

CHEVRON SEATTLE CONTROL DISTRIBUTION CONDUIT & CONDUCTOR SCHEDULE - 120/208VAC POWER CONDUITS/CONDUCTORS -										
COND. #	INSTALLED BY	PURPOSE	HAZLOC CLASSIFICATION	SIZE	CONDUIT TYPE*	CONDUCTOR SIZE & TYPE	PURPOSE	ORIGINATION	TERMINATION	COMMENTS
P-1	SITE CONTRACTOR	208VAC POWER	UNCLASSIFIED	4"	PVC/RGS	(4) 600 KCM RHW-USE	MAIN UTILITY POWER FEED	UTILITY TRANSFORMER	MDP	FIELD INSTALLED
P-2	SITE CONTRACTOR	208VAC POWER	UNCLASSIFIED	4"	PVC/RGS	(4) 600 KCMIL XHHW + (1) 4/0 AWG GND	MAIN UTILITY POWER FEED	MDP	MCE-1	FIELD INSTALLED
P-3	FACTORY	208VAC POWER	UNCLASSIFIED	2"	RGS	(4) 2/0 THWN + (1) #12 AWG GND	CATOX POWER FEED	MCE-1	CATOX CONTROLS	
P-4	FACTORY	208VAC POWER	CLASS 1, DIVISION 2, GP C/D	2"	RGS	(4) 2/0 THWN + (1) #12 AWG GND	CATOX HEATER POWER FEED	CATOX CONTROLS	CATOX HEATERS	
P-5	FACTORY	208VAC POWER	CLASS 1, DIVISION 2, GP C/D	1 1/4"	RGS/LT FLEX	(3) #3 AWG THWN + (1) #3 AWG GND	BLOWER B-301 MOTOR POWER	MCE-1	B-301	CONNECT VIA DISCONNECT, AS SHOWN
P-6	FACTORY	208VAC POWER	CLASS 1, DIVISION 2, GP C/D	1 1/4"	RGS/LT FLEX	(3) #3 AWG THWN + (1) #3 AWG GND	BLOWER B-302 MOTOR POWER	MCE-1	B-302	CONNECT VIA DISCONNECT, AS SHOWN
P-7	FACTORY	120VAC POWER	UNCLASSIFIED	3/4"	RGS	(2) #12 AWG THWN + #12 AWG GND	PANEL RCP POWER	MCE-1	PANEL RCP	FIELD INSTALLED
P-8	SITE CONTRACTOR	208VAC POWER	UNCLASSIFIED	2"	PVC/RGS	(4) #1 AWG THWN + #6 AWG GND	PANEL MCP POWER	MCE-1	PANEL MCP	FIELD INSTALLED
P-9	FACTORY	208VAC POWER	UNCLASSIFIED	1"	EMT/LT FLEX	(3) #8 AWG THWN + #8 AWG GND	COMPRESSOR A-401 POWER FEED	MCP	A-401	FIELD INSTALLED
P-10	FACTORY	208VAC POWER	CLASS 1, DIVISION 2, GP C/D	2"	RGS/LT FLEX	(3) #10 AWG THWN + #10 AWG GND	BATCH PUMP P-201 POWER FEED	MCP	P-201	COMPLETED AS PART OF SYSTEM PACKAGE
P-11	FACTORY	208VAC POWER	CLASS 1, DIVISION 2, GP C/D	2"	RGS/LT FLEX	(3) #10 AWG THWN + #10 AWG GND	BACKWASH PUMP P-202 POWER FEED	MCP	P-202	COMPLETED AS PART OF SYSTEM PACKAGE
P-12	FACTORY	208VAC POWER	CLASS 1, DIVISION 2, GP C/D	1-1/2"	RGS/LT FLEX	(3) #12 AWG THWN + #12 AWG GND	TRANSFER PUMP P-301 POWER FEED	MCP	P-301	COMPLETED AS PART OF SYSTEM PACKAGE

CHEVRON SEATTLE CONTROL DISTRIBUTION CONDUIT & CONDUCTOR SCHEDULE - 120VAC CONTROL CONDUITS/CONDUCTORS										
COND. #	INSTALLED BY	PURPOSE	HAZLOC CLASSIFICATION	SIZE	CONDUIT TYPE*	CONDUCTOR SIZE & TYPE	PURPOSE	ORIGINATION	TERMINATION	COMMENTS
C-1	FACTORY	120VAC CONTROL	CLASS 1, DIVISION 2, GP C/D	1"	RGS/L.T. FLEX	(4) BELDEN 8760 TSP + (17) #14 AWG THWN	CONTROL JUNCTION BOX JB-04 HOMERUN	RCP	JUNCTION BOX JB-4	
C-2	FACTORY	24VDC/120VAC CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) BELDEN 8760 TSP + (7) #14 AWG THWN	MOTORIZED VALVE MOV-301A CONTROL	JUNCTION BOX JB-4	MOV-301A	UTILIZE FLEXIBLE CONNECTION TO DEVICE
C-3	FACTORY	24VDC/120VAC CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) BELDEN 8760 TSP + (7) #14 AWG THWN	MOTORIZED VALVE MOV-301B CONTROL	JUNCTION BOX JB-4	MOV-301B	UTILIZE FLEXIBLE CONNECTION TO DEVICE
C-4	FACTORY	120VAC CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(3) #14 AWG THWN	SOLENOID VALVE SV-301 CONTROL	JUNCTION BOX JB-4	SV-301	UTILIZE FLEXIBLE CONNECTION TO DEVICE
C-5	FACTORY	24VDC/120VAC CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(7) #14 AWG THWN	MOTORIZED VALVE M-201 CONTROL	MCP	MOV-201	UTILIZE FLEXIBLE CONNECTION TO DEVICE
C-6	FACTORY	24VDC/120VAC CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(7) #14 AWG THWN	MOTORIZED VALVE M-202 CONTROL	MCP	MOV-202	UTILIZE FLEXIBLE CONNECTION TO DEVICE
C-7	FACTORY	120VAC CONTROL	UNCLASSIFIED	3/4"	RGS/L.T. FLEX	(3) #14 AWG THWN	SOLENOID VALVE SV-101 CONTROL	MCP	SV-101	UTILIZE FLEXIBLE CONNECTION TO DEVICE

CHEVRON SEATTLE CONTROL DISTRIBUTION CONDUIT & CONDUCTOR SCHEDULE - INTRINSICALLY SAFE CONDUITS/CONDUCTORS										
COND. #	INSTALLED BY	PURPOSE	HAZLOC CLASSIFICATION	SIZE	CONDUIT TYPE*	CONDUCTOR SIZE & TYPE	PURPOSE	ORIGINATION	TERMINATION	COMMENTS
IS-1	SITE CONTRACTOR	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 1, GP C/D	2"	PVC	(16) #14 THWN	WELL VAULT SWITCH HOMERUN	PANEL MCP	VARIOUS WELL VAULTS	FIELD INSTALLED
IS-2	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(1) BELDEN 8760 TSP + (6) #14 AWG THWN	I.S. JUNCTION BOX JB-01 HOMERUN	PANEL RCP	JUNCTION BOX JB-1	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-3	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) #14 AWG THWN	PRESSURE SWITCH PSH-301 FEED	JUNCTION BOX JB-1	PSH-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-4	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) #14 AWG THWN	PRESSURE SWITCH PSH-302 FEED	JUNCTION BOX JB-1	PSH-302	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-5	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) #14 AWG THWN	VACUUM SWITCH VSH-301 FEED	JUNCTION BOX JB-1	VSH-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-6	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(1) BELDEN 8760 TSP	FLOWMETER FIT-301 FEED	JUNCTION BOX JB-1	FIT-301 INST.	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-7	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(2) BELDEN 8760 TSP + (2) #14 AWG THWN	I.S. JUNCTION BOX JB-02 HOMERUN	PANEL RCP	JUNCTION BOX JB-2	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-8	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	LEL METER AIT-300 FEED	JUNCTION BOX JB-2	AIT-300 INST.	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-9	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	TEMP TRANSMITTER TT-300 FEED	JUNCTION BOX JB-2	TT-300 INST.	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-10	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(2) #14 AWG THWN	EMERGENCY STOP PUSHBUTTON	JUNCTION BOX JB-2	E-STOP	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-11	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(5) BELDEN 8760 TSP	I.S. JUNCTION BOX JB-03 HOMERUN	PANEL RCP	JUNCTION BOX JB-3	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-12	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	VACUUM TRANSMITTER VT-301 FEED	JUNCTION BOX JB-3	VT-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-13	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(1) BELDEN 8760 TSP	FLOW TRANSMITTER FIT-302 FEED	JUNCTION BOX JB-3	FIT-302	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-14	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	PRESS. TRANSMITTER PT-301 FEED	JUNCTION BOX JB-3	PT-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-15	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	TEMP TRANSMITTER TT-302 FEED	JUNCTION BOX JB-3	TT-302	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-16	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	TEMP TRANSMITTER TT-301 FEED	JUNCTION BOX JB-3	TT-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-17	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(1) BELDEN 8760 TSP + (2) #14 AWG THWN	I.S.INSTRUMENT HOMERUN	PANEL MCP	CONDULET	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-18	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-203 FEED	CONDULET	FQI-203	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-19	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) #14 AWG THWN	HIGH LEVEL SWITCH LSH-200 FEED	CONDULET	LSH-200	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-20	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(4) BELDEN 8760 TSP	I.S. JUNCTION BOX JB-05 HOMERUN	PANEL MCP	JUNCTION BOX JB-5	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-21	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	PRESS. TRANSMITTER PT-203 FEED	JUNCTION BOX JB-5	PT-203	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-22	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	FLOW TRANSMITTER FIT-204 FEED	JUNCTION BOX JB-5	FIT-204	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-23	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	TEMP TRANSMITTER TT-200B FEED	JUNCTION BOX JB-5	TT-200B	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-24	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	PRESS. TRANSMITTER PT-202 FEED	JUNCTION BOX JB-5	PT-202	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-25	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	1 1/2"	RGS	(10) BELDEN 8760 TSP + (8) #14 AWG THWN	I.S. JUNCTION BOX JB-06 HOMERUN	PANEL MCP	JUNCTION BOX JB-6	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-26	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-401 PULSE INPUT	JUNCTION BOX JB-6	FQI-401	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-27	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-402 PULSE INPUT	JUNCTION BOX JB-6	FQI-402	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-28	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-403 PULSE INPUT	JUNCTION BOX JB-6	FQI-403	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-29	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-404 PULSE INPUT	JUNCTION BOX JB-6	FQI-404	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-30	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-405 PULSE INPUT	JUNCTION BOX JB-6	FQI-405	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-31	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-406 PULSE INPUT	JUNCTION BOX JB-6	FQI-406	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-32	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-407 PULSE INPUT	JUNCTION BOX JB-6	FQI-407	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-33	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(1) BELDEN 8760 TSP	FLOW TOTALIZER FQI-408 PULSE INPUT	JUNCTION BOX JB-6	FQI-408	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-34	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	LEL METER AIT-100 FEED	JUNCTION BOX JB-6	AIT-100	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-35	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(2) #14 AWG THWN	LEVEL SWITCH LSH-100 FEED	JUNCTION BOX JB-6	LSH-100	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-36	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(2) #14 AWG THWN	EMERGENCY STOP PUSHBUTTON	JUNCTION BOX JB-6	E-STOP	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-37	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS	(6) #14 AWG THWN	I.S. JUNCTION BOX JB-07 HOMERUN	JUNCTION BOX JB-6	JUNCTION BOX JB-7	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-38	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(2) #14 AWG THWN	LEVEL SWITCH LSL-301	JUNCTION BOX JB-7	LSL-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-39	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(2) #14 AWG THWN	LEVEL SWITCH LSH-301	JUNCTION BOX JB-7	LSH-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-40	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	N/A	FLEXIBLE CABLE	(2) #14 AWG THWN	LEVEL SWITCH LSHH-301	JUNCTION BOX JB-7	LSHH-301	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-41	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	1 1/2"	RGS	(X) BELDEN 8760 TSP + (X) #14 AWG THWN	I.S. JUNCTION BOX JB-08 HOMERUN	PANEL MCP	JUNCTION BOX JB-8	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-42	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	TEMP TRANSMITTER TT-100 FEED	JUNCTION BOX JB-8	TT-100	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-43	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	PRESS. TRANSMITTER PT-201 FEED	JUNCTION BOX JB-8	PT-201	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-44	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(1) BELDEN 8760 TSP	FLOW TRANSMITTER FIT-201 FEED	JUNCTION BOX JB-8	FIT-201	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-45	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	LEVEL INDICATING TRANSMITTER LIT-201	JUNCTION BOX JB-8	LIT-201	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-46	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(2) #14 AWG THWN	LEVEL SWITCH LOW LSSL-201B	JUNCTION BOX JB-8	LSSL-201B	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-47	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(2) #14 AWG THWN	LEVEL SWITCH HIGH LSHH-201A	JUNCTION BOX JB-8	LSHH-201A	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.
IS-48	FACTORY	INTRINSICALLY SAFE CONTROL	CLASS 1, DIVISION 2, GP C/D	3/4"	RGS/FLEX CABLE	(1) BELDEN 8760 TSP	FLOW TRANSMITTER FIT-202	PANEL MCP	FIT-202	FOLLOW ALL REQUIREMENTS OF ART. 504 OF NEC.

CHEVRON SEATTLE CONTROL DISTRIBUTION CONDUIT & CONDUCTOR SCHEDULE - 24VDC/NETWORK INSTRUMENT CONDUITS/CONDUCTORS										
COND. #	INSTALLED BY	PURPOSE	HAZLOC CLASSIFICATION	SIZE	CONDUIT TYPE*	CONDUCTOR SIZE & TYPE	PURPOSE	ORIGINATION	TERMINATION	COMMENTS
I-1	FACTORY	ETHERNET NETWORK	UNCLASSIFIED	3/4"	RGS	(2) ETHERNET CAT6	RCP-MCE-1 NETWORK CONNECTION	PANEL RCP	PANEL MCE-1	
I-2	SITE CONTRACTOR	ETHERNET NETWORK	UNCLASSIFIED	3/4"	RGS	(1) ETHERNET CAT6	RCP-MCP NETWORK CONNECTION	PANEL RCP	PANEL MCP	FIELD INSTALLED
I-3	FACTORY	ETHERNET NETWORK	UNCLASSIFIED	3/4"	RGS	(1) ETHERNET CAT6	RCP-CATOX NETWORK CONNECTION	PANEL RCP	CATOX CONTROLS	
I-4	FACTORY	24VDC INSTRUMENT	UNCLASSIFIED	3/4"	RGS	(2) BELDEN 8760 TSP	INSTRUMENT JUNCTION BOX JB-09 HOMERUN	PANEL MCP	JUNCTION BOX JB-9	
I-5	FACTORY	24VDC INSTRUMENT	UNCLASSIFIED	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	TEMP TRANSMITTER TT-200A FEED	JUNCTION BOX JB-9	TT-200A	
I-6	FACTORY	24VDC INSTRUMENT	UNCLASSIFIED	3/4"	RGS/L.T. FLEX	(1) BELDEN 8760 TSP	PRESSURE TRANSMITTER PT-101 FEED	JUNCTION BOX JB-9	PT-101	

*All conduit fittings to be listed for wet-location with sealing gaskets on all penetrations entering/exiting junction boxes & enclosures. Liquid-tight flexible conduit shall be used where vibration is present, flexibility is required, and at all motor conduit boxes. Terminations of flexible conduit shall be made using liquid-tight connectors with integral insulated bushings and positive ground connections. The maximum length of flexible conduit shall be 24" for instruments & equipment, 36" for motors, and 48" for lighting.

CONDUIT AND CONDUCTOR SCHEDULE

SCALE: NONE

NOT FOR
CONSTRUCTION

REV.	ISSUED DATE	DESCRIPTION	BY	CHK'D
3	12/17/2020	RESUBMITTED BASED ON COMMENTS	CJM	BDC
2	08/13/2020	RESUBMITTED BASED ON COMMENTS	CJM	BDC
1	08/12/2020	RESUBMITTED BASED ON COMMENTS	CJM	BDC
0	05/27/2020	ISSUED FOR CUSTOMER REVIEW	CJM	BDC

SEAL

Prepared for:

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DUAL PHASE EXTRACTION SYSTEM
CHEVRON SEATTLE
SEATTLE, WA

SHEET TITLE

PROCESS EQUIPMENT
ELECTRICAL CONDUIT &
CONDUCTOR SCHEDULE

APPROVED BY
BDC

DESIGNED BY
CJM

PROJECT NUMBER
Q14972

CHECKED BY
JK

DRAWN BY
CJM

DRAWING NUMBER
E-07
SHEET 7 OF 7



CHEVRON SEATTLE

DUAL PHASE EXTRACTION SYSTEM

MAIN CONTROL PANEL SHOP DRAWINGS

FORMER CHEVRON SERVICE STATION #95439
3876 BRIDGE WAY NORTH
SEATTLE, WASHINGTON 98103

PREPARED BY:

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PREPARED FOR:

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www.arcadis.com

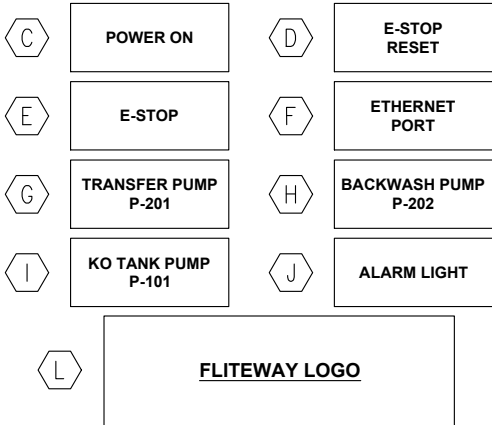
© FLITEWAY TECHNOLOGIES, INC.						SEAL	Prepared for: ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com	Prepared by: Fliteway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.fliteway.com	DUAL PHASE EXTRACTION SYSTEM MAIN CONTROL PANEL (MCP) SHOP DRAWINGS CHEVRON SEATTLE	SHEET TITLE CONTROL PANEL SHOP DRAWINGS TITLE SHEET	APPROVED BY JK	CHECKED BY JK
											DESIGNED BY BDC	DRAWN BY BDC
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-01
	1	5/27/2020	DRAFT-ISSUED FOR REVIEW	BMA	JK						SHEET 1 OF 11	
	0	4/15/2020	DRAFT-ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D							

MAIN PANEL LABEL

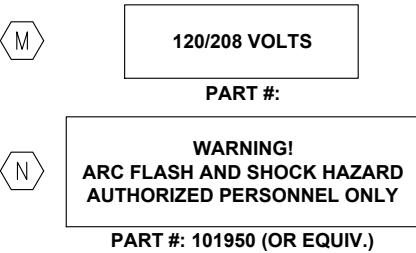


COLOR: WHITE W/BLACK LETTERING,
SIZE: 2" TALL X 5" WIDE, 1/4" TALL LETTERS

OPERATOR/INDICATOR LABELS

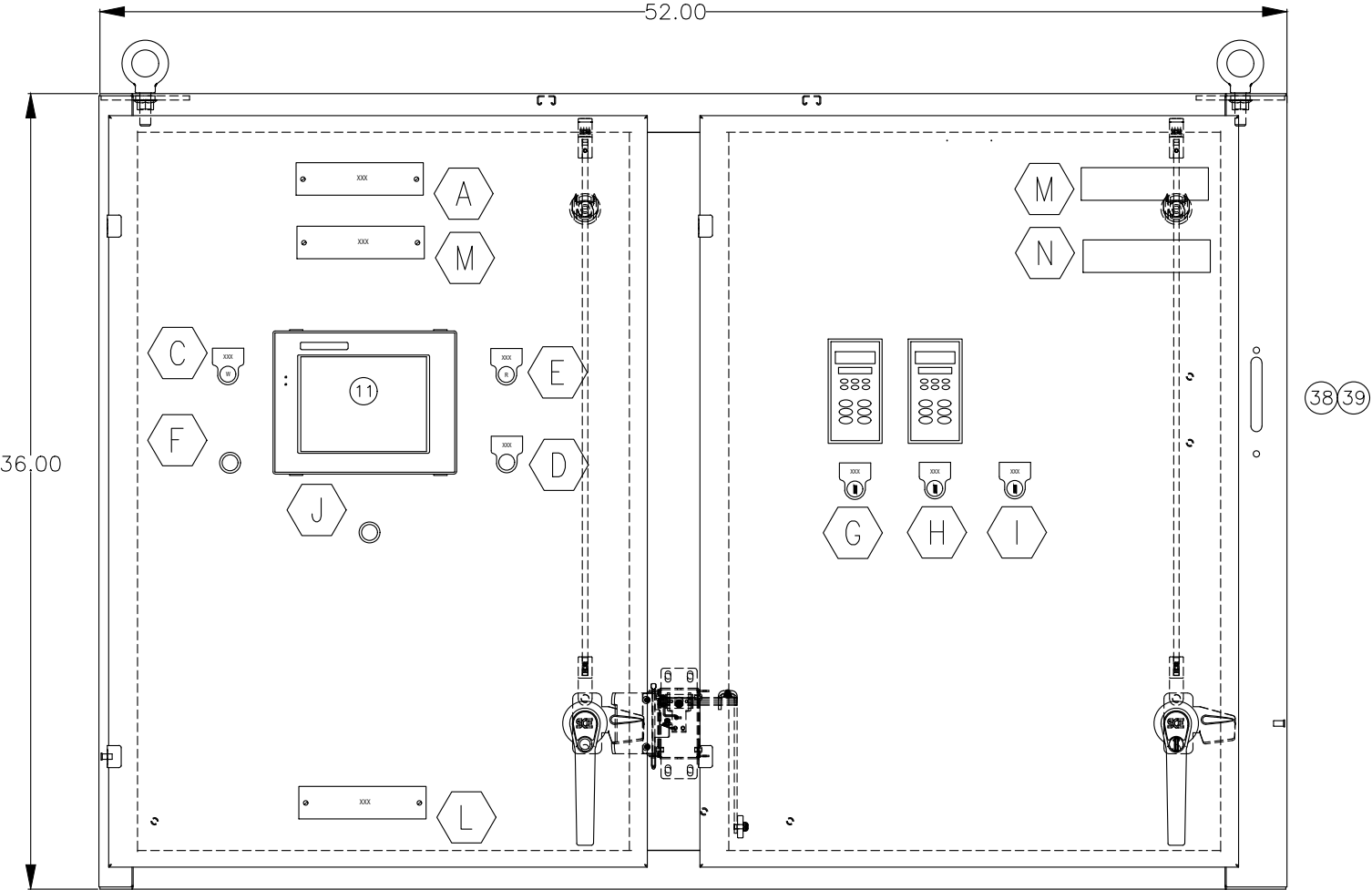


WARNING LABELS
BRADY CORPORATION OR EQUIVALENT



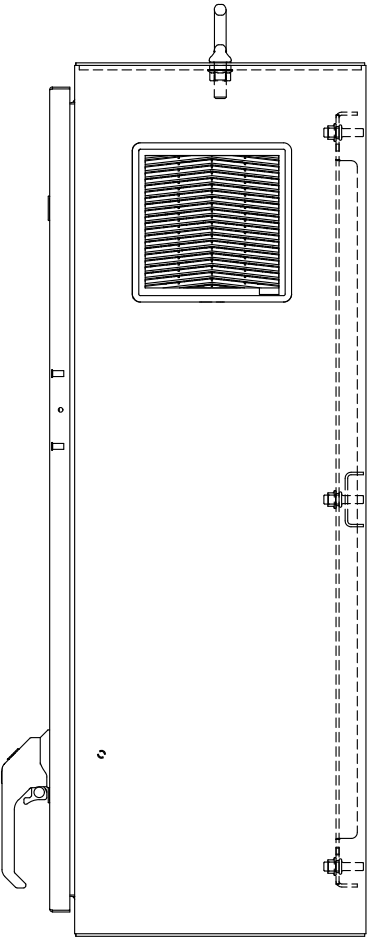
LABEL SCHEDULE

SCALE: N.T.S.



FRONT VIEW - ASSEMBLED

SCALE: AS SHOWN



SIDE VIEW

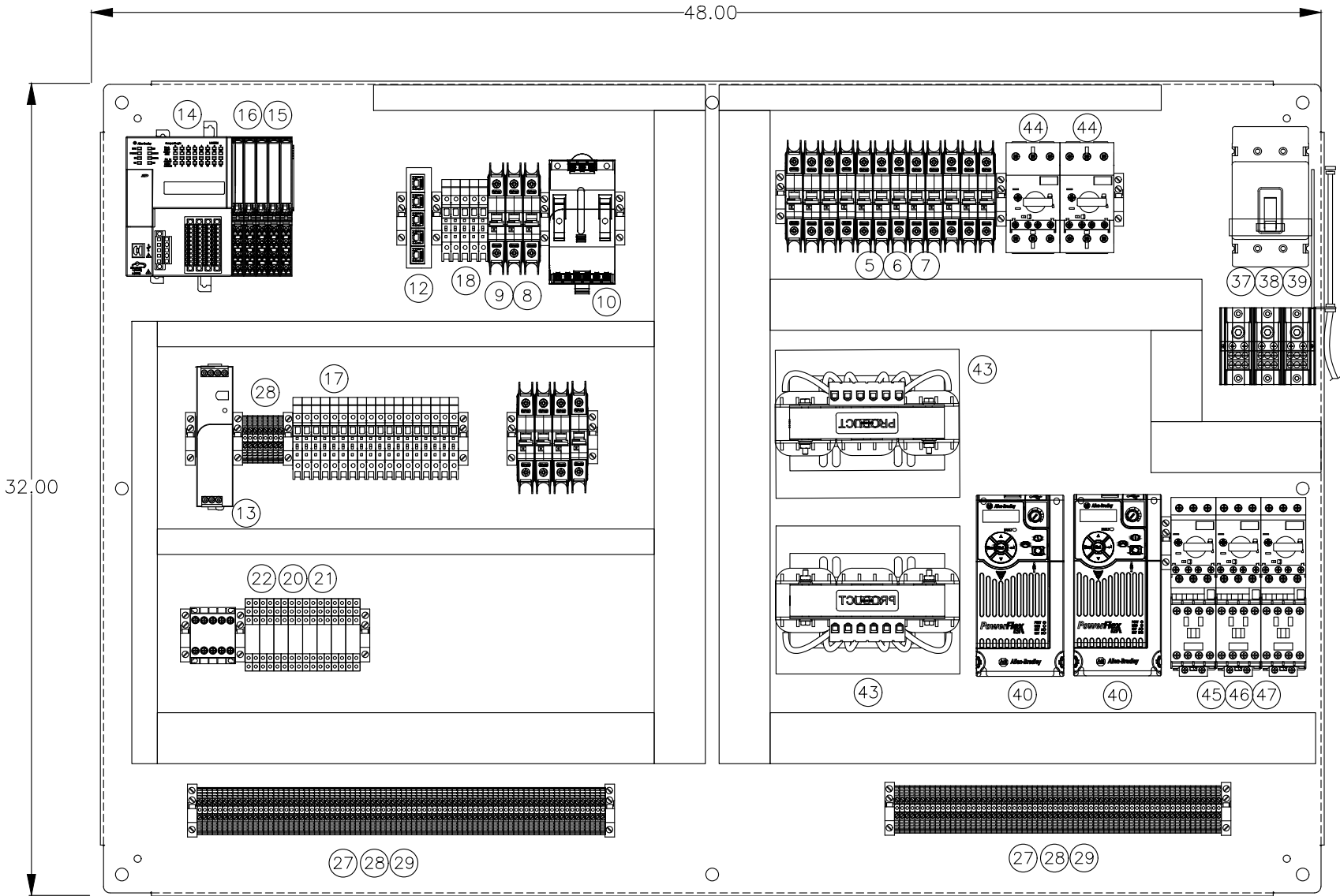
SCALE: AS SHOWN

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												CONTROL PANEL EXTERNAL LAYOUT		JK		JK	
							ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com		Fliteway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.fliteway.com			DESIGNED BY BDC		DRAWN BY BDC			
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK							PROJECT NUMBER Q14972		DRAWING NUMBER I-02			
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	REV.	ISSUED DATE	DESCRIPTION		BY	CK'D								SHEET 2 OF 11			

Item	Manufacturer	Part Number	Description	Qty
1	Saginaw	SCE-X2D5412	Double-Door Disconnect Enclosure, NEMA 4XSS, 36"H x 52"W x 12"D	1
2	Saginaw	SCE-36P52	Subpanel for Above	1
3	Hoffman	LEDA1M35	Panel Light, 120VAC, On/Off	1
4	Hoffman	PDFSWD	Door Switch	1
5	Allen-Bradley	1489-M3D500	Miniature Circuit Breaker, AC/DC, 3 Pole, D Curve, 50A	1
6	Allen-Bradley	1489-M1C200	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 20A	6
7	Allen-Bradley	1489-M1C100	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 10A	1
8	Allen-Bradley	1489-M1C070	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 7A	2
9	Allen-Bradley	1489-M1C050	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 5A	1
10	Allen-Bradley	4983-DC120-20	120VAC, 20A Surge Protector	1
11	C-More	EA9-T10WCL	C-More EA9 Series 10" Touch Screen HMI	1
12	Allen-Bradley	1783-US8T	8-port unmanaged switch	1
13	Allen-Bradley	1606-XLE240E	Power Supply, 24-28V DC, 240 W, 120/240V AC Input Voltage	1
14	Allen-Bradley	1769-L18ER-BB1B	CompactLogix 5370 L1 Controller, 512KB Memory, 8 I/O Expansion via 1734 POINT I/O, 8 Ethernet IP Nodes	1
15	Allen-Bradley	1734-IE8C	24V Dc 8 Channel High Density Analog Current Input Module	2
16	Allen-Bradley	1734-IB8	24V Dc 8 Channel 24vdc Discrete Input Module	3
17	Allen-Bradley	1492-WFB424	24-VDC Fuse Holder w/ Blown Fuse Indication	12
18	Allen-Bradley	1492-WFB250	120-VAC Fuse Holder w/ Blown Fuse Indication	10
19	Allen-Bradley	1492-REC15G	DIN Rail Receptacle, 15A, Ground Fault Current Interrupt	1
20	Allen-Bradley	700-HK36A1	700-HK General Purpose Slim Line Relay, 16 Amp Contact, SPDT, 120VAC	1
21	Allen-Bradley	700-HK36Z24	700-HK General Purpose Slim Line Relay, 16 Amp Contact, SPDT, 24VDC	8
22	Allen-Bradley	700-HN221	Screw Terminal Socket - Panel or DIN Rail Mounting 8-blade miniature socket with 16 A rating	9
23	Allen-Bradley	700-ADR	Diode Surge Suppressor Module, 6...220V DC	8
24	Allen Bradley	800FP-P7PN5W	22mm 120VAC White LED Pilot Light	1
25	Allen-Bradley	800FP-MT44PX02	40mm Mushroom Operator, Twist to Release, 40mm, Red, 2 N.C. Contact(s)	1
26	Allen-Bradley	800FP-F2PX20	22mm Push Button - Flush, Black, 2 N.O. Contacts	1
27	Allen-Bradley	1492-J3	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm (#22 AWG - #12 AWG)	100
28	Allen-Bradley	1492-JG3	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm (#22 AWG - #12 AWG) - Grounding	20
29	Allen-Bradley	1492-J3P	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm(#22 AWG - #12 AWG) - Fusible	24
30	Allen-Bradley	1492-FPK224	Plug w/ Blown Fuse Ind (24-VDC)	20
31	Allen-Bradley	1492-FPK2120	Plug w/ Blown Fuse Ind (120-VAC)	20
32	Allen-Bradley	1492-EAJ35	End Anchor, DIN Rail - Heavy Duty	25
33	Allen-Bradley	1492-DR6	Dinrail, Aluminum, 35MM, Raised	1
34	Allen-Bradley	1492-DR7	Dinrail, Aluminum, 35MM, Raised, Angled	1
35	Allen-Bradley	199-DR1	Dinrail, zinc-plated steel, 35MM	4
36	Eaton	GBK10	10 Terminal Ground Bar kit	1
37	Allen-Bradley	140G-G2C3-D12	Molded Case Circuit Breaker, G frame, 25 kA, T/M - Thermal Magnetic, 3 Poles, Rated Current 125 A	1
38	Allen-Bradley	140G-G-TLC13	Frame-G, Terminal Lug, Qty 3, FCCu 1x14-1/0(2.5-50)	2
39	Allen-Bradley	140G-G-FCX03	140G Remote Handle Accesory kit	1
40	Allen-Bradley	25B-B017N104	Powerflex 525, 3 phase, 208V, 5HP	2
41	Allen-Bradley	22-HIM-C25	Powerflex 525 HIM	2
42	Allen-Bradley	140M-F8E-C25	Motor Protection Circuit Breaker, 25A	2
43	MTE	RL-03501	3% Line Reactor, 208V, 3 Phase, 5HP	2
44	Allen-Bradley	140M-D8N-C25	MPCB, Standard Magnetic Trip (Fixed at 13 x le), 16-25 A, Std. Performance, Frame Size C	1
45	Allen-Bradley	100-C23D400	100-C Contactor, 23A, 1 N.O. 0 N.C. Auxiliary Contact Configuration, Single Pack	1
46	Allen-Bradley	140M-C-ASAR01M10	Trip Contact, Right Side Mounted, Trip (all causes) 0 N.O. 1 N.C., Trip (magnetic) 1 N.O. 0 N.C.	1
47	Allen-Bradley	140M-C-PEC23	ECO Connecting Module, 25A, for 140M-C to 100-C09...C23	1
48	Panduit	TBD	2" Wiring Duct, Grey	20
49	Panduit	TBD	1.5" Wiring Duct, Grey	20

BILL OF MATERIALS (BOM)

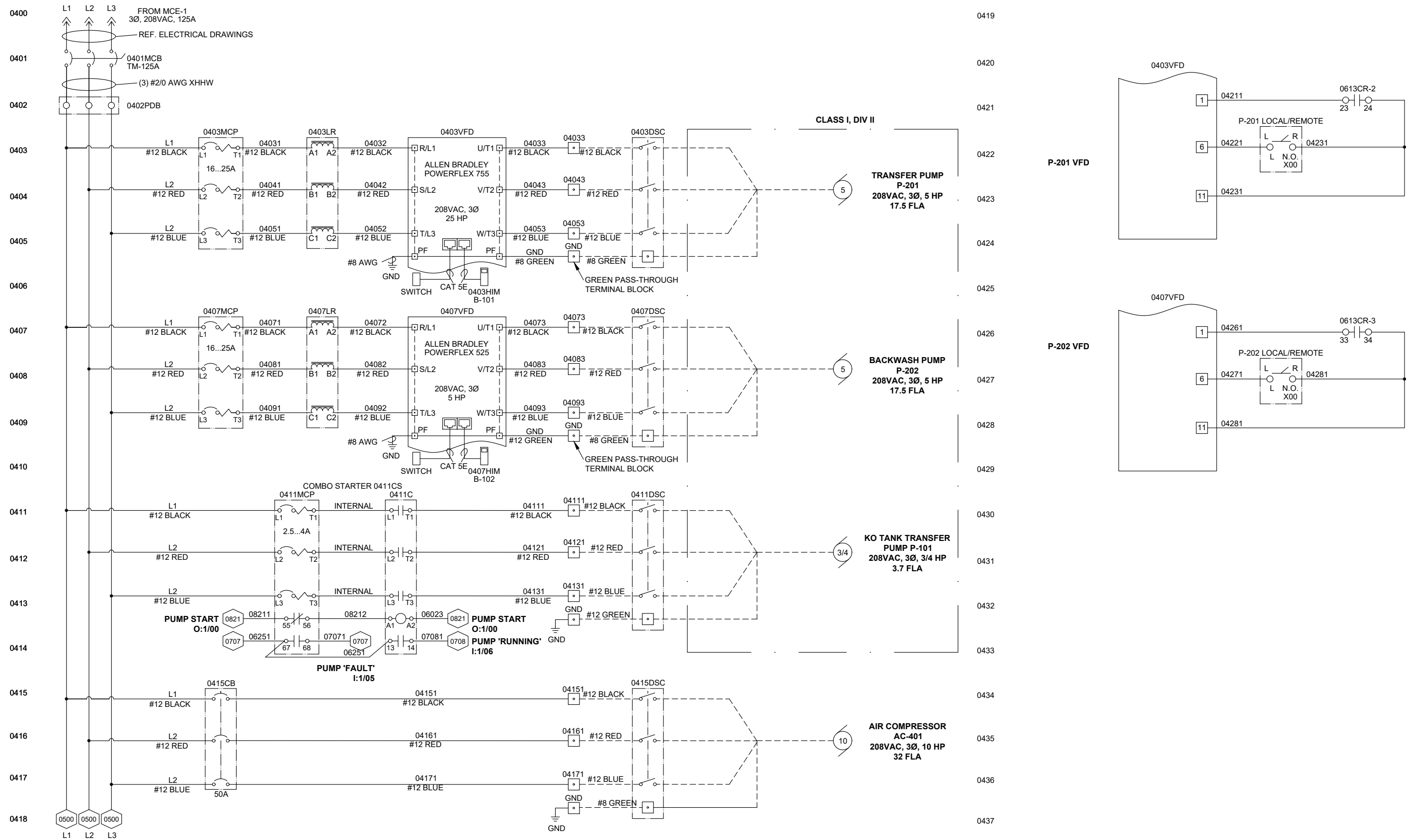
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INTERNAL (SUBPANEL) VIEW

