)
P/N: ARDV-05-813-00 578

LEGEND
REFERS TO SHEET 00B04

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LEGEND



CABLE-HARNESS POWER
(03L02CBx To Expansion Devicenet I/O Module)

P/N: ARDV-05-814-00 582

LEGEND

REFER TO SHEET 00B04



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ELECTRIC, UNLESS EXPRESSLY PROVIDED OTHERWISE BY CONTRACT.

ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS POWER (03L02CBx to Expansion Devicenet I/O Module)

LOC. CODE DATE
02/08/19 16

DRAWING NO. SECTION SUB. SEC. SHEET

201706 45 R 15

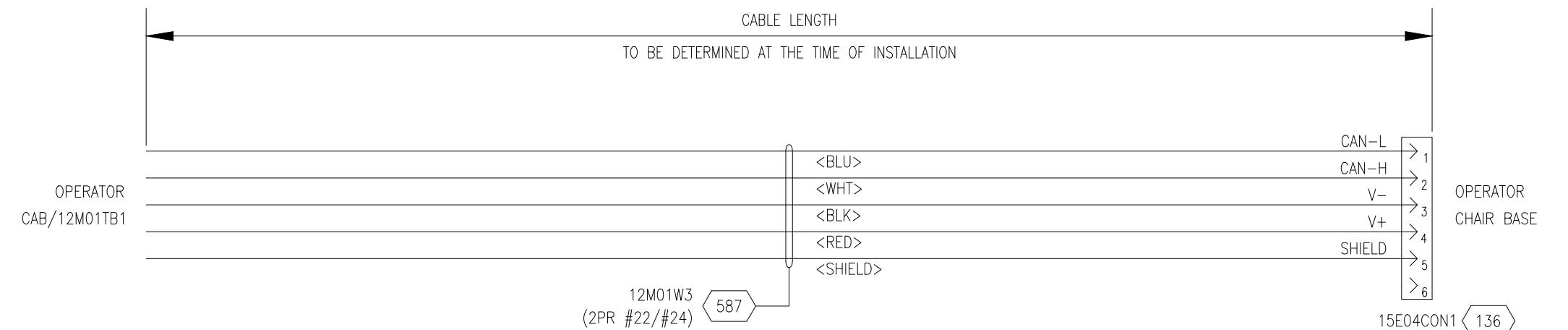
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DESCRIPTION

DATE BY CHKD REV.

DESCRIPTION

DATE BY CHKD



12M01W3
(2PR #22/#24) 587

CABLE-HARNESS DEVICENET
(Operator Cab To Operator Chair)

P/N: ARDV-05-815-00 584

LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS DEVICENET (Operator Cab to Operator Chair)

LOC. CODE DATE
201706 02/08/19 17

DRAWING NO. SECTION SUB. SEC. SHEET

201706 45 R 16

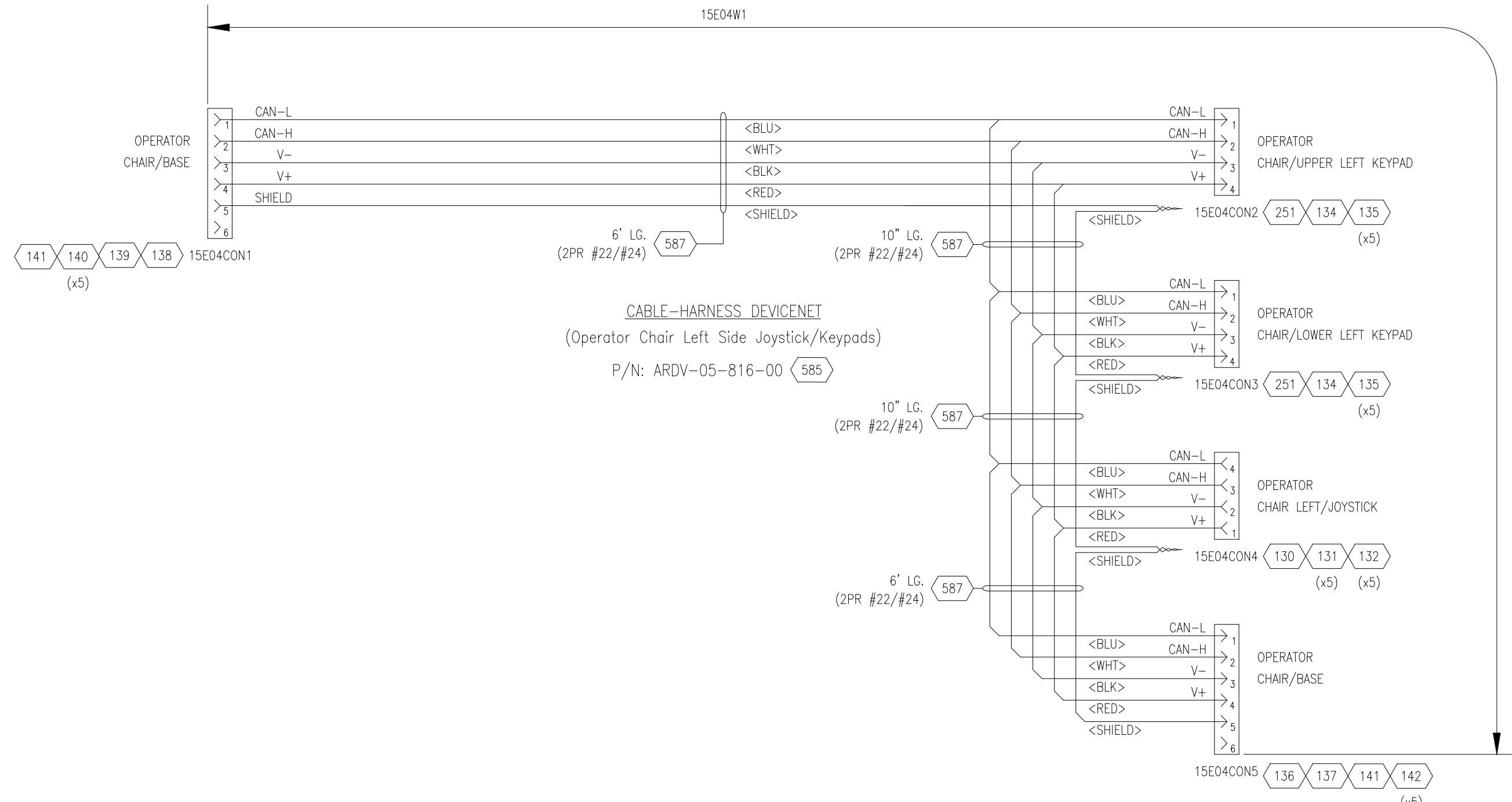
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DESCRIPTION

DATE BY CHKD REV.

