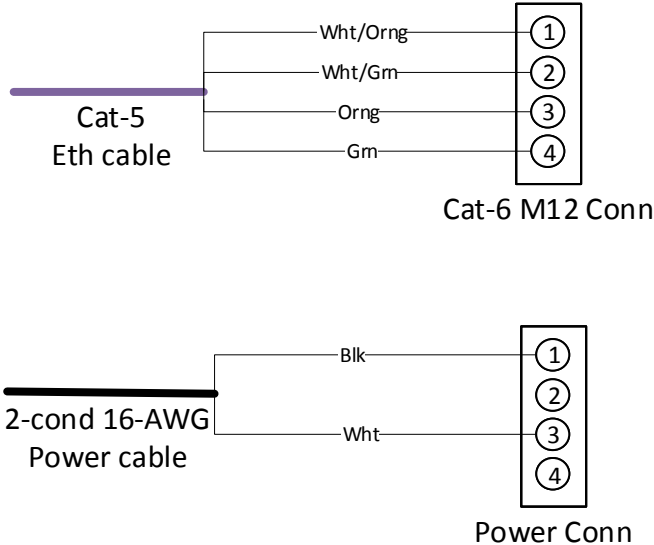


REV	DESCRIPTION	DATE	BY	CHECKED	APP
	SIX EPS Overview	10/19/2018	RK		

Schematics.vsd
Overview

XF

Hutch A



Intelligent chassis
192.168.1.200

Drop_Top
192.168.1.1

Drop_M1
192.168.1.5

Drop_FOE
192.168.1.3

Drop_PGM
192.168.1.7

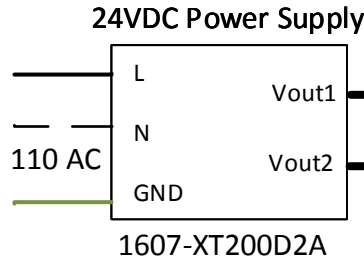
Satellite chassis B1
192.168.1.120

Satellite chassis C1
192.168.1.121

Satellite chassis C2
192.168.1.122

Satellite chassis C3
192.168.1.123

RG:D
Armor_D1
192.168.1.12



SEB

Drop_M4
192.168.1.13

Drop_M3
192.168.1.11

Drop_MNFL
192.168.1.15

Drop_DAA_DC
192.168.1.21

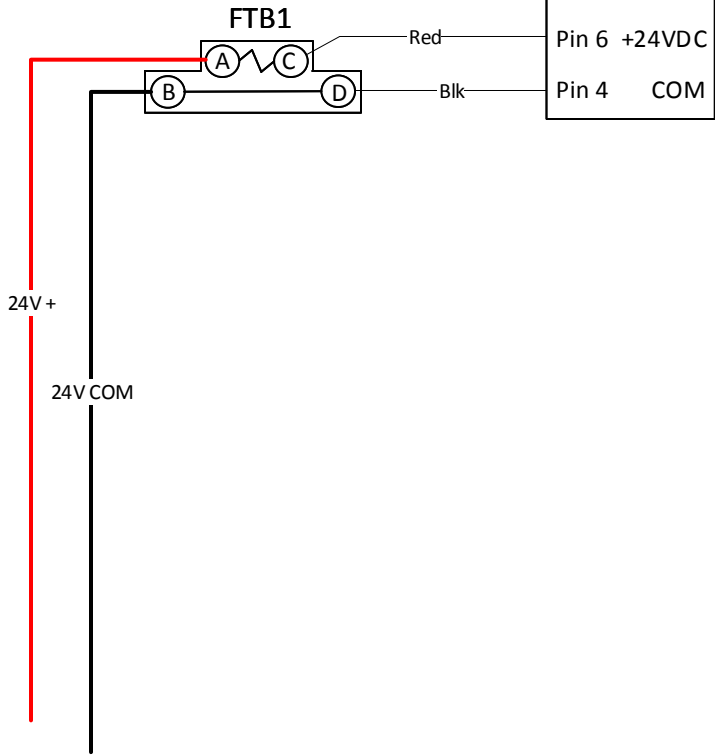
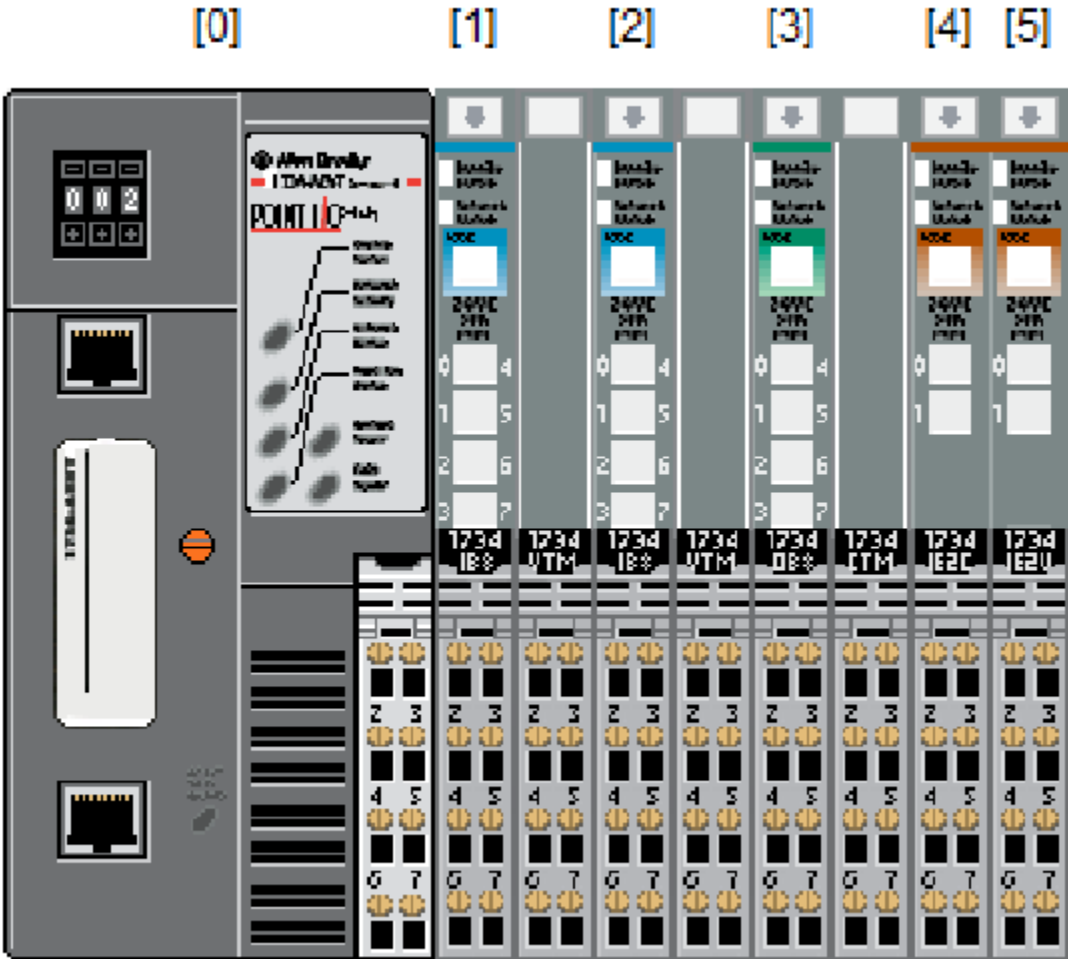
Drop_3AA
192.168.1.19

