


Unit #4

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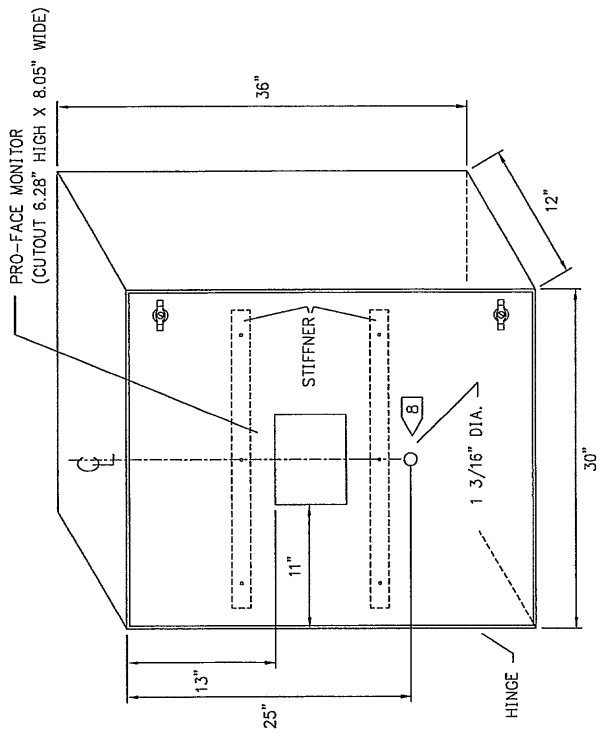


SPARTAN CONTROLS
 TOROMONT ENERGY SYSTEMS
 QUICKSILVER RESOURCES CANADA INC.
 COAL BED METHANE
 COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
 DRAWING INDEX
 UNIT #1134

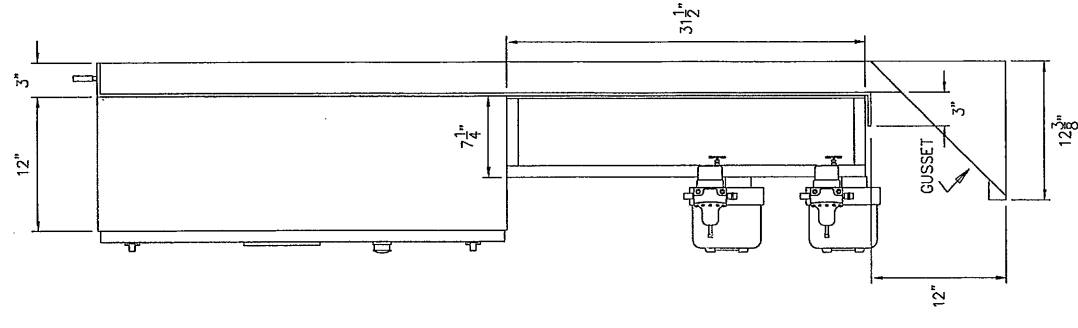
LSD: UNIT #1134
 PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-010-00 P.O.# REV. 8

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES; UPGRADE TO IPM (BY SKF)	08 SEP 11	RDW	SKF	MLL	MLL
7	FIELD CHANGES; REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	V/S	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

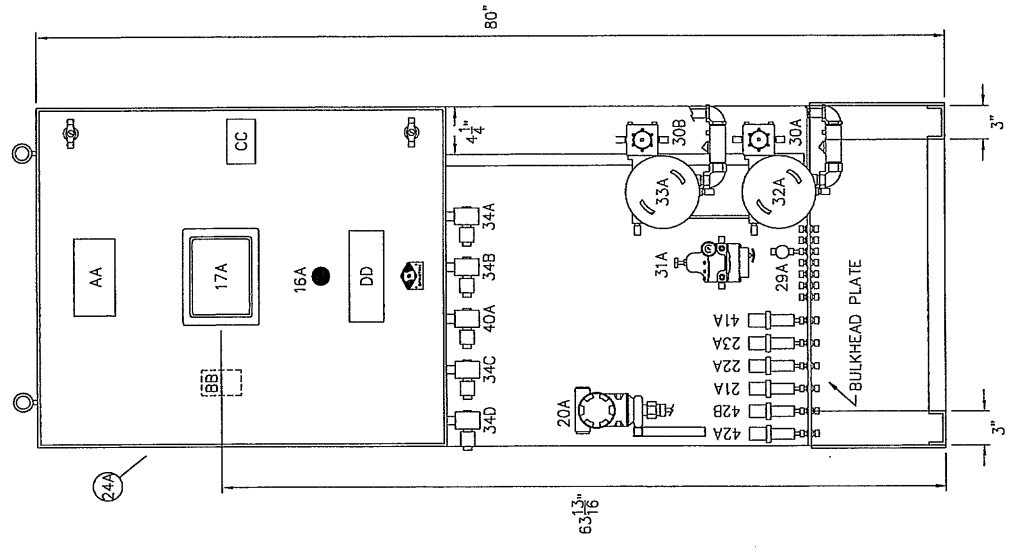
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CABINET DETAIL - FRONT VIEW



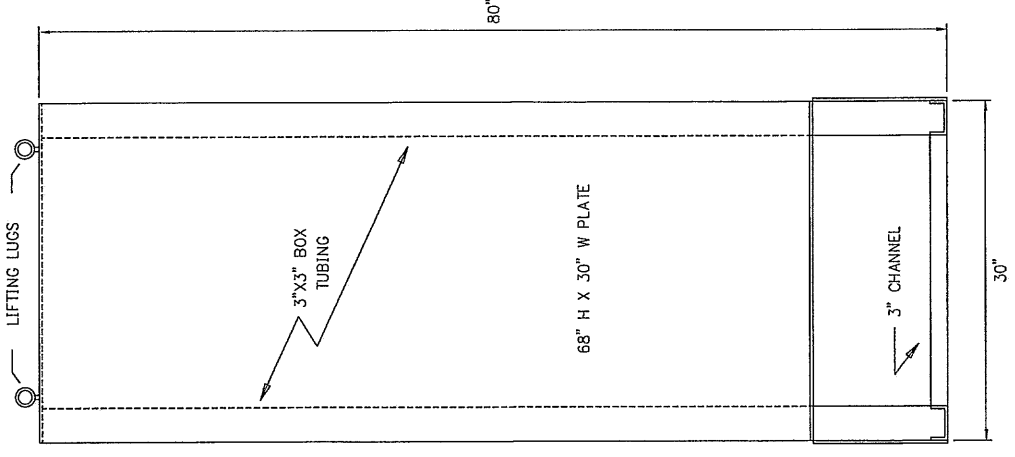
RIGHT SIDE VIEW



FRONT VIEW

LAMACOID TAG 'BB' - LOCATED ON BACK OF DOOR
(LAMACOID SIZE: 2.25x3.5, COLOUR: WHITE)

WARNING
ALL EQUIPMENT INSTALLED IN THIS PANEL MUST BE SUITABLE FOR USE IN A CLASS 1, DIVISION 2 LOCATION. USE OF CERAMIC OR SAND FILLED FUSES IS RECOMMENDED. ENSURE THERE IS NO GAS PRESENT AND POWER HAS BEEN REMOVED BEFORE OPERATING DISCONNECT TERMINALS. TEST JUMPERS AND/OR REMOVING FUSES.



RACK DETAIL - FRONT VIEW

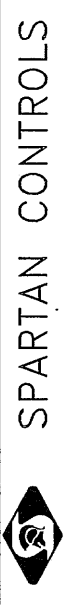
ITEM	LAMACOID TAG	SIZE	COLOUR
AA	REMVue-500	3.625x6.75	-
16A	USD	1x3	RED

LAMACOID TAG 'CC'
(LAMACOID SIZE: 2.5x4, COLOUR: RED)

WARNING
MORE THAN ONE LIVE CIRCUIT (see wiring diagram) DISCONNECT POWER BEFORE SERVICING AUTHORIZED PERSONNEL ONLY

- NOTES:
- CABINET TO BE 36" H X 30" W X 12" D, C/W SINGLE FRONT ACCESS DOOR. BASE SUPPORT MOUNTING HOLES (QTY. 6) REQUIRED.
 - PAINT COLOUR: SPARTAN CONTROLS BLUE.
 - ENCLOSURE RATING : NEMA 12.
 - CIRCUIT TUBING TO BE 1/4" 304SS. PROCESS TUBINGS TO BE 1/4" SWAGelok CADMIUM PLATED STEEL. PROCESS FITTINGS TO BE 1/4" SWAGelok 316SS. ALL STAINLESS STEEL LINES TO HAVE 316SS FERRULES.
 - SYSTEM VENTED TO TWO 3/8" BULKHEAD CONNECTIONS.
 - ALL DISCRETE END DEVICES NOT WIRED TO NON-INCENDIVE BARRIERS TO BE SUITABLE FOR CLASS 1, DIV 2 APPLICATION WITH 24VDC POWER.
 - ALL WIRING FOR TRANSMITTERS, SOLENOIDS & I/P TRANSDUCERS PENETRATING THROUGH ENCLOSURE TO BE RUN IN LIQUID TIGHT FLEXHOSE AND/OR CONNECTORS (CLASS 1, DIV 2).
 - ALL ALLEN-BRADLEY PUSHBUTTONS TO HAVE KEYED CUTOOUT.
 - ELECTRICAL AREA CLASSIFICATION: CSA CLASS 1, DIV. 2, GROUP D, TEMP CODE T2D.

DRIVER: WAUKESHA L7042GL
COMPRESSOR: ARIEL JGK/4-4



TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
EXTERNAL CABINET AND RACK LAYOUT

* INDICATES NOT INCLUDED

DRAWING No.	REFERENCE DRAWINGS	REV.	DATE	DESCRIPTION	CHK	DESIGN	APP
		8	08 SEP 11	FIELD CHANGES; UPGRADE TO IPM (BY SXF)	SXF	MLL	MLL
		7	21 JUL 09	FIELD CHANGES; REVISE IGNITION AND FUEL LOGIC	MLL	MLL	MLL
		6	20 AUG 07	FIELD CHANGES	BWK	BWK	BWK
		5	21 JUL 04	TOROMONT SHOP CHANGES	BWK	BWK	BWK
		4	28 JUN 04	ADDITIONAL CHANGES	BWK	BWK	BWK
		3	30 MAR 04	TOROMONT SHOP CHANGES	BWK	BWK	BWK
		2	23 MAR 04	SPARTAN AS BUILT	BWK	BWK	BWK

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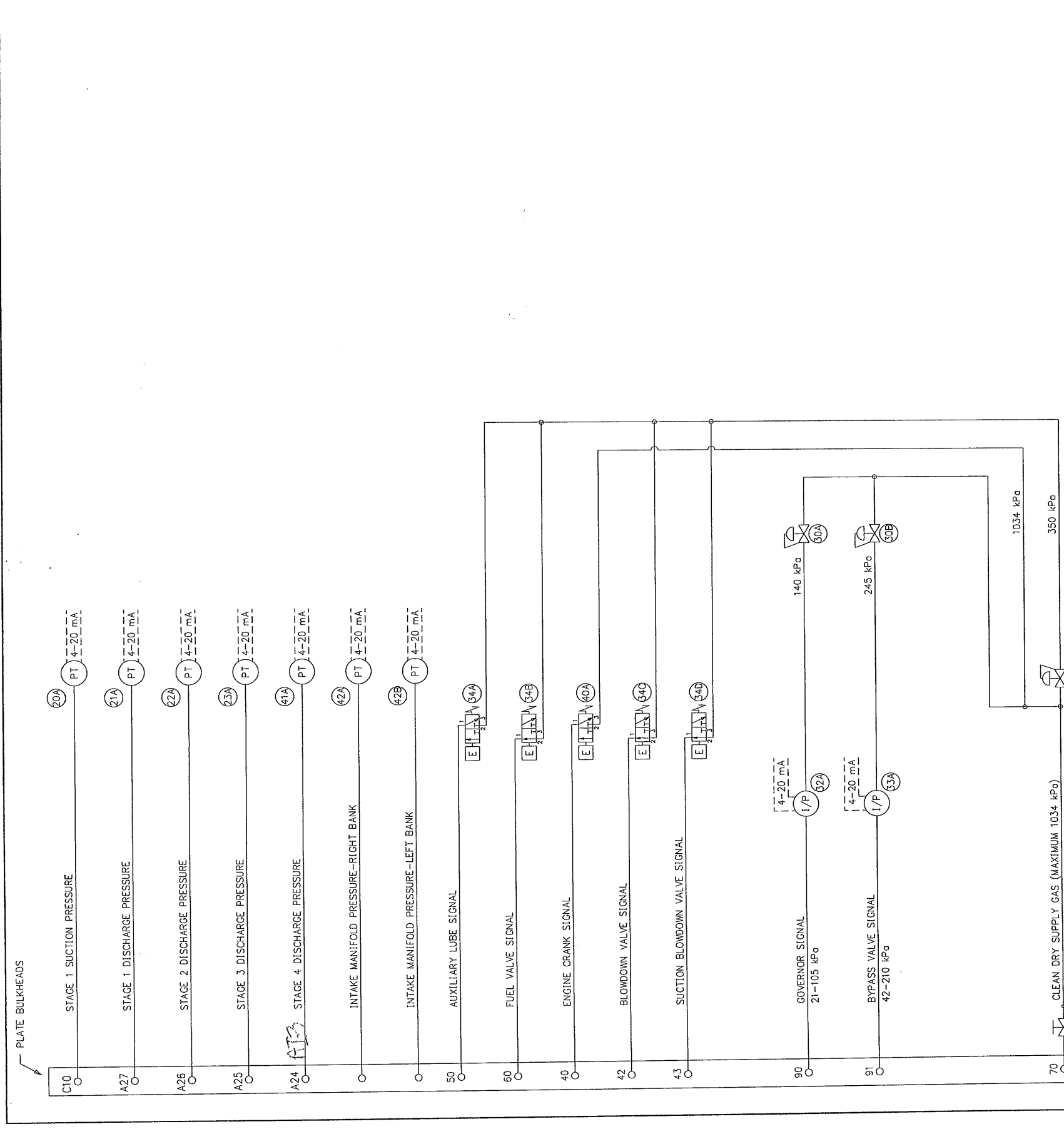
LSD:	UNIT #134	P.O.#
PROJECT No.	RM-10628-AA-100-00	REV. 8
DRAWING No.	NTS	
SCALE		