DESCRIPTION

DATE BY CHKD



LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSSES

CABLE-HARNESS DEVICENET (Operator Chair Left Side Joystick/Keypads)

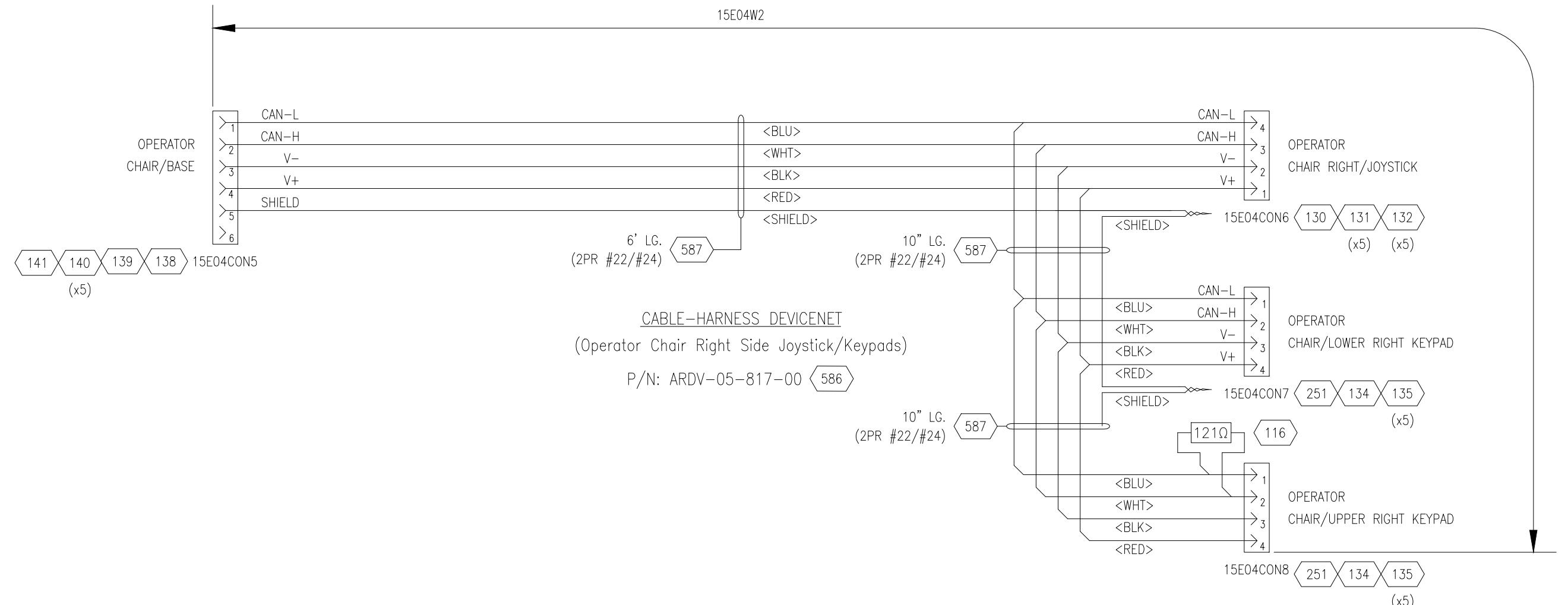
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LOC. CODE DATE
02/08/19 18

DRAWING NO. SECTION SUB. SEC. SHEET

201706 45 R 17

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						DESCRIPTION	DATE	BY	CHKD



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REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSSES

CABLE-HARNESS DEVICENET (Operator Chair Right Side Joystick/Keypads)

LOC. CODE

DATE

CONT. ON

02/08/19

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DRAWING NO.

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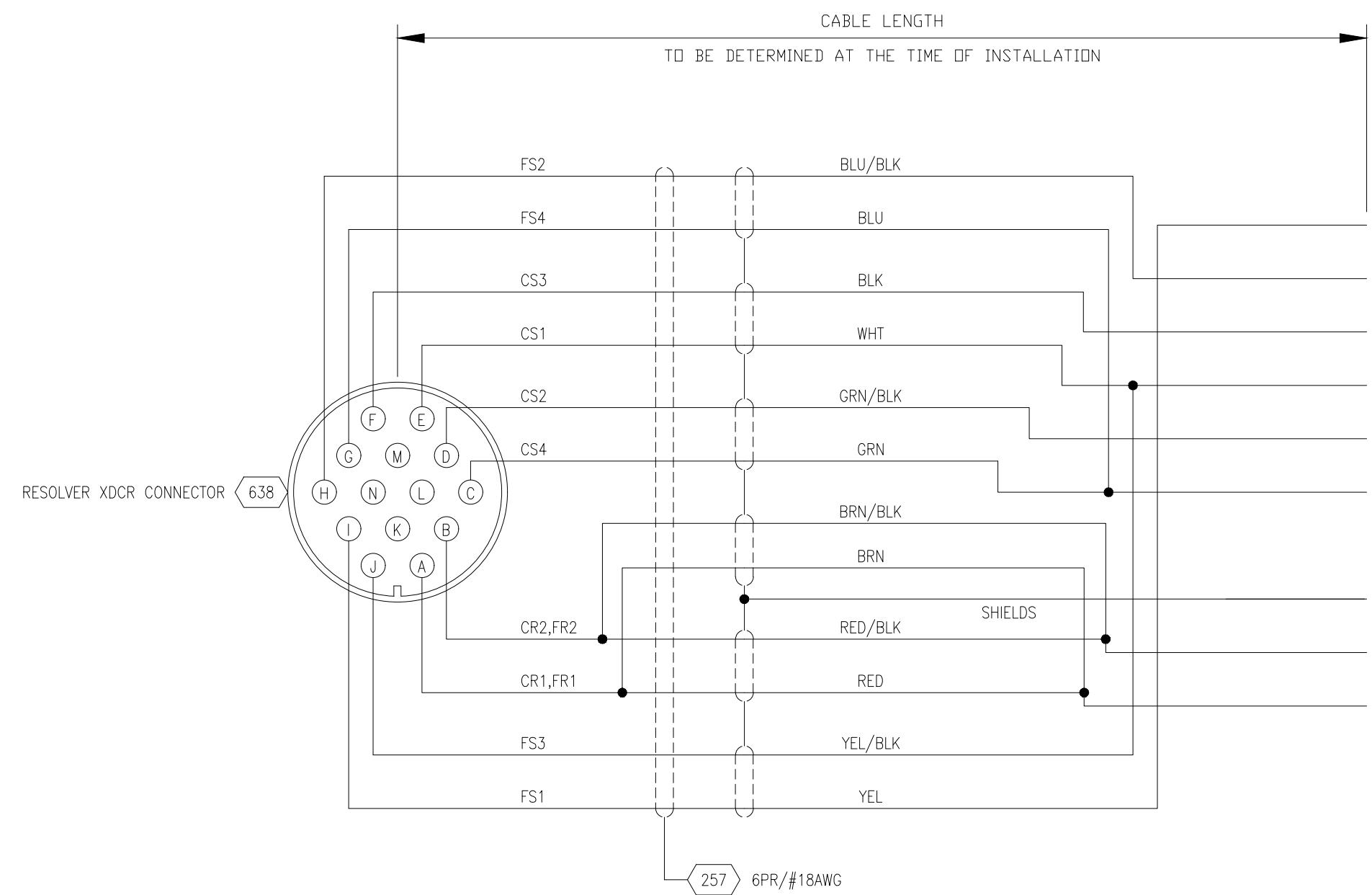
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			0	AS-INSTALLED	02/08/19	JCS	LDM

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD
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FILENAME:	20170645R18.dwg
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CABLE-HARNESS RESOLVER XDCR

(Multipass – Straight Connector)

P/N: ARDV-05-818-00 635

LEGEND

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ENGINEER:
L.D. MOODY
APPROVED BY:

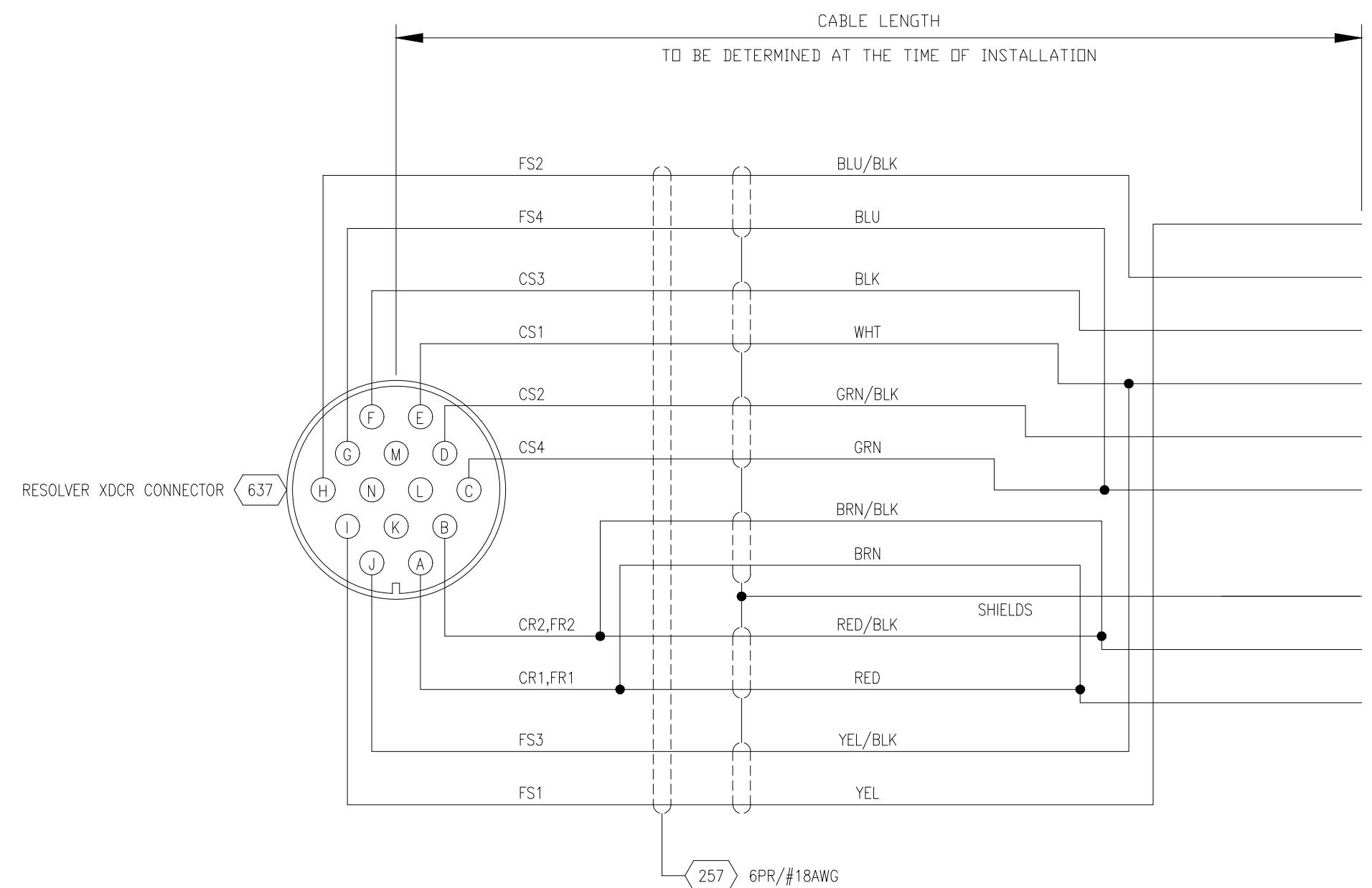
DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
CABLE-HARNESSES

FILENAME:
20170645R19.dwg
CABLE-HARNESS RESOLVER XDCR (Multipass Straight Connector)

LOC. CODE DATE CONT. ON
201706 02/08/19 20
DRAWING NO. SECTION SUB. SEC. SHEET
201706 45 R 19

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE	BY	CHKD



CABLE-HARNESS RESOLVER XDCR

(Multipass - 90' Connector)

P/N: ARDV-05-819-00 636

LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

APPROVED BY:

DRAWN BY:
J.C. STITT

CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CABLE-HARNESSES

CABLE-HARNESS RESOLVER XDCR (Multipass 90' Connector)

LOC. CODE

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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
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VALE-ITABIRA-DRILL 1119
ARDVARC CONTROL SYSTEM

CAMERAS – HAZCAM/DECK/MAST

P/N: (See Below)

SHEET	DESCRIPTION	P/N:
51A01	TITLE SHEET & SHEET INDEX	
51E01	CAMERA – HAZCAM W/18" MOUTING BRACKET (DRILL)	ARDV-04-405-00
51E02	CAMERA – HAZCAM W/6" MOUTING BRACKET (DRILL)	ARDV-04-405-01
51E04	CAMERA [IndigoVision] DECK W/MOUNTING BRACKET (DRILL)	ARDV-04-405-03
51E05	CAMERA [IndigoVision] MAST W/MOUNTING BRACKET (DRILL)	ARDV-04-405-04
51E06	CAMERA [Bosch] DECK W/MOUNTING BRACKET (DRILL)	ARDV-04-405-05
51E07	CAMERA [Bosch] DECK – CONNECTION DIAGRAM (DRILL)	
51E08	CAMERA [Bosch] MAST W/MOUNTING BRACKET (DRILL)	ARDV-04-405-06
51E09	CAMERA [Bosch] MAST – CONNECTION DIAGRAM (DRILL)	



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ENGINEER:
 L.D. MOODY

DRAWN BY:
 J.C. STITT

APPROVED BY:

CHECKED BY:
 L.D. MOODY

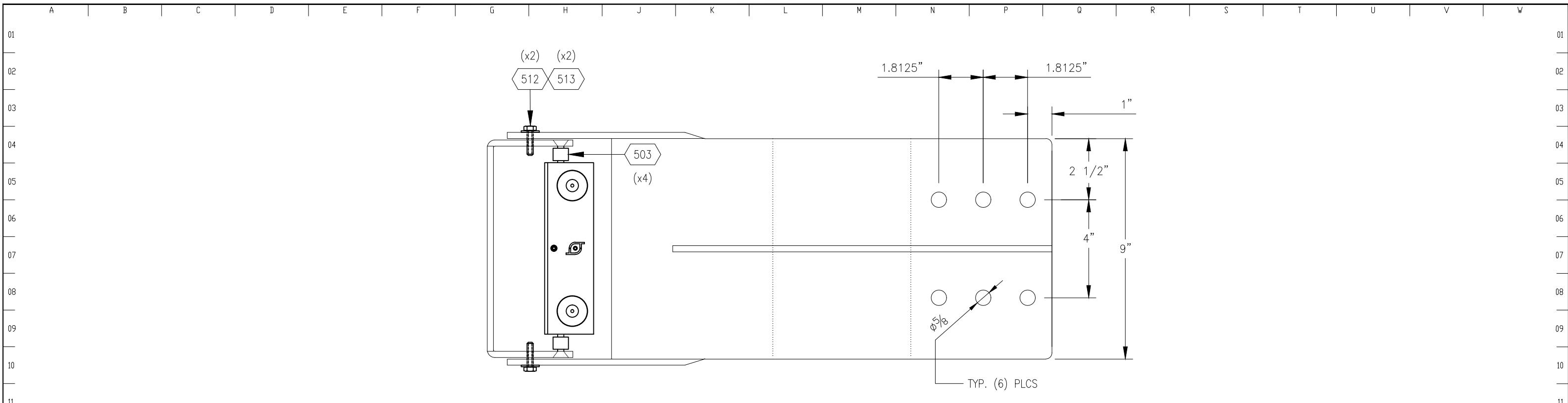
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 VALE-ITABIRA-DRILL 1119
 ARDVARC CONTROL SYSTEM
 CAMERAS – HAZCAM/DECK/MAST
 TITLE SHEET & SHEET INDEX

LOC. CODE
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DRAWING NO.
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			0	AS-INSTALLED	02/08/19	JCS	LDM