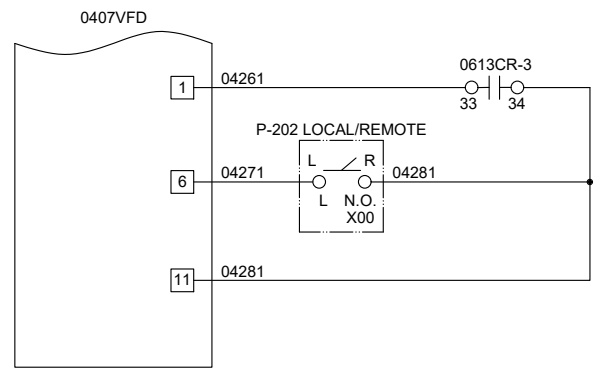
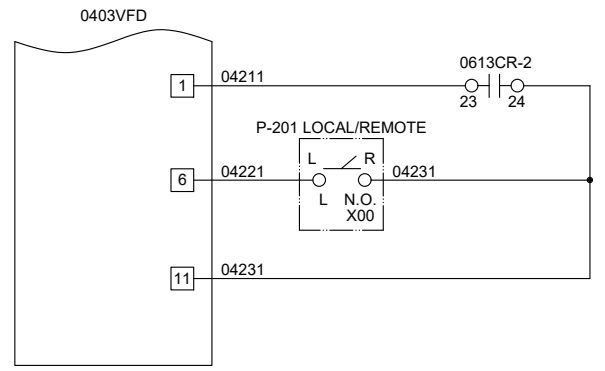
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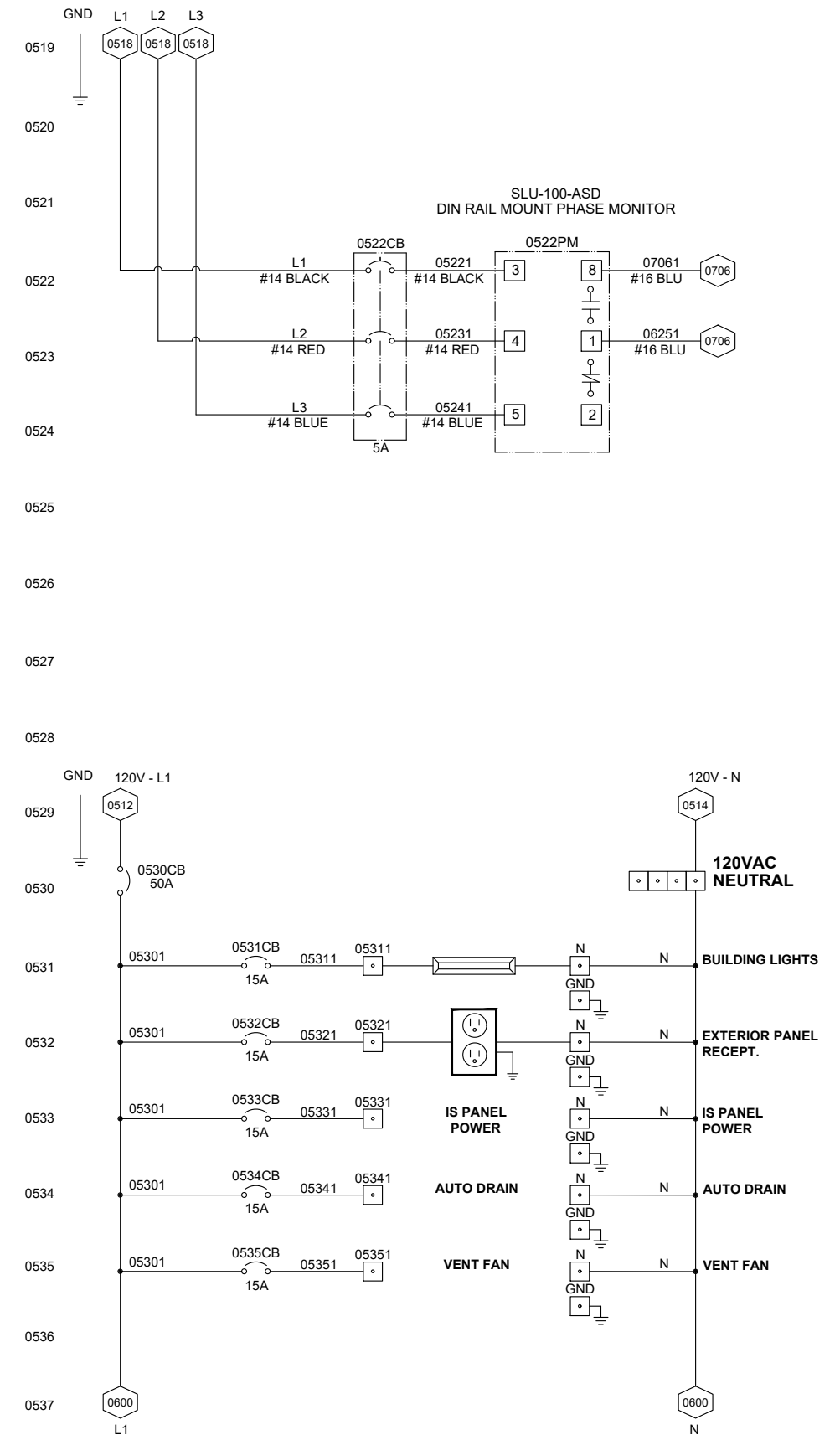
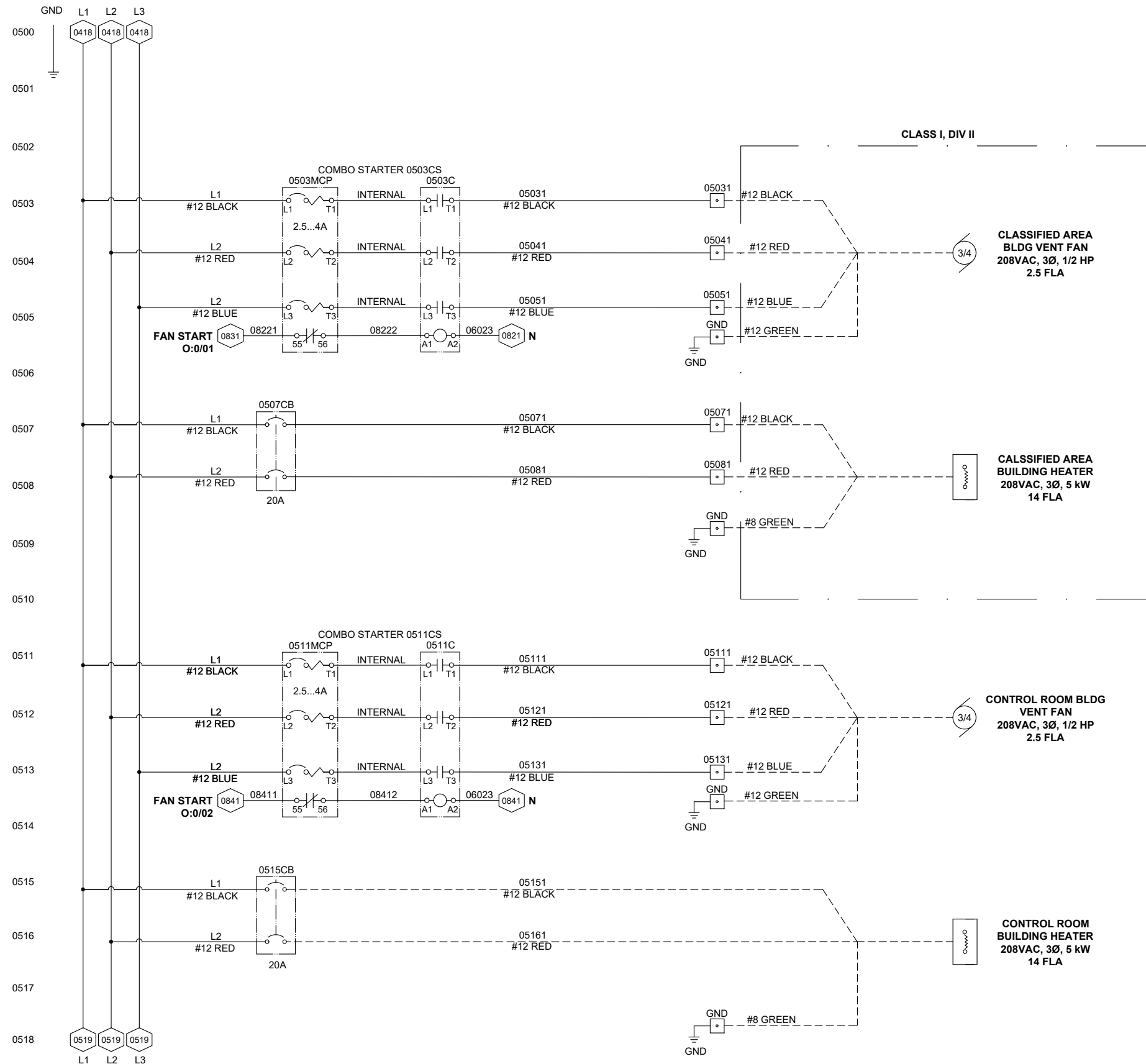
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REV.	ISSUED DATE	DESCRIPTION		BY	CK'D	



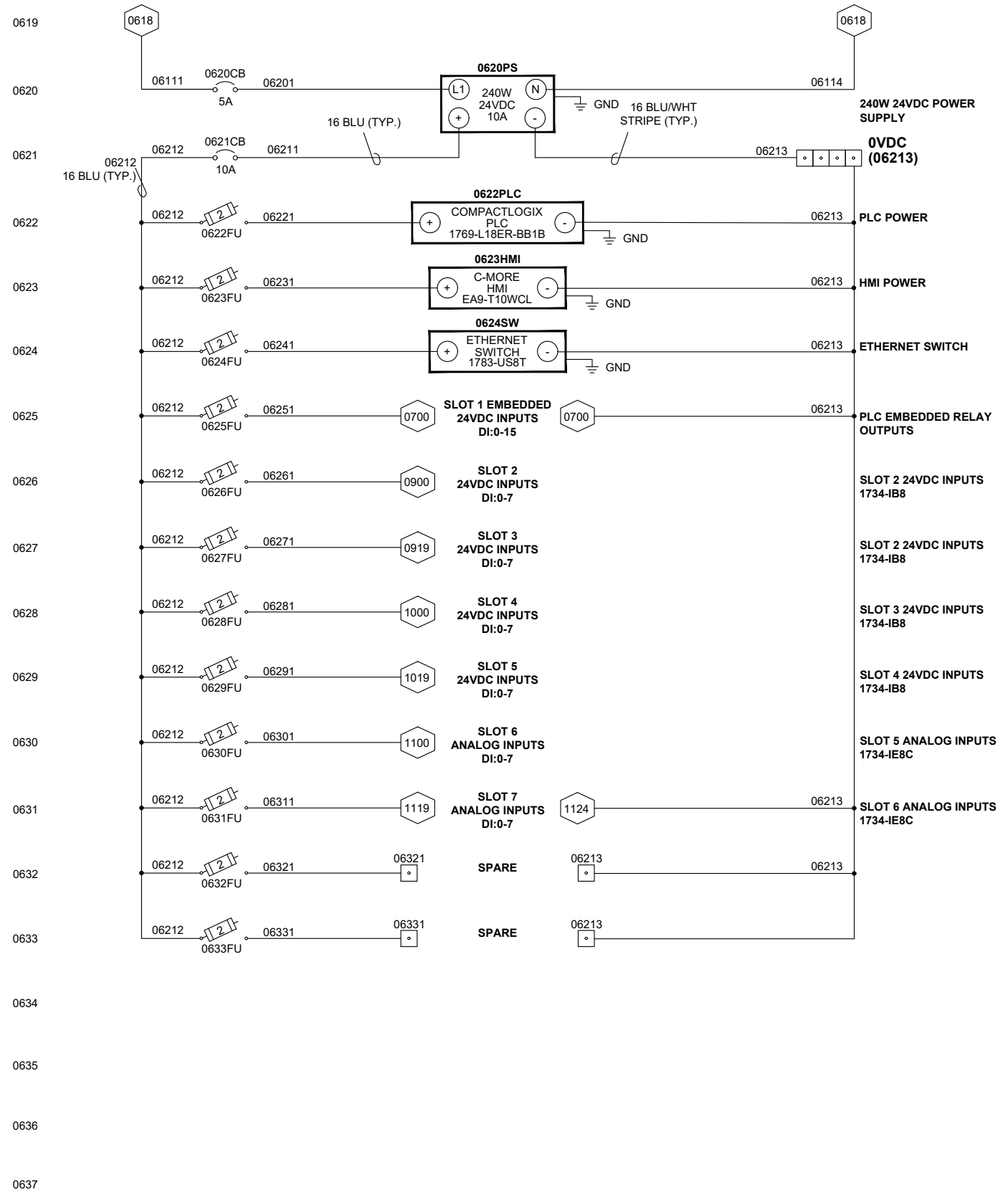
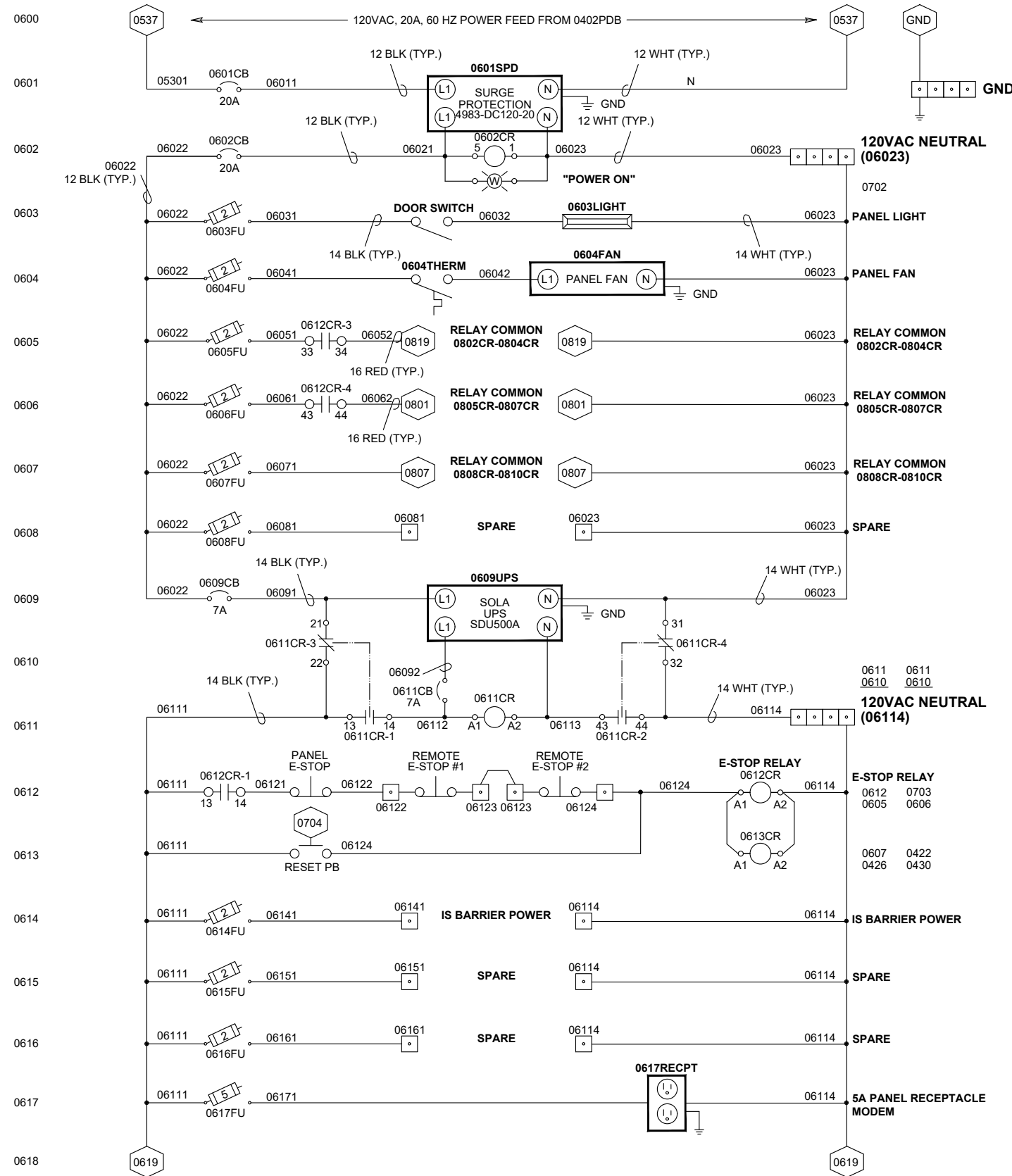
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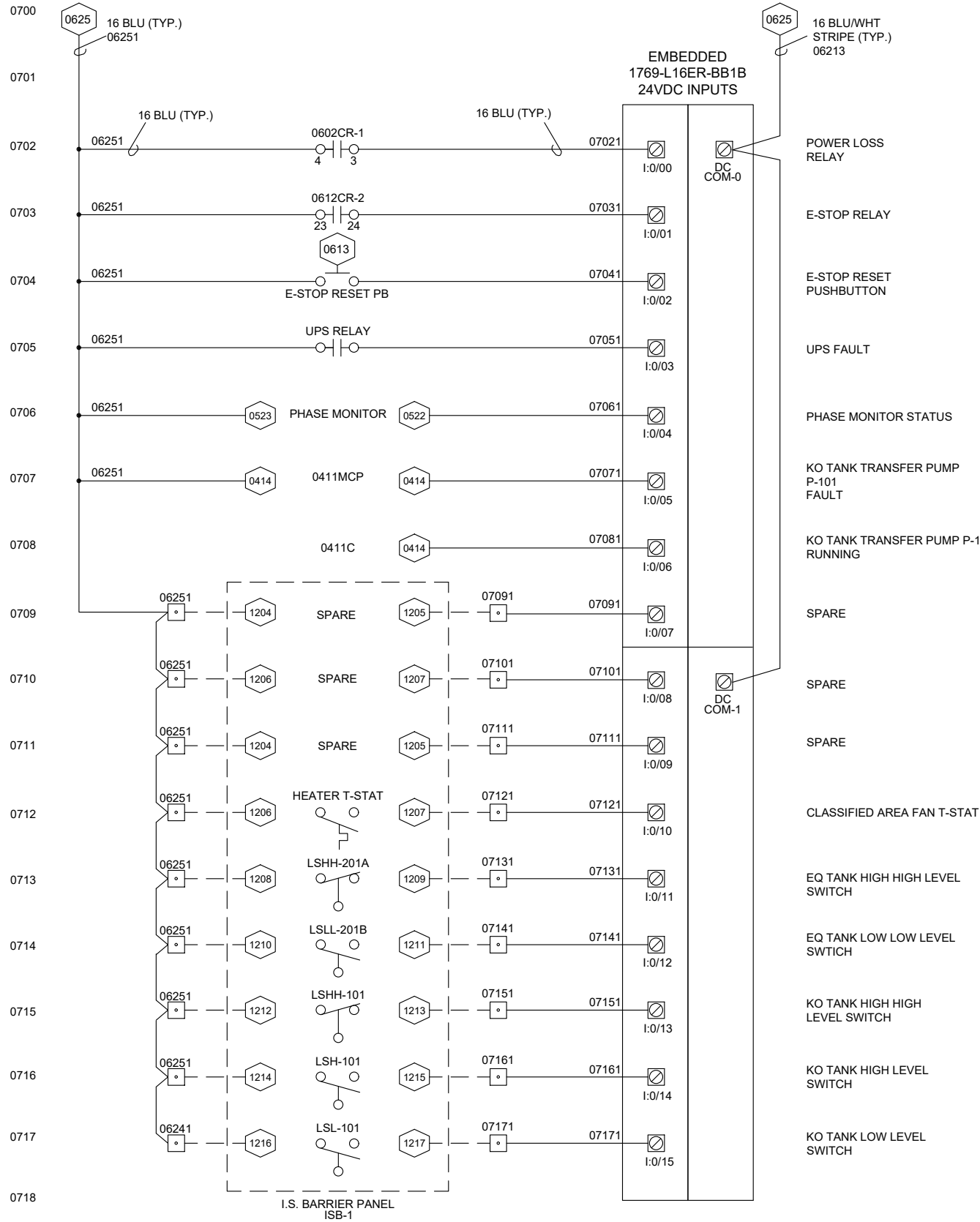
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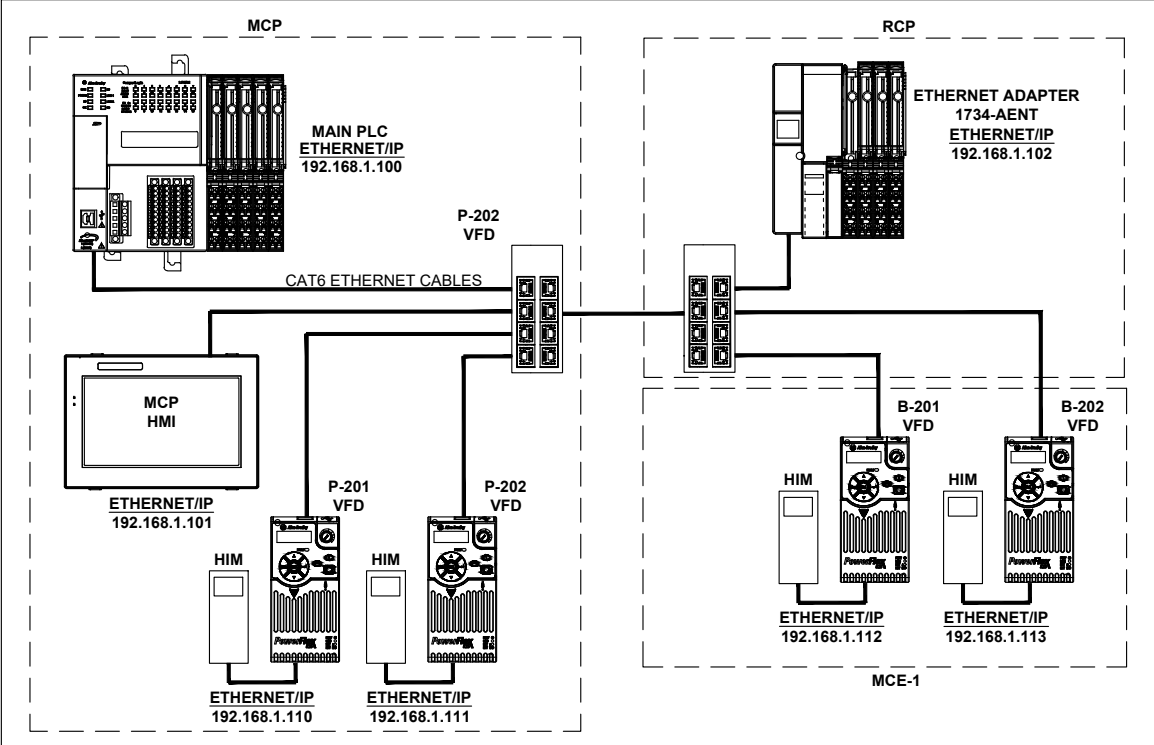


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										DESIGNED BY BDC			DRAWN BY BDC	
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK		ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com	Flitway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.flitway.com		PROJECT NUMBER Q14972			DRAWING NUMBER I-05	
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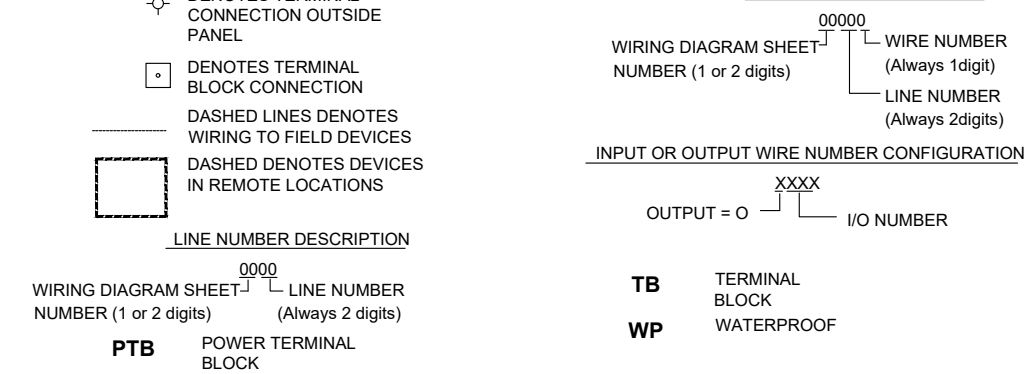




NETWORK ARCHITECTURE (N.T.S.)



LEGEND



REV.	ISSUED DATE	DESCRIPTION	BY	CK'D
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0	4/15/2020	DRAFT-ISSUED FOR REVIEW	BDC	JK

SEAL

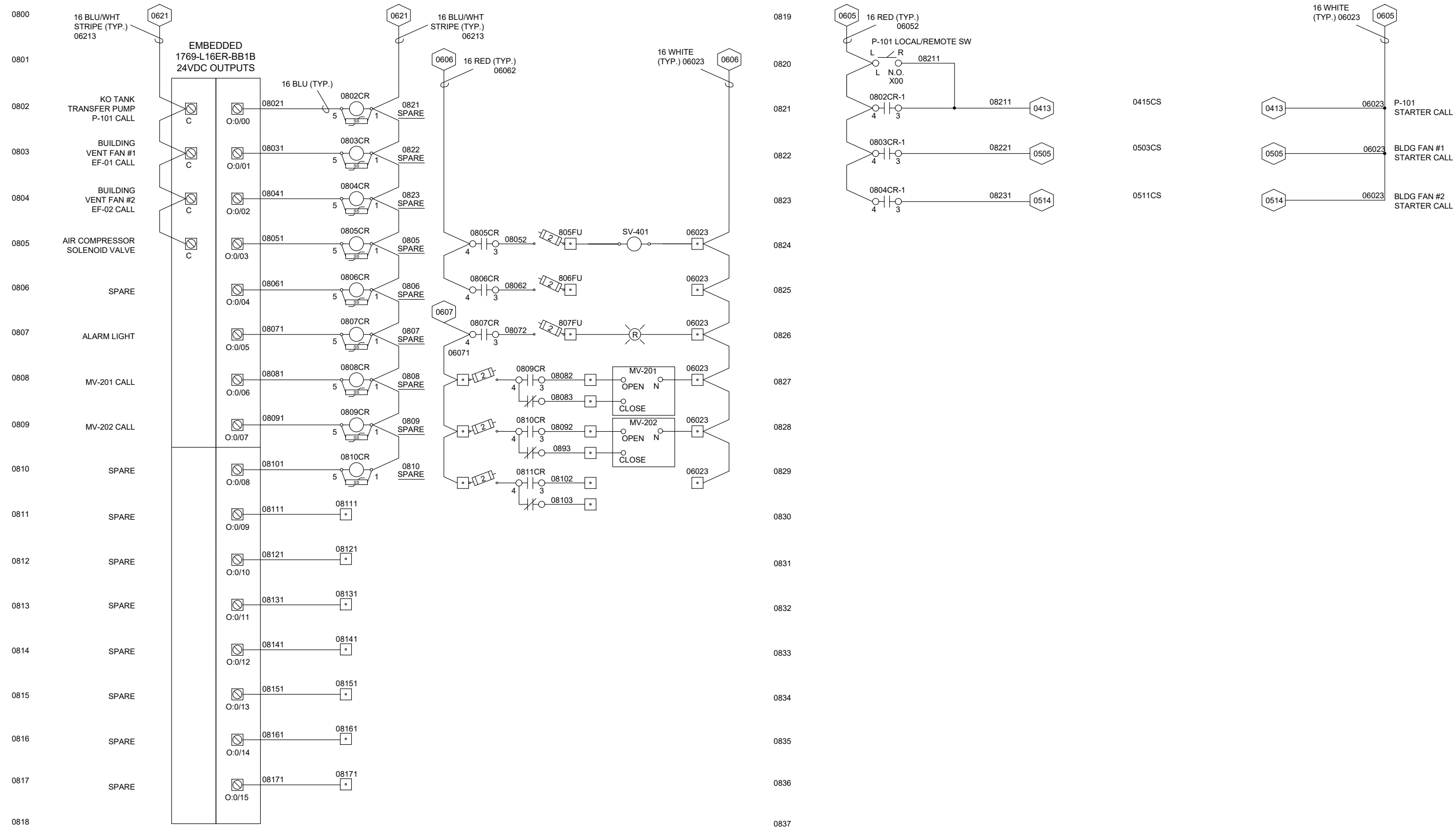
Prepared for:
ARCADIS
ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com

Prepared by:
Flitway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.flitway.com

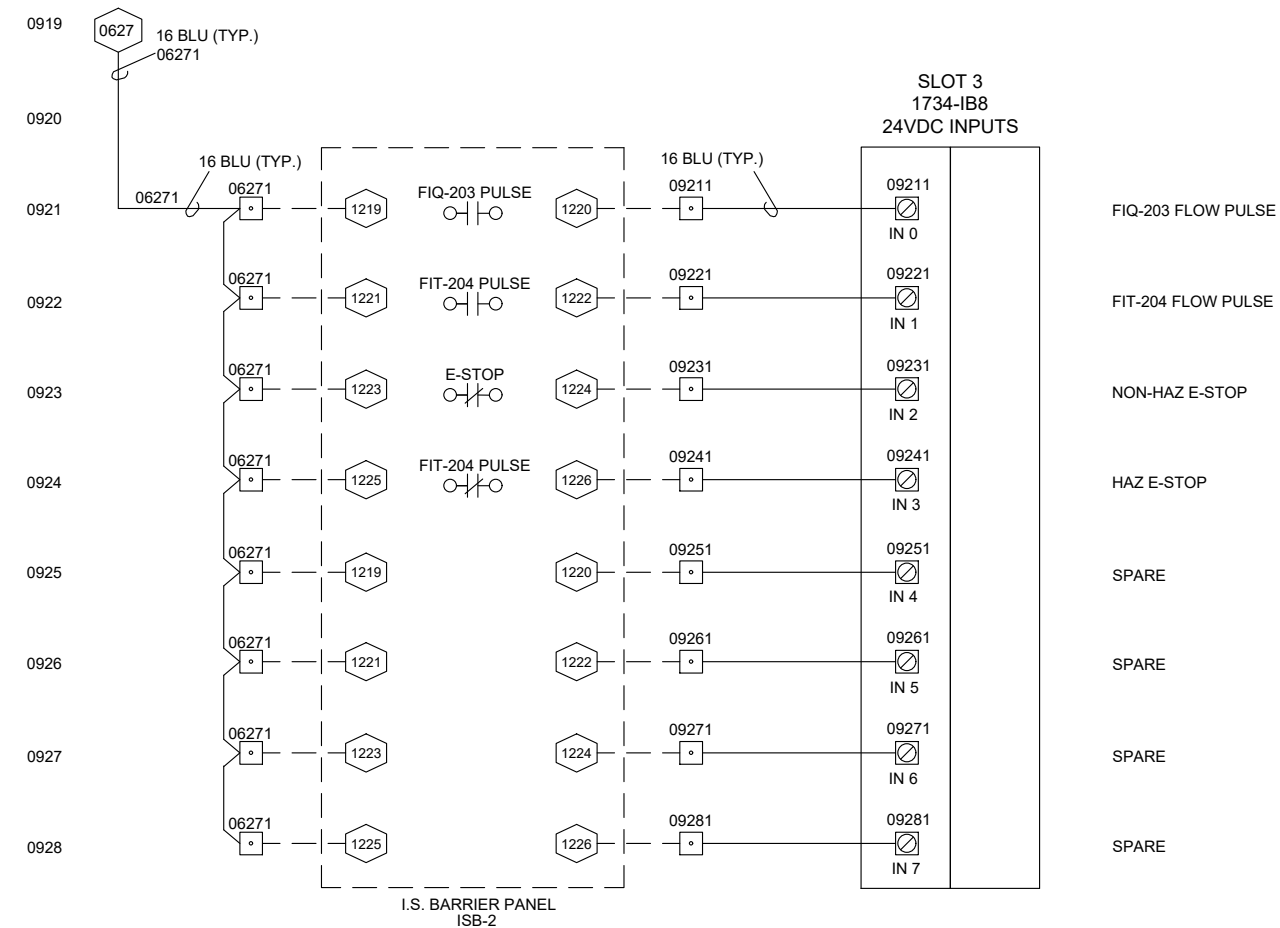
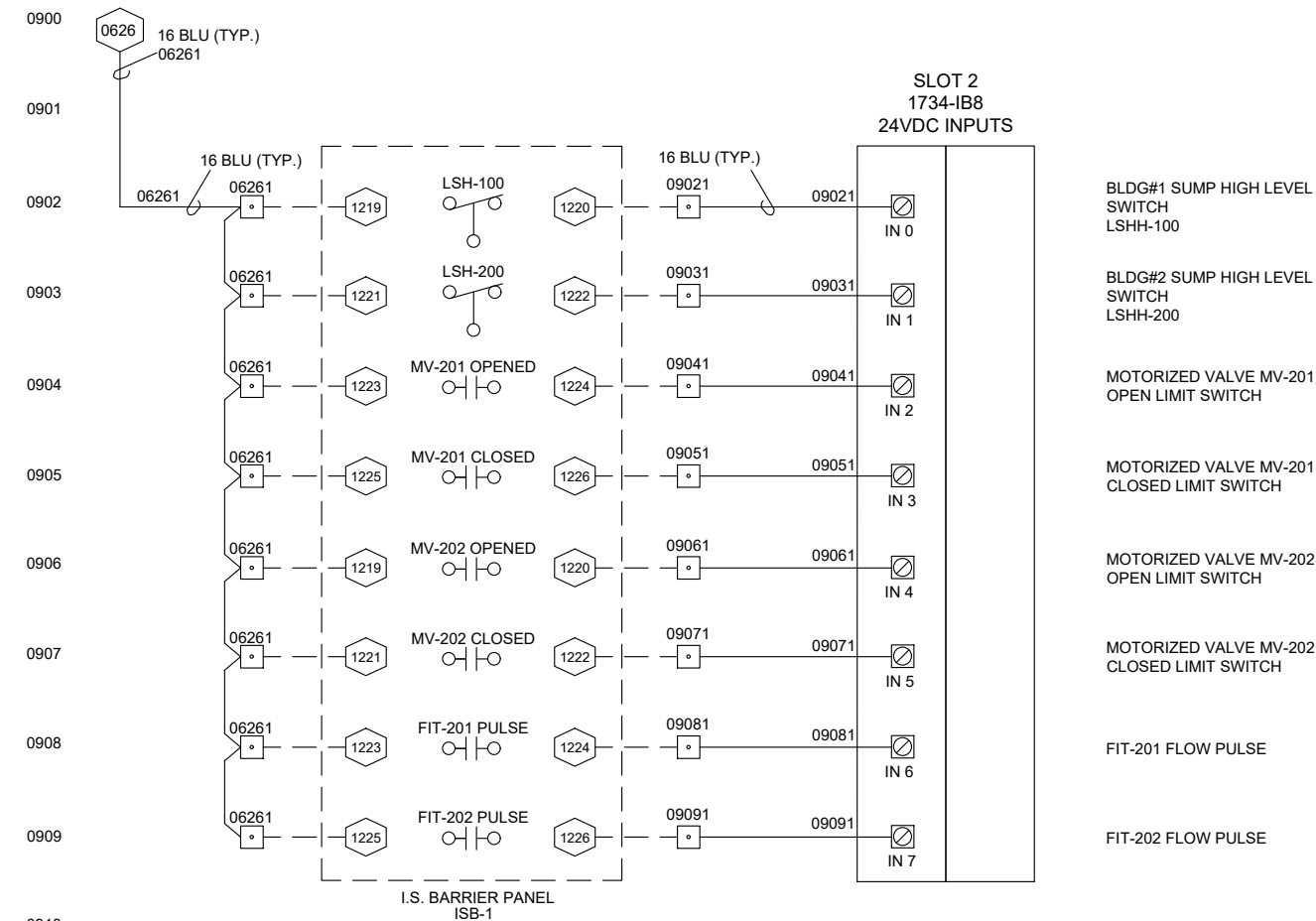
DUAL PHASE EXTRACTION SYSTEM MAIN CONTROL PANEL (MCP) SHOP DRAWINGS CHEVRON SEATTLE
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SHEET TITLE
MCP PLC EMBEDDED 24VDC INPUTS

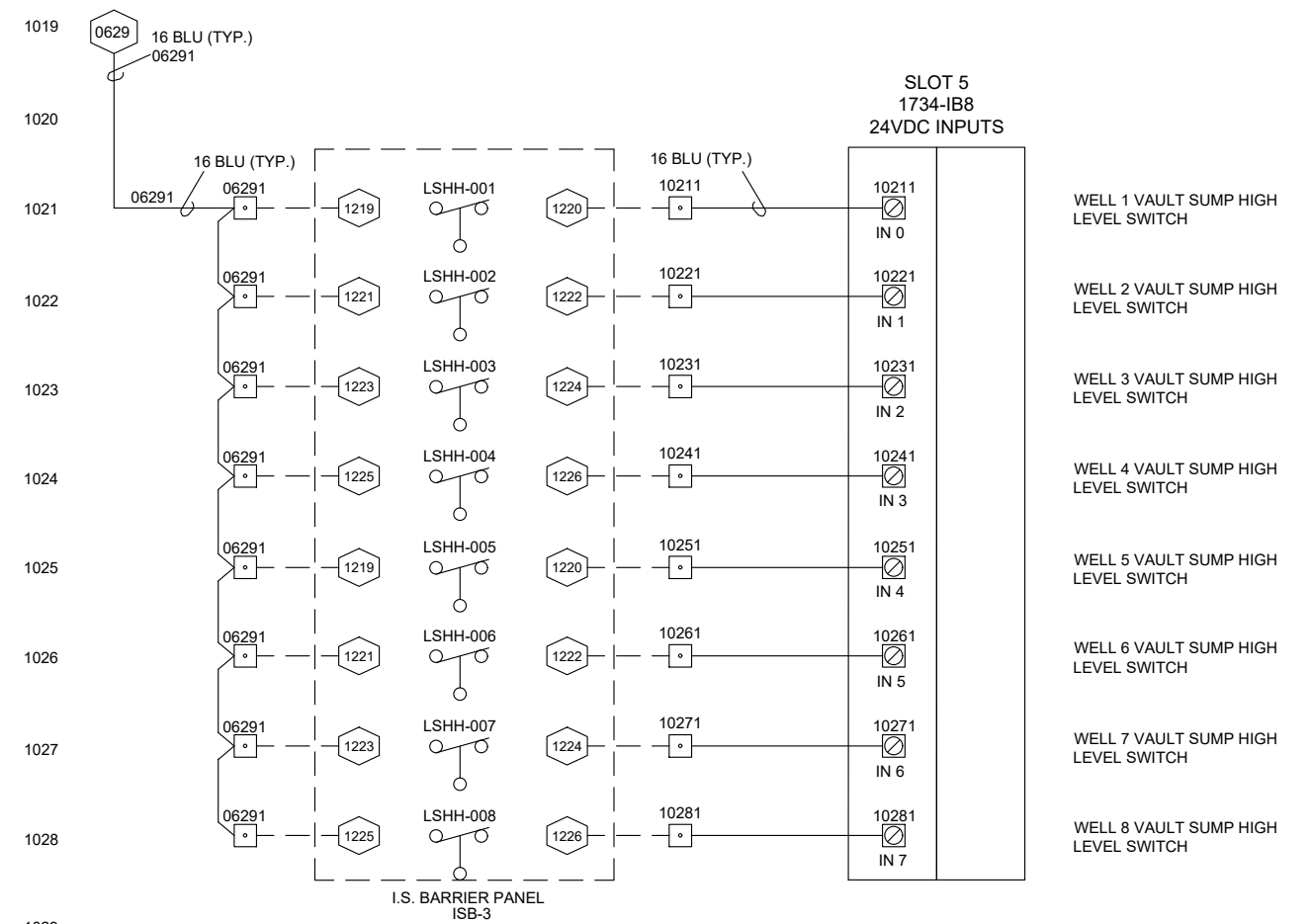
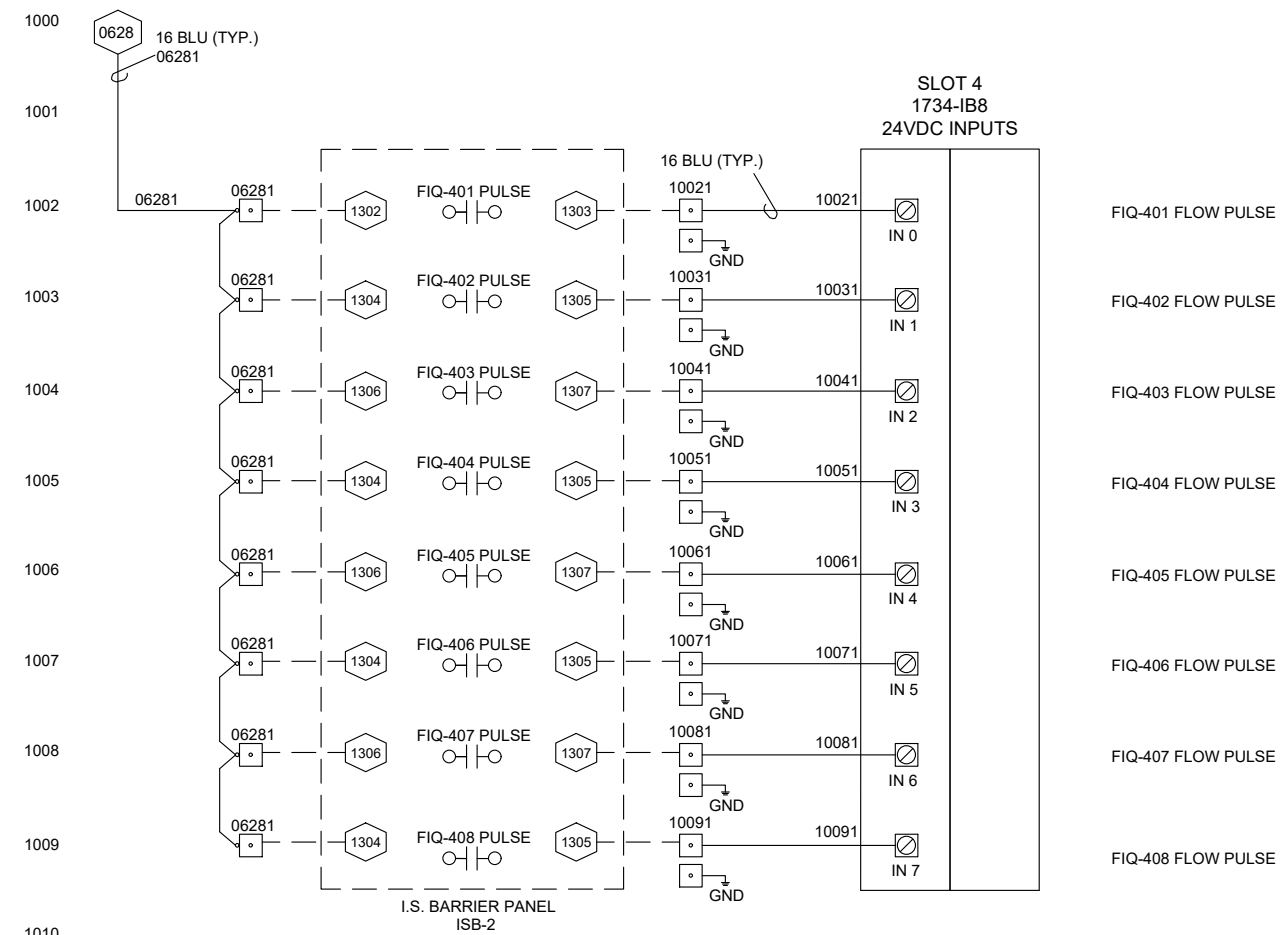
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DESIGNED BY BDC	DRAWN BY BDC
PROJECT NUMBER Q14972	DRAWING NUMBER I-07
	SHEET 7 OF 11



