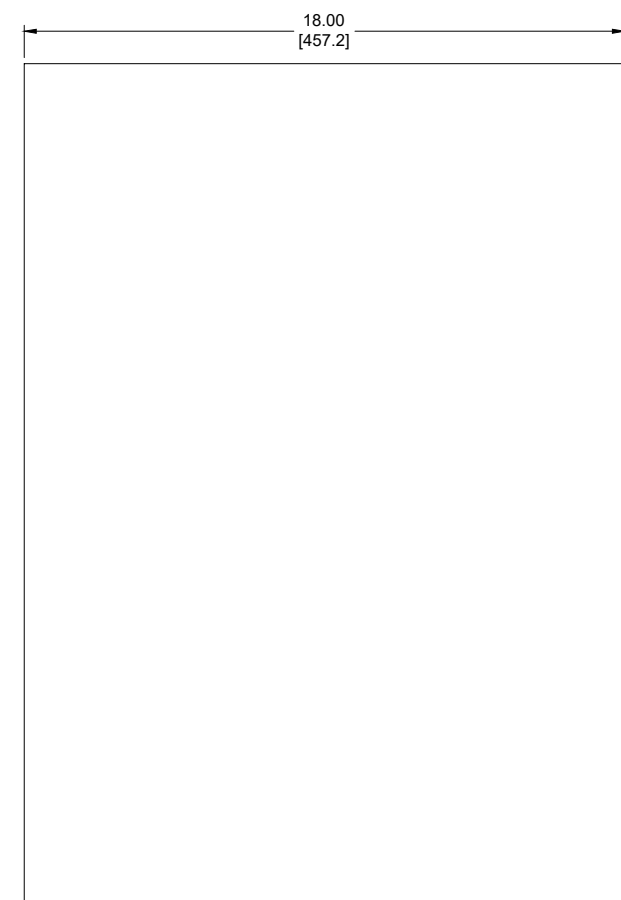
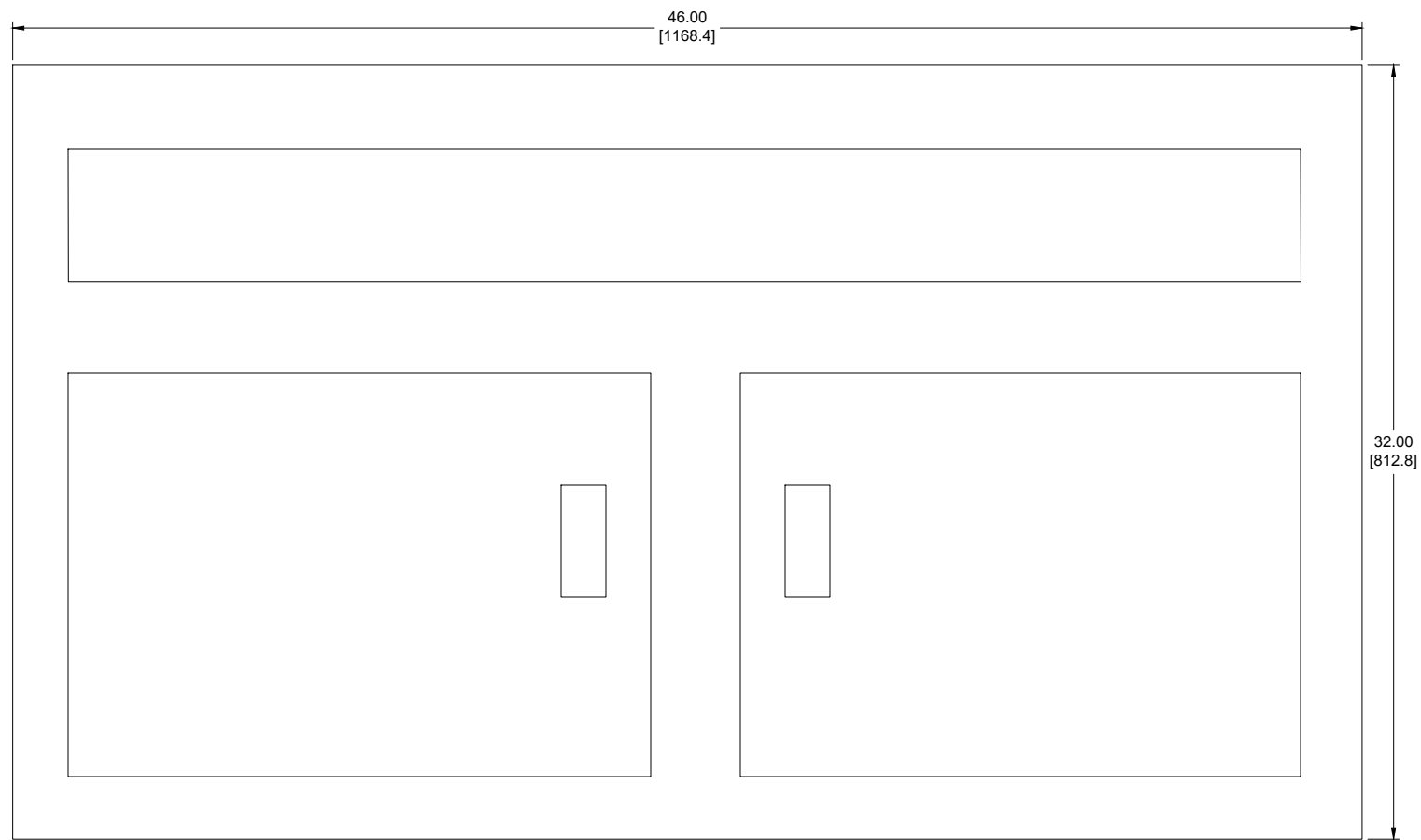
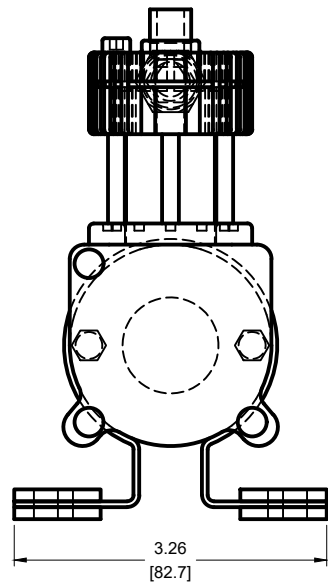
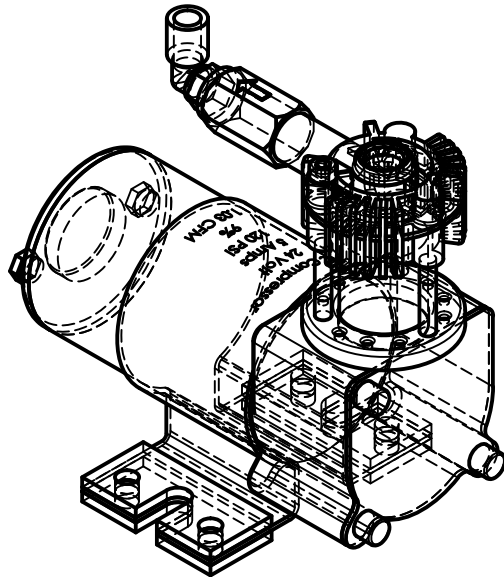
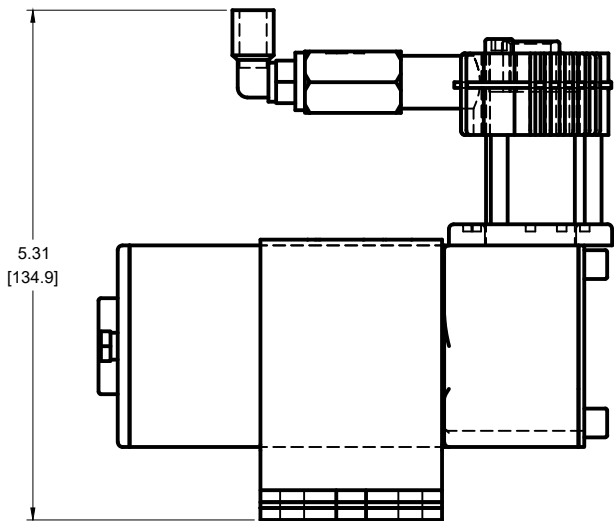
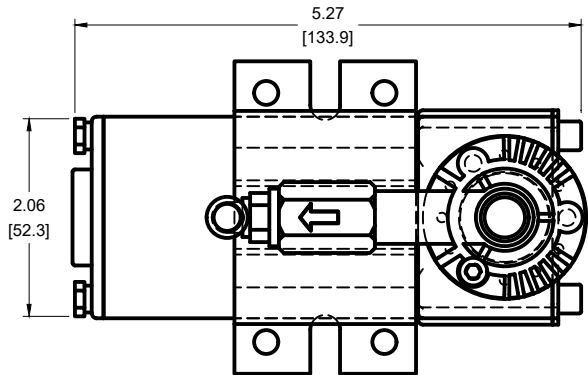