Drop_SC_STS
192.168.1.17

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 1 OF 21

Schematics.vsd
Drop_Mechanical

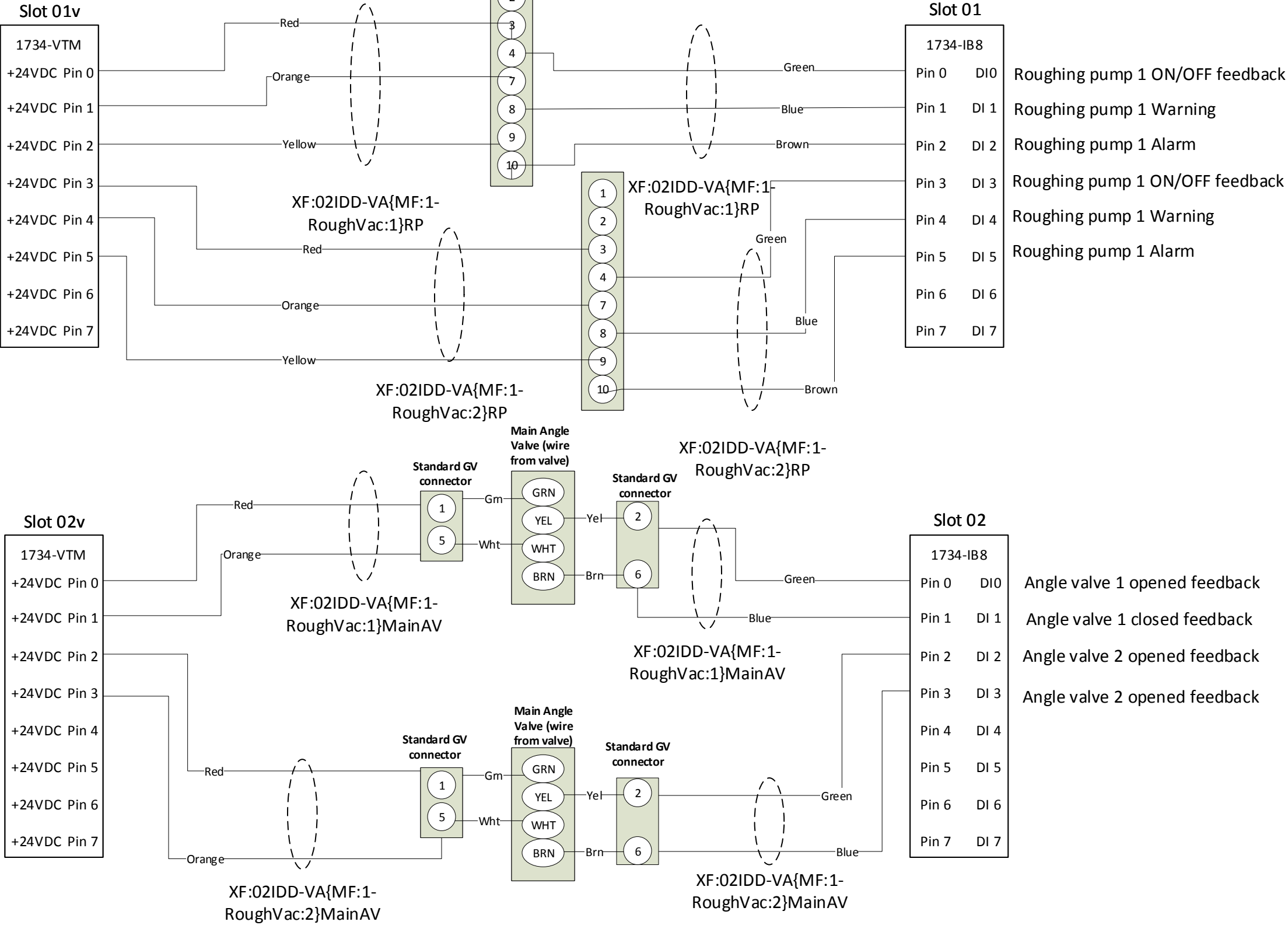
REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Drop_ArmSafety layout	10/19/2018	GB		



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 2 OF 21

Schematics.vsd
Drop_Mechanical
Slot 1, 2

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Drop_ArmSafety layout	10/19/2018	GB		



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 3 OF 21

4

3

2

1

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Mechanical room	10/19/18	GB		

Schematics.vsd
Drop_Mechanical
Slot 2, 5

Slot 02

1734-IB8		
DI 0	Pin 0	
DI 1	Pin 1	
DI 2	Pin 2	
DI 3	Pin 3	
DI 4	Pin 4	
DI 5	Pin 5	
DI 6	Pin 6	
DI 7	Pin 7	

Rough TCG 1 Relay 1 NC Status

Rough TCG 2 Relay 1 NC Status

Slot 02v

1734-VTM		
+24VDC	Pin 0	
+24VDC	Pin 1	
+24VDC	Pin 2	
+24VDC	Pin 3	
+24VDC	Pin 4	
+24VDC	Pin 5	
+24VDC	Pin 6	
+24VDC	Pin 7	

Blue vacuum
gauge

KJLC 275i
(DB9F)

XF:02IDD-VA{MF:1-
RoughVac:1}TCG

Blue vacuum
gauge

KJLC 275i
(DB9F)

XF:02IDD-VA{MF:1-
RoughVac:2}TCG

XF:02IDD-VA{MF:1-
RoughVac:1}TCG

MNFL TCG2

XF:02IDD-VA{MF:1-
RoughVac:2}TCG

Update wire colors
according to cable
pulled

Slot 05

1734-IE2V		
Pin 0	In0	
Pin 1	In1	
Pin 2	GND	
Pin 3	GND	
Pin 4	COM(0)	
Pin 5	COM(1)	
Pin 6	V+(0)	
Pin 7	V+(1)	

Rough TCG 1 Analog Reading

Rough TCG 2 Analog Reading

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 4 OF 21

Schematics.vsd
Drop_Mechanical
Slot 3,4

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Drop_Mechanical layout	10/19/2018	GB		

Roughing pump 1 ON/OFF
Roughing pump 2 ON/OFF
Angle valve 1 command
Angle valve 2 command

Slot 3		
1734-OB8		
DO 0	Pin 0	
DO 1	Pin 1	
DO 2	Pin 2	
DO 3	Pin 3	
DO 4	Pin 4	
DO 5	Pin 5	
DO 6	Pin 6	
DO 7	Pin 7	

Slot 3c

1734-CTM	
Pin 0	24V RET
Pin 1	24V RET
Pin 2	24V RET
Pin 3	24V RET
Pin 4	24V RET
Pin 5	24V RET
Pin 6	24V RET
Pin 7	24V RET

Slot 19

1734-IE2C		
AI 0	Pin 0	
AI 1	Pin 1	
GND	Pin 2	
GND	Pin 3	
ACOM	Pin 4	
ACOM	Pin 5	
V	Pin 6	
V	Pin 7	

Roughing pump 1 water flow
Roughing pump 2 water flow

①	+24 V
②	4-20 mA
③	GND
④	PNP Out
⑤	GND

Kobold Flow meter

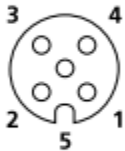
EPS Water Flow Meter SEB (M12-F)

①	+24 V
②	4-20 mA
③	GND
④	PNP Out
⑤	GND

Kobold Flow meter

EPS Water Flow Meter SEB (M12-F)

5 poles (all others)

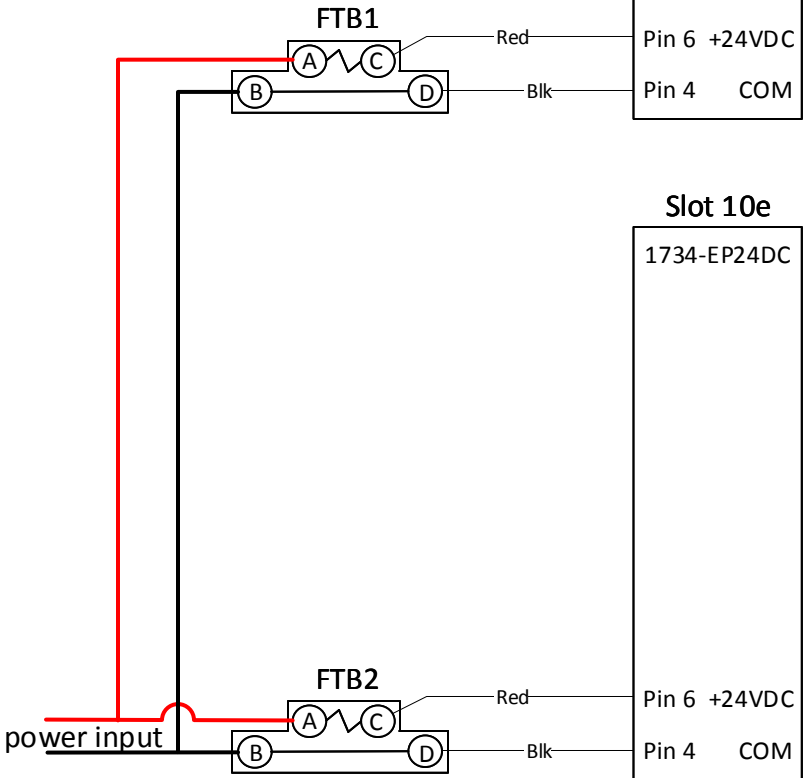
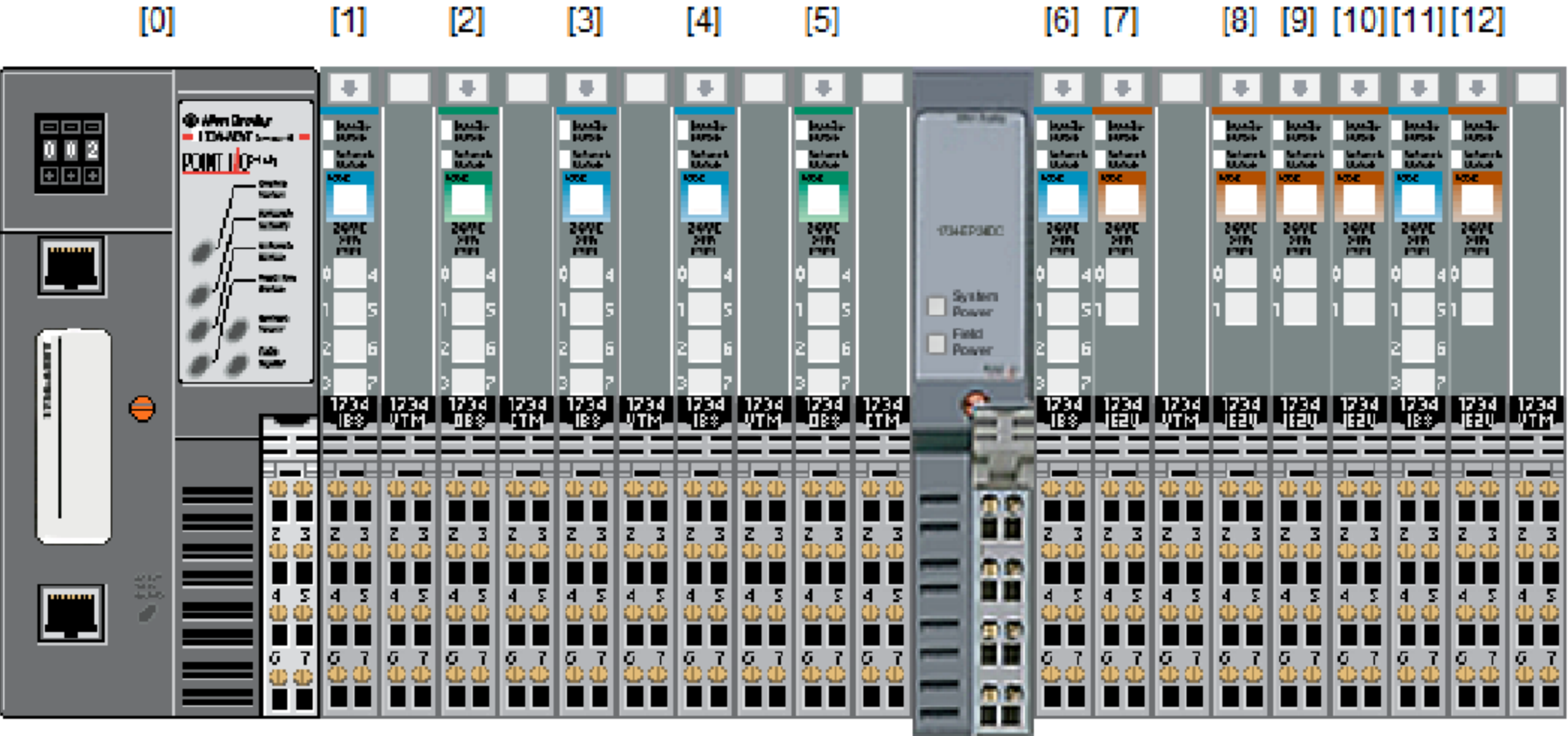