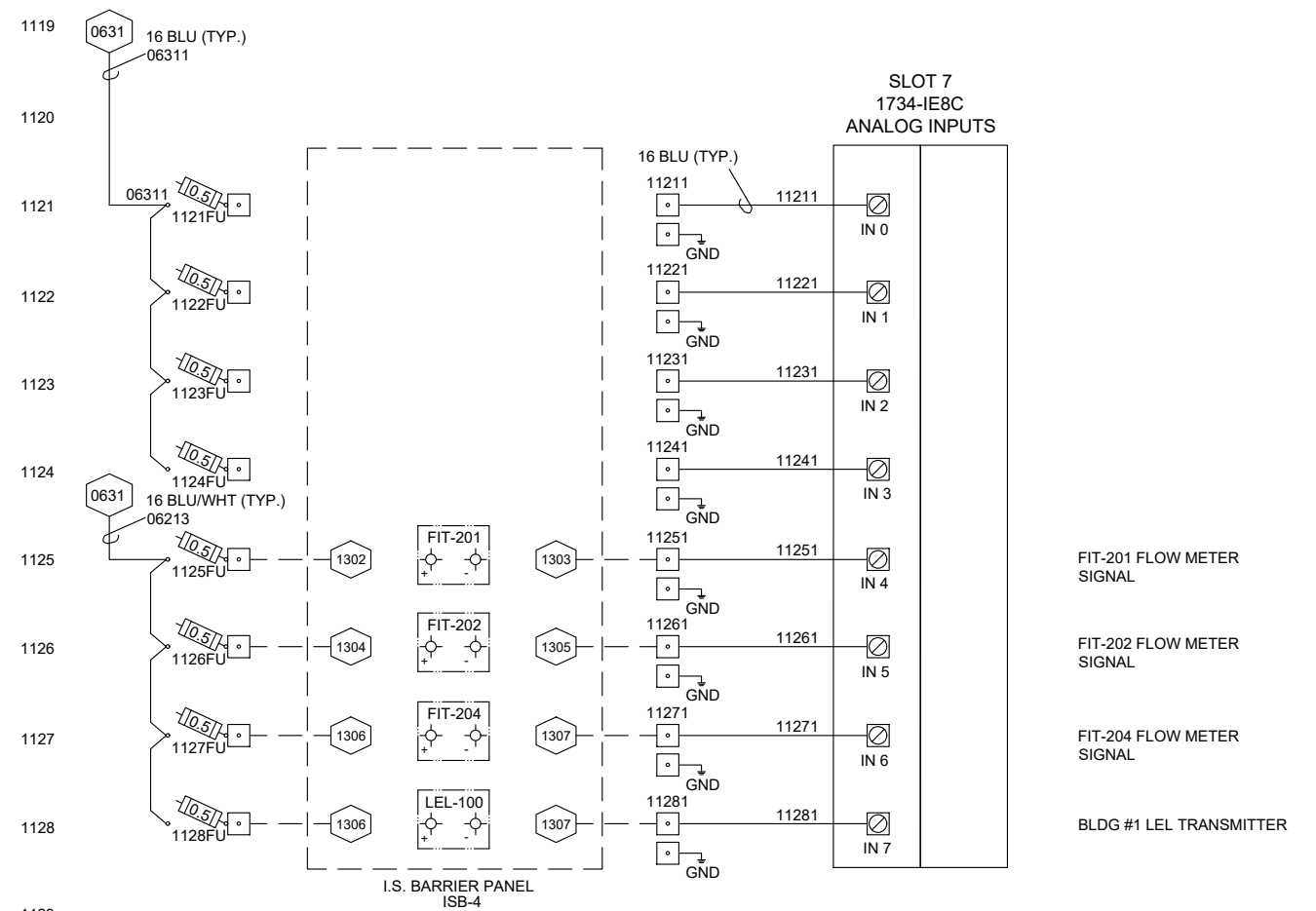
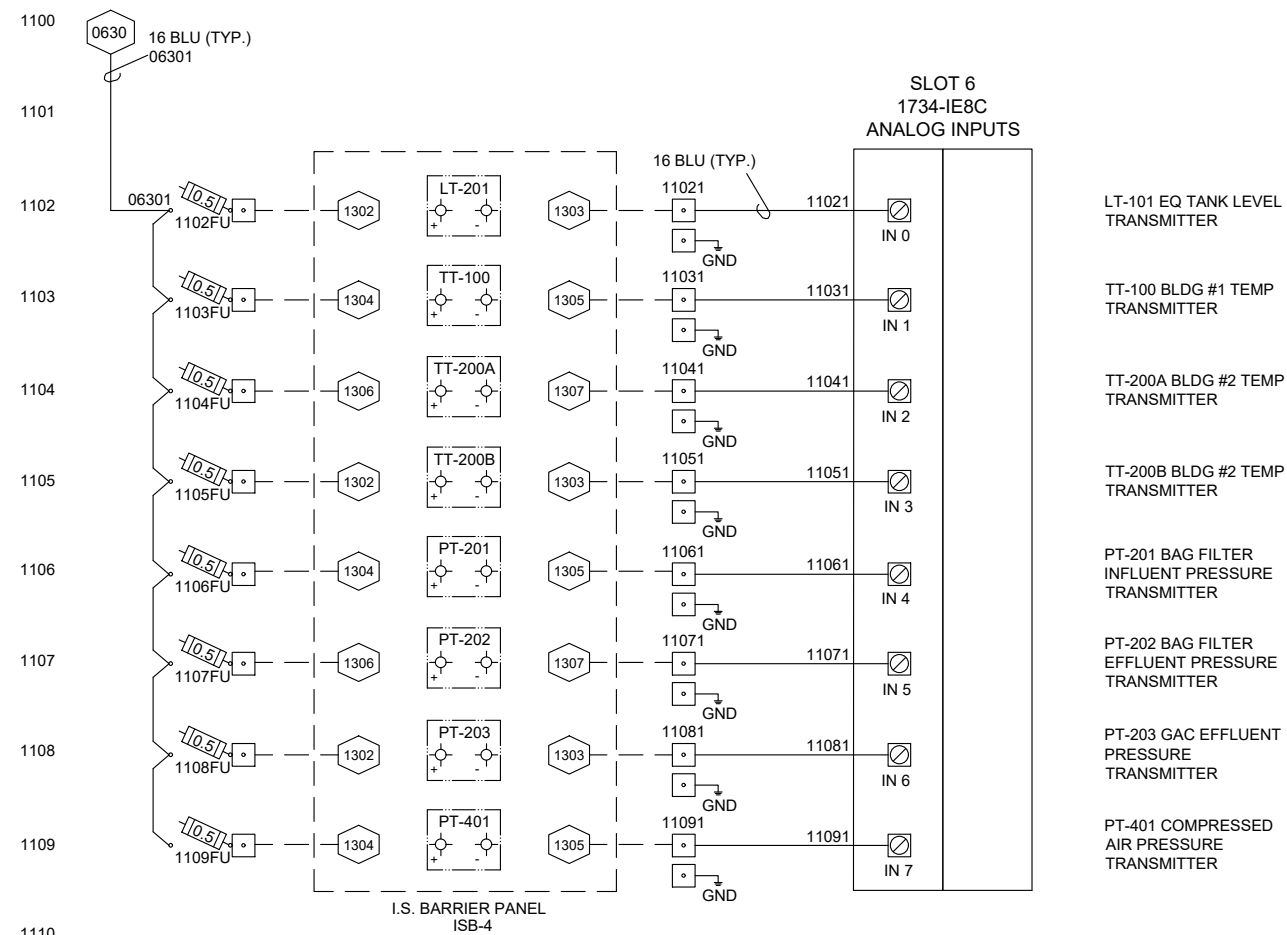
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	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-08 SHEET 8 OF 11
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	0	4/15/2020	DRAFT-ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D							



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											DESIGNED BY BDC	DRAWN BY BDC
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	0	4/15/2020	DRAFT-ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D						SHEET 9 OF 11	



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REV.	ISSUED DATE	DESCRIPTION	BY	CK'D
2	7/23/2021	CONSTRUCTION RECORD	BMA	JK
1	5/27/2020	DRAFT-ISSUED FOR REVIEW	BMA	JK
0	4/15/2020	DRAFT-ISSUED FOR REVIEW	BDC	JK

SEAL

Prepared for:
ARCADIS
ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com

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Flitway Technologies, Inc.
Flitway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.flitway.com

DUAL PHASE EXTRACTION SYSTEM MAIN CONTROL PANEL (MCP) SHOP DRAWINGS CHEVRON SEATTLE
--

SHEET TITLE
MCP SLOT 6/7 ANALOG INPUTS

APPROVED BY JK	CHECKED BY JK
DESIGNED BY BDC	DRAWN BY BDC
PROJECT NUMBER Q14972	DRAWING NUMBER I-11 SHEET 11 OF 11



CHEVRON SEATTLE

DUAL PHASE EXTRACTION SYSTEM

MOTOR CONTROL ENCLOSURE SHOP DRAWINGS

FORMER CHEVRON SERVICE STATION #95439
3876 BRIDGE WAY NORTH
SEATTLE, WASHINGTON 98103

PREPARED BY:

MAIN OFFICE
PRESIDIO SYSTEMS, INC.
159 Wright Brothers Ave.
Livermore, CA 94551
Tel: (925) 456-8400 Fax: (925) 456-8404
www.presidiosystems.com

LOCAL OFFICE
FLITEWAY TECHNOLOGIES, INC.
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www.fliteway.com

PREPARED FOR:

ARCADIS
2300 Clayton Rd
Concord, CA
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- I-01: MOTOR CONTROL PANEL SHOP DRAWINGS TITLE SHEET
- I-02: EXTERNAL LAYOUT
- I-03: BILL OF MATERIALS & INTERNAL SUBPANEL LAYOUT
- I-04: 208VAC POWER DISTRIBUTION
- I-05: 120VAC POWER DISTRIBUTION

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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-01
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK							
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
		REV.	ISSUED DATE	DESCRIPTION							BY	CK'D

MOTOR CONTROL ENCLOSURE MCE-2

OPERATOR/INDICATOR LABELS

480 VOLTS

PART #: 44215 (OR EQUIV)

LABEL SCHEDULE

Technical drawing of the interior of a safe, showing dimensions and internal components. The overall width is 37.00. The drawing includes various internal compartments, drawers, and a door with a handle. Key components and labels include:

- Dimensions:** Overall width is 37.00.
- Internal Components:**
 - Top Section:** A horizontal compartment with a handle (A) and a lock (K).
 - Bottom Section:** A horizontal compartment with a handle (L).
 - Central Section:** A large compartment (29) containing two drawers (B and C) and a lock (J).
 - Right Side:** A vertical compartment (8) with a handle and a lock (4).
 - Bottom Right:** A door with a handle (30) and a lock (4).
- Labels:** A, K, L, 29, B, C, J, 8, 4, 30, 3.

FRONT VIEW - ASSEMBLED

SIDE VIEW

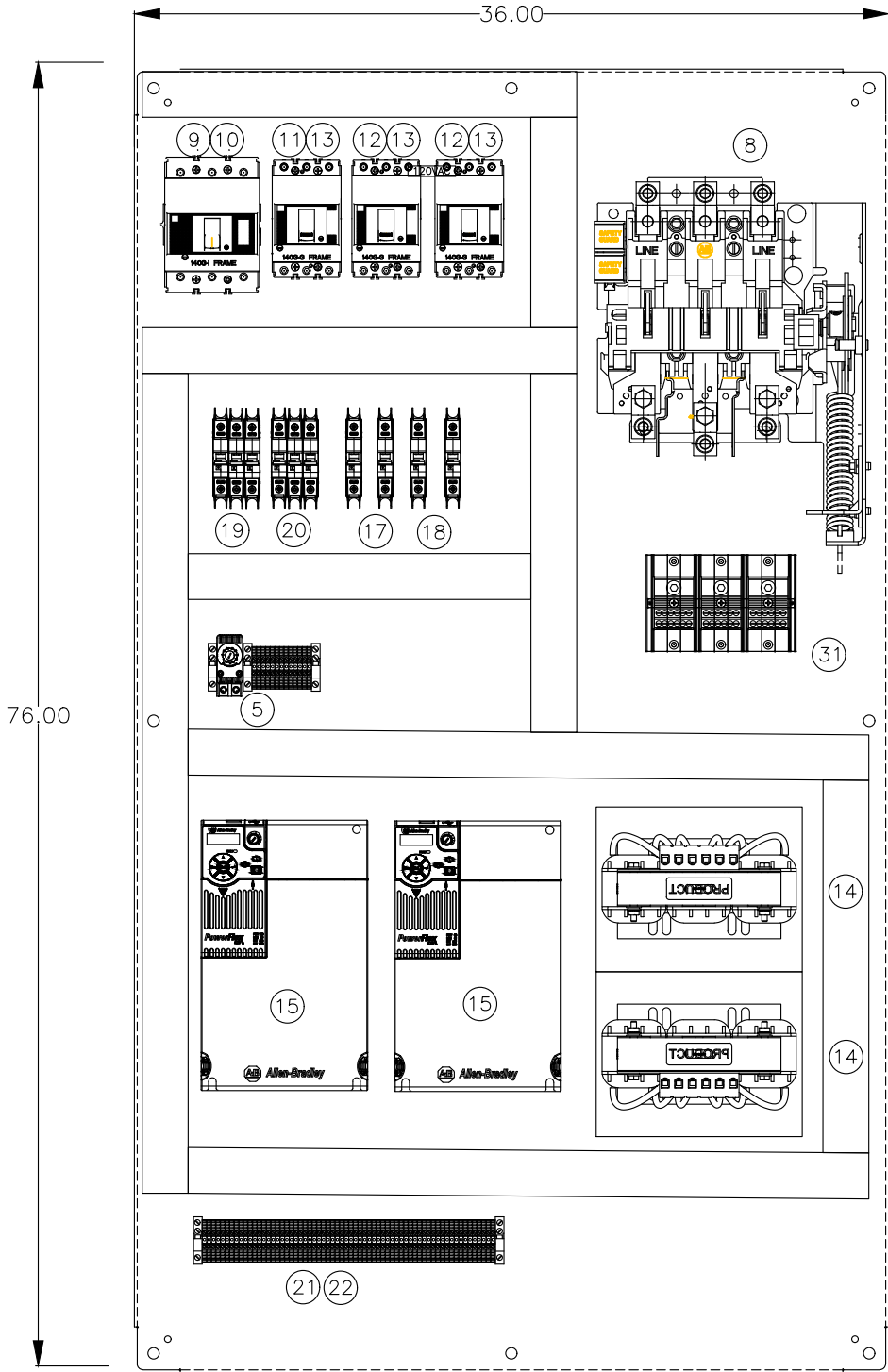
SCALE: AS SHOWN

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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-02
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK							
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D							

Item	Manufacturer	Part Number	Description	Qty
1	Saginaw	SCE-84XM4018	Single-Door Disconnect Enclosure, NEMA 4XSS, 60"H x 37"W x 16"D	1
2	Saginaw	SCE-60P36	Subpanel for Above (Back) 57"H x 33"W	1
3	Saginaw	SCE-N12FA44	Panel Fan, 120-VAC	1
4	Saginaw	SCE-N12FGA44	Fan Grill & Filter	1
5	Saginaw	SCE-TEMNO	Thermostat, NO	1
6	Hoffman	LEDA1M35	Panel Light, 120VAC, On/Off	1
7	Hoffman	PDFSWD	Door Switch	1
8	Allen-Bradley	1494U-J400-C4-HJ-LA-M-PC	140U - Universal Disconnect, Fusable, 400A rated. 4 ft flange mounted operator cable/handle assembly	1
9	Allen-Bradley	140G-I3C3-D17	Molded Case Circuit Breaker, I frame, 35 kA, T/M - Thermal Magnetic, 3 Poles, Rated Current 175 A	1
10	Allen-Bradley	140G-I-TLC13	Frame-K, Terminal Lug, Qty 3, FCCu 1x14-1/0(2.5-50)	2
11	Allen-Bradley	140G-G2C3-D12	Molded Case Circuit Breaker, G frame, 25 kA, T/M - Thermal Magnetic, 3 Poles, Rated Current 125 A	1
12	Allen-Bradley	140MG-G8P-D10	MCP, G-Frame, 35...65kA at 480V, Magnetic Only, Rated Current 100A	2
13	Allen-Bradley	140G-G-TLC13	Frame-G, Terminal Lug, Qty 3, FCCu 1x14-1/0(2.5-50)	6
14	MTE	RL-08001	3% Line Reactor, 208V, 80A	2
15	Allen-Bradley	25B-B062N104	PowerFlex 525 AC Drive, with Embedded EtherNet/IP and Safety, 208 VAC, 3 Phase, 20 HP, Frame 5	2
16	Allen-Bradley	22-HIM-C2S	Remote LCD Display, Digital Speed Control, IP66, NEMA Type 4X/12 - Indoor Use Only	2
17	Allen-Bradley	1489-M1C200	Miniature Circuit Breaker, AC, 1 Pole, C Curve, 20A	3
18	Allen-Bradley	1489-M1C100	Miniature Circuit Breaker, AC, 1 Pole, C Curve, 10A	1
19	Allen-Bradley	1489-M3C200	Miniature Circuit Breaker, AC, 3 Pole, C Curve, 20A	1
20	Allen-Bradley	1489-M3C100	Miniature Circuit Breaker, AC, 3 Pole, C Curve, 10A	1
21	Allen-Bradley	1492-J6	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm (#12 AWG - #4 AWG)	6
22	Allen-Bradley	1492-JG6	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm (#22 AWG - #12 AWG) - Grounding	5
23	Allen-Bradley	1492-EAJ35	End Anchor, DIN Rail - Heavy Duty	25
24	Allen-Bradley	1492-DR7	Dinrail, Aluminum, 35MM, Raised, Angled	1
25	Allen-Bradley	199-DR1	Dinrail, zinc-plated steel, 35MM	2
26	Eaton	GBK10	10 Terminal Ground Bar kit	1
27	Panduit	TBD	2" Wiring Duct, Grey	2
28	Panduit	TBD	1.5" Wiring Duct, Grey	2
29	Allied Moulded	AMHMI120L	12"x10" HMI Cover Kit with hinged cover and snap latch	1
30	Saginaw	RH10N12	NEMA 3R Rain Hood for 10" Panel Fan	2
31	Allen Bradley	1492-PD3287	Distribution Block, 760A, 600V AC/DC, 3P, Aluminum, 2 In/8 Out	

BILL OF MATERIALS (BOM)

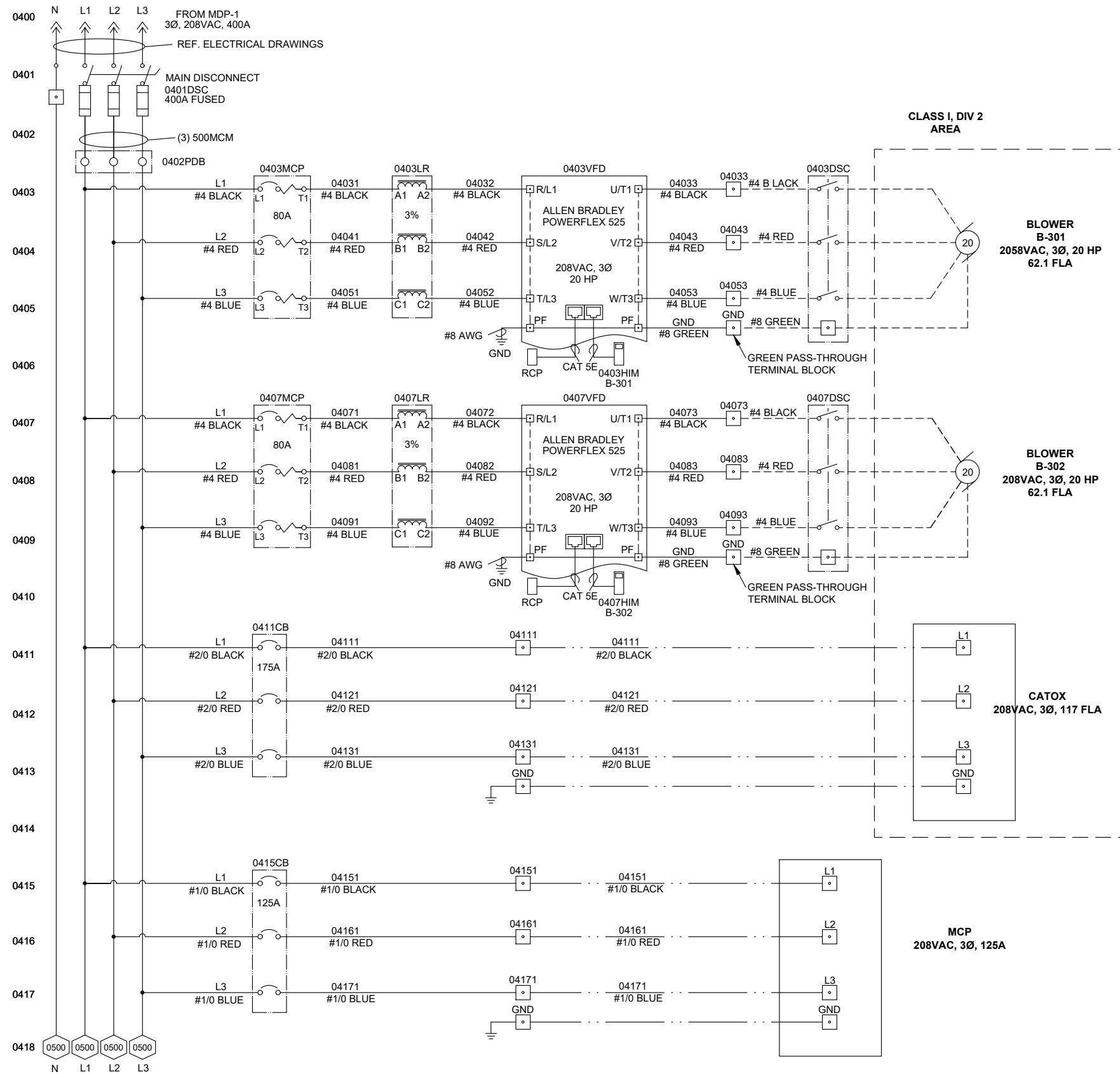
SCALE: N.T.S.



INTERNAL (SUBPANEL) VIEW

SCALE: AS SHOWN

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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-03
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK							
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D						SHEET 3 OF 5	



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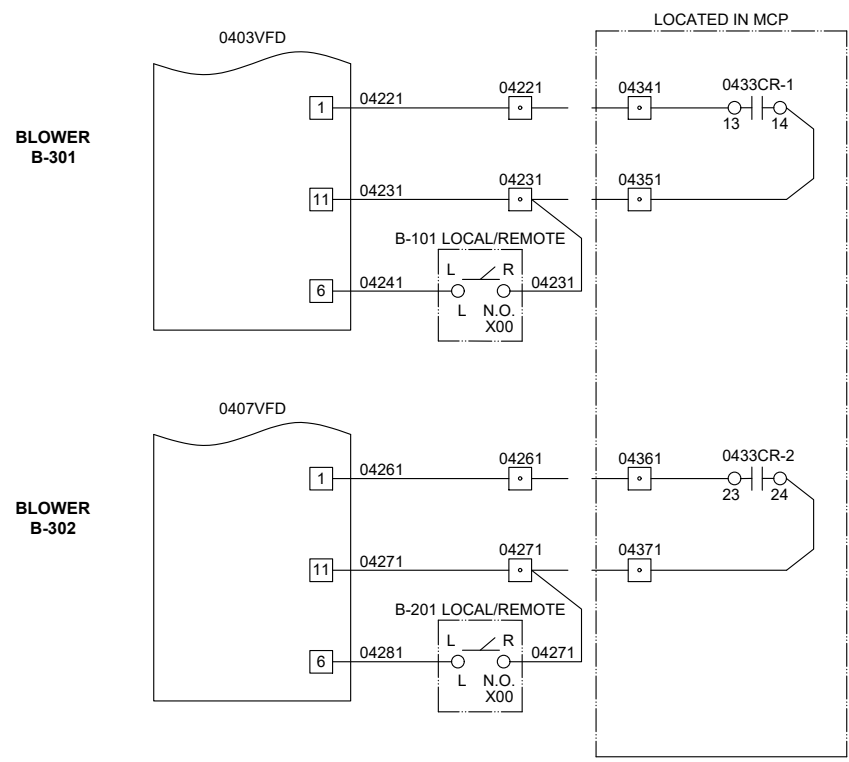
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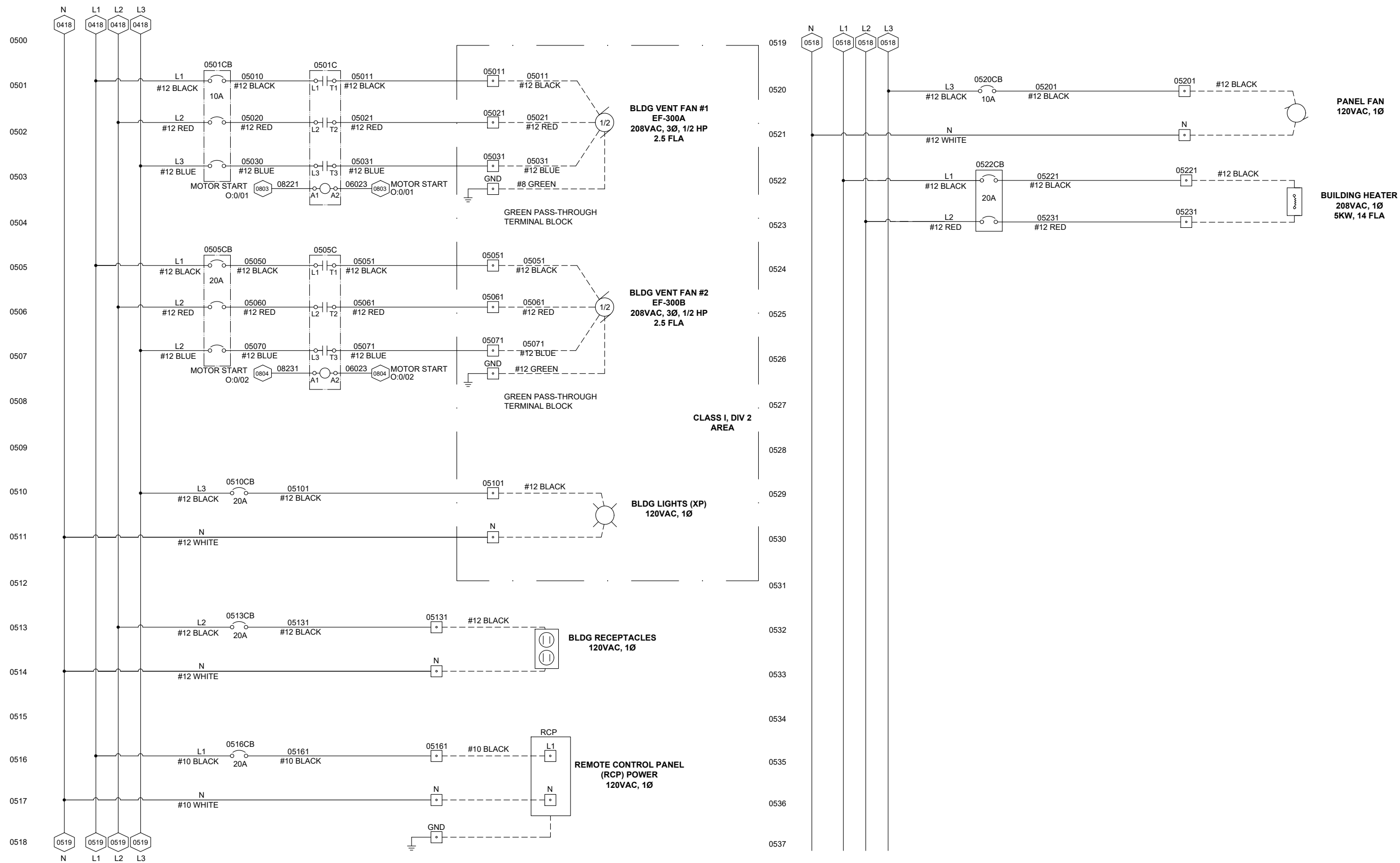
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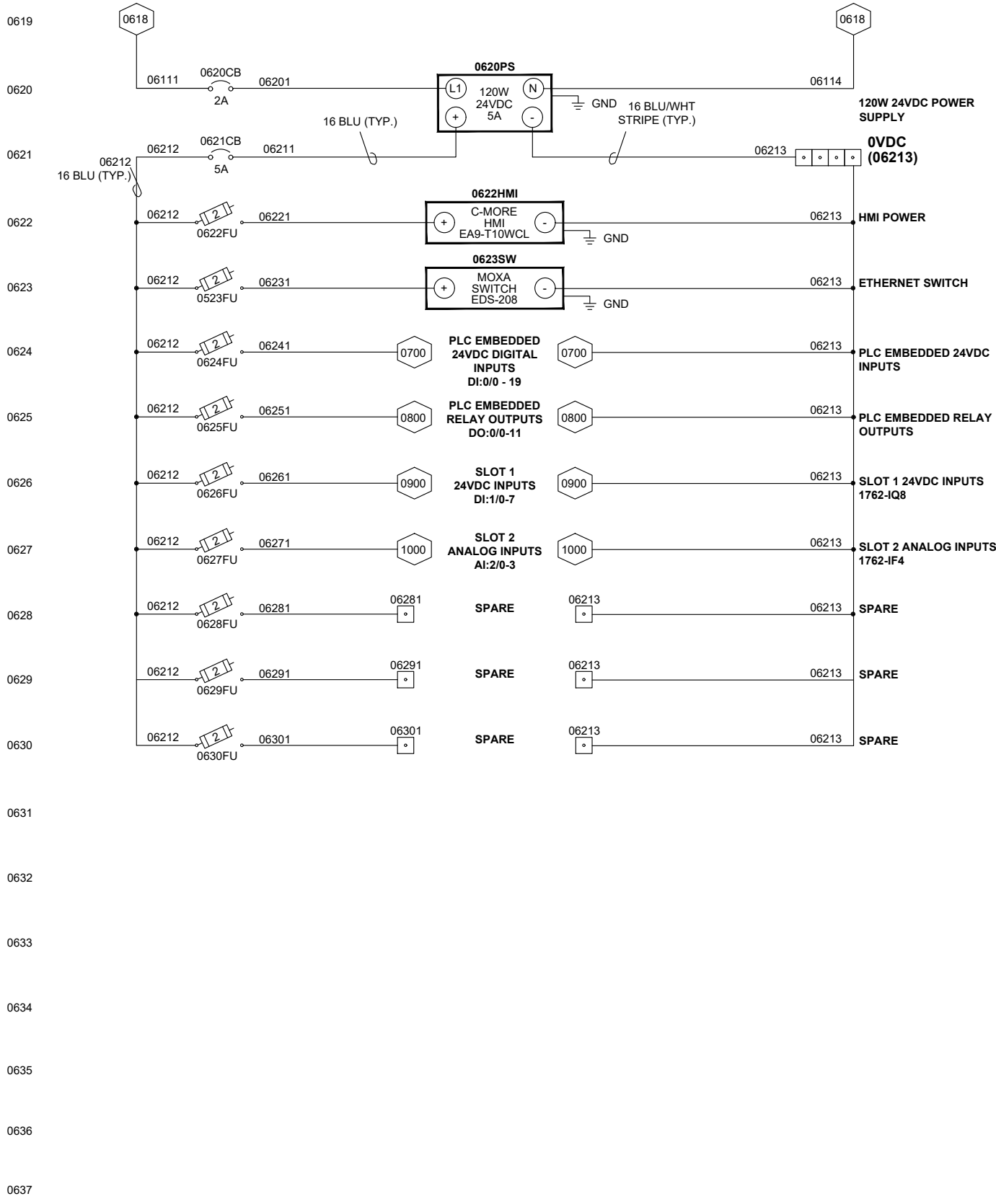
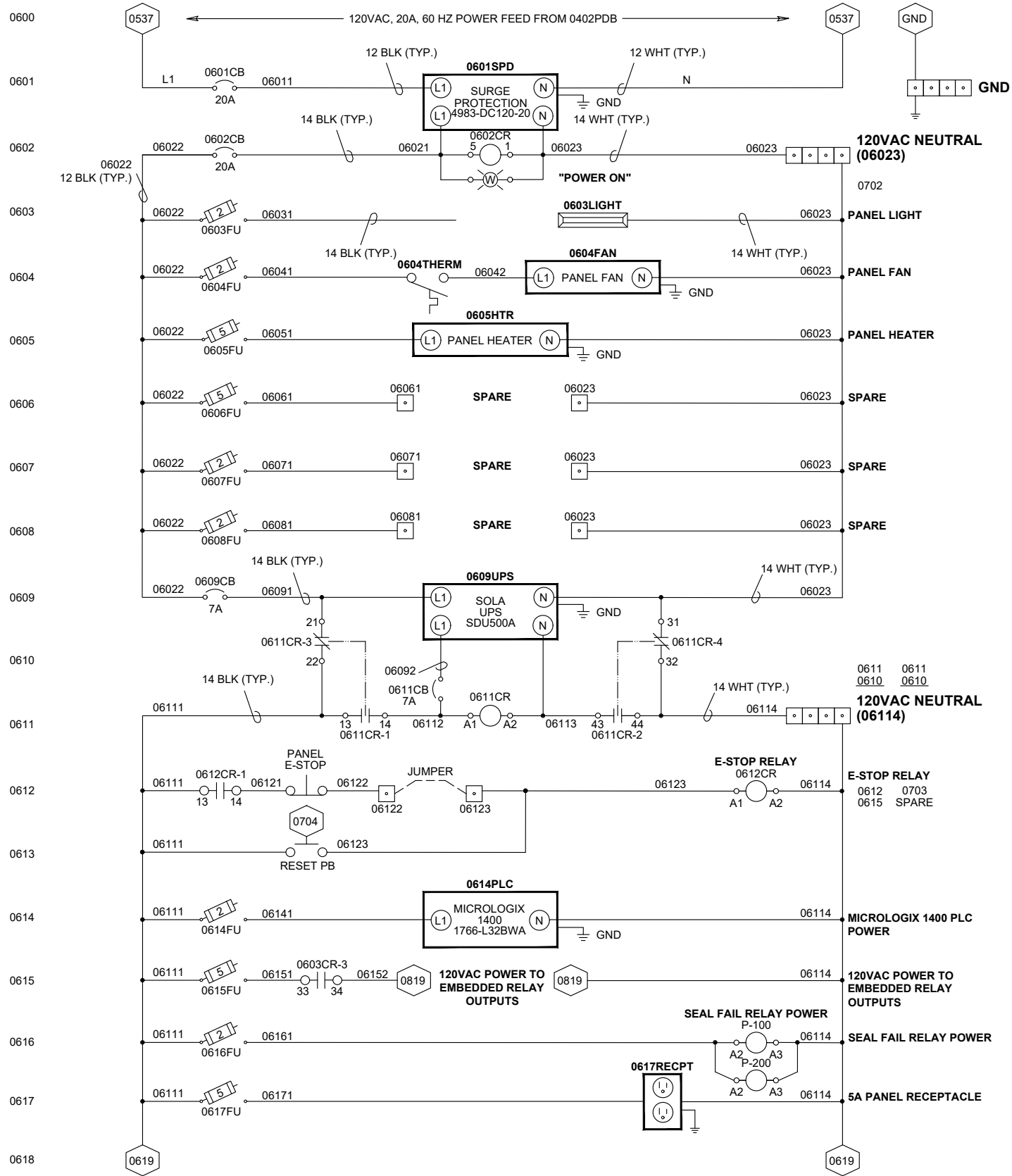
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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-05
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK							
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D						SHEET 5 OF 5	