ITEM	STD. QTY.	QTY. INCL.	PART NUMBER	DESCRIPTION	INSTRUCTIONS
1A	1	1	10-7582	REMVue-500 IPM, 16MB, 3RS232, RS485, ETHERNET	
2A	1	1	10-7504	REMVue-500 DISCRETE INPUT MODULE/BPT/COUNTER	
3A	1	1	10-7500	REMVue-500 DISCRETE INPUT MODULE/BPT	
4A	1	1	10-7506	REMVue-500 DISCRETE OUTPUT MODULE/BPT	
5A	1	1	10-7514	REMVue-500 ANALOG INPUT MODULE/BPT	
6A	1	1	10-7594	REMVue-500 COMBINATION I/O MODULE/12 DI/8 DO/8 AI/4 AO	
7A-E	5	3	10-7512	REMVue-500 ANALOG UNIVERSAL MODULE/BPT/TC	
8	37	40	95033.5	WEIDMULLER FUSED TERMINAL BLOCK/KDKST EN	
	27	30	GDA 50MA	BUSS 50mA CERAMIC FUSE	
	10	10	GDA 1A	BUSS 1 AMP CERAMIC FUSE	
	9	9	2227.6	WEIDMULLER FUSED TERMINAL BLOCK/ASK1 LD	
	2	2	GDA 250MA	BUSS 1/4 AMP CERAMIC FUSE	
	2	2	GDA 500MA	BUSS 1/2 AMP CERAMIC FUSE	
	1	1	GDA 1.6A	BUSS 1.6 AMP CERAMIC FUSE	
	3	3	GDA 2A	BUSS 2 AMP CERAMIC FUSE	
	3	3	GDA 5A	BUSS 5 AMP CERAMIC FUSE	
10	18	18	4674.6	WEIDMULLER TERMINAL BLOCK/SAK4 EN	
11	14	14	10215.0	WEIDMULLER DUAL STACK TERMINAL BLOCK/WDK2.5	
12	3	3	2128.6	WEIDMULLER TERMINAL BLOCK/SAK6N EN	
13	13	14	16319.3	WEIDMULLER CARRIER TAG SHTS5	
14A	1	1		CABLE REMVue-500/RS485	
15A	1	1	REM500/IPM	CABLE REMVue-500/GRAPHIC LOGIC CONTROLLER	
16A	1	1	800T-FX6D2P	ALLEN-BRADLEY P.B./MUSH/MAINT/RED/HS/INC	
17A	1	1	GLC2400-TC41-24V	PRO-FACE CONTROLLER/7.4" TFT COLOUR LCD/24VDC	
18	10	8	1N4007	DIODE	
19A-F	3	6	208010.4000.0	WIELAND TERMINAL BLOCK RELAY/24VDC/6AMP	
20A	1	1	208862S22A1B4C6	ROSEMOUNT PRESSURE TRANSMITTER/316SS/0-690 kPa	
21A	1	1	Y913057H25	BOURDON PRESSURE TRANSMITTER/316SS/0-2069 kPa	
22A	1	1	Y913057H25	BOURDON PRESSURE TRANSMITTER/316SS/0-2069 kPa	
23A	1	1	Y913057H30	BOURDON PRESSURE TRANSMITTER/316SS/0-6895 kPa	
24A	1	1	5412ES363012BL	EUROBEX ENCLOSURE/NEMA 4/PAINTED BLUE	
	1	1	0000094	SPARTAN LOGO	
	1	1	0002705	CUSTOM STEEL RACK/80" H X 30" W	
	1	1	0003064	1/P MOUNTING BRACKET	
25A	1	1	N-8020	18" LONG ILSCO BAR	
	1	1		GROUND LUG 2-14 GA.	
	3	3	GL 2165-1A	1" GLASTIC INSULATOR	
26A	1	1	0002736	FUSE KIT REMVue-500	
27A	1	1	178220000	WEIDMULLER 1782.2 FUSED TERMINAL BLOCK/SAKS4/TS35	
28	1	1	KTK 15A	BUSS KTK 15A FUSE	
29A	1	1	S-1VS4	WHITEY 1/4" ISOLATION VALVE/CARBON STEEL	
30A-B	2	2	67CFR-362	FISHER REGULATOR/35-245 kPa	
31A	1	1	67CFR-601	FISHER REGULATOR/245-875 kPa	
	1	1	1188579X042	FISHER 2" GAUGE/0-1100 kPa	
32A	1	1	546-XA	FISHER 1/P TRANSDUCER/4-20mA/21-105 kPa	
	1	1	1/2 CONDUIT SEAL	APPLETON 1/2 EYF-EYM CONDUIT SEAL/EPOXY SEALED/PRE-FAB'D	
	1	1	MF90-1	KILLARK 1/2" CONDUIT ELBOW	
	1	1	GUM-1	KILLARK 1/2" CONDUIT UNION	
	1	1	1/2 X CLOSE RGS	1/2" X CLOSE RGS RIDGED NIPPLE	
33A	1	1	546-XB	FISHER 1/P TRANSDUCER/4-20mA/42-210 kPa	
	1	1	1/2 CONDUIT SEAL	APPLETON 1/2 EYF-EYM CONDUIT SEAL/EPOXY SEALED/PRE-FAB'D	
	1	1	MF90-1	KILLARK 1/2" CONDUIT ELBOW	
	1	1	GUM-1	KILLARK 1/2" CONDUIT UNION	
	1	1	1/2 X CLOSE RGS	1/2" X CLOSE RGS RIDGED NIPPLE	
34A-D	3	4	EF8320G202-24	ASCO SOLENOID VALVE/24VDC	
35A	1	1	80.010.4005.0	WIELAND TERMINAL BLOCK RELAY/24VDC/20 mA	
36A-B	2	2	Y913057H22	BOURDON PRESSURE TRANSMITTER/316SS/0-1103 kPa	
37	12	17	WT-57.867.0000.0010	WIELAND NON-INCENDIVE BARRIER	
38	2	2	WM.900.102	WIELAND ANALOG NON-INCENDIVE BARRIER/125mA FUSE	
39	1	1	21.311.1253.0	WIELAND 6 EDS TERMINAL STRIP/1/2 POLE	
40A	1	1	EF8320G231	ASCO SOLENOID VALVE/24VDC	
41A	0	1	Y913057H31	BOURDON PRESSURE TRANSMITTER/316SS/0-10343 kPa	
42A-B	0	2	Y913057H75	BOURDON PRESSURE TRANSMITTER/316SS/-101-207 kPa	

SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
PNEUMATIC LOGIC AND BILL OF MATERIALS

LSD: UNIT #1134
PROJECT NO: PNT10628
SCALE: NTS
DRAWING NO: RM-10628-AA-200-00
REV: 8
P.O.#



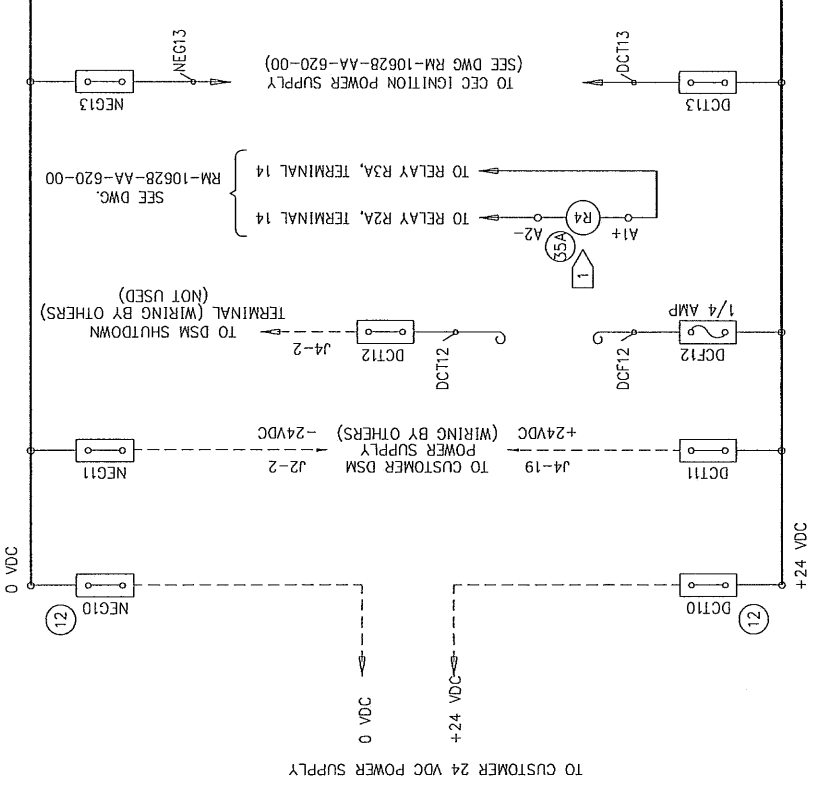
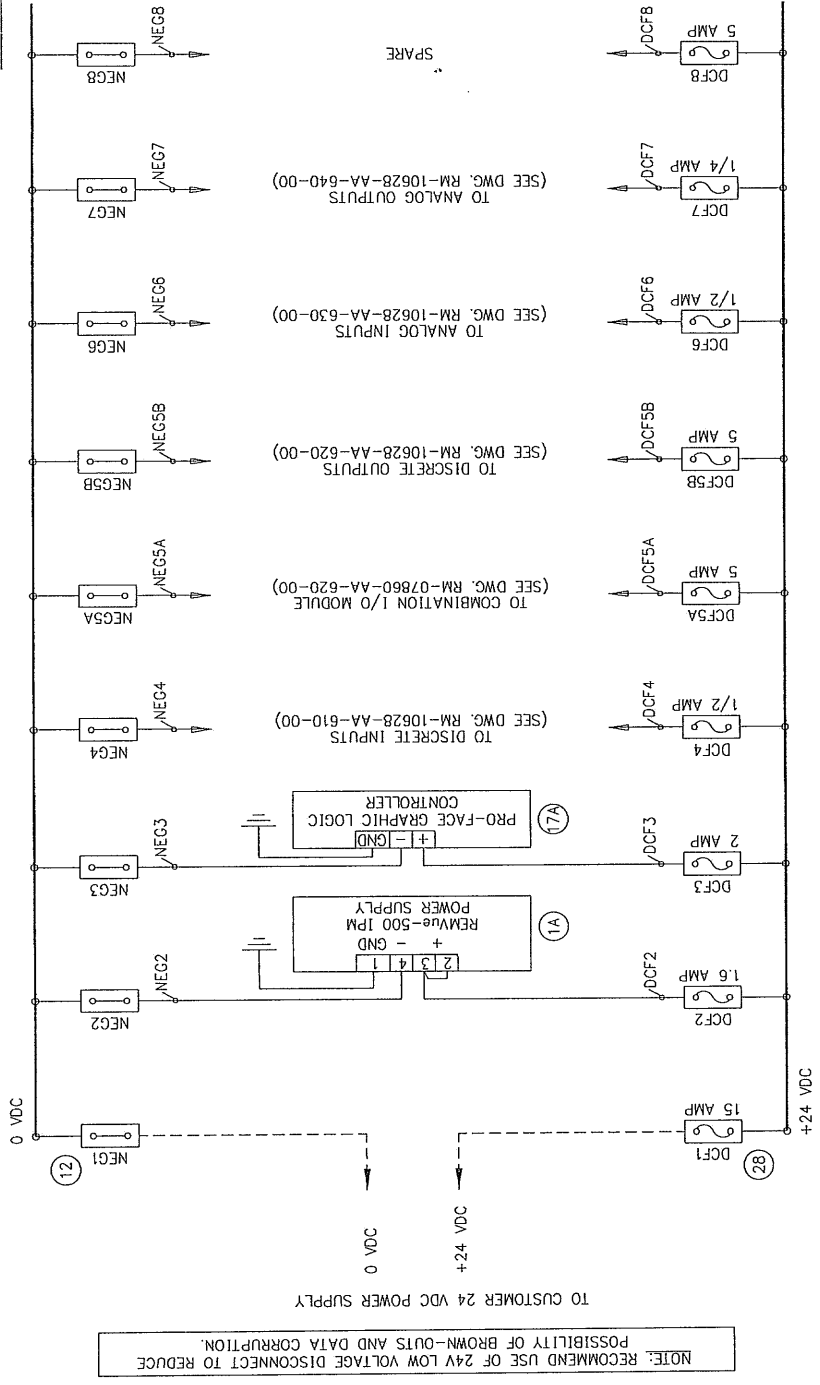
* INDICATES NOT INCLUDED

REV.	DATE	DESCRIPTION
2	23 MAR 04	SPARTAN AS BUILT
3	30 MAR 04	TOROMONT SHOP CHANGES
4	28 JUN 04	ADDITIONAL CHANGES
5	21 JUL 04	TOROMONT SHOP CHANGES
6	20 AUG 07	FIELD CHANGES
7	21 JUL 09	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC
8	08 SEP 11	FIELD CHANGES: UPGRADE TO IPM (BY SXF)

DRAWING No.	REFERENCE DRAWINGS

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DC POWER DISTRIBUTION



WIRE COLOUR CODE

GROUND	GREEN
+24 VDC	RED
24 VDC SWITCHED	ORANGE
0 VDC	BLUE
0 VDC SWITCHED	MEDIUM BLUE

WIRE LEGEND

—	PANEL WIRE
- - -	FIELD WIRE

NOTES:

1. FOR RELAY CONTACTS R4-1 SEE DWG. RM-10628-AA-610-00.

LEGEND:

- WELDMULLER ASK1 LD FUSED TERMINAL BLOCK (UNLESS NOTED OTHERWISE)
- WELDMULLER SAK4 EN FEED-THROUGH TERMINAL BLOCK (UNLESS NOTED OTHERWISE)

* INDICATES NOT INCLUDED

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP	MILL	MLL	SXF	RDW	PEM	VJS	PEM	PEM	MILL	MILL
8	FIELD CHANGES: UPGRADE TO IPM (BY SXF)	08 SEP 11														
7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09														
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	REFERENCE DRAWINGS															
	DRAWING No.															