1 = brown
2 = white
3 = blue
4 = black
5 = grey

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 5 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Spectrometer Backing Manifold IO layout	10/19/18	RK		

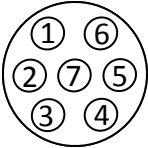
Schematics.vsd
Drop_MNFL



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 6 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Valves	10/19/18	HB		

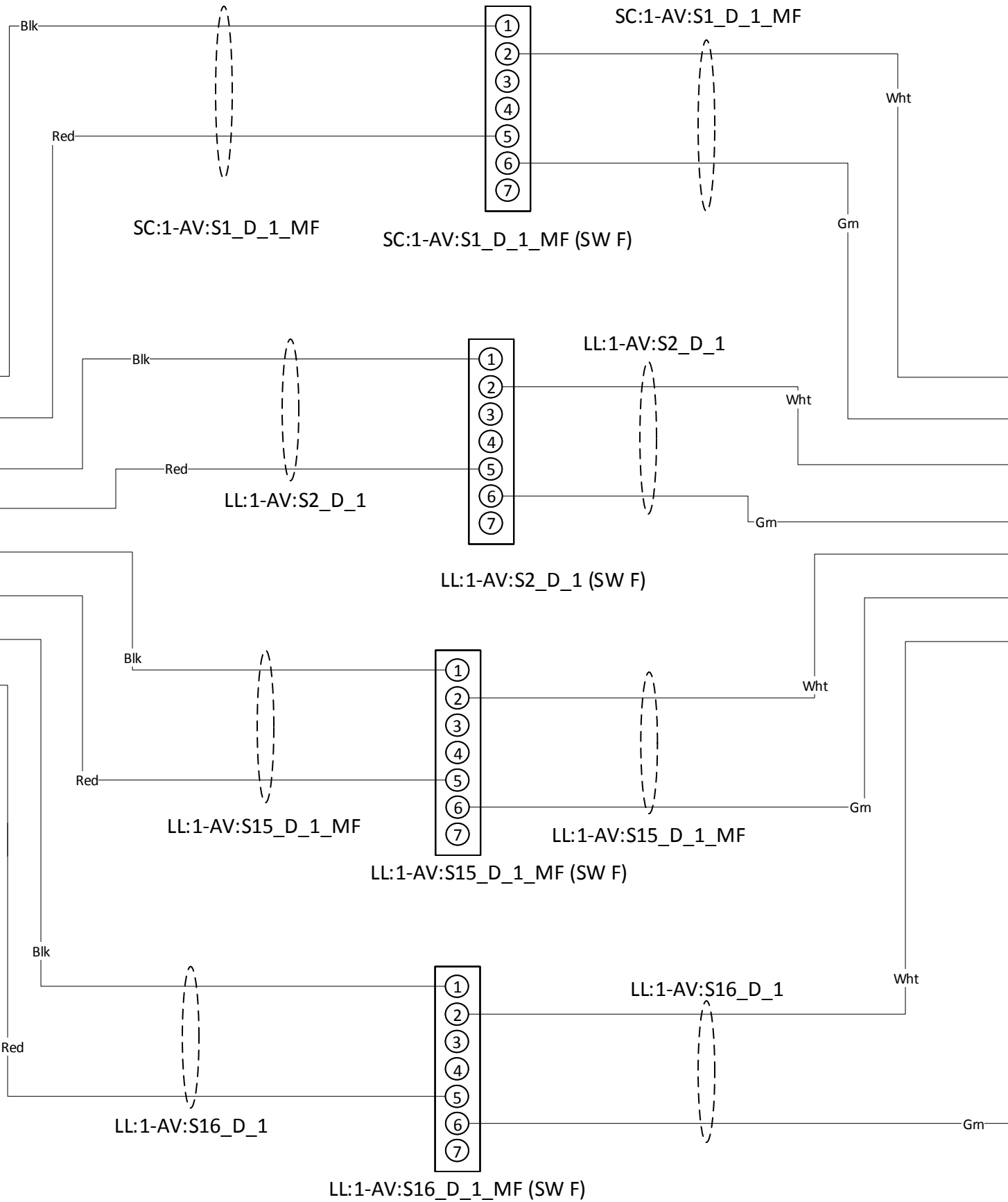
Schematics.vsd
Drop_MNFL Slot
1,1v



Valve SW Male:
Pin 1 – Green
Pin 2 - Yellow
Pin 5 – White
Pin 6 - Brown

Slot 01v
1734-VTM
+24VDC Pin 0
+24VDC Pin 1
+24VDC Pin 2
+24VDC Pin 3
+24VDC Pin 4
+24VDC Pin 5
+24VDC Pin 6
+24VDC Pin 7