REV.	ISSUED DATE	DESCRIPTION	BY	CK'D
2	7/23/2021	CONSTRUCTION RECORD	BMA	JK
1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK
0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK

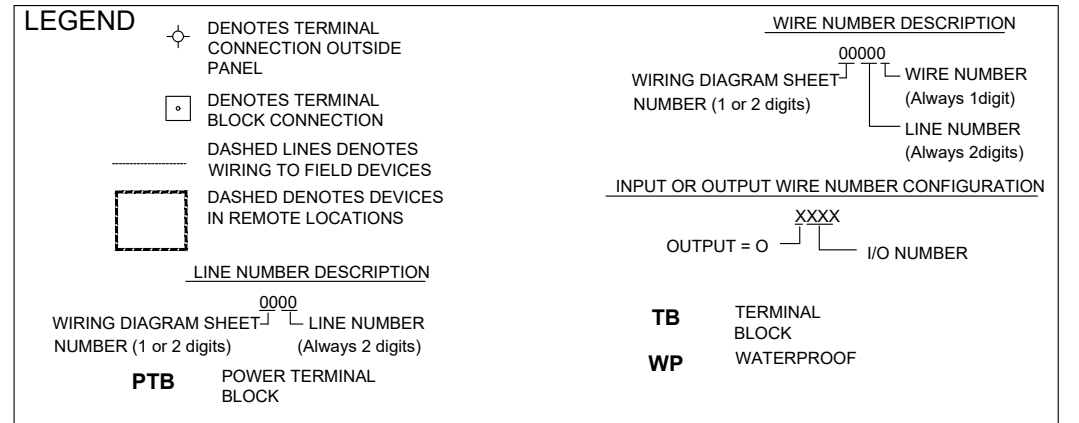
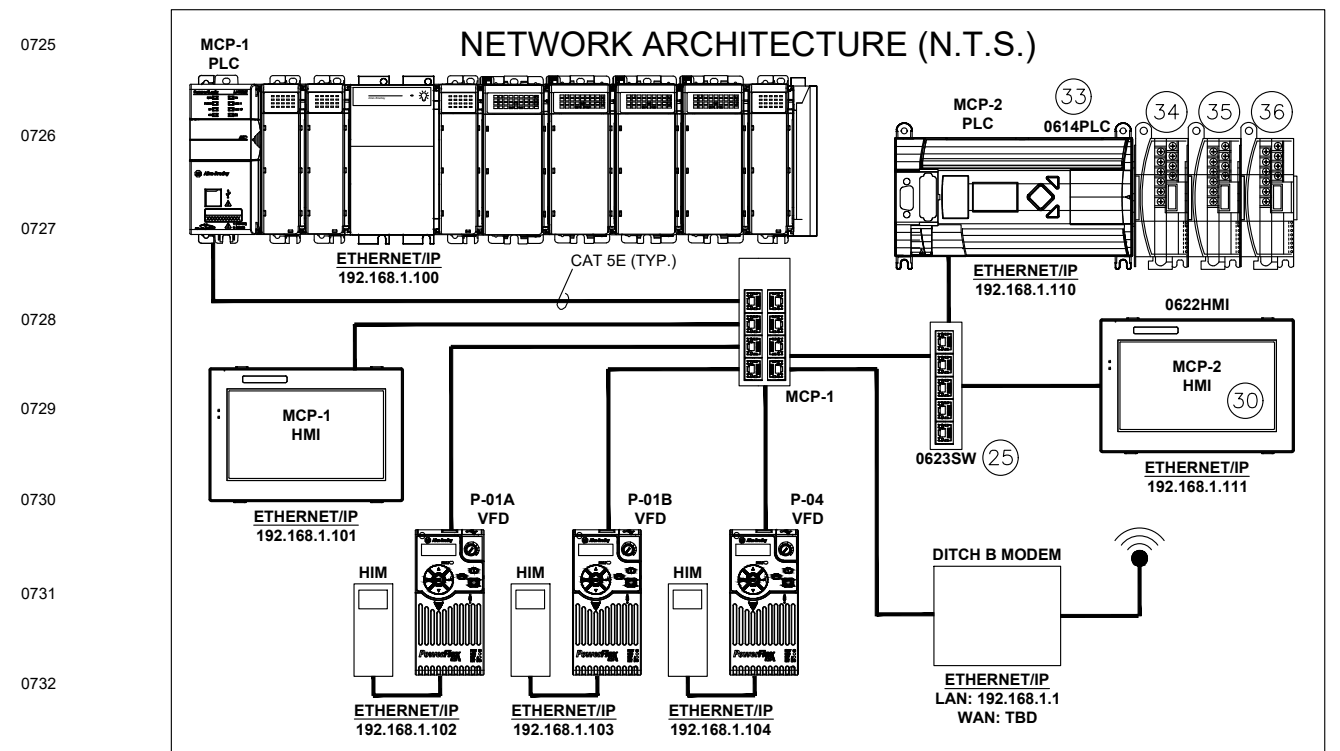
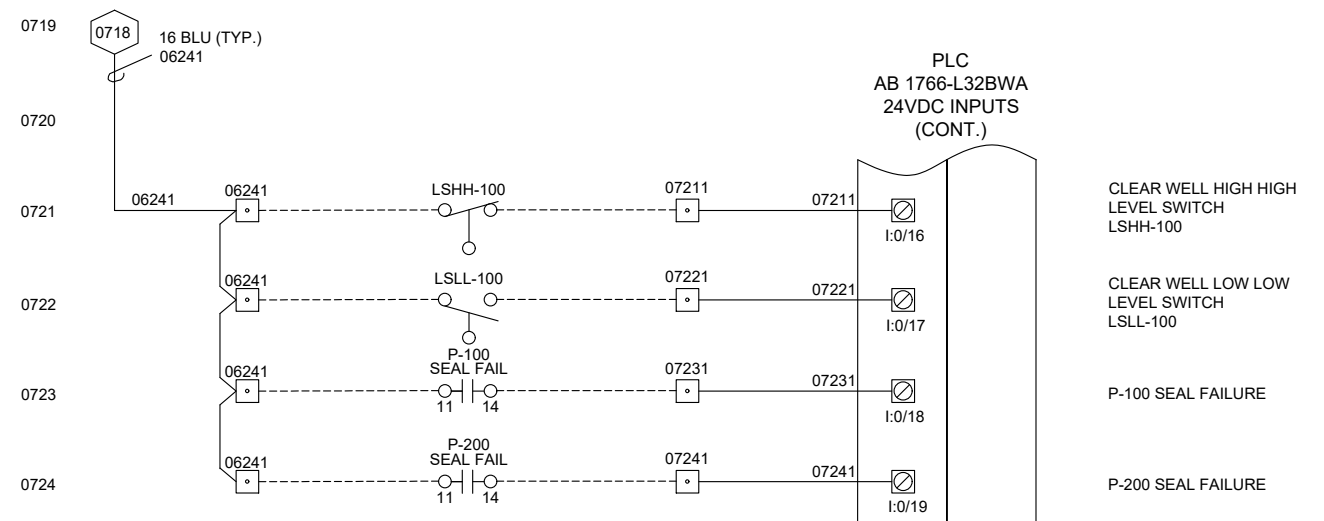
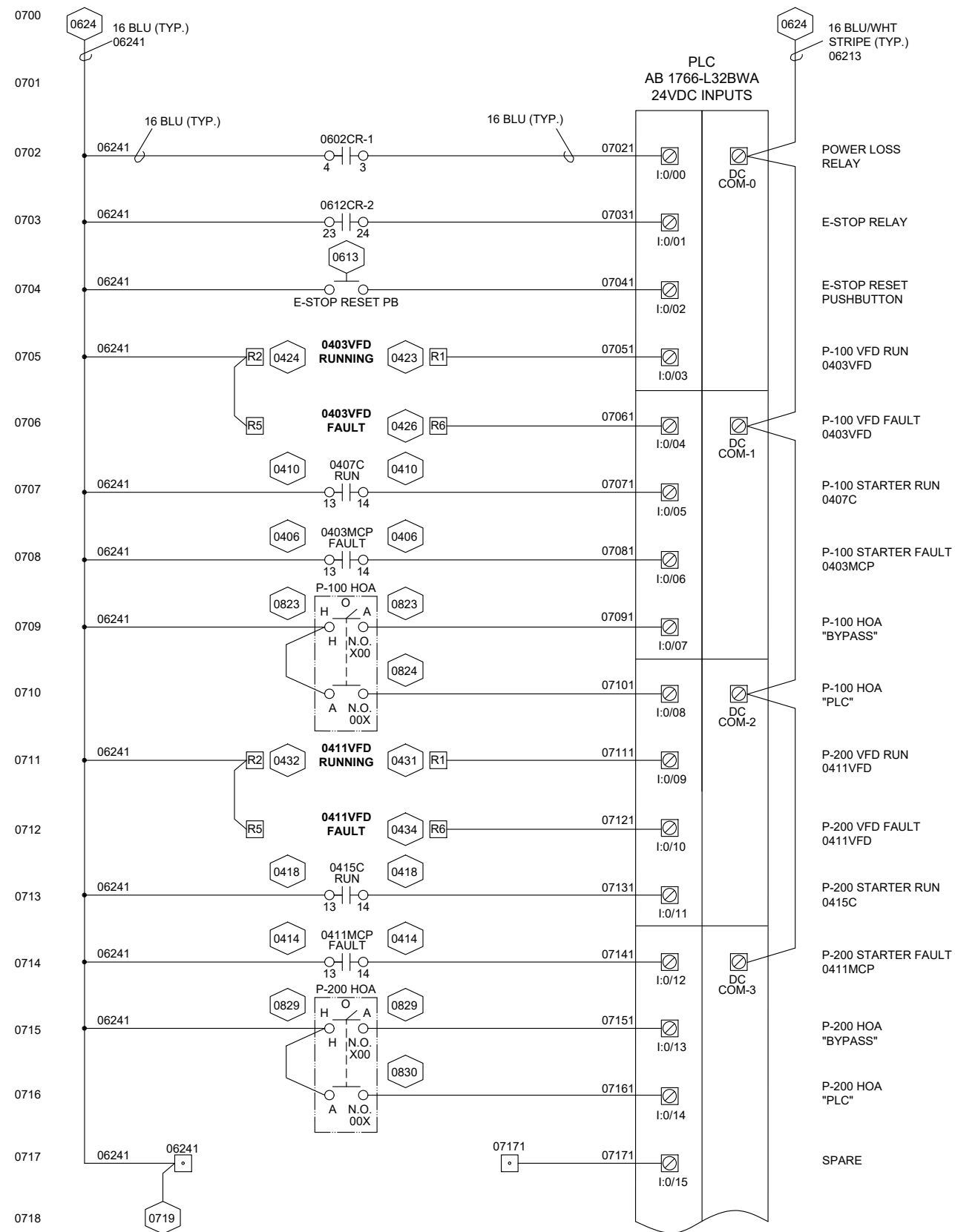
SEAL

**DUAL PHASE EXTRACTION SYSTEM
MOTOR CONTROL ENCLOSUE (MCE-1)
SHOP DRAWINGS
CHEVRON SEATTLE**

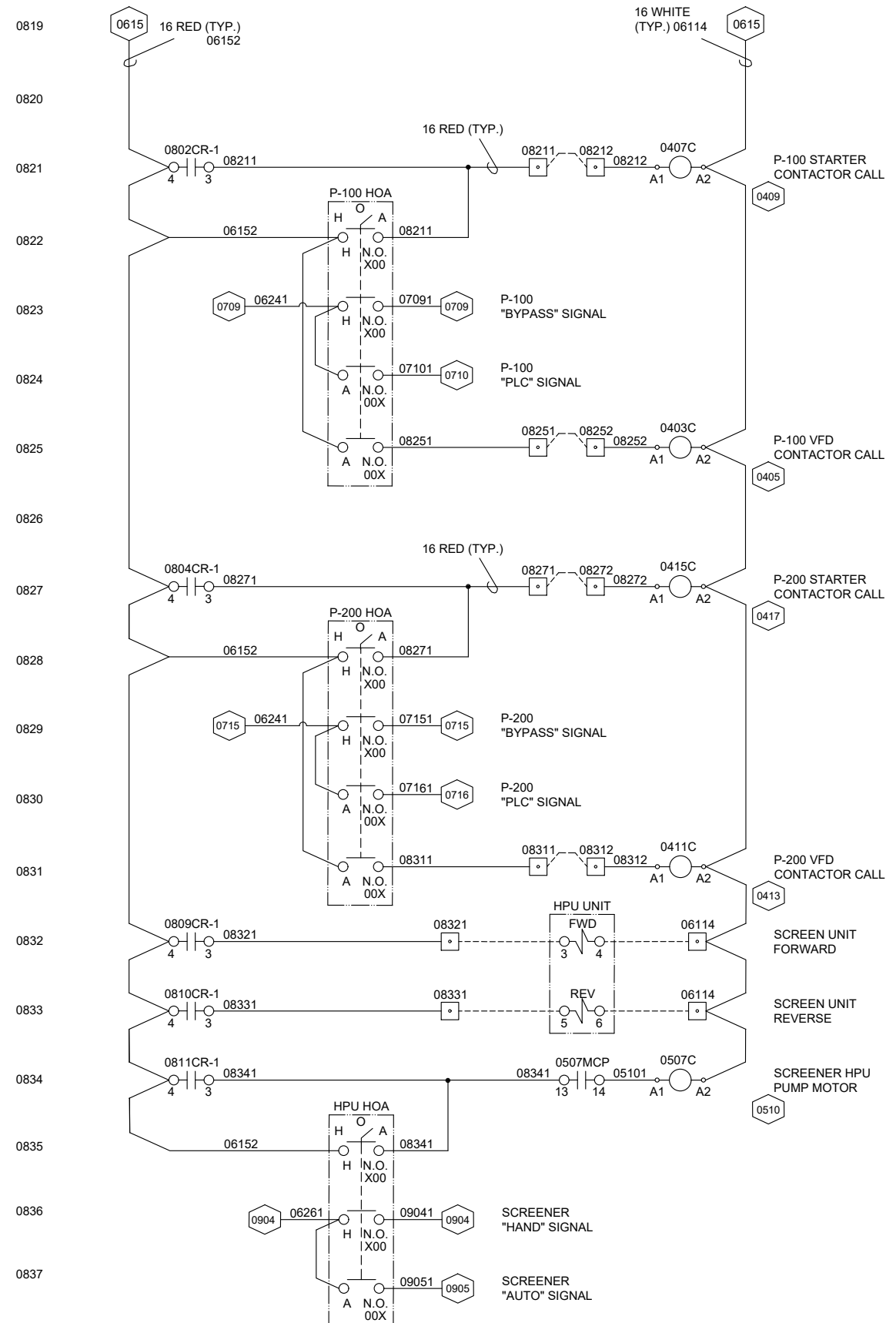
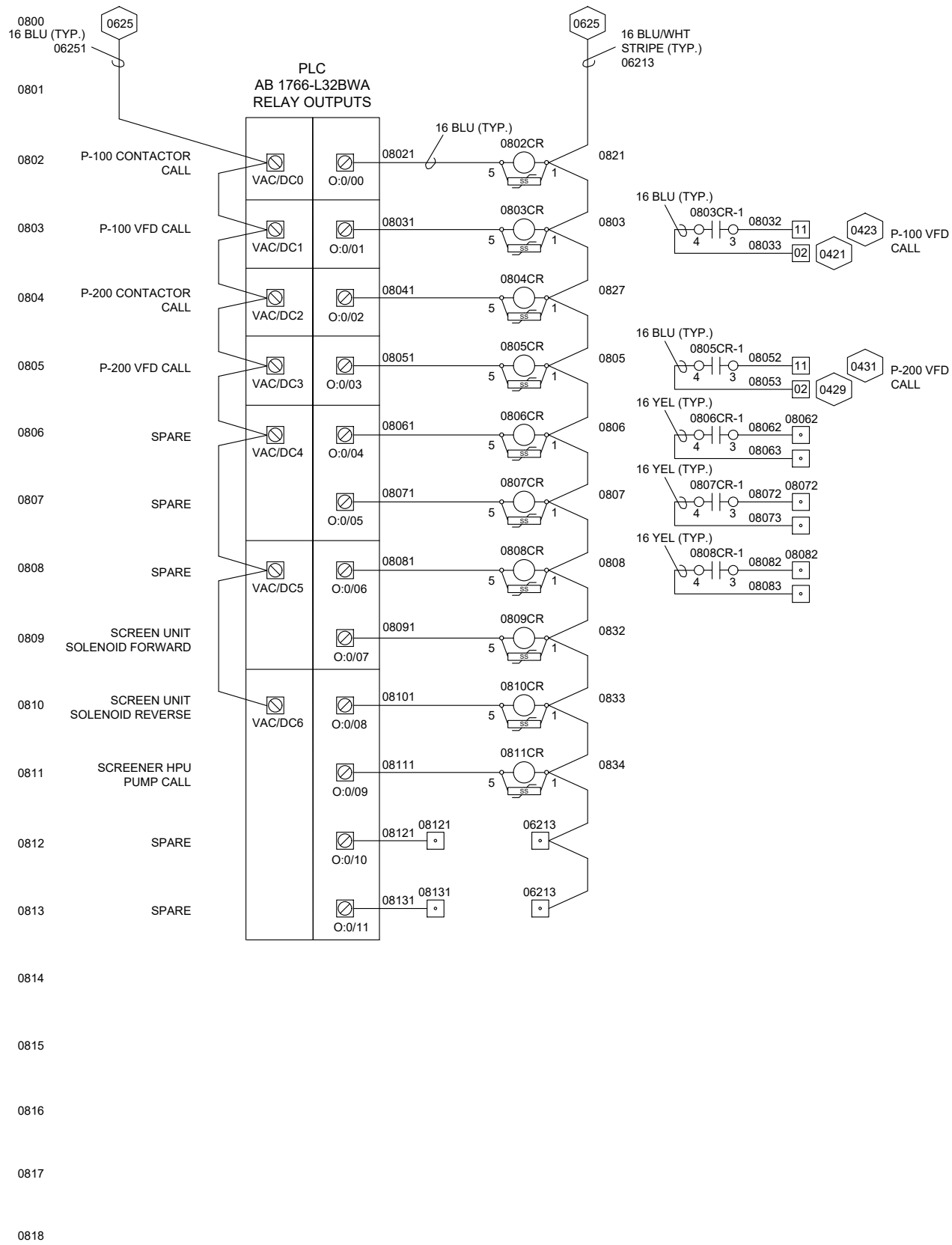
SHEET TITLE
**MCP-2
120VAC & 24VDC CONTROL
POWER DISTRIBUTION**

APPROVED BY
JK
DESIGNED BY
BMA
PROJECT NUMBER
Q14972

CHECKED BY
JK
DRAWN BY
BMA
DRAWING NUMBER
I-06
SHEET **6** OF **5**



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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-07
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK							
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D						SHEET 7 OF 5	



REV.	ISSUED DATE	DESCRIPTION	BY	CK'D
2	7/23/2021	CONSTRUCTION RECORD	BMA	JK
1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK
0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK

SEAL

Prepared for:



ARCADIS
2300 Clayton Rd
Concord, CA
Tel: (925) 274-1100
www.arcadis.com

Prepared by:

Flitway Technologies, Inc.
2129 E Birchwood Ave.
Cudahy, WI 53110
Tel: (414) 483-5600 Fax: (414) 483-1957
www.flitway.com

**DUAL PHASE EXTRACTION SYSTEM
MOTOR CONTROL ENCLOSUE (MCE-1)
SHOP DRAWINGS
CHEVRON SEATTLE**

SHEET TITLE

**MCP-2
PLC EMBEDDED
RELAY OUTPUTS**

APPROVED BY
JK

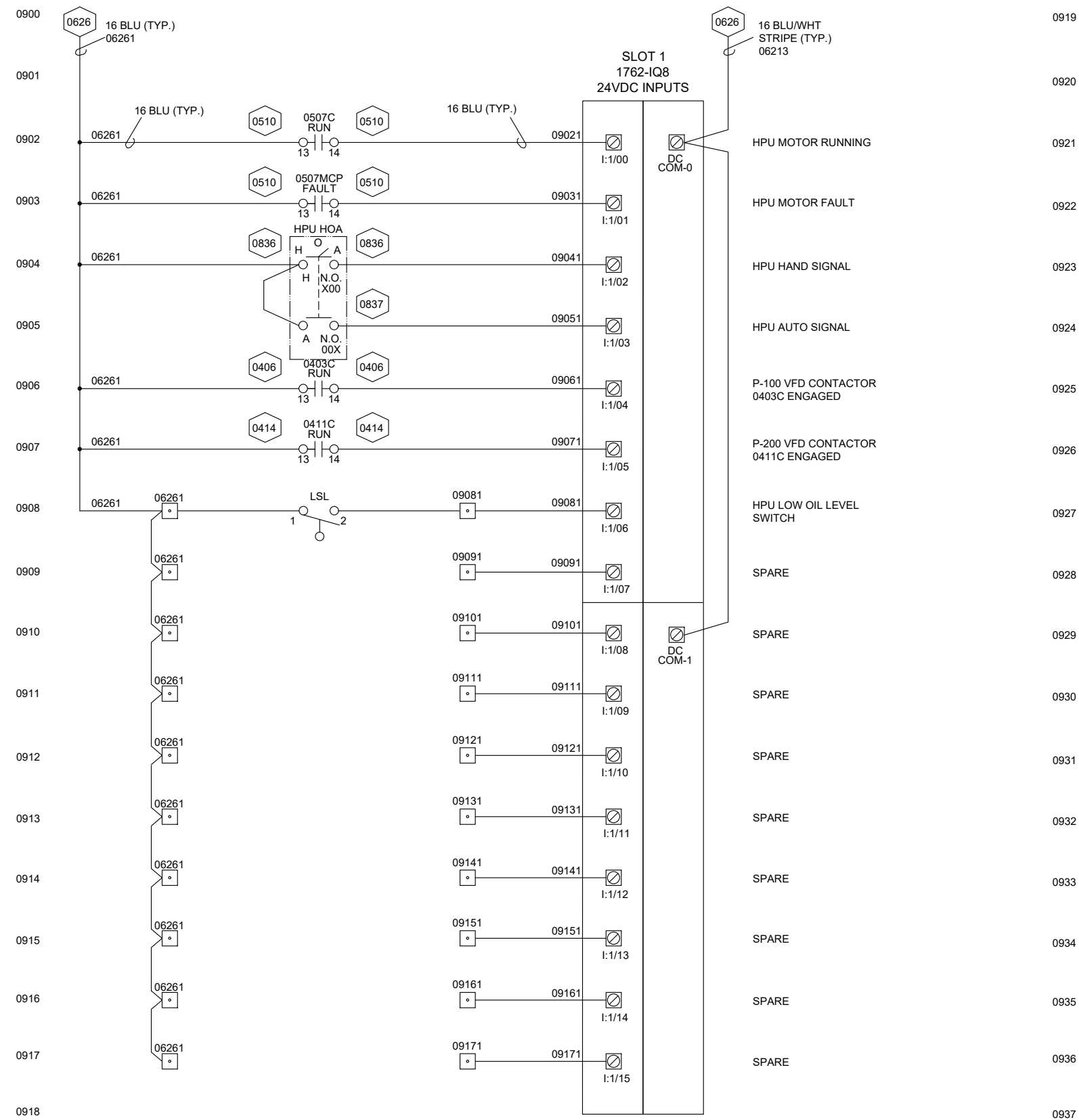
DESIGNED BY
BMA

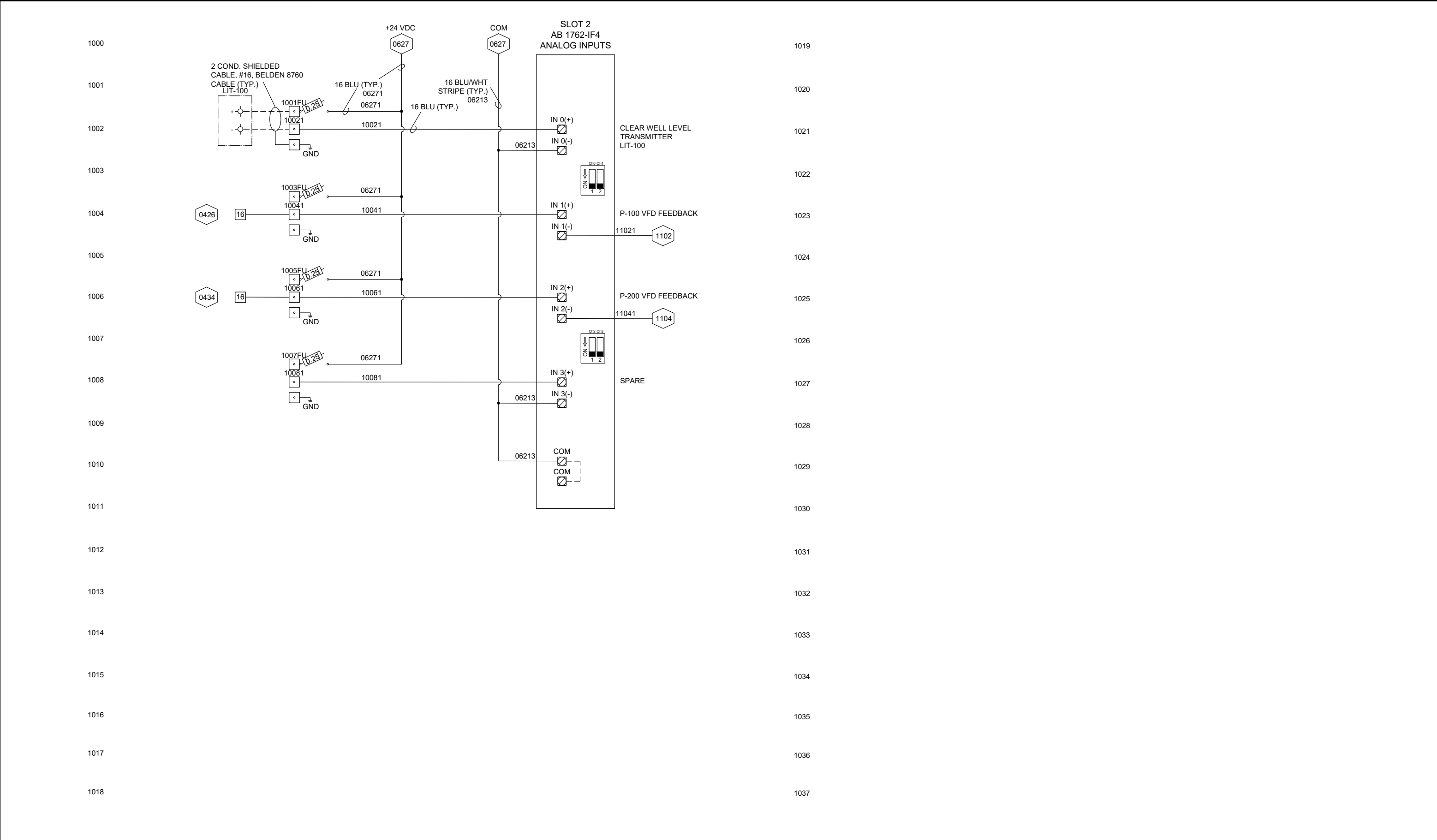
PROJECT NUMBER
Q14972

CHECKED BY
JK

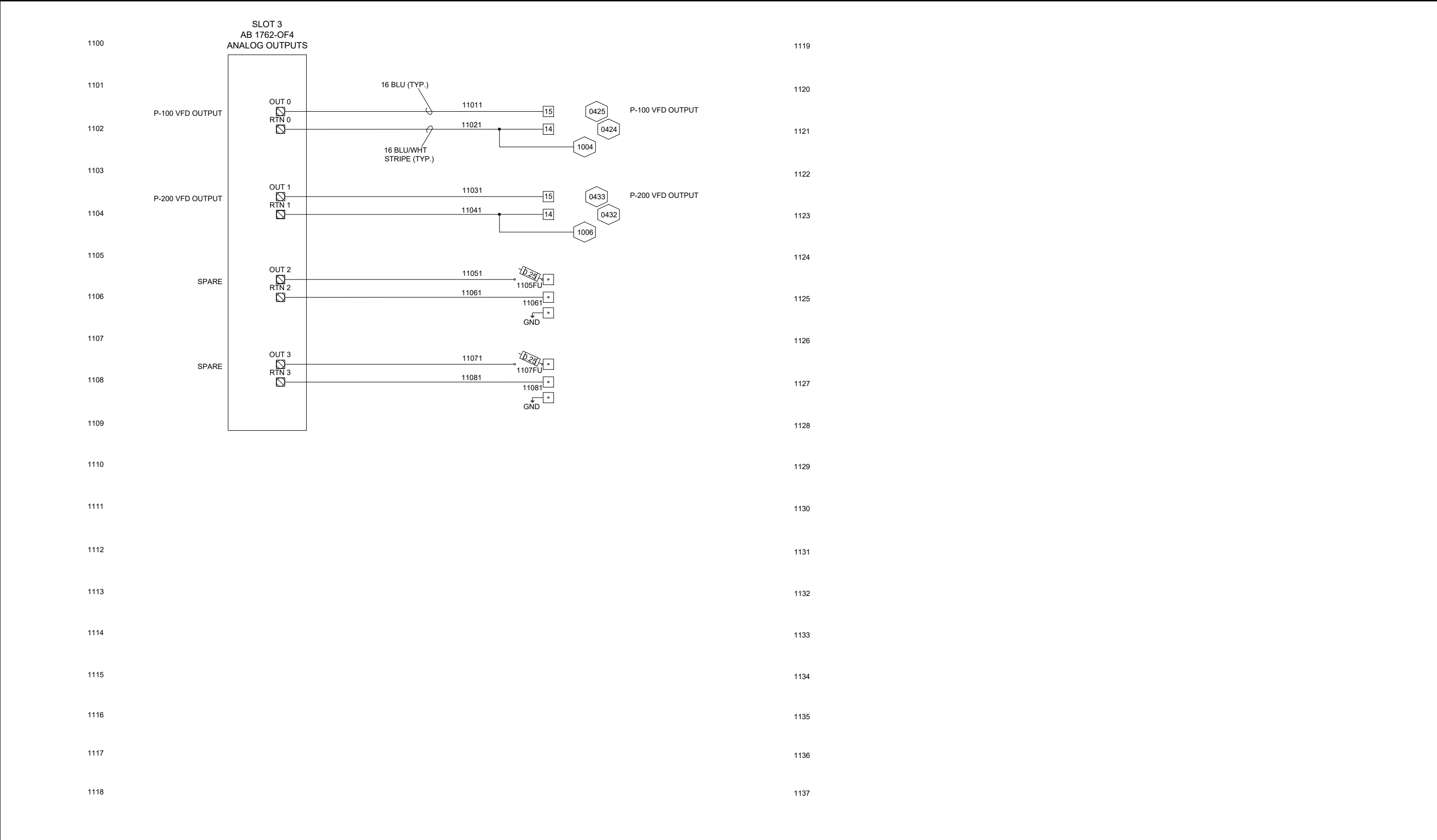
DRAWN BY
BMA

DRAWING NUMBER
I-08
SHEET **8** OF **5**





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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-10
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK							
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D							SHEET 10 OF 5



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											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-11
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK						SHEET 11 OF 5	
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D							

DUAL PHASE EXTRACTION SYSTEM
REMOTE CONTROL PANEL (RCP)
SHOP DRAWINGS
FORMER CHEVRON STATION
SEATTLE, WA

PREPARED BY:

MAIN OFFICE
PRESIDIO SYSTEMS, INC.
159 Wright Brothers Ave.
Livermore, CA 94551
Tel: (925) 456-8400 Fax: (925) 456-8404
www.presidiosystems.com

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PREPARED FOR:

ARCADIS
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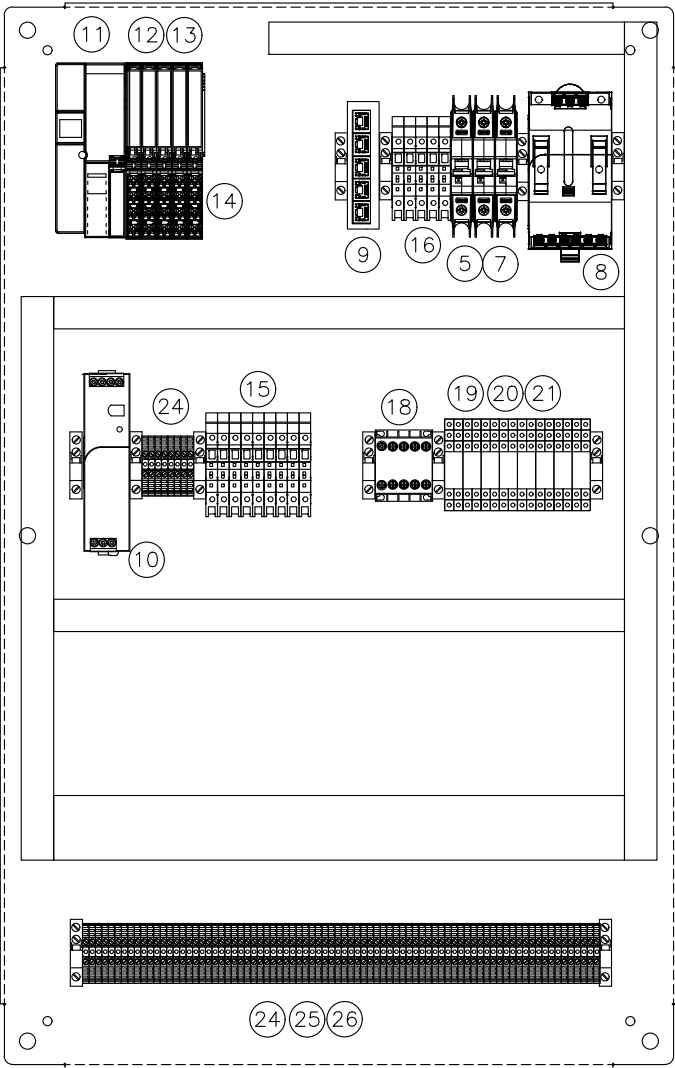
- I-01: MAIN CONTROL PANEL SHOP DRAWINGS TITLE SHEET
- I-02: EXTERNAL LAYOUT
- I-03: BILL OF MATERIALS & INTERNAL SUBPANEL LAYOUT
- I-04: 120VAC & 24VDC POWER DISTRIBUTION
- I-05: PLC EMBEDDED 24VDC INPUTS
- I-06: PLC EMBEDDED 24VDC OUTPUTS
- I-07: SLOTS 2 & 3 ANALOG INPUTS

© FLITEWAY TECHNOLOGIES, INC.						SEAL	Prepared for: ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com	Prepared by: Fliteway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.fliteway.com	DUAL PHASE EXTRACTION SYSTEM REMOTE CONTROL PANEL (RCP) SHOP DRAWINGS CHEVRON SEATTLE	SHEET TITLE RCP PANEL DRAWINGS TITLE SHEET	APPROVED BY JK	CHECKED BY JK
											DESIGNED BY BMA	DRAWN BY BMA
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK						PROJECT NUMBER Q14972	DRAWING NUMBER I-01
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK						SHEET 1 OF 7	
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK							
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D							

Item	Manufacturer	Part Number	Description	Qty
1	Saginaw	SCE-36EL2412LP	Single-Door Enclosure, NEMA 4, 36"H x 24"W x 12"D	1
2	Saginaw	SCE-36P24	Subpanel for Above	1
3	Hoffman	LEDA1M35	Panel Light, 120VAC, On/Off	1
4	Hoffman	PDFSWD	Door Switch	1
5	Allen-Bradley	1489-M1C200	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 20A	2
6	Allen-Bradley	1489-M1C100	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 10A	1
7	Allen-Bradley	1489-M1C070	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 7A	2
8	Allen-Bradley	1489-M1C050	Miniature Circuit Breaker, AC/DC, 1 Pole, C Curve, 5A	1
9	Allen-Bradley	4983-DC120-20	120VAC, 20A Surge Protector	1
10	C-More	EA9-T10WCL	C-More EA9 Series 10" Touch Screen HMI	1
11	Allen-Bradley	1783-US8T	8-port unmanaged switch	1
12	Allen-Bradley	1606-XLE240E	Power Supply, 24-28V DC, 240 W, 120/240V AC Input Voltage	1
13	Sola	SDU500A	500VA, 120VAC Uninterruptible Power Supply	1
14	Allen-Bradley	1734-AENT	Point IO Ethernet Adapter	1
16	Allen-Bradley	1734-IE8C	24V Dc 8 Channel High Density Analog Current Input Module	1
17	Allen-Bradley	1734-IE4C	24V Dc 4 Channel High Density Analog Current Input Module	1
18	Allen-Bradley	1734-TB	Terminal Block for 1734 Chassis	7
19	Allen-Bradley	1492-WFB424	24-VDC Fuse Holder w/ Blown Fuse Indication	10
20	Allen-Bradley	1492-WFB250	120-VAC Fuse Holder w/ Blown Fuse Indication	8
21	Allen-Bradley	1492-REC15G	DIN Rail Receptacle, 15A, Ground Fault Current Interrupt	1
22	Allen-Bradley	700-K22Z-D	Control relay, 4P, 120V Coil, 2 NO, 2 NC	1
23	Allen-Bradley	700-K40E-ZJ	Control relay, 4P, 24VDC Coil, 4 NO	2
24	Allen-Bradley	700-HK36A1	700-HK General Purpose Slim Line Relay, 16 Amp Contact, SPDT, 120VAC	1
25	Allen-Bradley	700-HK36Z24	700-HK General Purpose Slim Line Relay, 16 Amp Contact, SPDT, 24VDC	8
26	Allen-Bradley	700-HN221	Screw Terminal Socket - Panel or DIN Rail Mounting 8-blade miniature socket with 16 A rating	9
27	Allen-Bradley	700-ADR	Diode Surge Suppressor Module, 6...220V DC	8
28	Allen Bradley	800FP-P7PN5W	22mm 120VAC White LED Pilot Light	1
29	Allen-Bradley	800FP-MT44PX02	40mm Mushroom Operator, Twist to Release, 40mm, Red, 2 N.C. Contact(s)	1
30	Allen-Bradley	800FP-F2PX20	22mm Push Button - Flush, Black, 2 N.O. Contacts	1
31	Allen-Bradley	800FP-SM32PX30	22mm 3 Pos. Selector Switch - Plastic, Maintained, Black, Standard Knob, 3 NO Contact Blocks	2
32	Allen-Bradley	1492-J3	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm (#12 AWG - #12 AWG)	100
33	Allen-Bradley	1492-JG3	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm (#22 AWG - #12 AWG) - Grounding	20
34	Allen-Bradley	1492-J3P	1492-J IEC Term. Block, One-Circuit Feed-Thru Block, 3 mm(#22 AWG - #12 AWG) - Fusible	24
35	Allen-Bradley	1492-FPK224	Plug w/ Blown Fuse Ind (24-VDC)	12
36	Allen-Bradley	1492-FPK2120	Plug w/ Blown Fuse Ind (120-VAC)	12
37	Allen-Bradley	1492-EAJ35	End Anchor, DIN Rail - Heavy Duty	25
38	Allen-Bradley	1492-DR6	Dinrail, Aluminum, 35MM, Raised	1
39	Allen-Bradley	1492-DR7	Dinrail, Aluminum, 35MM, Raised, Angled	1
40	Allen-Bradley	199-DR1	Dinrail, zinc-plated steel, 35MM	4
41	Eaton	GBK10	10 Terminal Ground Bar kit	1
42	Panduit	TBD	2" Wiring Duct, Grey	20
43	Panduit	TBD	1.5" Wiring Duct, Grey	20