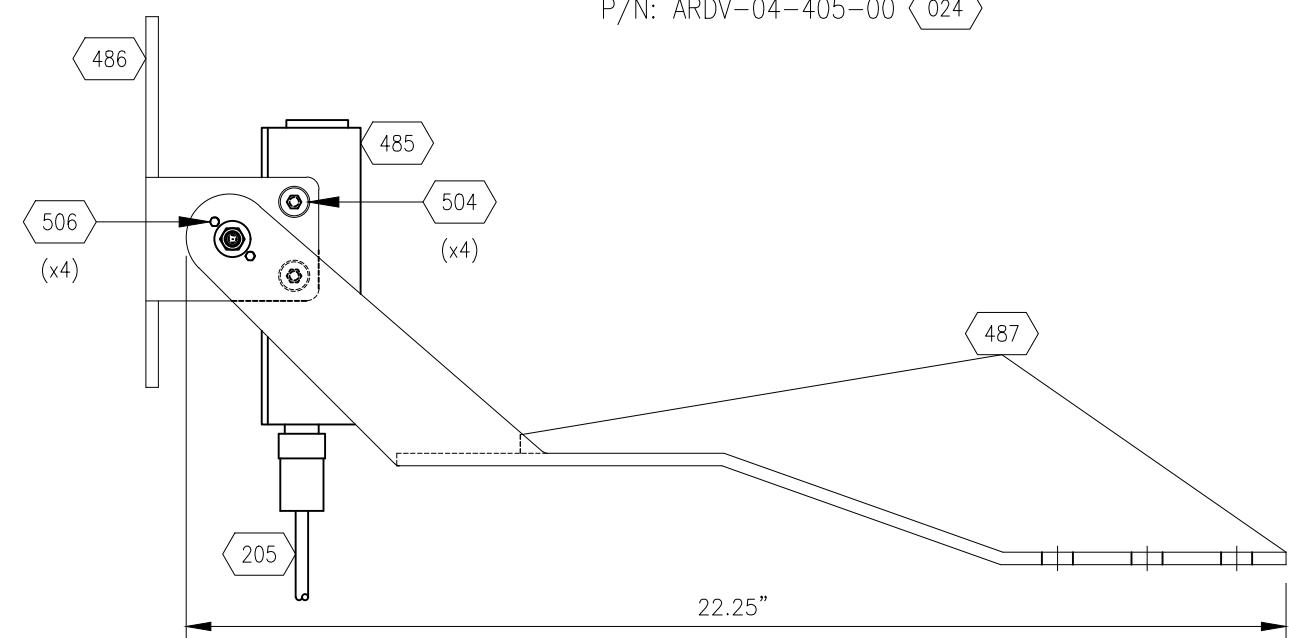
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FRONT VIEW

CAMERA-HAZCAM W/18" MOUNTING BRACKET (DRILL)

P/N: ARDV-04-405-00 024



SIDE VIEW

LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CAMERAS - HAZCAM/DECK/MAST

CAMERA - HAZCAM W/18" MOUTING BRACKET (DRILL)

LOC. CODE

DATE

02/08/19

CONT. ON

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DRAWING NO.

SECTION

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SUB. SEC.

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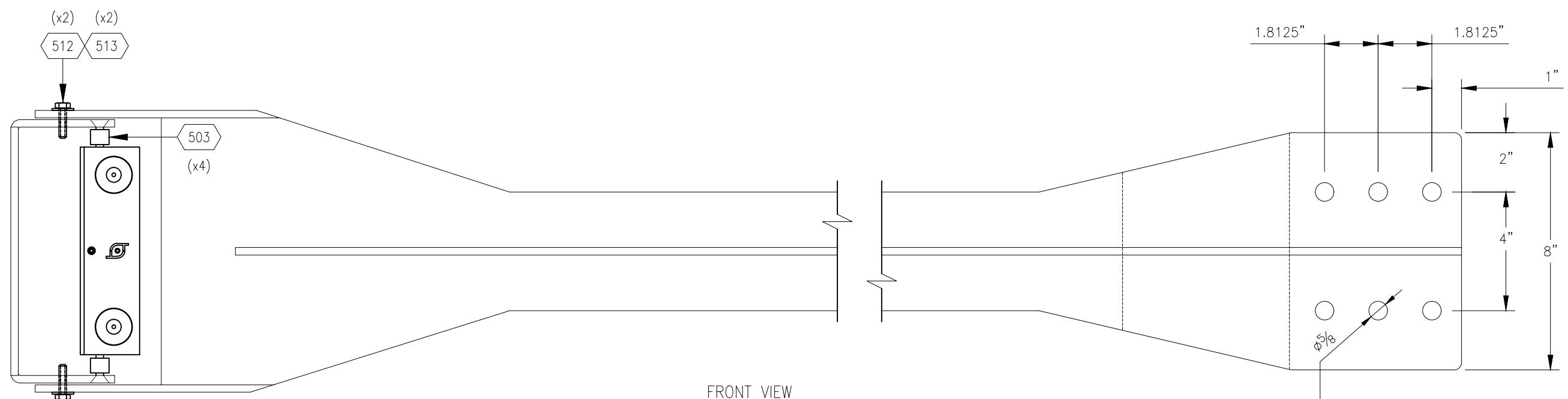
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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	DATE	BY	CHKD
						0	02/08/19	JCS	LDM

DESCRIPTION	DATE	BY	CHKD	FILENAME:	20170651E01.dwg
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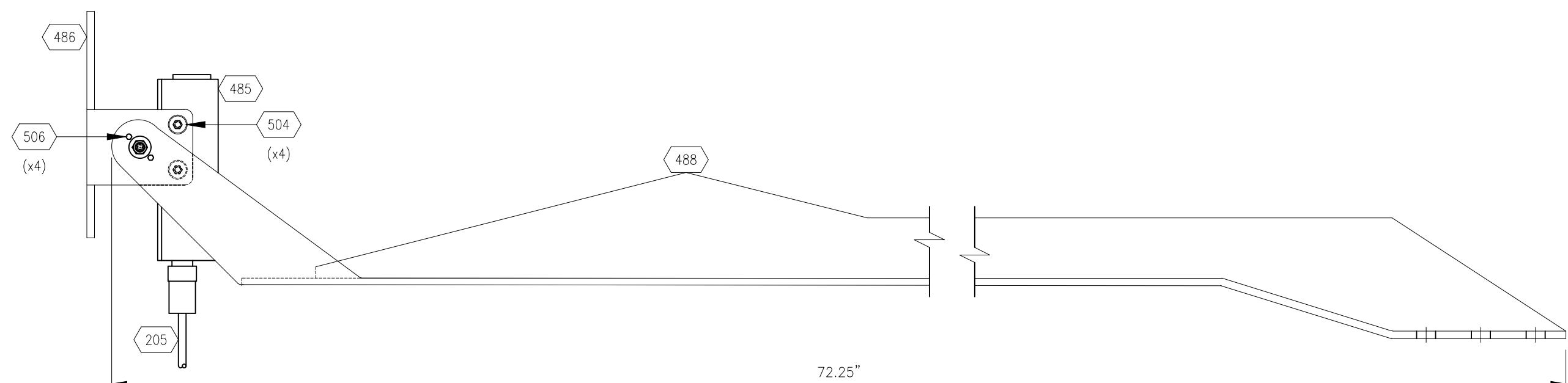
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DRAWING NO.	SECTION	SUB. SEC.	HEET



FRONT VIEW

CAMERA-HAZCAM W/6' MOUNTING BRACKET (DRILL)

P/N: ARDV-04-405-01 514



SIDE VIEW

LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CAMERAS - HAZCAM/DECK/MAST

CAMERA - HAZCAM W/6" MOUTING BRACKET (DRILL)

LOC. CODE
201706

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02/08/19

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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
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FILENAME:
20170651E02.dwg

