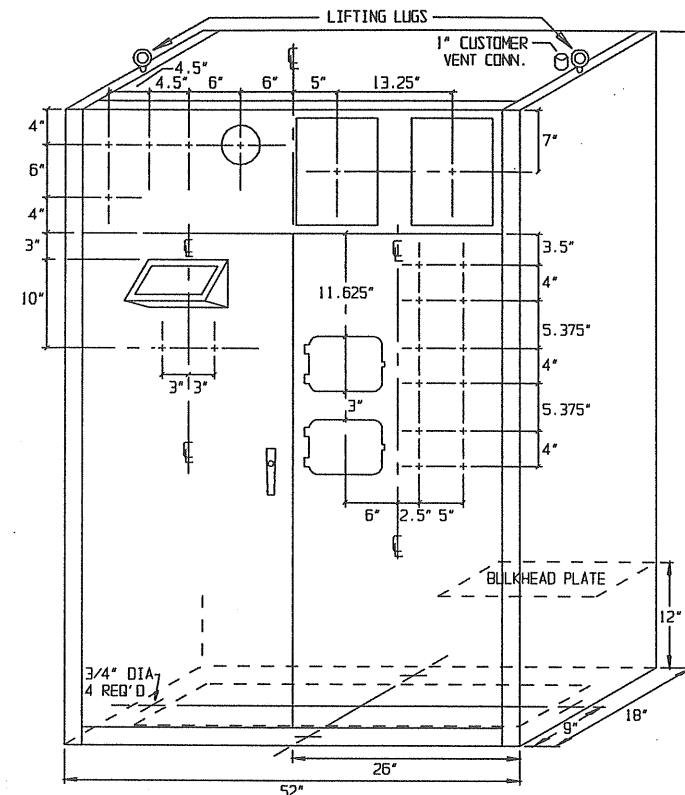
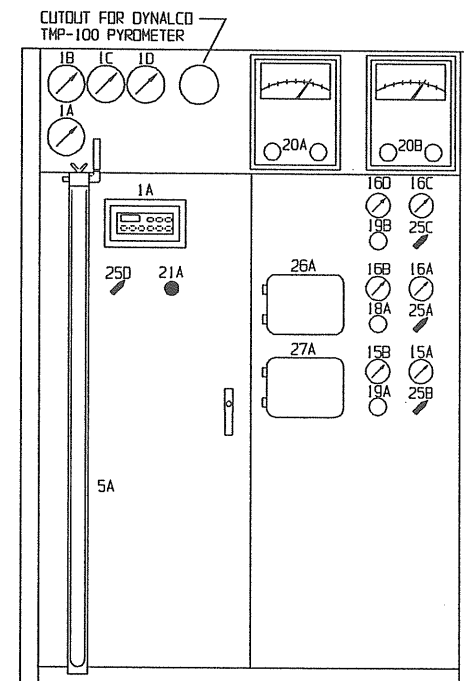
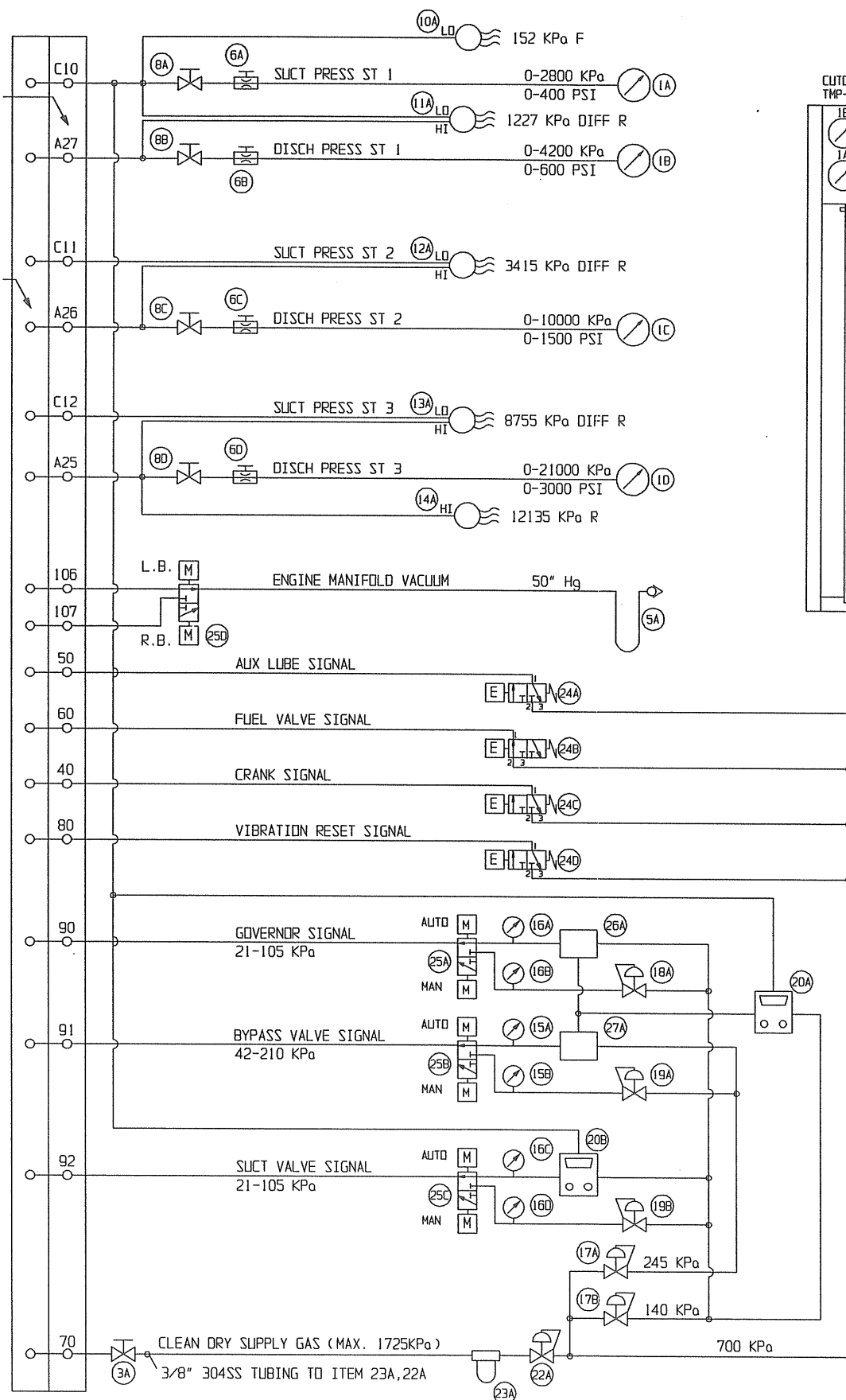
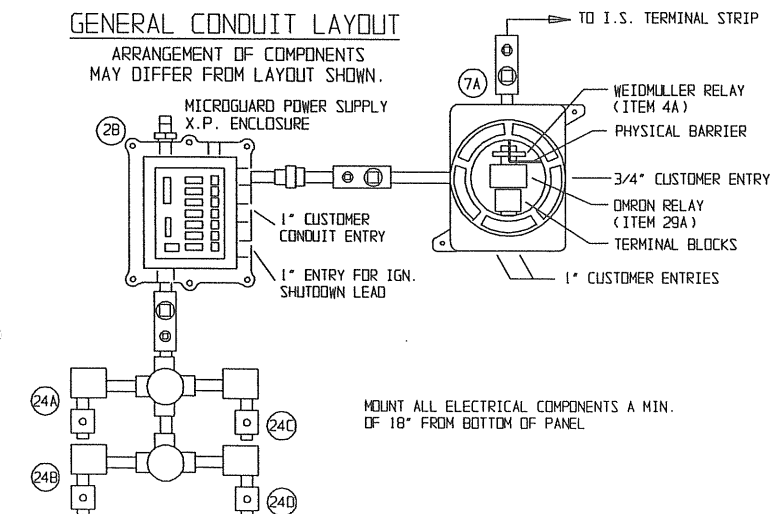