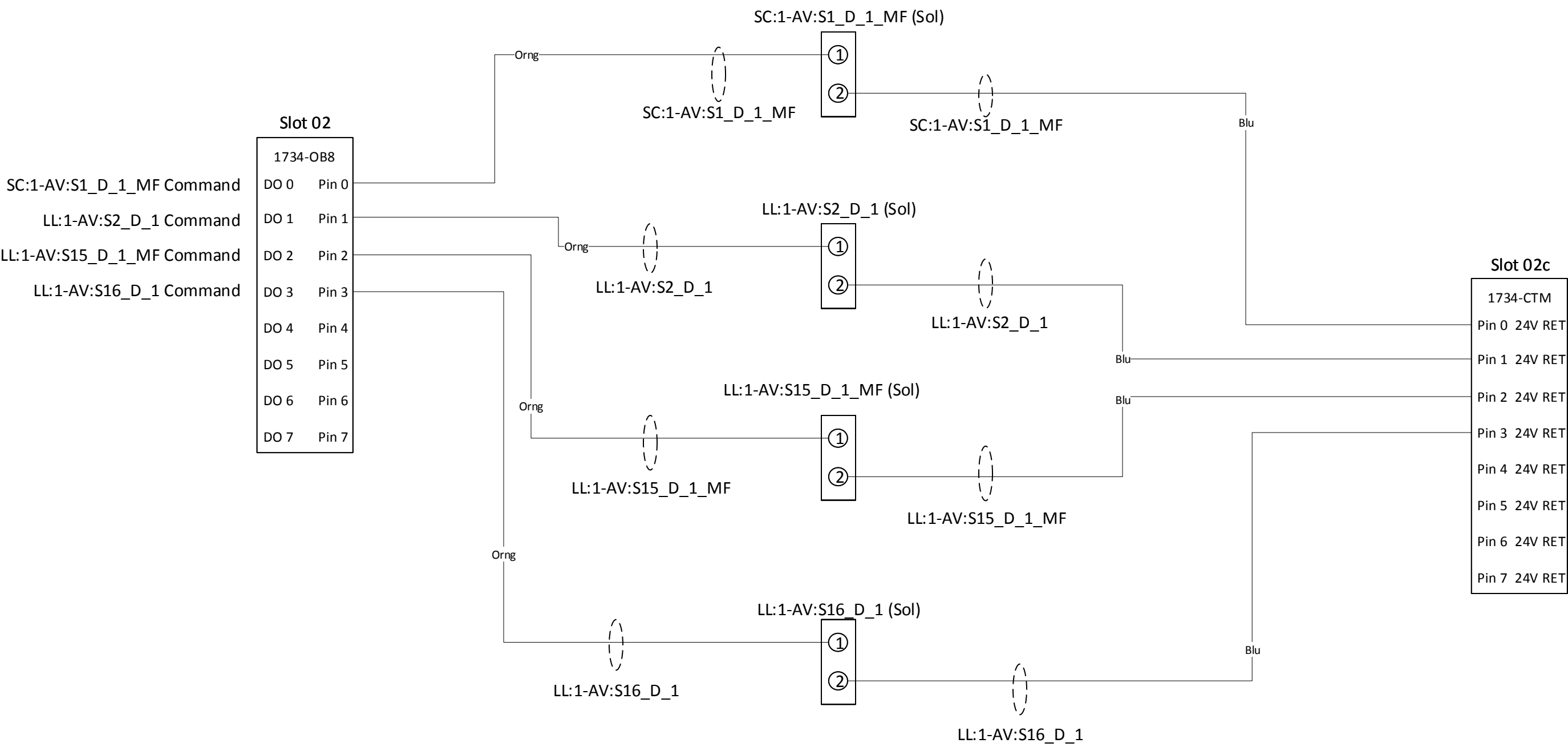
Slot 01
1734-IB8
Pin 0 DI0
Pin 1 DI 1
Pin 2 DI 2
Pin 3 DI 3
Pin 4 DI 4
Pin 5 DI 5
Pin 6 DI 6
Pin 7 DI 7



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 7 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Valves	10/19/18	HB		

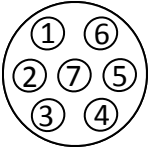
Schematics.vsd
Drop_MNFL Slot
2,2c_1



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 8 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Valves	10/19/18	HB		

Schematics.vsd
Drop_MNFL Slot
3,3v



Valve SW Male:
Pin 1 – Green
Pin 2 - Yellow
Pin 5 – White
Pin 6 - Brown

Slot 03v

1734-VTM
+24VDC Pin 0
+24VDC Pin 1
+24VDC Pin 2
+24VDC Pin 3
+24VDC Pin 4
+24VDC Pin 5
+24VDC Pin 6
+24VDC Pin 7

Slot 03

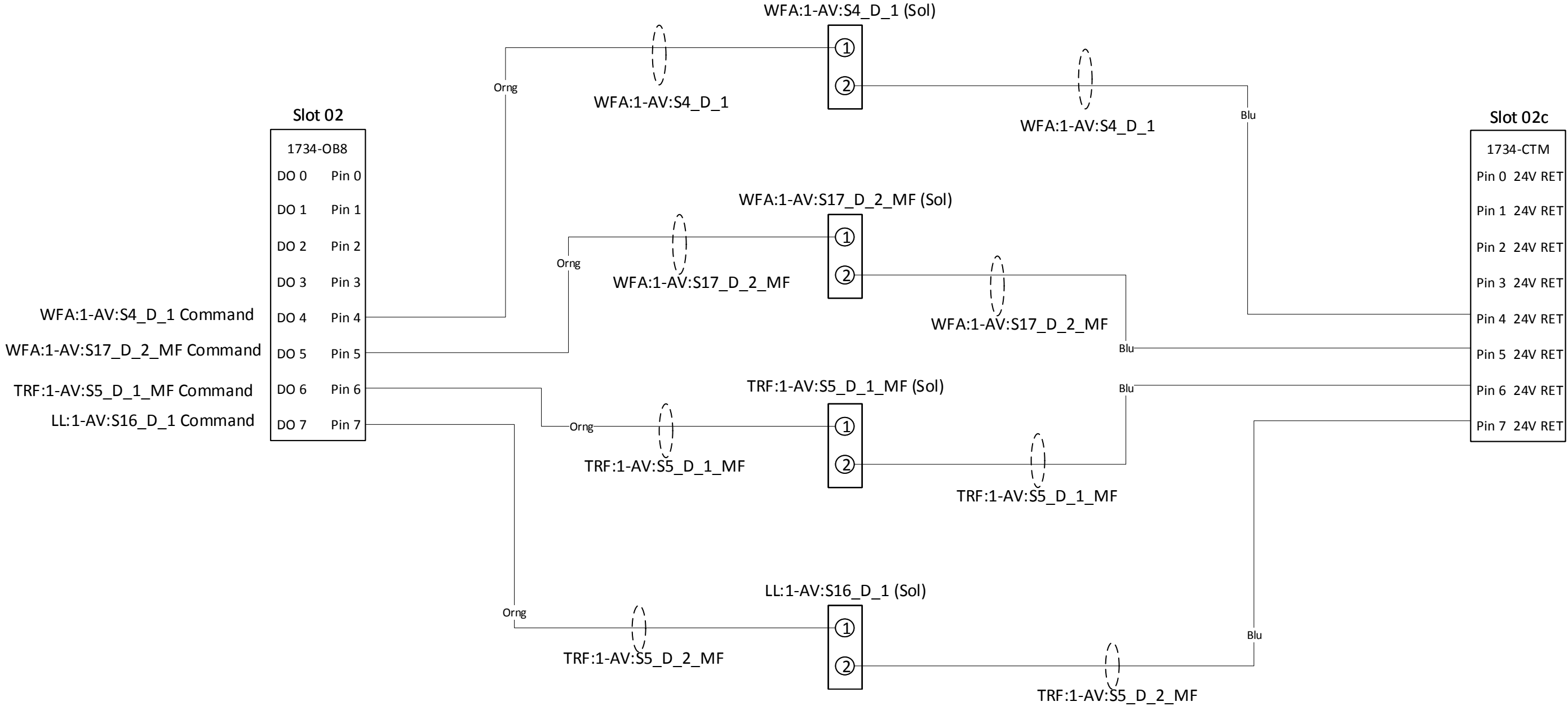
1734-IB8
Pin 0 DI 0
Pin 1 DI 1
Pin 2 DI 2
Pin 3 DI 3
Pin 4 DI 4
Pin 5 DI 5
Pin 6 DI 6
Pin 7 DI 7

WFA:1-AV:S4_D_1 Open Status
WFA:1-AV:S4_D_1 Close Status
WFA:1-AV:S17_D_2_MF Open Status
WFA:1-AV:S17_D_2_MF Close Status
TRF:1-AV:S5_D_1_MF Open Status
TRF:1-AV:S5_D_1_MF Close Status
TRF:1-AV:S5_D_2_MF Open Status
TRF:1-AV:S5_D_2_MF Close Status

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 9 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Valves	10/19/18	HB		

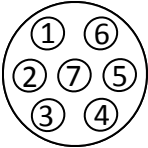
Schematics.vsd
Drop_MNFL Slot
2,2c_2



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 10 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Valves	10/19/18	HB		