BILL OF MATERIALS (BOM)

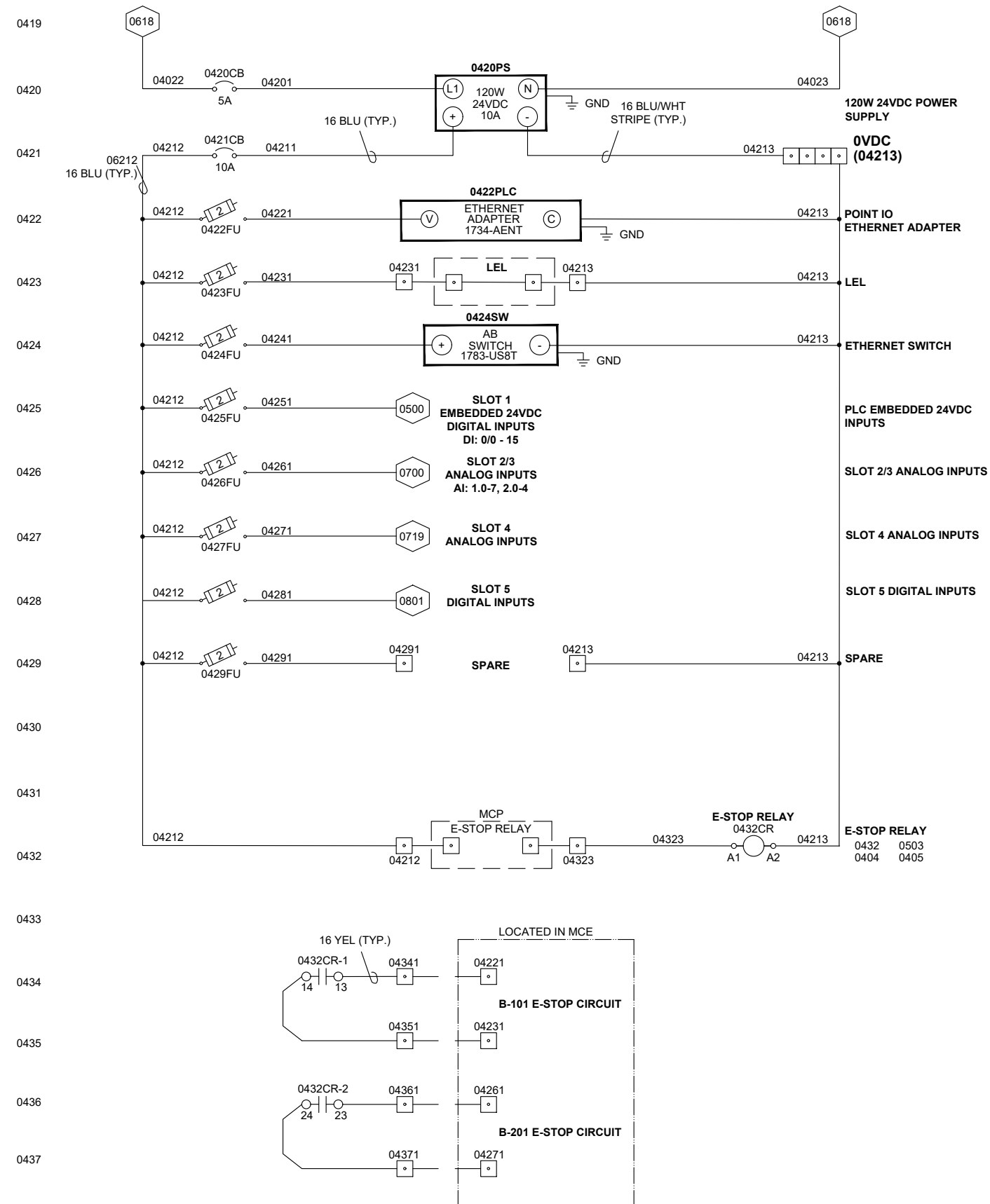
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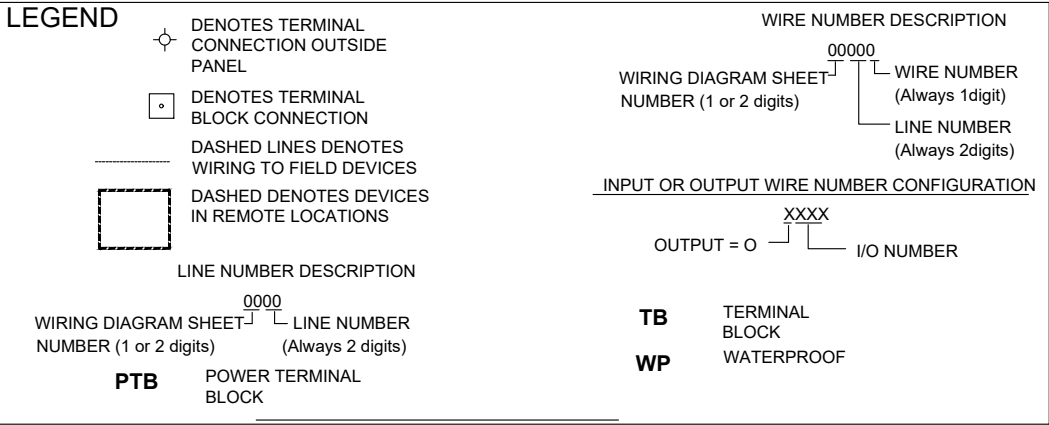
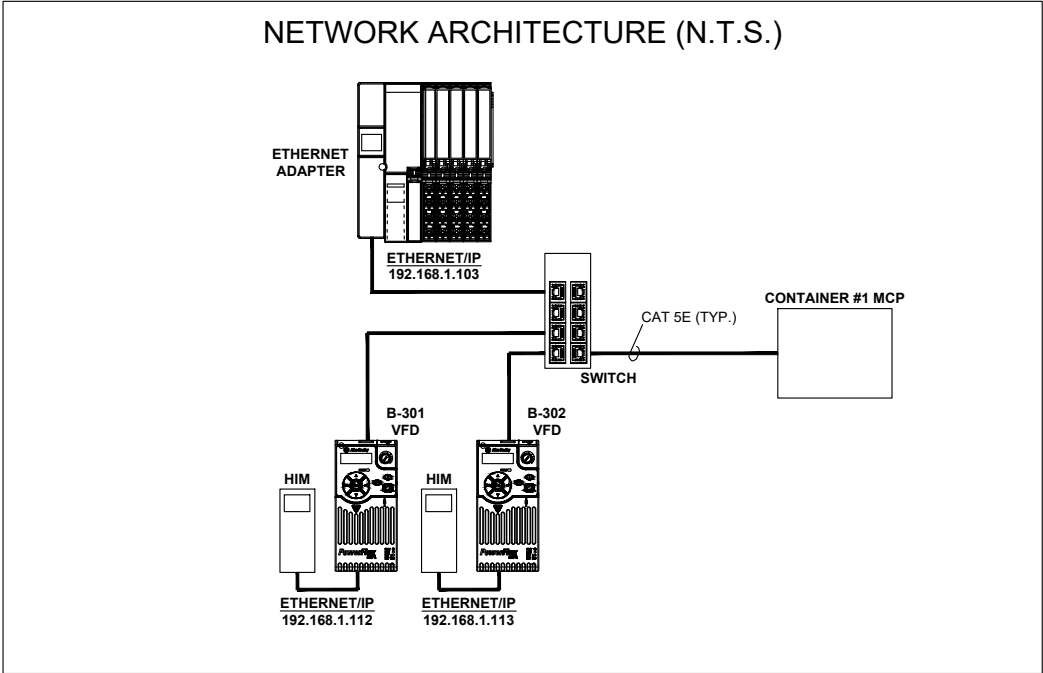
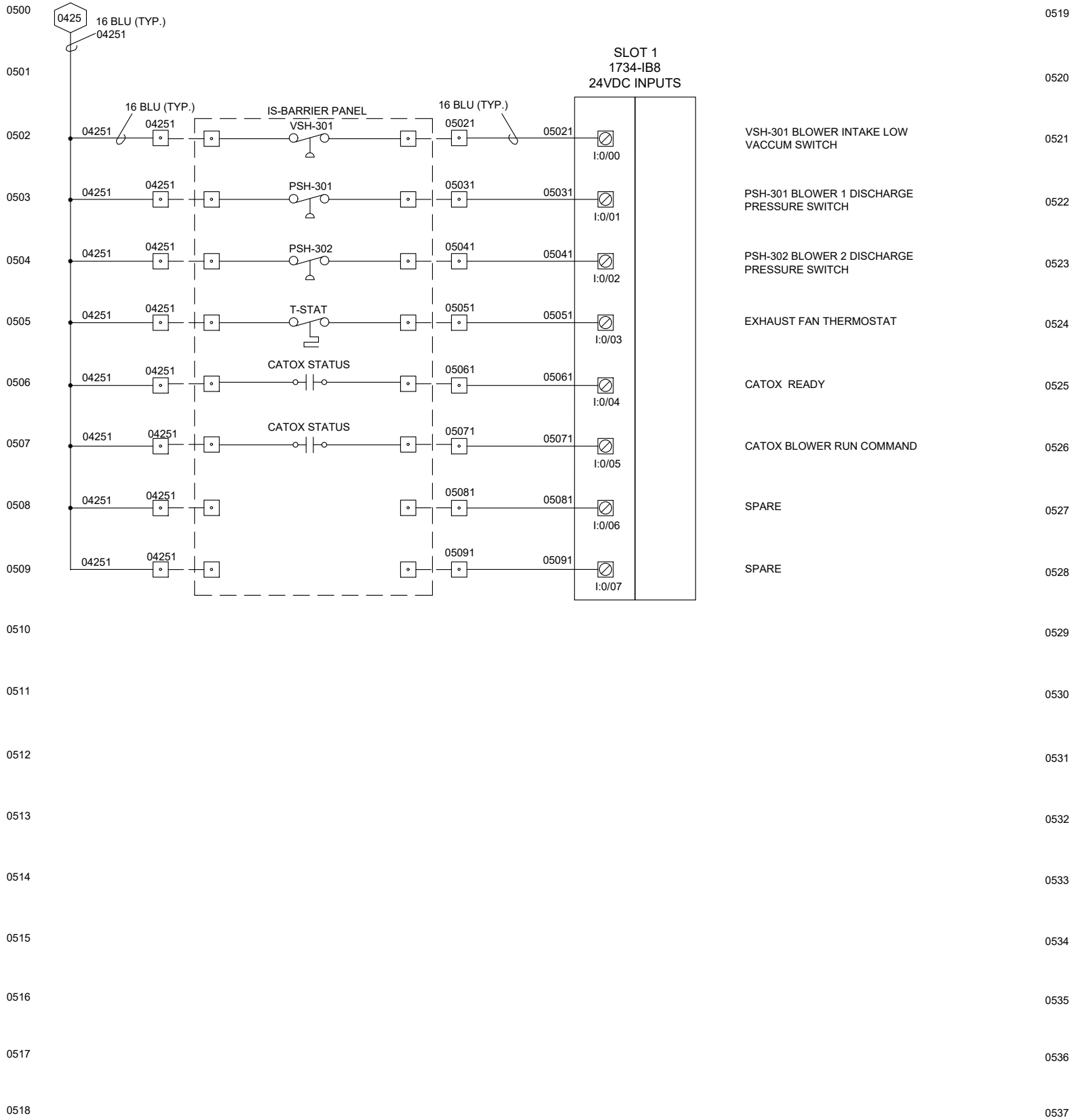


INTERNAL (SUBPANEL) VIEW

SCALE: AS SHOWN

© FLUTEWAY TECHNOLOGIES, INC.						SEAL	Prepared for:	Prepared by:	DUAL PHASE EXTRACTION SYSTEM REMOTE CONTROL PANEL (RCP) SHOP DRAWINGS CHEVRON SEATTLE	SHEET TITLE RCP BILL OF MATERIALS & INTERNAL SUBPANEL LAYOUT	APPROVED BY	CHECKED BY		
							 ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com	 Fluteway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.fluteway.com			DESIGNED BY	DRAWN BY		
	2	7/23/2021	CONSTRUCTION RECORD	BMA	JK	BMA					BMA			
	1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK	PROJECT NUMBER Q14972					DRAWING NUMBER I-03			
	0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK									
	REV.	ISSUED DATE	DESCRIPTION	BY	CK'D									





REV.	ISSUED DATE	DESCRIPTION	BY	CK'D
2	7/23/2021	CONSTRUCTION RECORD	BMA	JK
1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK
0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK

SEAL

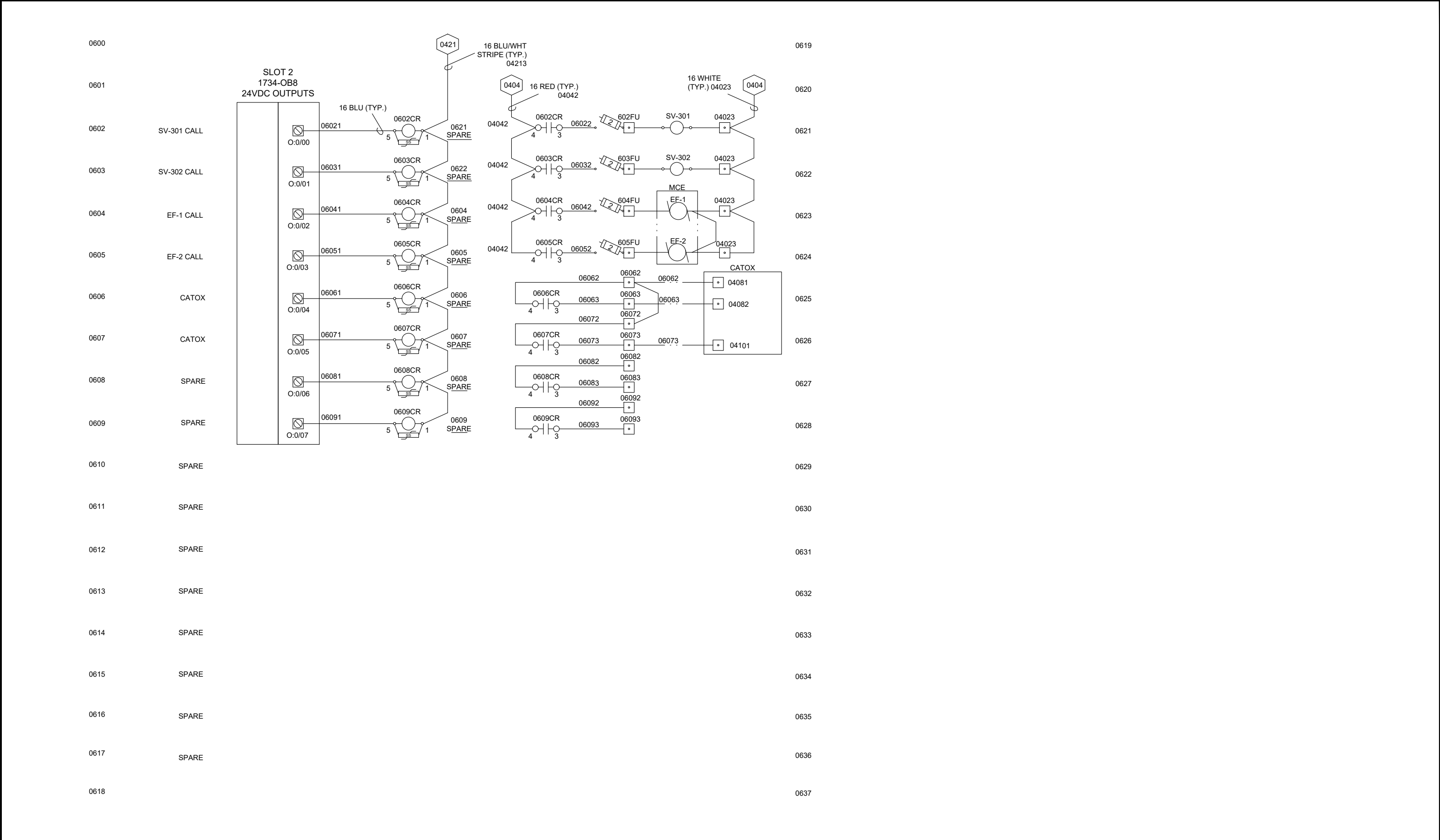
Prepared for:
ARCADIS
ARCADIS 2300 Clayton Rd Concord, CA Tel: (925) 274-1100 www.arcadis.com

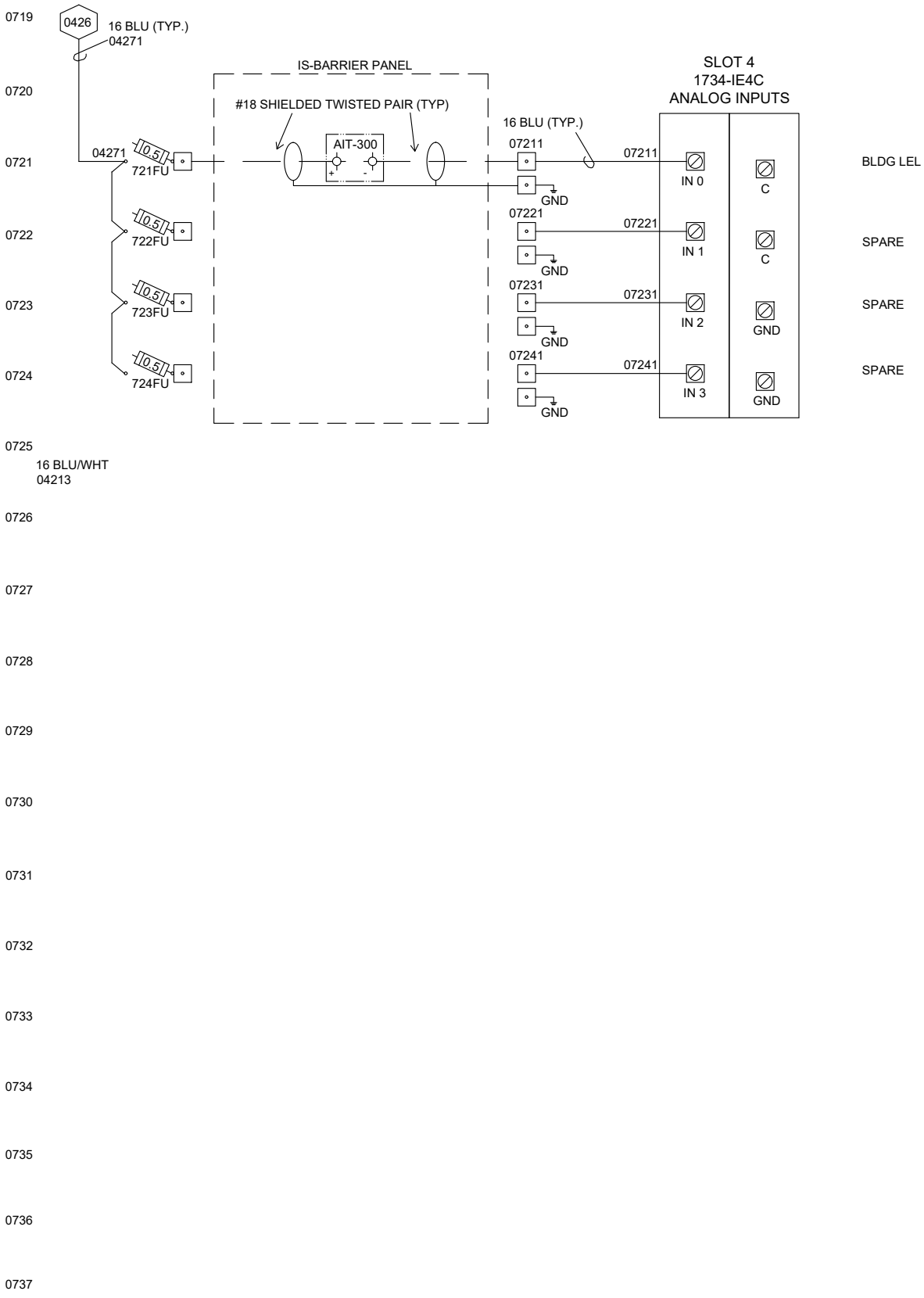
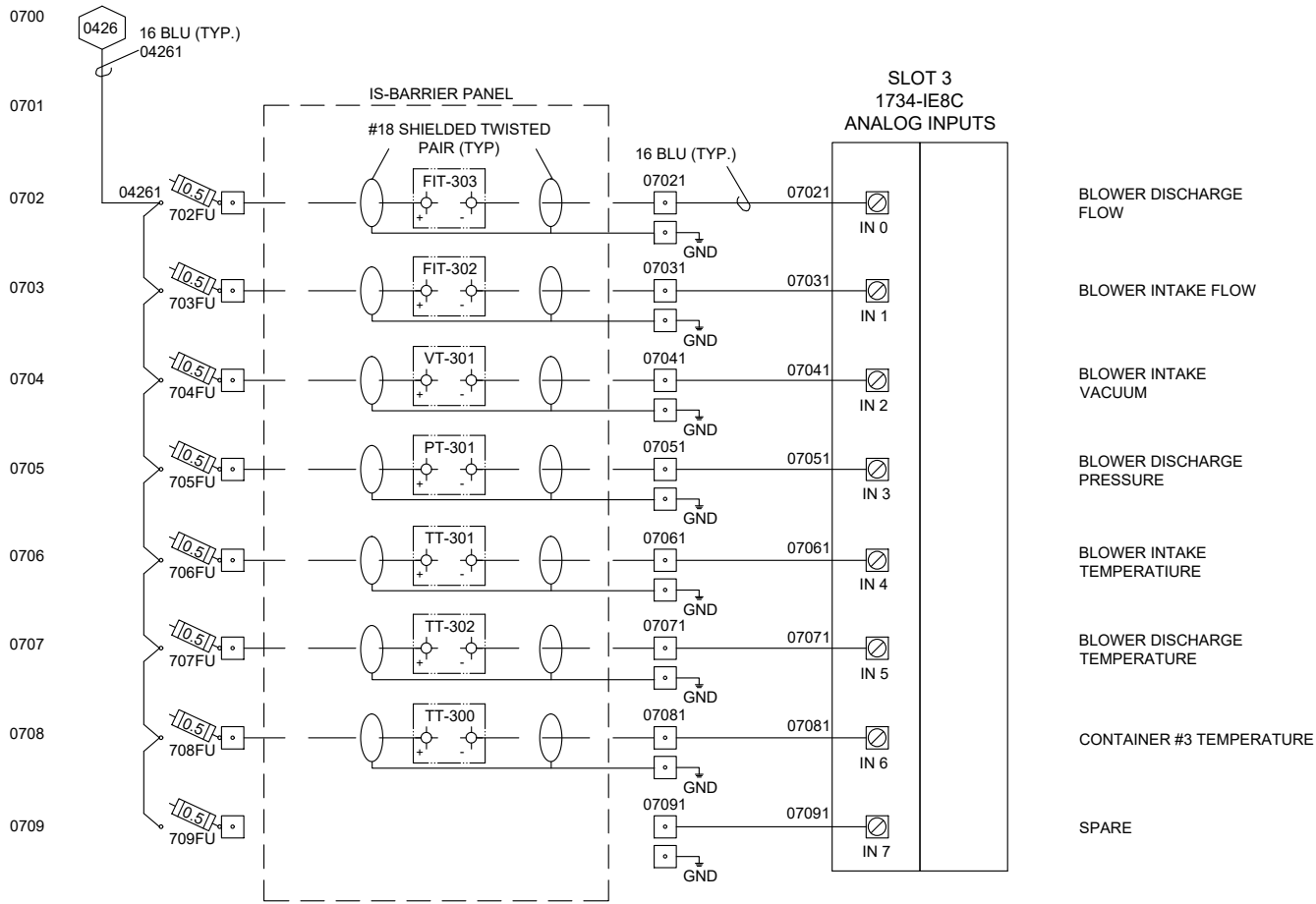
Prepared by:
Flitway Technologies, Inc.
Flitway Technologies, Inc. 2129 E Birchwood Ave. Cudahy, WI 53110 Tel: (414) 483-5600 Fax: (414) 483-1957 www.flitway.com

DUAL PHASE EXTRACTION SYSTEM REMOTE CONTROL PANEL (RCP) SHOP DRAWINGS CHEVRON SEATTLE
--

SHEET TITLE
MCP-2 PLC EMBEDDED 24VDC INPUTS

APPROVED BY JK	CHECKED BY JK
DESIGNED BY BMA	DRAWN BY BMA
PROJECT NUMBER Q14972	DRAWING NUMBER I-05
	SHEET 5 OF 7





REV.	ISSUED DATE	DESCRIPTION	BY	CK'D
2	7/23/2021	CONSTRUCTION RECORD	BMA	JK
1	5/27/2020	DRAFT- ISSUED FOR REVIEW	BMA	JK
0	4/15/2020	DRAFT- ISSUED FOR REVIEW	BDC	JK

SEAL

Prepared for:

ARCADIS

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Prepared by:

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Tel: (414) 483-5600 Fax: (414) 483-1957
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**DUAL PHASE EXTRACTION SYSTEM
REMOTE CONTROL PANEL (RCP)
SHOP DRAWINGS
CHEVRON SEATTLE**

SHEET TITLE

**MCP-2
SLOTS 1 & 2
ANALOG INPUTS**

APPROVED BY **JK**

DESIGNED BY **BMA**

PROJECT NUMBER **Q14972**

CHECKED BY **JK**

DRAWN BY **BMA**

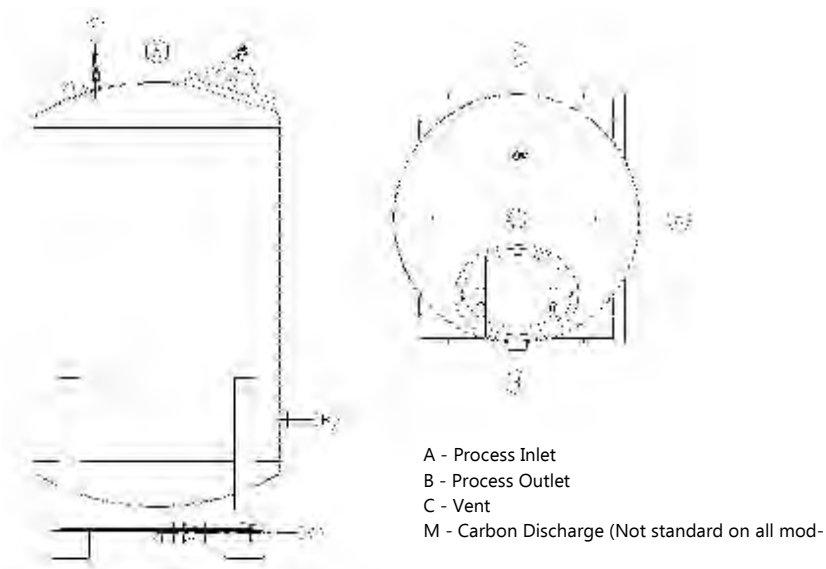
DRAWING NUMBER **I-07**

SHEET **7** OF **7**

HPAF SERIES FILTERS

HPAF series filters are designed to treat liquid streams in a wide variety of adsorption applications. The modular design enables the units to easily fit into a wide variety of installations. Standard features include steel construction with epoxy internal coating, efficient internal collector array, forklift skid and lifting eyes.

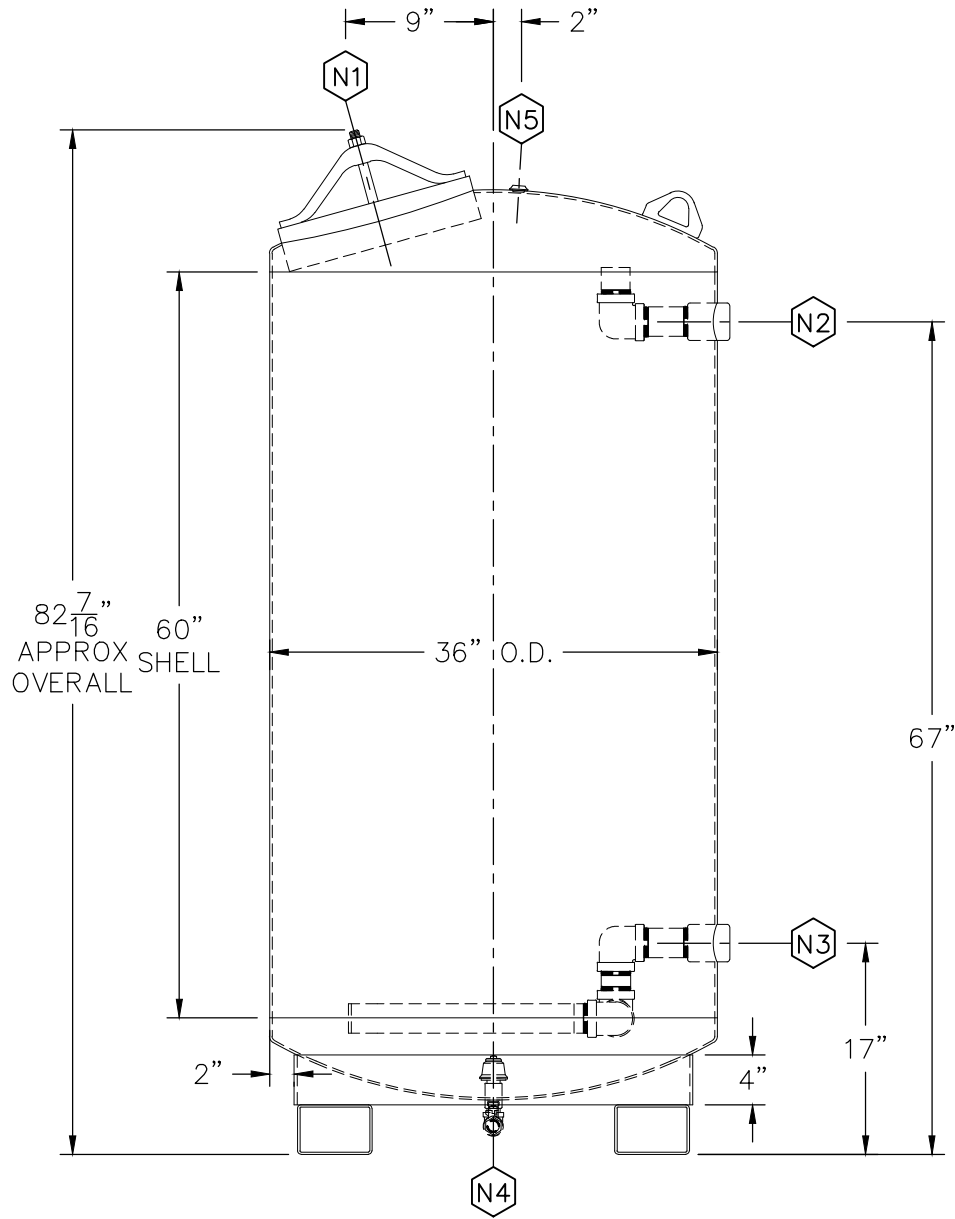
A wide variety of options and contact medias are available, con-



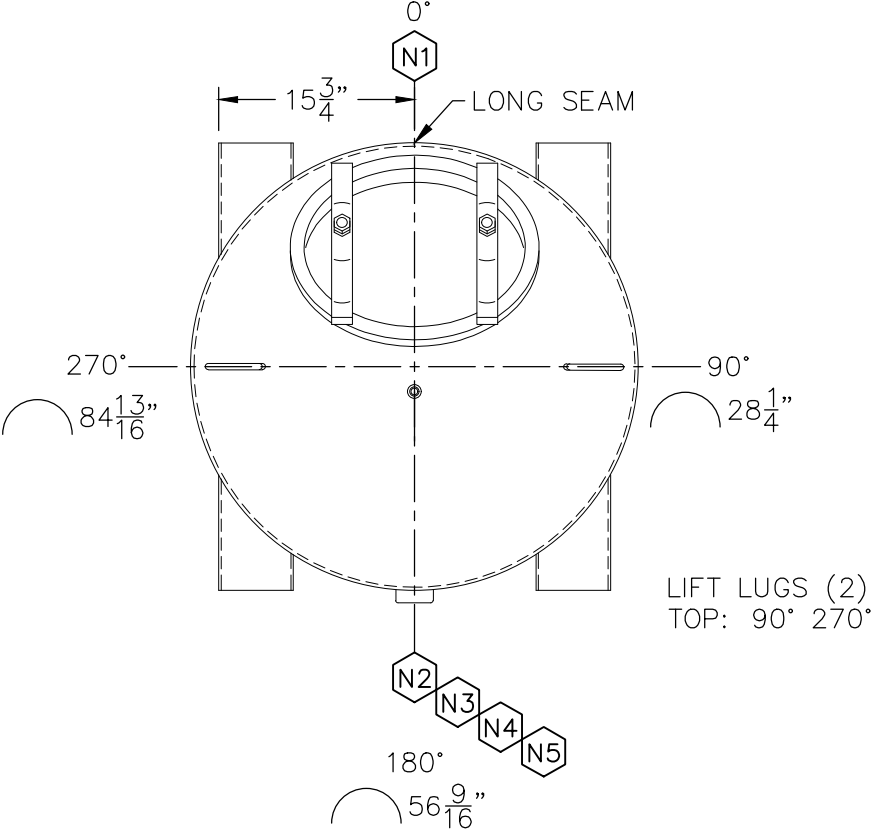
Standard Model Shown - Detailed Submittal Drawings Available

HPAF SERIES STANDARD SPECIFICATIONS

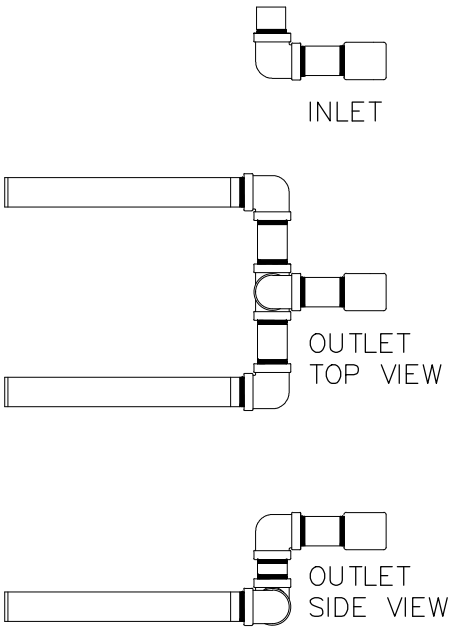
Model Number	HPAF-500	HPAF-1000	HPAF-2000	HPAF-3000	HPAF-5000	HPAF-10,000	L10
Overall Height	5'11"	7'2"	8'6"	8'11"	9'11"	10'9"	15'10"
Diameter	30"	36"	48"	60"	72"	96"	120"
Process Connection	2" FNPT	2" FNPT	3" FNPT	3" FNPT	4" FNPT	6" FLNG	8" FLNG
Typical GAC Fill (28#/FT ³)	500 Lbs	1,000 Lbs	2,000 Lbs	3,000 Lbs	5,000 Lbs	10,000 Lbs	20,000 Lbs
Shipping Weight (empty)	350 Lbs	535 Lbs	1,020 Lbs	1,525 Lbs	2,490 Lbs	3,800 Lbs	7,250 Lbs
Operational Weight	1,700 Lbs	3,300 Lbs	6,800 Lbs	10,700 Lbs	17,900 Lbs	31,200 Lbs	68,400 Lbs
Optimal Water Flows at standard conditions	8-25 GPM	10 to 35 gpm	15 to 70 gpm	25 to 120 gpm	35 to 165 gpm	60 to 300 gpm	100 to 480 gpm
Available Bed Volume	20 FT ³	35 FT ³	75 FT ³	117 FT ³	196 FT ³	400 FT ³	780 FT ³
Maximum Pressure	75 PSIG	75 PSIG	75 PSIG	75 PSIG	75 PSIG	75 PSIG	75 PSIG
Maximum Vacuum	28" Hg	28" Hg	28" Hg	28" Hg	28" Hg	28" Hg	28" Hg



ELEVATION VIEW
NOT TRUE ORIENTATION




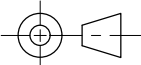
PLAN VIEW
TRUE ORIENTATION



INTERNALS

NOZZLE SCHEDULE		
ID	DESCRIPTION	SERVICE
N1	14" x 18" ELLIPTICAL MANWAY w/COVER	UPPER BED ACCESS
N2	2" 3000# FNPT FULL COUPLING	PROCESS INFLUENT
N3	2" 3000# FNPT FULL COUPLING	PROCESS EFFLUENT
N4	1/2" 3000# FNPT FULL COUPLING	DRAIN w/ BALL VALVE
N5	1/4" FNPT TANK FLANGE	VENT w/ PILOT