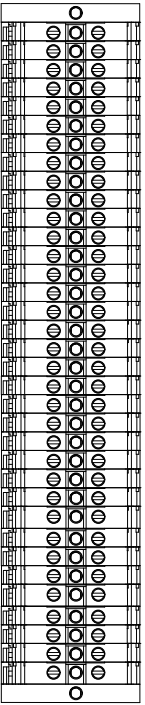
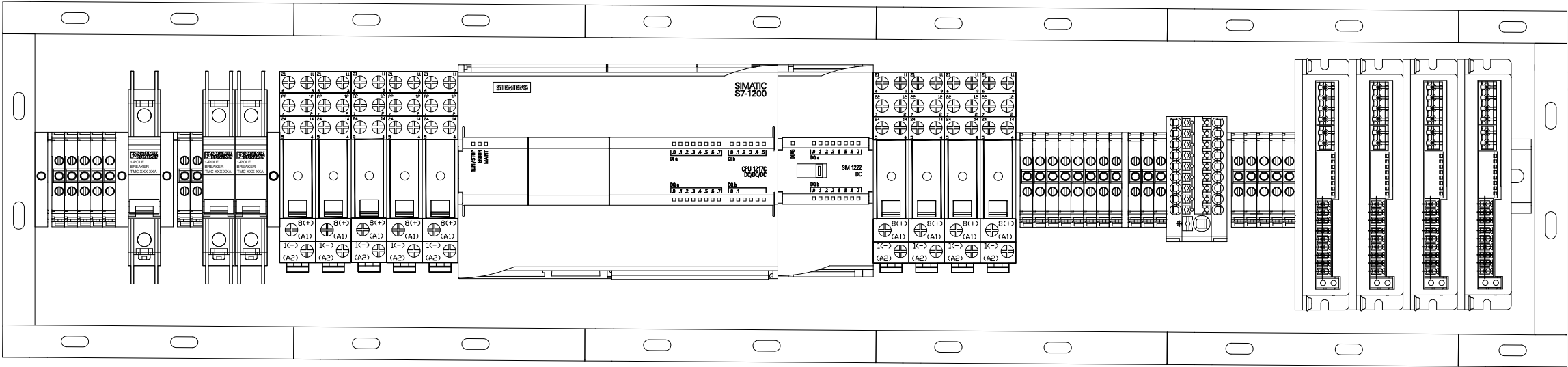
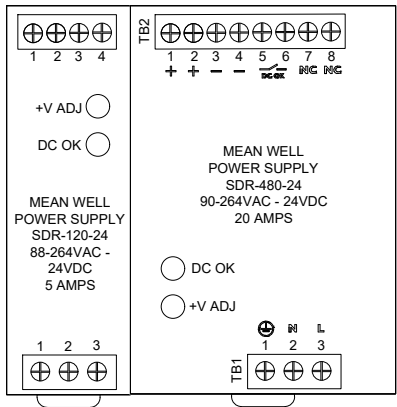


INTEGRATED MILL SYSTEMS				DRAWN		DATE						INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL ENCLOSURE ARRANGEMENT			
				TJ		04/28/24									
				CHECKED											
				Initials											
				ENG. APP'D		Initials									
2				04/28/24		TJ		AS BUILT AS SHIPPED		APP'D PROD.		Initials			
REV				DATE		BY		DESCRIPTION							

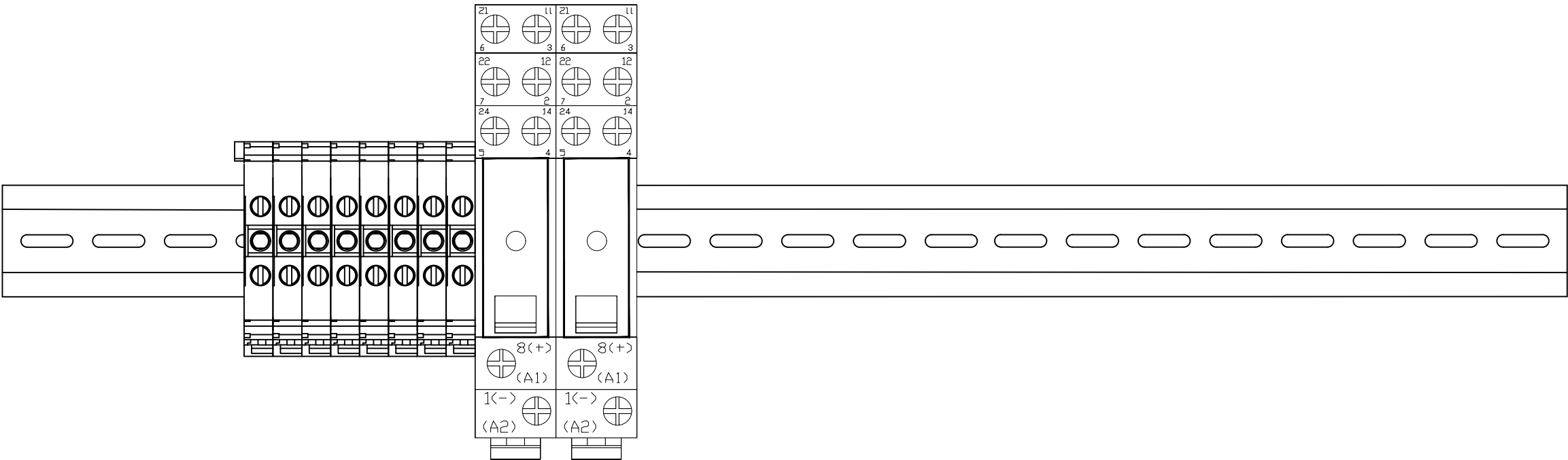
SIZE	DWG. NO.		I24001 - A100		CONT. ON.	SH NO
D					02	01



INTEGRATED MILL SYSTEMS					DRAWN	DATE						INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL AIR COMPRESSOR/PNEUMATICS			
					TJ	04/28/25									
					CHECKED	Initials									
					ENG. APP'D	Initials									
	2	04/28/24	TJ	AS BUILT AS SHIPPED	APP'D PROD.	Initials									
REV DATE BY DESCRIPTION								SIZE	DWG. NO.			CONT.ON.	SH NO		
								D	I24001	- A100		03	02		



INTEGRATED MILL SYSTEMS					DRAWN	DATE	 INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL ENCLOSURE SUB-PANEL ARRANGEMENT				CONT.ON.	SH NO
					TJ	04/28/25					04	03
					CHECKED	Initials						
					ENG. APP'D	Initials						
2	04/28/2025	TJ	AS BUILT AS SHIPPED	APP'D PROD.	Initials		SIZE	DWG. NO.	I24001 - A100			
REV	DATE	BY	DESCRIPTION				D					



INTEGRATED MILL SYSTEMS				DRAWN	DATE				INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL ENCLOSURE SUB-PANEL PNEUMATIC ARRANGEMENT		
				TJ	04/28/25						
				CHECKED	Initials						
				ENG. APP'D	Initials						
	2	04/28/25	TJ	AS BUILT AS SHIPPED							
REV	DATE	BY	DESCRIPTION			APP'D PROD.	Initials	SIZE D	DWG. NO. I24001 - A100	CONT.ON. 05	SH NO 04

120VAC

⚠ DANGER

Arc Flash and Shock Hazard

Do not operate controls or open covers without appropriate personal protection equipment.

Failure to comply may result in injury or death!

Refer to NFPA 70E for PPE requirements.