Schematics.vsd
Drop_MNFL Slot
4,4v



Valve SW Male:
Pin 1 – Green
Pin 2 - Yellow
Pin 5 – White
Pin 6 - Brown

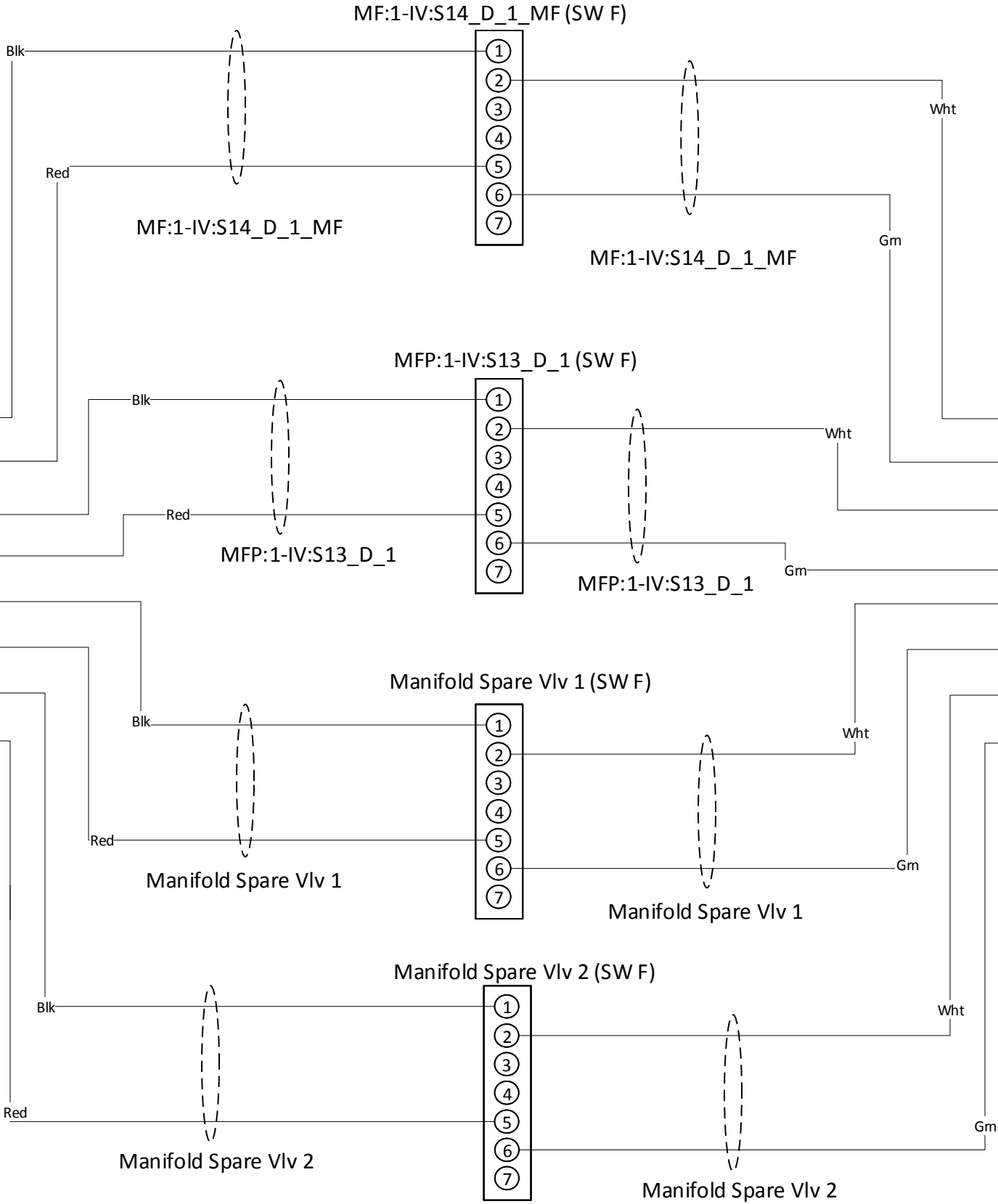
Slot 04v

1734-VTM
+24VDC Pin 0
+24VDC Pin 1
+24VDC Pin 2
+24VDC Pin 3
+24VDC Pin 4
+24VDC Pin 5
+24VDC Pin 6
+24VDC Pin 7

Slot 04

1734-IB8
Pin 0 DI 0
Pin 1 DI 1
Pin 2 DI 2
Pin 3 DI 3
Pin 4 DI 4
Pin 5 DI 5
Pin 6 DI 6
Pin 7 DI 7

MF:1-IV:S14_D_1_MF Open Status
MF:1-IV:S14_D_1_MF Close Status
MFP:1-IV:S13_D_1 Open Status
MFP:1-IV:S13_D_1 Close Status
Manifold Spare Vlv 1 Open Status
Manifold Spare Vlv 1 Close Status
Manifold Spare Vlv 2 Open Status
Manifold Spare Vlv 2 Close Status



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 11 OF 21

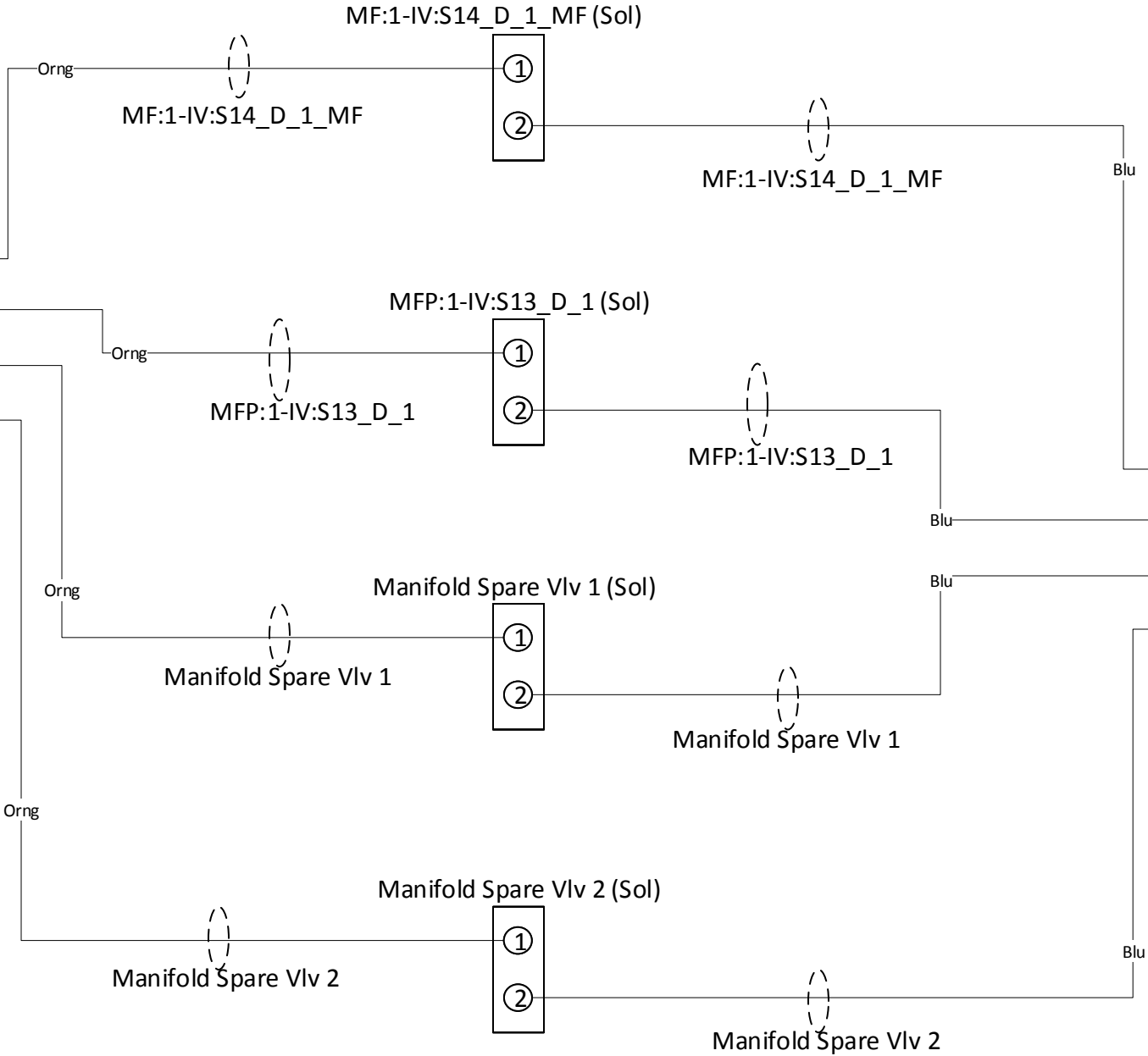
REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Valves	10/19/18	HB		

Schematics.vsdx
Drop_MNFL Slot
5,5c

MF:1-IV:S14_D_1_MF Command
MFP:1-IV:S13_D_1 Command
Manifold Spare Vlv 1 Command
Manifold Spare Vlv 2 Command

Slot 05	
1734-OB8	
DO 0	Pin 0
DO 1	Pin 1
DO 2	Pin 2
DO 3	Pin 3
DO 4	Pin 4
DO 5	Pin 5
DO 6	Pin 6
DO 7	Pin 7

Slot 05c	
1734-CTM	
Pin 0	24V RET
Pin 1	24V RET
Pin 2	24V RET
Pin 3	24V RET
Pin 4	24V RET
Pin 5	24V RET
Pin 6	24V RET
Pin 7	24V RET



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 12 OF 21

4

3

2

1

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold 275i gauges	10/19/18	HB		

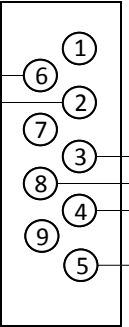
Schematics.vsdx
Drop_MNFL Slot
6,7,7v,8

Slot 06

1734-IB8		
DI 0	Pin 0	
DI 1	Pin 1	
DI 2	Pin 2	
DI 3	Pin 3	
DI 4	Pin 4	
DI 5	Pin 5	
DI 6	Pin 6	
DI 7	Pin 7	