VESSEL DESIGN DATA			
VESSEL REGISTRATION	N/A	YEAR BUILT	NOT YET BUILT
VESSEL CONSTRUCTION	NON-CODE	VESSEL SERIAL NUMBER	TBD
INTERNAL DESIGN PRESSURE	75 PSIG	CAPACITY (VOLUME)	35 CUBIC Ft
INTERNAL DESIGN TEMP.	140 DEG. F	SHIPPING WEIGHT	790 Lbs
EXTERNAL DESIGN PRESSURE	ATMOSPHERIC	OPERATIONAL WEIGHT	4128 Lbs
OPERATING PRESSURE	N/A	SHELL 1 MATERIAL	SA-36 ROLLED PLATE NOM. TH. = 0.1875"
OPERATING TEMP.	N/A	SHELL 2 MATERIAL	N/A
MIN. DESIGN METAL TEMP.	-20 DEG. F @ 75 PSIG	TOP HEAD MATERIAL	SA-36 HOT FORMED NOM. TH. = 0.1875"
MAWP (NEW & COLD)	91.94 PSI (LMTD BY HEAD)	BOTTOM HEAD MATERIAL	SA-36 HOT FORMED NOM. TH. = 0.1875"
MAWP (HOT & CORRODED)	91.94 PSI (LMTD BY HEAD)	NOZZLES NECKS/CPLGS	SA-106-B, SA-105, SA-312-TP304
HYDROSTATIC TEST PRESSURE	97.50 PSI	GASKETS	BUNA-N
HYDROSTATIC TEST MEDIUM	WATER	INTERNALS	STAINLESS STEEL
CORROSION ALLOWANCE	NONE	SURFACE PREP INTERNAL	SSPC-SP10
RADIOGRAPHY	NONE	SURFACE PREP EXTERNAL	SSPC-SP6
POST WELD HEAT TREAT.	N/A	INTERNAL COATING	CARBOLINE CARBOGUARD 635 5-10 MILS DFT
MATERIAL IMPACT TESTS	N/A	EXTERNAL PRIMER	CARBOLINE CARBOGUARD 635 5-10 MILS DFT
MATERIAL HARDNESS	N/A	EXTERNAL PAINT/COATING	CARBOLINE CARBOTHANE 8845 (BLUE) 3-5 MILS DFT

<div></div> <div>1424 ABRAHAM DRIVE ANDERSON, INDIANA 46013</div> <div>Ph: (765) 643-3941 Fx: (765) 643-3949</div>		REV NO	REVISION NOTE	DATE	SIGNATURE	
		1				
		2				
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		5				
	ALL INFORMATION CONTAINED IN THIS DOCUMENT IS PROPERTY OF TETRASOLV FILTRATION AND MAY NOT BE REPRODUCED WITHOUT PERMISSION	CUSTOMER TBD		JOB # TBD	DATE 2/20/18	SCALE NTS
		DESIGNED BY S.BLITCHINGTON		HPAF-1000		
		APPROVED BY —		QUANTITY TBD	UNITS IPS	DRAWING # D1,R0

VALVES AND PIPING

GLOBE

BALL

BUTTERFLY

CHECK

GATE

ORIFICE METERING

LUBRICATED PLUG

VACUUM RELIEF

PRESSURE RELIEF

PRESSURE REDUCING INTERNAL RELIEF

PRESSURE REDUCING EXTERNAL PRESSURE

PRESSURE REDUCING DIFFERENTIAL PRESSURE

PRESSURE REDUCING VENTED

3 WAY

REDUCER

Y-STRAINER

SAMPLE/TEST PORT

FLANGE

UNION

ORFICE PLATE

VALVE NORMALLY OPEN

VALVE NORMALLY CLOSED

EQUIPMENT

VAPOR/LIQUID SEPARATOR

AIR STRIPPER

HEAT EXCHANGER

VANE COMPRESSOR

LIQUID RING PUMP

INTAKE SCREEN

FLAME ARRESTOR

SPARK IGNITOR

DOUBLE-ACTING PNEUMATIC ACTUATOR

OIL/WATER SEPERATOR

CENTRIFUGAL FAN

CENTRIFUGAL PUMP

METERING PUMP

INLINE SILENCER

FLAME TRAP

SPRING-RETURN SINGLE-ACTING PNEUMATIC ACTUATOR

GAS QUENCH/SCRUBBER

PARTICULATE SCRUBBER

PRESSURE BLOWER

PROGRESSIVE CAVITY PUMP

REGENERATIVE BLOWER

AIR INTAKE FILTER/SILENCER

FLEX CONNECTOR

FLEXIBLE HOSE CONNECTOR

COMPRESSED AIR RESERVIOR

OBSERVATION VIEW PORT

CONTROL PANEL

VENTILATION FAN

GAS BURNER

ROTARY CLAW BLOWER

PANEL FILTER

COMPRESSED AIR FILTER WITH DRAIN

AIR FLOW INDICATOR

SELF-AVERAGING PITOT STATION

SIGHT TUBE

POSITIVE DISPLACEMENT BLOWER

ELECTRIC HEATER

CERAMIC HEAT EXCHANGE MEDIA

CATALYST REACTOR

LIQUID FLOW METER

PITOT STATIC

MECHANICAL LINK

TYPE, ACTION, OR CONTROL ABBREVIATIONS

AAH

ANALYTICAL ALARM HIGH

AAL

ANALYTICAL ALARM LOW

AC

ALTERNATING CURRENT

AE

ANALYTICAL ELEMENT

AI

ANALOG INPUT

AM

AUTO MANUAL

AO

ANALOG OUTPUT

AT

ANALYTICAL TRANSMITTER

B

BURNER

CV

CONTROL VALVE

DC

DIRECT CURRENT

DI

DIGITAL INPUT

DO

DIGITAL OUTPUT

DPI

DIFFERENTIAL PRESSURE INDICATOR

DPS

DIFFERENTIAL PRESSURE SWITCH

EH

ELECTRIC HEATER

ENET

ETHERNET

F

FAN

FAR

FORWARD AUTO REVERSE

FE

FLOW ELEMENT/SENSOR

FI

FLOW INDICATOR

FIR

FLOW INDICATING RECORDER

FIT

FLOW INDICATING TRANSMITTER

FS

FLOW SWITCH

HOA

HAND OFF AUTO

HS

HAND SWITCH

HV

HAND VALVE

LAH

LEVEL ALARM HIGH

LAL

LEVEL ALARM LOW

LEL

LOWER EXPLOSIVE LIMIT

LSH

LEVEL SWITCH HIGH

LSHH

LEVEL SWITCH HIGH HIGH

LSL

LEVEL SWITCH LOW

LSLL

LEVEL SWITCH LOW LOW

LT

LEVEL TRANSMITTER

M

MOTOR

MV

MOTORIZED VALVE

N

NOZZLE

NC

NORMALLY CLOSED

NO

NORMALLY OPENED

OC

OPEN-CLOSE

OCA

OPEN-CLOSE-AUTO

OO

ON-OFF

OOA

ON-OFF-AUTO

OOR

ON-OFF-REMOTE

P

PUMP

PAH

PRESSURE ALARM HIGH

PAL

PRESSURE ALARM LOW

PC

PRESSURE CONTROL

PCV

PRESSURE CONTROL VALVE

PI

PRESSURE INDICATOR

PIR

PRESSURE INDICATING RECORDER

PIS

PRESSURE INDICATING SWITCH

PIT

PRESSURE INDICATING TRANSMITTER

PLC

PROGRAMMABLE LOGIC CONTROLLER

PRV

PRESSURE RELIEF VALVE

PRX

PRESSURE RELIEF RUPTURE DISK

PS

PRESSURE SWITCH

PSH

PRESSURE SWITCH HIGH

PSL

PRESSURE SWITCH LOW

PT

PRESSURE TRANSMITTER

SR

SPRING RETURN

SS

START-STOP

SSOV

SAFETY SHUT OFF VALVE

SV

SOLENOID VALVE

TAH

TEMPERATURE ALARM HIGH

TAL

TEMPERATURE ALARM LOW

TCV

TEMPERATURE CONTROL VALVE

TE

TEMPERATURE ELEMENT

TI

TEMPERATURE INDICATOR

TIC

TEMPERATURE INDICATING CONTROLLER

TIR

TEMPERATURE INDICATING RECORDER

TIT

TEMPERATURE INDICATING TRANSMITTER

TS

TEMPERATURE SWITCH

TSH

TEMPERATURE SWITCH HIGH

TSL

TEMPERATURE SWITCH LOW

TT

TEMPERATURE TRANSMITTER

VFD

VARIABLE FREQUENCY DRIVE

VRV

VACUUM RELIEF VALVE

XCV

CHECK VALVE

XDA

DETONATION ARRESTOR

XFA

FLAME ARRESTOR

XFT

FLAME TRAP

XHE

HEAT EXCHANGER

XIF

INLET FILTER

XIS

INLET SCREEN

XJ

FLEX CONNECTOR/EXPANSION JOINT

XS

SILENCER

XSI

SPARK IGNITER

XUV

UV DETECTOR

XV

UNCLASSIFIED VALVE

YC

EVENT CLOSED

YI

EVENT INDICATOR

YO

EVENT OPEN

ZAC

POSITION ALARM CLOSED

ZAO

POSITION ALARM OPEN

ZS

POSITION SWITCH

ZSC

POSITION SWITCH CLOSED

ZSO

POSITION SWITCH OPEN

ZT

POSITION TRANSMITTER

TRANSUCERS

EXAMPLE:

CURRENT TO PNEUMATIC TRANSDUCER (MOUNTED BEHIND-THE-PANEL)

A

ANALOG

D

DIGITAL

E

VOLTAGE

F

FREQUENCY

I

CURRENT

P

PNEUMATIC

PF

PULSE FREQUENCY

PD

PULSE DURATION

BUBBLE SYMBOL

ABBREVIATION

LSH

TYPE, ACTION OR CONTROL

2

INSTRUMENT IDENTIFICATION

INSTRUMENT LOCATION, TYPE OR ABSENCE OF LINE DENOTES LOCATION (SEE RIGHT)

INSTRUMENT IDENTIFICATION

FIELD MOUNTED INSTRUMENT

PANEL MOUNTED INSTRUMENT

BEHIND-THE-PANEL MOUNTED INSTRUMENT

PILOT LIGHT/ALARM LIGHT (LIGHT COLOR)

PROGRAMMABLE LOGIC CONTROLS

SPECIAL CASES

ON AND OFF EVENT LIGHTS

OPENED AND CLOSED POSITION LIGHTS

OPENED AND CLOSED POSITION SWITCHES

INTERLOCKS

OPERATORS

MOTOR

MOTORIZED VALVE

PNEUMATIC ACTUATOR

PNEUMATIC VALVE

VARIABLE FREQUENCY DRIVE

SOLENOID VALVE

MANUAL

MANUAL VALVE

LINE LEGEND

PIPING

PROCESS DUCTWORK

COMPRESSED AIR

PNEUMATIC SIGNAL

ELECTRICAL SIGNAL OTHER

ANALOG SIGNAL

NON CONNECTING LINES

CONNECTING LINES

DATA LINK

HOSE

FLOW DIRECTION

OTHERS

CCC

PROCESS FLOW DIAGRAM LEGEND

TEMPERATURE DEGREES FAHRENHEIT

VAPOR FLOW STANDARD CUBIC FEET PER MINUTE

PRESSURE POUNDS PER SQUARE INCH GAGE

CONCENTRATION PARTS PER MILLION

WATER FLOW GALLONS PER MINUTE

PROCESS NO.

NOTES

1. SPECIFICATIONS AND DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTIFICATION.

2. REFERENCE ANSI/ISA-S5.1 FOR SYMBOLS NOT SHOWN ON THIS LEGEND.

3. THIS IS A STANDARD LEGEND, THEREFORE, NOT ALL OF THIS INFORMATION MAY APPLY.

4. THESE SYMBOLS AND ABBREVIATIONS ARE SPECIFIC TO CATALYTIC COMBUSTION CORPORATION AND MAY DIFFER FROM ISA.

REV

DESCRIPTION

DATE

BY

DRAWING STATUS:

DATE:

BY:

MATERIAL:

SEE BOM

WEIGHT:

N/A

TOLERANCES:

.X = 0.06

.XX = 0.03

.XXX = 0.015

∠ = 0.5°

CATALYTIC COMBUSTION

EMISSION TECHNOLOGIES

Catalytic Combustion Corporation

311 Riggs Street

Bloomer, WI 54724

Telephone: 715-568-2882

Fax: 715-568-2884

www.catalyticcombustion.com

THIRD ANGLE PROJECTION

INCH [mm]

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CUSTOMER:

TITLE:

LEGEND OF SYMBOLS

PROCESS & INSTRUMENTATION DIAGRAM

PROJECT/PRODUCT:

DRAWING:

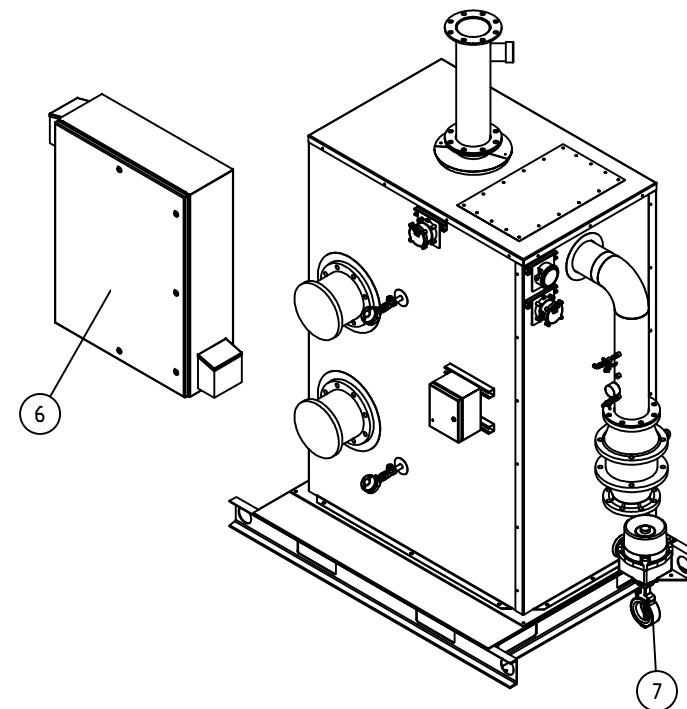
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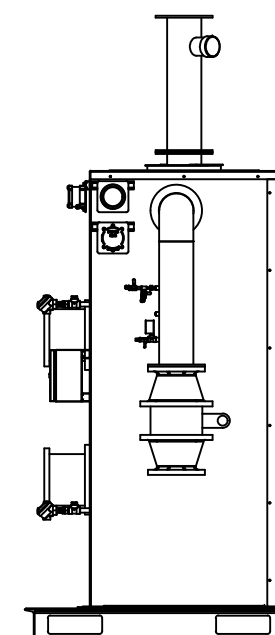
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0

B



ITEM	DESCRIPTION
1	PROCESS INLET
2	25KW HEATERS
3	CATALYST ACCESS
4	EXHAUST STUB
5	3' SAMPLE PORTS
6	CONTROL PANEL (SHIPPED LOOSE)
7	4' MODULATING CONTROL VALVE (SHIPPED LOOSE)



REV	DESCRIPTION	DATE	BY	DRAWING STATUS:		DATE:	BY:	MATERIAL:	Catalytic Combustion Corporation 311 Riggs Street Bloomer, WI 54724 Telephone: 715-568-2882 Fax: 715-568-2884 www.catalyticcombustion.com		DATE:	CUSTOMER:	
.								SEE BOM	<div>CATALYTIC COMBUSTION</div> <div>EMISSION TECHNOLOGIES</div> <div></div> <div>THIRD ANGLE PROJECTION</div> <div>INCH [mm]</div>	<div>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CATALYTIC COMBUSTION CORPORATION ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE PERMISSION OF CATALYTIC COMBUSTION CORPORATION IS STRICTLY PROHIBITED.</div> <div>DO NOT SCALE THIS DRAWING.</div>	1/17/2020	FLITEWAY TECHNOLOGIES, INC.	
.			.	PRELIMINARY	.	.	WEIGHT:	SCALE:			TITLE: SRCD 500E CATALYTIC OXIDIZER GENERAL ARRANGEMENT		
.			X	FOR APPROVAL	1/17/20	MB	N/A	NTS					
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										W0141036	100	0	B

Mink

Claw Vacuum Pumps
MM 1402/1502 AV



- › **Efficient:**
energy-efficient,
minimized operating costs
- › **Nearly Maintenance-Free:**
dry and contact-free
compression
- › **Reliable:**
operationally reliable

Busch Mink claw vacuum technology for industrial vacuum generation offers the highest possible energy efficiency combined with low maintenance and a constant level of performance.

The sophisticated design of Busch claw vacuum technology allows Mink claw vacuum pumps to operate at extremely high efficiency levels, which has a positive effect on the pumping speed and energy consumption. In practice this means substantial energy savings for the same pumping speed when compared to conventional vacuum generators.

The contact-free operating principle of claw vacuum technology provides the additional benefit of nearly maintenance-free operation: None of the internal moving parts of the vacuum pump come in contact with each other, so components are not subject to wear. Servicing tasks such as inspection and replacement of worn parts are eliminated completely.

The proven, completely dry claw vacuum technology of Mink claw vacuum pumps allows them to run without operating fluids in the compression chamber. This means that the possibility of contamination of the pumped medium and environmental emissions is eliminated. In addition, no costs arise for the purchase, replacement and disposal of operating fluids.

Mink claw vacuum pumps are air cooled, so installation and maintenance of a cooling system is unnecessary. Their contact-free operating principle allows them to run extremely efficiently throughout the vacuum range and to deliver constantly high pumping speeds during their entire life cycle.

The outstanding reliability and long service lifetime of Mink claw vacuum pumps are also a result of the contact-free and dry compression. An intelligent sound insulation design allows Mink claw vacuum pumps to operate at low sound levels.

**Mink – efficient and reliable
vacuum generation.**



Mink MM 1502 AV

Mink

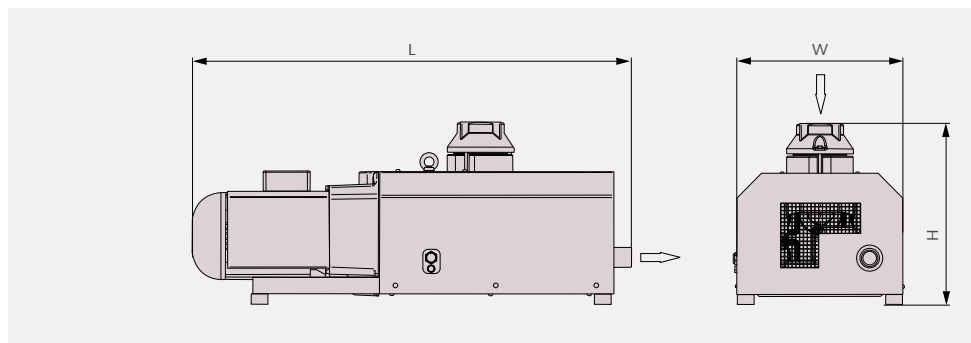
Claw Vacuum Pumps MM 1402/1502 AV



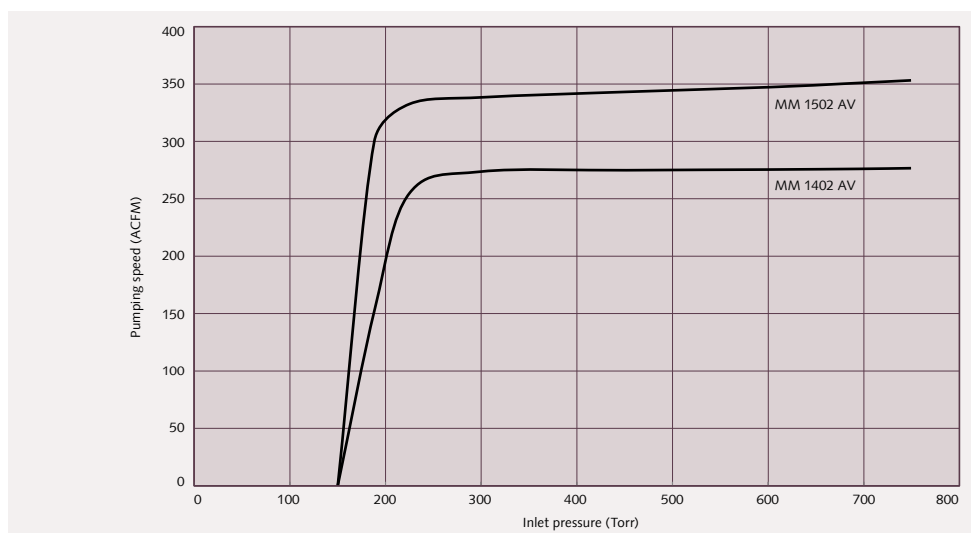
Technical specifications

Mink claw vacuum pumps feature two claw-shaped rotors that move in opposite directions, mounted in a housing. The shape of these claw rotors extracts, compresses and expels air or gas. The rotors do not come in contact with each other or the housing, so no lubricants or operating fluids are required in the compression chamber. The minimal clearance between the rotors and the chamber housing optimizes the internal seal and ensures constantly high pumping speeds. An effective air cooling system guarantees optimal operating temperatures. A synchronizing gearbox maintains precise rotor timing. Mink claw vacuum pumps are driven by a directly flange-mounted asynchronous motor of efficiency class IE3.

Mink MM 1402/1502 AV



Pumping speed Air at 70 °F. Tolerance: ± 10%



Technical Data		MM 1402 AV	MM 1502 AV
Max. pumping speed	ACFM	277	353
Ultimate pressure	Torr	150	150
Nominal motor rating	HP	12	15
Nominal motor speed	RPM	3600	3600
Sound level (ISO 2151)	dB(A)	83	86
Approximate weight	Lbs	706	717
Dimensions (L x W x H)	inches	51 3/8 x 20 1/4 x 21 1/2	51 3/8 x 20 1/4 x 21 1/2
Gas inlet / outlet	NPT	3" / 2"	3" / 2"

All performance data is based on ambient conditions of 14.7 PSIA and 70 °F, and has a tolerance of ± 10%.

Busch LLC

516 Viking Drive | Virginia Beach, VA 23452 | Phone 757-463-7800 | info@buschusa.com | www.buschusa.com

Argentina Australia বাংলাদেশ België Brasil Canada Česko Chile 中国 Colombia Danmark Deutschland España France भारत गणराज्य Ireland ישראל Italia 日本 대한민국 Magyarország Malaysia México Nederland New Zealand Norge Österreich Perú Polska Portugal România Россия Schweiz Singapore South Africa Suomi Sverige 台灣 ประเทศไทย Türkiye الإمارات العربية المتحدة United Kingdom USA

Technical data is subject to change. Created in Germany MG PL MM14021502AV USenus 07/2017 7Aa



No.: 02036ET3E256TC

Date: 9/22/2011

DATA SHEET

Three-phase induction motor - Squirrel cage rotor

Customer :
Product line : W22 NEMA Premium

Frame : 256T
Output : 20 HP
Frequency : 60 Hz
Poles : 2
Full load speed : 3520
Slip : 2.22 %
Voltage : 208-230/460 V
Rated current : 51.3-46.4/23.2 A
Locked rotor current : 278/139 A
Locked rotor current (I_L/I_n) : 6.0
No-load current : 13.0/6.50 A
Full load torque : 29.4 lb.ft
Locked rotor torque : 200 %
Breakdown torque : 240 %
Design : B
Insulation class : F
Temperature rise : 80 K
Locked rotor time : 21 s (hot)
Service factor : 1.25
Duty cycle : S1
Ambient temperature : -20°C - +40°C
Altitude : 1000 m
Degree of Protection : IP55
Approximate weight : 269 lb
Moment of inertia : 1.5356 sq.ft.lb
Noise level : 72 dB(A)

	D.E.	N.D.E.	Load	Power factor	Efficiency (%)
Bearings	6309 C3	6209 C3	100%	0.89	91.0
Regreasing interval	19000 h	20000 h	75%	0.87	91.7
Grease amount	13 g	9 g	50%	0.82	91.0

Notes:

Performed by:

Checked:

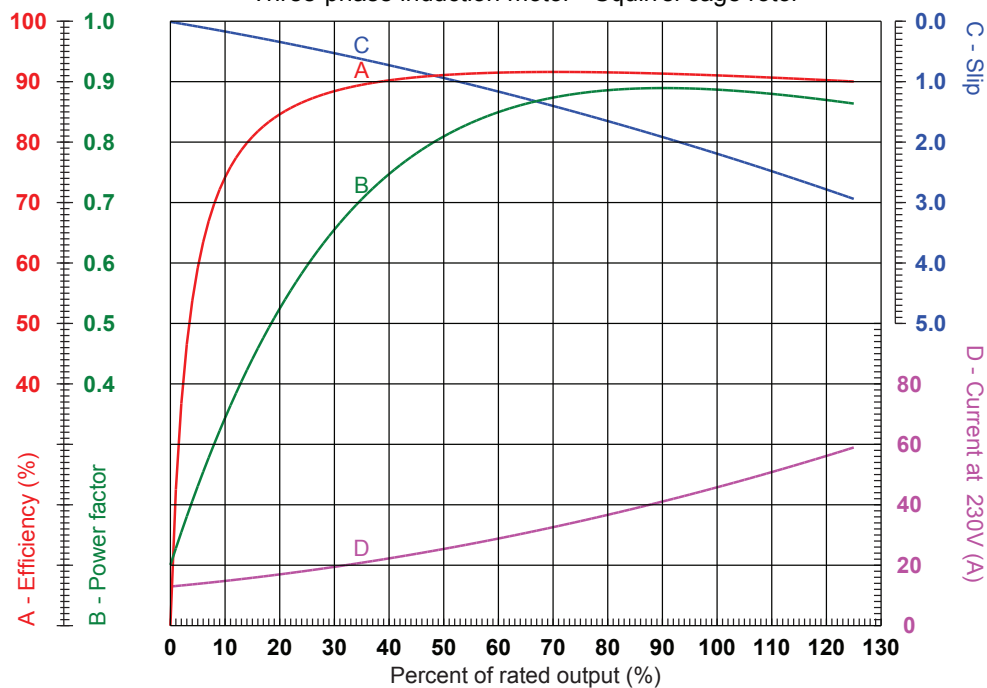


No.: 02036ET3E256TC

Date: 9/22/2011

PERFORMANCE CURVES RELATED TO RATED OUTPUT

Three-phase induction motor - Squirrel cage rotor



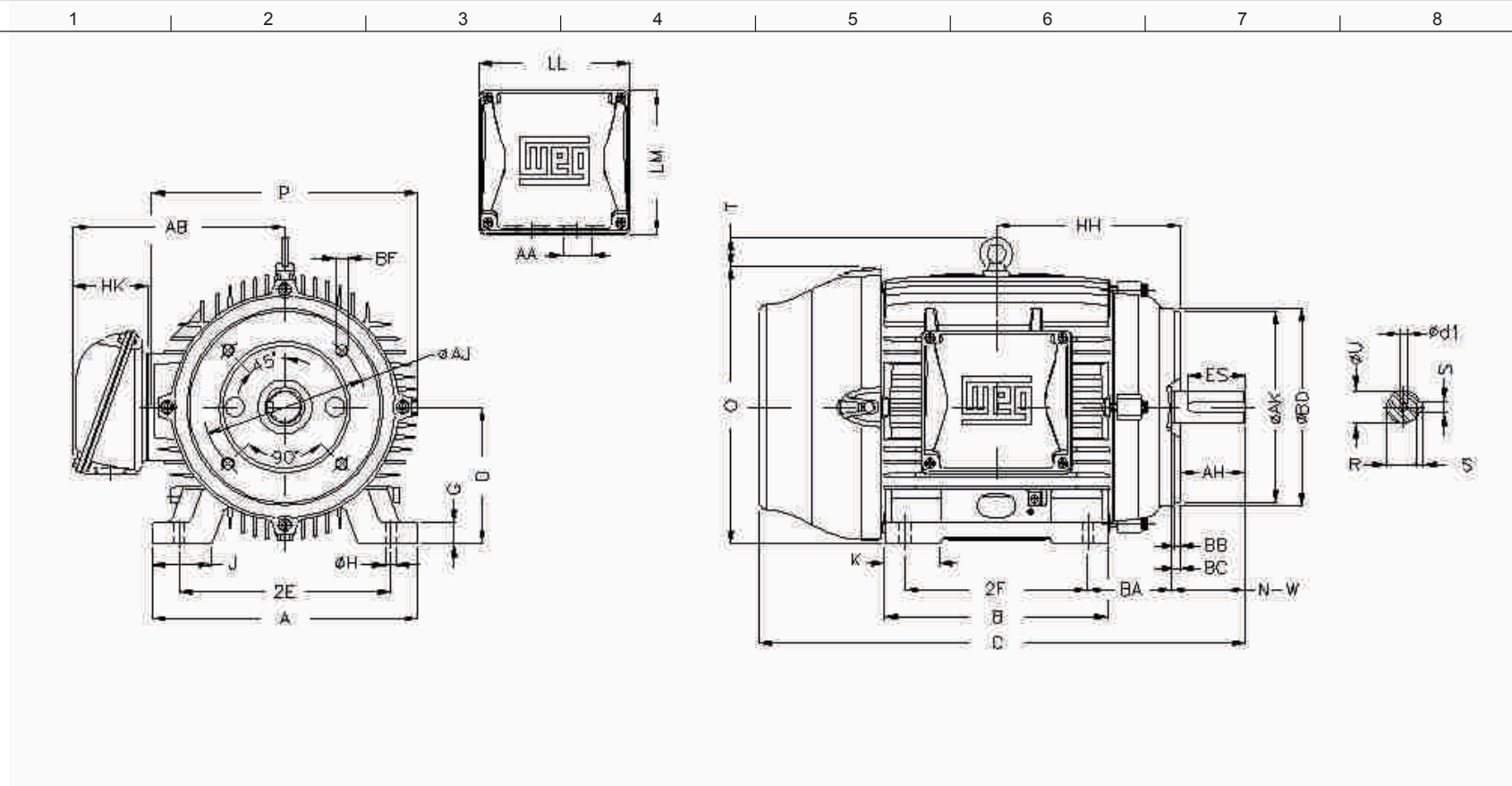
Customer :
Product line : W22 NEMA Premium

Output	: 20 HP	Locked rotor current (I _L /I _n)	: 6.0
Frame	: 256T	Duty cycle	: S1
Full load speed	: 3520	Service factor	: 1.25
Frequency	: 60 Hz	Design	: B
Voltage	: 208-230/460 V	Locked rotor torque	: 200 %
Insulation class	: F	Breakdown torque	: 240 %
Rated current	: 51.3-46.4/23.2 A		

Notes:

Performed by:

Checked:



E	2E 10.000	J 2.539	A 12.126	P 12.953	AB 10.394	Notes:	
	2F 10.000	K 2.559	B 11.732	BA 4.250	U 1.625	Performed by:	
F	N-W 4.000	ES 2.756	S 0.375	R 1.406	depth 0.375	Checked:	
	D 6.250	G 0.827	HB 3.061	O 12.598	T 2.087	Customer:	
	HF 6.565	HH 9.250	HK 3.937	H 0.531	C 24.945	W22 NEMA Premium	
	LL 7.795	LM 7.402	AA NPT 1 1/2"	d1 A 4	d2 A 4	Three-phase induction motor Frame 256T - IP55	
	Flange FC-184	AJ 7.250	AK 8.500	BD 8.875	BF UNC 1/2"x13		
	BB 0.250	BC 0.250	AH 3.750				
						9/22/2011	02036ET3E256



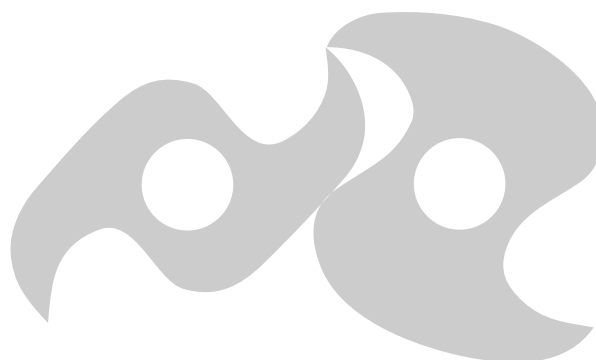


Instruction Manual

Mink

Claw Vacuum Pumps

MM 1402 AV, MM 1502 AV



Busch Produktions GmbH
Schausinslandstraße 1, 79689 Maulburg
Germany

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1 Safety

Prior to handling the machine, this instruction manual should be read and understood. If anything needs to be clarified, please contact your Busch representative.

Read this manual carefully before use and keep for future reference.

This instruction manual remains valid as long as the customer does not change anything on the product.

The machine is intended for industrial use. It must be handled only by technically trained personnel.

Always wear appropriate personal protective equipment in accordance with the local regulations.

The machine has been designed and manufactured according to state-of-the-art methods. Nevertheless, residual risks may remain. This instruction manual highlights potential hazards where appropriate. Safety notes and warning messages are tagged with one of the keywords DANGER, WARNING, CAUTION, NOTICE and NOTE as follows:

DANGER

... indicates an imminent dangerous situation that will result in death or serious injuries if not prevented.

WARNING

... indicates a potentially dangerous situation that could result in death or serious injuries.

CAUTION

... indicates a potentially dangerous situation that could result in minor injuries.

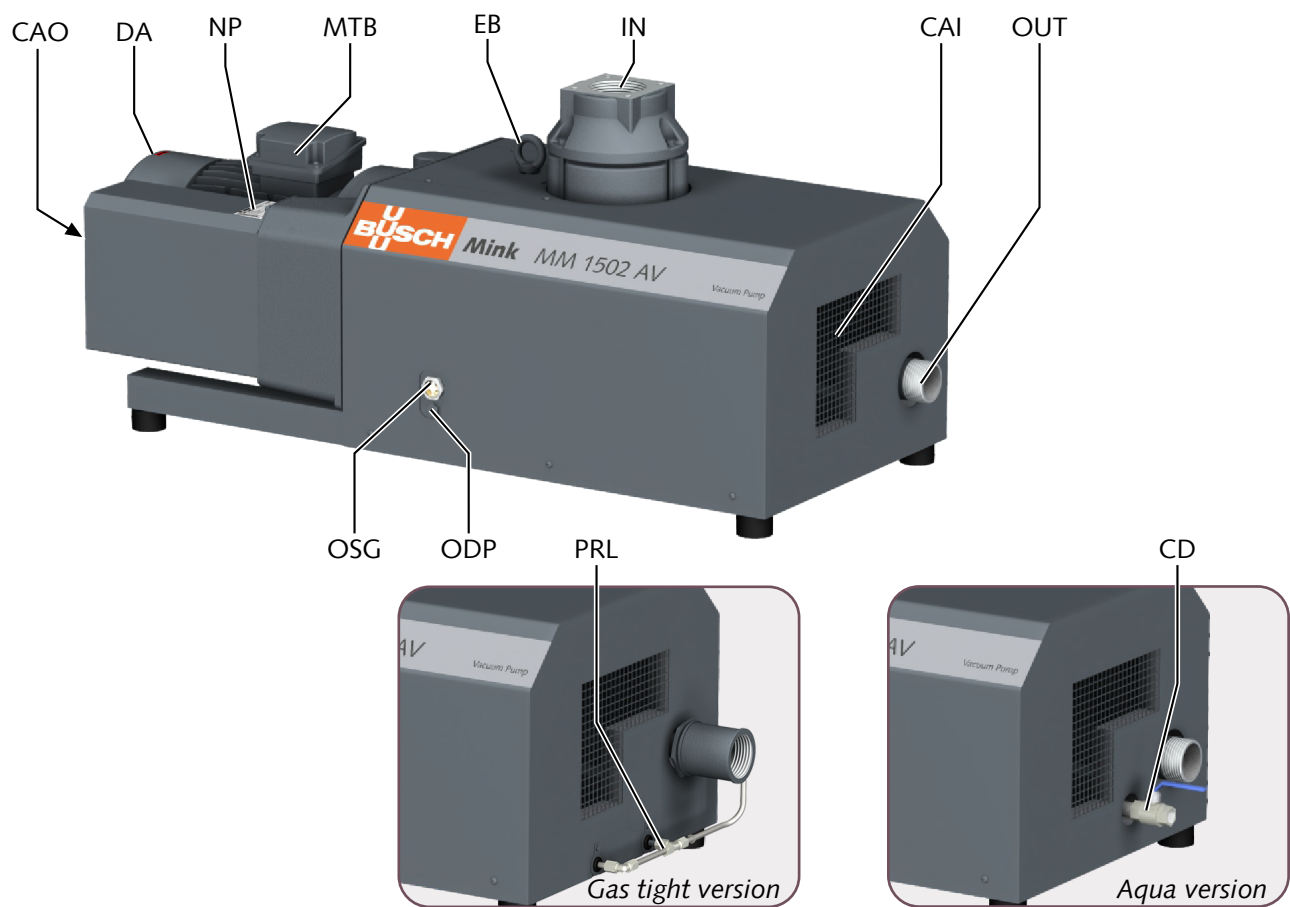
NOTICE

... indicates a potentially dangerous situation that could result in damage to property.

NOTE


... indicates helpful tips and recommendations, as well as information for efficient and trouble-free operation.

2 Product Description



The machine appearance may differ from the illustration.

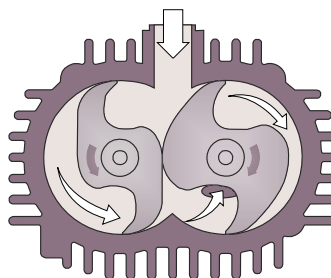
IN	Suction connection	ODP	Oil drain plug
OUT	Discharge connection	CAI	Cooling air inlet
OSG	Oil sight glass	CAO	Cooling air outlet
NP	Nameplate	EB	Eye bolt
CD	Condensate drain	MTB	Motor terminal box
DA	Directional arrow	PRL	Pressure relief line

 **NOTE**

Technical term.

In this instruction manual, we consider that the term ‘machine’ refers to the ‘vacuum pump’.

2.1 Operating Principle



The machine works on the claw principle.

The Mink MM is fully air-cooled thanks to an integrated fan in the drive unit.

2.2 Application

The machine is intended for the suction of air and other dry, non-aggressive, non-toxic and non-explosive gases.

Conveying of other media leads to an increased thermal and/or mechanical load on the machine and is permissible only after a consultation with Busch.

The machine is intended for the placement in a non-potentially explosive environment.

The machine is capable of maintaining ultimate pressure, see Technical Data [► 23].

The machine is suitable for continuous operation.

Permitted environmental conditions, see Technical Data [► 23].

2.3 Design Options

The design options described in the following chapters might be combined.

Please refer to the nameplate (NP) to identify the corresponding design option of your machine.

Design option	Codification	Example
Standard (no design option)	0	MM 1402 AV0
Gas tight version	G	MM 1402 AVG
Aqua version	A	MM 1402 AVA

2.3.1 Gas Tight Version



WARNING

Media potentially dangerous.

Risk of poisoning!

Risk of infection!

- Wear appropriate personal protective equipment in case of high concentration of the medium in the ambient atmosphere of the machine.

The gas tight version is a design option for applications where the process gas remains in the machine and does not escape to the environment.

It is a very important feature for applications where gases potentially dangerous to human health are not allowed and the concentration of the process gas must not exceed the admissible values of the ambient atmosphere of the machine.

This machine is specifically equipped with:

- pressure relief lines
- collecting lines
- shaft seal rings.