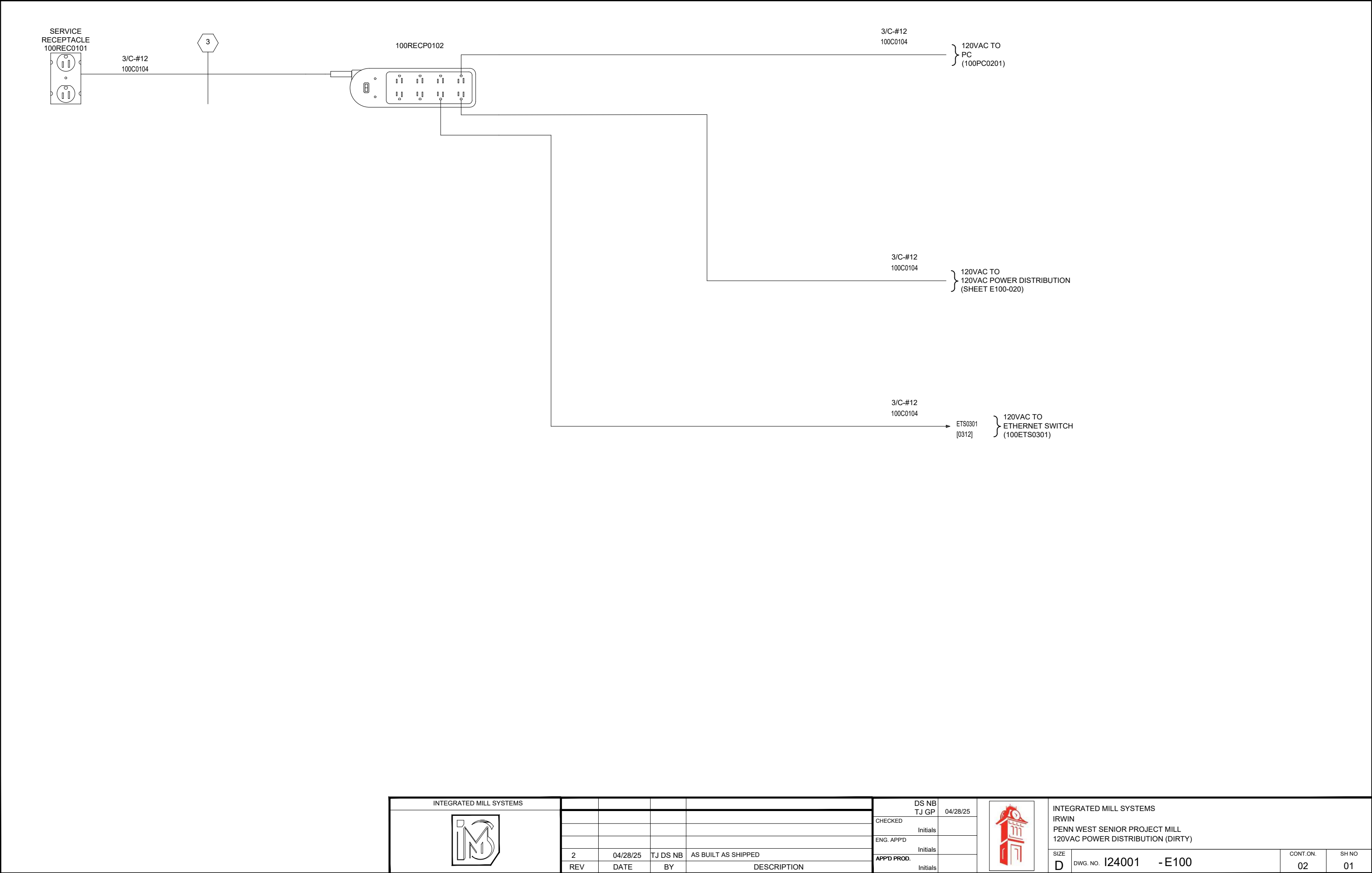
⚠

SOURCE 1		
System Supply:	120	Volts AC Max.
	31.2	Full Load Amps
	60	Hertz
	1	Phase
Largest Motor:	0.161 HP	
Short Ckt. Cur. Rating:	10 kA rms Symmetrical	
	24 V Max.	
INTEGRATED MILL SYSTEMS INC. WILLOUGHBY, OHIO USA		

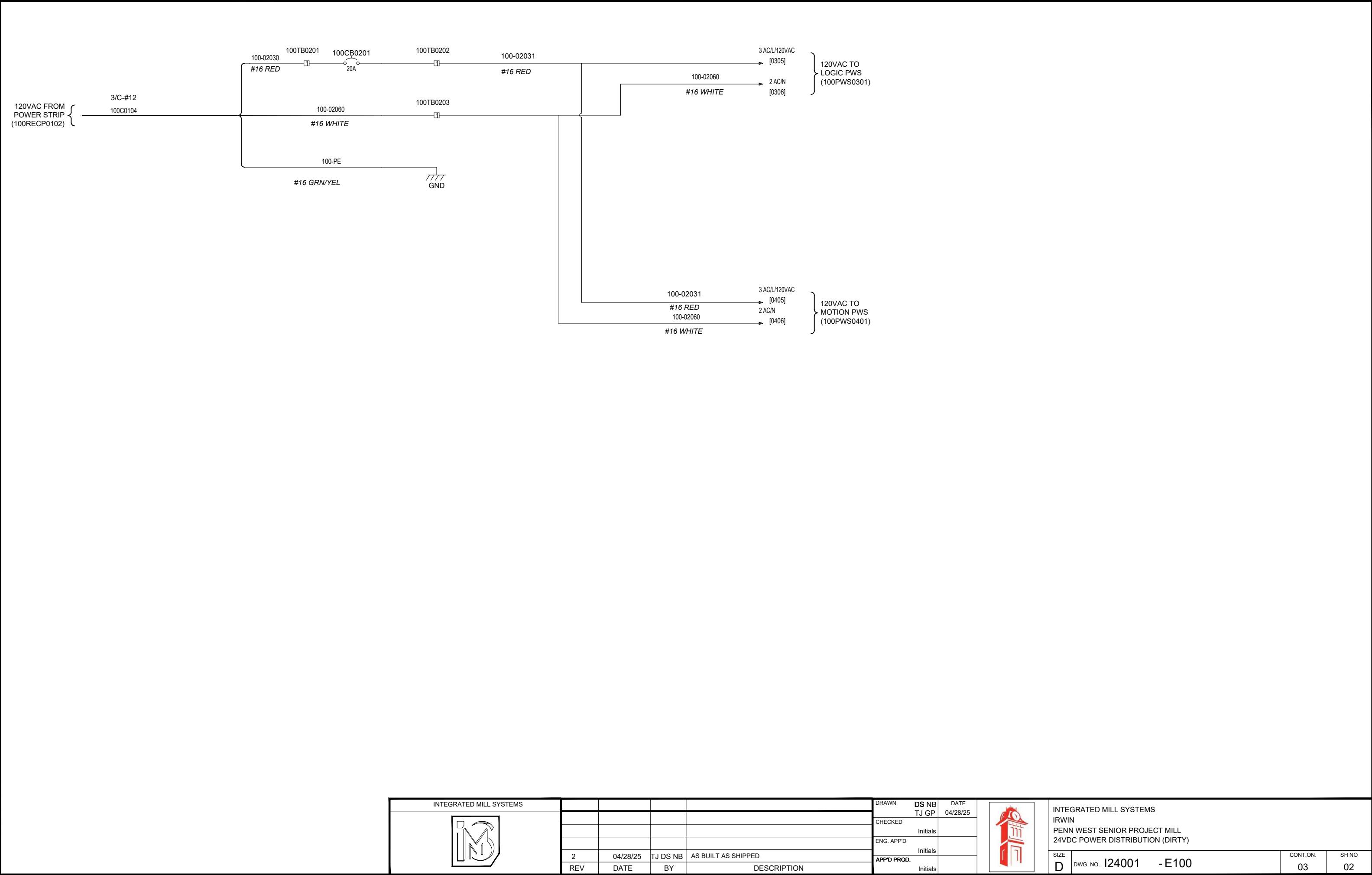
INTEGRATED MILL SYSTEMS					DRAWN	DATE		INTEGRATED MILL SYSTEMS			
					TJ DS	04/28/25		IRWIN			
					CHECKED	Initials		PENN WEST SENIOR PROJECT MILL			
					ENG. APP'D	Initials		ENCLOSURE NAMEPLATE ARRANGEMENT			
					APP'D PROD.	Initials					
	2	04/28/25	TJ DS	AS BUILT AS SHIPPED		SIZE		DWG. NO. I24001 - A100		CONT.ON.	SH NO
	REV	DATE	BY	DESCRIPTION		D				06	05