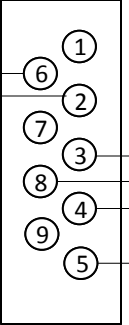
SC:1-TCG:S1_1 Relay 1 NC Status
LL:1-TCG:S15_1 Relay 1 NC Status
ACP15:1-TCG:S16_1 Relay 1 NC Status
WFA:1-TCG:S17_1 Relay 1 NC Status

KJLC 275i
(DB9F)



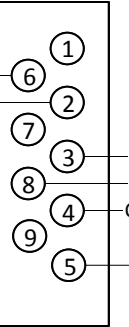
MNFL TCG1

KJLC 275i
(DB9F)



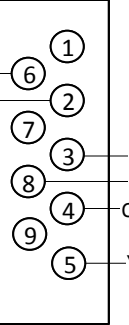
MNFL TCG2

KJLC 275i
(DB9F)



MNFL TCG3

KJLC 275i
(DB9F)



MNFL TCG4

Slot 07

1734-IE2V		
Pin 0	In0	
Pin 1	In1	
Pin 2	GND	
Pin 3	GND	
Pin 4	COM(0)	
Pin 5	COM(1)	
Pin 6	V+(0)	
Pin 7	V+(1)	

SC:1-TCG:S1_1 Analog Reading
LL:1-TCG:S15_1 Analog Reading

Slot 08

1734-IE2V		
Pin 0	In0	
Pin 1	In1	
Pin 2	GND	
Pin 3	GND	
Pin 4	COM(0)	
Pin 5	COM(1)	
Pin 6	V+(0)	
Pin 7	V+(1)	

ACP15:1-TCG:S16_1 Analog Reading
WFA:1-TCG:S17_1 Analog Reading

Slot 07v

1734-VTM		
+24VDC	Pin 0	
+24VDC	Pin 1	
+24VDC	Pin 2	
+24VDC	Pin 3	
+24VDC	Pin 4	
+24VDC	Pin 5	
+24VDC	Pin 6	
+24VDC	Pin 7	

MNFL SC:1-
TCG:S1_1

MNFL LL:1-
TCG:S15_1

MNFL
ACP15:1-
TCG:S16_1

MNFL WFA:1-
TCG:S17_1

MNFL SC:1-
TCG:S1_1

MNFL LL:1-
TCG:S15_1

MNFL
ACP15:1-
TCG:S16_1

MNFL WFA:1-
TCG:S17_1

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 13 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold 275i gauges	10/19/18	HB		

Schematics.vsd
Drop_MNFL Slot
6,7v,9,10

Slot 06

1734-IB8	
DI 0	Pin 0
DI 1	Pin 1
DI 2	Pin 2
DI 3	Pin 3
DI 4	Pin 4
DI 5	Pin 5
DI 6	Pin 6
DI 7	Pin 7

TRF:1-TCG:S5_1 Relay 1 NC Status

TRF:1-TCG:S5_2 Relay 1 NC Status

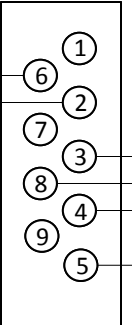
MF:1-TCG:S14_1 Relay 1 NC Status

MFP:1-TCG:S13_1 Relay 1 NC Status

Slot 07v

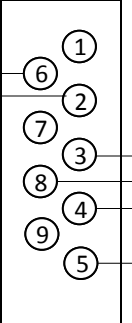
1734-VTM	
+24VDC	Pin 0
+24VDC	Pin 1
+24VDC	Pin 2
+24VDC	Pin 3
+24VDC	Pin 4
+24VDC	Pin 5
+24VDC	Pin 6
+24VDC	Pin 7

KJLC 275i
(DB9F)



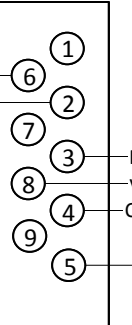
MNFL TCG5

KJLC 275i
(DB9F)



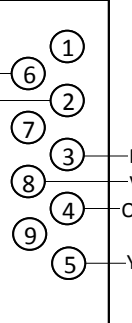
MNFL TCG6

KJLC 275i
(DB9F)



MNFL TCG7

KJLC 275i
(DB9F)



MNFL TCG8

MNFL TRF:1-TCG:S5_1

MNFL TRF:1-TCG:S5_2

MNFL MF:1-TCG:S14_1

MNFL MFP:1-TCG:S13_1

MNFL TRF:1-TCG:S5_1

MNFL TRF:1-TCG:S5_2

MNFL MF:1-TCG:S14_1

MNFL MFP:1-TCG:S13_1

Slot 09

1734-IE2V	
Pin 0	In0
Pin 1	In1
Pin 2	GND
Pin 3	GND
Pin 4	COM(0)
Pin 5	COM(1)
Pin 6	V+(0)
Pin 7	V+(1)

TRF:1-TCG:S5_1 Analog Reading

TRF:1-TCG:S5_2 Analog Reading

Slot 10

1734-IE2V	
Pin 0	In0
Pin 1	In1
Pin 2	GND
Pin 3	GND
Pin 4	COM(0)
Pin 5	COM(1)
Pin 6	V+(0)
Pin 7	V+(1)

MF:1-TCG:S14_1 Analog Reading

MFP:1-TCG:S13_1 Analog Reading

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 14 OF 21

4

3

2

1

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold 275i gauges	10/19/18	HB		

Schematics.vsd
Drop_MNFL Slot
11,12,12v

Slot 11

1734-IB8	
DI 0	Pin 0
DI 1	Pin 1
DI 2	Pin 2
DI 3	Pin 3
DI 4	Pin 4
DI 5	Pin 5
DI 6	Pin 6
DI 7	Pin 7

A100L:1-TCG:S12_1 Relay 1 NC Status

TCG10 Relay 1 NC Status

Slot 12v

1734-VTM	
+24VDC	Pin 0
+24VDC	Pin 1
+24VDC	Pin 2
+24VDC	Pin 3
+24VDC	Pin 4
+24VDC	Pin 5
+24VDC	Pin 6
+24VDC	Pin 7

KJLC 275i
(DB9F)

①	
②	
③	
④	
⑤	
⑥	Gm
⑦	Brn
⑧	
⑨	

MNFL
A100L:1-
TCG:S12_1

MNFL TCG9

KJLC 275i
(DB9F)