Requirements for a proper functioning:

Ambient pressure	The gas tight machine requires an ambient pressure at the gas discharge during the whole operation range of +/- 200 hPa (mbar), unless otherwise specified on the nameplate.
Leakage rate	The machine is not absolutely gas tight. The leakage rate of the machine described in this manual is of 0.1 hPa l/s (mbar l/s) at a suction pressure of 250 mbar. It can considerably increase up to prohibited pressure values at the gas inlet/outlet due to used shaft seal rings or clogged pressure relief lines.
Ambient environment	Closed air cooling systems are not suitable and therefore prohibited. <ul style="list-style-type: none">• Make sure that the machine is sufficiently vented (see Installation Conditions [► 8]).

2.3.2 Aqua Version

The Aqua version is a design option for conveying condensable vapours (water).

This machine is specifically equipped with:

- corrosion protection coating
- condensate drain (CD) in the internal silencer.

2.4 Optional Accessories

2.4.1 Inlet Filter

The inlet filter protects the machine against dust and other solids in the process gas. The inlet filter is available with a paper or polyester cartridge.

2.4.2 Vacuum Relief Valve

The ultimate pressure is limited by a vacuum relief valve. The vacuum relief valve is adjusted ex-works to the minimum permitted ultimate pressure (see nameplate).

3 Transport

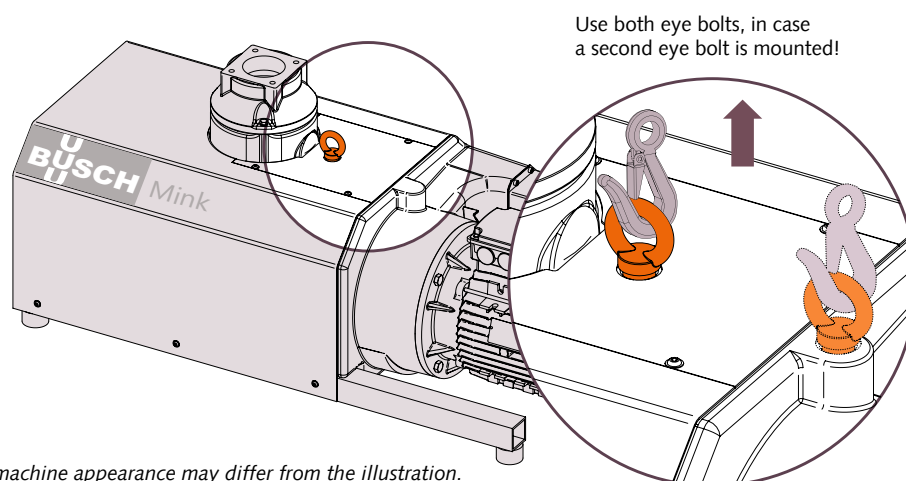
WARNING

Suspended load.

Risk of severe injury!

- Do not walk, stand or work under suspended loads.
- Make sure that the eyebolt (EB) is in faultless condition, fully screwed in and tightened by hand.

Machine weight:
see the technical data or the nameplate



The machine appearance may differ from the illustration.

WARNING

Lifting the machine using the motor eye bolt.

Risk of severe injury!

- Do not lift the machine using the eye bolt fitted to the motor. Only lift the machine as previously shown.
- Check the machine for transport damage.

If the machine is secured to a base plate:

- Remove the machine from the base plate.

4 Storage

- Seal all apertures with adhesive tape or reuse provided caps.

If the machine is to be stored for more than 3 months:

- Wrap the machine in a corrosion inhibiting film.
- Store the machine indoors, dry, dust free and if possible in original packaging preferably at temperatures between 0 ... 40 °C.

5 Installation

5.1 Installation Conditions

WARNING

Gas tight version:

The machine is not absolutely gas tight, possible leakages of dangerous media.

Risk of poisoning!

Risk of infection!

- Make sure that the ambient atmosphere of the machine is sufficiently ventilated.
Closed air cooling systems are not suitable and therefore prohibited.

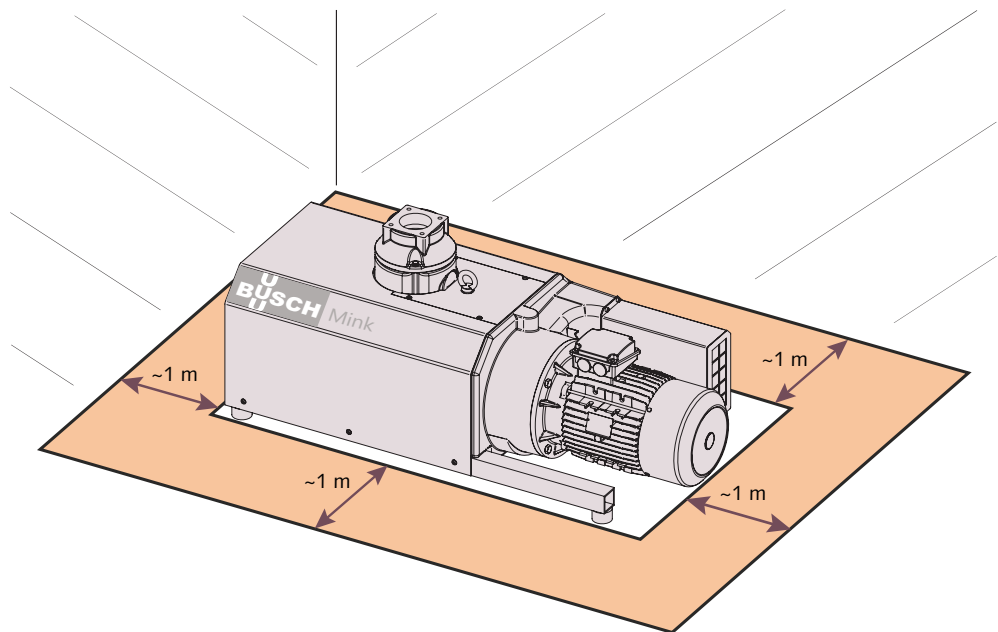
NOTICE

Use of the machine outside of the permitted installation conditions.

Risk of premature failure!

Loss of efficiency!

- Take care that the installation conditions are fully complied with.



Other values may apply after Busch approval

- Make sure that the environment of the machine is not potentially explosive.
- Make sure that the ambient conditions comply with the Technical Data [► 23].
- Make sure that the environmental conditions comply with the protection class of the motor and the electrical instruments.
- Make sure that the installation space or location is vented such that sufficient cooling of the machine is provided.
- Make sure that cooling air inlets and outlets are not covered or obstructed and that the cooling air flow is not affected adversely in any other way.
- Make sure that the oil sight glass (OSG) remains easily visible.
- Make sure that enough space remains for maintenance work.

- Make sure that the machine is placed or mounted horizontally, a maximum of 1° in any direction is acceptable.
- Check the oil level, see Oil Level Inspection [► 15].
- Make sure that all provided covers, guards, hoods, etc. are mounted.

If the machine is installed at an altitude greater than 1000 meters above sea level:

- Contact your Busch representative, the motor should be derated or the ambient temperature limited.

5.2 Connecting Lines / Pipes

- Remove all protective caps before installation.
- Make sure that the connection lines cause no stress on the machine's connection; if necessary use flexible joints.
- Make sure that the line size of the connection lines over the entire length is at least as large as the connections of the machine.

In case of very long connection lines it is advisable to use larger line sizes in order to avoid a loss of efficiency. Seek advice from your Busch representative.

5.2.1 Suction Connection

NOTICE

Ingress of foreign objects or liquids.

Risk of damage to the machine!

If the inlet gas contains dust or other foreign solid particles:

- Install a suitable filter (5 micron or less) upstream from the machine.

Connection size:

- G3

Depending on the specific order, other connection dimensions may apply.

5.2.2 Discharge Connection

Connection size:

- R2

Depending on the specific order, other connection dimensions may apply.

- Make sure that the discharged gas will flow without obstruction. Do not shut off or throttle the discharge line or use it as a pressurised air source.

Unless the aspirated air is discharged to the environment right at the machine:

- Make sure that the discharge line either slopes away from the machine or provide a liquid separator or a siphon with a drain cock, so that no liquids can flow back into the machine.

5.3 Filling Oil

! NOTICE

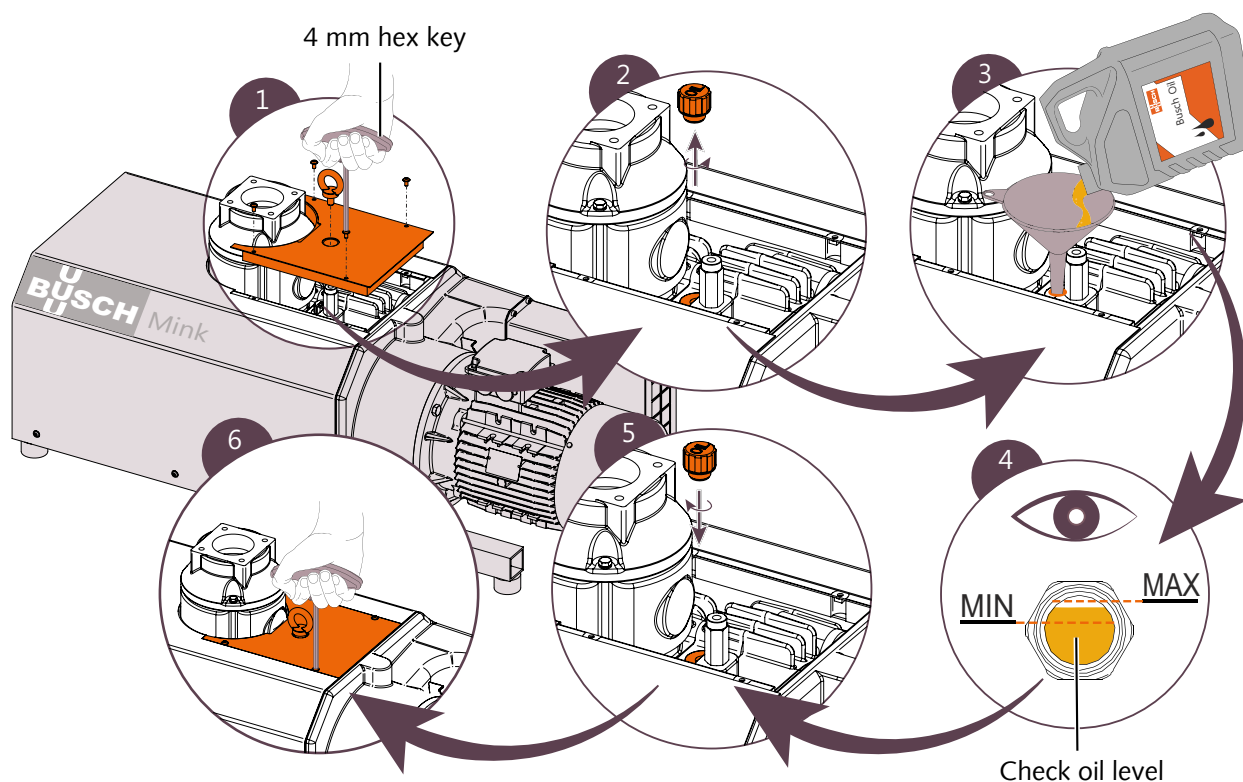
Use of an inappropriate oil.

Risk of premature failure!

Loss of efficiency!

- Only use an oil type which has previously been approved and recommended by Busch.

For oil type and oil capacity see Technical Data [► 23] and Oil [► 23].



The oil level should stay constant over the lifetime of the oil. If the level does fall, this indicates a leak and the machine requires repair.

5.4 Electrical Connection

DANGER

Live wires.

Risk of electrical shock.

- Electrical installation work must only be executed by qualified personnel.
- Make sure that the power supply for the motor is compatible with the data on the nameplate of the motor.
- The electrical installation must comply with applicable national and international standards.
- Provide a lockable disconnect switch on the power line so that the machine is completely secured during maintenance tasks.
- Provide an overload protection according to EN 60204-1 for the motor.
- Make sure that the motor of the machine will not be affected by electric or electromagnetic disturbance from the mains; if necessary seek advice from Busch.
- Connect the protective earth conductor.
- Electrically connect the motor.

NOTICE

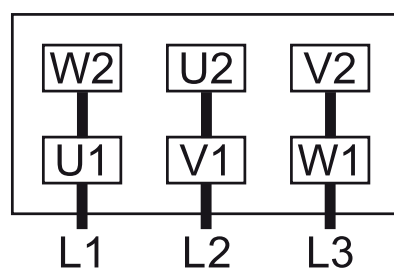
Incorrect connection.

Risk of damage to the motor!

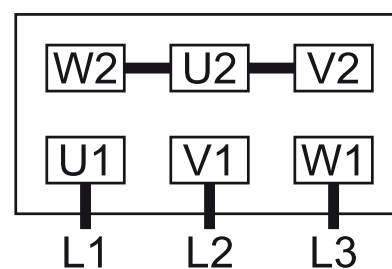
- The wiring diagrams given below are typical. Check the inside of the terminal box for motor connection instructions/diagrams.

5.4.1 Wiring Diagram Three-Phase Motor

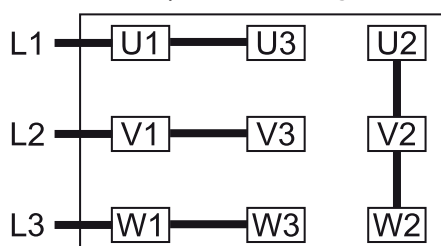
Delta connection (low voltage):



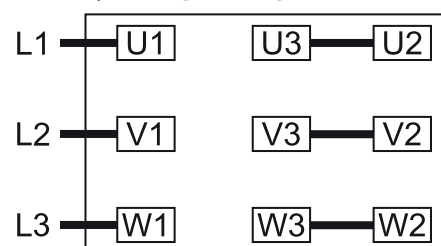
Star connection (high voltage):



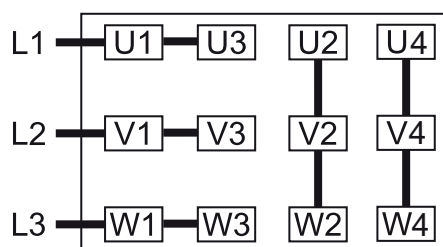
Double star connection, multi-voltage motor with 9 pins (low voltage):



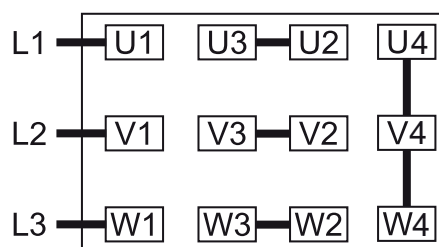
Star connection, multi-voltage motor with 9 pins (high voltage):



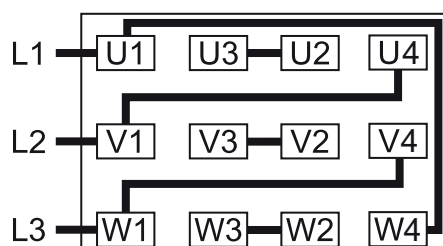
Double star connection, multi-voltage motor with 12 pins (low voltage):



Star connection, multi-voltage motor with 12 pins (high voltage):



Delta connection, multi-voltage motor with 12 pins (middle voltage):



! NOTICE

Incorrect direction of rotation.

Risk of damage to the machine!

- Operation in the wrong direction of rotation can destroy the machine in a short time! Prior to start-up, ensure that the machine is operated in the right direction.

- Determine the intended direction of rotation with the arrow (stuck on or cast).
- Jog the motor briefly.

If the rotation of the motor must be changed:

- Switch any two of the motor phase wires.

6 Commissioning

NOTICE

Lubricating a dry running machine (compression chamber).

Risk of damage to the machine!

- Do not lubricate the compression chamber of the machine with oil or grease.

CAUTION

During operation the surface of the machine may reach temperatures of more than 70°C.

Risk of burns!

- Avoid contact with the machine during and directly after operation.



CAUTION

Noise of running machine.

Risk of damage to hearing!

If persons are present in the vicinity of a non noise insulated machine over extended periods:

- Make sure that ear protection is being used.
- Make sure that the installation conditions (see Installation Conditions [► 8]) are met.
- Switch on the machine.
- Make sure that the maximum permissible number of starts does not exceed 12 starts per hour. Those starts should be spread within the hour.
- Make sure that the operating conditions comply with the Technical Data [► 23].

As soon as the machine is operated under normal operating conditions:

- Measure the motor current and record it as reference for future maintenance and troubleshooting work.

6.1 Conveying Condensable Vapours

Water vapour within the gas flow is tolerated within certain limits. The conveyance of other vapours shall be agreed upon with Busch.

The Aqua version is a design option for conveying condensable vapours (water).

If condensable vapours are to be conveyed:

Before process:

- Warm up the machine for approximately half an hour.

After process:

- Operate the machine for approximately another half an hour.
- Regularly drain condensate from the silencer with the drain cock.

7 Maintenance



WARNING

Machines contaminated with hazardous material.

Risk of poisoning!

Risk of infection!

If the machine is contaminated with hazardous material:

- Wear appropriate personal protective equipment.

CAUTION

Hot surface.

Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first.

NOTICE

Using inappropriate cleaners.

Risk of removing safety stickers and protective paint!

- Do not use incompatible solvents to clean the machine.

CAUTION

Failing to properly maintain the machine.

Risk of injuries!

Risk of premature failure and loss of efficiency!

- Respect the maintenance intervals or ask your Busch representative for service.
- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.

If necessary:

- Disconnect all connections.

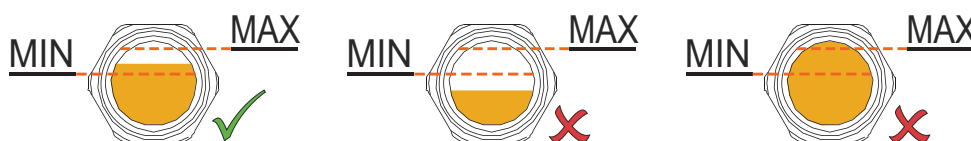
7.1 Maintenance Schedule

The maintenance intervals depend very much on the individual operating conditions. The intervals given below are desired to be considered as starting values which should be shortened or extended as appropriate. Particularly harsh applications or heavy duty operation, such as high dust loads in the environment or in the process gas, other contamination or ingress of process material, can make it necessary to shorten the maintenance intervals significantly.

Interval	Maintenance work
Monthly	In case of an inlet filter being installed: <ul style="list-style-type: none"> • Check the inlet filter cartridge, replace if necessary.
Every 3 months	<ul style="list-style-type: none"> • Check the oil level, see Oil Level Inspection [► 15].
Every 6 months	<ul style="list-style-type: none"> • Clean the machine from dust and dirt.
Gas tight version only Every 5000 hours, at the latest after 2 years	Depending on the requirements in terms of gas tightness: <ul style="list-style-type: none"> • Replace sealing rings (contact Busch).
Gas tight version only Every 10000 hours, at the latest after 2 years	<ul style="list-style-type: none"> • Check that pressure lines are not clogged, see Pressure Relief Lines Maintenance (Gas Tight Version Only) [► 18].
Every 20000 hours	<ul style="list-style-type: none"> • Change the oil. <p>The change interval of 20000 operating hours is valid for Busch approved oils only. The change interval depends very much on the operating conditions. Borderline operation may reduce the change interval down to approximately 5000 operating hours. Other oils may reduce the change interval.</p>
Every 6 years	<ul style="list-style-type: none"> • Have a major overhaul on the machine (contact Busch).

7.2 Oil Level Inspection

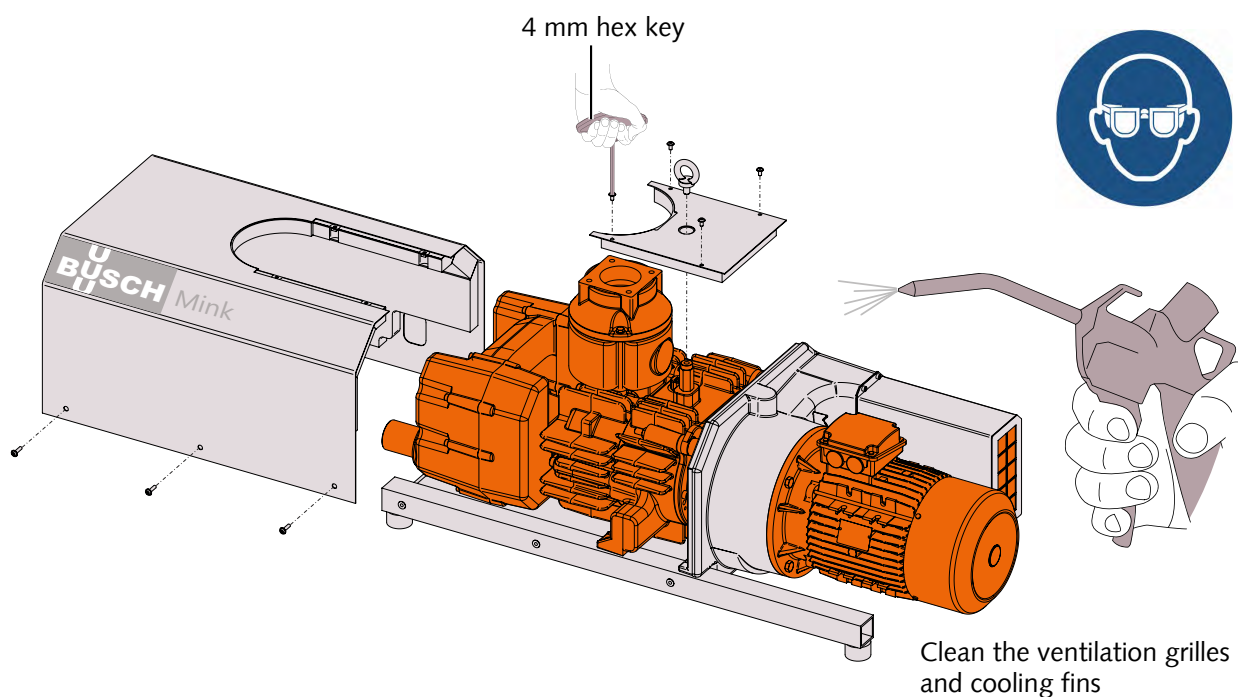
- Shut down the machine.
- When the machine is stopped, wait 1 minute before checking the oil level.



The oil level should stay constant over the lifetime of the oil. If the level does fall, this indicates a leak and the machine requires repair.

- Fill up if necessary, see Oil Filling [► 10].

7.3 Cleaning from Dust and Dirt



7.4 Oil Change

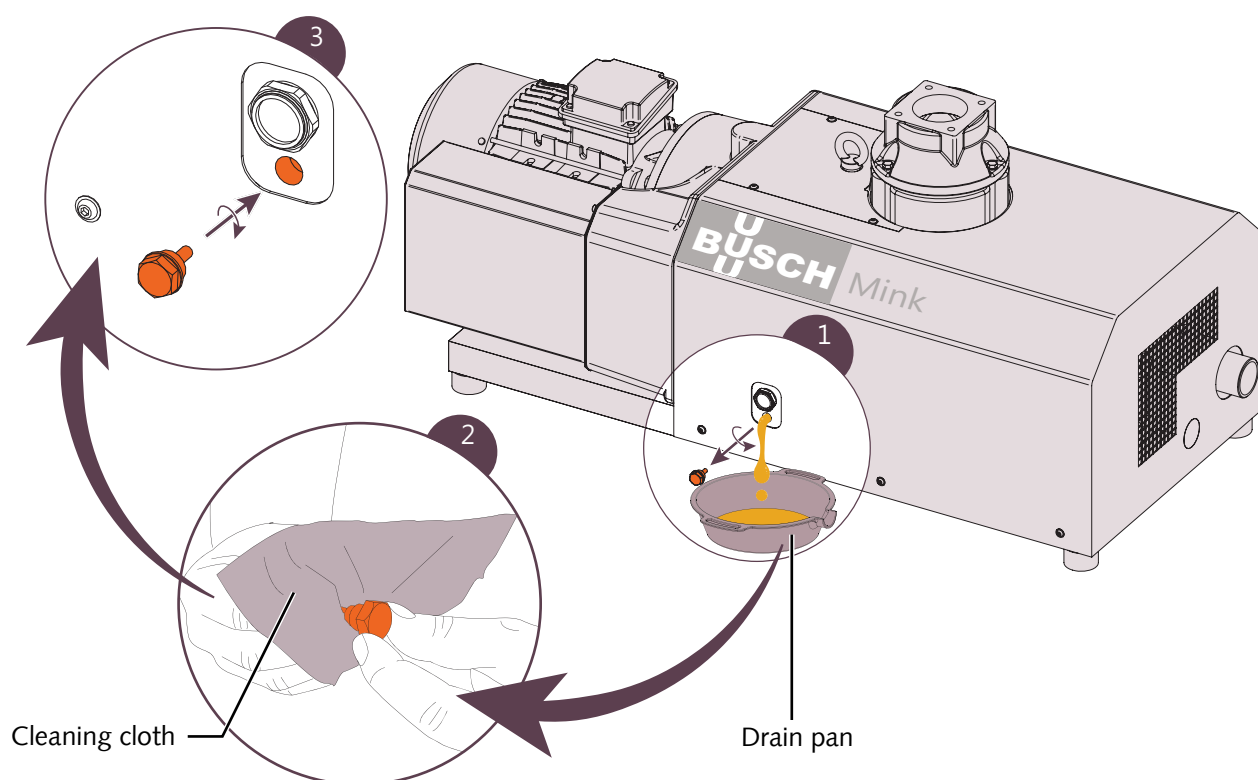
! NOTICE

Use of an inappropriate oil.

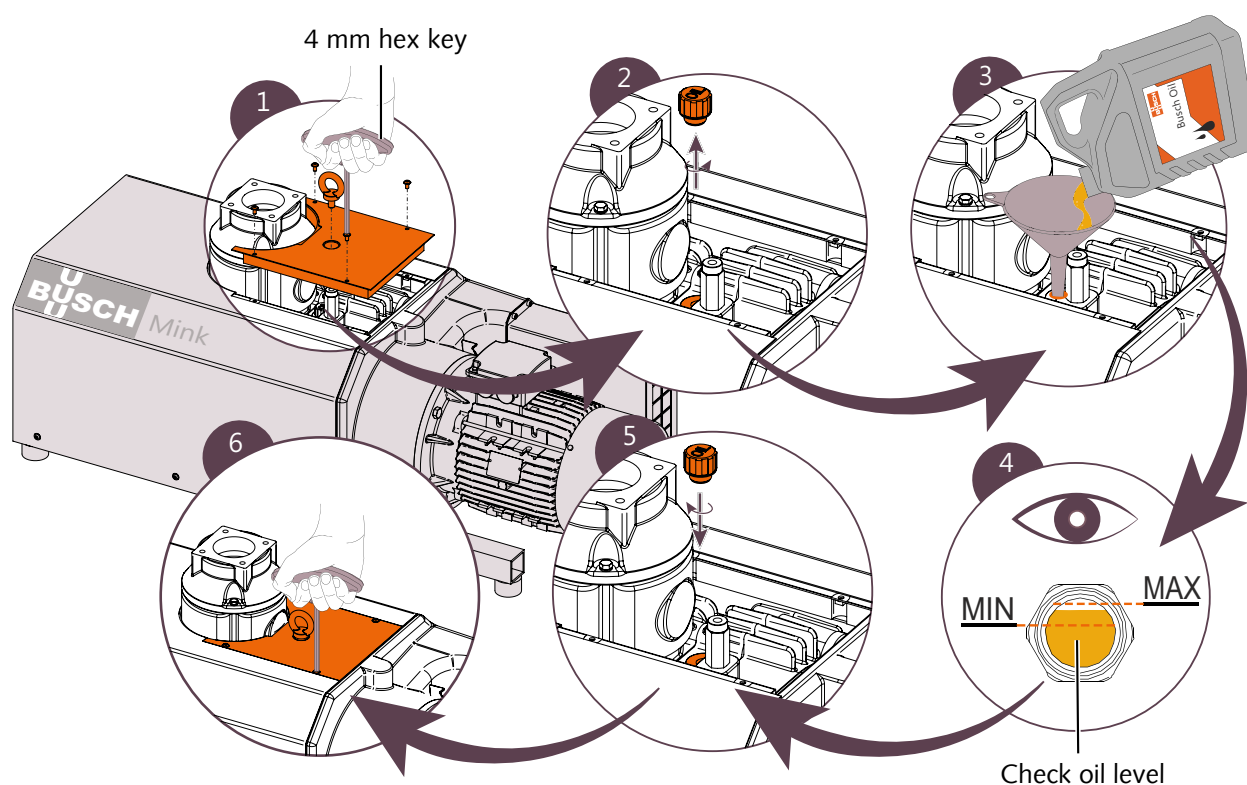
Risk of premature failure!

Loss of efficiency!

- Only use an oil type which has previously been approved and recommended by Busch.



For oil type and oil capacity see Technical Data [► 23] and Oil [► 23].



The oil level should stay constant over the lifetime of the oil. If the level does fall, this indicates a leak and the machine requires repair.

7.5 Pressure Relief Lines Maintenance (Gas Tight Version Only)



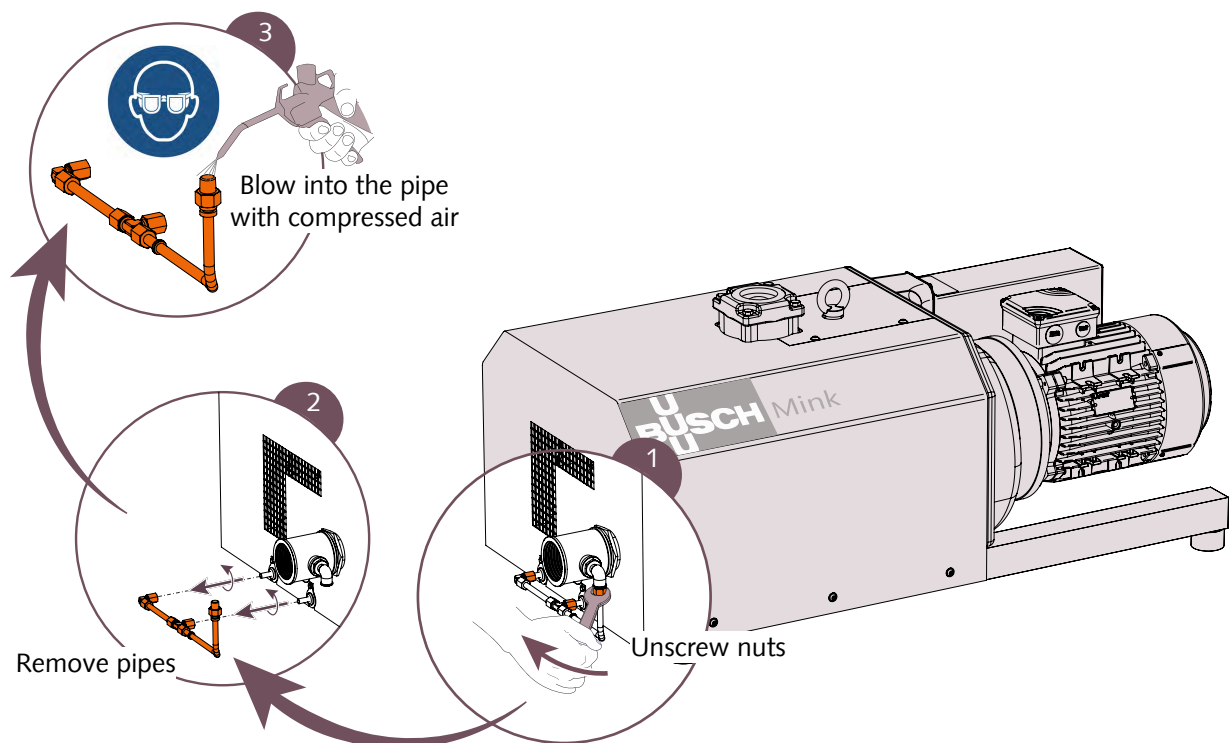
WARNING

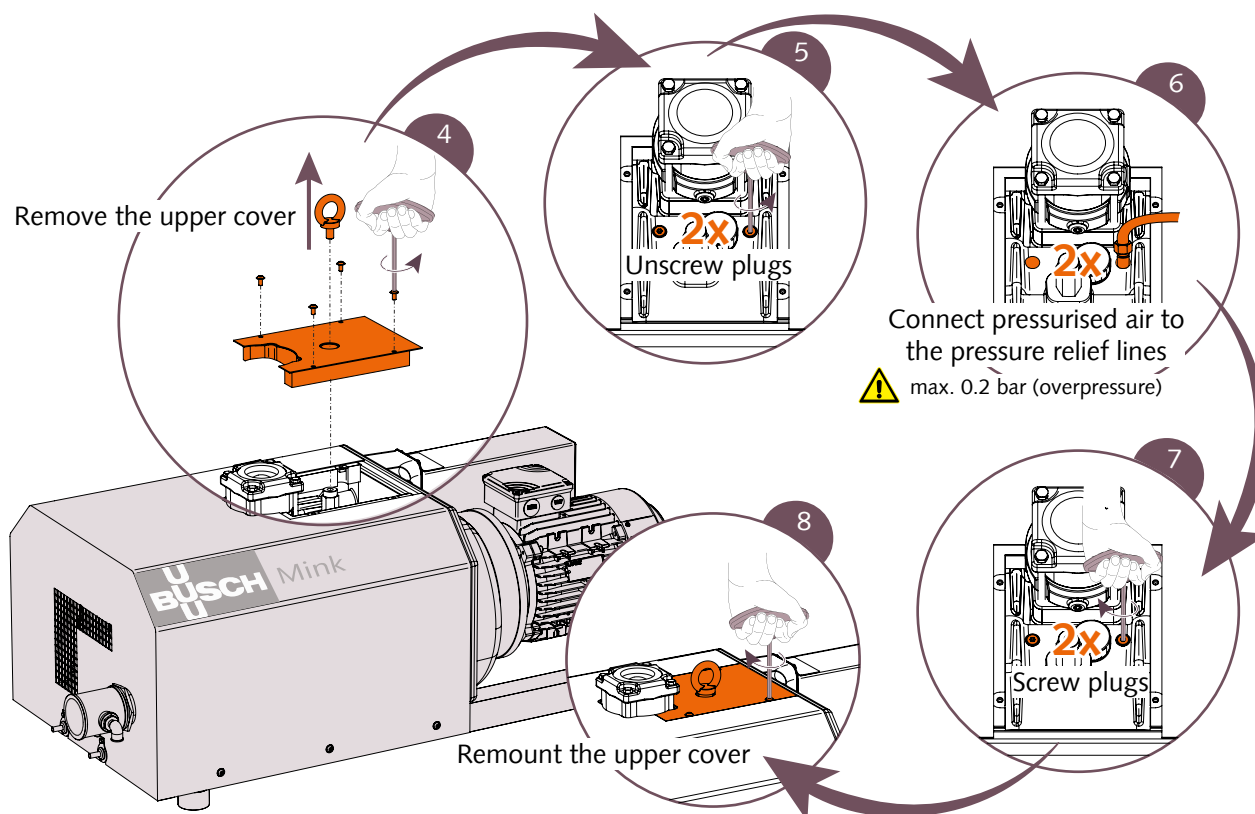
Media potentially dangerous.

Risk of poisoning!

Risk of infection!

- Wear appropriate personal protective equipment in case of high concentration of the medium in the ambient atmosphere of the machine.
- Check that pressure relief lines (PRL) are not clogged as described in the following illustrations.





! NOTICE

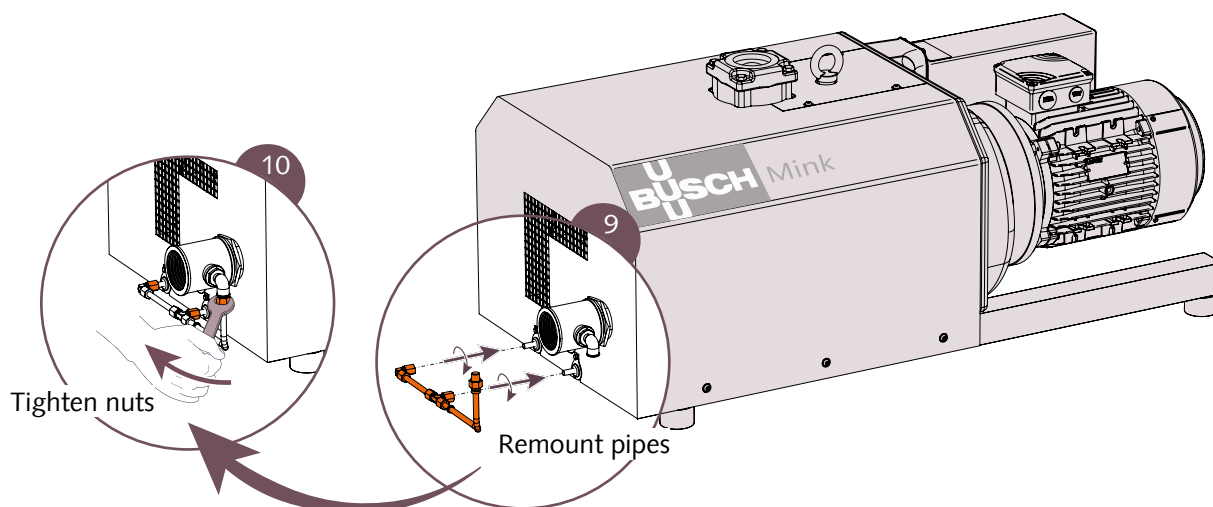
Pressurised air systems supply too high pressure.

Risk of damage to the machine!

- Adjust the pressurised air to 0.2 bar(g) by means of a pressure regulator.

In case of clogged pressure relief lines:

- Remove the clogging or have the machine repaired (contact Busch).



8 Overhaul

NOTICE

Improper assembly.

Risk of premature failure!

Loss of efficiency!

- It is highly recommended that any dismantling of the machine that goes beyond anything that is described in this manual should be done through Busch.



WARNING

Machines contaminated with hazardous material.

Risk of poisoning!

Risk of infection!

If the machine is contaminated with hazardous material:

- Wear appropriate personal protective equipment.

In case of the machine having conveyed gas that was contaminated with foreign materials which are dangerous to health:

- Decontaminate the machine as much as possible and state the contamination status in a 'Declaration of Contamination'.

Busch will only accept machines that come with a completely filled in and legally binding signed 'Declaration of Contamination'.

(Form downloadable from www.buschvacuum.com)

9 Decommissioning

- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.
- Disconnect all connections.

If the machine is going to be stored:

- See Storage [► 7].

9.1 Dismantling and Disposal

- Drain the oil.
- Separate special waste from the machine.
- Dispose of special waste in compliance with applicable regulations.
- Dispose of the machine as scrap metal.

10 Spare Parts

NOTICE

Use of non-Busch genuine spare parts.

Risk of premature failure!

Loss of efficiency!

- The exclusive use of Busch genuine spare parts and consumables is recommended for the correct functioning of the machine and to validate the warranty.