BILL OF MATERIALS					
ITEM	DEVICE NUMBER	QTY	VENDOR	PART NUMBER	Device Description
1					MISC
2	100-PC1001	1	Office Depot	J1-7050MM04	Refurbished Desktop PC, Intel® Core™ i7, 16GM Memory, 512GB Solid State Drive, Windows® 10, J1-7050MM04
3	100-HMI1001	1	Amazon		10.1 Inch Small Touchscreen Monitor, Small HDMI Monitor Security Camera Portable Monitor Screen LCD Display with Speaker, HDMI VGA AV Port for PC CCTV Security System Raspberry Pi
4	100-HMI1001	1	Amazon		5 Port Gigabit Unmanaged Ethernet Switch
5	Mill Motor	1	Mosebach Electric Power Supply	SMD23E2-240E-S12-GB10A	Ethernet Integrated Stepper Motor, Included 10:1 Gearbox
6	SD1/SD2	2	Moons	LN174S-W0601-125-S-065	Linear Stepper Motor "NEMA17 Non-captive Linear Stepper Motors, High performance, Exceptional endurance, Low noise,Highly effective. Multiple options:different motor size different lead screw different nuts."
7	01, 100-STD2202, 100-STD2203, 10	4	Automation Direct	EM542S	EM542S - Stepper Driver
8		1	Harbor Freight	57780	YUKON 46 in. Mobile Workbench with Solid Wood Top, Blue
9					WIRING
10		~35 ft	IMS Stock		Black Wire 14 AWG
11		~35ft	IMS Stock		Red Wire 14 AWG
12		~35ft	IMS Stock		Green with yellow stripe ire 14 AWG
13		~35ft	IMS Stock		IMS Blue Wire 18 AWG
14		~25ft	IMS Stock		White Wire 16 AWG
15		~25ft	IMS Stock		White with Blue Stripe 18 AWG
16		~20ft	IMS Stock		Orange Wire 14 AWG
17					RELAY/TERMINAL BLOCK
18	100-CRXXXX	2	IMS Stock		Relay 700-HPS2Z24 (10 Pack)
19	100-TBXXXX	1	Phoenix Contact		Terminal Block "Feed-through terminal block - PT 2,5
20	100-SRXXXX	1	Rockwell Automation	700-HPS2Z24	24V DPDT PCB Style 2 Pole Safety Relay
21	100-TBXXXX	2	Phoenix Contact		Fused Terminal Block "Fuse modular terminal block - UT 4-PE/L/HESILED 24 (5X20) 120KOHM3214321"
22					POWER SUPPLIES
23	100-PWS0401	1	IMS Stock		Motors Power Supply Mean Well SDR-480-24 480W 20A 24VDC Single Output AC to DC DIN Rail Power Supply
24	100-PWS0301	1	IMS Stock		PLC Power Supply, MEAN WELL SDR-120-24 Single Output Industrial DIN Rail Power Supply, 24 Volts 5 Amps 120 Watts
25					CIRCUIT BREAKER
26	100-CBXXXX	2	Phoenix Contact		Circuit Breaker (20A) "Thermomagnetic device circuit breaker - TMC 81C 20A
27	100-CBXXXX	2	Phoenix Contact		Circuit Breaker (5A) "Thermomagnetic device circuit breaker - TMC 81C 05A
28					PNEUMATICS
29	Compressor	1	Viair	2495	Compressor 24 V, 6-A Draw, 120 PSI Max
30	Sol-XXXX	2	Automation Direct	AVS-523C1-24D	Solenoid Valve 5-port 4 way 3 position, 1/8th NPT inlet port
31					M12 CONNECTIONS
32		8	Amazon	BOCX5CN6GK	M12 5 Pin Female Connector Cable A Coded Straight Back Mount Cable Waterproof Female Aviation Socket
33		1	Amazon	BOCXSPX5MT	M12 8Pin Female Connector Cable A Coded Straight Back Mount Cable Waterproof Female Aviation Socket
34		2	Automation Direct	8000-88590-0000000	M12 Connector Block
35		1	Amazon	B0D4ZC86D8	M12 8 Pin Extensin Cable A-Coding Male to Female Straight Connector
36		2	Amazon	00-197644012022	Papuga M12 Male to M8 Female 4 Pin A-Coded Adapter Quick Disconnect
37		1	Automation Direct	8000-88590-0000000	8 ports, For M12 Connectors
38		6	Automation Direct	7000-12721-0000000	Murrelektronik connector M12 barrel 5-pin male axial connection, accepts cable diameter size 4-6mm, 18 AWG, screw terminal connection, IP67
39		12	Automation Direct	7000-40041-2150300	M12 Connector Cable, Female to Male
40					SENSORS
41	RTD	1	Automation Direct	RTD0100-06-010-H	Temperature Sensor, up to 302 F, m12 Connectors
42	PD	1	Grainger	5LRN6	Pressure Sensor 1/4 NPT Male
43		1	Automation Direct	LPF-U-404004	RFID Encoded Safety Switch Set, LPF type, Safety for pnueumatics
44	LC	1	Automation Direct	YBES-14K4-0170-P012	light curtain 14mm resolution, 170 mm protect height, Sender and Reciever Pair
45	BB-1 , BB2	2	Automation direct	OPT2040	Fibre optic Amp 1 channel M8 connector
46	BB-1, BB2	2	Automation direct	OPT2040	Through beam sensing heads 90 degree cuttable 2m cable, set of 2
47	SE1, SE2, SEHeight	3	P3 America	SXM30-150-1R-LF	String Encoder 150 mm measuring range

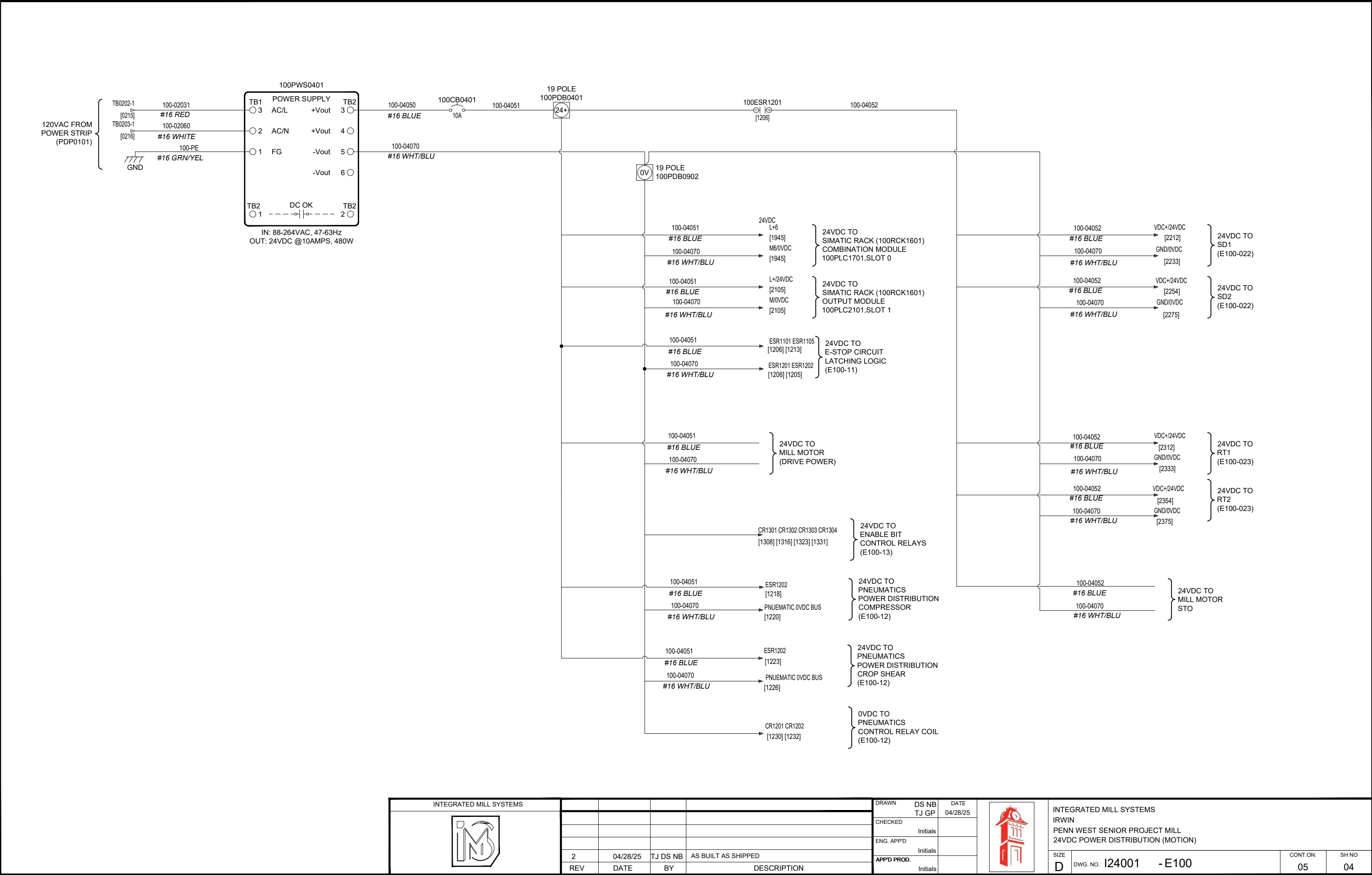
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						TJ	04/28/25		IRWIN		
						CHECKED			PENN WEST SENIOR PROJECT MILL		
						ENG. APP'D			BILL OF MATERIALS		
	2	04/28/25	TJ	AS BUILT AS SHIPPED		APP'D PROD.		SIZE			CONT.ON.
	REV	DATE	BY	DESCRIPTION				D	DWG. NO. I24001 - A100		END