SEQUENCE:	MICROGUARD CONFIGURATIONS (VER. 3.90)	F4 CONFIG TACH 1 OVERSPEED TEST: ALARM
CONFIG SEQUENCE: ENGINE		F5 CONFIG TACH 1 UNDERSPEED: 550 RPM
CONFIG VALVE SEQUENCING: OFF		F6 CONFIG TACH 1 UNDERSPEED: ALARM
CONFIG RELAY G1: AUX LUBE		F7 CONFIG TACH 2 PULSES/REV: 01
CONFIG RELAY G2: CRANK		F9 CONFIG TACH 2 OVERSPEED: 0 RPM
CONFIG RELAY G3: MAIN FUEL		FA CONFIG PRELUBE: 120 SEC.
CONFIG RELAY G4: VIBRATION RESET		FB CONFIG ENG PURGE: 3 SEC.
CONFIG RELAY G5: ALARM		FC CONFIG CRANK: 30 SEC.
CONFIG RELAY G6: RUN RELAY		FD CONFIG CLASS B: 120 SEC.
CONFIG RELAY G7: IGNITION GROUND		FE CONFIG CLASS b: 20 SEC.
CONFIG: 1 CRANK ATTEMPTS		FF CONFIG IGNITION GRND: 3 SEC.
CONFIG AUTO STOP/START: DISABLED		FG CONFIG POST LUBE: 180 SEC.
CONFIG PRE-LUBE: TIME & PRESSURE		FK CONFIG TEST: 180 SEC.
CONFIG VIB. RESET: DURING B-TIMER		FN CONFIG PURGE ENABLE: 50 RPM
CONFIG CLASS C BYPASS: DISABLED		FO CONFIG FUEL DELAY: 0 SEC.
CONFIG POWER FAILURE: RESET TO LOCKOUT		FR CONFIG RUN/PRE-FUEL: 50 RPM
		CHANNELS:
		CONFIG HIGHEST NO. OF CHANNELS USED: 1-31
		COMMUNICATION:
		CONFIG BAUD RATE: 9600
		CONFIG ADDRESS: 01
		CONFIG PROTOCOL: G0LD MODBUS
		NOT USED