①	
②	
③	
④	
⑤	
⑥	Gm
⑦	Brn
⑧	
⑨	

MNFL TCG10

MNFL TCG10

MNFL
A100L:1-
TCG:S12_1

MNFL TCG10

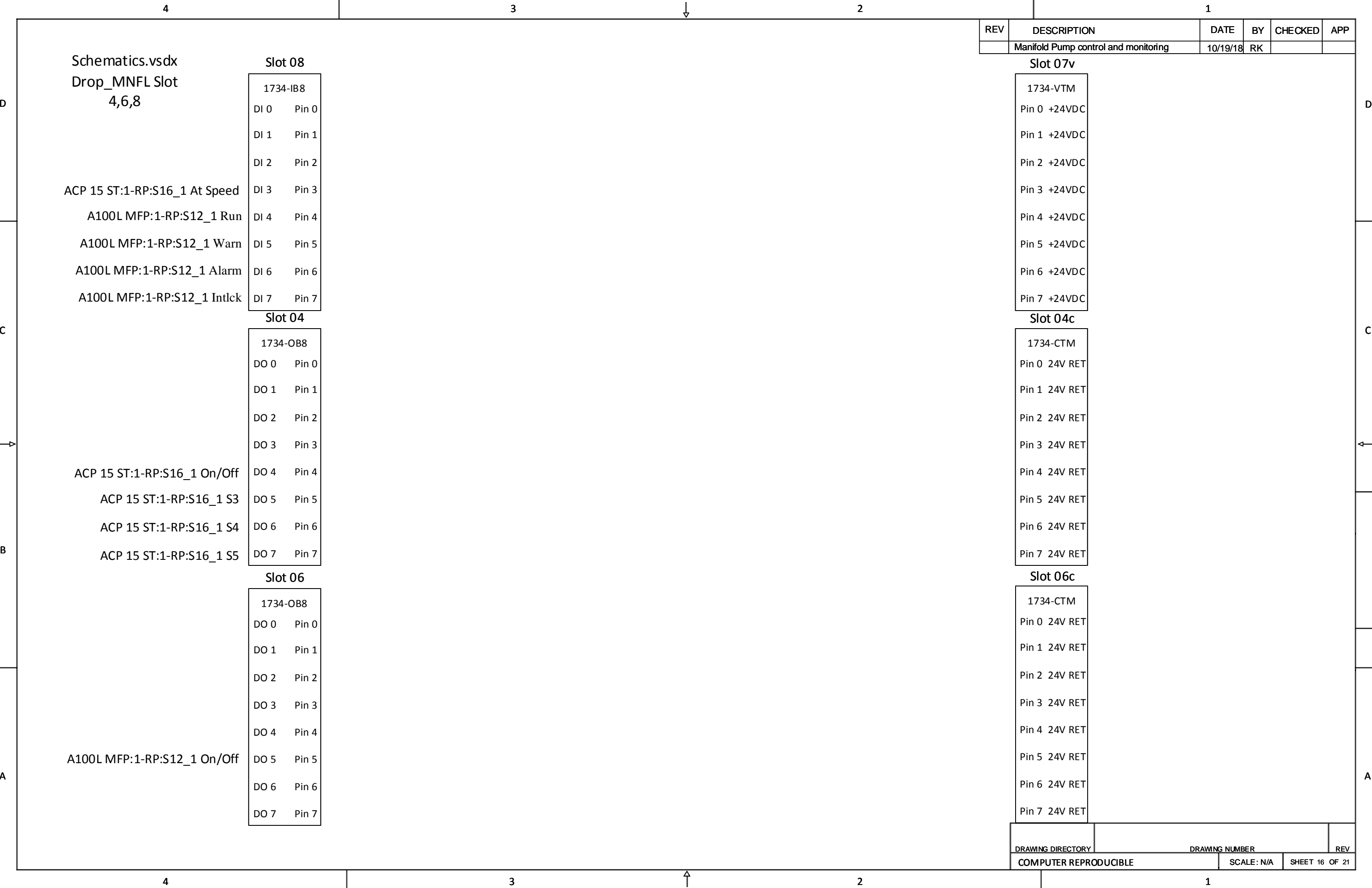
Slot 12

1734-IE2V	
Pin 0	In0
Pin 1	In1
Pin 2	GND
Pin 3	GND
Pin 4	COM(0)
Pin 5	COM(1)
Pin 6	V+(0)
Pin 7	V+(1)

A100L:1-TCG:S12_1 Analog Reading

TCG10 Analog Reading

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 15 OF 21



REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Backing Manifold Ion Gauges	10/19/18	RK		

D

C

B

A

D

C

B

A

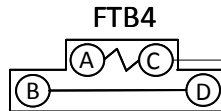
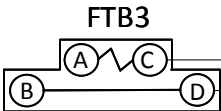
Schematics.vsd
Drop_MNFL Slot
6,8,14

Slot 06

1734-OB8	
DO 0	Pin 0
DO 1	Pin 1
DO 2	Pin 2
DO 3	Pin 3
DO 4	Pin 4
DO 5	Pin 5
DO 6	Pin 6
DO 7	Pin 7

WFA:1-HFG:S4_1 On/Off Command

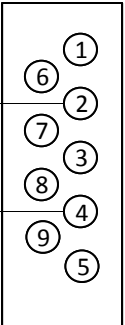
TRF:1-HFG:S5_1 On/Off Command



Slot 07v

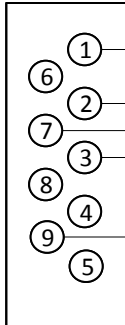
1734-VTM	
+24VDC	Pin 0
+24VDC	Pin 1
+24VDC	Pin 2
+24VDC	Pin 3
+24VDC	Pin 4
+24VDC	Pin 5
+24VDC	Pin 6
+24VDC	Pin 7

KJLC 354
RS485 and Power Conn
(DB9F)



Ion Gauge 1

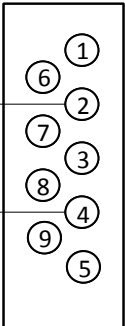
KJLC 354
RS485 and Power Conn
(DB9F)



Ion Gauge 1

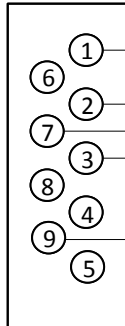
WFA:1-HFG:S4_1
Signal

KJLC 354
RS485 and Power Conn
(DB9F)



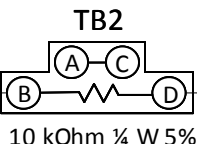
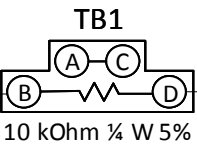
Ion Gauge 2

KJLC 354
RS485 and Power Conn
(DB9F)



Ion Gauge 2

TRF:1-HFG:S5_1
Signal



Slot 06c

1734-CTM	
Pin 0	24V RET
Pin 1	24V RET
Pin 2	24V RET
Pin 3	24V RET
Pin 4	24V RET
Pin 5	24V RET
Pin 6	24V RET
Pin 7	24V RET

Slot 14

1734-IE2V	
Pin 0	In0
Pin 1	In1
Pin 2	GND
Pin 3	GND
Pin 4	COM(0)
Pin 5	OM(1)
Pin 6	V+(0)
Pin 7	V+(1)

Slot 08

1734-IB8	
Pin 0	DI0
Pin 1	DI 1
Pin 2	DI 2
Pin 3	DI 3
Pin 4	DI 4
Pin 5	DI 5
Pin 6	DI 6
Pin 7	DI 7

WFA:1-HFG:S4_1 Pressure Reading

TRF:1-HFG:S5_1 Pressure Reading

WFA:1-HFG:S4_1 Sensor Status

TRF:1-HFG:S5_1 Sensor Status

DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 17 OF 21

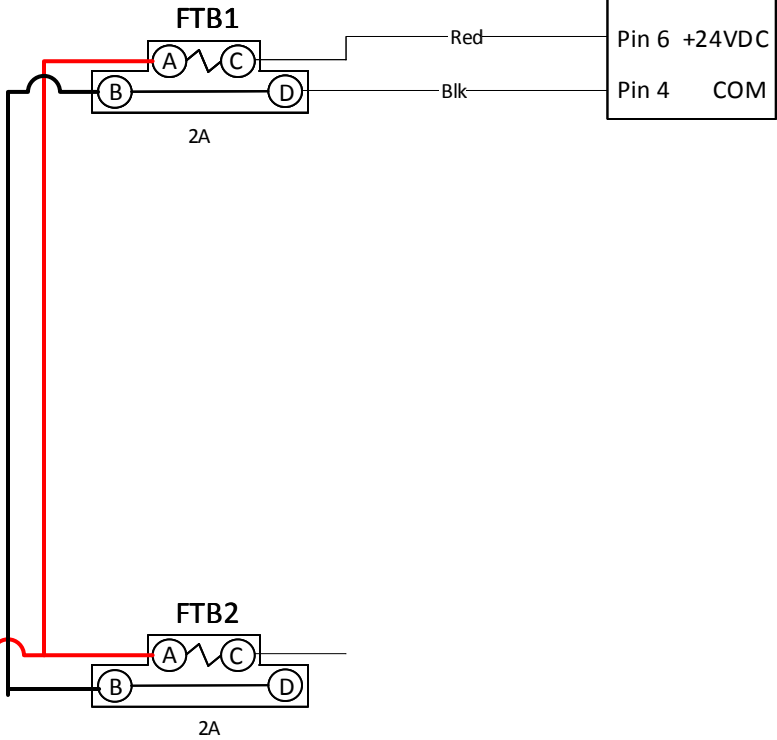
REV	DESCRIPTION	DATE	BY	CHECKED	APP
	Sample Chamber/Transfer System IO layout	10/19/18	RK		

1734-AENTR

Pin 6 +24VDC

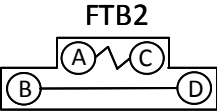
Pin 4 COM

Schematics.vsdx
Drop_SC_New



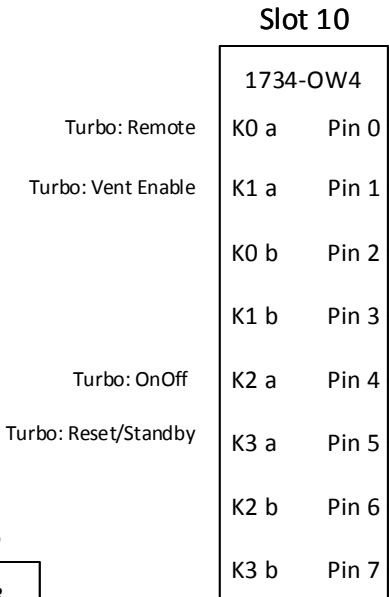
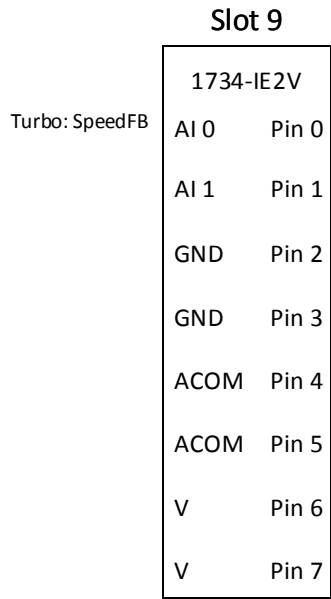
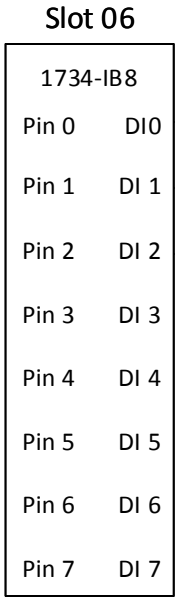
DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 18 OF 21