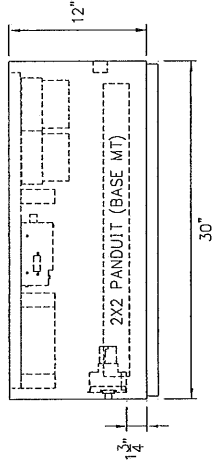
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SPARTAN CONTROLS

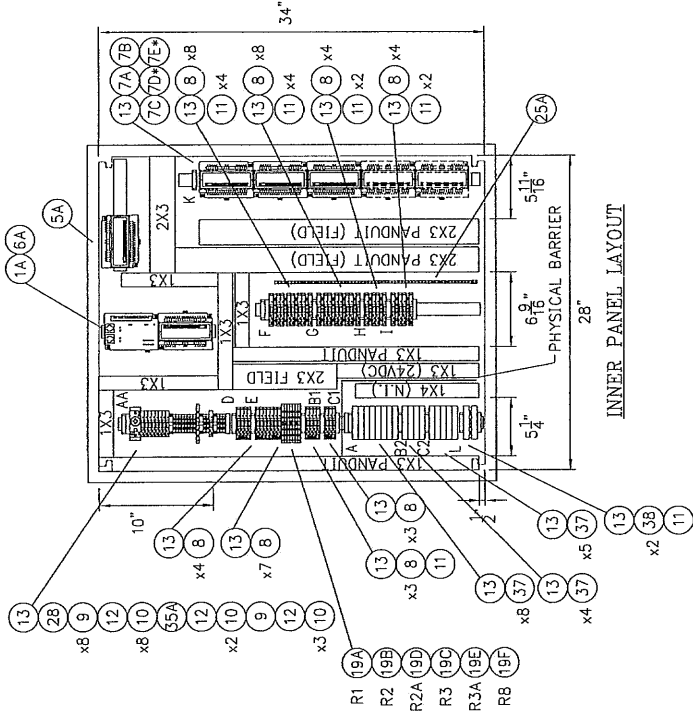
TOROMONT ENERGY SYSTEMS
 QUICKSILVER RESOURCES CANADA INC.
 COAL BED METHANE
 COMPRESSOR UNIT CONTROL PANEL (REMVUE-500/S)
 POWER DISTRIBUTION WIRING
 UNIT #1134

LSD: PROJECT No. PNT10628 SCALE: NTS DRAWING No. RM-10628-AA-500-00 REV. 8
 P.O.#

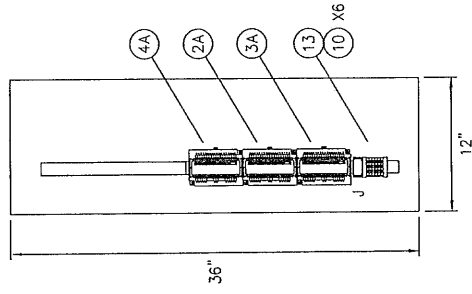
ITEM	TERMINAL STRIP IDENTIFIER
AA	DC POWER DISTRIBUTION
A	TS 1 (D.I. BARRIERS)
B1	TS 2 (O.I. TERMINALS) ALL FUSES 50 mA
B2	TS 2 (D.I. BARRIERS)
C1	TS 3 (D.I. TERMINALS) ALL FUSES 50 mA
C2	TS 3 (D.I. BARRIERS)
D	TS 4 (D.O. TERMINALS) ALL FUSES 1A
E	TS 5 (D.O. TERMINALS) ALL FUSES 1A
F	TS 6 (A.I. TERMINALS) ALL FUSES 50 mA
G	TS 7 (A.I. TERMINALS) ALL FUSES 50 mA
H	TS 8 (A.O. TERMINALS) ALL FUSES 50 mA
J	TS 9 (A.O. TERMINALS) ALL FUSES 50 mA
K	COMM.'S (COMMUNICATION TERMINALS)
L	THERMOCOUPLES
	TS 6 (A.I. BARRIERS)



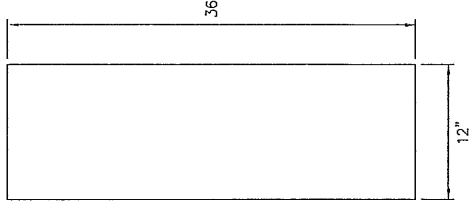
TOP VIEW PANEL LAYOUT



INNER PANEL LAYOUT



LEFT SIDE INTERNAL LAYOUT

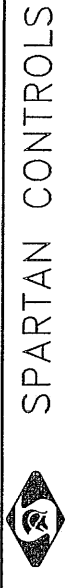


RIGHT SIDE INTERNAL LAYOUT

* INDICATES NOT INCLUDED

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP	08 SEP 11	RDW	SXF	MLL	MLL	MLL
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7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09	VJS	BWK	BWK	BWK		VJS	BWK	BWK	BWK	BWK
6	FIELD CHANGES	20 AUG 07										
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK		PEM	BWK	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK		PEM	BWK	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK		AW	BWK	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK		AW	BWK	BWK	BWK	BWK
	REFERENCE DRAWINGS											

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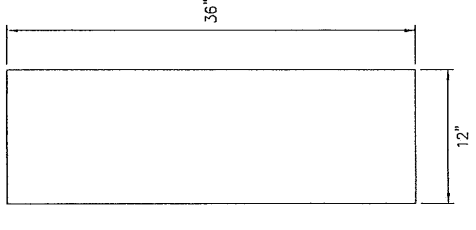
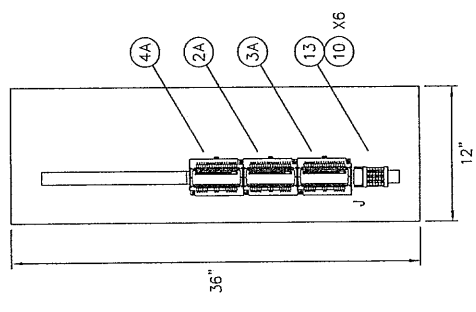
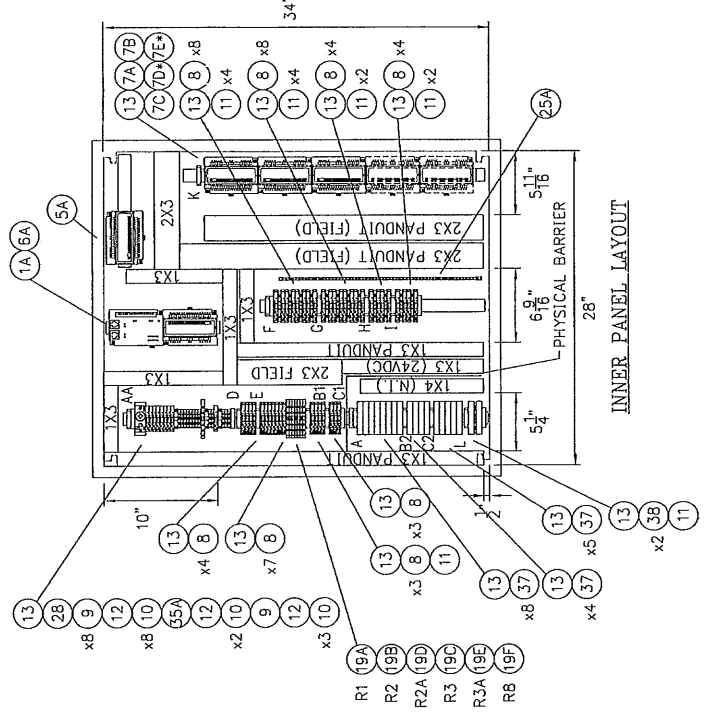
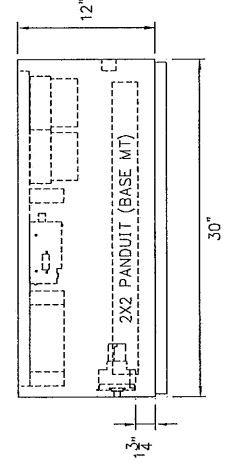


SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
 QUICKSILVER RESOURCES CANADA INC.
 COAL BED METHANE
 COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
 INTERNAL CABINET LAYOUT

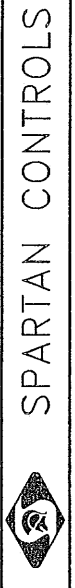
LSD: UNIT #1134
 PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-100-01 P.O.# REV. 8

ITEM	TERMINAL STRIP IDENTIFIER
AA	DC POWER DISTRIBUTION
A	TS 1 (O.I. BARRIERS)
B1	TS 2 (O.I. TERMINALS) ALL FUSES 50 mA
B2	TS 2 (O.I. BARRIERS)
C1	TS 3 (O.I. TERMINALS) ALL FUSES 50 mA
C2	TS 3 (O.I. BARRIERS)
D	TS 4 (D.O. TERMINALS) ALL FUSES 1A
E	TS 5 (D.O. TERMINALS) ALL FUSES 1A
F	TS 6 (A.I. TERMINALS) ALL FUSES 50 mA
G	TS 7 (A.I. TERMINALS) ALL FUSES 50 mA
H	TS 8 (A.O. TERMINALS) ALL FUSES 50 mA
I	TS 9 (A.O. TERMINALS) ALL FUSES 50 mA
J	COMM.'S (COMMUNICATION TERMINALS)
K	THERMOCOUPLES
L	TS 6 (A.I. BARRIERS)



* INDICATES NOT INCLUDED

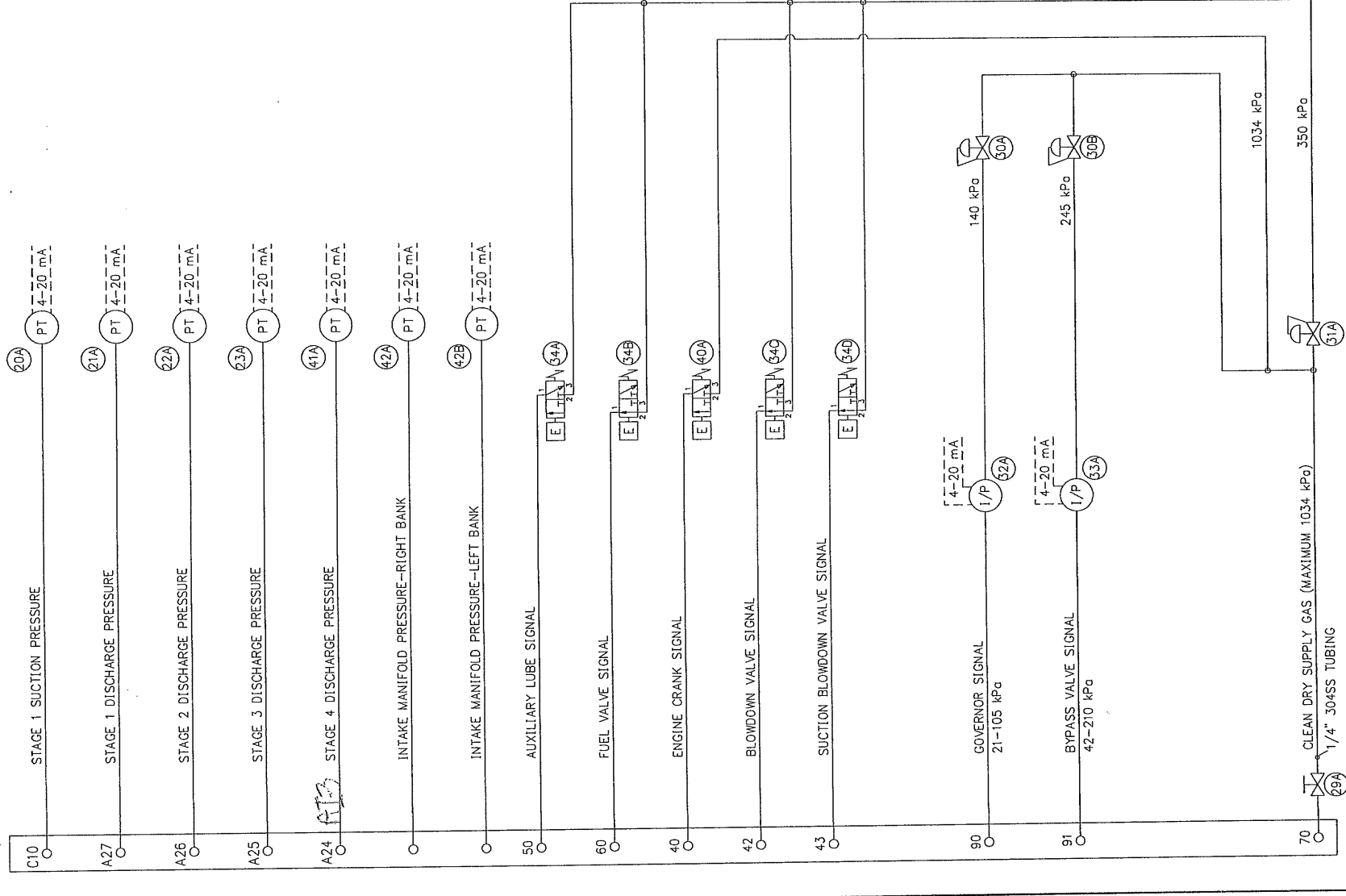
DRAWING No.	REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
	8	FIELD CHANGES; UPGRADE TO .IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
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		REFERENCE DRAWINGS					
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TOROMONT ENERGY SYSTEMS
 QUICKSILVER RESOURCES CANADA INC.
 COAL BED METHANE
 COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
 INTERNAL CABINET LAYOUT