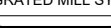


INTEGRATED MILL SYSTEMS						DS NB TJ GP	04/28/25		INTEGRATED MILL SYSTEMS					
						CHECKED			IRWIN					
							Initials		PENN WEST SENIOR PROJECT MILL					
						ENG. APP'D			120VAC POWER DISTRIBUTION (DIRTY)					
							Initials							
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED		APP'D PROD.			SIZE				CONT.ON.	SH NO
	REV	DATE	BY	DESCRIPTION					D	DWG. NO. I24001 -E100			02	01



INTEGRATED MILL SYSTEMS				DRAWN	DS NB	DATE	INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL 24VDC POWER DISTRIBUTION (DIRTY) SIZE D DWG. NO. I24001 -E100 CONT.ON. 03 SH NO 02			
IM				CHECKED	TJ GP	04/28/25				
				ENG. APP'D	Initials					
				APP'D PROD.	Initials					
2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED							
REV	DATE	BY	DESCRIPTION							



INTEGRATED MILL SYSTEMS					DRAWN	DS NB	DATE						INTEGRATED MILL SYSTEMS			
						DS NB							IRWIN			
						TJ GP	04/28/25						PENN WEST SENIOR PROJECT MILL			
													24VDC POWER DISTRIBUTION (MOTION)			
				CHECKED	Initials											
				ENG. APP'D	Initials											
				APP'D PROD.	Initials											
2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED						SIZE				CONT. ON.	SH NO		
REV	DATE	BY	DESCRIPTION						D	DWG. NO. I24001 - E100			05	04		

SPARE SHEET
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INTEGRATED MILL SYSTEMS								DS NB TJ GP	04/28/25		INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL SPARE SHEET			
					CHECKED	Initials								
					ENG. APP'D	Initials								
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED	APP'D PROD.	Initials								
REV	DATE	BY	DESCRIPTION								SIZE D	DWG. NO. I24001 -E100	CONT.ON. 06	SH NO 05

SPARE SHEET
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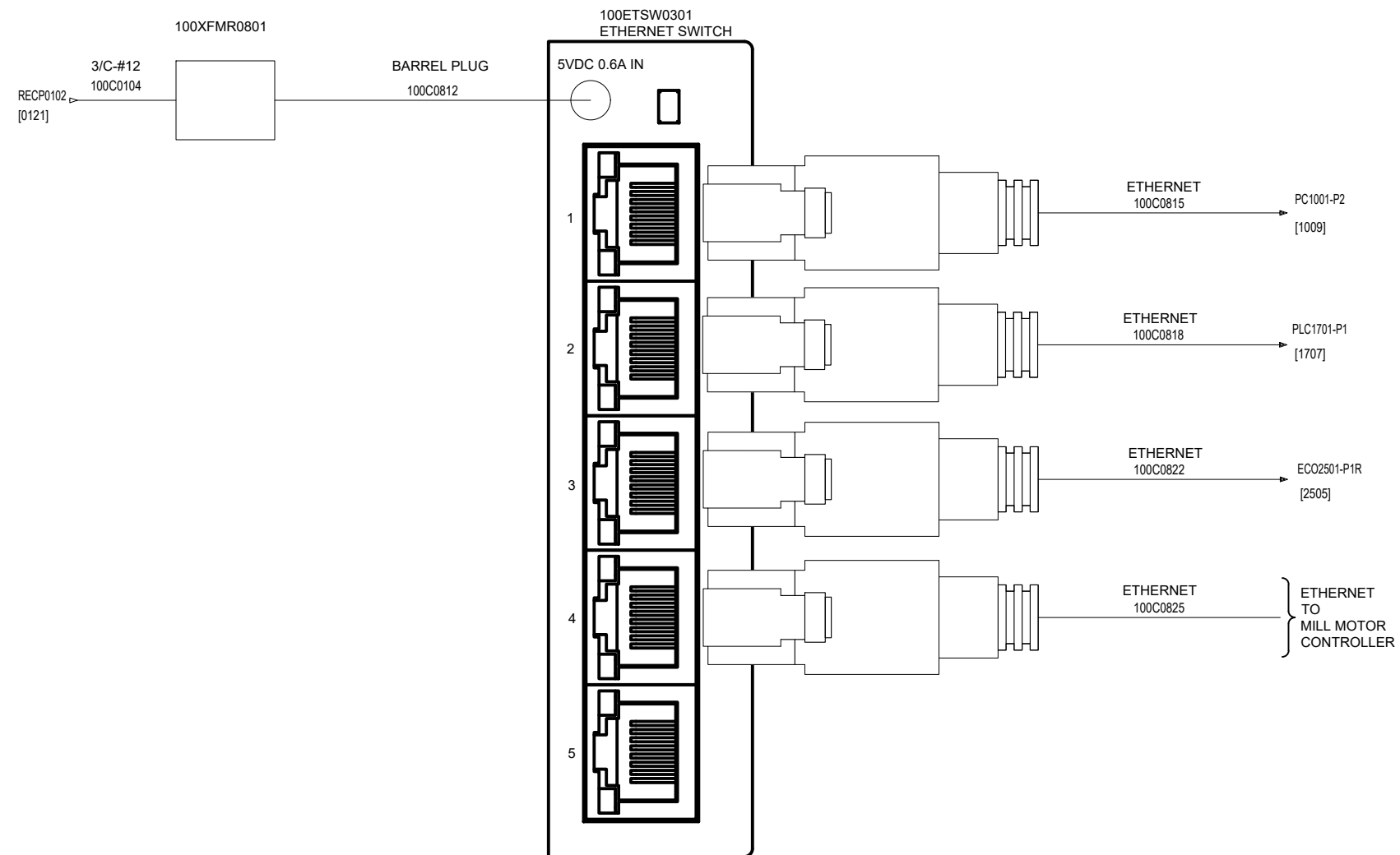
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				TJ GP						
				CHECKED	Initials					
				ENG. APP'D	Initials					
				APP'D PROD.	Initials		SIZE	DWG. NO. I24001 -E100	CONT.ON.	SH NO
				REV	DATE	BY	DESCRIPTION		07	06

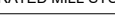
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SPARE SHEET
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INTEGRATED MILL SYSTEMS				DRAWN	DS NB	DATE		INTEGRATED MILL SYSTEMS		
				TJ GP	TJ GP	04/28/25		IRWIN		
				CHECKED		Initials		PENN WEST SENIOR PROJECT MILL		
				ENG. APP'D		Initials		SPARE SHEET		
				APP'D PROD.	Initials	SIZE		DWG. NO.	-E100	CONT.ON.
REV	DATE	BY	DESCRIPTION				D	08	07	
2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED							



INTEGRATED MILL SYSTEMS						DRAWN DS NB TJ GP		DATE 04/28/25				INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL ETHERNET SWITCH					
						CHECKED											
						Initials											
						ENG. APP'D											
						Initials											
		2				04/28/25		TJ DS NB		AS BUILT AS SHIPPED		APP'D PROD.					
		REV		DATE		BY		DESCRIPTION				Initials				SIZE D	
																DWG. NO. I24001 - E100	
																CONT.ON. 09	
																SH NO 08	