CONSTRUCTION NOTES:
2 PANELS REQUIRED
CABINET ENCLOSED WITH DUAL FRONT ACCESS DOORS
PAINT COLOUR: ASA-61 GREY
CIRCUIT TUBING TO BE COLOUR CODED POLYETHYLENE
PROCESS TUBING TO BE 1/4" 304SS
ALL FITTINGS TO BE SWAGelok CADMIUM PLATED STEEL
SYSTEM VENTED TO COMMON VENT HEADER
ALL PNEUMATIC COMPONENTS SHOWN IN OPERATING STATE
DRIP SHIELD OVER MICROGUARD ANNUNCIATOR REQUIRED
ELECTRICAL AREA CLASSIFICATION: CLASS 1, DIV 1, GROUP D

LINE USE	COLOUR
SPEED CONTROL PROCESS	BLUE
SUPPLY	GREEN
FUEL GAS VALVE SIGNAL	YELLOW
INTERCONNECTING	ORANGE
VENT	WHITE
TRIP	RED
PROCESS PRESSURE	METALLIC

SERIAL NO	ESL WO#	P.O #	LOCATION	LSO
DM-2638B	93089	306823	PORTAGE	
DM-2638C	93090	306825	STOCK	

REV.	DESCRIPTION	BY	DATE
3	SPARTAN AS BUILT	AW	94/03/04
2	ADD OMRON RELAY, ITEM 29A	AW	94/01/20
1	DEL SUCT PRESS ST 1 X' MIT&I/P' S; CAB-52"; ADD 4195'S, 2506'S AND DISCH PR ST3 SW.	PEM	93/12/17

SPARTAN CONTROLS LTD. ELECTRONIC COMPRESSOR PROTECTION AND CONTROL SYSTEM FOR ENERFLEX SYSTEMS LTD. PINNACLE RESOURCES LTD. JOB #93089/90			
DRAWN	AW	CHK'D	
DATE	93/10/21	DATE	
ENERFLEX DWG. NO. CPS93089/90		DWG. NO.	DM-2638B,C
		SHT	1/2
		REV	3

5 AMP
24 VDC

XP/-24

9A
XP/+24

MICROGUARD POWER SUPPLY CONN.

MICROGUARD OUTPUT RELAYS

AUX. LUBE RELAY
AUX. LUBE SOLENOID

CRANK RELAY
CRANK SOLENOID

FUEL VALVE RELAY
FUEL VALVE SOLENOID

VIBRATION RESET RELAY
VIBRATION RESET SOLENOID

ALARM RELAY
(CONTACT OPEN ON SHUTDOWN OR ALARM)
(NOT USED)

RUN RELAY
TO REMOTE STATUS ALARM

IGNITION GROUND RELAY
TO REMOTE STATUS ALARM

XP1-1
60

XP1-2
61

XP1-3
90

XP1-4
91

TO CUSTOMER IQ500 POWER DISCONNECT

9.9

SEE ANN. CH.

1 - LUBRICATOR NO FLOW 1
8 - LUBRICATOR NO FLOW 2
27 - HI INLET FILTER SEPARATOR LIQ LEVEL 1
28 - HI INLET FILTER SEPARATOR LIQ LEVEL 2
30 - HI ENG AIR INTAKE MANIFOLD TEMP-L.B.
31 - HI ENG AIR INTAKE MANIFOLD TEMP-R.B.