LSD:	UNIT #1134	P.O.#	B
PROJECT No.	PN10628	SCALE:	NTS
DRAWING No.	RM-10628-AA-100-01	REV.	B

PLATE BULKHEADS

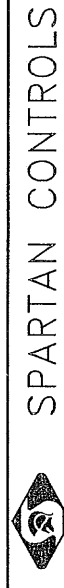


INDICATES NOT INCLUDED

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES: UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

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ITEM	STD. QTY.	QTY. INCL.	PART NUMBER	DESCRIPTION	INSTRUCTIONS
1A	1	1	10-7582	REMVue-500 IPM, 16MB, JRS232, RS485, ETHERNET	-
2A	1	1	10-7504	DISCRETE INPUT MODULE/BPT/COUNTER	-
3A	1	1	10-7500	DISCRETE INPUT MODULE/BPT	-
4A	1	1	10-7506	DISCRETE OUTPUT MODULE/BPT	-
5A	1	1	10-7514	ANALOG INPUT MODULE/BPT	-
6A	1	1	10-7594	ANALOG UNIVERSAL MODULE/BPT/TC	-
7A-E	5	3	10-7512	COMBINATION I/O MODULE/12 DI/8 DO/8 AI/4 AO	-
8	37	40	95033.5	WEIDMULLER FUSED TERMINAL BLOCK/KDKS1 EN	-
	27	30	GDA 50MA	WEIDMULLER FUSED TERMINAL BLOCK/ASK1 LD	-
9	10	10	GDA 1A	BUSS 1 AMP CERAMIC FUSE	-
	9	9	2227.6	WEIDMULLER FUSED TERMINAL BLOCK/ASK1 LD	-
	2	2	GDA 250MA	BUSS 1/4 AMP CERAMIC FUSE	-
	2	2	GDA 500MA	BUSS 1/2 AMP CERAMIC FUSE	-
	1	1	GDA 1.6A	BUSS 1.6 AMP CERAMIC FUSE	-
	1	1	GDA 2A	BUSS 2 AMP CERAMIC FUSE	-
	3	3	GDA 5A	BUSS 5 AMP CERAMIC FUSE	-
10	18	18	4674.6	WEIDMULLER TERMINAL BLOCK/SAK4 EN	-
11	14	14	10215.0	WEIDMULLER DUAL STACK TERMINAL BLOCK/WDK2.5	-
12	3	3	2128.6	WEIDMULLER TERMINAL BLOCK/SAK6N EN	-
13	13	14	16319.3	WEIDMULLER CARRIER TAG SHTSS	-
14A	1	1		CABLE REMVue-500/RS485	-
15A	1	1	REM500/IPM	CABLE REMVue-500/GRAPHIC LOGIC CONTROLLER	-
16A	1	1	800T-FX6D2P	ALLEN-BRADLEY P.B./MUSH/MAINT/RED/HS/INC	-
17A	1	1	GLC2400-TC41-24V	PRO-FACE CONTROLLER/7.4" TFT COLOUR LCD/24VDC	-
18	10	10	IN4007	DIODE	BY MFG.
19A-F	3	6	80.010.4000.0	WIELAND TERMINAL BLOCK RELAY/24VDC/6AMP	-
20A	1	1	208862S22A1B4C6	ROSEMOUNT PRESSURE TRANSMITTER/316SST/0-690 kPa	-
21A	1	1	Y913057H25	BOURDON PRESSURE TRANSMITTER/316SST/0-2069 kPa	-
22A	1	1	Y913057H25	BOURDON PRESSURE TRANSMITTER/316SST/0-2069 kPa	-
23A	1	1	Y913057H30	BOURDON PRESSURE TRANSMITTER/316SST/0-6895 kPa	-
24A	1	1	5412ES363012BL	EUROBEX ENCLOSURE/NEMA 4/PAINTED BLUE	-
	1	1	0000094	SPARTAN LOGO	-
	1	1	0002705	CUSTOM STEEL RACK/80" H X 30" W	-
	1	1	0003064	1/P MOUNTING BRACKET	-
25A	1	1	N-8020	18" LONG ILSCO BAR	-
	1	1	GROUND LUG SMALL	GROUND LUG 2-14 GA.	-
	3	3	GL 2165-1A	1" GLASTIC INSULATOR	-
26A					-
27A	1	1	0002736	FUSE KIT REMVue-500	-
28	1	1	178220000	WEIDMULLER 1782.2 FUSED TERMINAL BLOCK/SAK54/TS35	-
	1	1	KTK 15A	BUSS KTK 15A FUSE	-
29A	1	1	S-1VS4	WHITEY 1/4" ISOLATION VALVE/CARBON STEEL	BY MFG.
30A-B	2	2	67CFR-362	FISHER REGULATOR/35-245 kPa	-
31A	1	1	67CFR-601	FISHER REGULATOR/245-875 kPa	-
	1	1	1188579X042	FISHER 2" GAUGE/0-1100 kPa	-
32A	1	1	546-7XA	FISHER 1/P TRANSDUCER/4-20mA/21-105 kPa	-
	1	1	1/2 CONDUIT SEAL	APPLETON 1/2 EYF-EYM CONDUIT SEAL/EPOXY SEALED/PRE-FAB'D	-
	1	1	MF90-1	KILLARK 1/2" CONDUIT ELBOW	-
	1	1	GUM-1	KILLARK 1/2" CONDUIT UNION	-
	1	1	1/2 X CLOSE RGS	KILLARK 1/2" CONDUIT UNION	-
33A	1	1	546-XB	FISHER 1/P TRANSDUCER/4-20mA/42-210 kPa	-
	1	1	1/2 CONDUIT SEAL	APPLETON 1/2 EYF-EYM CONDUIT SEAL/EPOXY SEALED/PRE-FAB'D	-
	1	1	MF90-1	KILLARK 1/2" CONDUIT ELBOW	-
	1	1	GUM-1	KILLARK 1/2" CONDUIT UNION	-
	1	1	1/2 X CLOSE RGS	KILLARK 1/2" CONDUIT UNION	-
34A-D	3	4	EF83206202-24	ASCO SOLENOID VALVE/24VDC	-
35A	1	1	80.010.4005.0	WIELAND TERMINAL BLOCK RELAY/24VDC/20 mA	-
36A-B	2	2	Y913057H22	BOURDON PRESSURE TRANSMITTER/316SST/0-1103 kPa	-
37	12	17	WT-57.867.0000.0010	WIELAND NON-INCENDIVE BARRIER	-
	38	2	WW.900.102	WIELAND ANALOG NON-INCENDIVE BARRIER/125mA FUSE	-
39	1	2	21.311.1253.0	WIELAND 6 EDS TERMINAL STRIP/1/2 POLE	-
40A	1	1	EF83206231	ASCO SOLENOID VALVE/24VDC	-
41A	0	1	Y913057H31	BOURDON PRESSURE TRANSMITTER/316SST/0-10343 kPa	-
42A-B	0	2	Y913057H75	BOURDON PRESSURE TRANSMITTER/316SST/-101-207 kPa	-



TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
PNEUMATIC LOGIC AND BILL OF MATERIALS

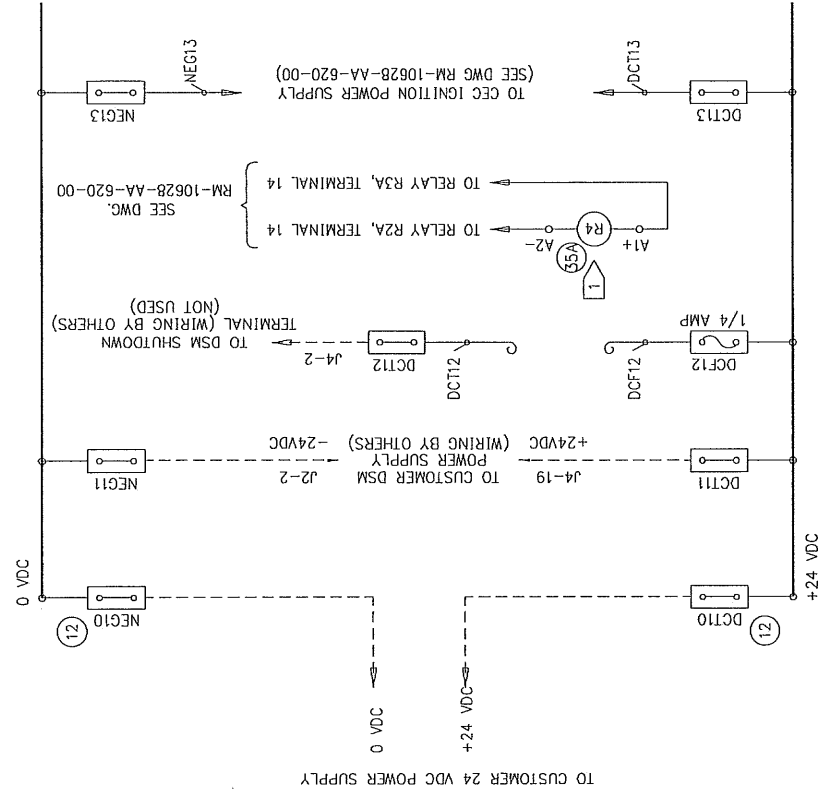
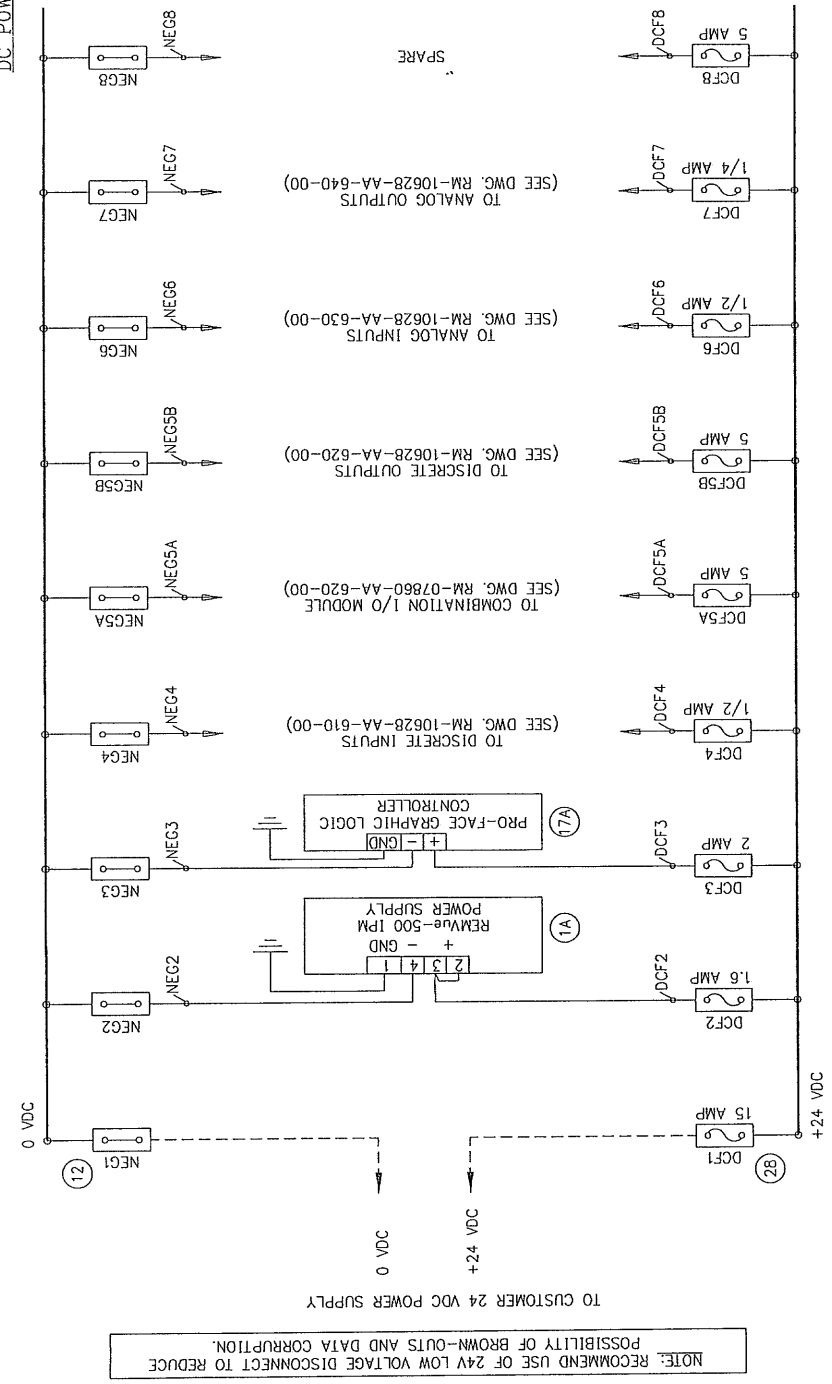
PROJECT NO.	PN10628	SCALE	NTS	DRAWING NO.	RM-10628-AA-200-00	REV.	8
LSD:				UNIT #	#1134	P.O.#	

DATE	DRAWN	CHK	DESIGN	APP
08 SEP 11	RDW	SXF	MLL	MLL
21 JUL 09	PEM	MLL	MLL	MLL
20 AUG 07	VJS	BWK	BWK	BWK
21 JUL 04	PEM	BWK	BWK	BWK
28 JUN 04	PEM	BWK	BWK	BWK
30 MAR 04	AW	BWK	BWK	BWK
23 MAR 04	AW	BWK	BWK	BWK

DRAWING No. _____
REFERENCE DRAWINGS _____
REV. _____

September 08 2011 3:12pm

DC POWER DISTRIBUTION



NOTES:

1 FOR RELAY CONTACTS R4-1 SEE DWG. RM-10628-AA-610-00.

LEGEND:

- WELD MULLER ASK1 LD. FUSED TERMINAL BLOCK (UNLESS NOTED OTHERWISE)
- WELD MULLER SAK4 EN FEED-THROUGH TERMINAL BLOCK (UNLESS NOTED OTHERWISE)



SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE

COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
POWER DISTRIBUTION WIRING
UNIT #1134

* INDICATES NOT INCLUDED

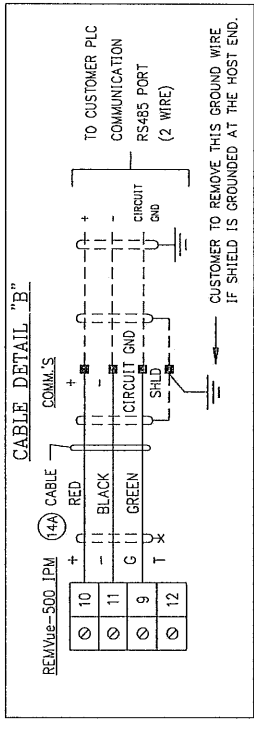
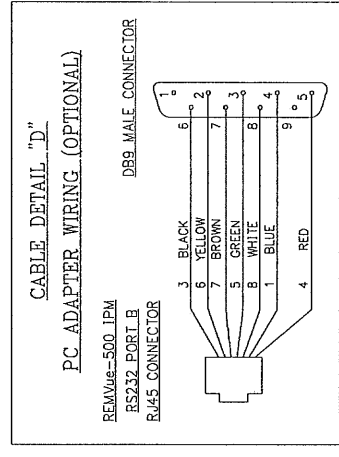
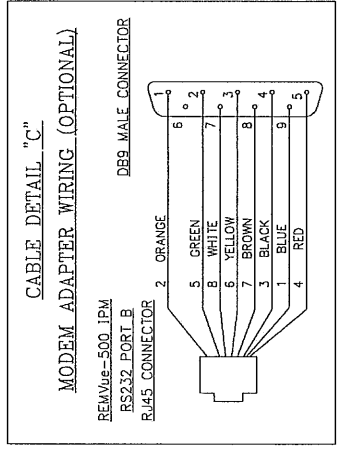
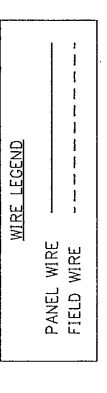
REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP	BWK	BWK	BWK	BWK	BWK	BWK	MLL	MLL	SXF	RDW	PEM	VJS	BWK	BWK	BWK	BWK	BWK	BWK	BWK	BWK	MLL	MLL	MLL	
8	FIELD CHANGES, UPGRADE TO IPM (BY SXF)	06 SEP 11																												
7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09																												
6	FIELD CHANGES	20 AUG 07																												
5	TOROMONT SHOP CHANGES	21 JUL 04																												
4	ADDITIONAL CHANGES	28 JUN 04																												
3	TOROMONT SHOP CHANGES	30 MAR 04																												
2	SPARTAN AS BUILT	23 MAR 04																												
1	REFERENCE DRAWINGS																													

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LSD: PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-500-00 P.O.# REV. 8

WIRE COLOUR CODE

GROUND	GREEN
+24 VDC	RED
24 VDC SWITCHED	ORANGE
0 VDC	BLUE
0 VDC SWITCHED	MEDIUM BLUE



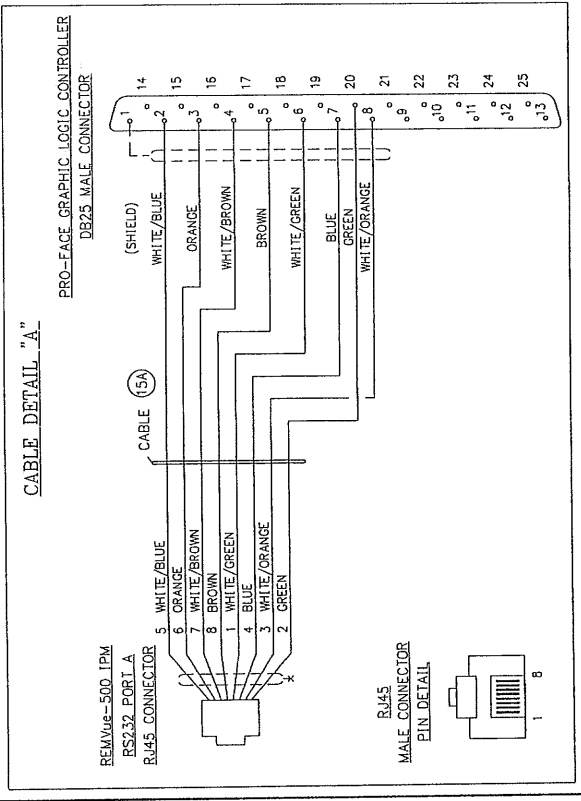
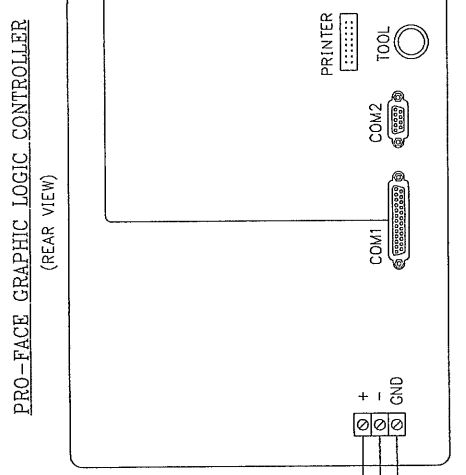
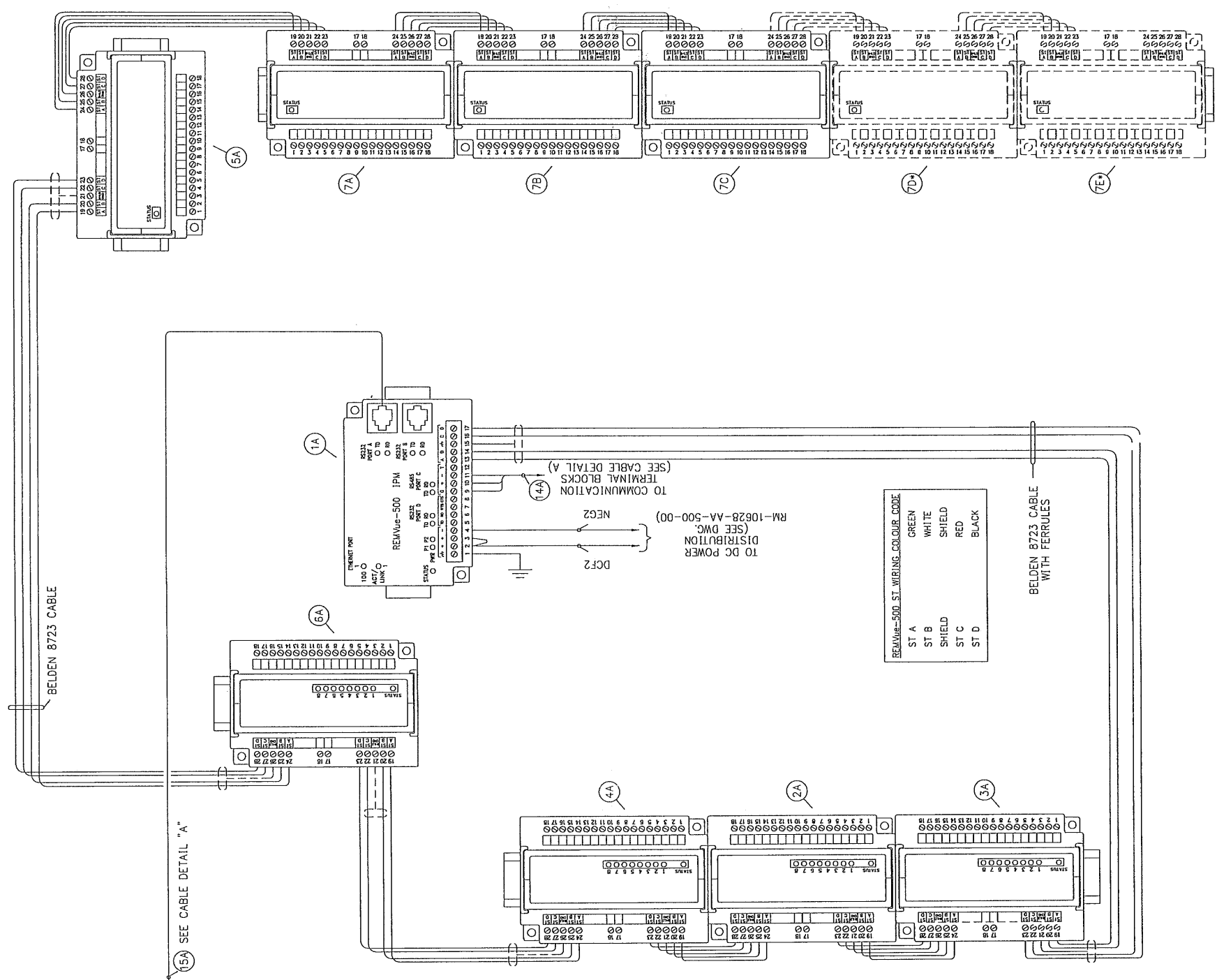
A DAISY CHAIN WIRING CONFIGURATION SHOULD BE USED TO CONNECT THE HOST AND SLAVE DEVICES. ALL CABLE SHIELDS SHOULD BE CONNECTED AND GROUNDING AT ONE END ONLY (AT THE HOST END IF POSSIBLE). 150 OHM TERMINATION RESISTORS SHOULD BE INSTALLED AT THE HOST AND THE LAST SLAVE ON THE BUS. THE REMVue-500 IPM HAS INTERNAL TERMINATION COMPONENTS (150 OHM RESISTOR AND 0.1uF CAP. IN SERIES). TIE TERMINAL T (12) TO RS485- (11) TO UTILIZE THE INTERNAL TERMINATION.

ADDRESS	17	COMMUNICATIONS	CONFEIG
BAUD	9600	BAUD	N,8,1

SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
REMVue-500 WIRING DETAILS
UNIT #1134

LSD: PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-500-01 REV. 8

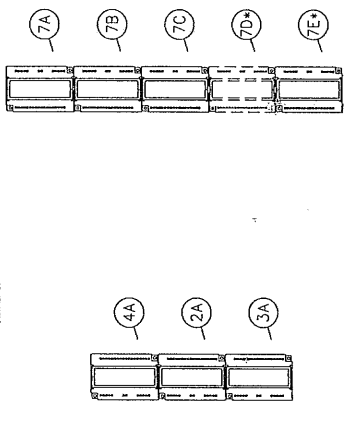
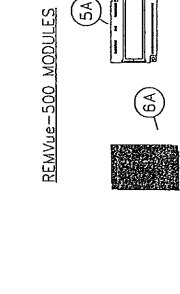
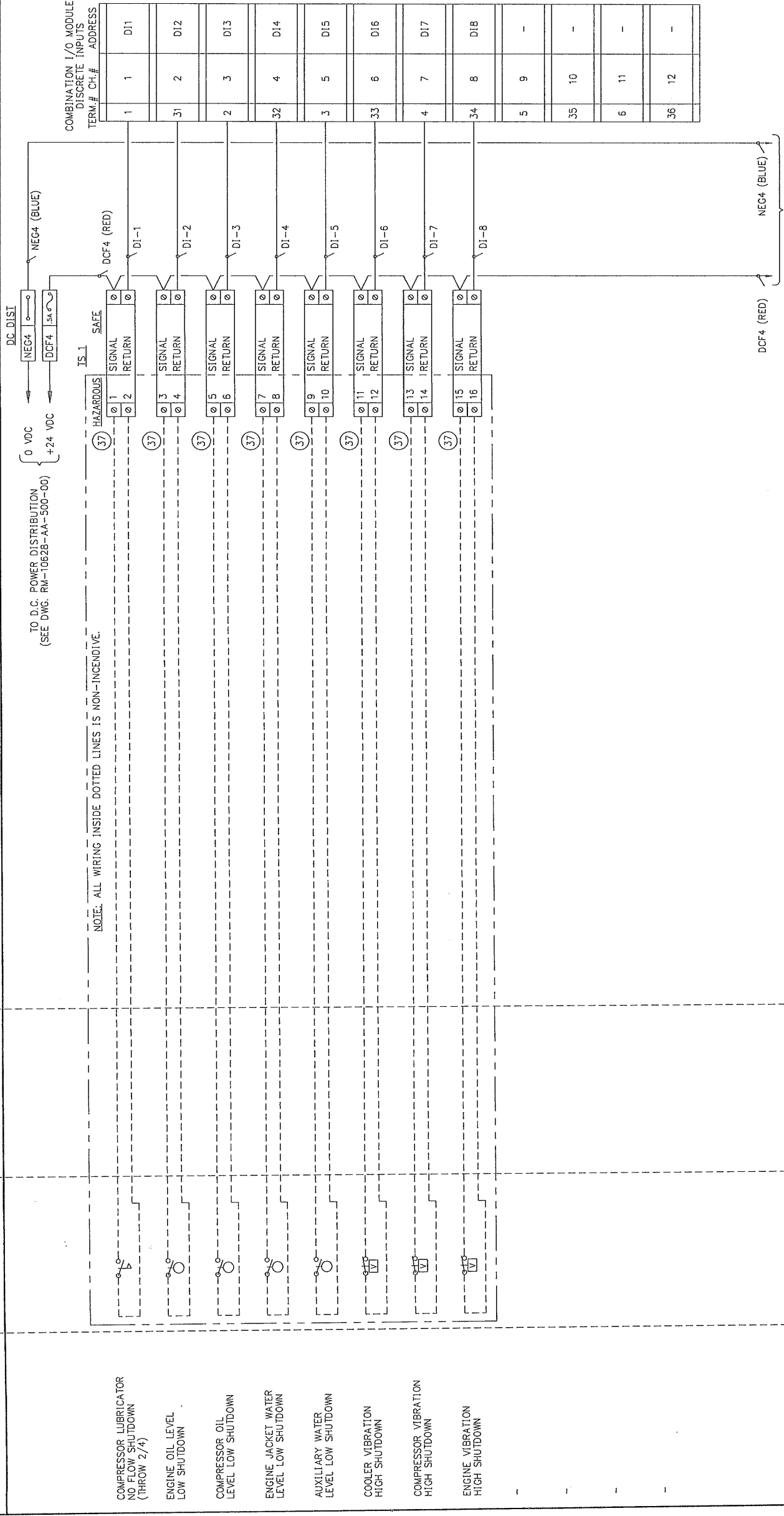


* INDICATES NOT INCLUDED

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES; UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES; REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK
1	REFERENCE DRAWINGS					

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UNIT CONTROL PLC PANEL

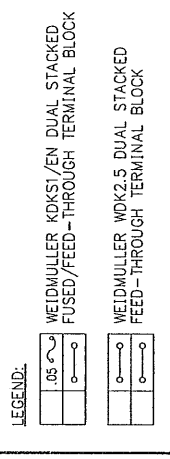


WIRE COLOUR CODE

GROUND	GREEN
+24 VDC	RED
24 VDC SWITCHED	ORANGE
0 VDC	BLUE
0 VDC SWITCHED	MEDIUM BLUE

WIRE LEGEND

PANEL WIRE	_____
FIELD WIRE	-----



NOTE: ALL WIRING INSIDE DOTTED LINES IS NON-INCENDITIVE.