Spare part	Description	Part no.
Oil fill plug (=Venting valve)	Includes appropriate seal ring	0543 138 026
Oil sight glass		0583 000 001
Seal ring	For oil sight glass	0480 000 271
Oil drain plug	Includes appropriate seal ring	0415 134 870
Seal ring	For oil drain plug	0482 137 352
Inlet flange lower part	Includes non-return valve	0916 000 672
Inlet screen		0534 000 094

If other parts are required:

- Contact your Busch representative for the detailed spare parts list.

11 Troubleshooting

DANGER

Live wires.

Risk of electrical shock.

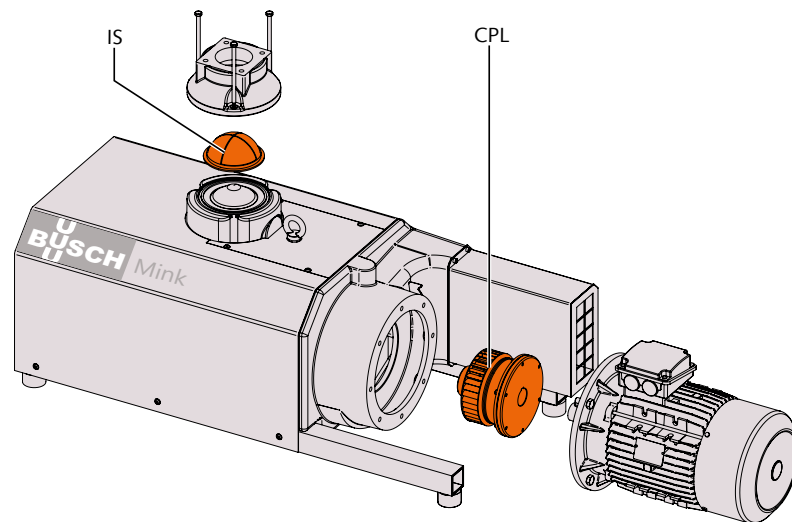
- Electrical installation work must only be executed by qualified personnel.

CAUTION

Hot surface.

Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first.



Problem	Possible Cause	Remedy
The machine does not start.	The motor is not supplied with the correct voltage.	• Check the power supply.
	The motor is defective.	• Replace the motor.
	The coupling (CPL) is defective.	• Replace the coupling (CPL).
The machine does not reach the usual pressure on the suction connection.	The inlet screen (IS) is partially clogged.	• Clean the inlet screen (IS).
	The inlet filter cartridge (optional) is partially clogged.	• Replace the inlet filter cartridge.
	Internal parts are worn or damaged.	• Repair the machine (contact Busch).
The machine runs very noisily.	Worn coupling (CPL).	• Replace the coupling (CPL).
	Oil level too low.	• Top up oil.
	Defective bearings.	• Repair the machine (contact Busch).
The machine runs too hot.	Insufficient cooling.	• Remove dust and dirt from the machine.
	Ambient temperature too high.	• Observe the permitted ambient temperature, see Technical Data [► 23].
	Temperature of the process gases at the inlet too high.	• Observe the permitted gas inlet temperature, see Technical Data [► 23].
	Oil level too low.	• Top up oil.

For the solution of problems not mentioned in the troubleshooting chart contact your Busch representative.

12 Technical Data

		MM 1402 AV	MM 1502 AV
Nominal pumping speed (50Hz / 60Hz)	m ³ /h	400 / 470	500 / 600
Ultimate pressure	hPa (mbar) abs.	200	
Nominal motor rating (50Hz / 60Hz)	kW	7.5 / 9.5	11.0 / 12.6
Nominal motor speed	min ⁻¹	3000 / 3600	
Permitted motor speed range	min ⁻¹	1200 ... 3600 ► ≥200 hPa (mbar) abs.	
Noise level (EN ISO 2151) at 400 hPa (mbar) abs. suction pressure (50Hz / 60Hz)	dB(A)	79 / 83	80 / 86
Ambient temperature range	°C	0 ... 40*	
Inlet gas temperature range	°C	0 ... 40*	
Ambient pressure		Atmospheric pressure	
Oil capacity	l	1.2	
Weight approx. (50Hz / 60Hz)	kg	~ 290 / 320	~ 325

* In case of higher or lower temperatures, please consult your Busch representative.

13 Oil

	VS 150	VSB 100
ISO-VG	150	100
Part number 1 L packaging	0831 164 883	0831 168 351
Part number 5 L packaging	0831 164 884	0831 168 352
Remark	Standard oil for non-demanding applications	Food applications (H1)

14 EU Declaration of Conformity

This Declaration of Conformity and the CE-mark affixed to the nameplate are valid for the machine within the Busch scope of delivery. This Declaration of Conformity is issued under the sole responsibility of the manufacturer. When this machine is integrated into a superordinate machinery the manufacturer of the superordinate machinery (this can be the operating company, too) must conduct the conformity assessment process for the superordinate machine or plant, issue the Declaration of Conformity for it and affix the CE-mark.

The manufacturer

Busch Produktions GmbH
Schauinslandstr. 1
DE-79689 Maulburg



declares that the machine(s): **Mink MM 1402 AV; MM 1502 AV**

has (have) been manufactured in accordance with the European Directives:

- 'Machinery' 2006/42/EC
- 'Electromagnetic Compatibility' 2014/30/EU
- 'RoHS 2' 2011/65/EU, 2017/2102, restriction of the use of certain hazardous substances in electrical and electronic equipment

and following the standards.

Standard	Title of the Standard
EN ISO 12100:2010	Safety of machinery - Basic concepts, general principles of design
EN ISO 13857:2008	Safety of machinery - Safety distances to prevent hazard zones being reached by the upper and lower limbs
EN 1012-1:2010 EN 1012-2:1996 + A1:2009	Compressors and vacuum pumps - Safety requirements - Part 1 and Part 2
EN ISO 2151:2008	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
EN 60204-1:2006 + A1:2009	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 61000-6-2:2005	Electromagnetic compatibility (EMC) - Generic standards. Immunity for industrial environments
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) - Generic standards. Emission standard for industrial environments
EN ISO 13849-1:2015 ⁽¹⁾	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

Person authorised to compile the technical file:

Gerd Rohweder
 Busch Dienste GmbH
 Schauinslandstr. 1
 DE-79689 Maulburg

Maulburg, 10.10.2018

Dr. Martin Gutmann, General Manager

⁽¹⁾ In case control systems are integrated.

Note

Busch Vacuum Pumps and Systems

All over the World in Industry

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www.buschvacuum.com/ar
info@busch.com.ar

Australia

www.buschvacuum.com/au
sales@busch.com.au

Austria

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busch@busch.at

Bangladesh

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info@busch.be

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service_sales@busch.co.il

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busch@busch.co.kr

Malaysia

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busch@busch.com.my

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info@busch.com.mx

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info@busch.nl

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sales@busch.co.nz

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post@busch.no

Peru

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info@busch.com.pe

Poland

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busch@busch.com.pl

Portugal

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busch@busch.pt

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office@buschromania.ro

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info@busch.ru

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contacto@buschiberica.es

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info@busch.se

Switzerland

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info@buschag.ch

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Thailand

www.buschvacuum.com/th
info@busch.co.th

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vakutek@ttmail.com

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sales@busch.ae

United Kingdom

www.buschvacuum.com/uk
sales@busch.co.uk

USA

www.buschvacuum.com/us
info@buschusa.com



BF Series

Single Bag Housings: #1, #2, #3 and #4 sizes



- Designed for industrial and commercial filter applications
- Heavy duty construction for maximum durability
- 1/8" perforated stainless steel basket (optional perforations and mesh sizes available)
- #1 and #2 Size Housings:
 - Available in 316L Stainless Steel, 304L Stainless Steel or Carbon Steel construction for a wide range of chemical compatibility
 - Clamp or Swing Bolt closures
 - Stainless steel compression spring provides positive bag sealing
 - Adjustable stainless steel leg assembly
 - 1/4" FNPT gauge ports and 1/2" FNPT drain port
- #3 and #4 Size Housings:
 - 316 Stainless Steel construction
 - Clamp closure for easy bag change outs
 - Optional compression spring and adjustable mounting legs

Applications

Water	Chemicals
Food & Beverage	Electronics
Oil	Inks / Paints / Coatings
Coolants	Pulp & Paper

Specifications & Operating Parameters

Maximum Operating Pressure

150 psig (10.3 bar) @ 300°F (149°C)

Connections

Inlet /Outlet:

2" FNPT (#1 and #2 Sizes)

3/4", 1" and 1 1/2" FNPT (#3 and #4 Sizes)

Optional: RF Flanges or Sanitary Ferrules

Drain Port: 1/2" FNPT (#1 and #2 Sizes)

Gauge Ports: 1/4" FNPT - clean and dirty sides (#1 and #2 sizes)

Vent Port: 1/4" NPT Plug

Gaskets

Buna N

Optional: EPR, Silicone, Teflon Encapsulated Silicone, Viton

Baskets

1/8" perforated stainless steel

Options: various perforation and mesh sizes

Materials of Construction

Head / Shell:

#1 and #2 Sizes

316L Stainless Steel, 304L Stainless Steel, Carbon Steel

#3 and #4 Sizes

316L Stainless Steel

Eye Nuts: Zinc plated steel

Mounting Legs: 304L Stainless Steel

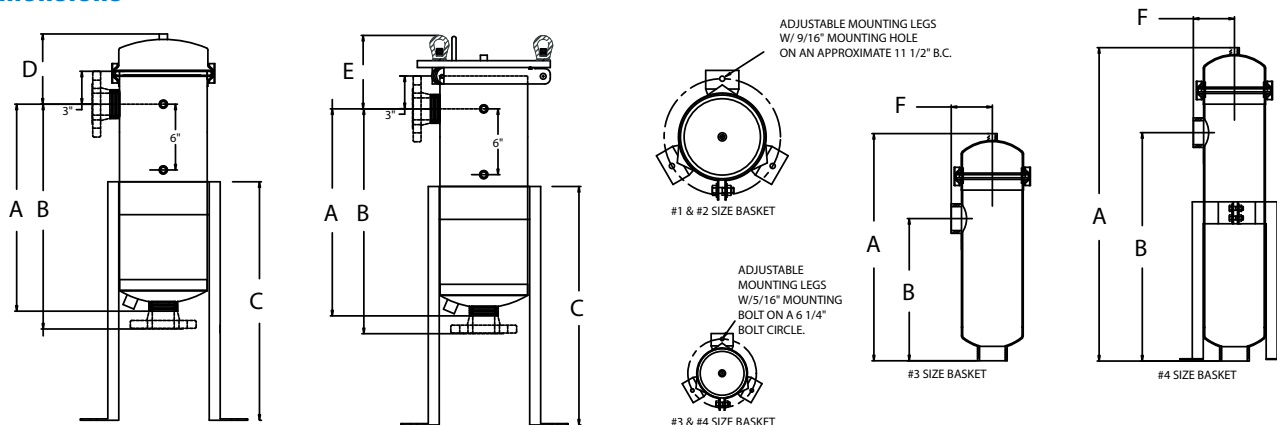
Options

- Side Inlet / Side Outlet (#1 and #2 sizes)
 - 134 epoxy coating for seawater and corrosive applications
- See ordering guide for complete selection of options*

MODEL AND BAG SIZE	CLOSURE	MAX FLOW RATE* GPM (LPM)	DRAIN SIZE	DIMENSIONS					
				A	B	C	D	E	F
BFS-1 / BFC-1	Clamp or Swing Bolt	70 (265)	1/2"	18 7/8" (47.9 cm)	20 1/2" (52.1 cm)	21 3/4" (55.2 cm)	3" (7.6 cm)	6 11/16" (17.0 cm)	3" (7.6 cm)
BFS-2 / BFC-2	Clamp or Swing Bolt	150 (567)	1/2"	34 7/8" (88.6 cm)	22 3/4" (92.7 cm)	21 3/4" (55.2 cm)	3" (7.6 cm)	6 11/16" (17.0 cm)	3" (7.6 cm)
BFS-3	Clamp	25 (95)		16 9/16" (42.1 cm)	10 3/8" (26.4 cm)				
BFS-4	Clamp	40 (151)		22 7/8" (58.1 cm)	16 11/16" (42.4 cm)				

*Flow rates are guidelines only. Actual flow rates are based upon fluid, viscosity, bag type, micron ratings and other factors

Dimensions



Ordering Guide (Example: BFS-2SB-2-316-B)

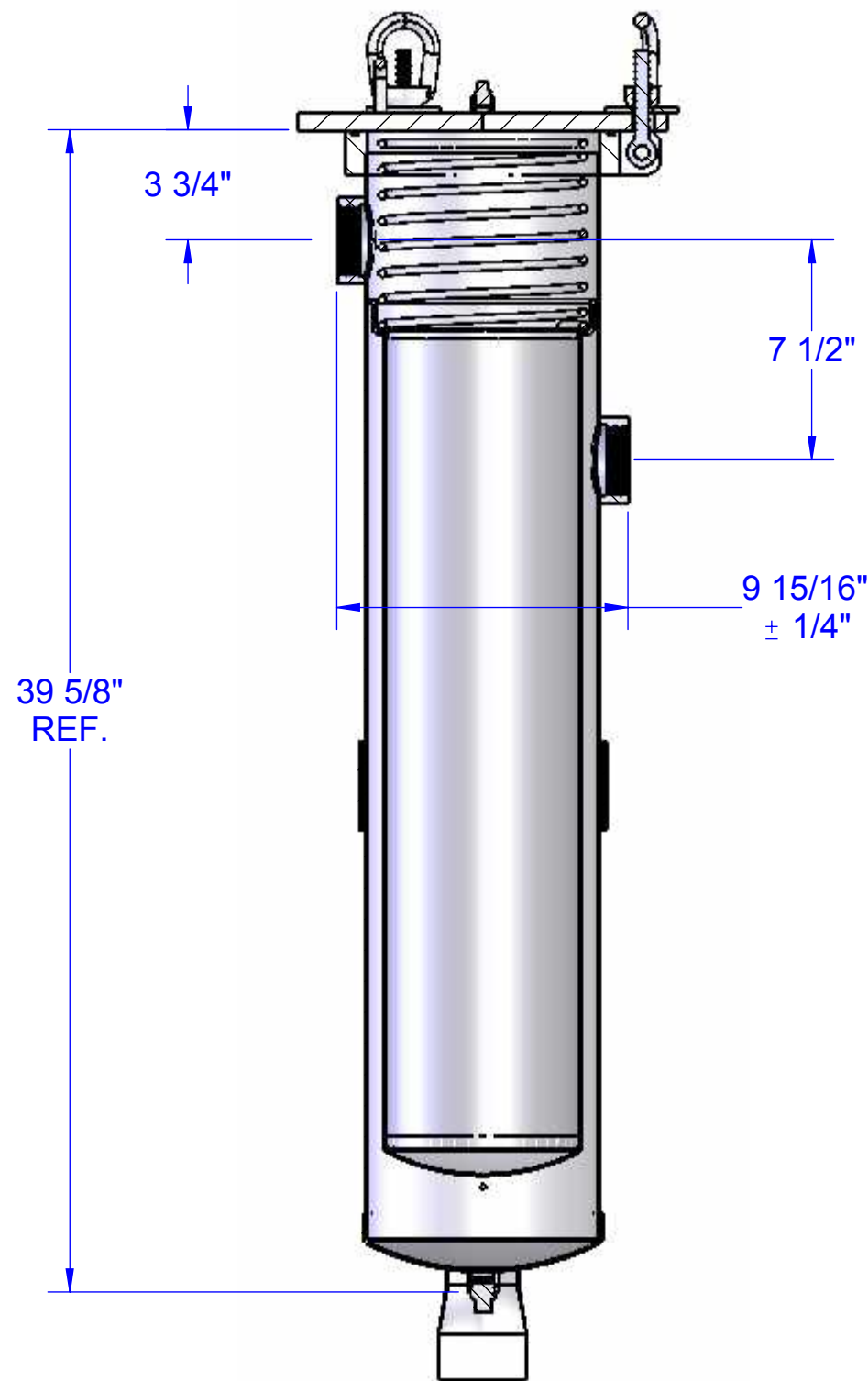
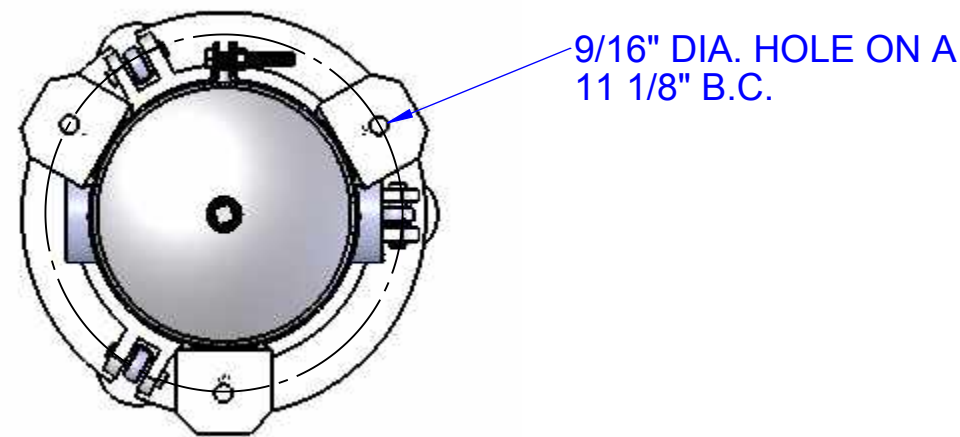
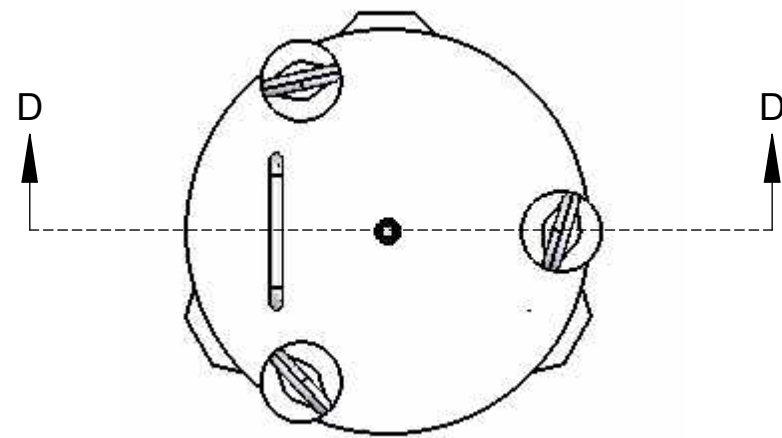
BFS - 2 SB - 2 - 316 - B						
MODEL	BAG SIZE	CLOSURE	PIPE SIZE	MATERIAL	CONNECTION ORIENTATION	GASKET
#1 and #2 Sizes						
BFS = Stainless Steel BFC = Carbon Steel	1 2	C = Clamp SB = Swing Bolt	2 = 2" FNPT (standard) 2F = 2" RF Flange 3 = 3" FNPT 3F = 3" RF Flange 2TC = 2" Sanitary Ferrules	304 = 304 SS 316 = 316 SS 134 = 134 Coating over 304 SS*	Blank = Side In / Bottom Out 2 = Side In / Side Out	B = Buna N (Standard) E = EPDM S = Silicone V = Viton
#3 and #4 Sizes						
BFS = Stainless Steel	3 4	C = Clamp	75 = 3/4" FNPT 1 = 1" RF Flange 1.5 = 1 1/2" FNPT (standard)	316 = 316 SS	Blank = Side In / Bottom Out 2 = Side In / Side Out (Hold Down Spring Recommended)	B = Buna N (Standard) E = EPDM S = Silicone V = Viton

* Note: 134 Coating must have swing bolt closure and flanged connections.

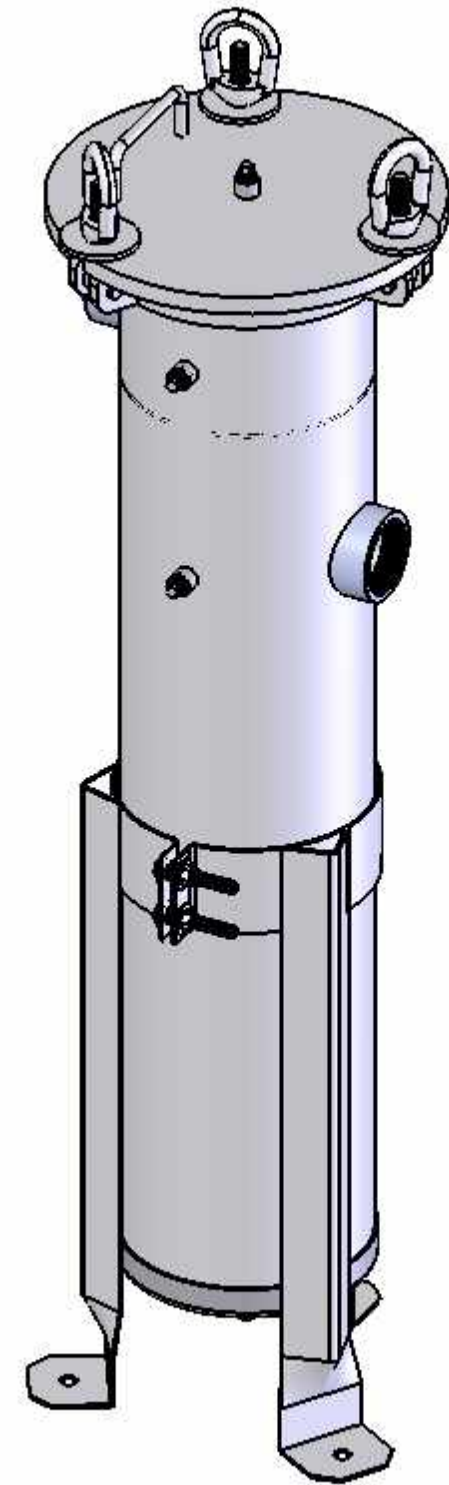
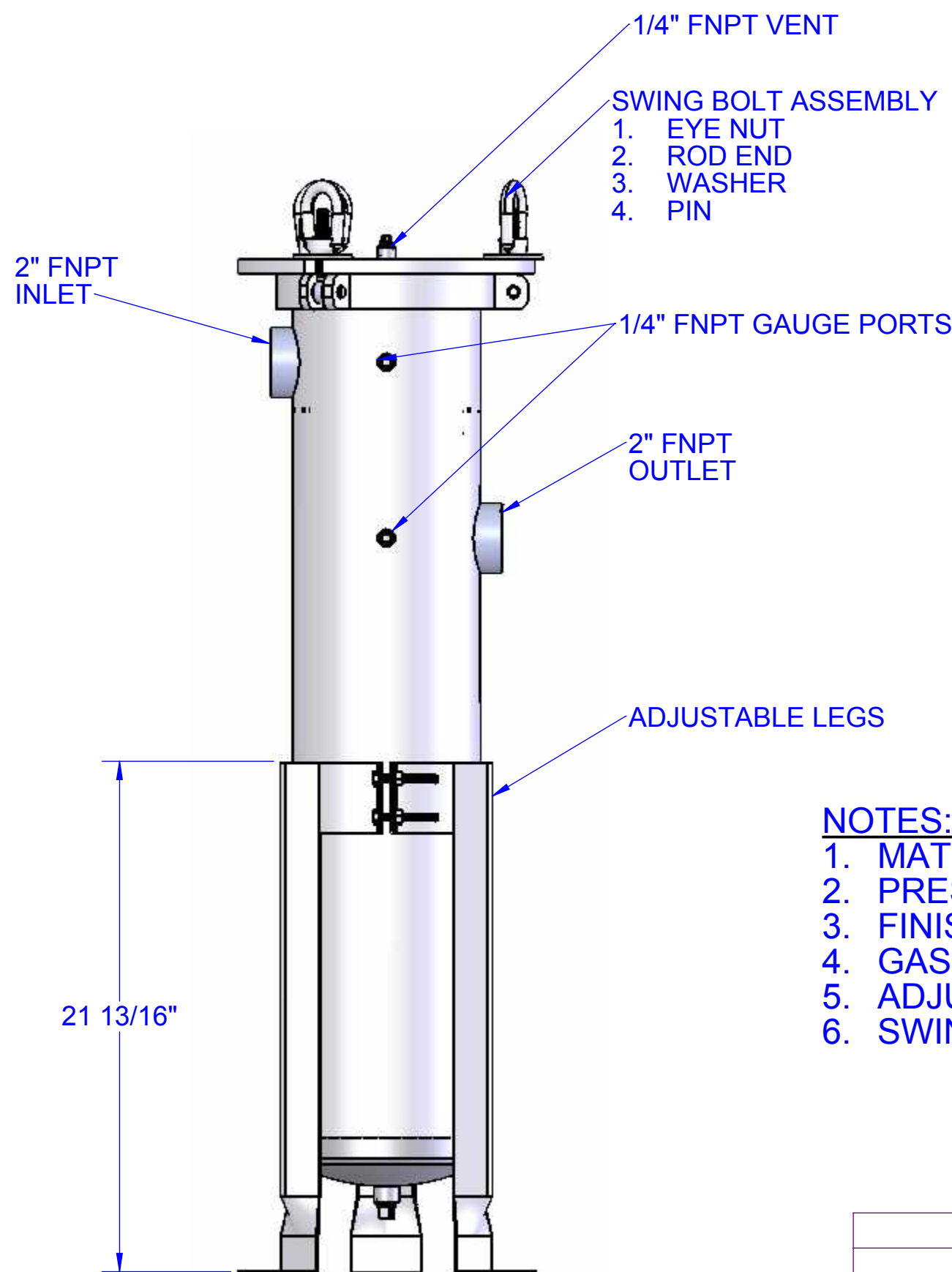
Customization

Housings may be customized to meet your precise requirements. Contact Shelco's technical support staff or your distributor for more information.






SECTION D-D



NOTES:

1. MATERIAL: 304L OR 316L
2. PRESSURE: 150 PSI
3. FINISH: POLY-COAT
4. GASKET: BUNA
5. ADJUSTABLE MOUNTING LEGS: 304 S.S.
6. SWING BOLT ASSEMBLY HARDWARE: ZINC PLATED STEEL

		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 SHELCO FILTERS MIDDLETOWN, CT 06457	
		DIMENSIONS ARE IN INCHES TOLERANCES:	DRAWN	LJR		11/09/12
		FRACTIONAL ± 1/8" ANGULAR: MACH ± 1° BEND ± TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.005	CHECKED			
		INTERPRET GEOMETRIC TOLERANCING PER:	ENG APPR.			
		MATERIAL	MFG APPR.			
			Q.A.			
		FINISH	TITLE:			
			BFS-2SB-2-2			
		COMMENTS:	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF THE TINNY CORPORATION. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF THE TINNY CORPORATION IS PROHIBITED.		SIZE C	
OUTLET DIM	2/13/13/LJR				DWG. NO. -	
CHANGES	DATE/NAME				REV A	
APPLICATION		DO NOT SCALE DRAWING			WEIGHT: 9.993	
					SHEET 1 OF 2	

CA SERIES

RECIPROCATING AIR COMPRESSORS



**RECIPROCATING
AIR COMPRESSORS
5-15HP**



**SOME COMPANIES ARE FOUNDED ON HARD WORK.
OTHERS ARE FOUNDED ON IDEALS.**

FS-CURTIS WAS FOUNDED ON BOTH.

A HISTORY OF

1854

Curtis & Co. –
Empire Saw founded
in St. Louis, MO, USA

1857

Earned Agricultural
and Mechanical Fair
award for excellence
and quality

1876

Named Curtis
and Co.
Manufacturing

1897

Built first
reciprocating
air compressor
that later evolved
into the Master
Line Series

1914

Supported U.S.
Government efforts
by producing more
than 2 million Howitzer
shell forgings

1940

Designed and
developed
mobile oxygen
compressors to be
used in Aerospace
applications

1955

Merged with U.S.
Air Compressor
Company, Central
Petroleum Company,
Lewis Machine
Company



REAL-WORLD PEOPLE

When you're successful, we're successful. That's why FS-Curtis listens. Trust and dependability are the foundations of our past and the fabric of our future, so you can count on being treated with the personal touch you deserve.

**“Trust and dependability are
the foundations of our past
and the fabric of our future.”**

~ Brent Becker – President, FS-Curtis



More than 150 years ago, the FS-Curtis way of doing business was established through two key commitments: a dedication to building quality products and a dedication to responsive customer service.

Over the decades, the company and its products have evolved through innovation and new technologies. But those commitments to quality and service remain unchanged. Today, just as in 1854, FS-Curtis customers can depend on our products for reliable, long-term service. Equally as important, they can depend on getting the same from our people.

EXCELLENCE

1976

Merged with Toledo Tools as Curtis-Toledo Inc.

1979

Introduction of Challenge Air Series reciprocating air compressors

1995

Began manufacturing and assembling Rotary Screw compressors

2005

Expanded global market reach by joining forces with Fusheng Industrial

2006

U.S. Headquarters certified as ISO9001:2000 and ISO14001:2004

2010

Introduced next generation GSV Variable Speed Rotary Screw compressors



REAL-WORLD PRODUCTS

Take more than a century of experience building quality compressors, add in a staff that's listening to the needs of the market, and the result is a product lineup that's built for tough working conditions. No wonder so many customers around the world depend on FS-Curtis compressors day in and day out.

THE INDUSTRY WORKHORSE

For automotive, light industrial and other challenging applications, CA Series compressors are built to last. Components are selected based on durability and performance, ensuring that your CA Series compressor delivers reliable performance in demanding applications. Precision-machined components and a dedication to materials of construction that are meant for real world working conditions further assure long-term durability.



BUILT TO LAST



CA SERIES FEATURES AT A GLANCE

THE MOST DURABLE PUMP CONSTRUCTION AVAILABLE

Meticulous material selection ensures long-term reliability.

- 100% cast-iron cylinders and cylinder heads
- Long-lasting, corrosion-resistant crankshaft
- Reduces thermal stress for increased reliability
- Deep-finned cast-iron cylinders and cylinder head for cool operation
- Slow-turning pump increases pump life

INDUSTRIAL DESIGN

The most robust reciprocating air compressor in its class.

- Provides higher pressures, better efficiency and longer life
- Ready to handle rugged, heavy-duty applications

QUALITY COMPONENTS

For extended product life and continuous performance.

- Industrial-grade main roller bearings are precision fit for support of all rotating parts
- High-flow, heavy-duty stainless-steel valve system delivers more cfm per horsepower
- Robust intercooler increases compressor efficiency
- Metal intake filter/silencer is superior to plastic
- Heavy-duty stamped-steel belt guard
- Suction valve head unloaders for continuous running air compressors



**AMERICAN
CRAFTSMANSHIP
ST. LOUIS, MO USA**

Compare CA Series compressors with any other brand, and you'll see the difference.

THE PERFECT CHOICE

CA Series compressors aren't just built to handle harsh environments — they're also available in a wide range of configurations to meet your exact application. You'll get the rugged construction you desire in the configuration you need.



SIMPLEX

Simplex compressors are well suited for common applications where only one compressor is needed.

- Magnetic motor starter
- Manual tank drain
- Oil sight glass
- Horizontal or vertical tank configurations available
- Factory oil filled

DUPLEX

Duplex compressors are ideal when there are varying demand levels during operation. By alternating demand across two pumps, a duplex compressor also delivers longer pump life. The redundant pumps ensure you'll always have air, eliminating maintenance downtime.

- Alternator control panel comes mounted with magnetic motor starters and thermal overload protection
- Compressors alternate during normal operation
- Both compressors run when system demands
- Duplex design reduces electrical cost and eliminates downtime
- Factory oil filled



GAS DRIVEN

Gas-driven models are ideal for applications that require air when electricity isn't readily available. FS-Curtis gas-driven models are perfect for fleet and service applications.

- Choose between Kohler or Honda engines
- OSHA-approved totally enclosed metal belt guard
- ASME-approved air receiver
- 12V DC starter with alternator
- Engine idle control

ULTRA PACK

CA Series compressors are already an outstanding value, and an FS-Curtis Ultra Pack gives you even more. An Ultra Pack includes a CA Series compressor fully packaged with the most common options and accessories. You'll save money and time by getting it all in one package, and you'll be assured of increasing air quality while reducing maintenance needs. Industry-leading five-year bumper-to-bumper warranty available — talk with your FS-Curtis representative for more details.

- Air-cooled aftercooler
- Magnetic motor starter (Simplex)
- Alternator panel (Duplex)
- Dual control (10-15HP Simplex)
- Low oil level shutdown
- Automatic tank drain
- Tank isolator pads
- Factory oil filled



TECHNICAL DATA

STANDARD FEATURES	STANDARD (Simplex/Duplex)	SIMPLEX/DUPLEX ULTRA PACK (Simplex/Duplex)	GAS DRIVEN
100% cast-iron cylinders and cylinder heads	•	•	•
Factory oil filled	•	•	•
Magnetic motor starter (Simplex)	•	•	
Alternator control panel complete with magnetic starters (Duplex)	•	•	
NEMA-designed electric motor	•	•	
Automatic start/stop control	•	•	
ASME-approved air receiver	•	•	•
Manual condensate tank drain valve	•	•	•
Dial read-out pressure gauge	•	•	•
U.L.-approved pressure switch	•	•	
ASME-approved safety valve	•	•	•
ASME-approved discharge valve	•	•	•
Metal intake filter/silencers	•	•	•
Dynamically balanced flywheel	•	•	•
OSHA-approved totally enclosed metal belt guard	•	•	•
Gasoline engine (Honda or Kohler)			•
Dual control (Simplex only)	0	•	
Air-cooled aftercooler	0	•	
Low oil level shutdown	0	•	
Automatic tank drain	0	•	
Tank isolator pads	0	•	0

o Optional Feature • Standard Feature ■ Ultra Pack Features

ULTRA PACK DELIVERS

There's no better compressor value than an FS-Curtis Ultra Pack. As you can see, you'll get every top-quality FS-Curtis feature. Plus, only Ultra Pack purchases come with a 5-year "bumper-to-bumper" warranty.



HIGH-QUALITY CONSTRUCTION

All critical components in the CA Series are selected and assembled for long-term performance. So you won't have to worry about the cylinders, cylinder heads, crankshaft, connecting rods or pistons wearing out before their time. Plus, stainless steel valves are included on all models. Just as important as the materials is the FS-Curtis standard for quality. All parts are manufactured to precision tolerances for high efficiency, powerful performance and years of service under demanding conditions.

ELECTRIC MODELS

MODELS	HP	PUMP	CYLINDERS	CFM (@175psi)	CONFIGURATION	STANDARD PACKAGE			ULTRA PACK*		
						TANK (Gal.)	DIMENSIONS (LxWxH-In.)	WEIGHT (lbs.)	TANK (Gal.)	DIMENSIONS (LxWxH-In.)	WEIGHT (Lbs.)
CA5	5	E50	3	17.4 Simplex	Horizontal	80	69 x 24 x 47	525	80	69 x 32 x 48	600
					Vertical		36 x 25 x 74			39 x 40 x 74	
CA5+	5	E57	2	18.5 Simplex	Horizontal	80	69 x 24 x 47	510	80	69 x 32 x 48	575
				37 Duplex	Horizontal		36 x 25 x 74			39 x 40 x 74	
CA7.5	7.5	E57	2	23.2 Simplex	Horizontal	80	69 x 24 x 47	530	80	69 x 32 x 48	580
				46.4 Duplex	Horizontal		35 x 25 x 74			39 x 36 x 74	
CA10	10	E71	3	34.2 Simplex	Horizontal	120	73 x 26 x 53	940	120	74 x 37 x 54	1026
				68.4 Duplex	Vertical		43 x 31 x 79			43 x 36 x 80	
CA15	15	E15	3	46.5 Simplex	Horizontal	120	90 x 30 x 53	1225	120	96 x 33 x 55	1311
							74 x 28 x 58			75 x 39 x 59	

*View features chart for Ultra Pack features.

GAS-DRIVEN MODELS

MODELS	HP	ENGINE	PUMP	CYLINDERS	TANK (Gal.)	CFM (@175psi)	DIMENSIONS (LxWxH-In.)	WEIGHT (Lbs.)
CA13-H	13	Honda	E57	2	30	22	50 x 24 x 50	460
CA14-K	14	Kohler	E57	2	30	22.5	50 x 24 x 50	486

THE IDEAL CHOICE

SUPERIOR CONSTRUCTION FOR DEMANDING ENVIRONMENTS.

Every FS-Curtis compressor is manufactured for heavy-duty, durable, long-term service, even in harsh conditions. From the superior cast-iron build to best-in-class features, you can count on FS-Curtis to deliver quality and performance.



STANDARD



PREMIUM



ELITE

Overview	Industry-leading entry level features	Robust construction and enhanced features for demanding applications	The most rugged reciprocating compressor on the market
Horsepower (HP)	5-10HP	5-15HP	5-30HP
Lubrication Technology	Splash	Splash	Pressure
Recommended Use	Intermittent	Intermittent and Continuous Run	Intermittent and Continuous Run
Applications	Light Industrial, DIY, Commercial, Automotive	Light Industrial, Industrial, Commercial, Automotive	Light Industrial, Industrial, Commercial, Heavy-Use Automotive
Ultra Pack Available	No	Yes	Yes
Warranty	Standard 12-Month Factory Warranty; 2-Year Extended Available	Standard 12-Month Factory Warranty; 5-Year Extended or 5-Year Bumper-To-Bumper with Ultra Pack Available	Standard 12-Month Factory Warranty; 5-Year Extended or 5-Year Bumper-To-Bumper with Ultra Pack Available

THERE'S AN FS-CURTIS COMPRESSOR THAT IS RIGHT FOR EVERY NEED!

Work with your FS-Curtis distributor to select from a full range of rotary and reciprocating compressors as well as air treatment products to best meet your application.



EASY TO WORK WITH

Just as you get personal attention from FS-Curtis when selecting equipment, you're also supported worldwide by great people. You can count on the global FS-Curtis staff and representatives to listen to your needs and work with you to develop the solution that's best for your situation. Our people are committed to serving you well and FS-Curtis provides extensive training in the field and at our St. Louis headquarters to ensure that you have the support you need.

In addition, authorized FS-Curtis distributors use genuine FS-Curtis parts, lubricants and filter kits to maximize the service life of your equipment. And with a nationwide network of service centers, you don't need to worry about added downtime waiting for parts.

QUALITY PARTS MATTER

At FS-Curtis, quality is never compromised. That's why we control production using ISO 9001:2008 and ISO 14001:2004 standards, and it's also why we maintain a large inventory of replacement parts.

Using only genuine FS-Curtis replacement parts not only helps ensure continued reliable service of your equipment, but the large inventory also helps keep parts affordable and available. We're dedicated to maximizing your productivity, and that includes maximizing your uptime.

Through the dependability of our people and our quality-focused manufacturing, FS-Curtis will continue to be a trusted name serving even more markets through our ever-growing global presence.



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Improvements and research are continuous
at FS-Curtis. Specifications may change
without notice.

ISO 9001
ISO 14001

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