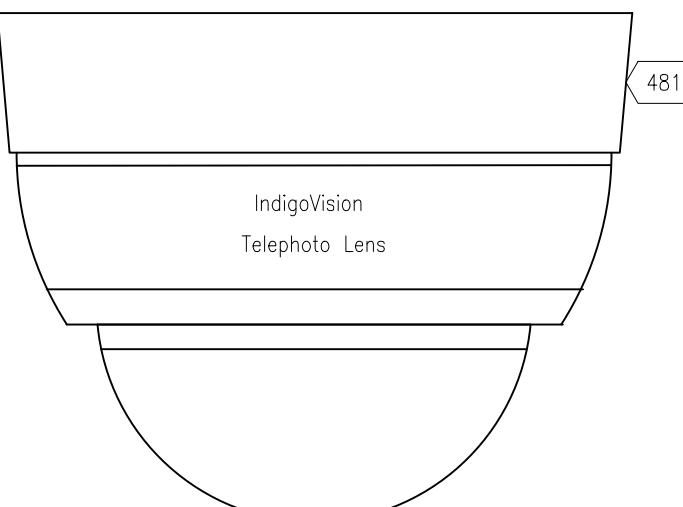
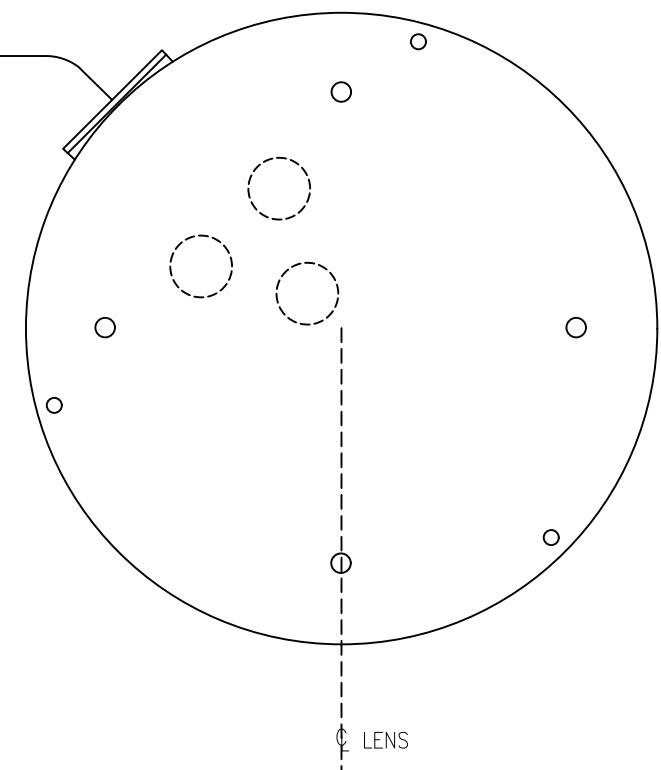
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REFER TO SHEET 12C01
FOR ETHERNET
CONNECTION DIAGRAM

CABLE-HARNESS ETHERNET CAT5e
(PoE Power Over Ethernet)
P/N: ARDV-05-809-00 < 523 >

— BIT CAMERA
ETHERNET CABLE # 30K06W11

NOTE:
CAMERA MOUNTING BRACKET
TO BE FABRICATED IN THE FIELD
AT THE TIME OF INSTALLATION.



FRONT VIEW

CAMERA [IndigoVision] – DECK W/MOUNTING BRACKET (DRILL)

P/N: ARDV-04-405-03 < 517 >

LEGEND



FLANDERS
www.flandersinc.com

ENGINEER:	L.D. MOODY	DRAWN BY:	J.C. STITT
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DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CAMERAS = HA7CAM / DECK / MAST

CAMERA [IndigoVision] DECK W/MOUNT

CAMERA [IndigoVision] DECK W/ MOUNTING BRACKET (DRILL)

LOC. CODE	DATE	CONT. ON
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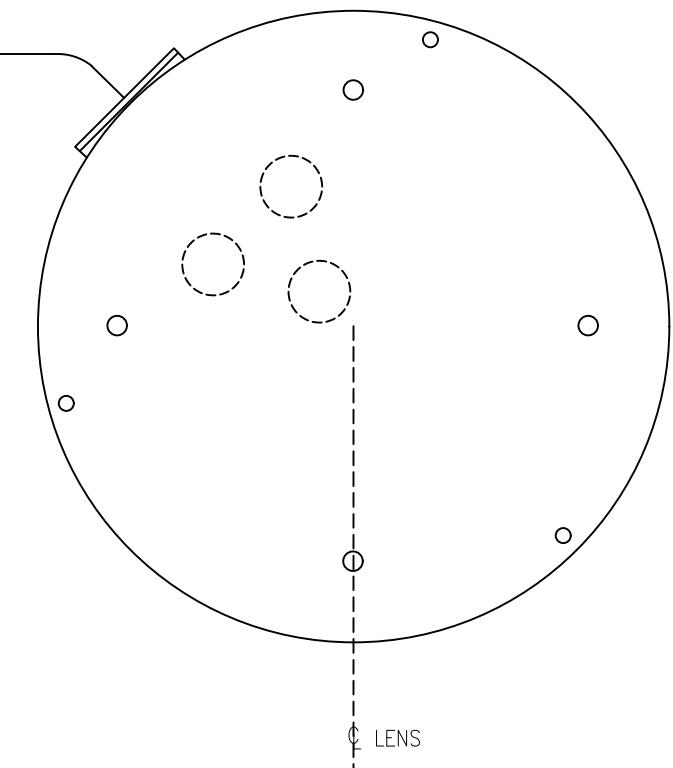
2017/06 51 / 104

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REFER TO SHEET 12C01 FOR ETHERNET CONNECTION DIAGRAM

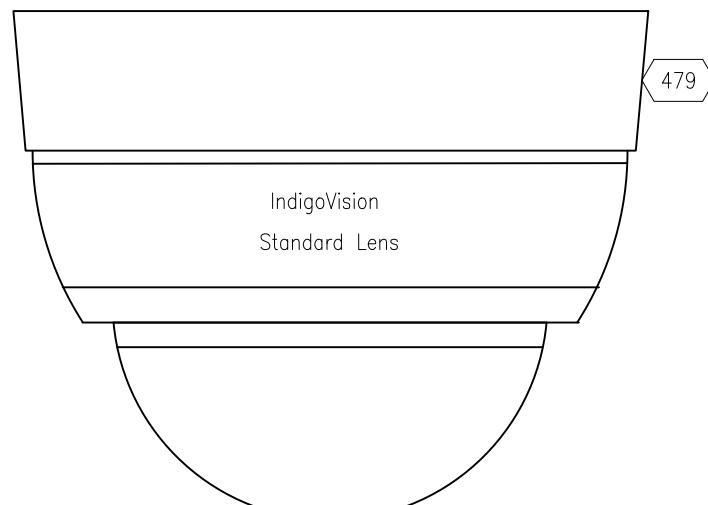
CABLE-HARNESS ETHERNET CAT5e
(PoE Power Over Ethernet)
P/N: ARDV-05-809-00 523

DECK CAMERA
ETHERNET CABLE # 30K06W12



NOTE:
CAMERA MOUNTING BRACKET
TO BE FABRICATED IN THE FIELD
AT THE TIME OF INSTALLATION.