DESCRIPTION	SKID DEVICE	PLANT DCS
COMPRESSOR LUBRICATOR NO FLOW SHUTDOWN (THROW 2/4)		
ENGINE OIL LEVEL LOW SHUTDOWN		
COMPRESSOR OIL LEVEL LOW SHUTDOWN		
ENGINE JACKET WATER LEVEL LOW SHUTDOWN		
AUXILIARY WATER LEVEL LOW SHUTDOWN		
COOLER VIBRATION HIGH SHUTDOWN		
COMPRESSOR VIBRATION HIGH SHUTDOWN		
ENGINE VIBRATION HIGH SHUTDOWN		

* INDICATES NOT INCLUDED

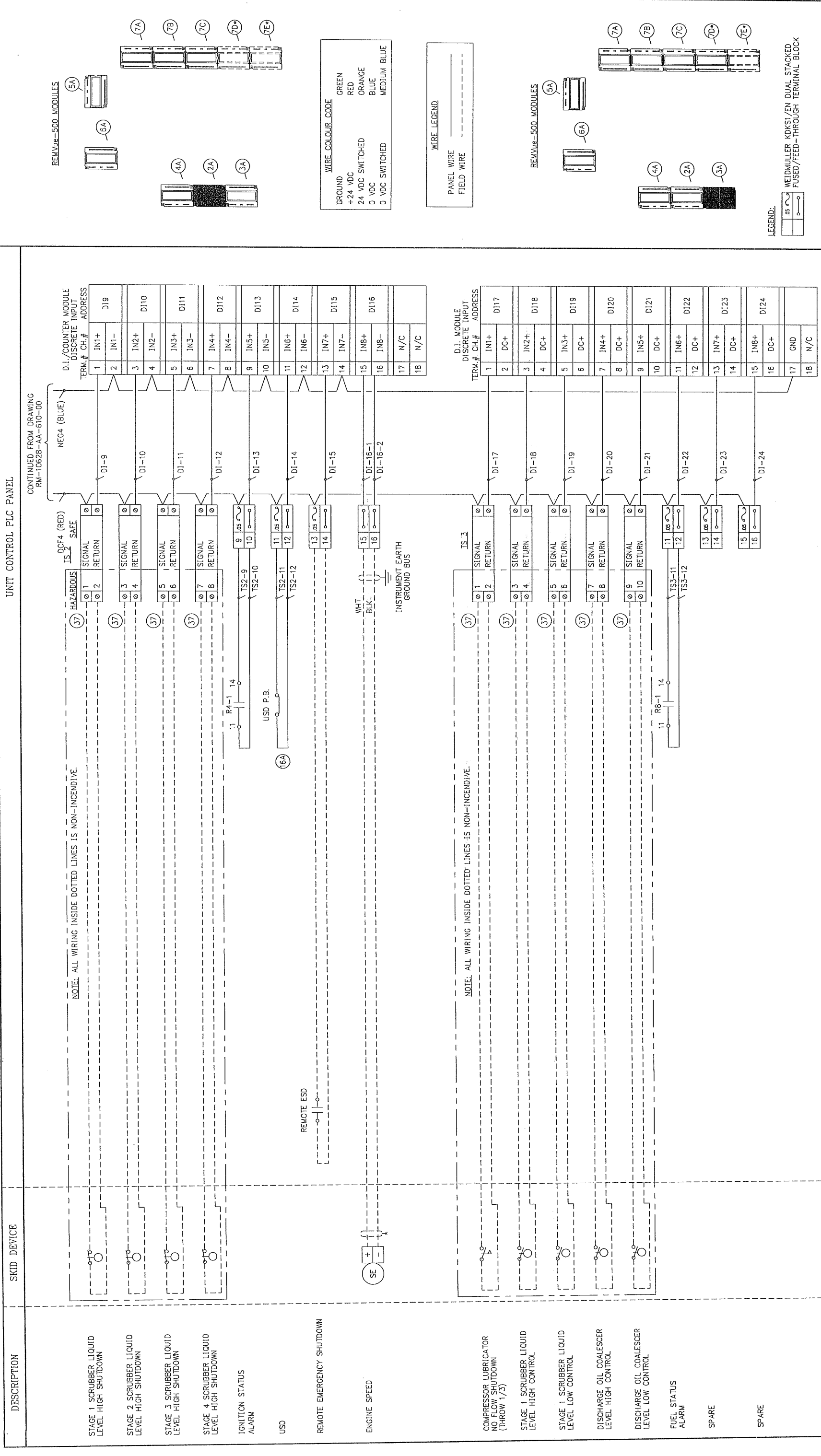
SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
DISCRETE INPUT WIRING DIAGRAM
UNIT #1134

LSD: PROJECT: PN10628 SCALE: NTS DRAWING NO: RM-10628-AA-610-00 P.O.# REV: 8

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
8	FIELD CHANGES: UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL

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SPARTAN CONTROLS

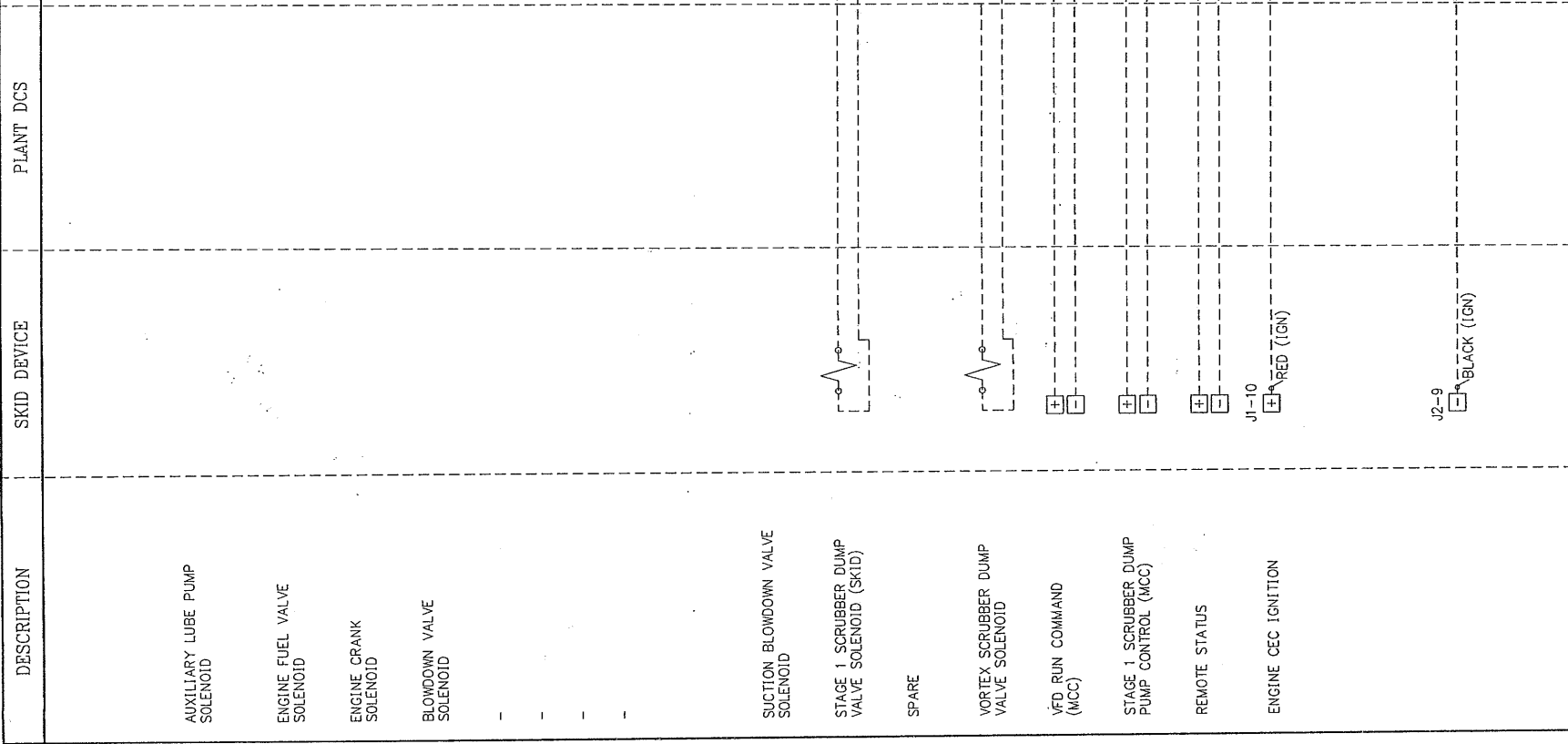
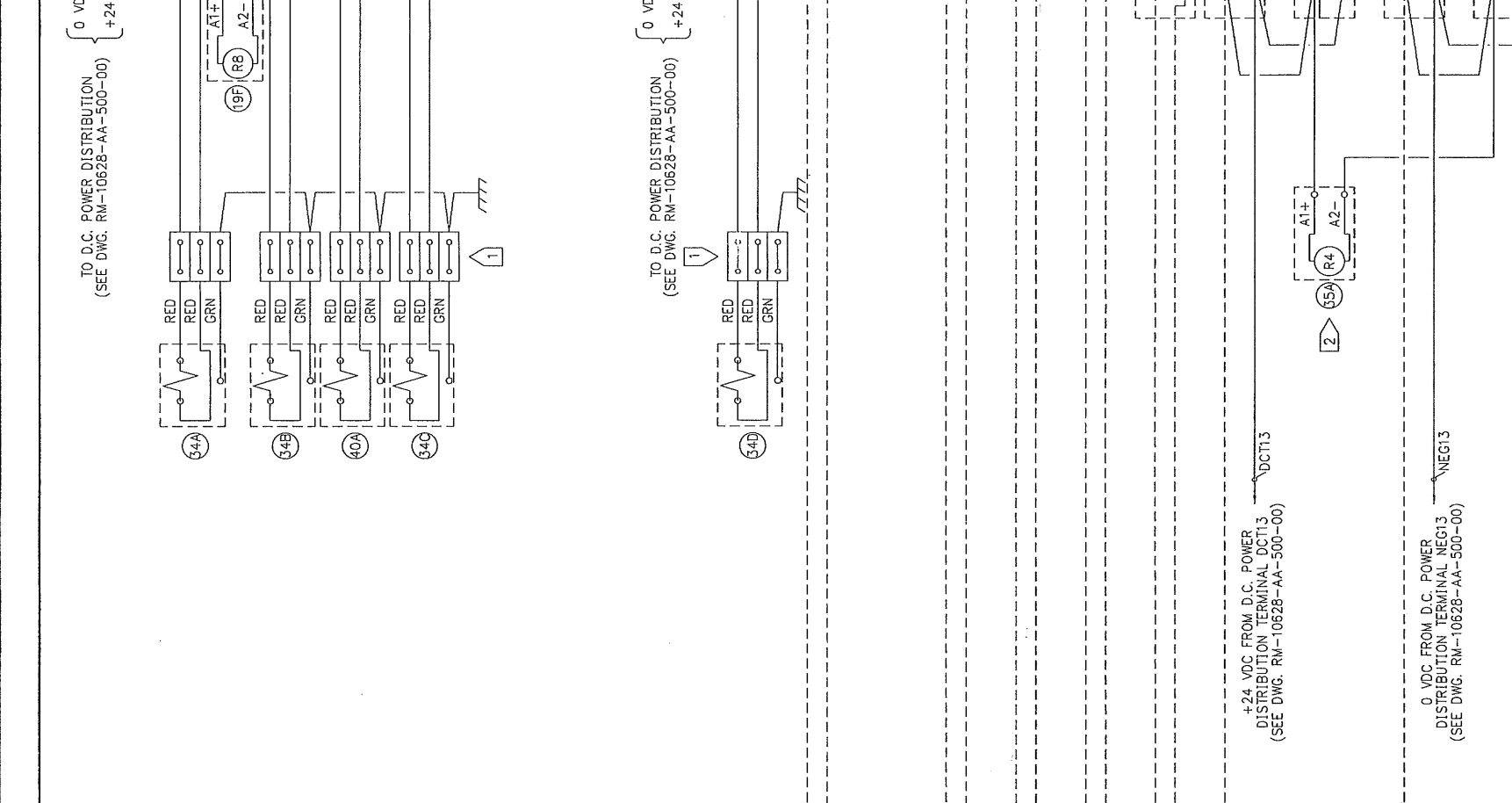
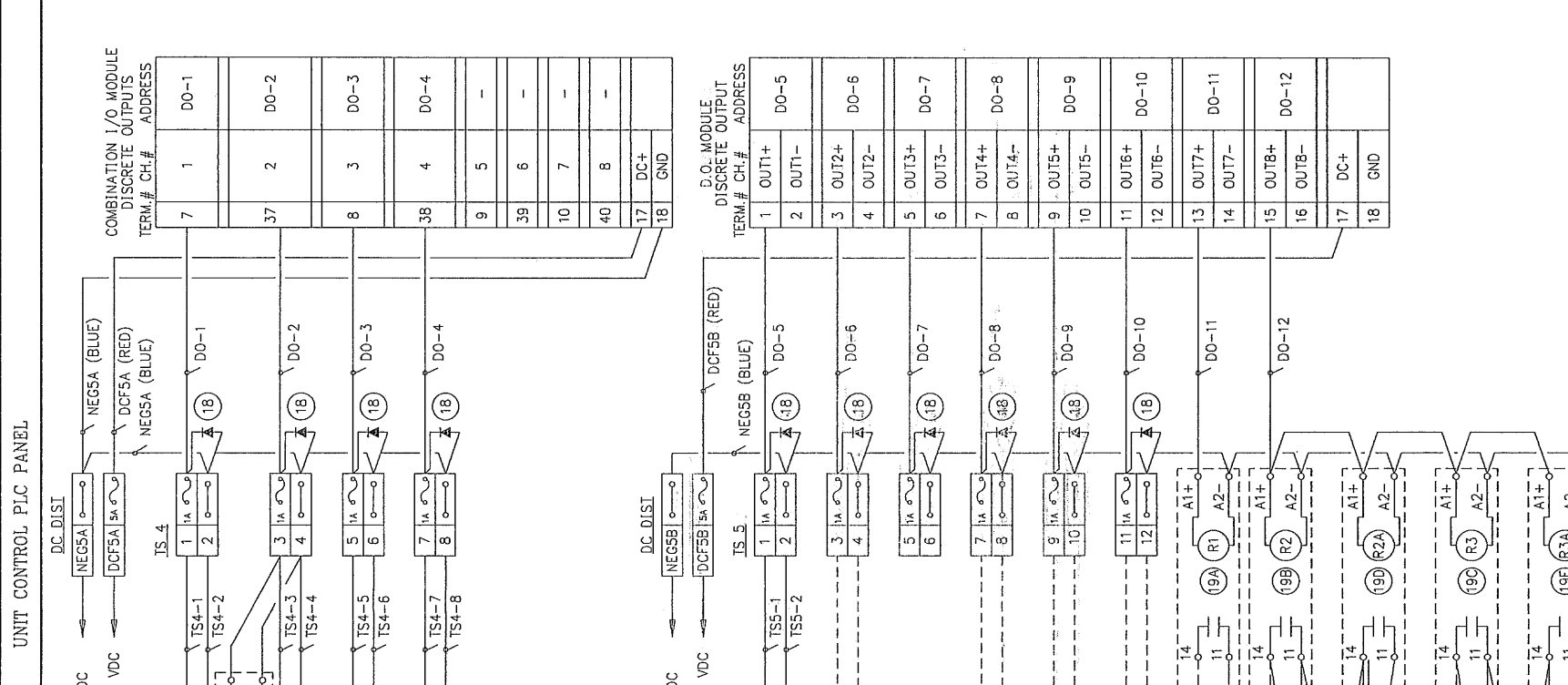
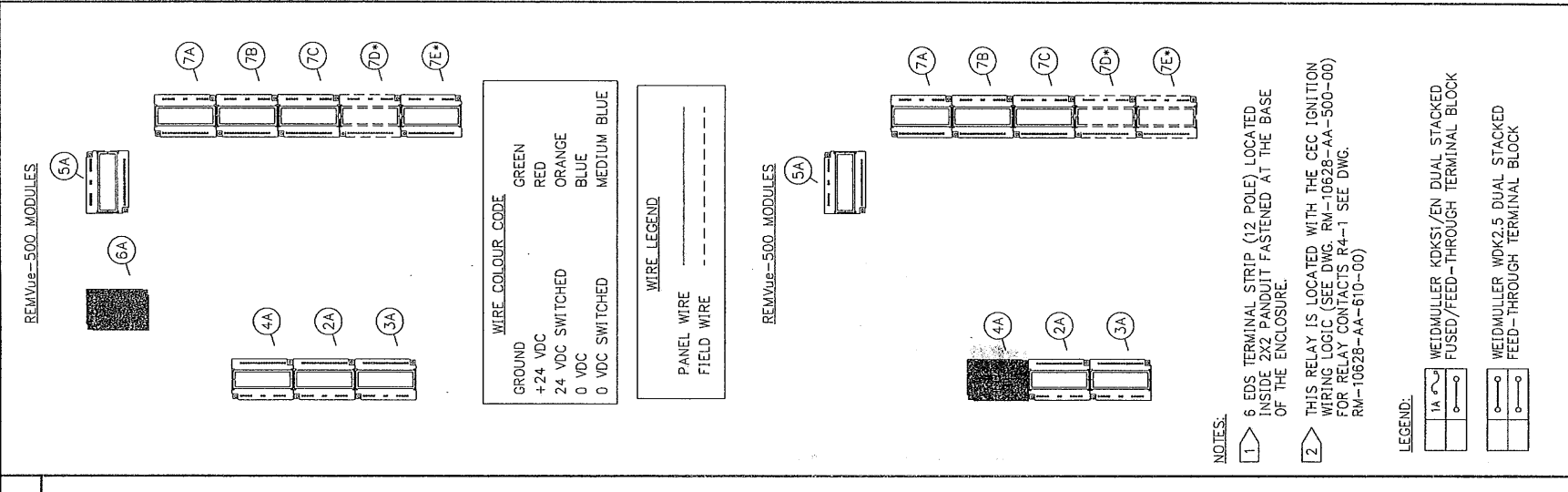
TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVUE-500/S)
DISCRETE INPUT WIRING DIAGRAM
UNIT #1134