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	WFA/TRF VAT valves	10/19/2018	RK		



Update wire
colors
according to
cable used

Schematics.vsd
Drop_SC_New LL
Turbo



XF:02IDD-VA{LL:1-HighVac:1}TMP

LL Turbo – TC110

24 VDC power +24V

This is a DB15-male
connector

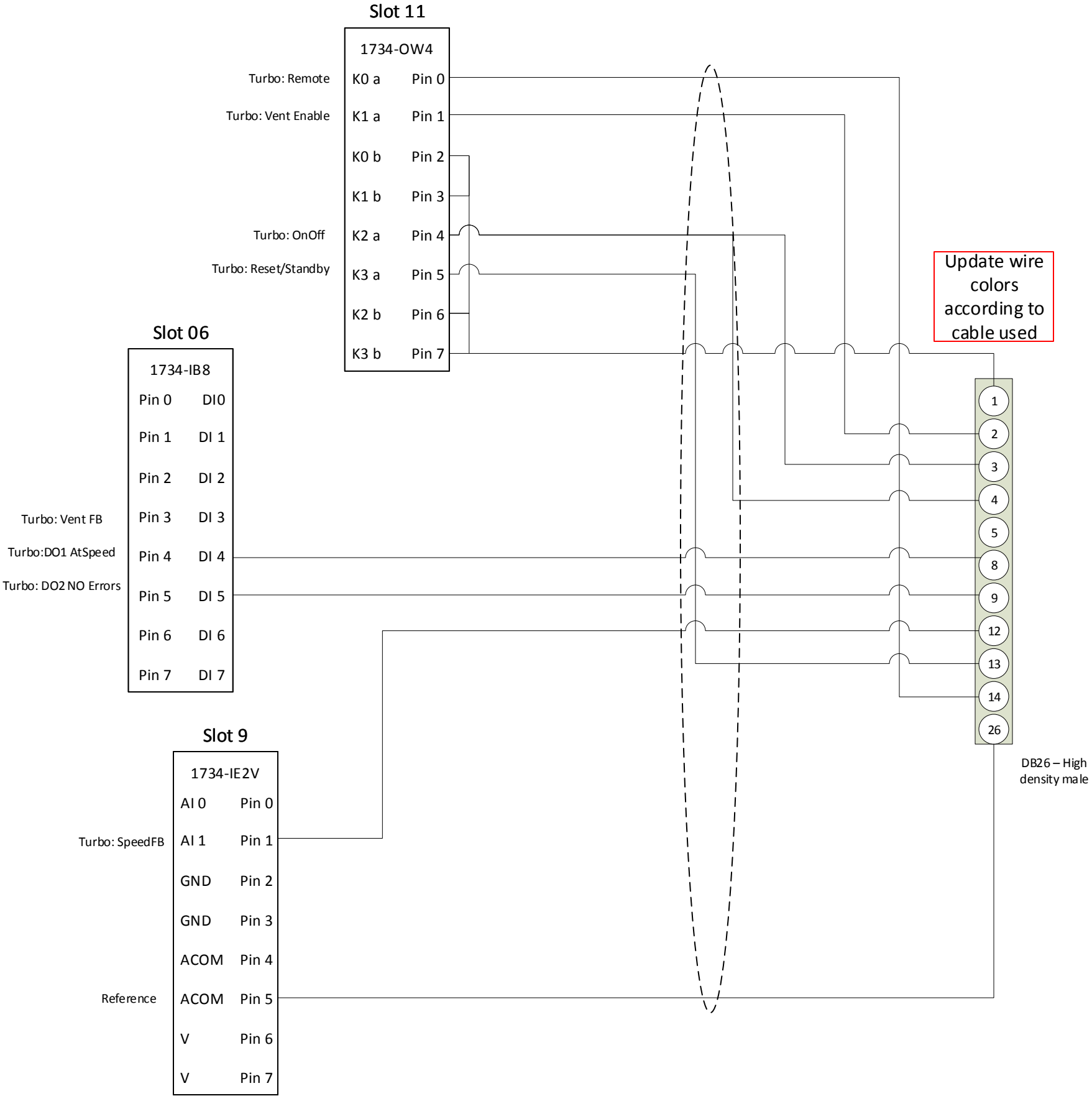
Andi can tell us
how long this cable
should be because
the pump is not
installed yet

24 VDC power COM

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	WFA/TRF VAT valves	10/19/ 2018	RK		

Schematics.vsdx
Drop_SC_New SC
Turbo

XF:02IDD-VA{SC:1-HighVac:1}TMP



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 20 OF 21

4

3

2

1

REV	DESCRIPTION	DATE	BY	CHECKED	APP
	WFA/TRF VAT valves	10/19/2018	RK		

Schematics.vsd
Drop_SC_New
SCTurboGV

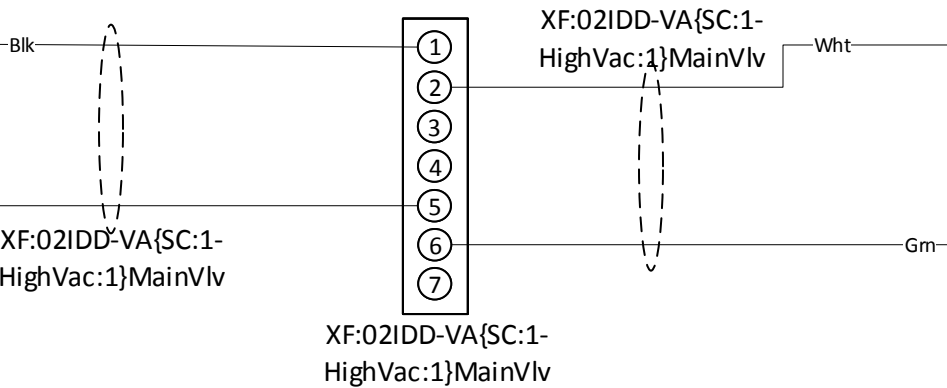
Slot 06v

1734-VTM
+24VDC Pin 0
+24VDC Pin 1
+24VDC Pin 2
+24VDC Pin 3
+24VDC Pin 4
+24VDC Pin 5
+24VDC Pin 6
+24VDC Pin 7

Slot 06

1734-IB8
Pin 0 DI 0
Pin 1 DI 1
Pin 2 DI 2
Pin 3 DI 3
Pin 4 DI 4
Pin 5 DI 5
Pin 6 DI 6
Pin 7 DI 7

XF:02IDD-VA{SC:1-HighVac:1}MainVlv
Opened
XF:02IDD-VA{SC:1-HighVac:1}MainVlv
Closed



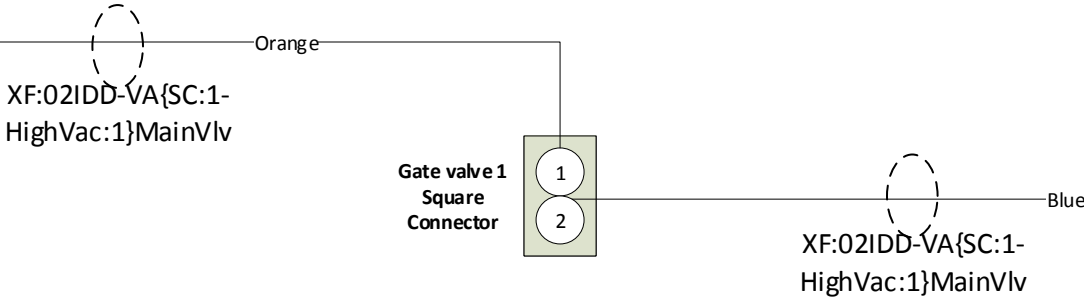
Slot 8

1734-OB8
DO 0 Pin 0
DO 1 Pin 1
DO 2 Pin 2
DO 3 Pin 3
DO 4 Pin 4
DO 5 Pin 5
DO 6 Pin 6
DO 7 Pin 7

Slot 8c

1734-CTM
Pin 0 24V RET
Pin 1 24V RET
Pin 2 24V RET
Pin 3 24V RET
Pin 4 24V RET
Pin 5 24V RET
Pin 6 24V RET
Pin 7 24V RET

XF:02IDD-VA{SC:1-HighVac:1}MainVlv Cmd



DRAWING DIRECTORY	DRAWING NUMBER	REV
COMPUTER REPRODUCIBLE	SCALE: N/A	SHEET 21 OF 21