TOP VIEW



FRONT VIEW

CAMERA [IndigoVision] - MAST W/MOUNTING BRACKET (DRILL)

P/N: ARDV-04-405-04 518

LEGEND
REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CAMERAS - HAZCAM/DECK/MAST

CAMERA [IndigoVision] MAST W/MOUNTING BRACKET (DRILL)

LOC. CODE DATE
201706 02/08/19 06

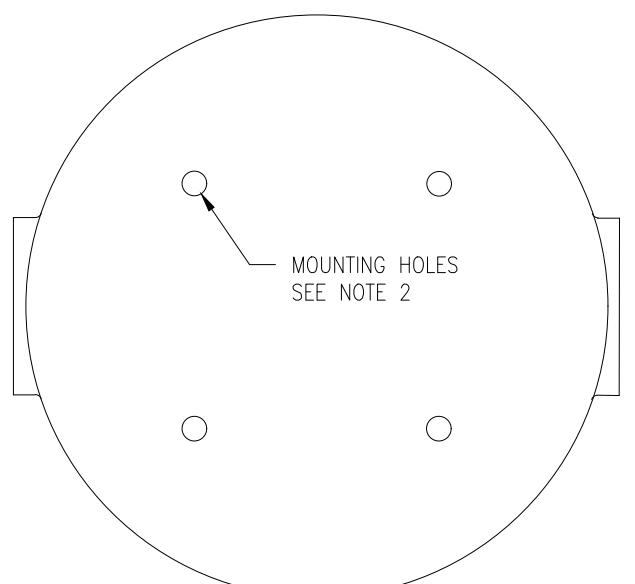
DRAWING NO. SECTION SUB. SEC. SHEET

201706 51 E 05

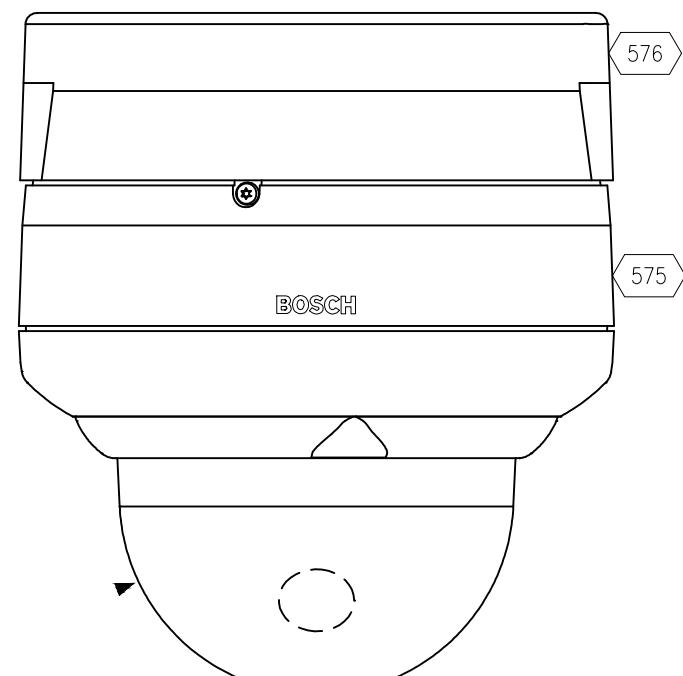
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

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TOP VIEW

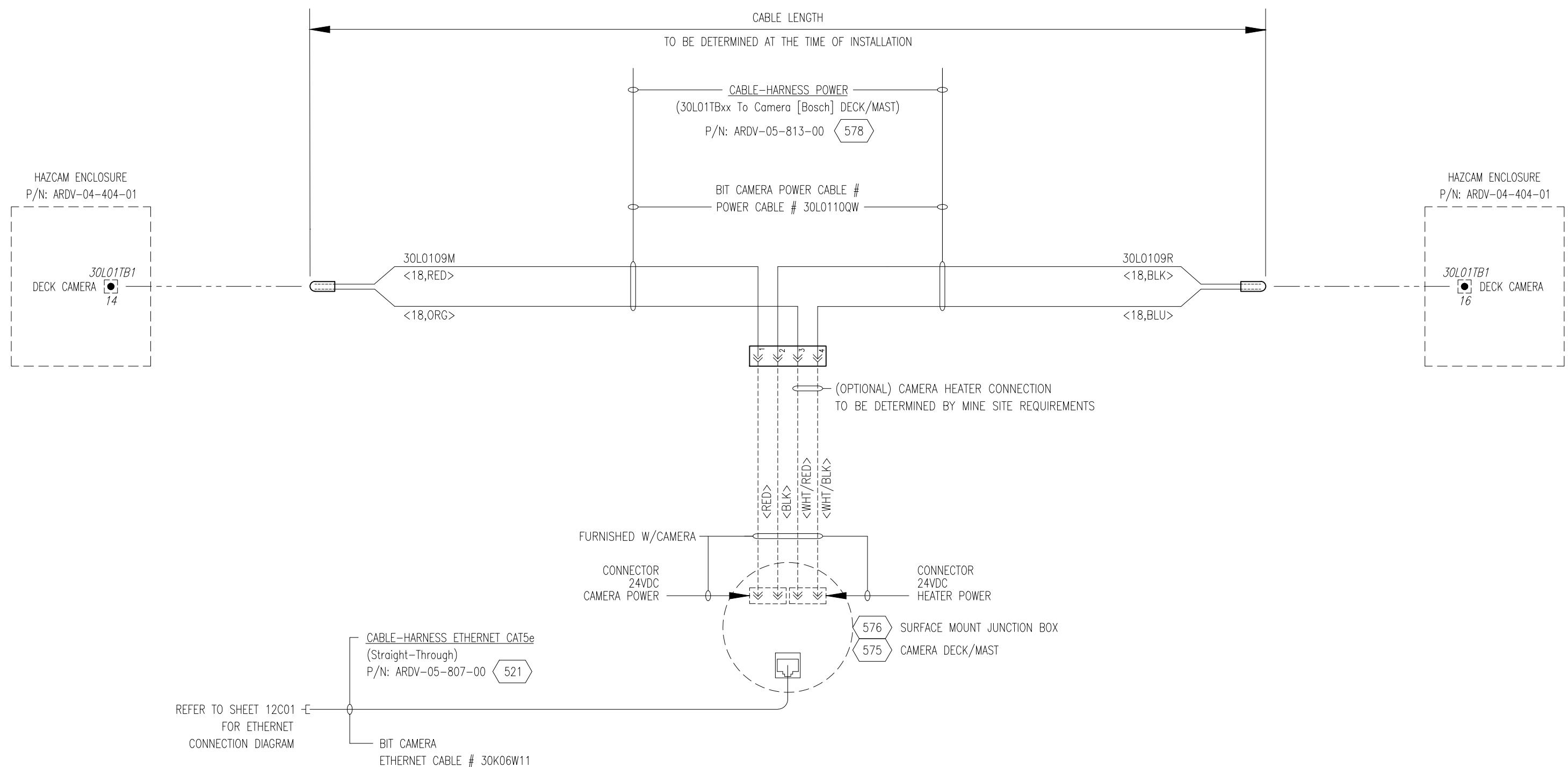


FRONT VIEW

CAMERA [Bosch] DECK W/MOUNTING BRACKET (DRILL)

P/N: ARDV-04-405-05 573

LEGEND



CAMERA [Bosch] DECK - CONNECTION DIAGRAM (DRILL)

LEGEND

REFER TO SHEET 00B04

HAZCAM ENCLOSURE
P/N: ARDV-04-404-01

MAST CAMERA
30L01TB1
13

CABLE LENGTH
TO BE DETERMINED AT THE TIME OF INSTALLATION

CABLE-HARNESS POWER
(30L01TBxx To Camera [Bosch] DECK/MAST)
P/N: ARDV-05-813-00 578