LSD: PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-610-01 REV. 8

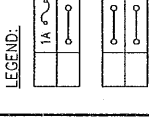
REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES: UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	V/S	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

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REFERENCE DRAWINGS



NOTES:
 1 6 EDS TERMINAL STRIP (12 POLE) LOCATED INSIDE 2X2 PANDUIT FASTENED AT THE BASE OF THE ENCLOSURE.
 2 THIS RELAY IS LOCATED WITH THE CEC IGNITION WIRING LOGIC (SEE DWG. RM-10628-AA-500-00) FOR RELAY CONTACTS R4-1 SEE DWG. RM-10628-AA-610-00



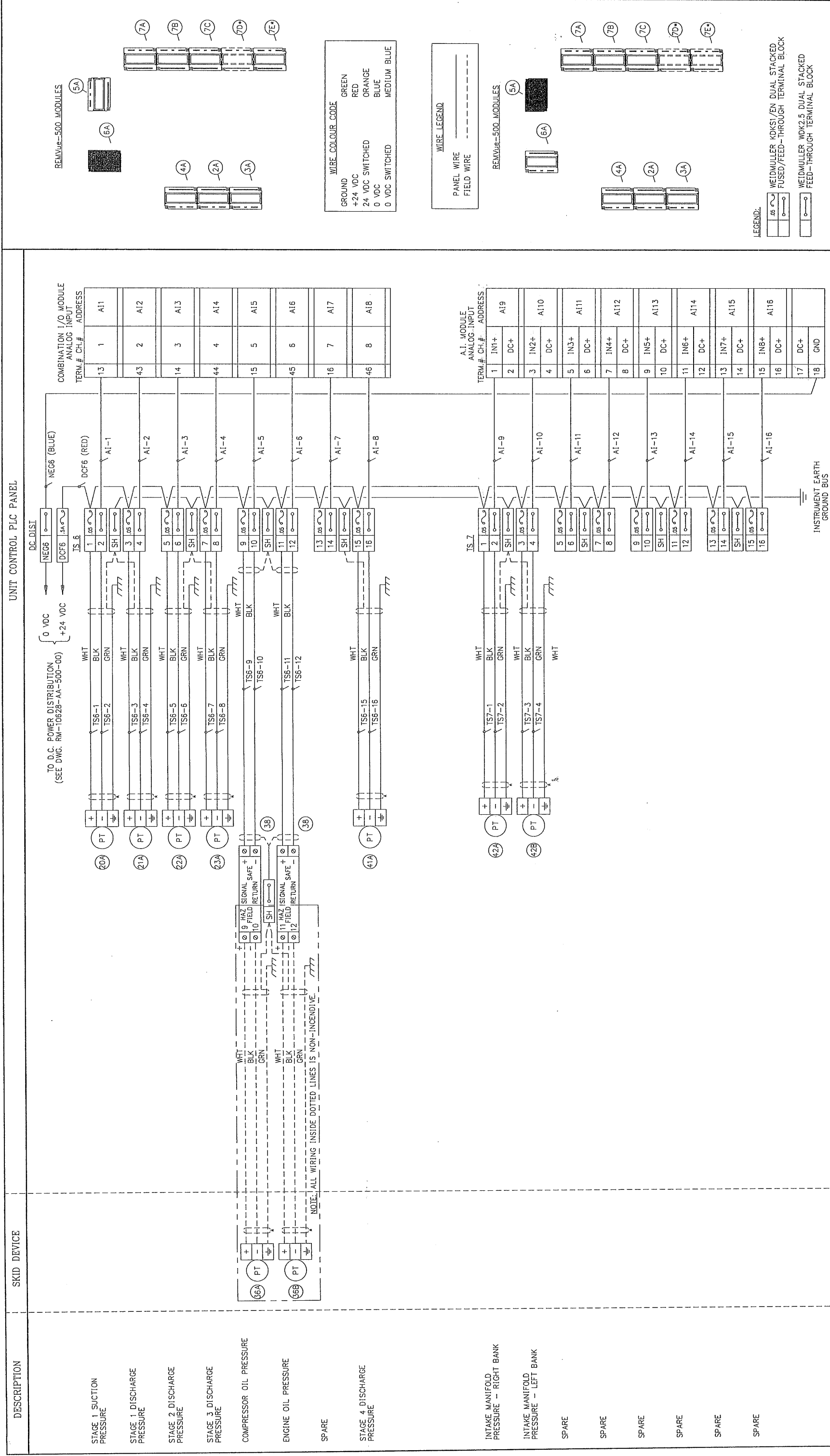
SPARTAN CONTROLS
 TOROMONT ENERGY SYSTEMS
 QUICKSILVER RESOURCES CANADA INC.
 COAL BED METHANE
 COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
 DISCRETE OUTPUT WIRING DIAGRAM
 UNIT #1134

LSD: PROJECT No. PN10628 SCALE NTS DRAWING No. RM-10628-AA-620-00 REV. 8 P.O.#

REV.	DATE	DRAWN	CHK	DESIGN	APP
8	08 SEP 11	RDW	SXF	MLL	MLL
7	21 JUL 09	PEM	MLL	MLL	MLL
6	20 AUG 07	VJS	BWK	BWK	BWK
5	21 JUL 04	PEM	BWK	BWK	BWK
4	28 JUN 04	PEM	BWK	BWK	BWK
3	30 MAR 04	AW	BWK	BWK	BWK
2	23 MAR 04	AW	BWK	BWK	BWK

DESCRIPTION: SPARTAN AS BUILT
 * INDICATES NOT INCLUDED

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SPARTAN CONTROLS

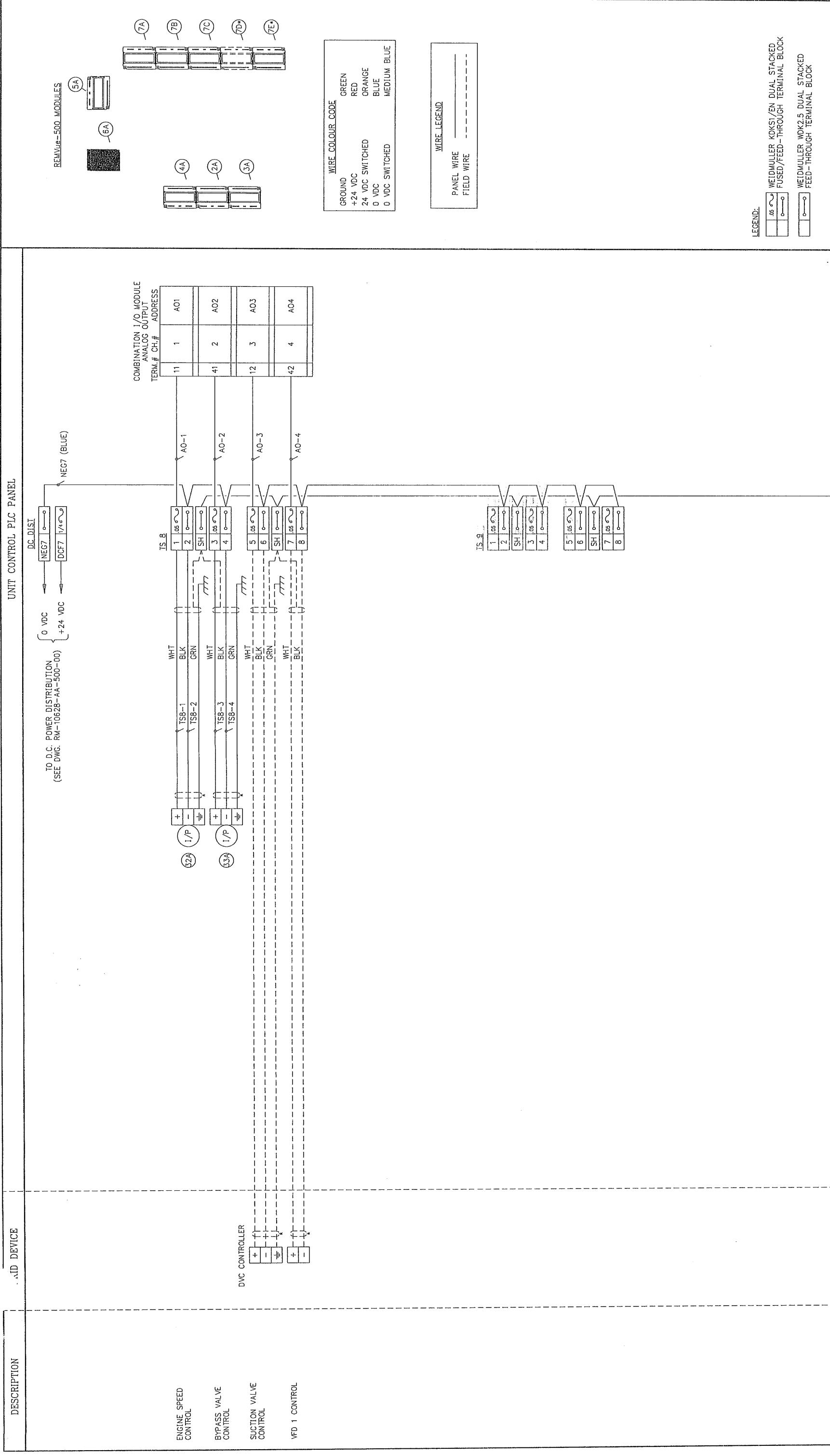
TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REWVUE-500/S)
ANALOG INPUT WIRING DIAGRAM
UNIT #1134