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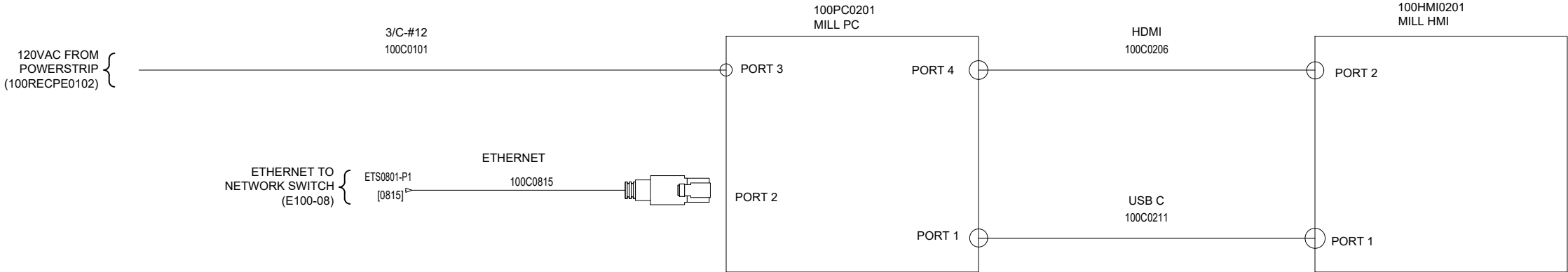
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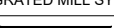
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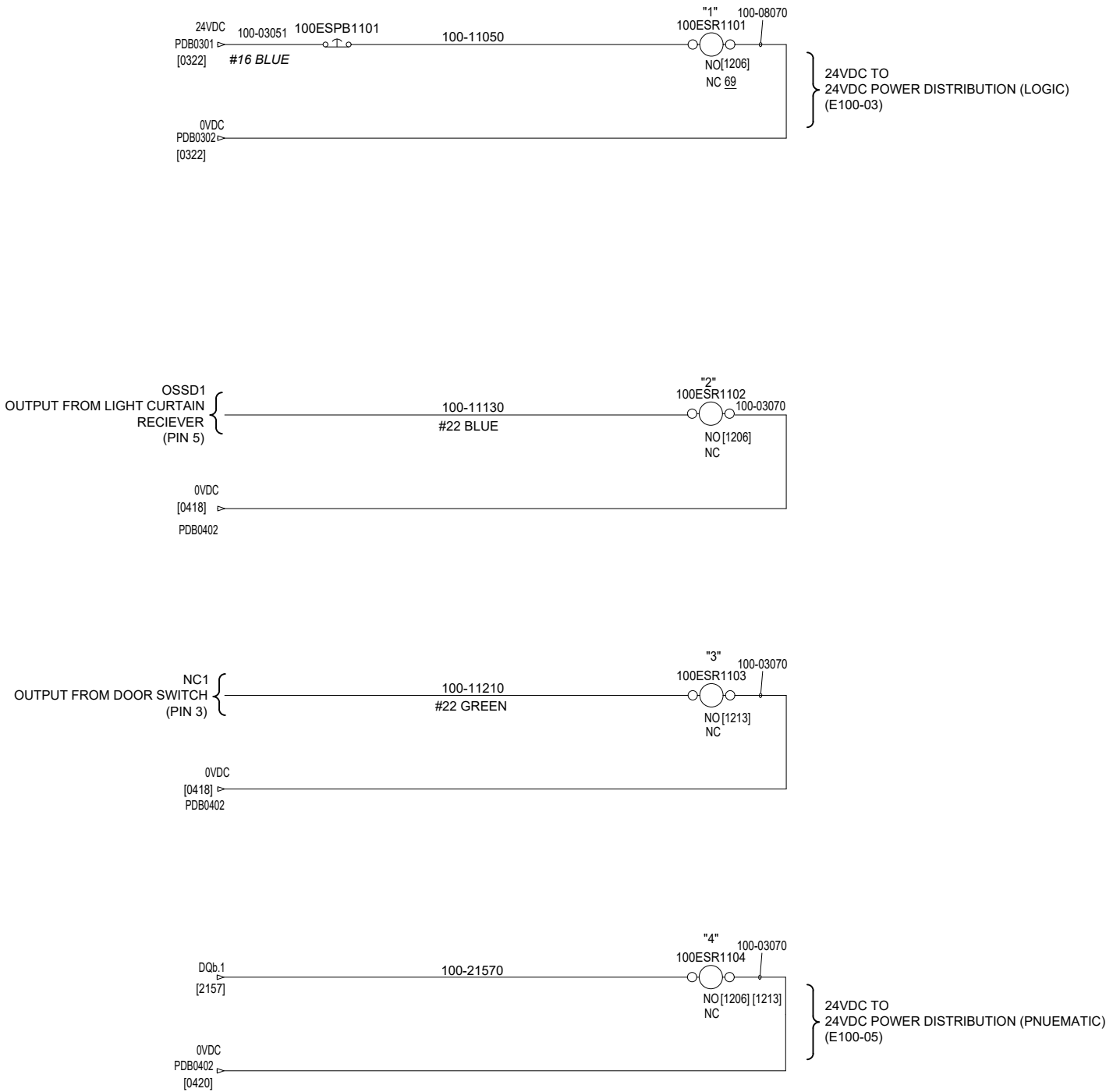
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SPARE SHEET
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INTEGRATED MILL SYSTEMS								DRAWN	DS NB	DATE		INTEGRATED MILL SYSTEMS				
						CHECKED	TJ GP	04/28/25	IRWIN							
							Initials		PENN WEST SENIOR PROJECT MILL							
						ENG. APP'D	Initials		SPARE SHEET							
						APP'D PROD.	Initials									
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED							SIZE	DWG. NO.	I24001	-E100	CONT.ON.	SH NO
	REV	DATE	BY	DESCRIPTION							D				10	09



INTEGRATED MILL SYSTEMS				DRAWN DS NB TJ GP				DATE 04/28/25			INTEGRATED MILL SYSTEMS						
				CHECKED				Initials			IRWIN						
				ENG. APP'D				Initials			PENN WEST SENIOR PROJECT MILL						
				APP'D PROD.				Initials			CABINET PC AND HMI POWER						
				REV				DATE			BY		DESCRIPTION		SIZE D		DWG. NO. I24001 -E100
2				04/28/25		TJ DS NB		AS BUILT AS SHIPPED									



INTEGRATED MILL SYSTEMS				DS NB TJ GP				04/28/25			INTEGRATED MILL SYSTEMS			
				CHECKED		Initials		IRWIN PENN WEST SENIOR PROJECT MILL E-STOP COIL AND E-STOP CONTACTS						
				ENG. APP'D		Initials								
				APP'D PROD.		Initials								
2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED											
REV	DATE	BY	DESCRIPTION											
SIZE		D		DWG. NO.		I24001 -E100		CONT.ON.		SH NO				
								12		11				

SPARE SHEET
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INTEGRATED MILL SYSTEMS				DS NB TJ GP		04/28/25	INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL SPARE SHEET			
				CHECKED	Initials					
				ENG. APP'D	Initials					
				APP'D PROD.	Initials					
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED			SIZE D DWG. NO. I24001 -E100			
REV	DATE	BY	DESCRIPTION						CONT.ON. 15	SH NO 14

[illegible]

CPU

INPUTS 1.5V
DIFFERENTIAL a

X-11
1 2M

X-11
2 2M

X-11
3 DI b.2+

X-11
4 DI b.2-

X-11
5 DI b.3+

X-11
6 DI b.3-

X-11
7 DI b.4+

X-11
8 DI b.4-

X-11
9 DI b.5+

X-11
10 DI b.5-

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RIGHT OF THIS SHEET

ANALOG INPUTS

X-12
11 DI b.1

X-12
12 DI b.2

X-12
13 DI b.3

CONTINUED TO THE
NEXT SHEET

INTEGRATED MILL SYSTEMS					DS NB TJ GP	04/28/25		INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL 100RCK1601, SLOT 0 - COMBINATION MODULE - DIFFERENTIAL INPUTS										
					CHECKED			<table><tr><td>SIZE</td><td colspan="2">DWG. NO. I24001 - E100</td><td>CONT. ON.</td><td>SH NO</td></tr><tr><td>D</td><td colspan="2"></td><td>19</td><td>18</td></tr></table>	SIZE	DWG. NO. I24001 - E100		CONT. ON.	SH NO	D			19	18
	SIZE	DWG. NO. I24001 - E100		CONT. ON.	SH NO													
	D			19	18													
						Initials												
					ENG. APP'D													
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED	Initials													
	REV	DATE	BY	DESCRIPTION	APP'D PROD.	Initials												