DECK CAMERA

POWER CABLE # 30L0106QW

HAZCAM ENCLOSURE
P/N: ARDV-04-404-01

MAST CAMERA
30L01TB1
15

30L0105M
<18,RED>
<18,ORG>

30L0105R
<18,BLK>
<18,BLU>

(OPTIONAL) CAMERA HEATER CONNECTION
TO BE DETERMINED BY MINE SITE REQUIREMENTS

FURNISHED W/CAMERA
CONNECTOR 24VDC
CAMERA POWER
CONNECTOR 24VDC
HEATER POWER

SURFACE MOUNT JUNCTION BOX
576
575
CAMERA DECK/MAST

CABLE-HARNESS ETHERNET CAT5e
(Straight-Through)
P/N: ARDV-05-807-00 521

REFER TO SHEET 12C01
FOR ETHERNET
CONNECTION DIAGRAM

DECK CAMERA
ETHERNET CABLE # 30K06W12

CAMERA [Bosch] MAST – CONNECTION DIAGRAM (DRILL)

LEGEND

REFER TO SHEET 00B04



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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

CAMERAS – HAZCAM/DECK/MAST

CAMERA [Bosch] MAST – CONNECTION DIAGRAM (DRILL)

LOC. CODE
DATE
02/08/19
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DRAWING NO.
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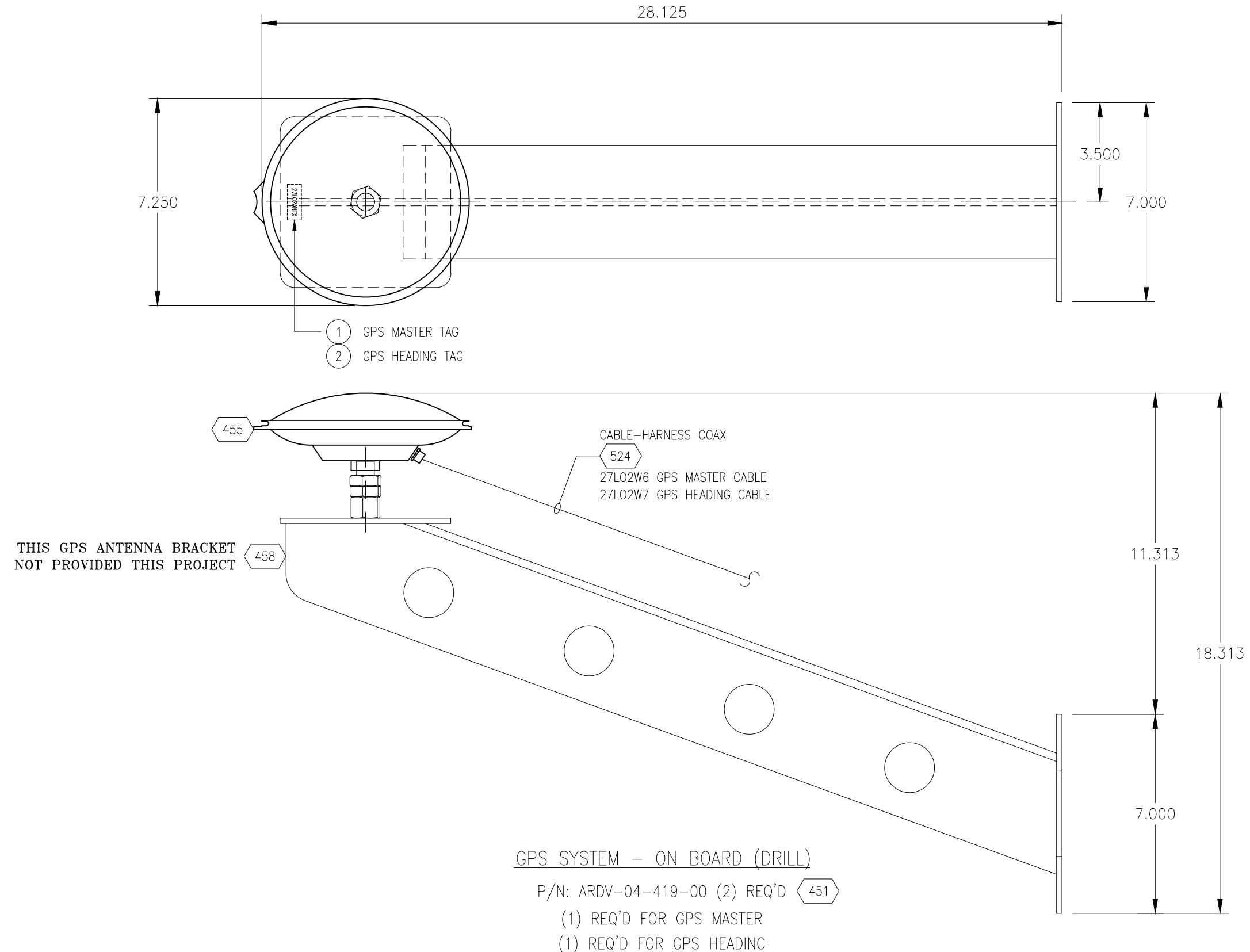
REV.	DESCRIPTION	DATE	BY	CHKD	REV.	DESCRIPTION	DATE

0 AS-INSTALLED
02/08/19 JCS LDM
DATE BY CHKD
FILENAME:
20170651E09.dwg

TAGS SCHEDULE					TAGS SCHEDULE				
TAG NO.	SIZE	TAG COLOR	TEXT COLOR	DESCRIPTION	TAG NO.	SIZE	TAG COLOR	TEXT COLOR	DESCRIPTION
(1)	1/2" x 1-1/2"	WHITE	BLACK	27L02ANT1					
(2)	1/2" x 1-1/2"	WHITE	BLACK	27L02ANT2					

LEOEND

LEGEND



GPS SYSTEM – ON BOARD (DRILL)