LSD: PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-630-00 REV. 8

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES; UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES; REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

DRAWING No. REFERENCE DRAWINGS

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SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
ANALOG OUTPUT WIRING DIAGRAM

LSD: UNIT #1134

PROJECT No. PN10628 SCALE: NTS DRAWING No. RM-10628-AA-640-00 REV. 8

REV.	DATE	DESCRIPTION	BY	CHK	APP
8	08 SEP 11	FIELD CHANGES: UPGRADE TO IPM (BY SKF)	MLL	MLL	MLL
7	21 JUL 09	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	MLL	MLL	MLL
6	20 AUG 07	FIELD CHANGES	BWK	BWK	BWK
5	21 JUL 04	TOROMONT SHOP CHANGES	BWK	BWK	BWK
4	28 JUN 04	ADDITIONAL CHANGES	BWK	BWK	BWK
3	30 MAR 04	TOROMONT SHOP CHANGES	BWK	BWK	BWK
2	23 MAR 04	SPARTAN AS BUILT	AW	BWK	BWK
1		DESCRIPTION			

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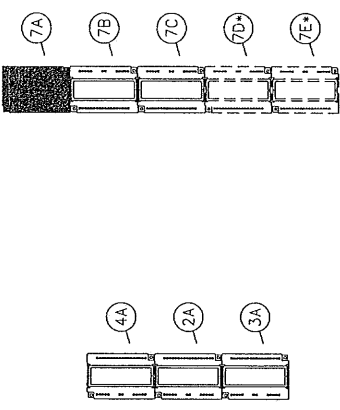
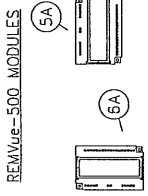
UNIT CONTROL PLC PANEL

DESCRIPTION

SKID DEVICE

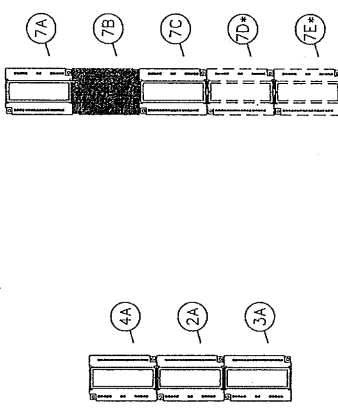
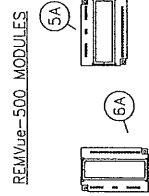
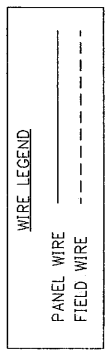
DESCRIPTION	SKID DEVICE	UNIVERSAL A.I. MODULE THERMOCOUPLE INPUT	
		TERM.#	CH.# ADDRESS
COMPRESSOR OIL TEMPERATURE		1	INI+
		2	INI-
ENGINE OIL TEMPERATURE		3	IN2+
		4	IN2-
ENGINE JACKET WATER TEMPERATURE		5	IN3+
		6	IN3-
COMPRESSOR STAGE 4 DISCHARGE TEMPERATURE		7	IN4+
		8	IN4-
COMPRESSOR STAGE 3 DISCHARGE TEMPERATURE		9	IN5+
		10	IN5-
COMPRESSOR STAGE 1 DISCHARGE TEMPERATURE		11	IN6+
		12	IN6-
COMPRESSOR STAGE 2 DISCHARGE TEMPERATURE		13	IN7+
		14	IN7-
PANEL AMBIENT TEMPERATURE		15	IN8+
		16	IN8-
		17	N/C
		18	N/C

DESCRIPTION	SKID DEVICE	UNIVERSAL A.I. MODULE THERMOCOUPLE INPUT	
		TERM.#	CH.# ADDRESS
ENGINE LEFT CYLINDER EXHAUST TEMPERATURE 1		1	INI+
		2	INI-
ENGINE LEFT CYLINDER EXHAUST TEMPERATURE 2		3	IN2+
		4	IN2-
ENGINE LEFT CYLINDER EXHAUST TEMPERATURE 3		5	IN3+
		6	IN3-
ENGINE LEFT CYLINDER EXHAUST TEMPERATURE 4		7	IN4+
		8	IN4-
ENGINE LEFT CYLINDER EXHAUST TEMPERATURE 5		9	IN5+
		10	IN5-
ENGINE LEFT CYLINDER EXHAUST TEMPERATURE 6		11	IN6+
		12	IN6-
ENGINE RIGHT CYLINDER EXHAUST TEMPERATURE 1		13	IN7+
		14	IN7-
ENGINE RIGHT CYLINDER EXHAUST TEMPERATURE 2		15	IN8+
		16	IN8-
		17	N/C
		18	N/C



WIRE COLOUR CODE

GROUND	GREEN
+24 VDC	RED
24 VDC SWITCHED	ORANGE
0 VDC	BLUE
0 VDC SWITCHED	MEDIUM BLUE



SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
THERMOCOUPLE INPUT WIRING DIAGRAM

LSD: UNIT #1134
PROJECT No. PN10628
SCALE: NTS
DRAWING No. RM-10628-AA-650-00
REV. 8

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES; UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES; REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

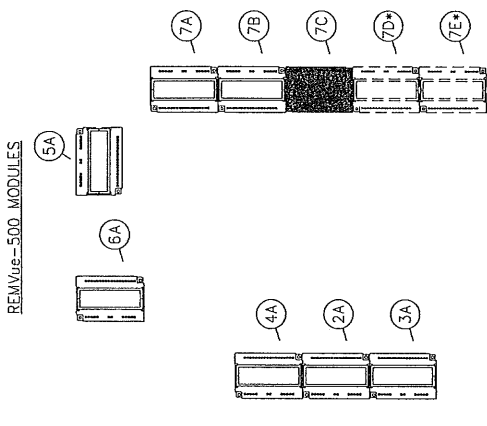
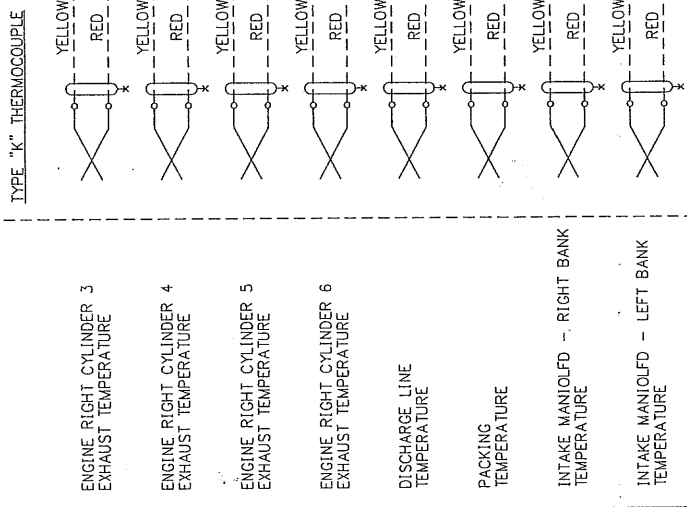
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UNIT CONTROL PLC PANEL

DESCRIPTION

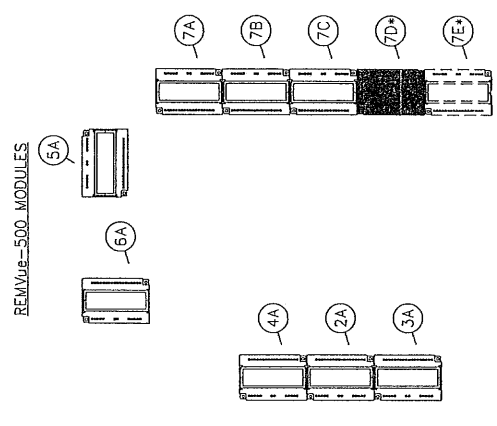
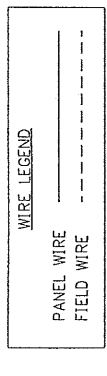
SKID DEVICE

UNIVERSAL A.I. MODULE THERMOCOUPLE INPUT TERM. # CH.# ADDRESS	TC17	TC18	TC19	TC20	TC21	TC22	TC23	TC24
1 IN1+	2 IN1-	3 IN2+	4 IN2-	5 IN3+	6 IN3-	7 IN4+	8 IN4-	9 IN5+
10 IN5-	11 IN6+	12 IN6-	13 IN7+	14 IN7-	15 IN8+	16 IN8-	17 N/C	18 N/C



WIRE COLOUR CODE

GROUND	GREEN
+24 VDC	RED
24 VDC SWITCHED	ORANGE
0 VDC	BLUE
0 VDC SWITCHED	MEDIUM BLUE



UNIVERSAL A.I. MODULE THERMOCOUPLE INPUT TERM. # CH.# ADDRESS	TC25	TC26	TC27	TC28	TC29	TC30	TC31	TC32
1 IN1+	2 IN1-	3 IN2+	4 IN2-	5 IN3+	6 IN3-	7 IN4+	8 IN4-	9 IN5+
10 IN5-	11 IN6+	12 IN6-	13 IN7+	14 IN7-	15 IN8+	16 IN8-	17 N/C	18 N/C

MODULE SHOWN FOR FUTURE PURPOSES ONLY.

INDICATES NOT INCLUDED

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES: UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES: REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

SPARTAN CONTROLS

TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
THERMOCOUPLE INPUT WIRING DIAGRAM

LSD: UNIT #1134

PROJECT No. PN10628 DRAWING No. NTS SCALE: RM-10628-AA-650-01

P.O.# REV. 8

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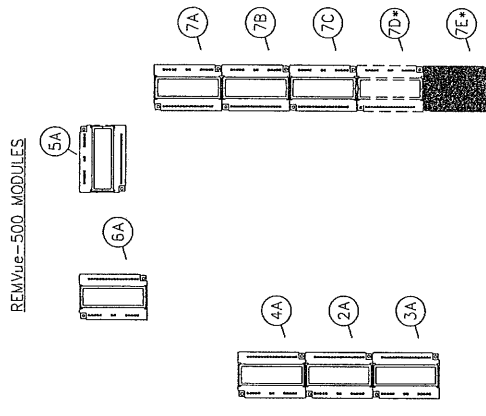
UNIT CONTROL PLC PANEL

DESCRIPTION

SKID DEVICE

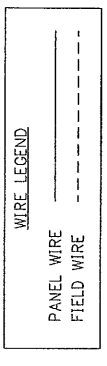
TERM. #	CH.#	ADDRESS
1	IN1+	TC33
2	IN1-	
3	IN2+	TC34
4	IN2-	
5	IN3+	TC35
6	IN3-	
7	IN4+	TC36
8	IN4-	
9	IN5+	TC37
10	IN5-	
11	IN6+	TC38
12	IN6-	
13	IN7+	TC39
14	IN7-	
15	IN8+	TC40
16	IN8-	
17	N/C	
18	N/C	

MODULE SHOWN FOR FUTURE PURPOSES ONLY.



WIRE COLOUR CODE

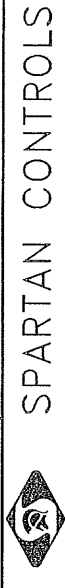
GROUND	GREEN
+24 VDC	RED
24 VDC SWITCHED	ORANGE
0 VDC	BLUE
0 VDC SWITCHED	MEDIUM BLUE



* INDICATES NOT INCLUDED

REV.	DESCRIPTION	DATE	DRAWN	CHK	DESIGN	APP
8	FIELD CHANGES; UPGRADE TO IPM (BY SXF)	08 SEP 11	RDW	SXF	MLL	MLL
7	FIELD CHANGES; REVISE IGNITION AND FUEL LOGIC	21 JUL 09	PEM	MLL	MLL	MLL
6	FIELD CHANGES	20 AUG 07	VJS	BWK	BWK	BWK
5	TOROMONT SHOP CHANGES	21 JUL 04	PEM	BWK	BWK	BWK
4	ADDITIONAL CHANGES	28 JUN 04	PEM	BWK	BWK	BWK
3	TOROMONT SHOP CHANGES	30 MAR 04	AW	BWK	BWK	BWK
2	SPARTAN AS BUILT	23 MAR 04	AW	BWK	BWK	BWK

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TOROMONT ENERGY SYSTEMS
QUICKSILVER RESOURCES CANADA INC.
COAL BED METHANE
COMPRESSOR UNIT CONTROL PANEL (REMVue-500/S)
THERMOCOUPLE INPUT WIRING DIAGRAM

LSD: UNIT #1134
PROJECT No. PN10628
SCALE: NTS
DRAWING No. RM-10628-AA-650-02
REV. 8
P.O.#