CONTINUED FROM THE
PREVIOUS SHEET

CPU

OUTPUTS 1.5V
DIFFERENTIAL

5M 1

5M 2

DQ a.0+ 3

DQ a.0- 4

DQ a.1+ 5

DQ a.1- 6

DQ a.2+ 7

DQ a.2- 8

DQ a.3+ 9

DQ a.3- 10

CONTINUED TO THE
RIGHT OF THIS SHEET

CONTINUED FROM THE
LEFT OF THIS SHEET

OUTPUTS DQ b

6L+ 11

6M 12

DQ a.4 11

DQ a.5 12

DQ a.6 11

DQ a.7 12

DQ b.0 11

DQ b.1 12

CONTINUED TO THE
NEXT SHEET

[0411]
PDB0401
24VDC

100-19480
#16 BLUE

[0412]
PDB0402
0VDC

100-04070
#16 WHT/BLU

STD2201-PUL+
[2225]

STD2202-PUL+
[2267]

STD2301-PUL+
[2325]

STD2302-PUL+
[2367]

STD2201-DIR+
[2224]

STD2202-DIR+
[2264]

INTEGRATED MILL SYSTEMS



2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED
REV	DATE	BY	DESCRIPTION

DRAWN	DS NB	DATE
CHECKED	TJ GP	04/28/25
ENG. APP'D	Initials	
APP'D PROD.	Initials	

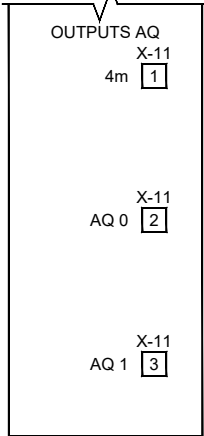


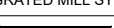
INTEGRATED MILL SYSTEMS
IRWIN
PENN WEST SENIOR PROJECT MILL
100RCK1601, SLOT 0 - COMBINATION MODULE - DIFFERENTIAL/DIGITAL OUTPUTS

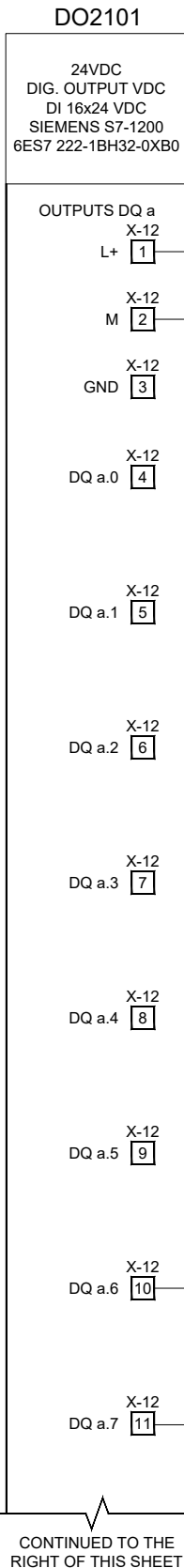
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D	I24001		20	19