P/N: ARDV-04-419-00 (2) REQ'D 451

(1) REQ'D FOR GPS MASTER

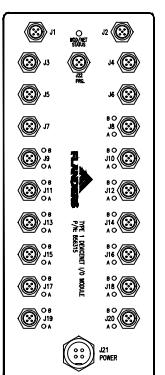
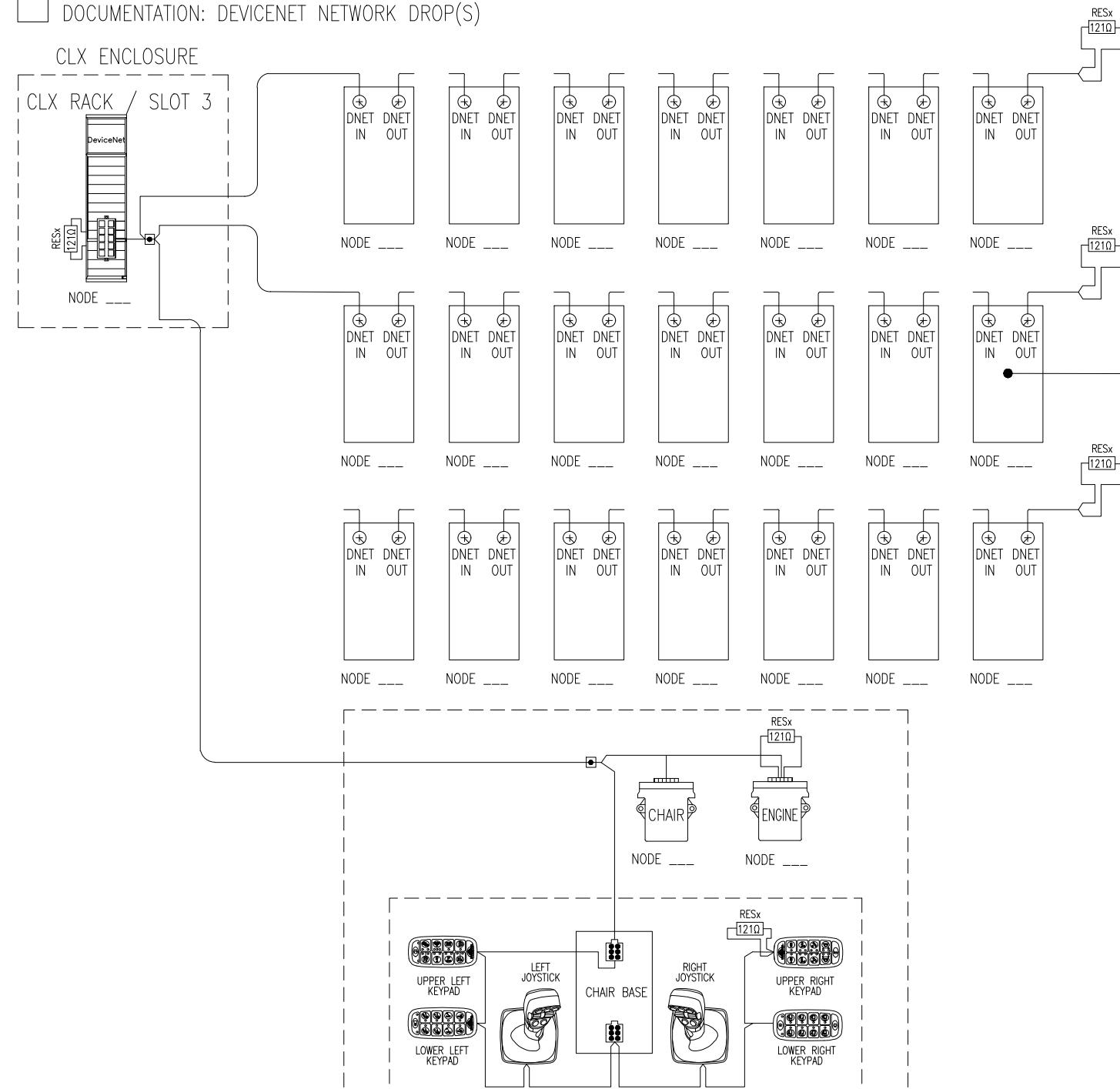
(1) REQ'D FOR GPS HEADING

LEGEND

LEGEND

FIELD CHECK LIST

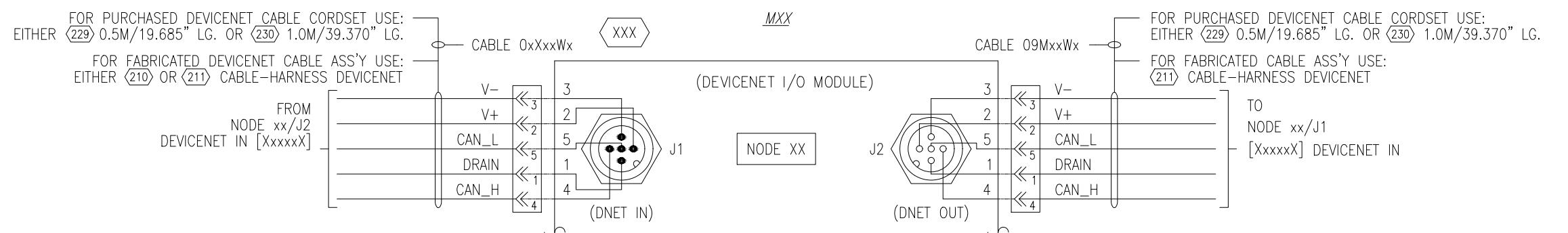
1. DATE INSTALLED: ____ / ____ / ____
MM DD YYYY
 2. DOCUMENTATION: DEVICENET NETWORK DROP(S)



(117)
DEVICENTTM TYPE 1 I/O MODULE (SHOWN)
DEVICENTTM TYPE 2 I/O MODULE
DEVICENTTM EXPANSION I/O MODULE

FIELD CHECK LIST

3. DOCUMENTATION: DEVICENET CABLES (PLEASE CIRCLE THE BOM ITEM NUMBER USE FOR BOTH THE DEVICENET IN & OUT CABLES OR TERMINATING RESISTOR (TYPICAL) EACH DEVINET I/O MODULE)



4. SHEET 18P01 DRILL MODE LIGHT BOX / CABLE CONNECTIONS? INDICATE BOTH THE LOCATON OF THE DRILL MODE LIGHT BOX(S) AND THE CABLE CONNECTION SEQUENCE.



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ENGINEER:
L.D. MOODY
APPROVED BY:
L.D. MOODY

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
FIELD: CHECK LIST, NOTES & SKETCHES

FILNAME:
20170699B02.dwg
CHECK LIST - DOCUMENTATION - DEVICENET CABLE(S)

LOC. CODE
201706
DATE
02/08/19
CONT. ON
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			0	AS-INSTALLED	02/08/19	JCS	LDM

REV. DESCRIPTION DATE BY CHKD REV. DESCRIPTION DATE BY CHKD

FIELD CHECK LIST

5. DOCUMENTATION: ARDVARC KIT # & COMPONENT(S) S/M



FLANDERS
www.flandersinc.com

ENGINEER:
J. R. MOODY

L.D. MOOD

THE INFLUENCE OF CULTURE ON LANGUAGE LEARNING

FLANDERS
IN WHOLE

DRAWING TITLE:

VALE-ITABIRA-DRILL1119
APPVARS CONTROL SYSTEM

ARDVARC CONTROL SYSTEM
FIELD CHECK LIST NOTES

FIELD: CHECK LIST, NOTES

— 1 —

8 SKETCHES

& SKETCHES

LOC. CODE

[View Details](#)

DRAWING NI

20170

FIELD NOTES: DESIGN CHANCES, IMPROVEMENTS, ISSUES, OTHER ...

1 _____

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ENGINEER:
L.D. MOODY

DRAWN BY:
J.C. STITT

APPROVED BY:

CHECKED BY:

L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119

ARDVARC CONTROL SYSTEM

FIELD: CHECK LIST, NOTES & SKETCHES

NOTES - DESIGN CHANCES, IMPROVEMENTS, ISSUES, OTHER ...

LOC. CODE
201706

DATE
02/08/19

CONT. ON
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DRAWING NO.
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REV.	DESCRIPTION	DATE	BY	CHKD	REV.	AS-INSTALLED	02/08/19	JCS	LDM

DESCRIPTION

DATE

BY

CHKD

FIELD NOTES: DESIGN CHANCES, IMPROVEMENTS, ISSUES, OTHER .

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02 | FIELD SKETCHES: CONNECTIONS REQ'D (NOT SHOWN), BRACKET (FIELD FACRICATED), IMPROVEMENTS, ISSUES, OTHER ...
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ENGINEER:
L.D. MOODY
APPROVED BY:

DRAWN BY:
J.C. STITT
CHECKED BY:
L.D. MOODY

DRAWING TITLE:
VALE-ITABIRA-DRILL1119
ARDVARC CONTROL SYSTEM
FIELD: CHECK LIST, NOTES & SKETCHES
SKETCHES - CONNECTIONS REQ'D (NOT SHOWN).
FILENAME:
20170699B10.dwg

LOC. CODE DATE CONT. ON
201706 02/08/19 08
DRAWING NO. SECTION SUB. SEC. SHEET
201706 99 B 10

REV.	DESCRIPTION	DATE	BY	CHKD	REV.	0 AS-INSTALLED	02/08/19	JCS	LDM
						DESCRIPTION	DATE	BY	CHKD

FIELD SKETCHES: CONNECTIONS REQ'D (NOT SHOWN), BRACKET (FIELD FACRICATED), IMPROVEMENTS, ISSUES, OTHER ...

5 _____



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