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PREVIOUS SHEET

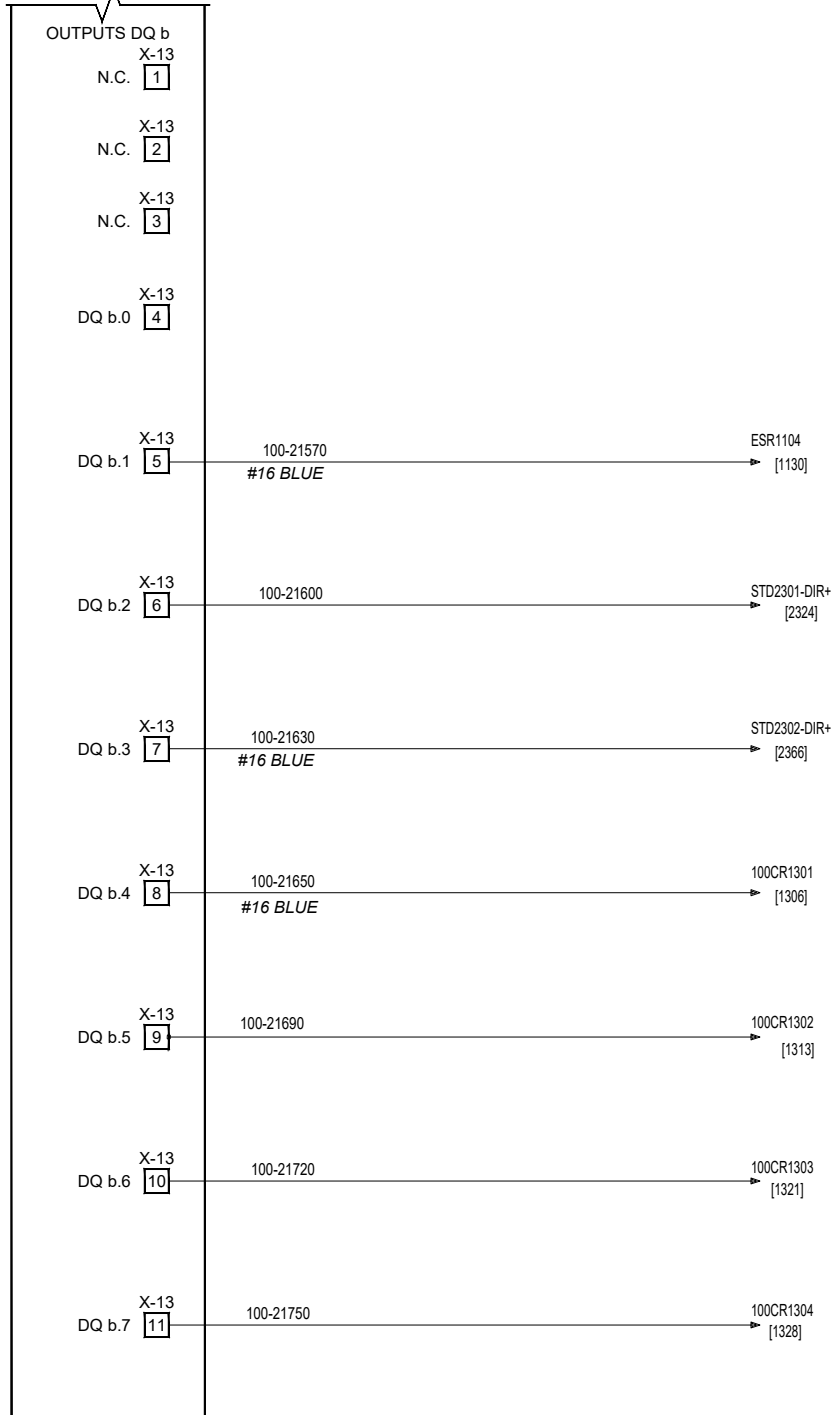
CPU



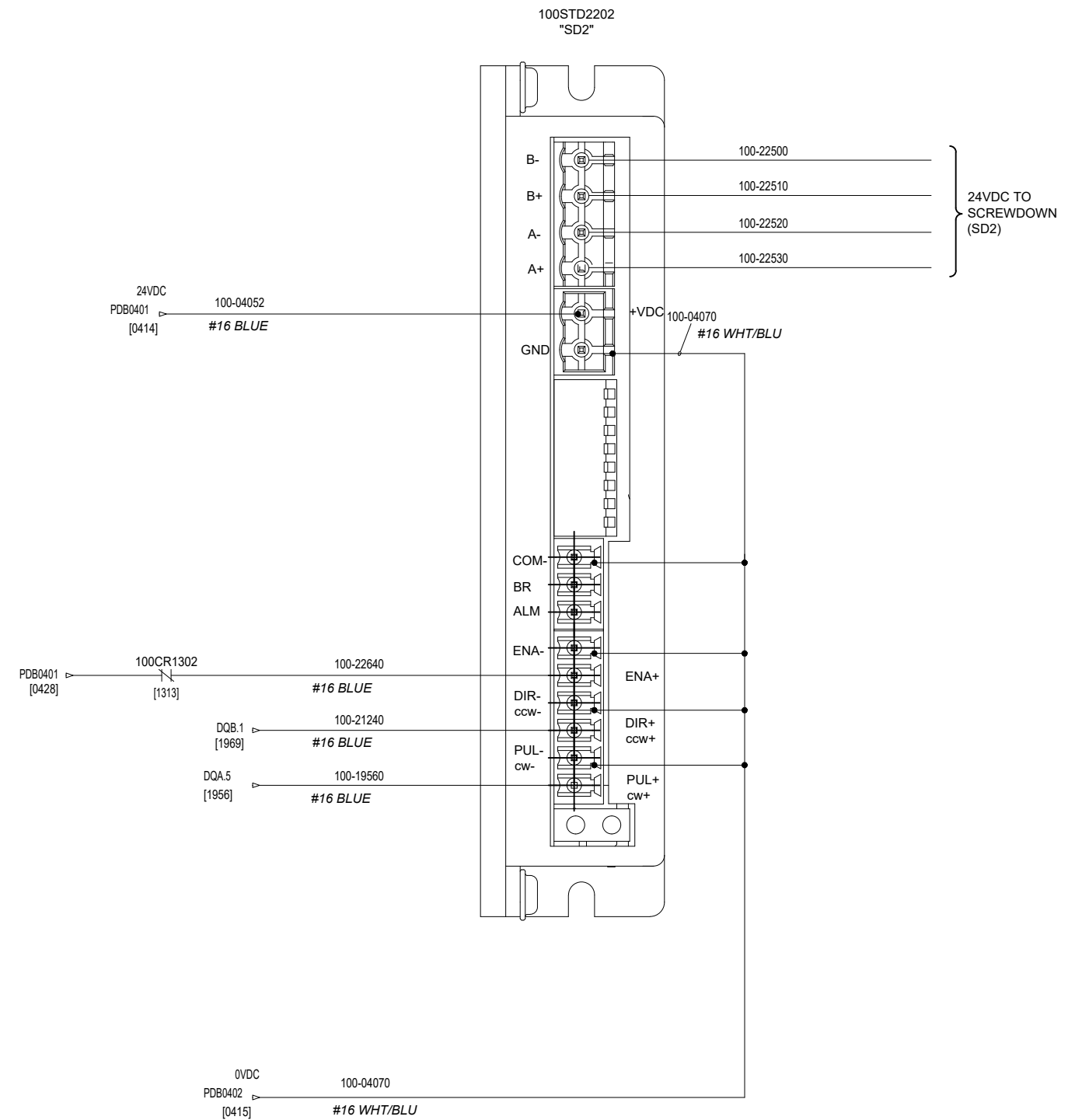
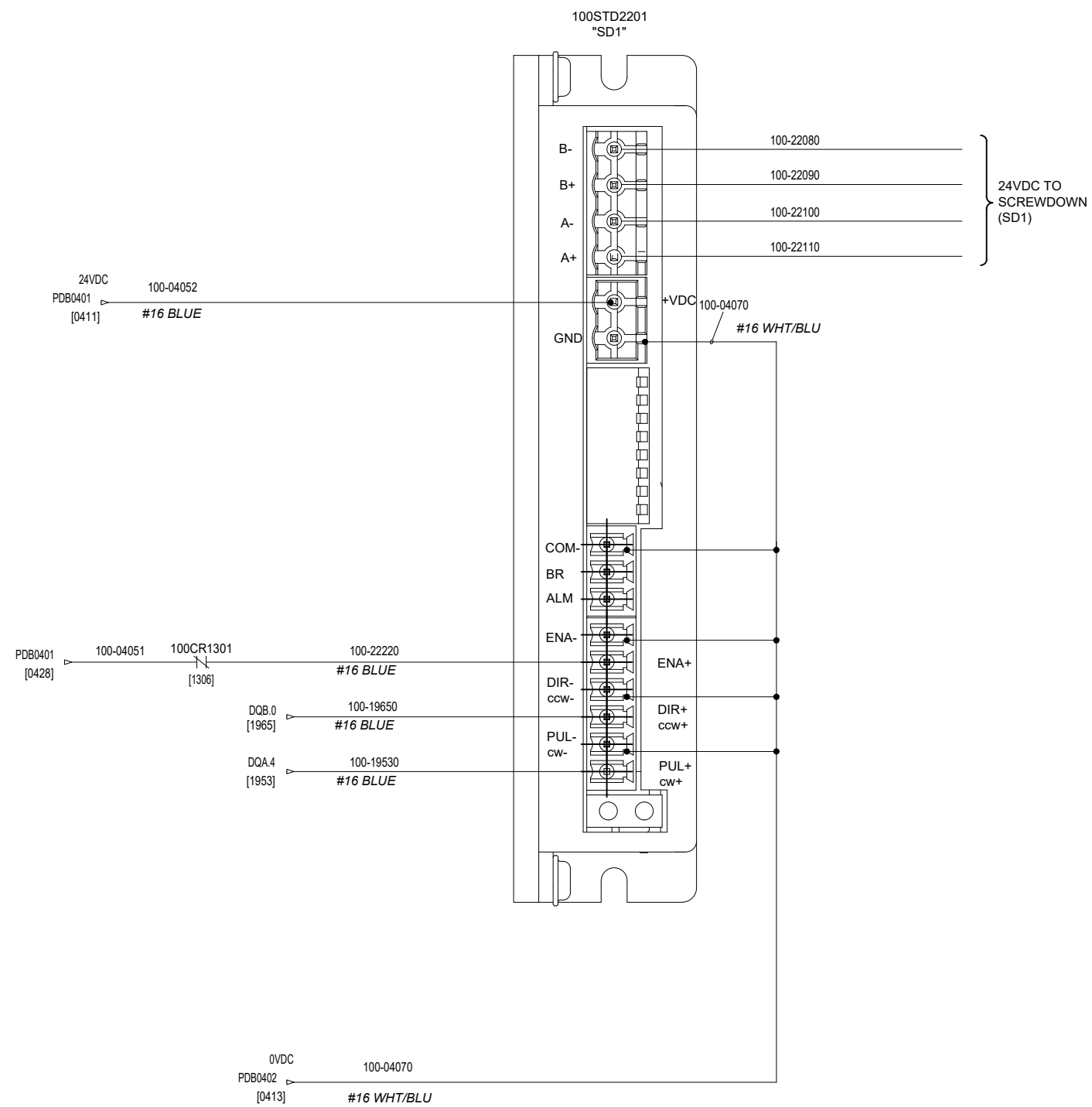
INTEGRATED MILL SYSTEMS				DRAWN				DS NB		DATE						INTEGRATED MILL SYSTEMS									
				DS NB				TJ GP		04/28/25						IRWIN									
				CHECKED				Initials								PENN WEST SENIOR PROJECT MILL									
				ENG. APP'D				Initials								100RCK1601, SLOT 0 - COMBINATION MODULE - ANALOG OUTPUTS									
2				04/28/25		TJ DS NB		AS BUILT AS SHIPPED		APP'D PROD.		Initials				SIZE		DWG. NO.		CONT.ON.		SH NO			
REV				DATE		BY		DESCRIPTION				Initials				D		I24001		-E100		21		20	

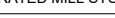


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INTEGRATED MILL SYSTEMS								DRAWN	DS NB	DATE		INTEGRATED MILL SYSTEMS						
							CHECKED	TJ GP	04/28/25			IRWIN						
								Initials				PENN WEST SENIOR PROJECT MILL						
							ENG. APP'D					100RCK1601, SLOT 1 DIGITAL OUTPUT MODULE						
								Initials										
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED				APP'D PROD.				SIZE	DWG. NO.	I24001	-E100	CONT.ON.	SH NO	
	REV	DATE	BY	DESCRIPTION								D					22	21



INTEGRATED MILL SYSTEMS						DRAWN DS NB TJ GP		DATE 04/28/25				INTEGRATED MILL SYSTEMS IRWIN PENN WEST SENIOR PROJECT MILL STEPPER MOTOR CONTROLLERS (SD1, SD2)								
						CHECKED														
						Initials														
						ENG. APP'D		Initials												
		2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED				APP'D PROD.											
		REV	DATE	BY	DESCRIPTION				Initials				SIZE D		DWG. NO. I24001 - E100		CONT.ON. 23		SH NO 22	

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SPARE SHEET
(INTENTIONALLY LEFT BLANK)

INTEGRATED MILL SYSTEMS								DRAWN	DS NB	DATE		INTEGRATED MILL SYSTEMS				
						CHECKED	TJ GP	04/28/25	IRWIN							
							Initials		PENN WEST SENIOR PROJECT MILL							
							ENG. APP'D	Initials		SPARE SHEET						
							APP'D PROD.	Initials								
	2	04/28/25	TJ DS NB	AS BUILT AS SHIPPED							SIZE	DWG. NO.	I24001	-E100	CONT.ON.	SH NO
	REV	DATE	BY	DESCRIPTION							D				25	24