PANEL I. S. T.B. (COM. RET.)	SENSOR	PANEL I. S. T.B.	ANNUNCIATOR CABLE	ANNUN. T.B.	DESCRIPTION	CLASS	ANNUNCIATOR CHANNEL INPUT
C1		1	ORANGE	1	LEGEND	**	B
C2		2	ORANGE/RED	2	CMP OIL PRESS	LL	b
C3		3	ORANGE/GREEN	3	ENG OIL PRESS	LL	b
C4		4	ORANGE/BLACK	4	ENG JW TEMP	HH	B
C5		5	ORANGE/BLUE/WHITE	5	COOLER VBRTN	HH	A
C6		6	ORANGE/BLACK/WHITE	6	COMPRSR VBRTN	HH	A
C7		7	ORANGE/RED/BLUE	7	ENGINE VBRTN	HH	A
C8		8	ORANGE/BLACK/GREEN	8	LEGEND	**	A
C9		9	WHITE	9	SPARE		
C10		10		10	ST1 SUCT PRESS	LL	C
C11		11		11	ST1 DSCH D.P.	HH	A
C12		12		12	ST2 DSCH D.P.	HH	A
C13		13		13	ST3 DSCH D.P.	HH	A
C14		14		14	ST3 DSCH PRESS	HH	A
C15		15	WHITE/BLUE/RED	15	CYL. 1 TEMP	HH	A
C16		16	WHITE/BLACK/GREEN	16	CYL. 2 TEMP	HH	A
C17		17	WHITE/BLACK/BLUE	17	CYL. 3 TEMP	HH	A
C18		18	BLUE	18	CYL. 4 TEMP	HH	A
C19		19	BLUE/RED	19	ENG OIL TEMP	HH	A
C20		20	BLUE/WHITE	20	CMP OIL TEMP	HH	A
C21		21	BLUE/BLACK	21	ENG OIL LEVEL	LL	A
C22		22	BLUE/BLACK/WHITE	22	CMP OIL LEVEL	LL	A
C23		23	BLUE/WHITE/ORANGE	23	ENG JW LEVEL	LL	A
C24		24	BLUE/RED/ORANGE	24	AUX WTR LEVEL	LL	A
C25		25	BLUE/GREEN/RED	25	ST2 SUCT LEVEL	HH	A
C26		26	GREEN	26	ST3 SUCT LEVEL	HH	A
C27		27	GREEN/BLACK	27	LEGEND	**	A
C28		28	GREEN/WHITE	28	LEGEND	**	A
C29		29	GREEN/BLACK/WHITE	29	SPARE		
C30		30	GREEN/BLUE/WHITE	30	LEGEND	**	A
C31		31	GREEN/ORANGE/RED	31	LEGEND	**	A
					GROUND RETURN		
					EMRGNCY SHDN	**	A

NOTE: ALL CHANNELS ARE CONFIGURED AS N.C. EXCEPT SPARES (N.O.) OR IF STATED OTHERWISE.

REF: MICROGUARD CONFIGURATION FOR UNDERSPEED/OVERSPEED SETTINGS.

2 PANELS

Gauge Range	Panel	Range
0-2800	1A	0-2800
0-4200	1B	0-4200
0-1000	1C	0-1000
0-2100	1D	0-2100

WIRE COLOUR CODE		TERMINAL & WIRE LEGEND	
110 VAC HOT	BLACK	X.P. PANEL TERMINAL	■
110 VAC SWITCHED	BROWN	I.S. PANEL TERMINAL	□
110 VAC NEUTRAL	WHITE	ANNUNCIATOR TERMINAL	⊗
GROUND	GREEN	WEIDMULLER RELAY TERMINAL	⊠
INTRINSIC CIRCUIT	PURPLE	SKID TERMINAL	△
INTRINSIC COMMON	YELLOW	CUSTOMER TERMINAL	▲
+24 VDC	RED	MICROGUARD POWER SUPPLY & X.P. RELAY OUTPUT TERMINALS	⊙
24 VDC SWITCHED	ORANGE		
-24 VDC	BLUE		
BARRIER DC INPUT	GREY		

29A	DMRON G7L-2A-BUBJ RELAY - 24VDC	BY S.M.L.
28A-B	FISHER MTG-726 MOUNTING BRACKET	
27A	FISHER 2506-3 RECEIVER CONT 21-105KPa IN/42-210 KPa OUT	
26A	FISHER 2506-1 RECEIVER CONT	21-105 KPa
25A-D	WHITE B-42XS4-KN SELECTOR	
24A-D	ASCO EFB320G202-24 SOLENOID	24 VDC
23A	HEADLINE 360A 1/2 FILTER	
22A	FISHER 67AFR-226 REG C/W 13A6009X012	0-700 KPa
21A	TM ZB2BT4 MAINTAINED RED PB C/W ZB2BT102	BY S.M.L.
20A-B	FISHER 4195KB-535 CONT 0-4200 KPa SSBT	21-105 KPa
19A-B	FISHER 67-450 REG C/W 2185LD12	35-245 KPa
18A	FISHER 67-450 REG C/W 2185LD11	35-245 KPa
17A	FISHER 67AFR-362 REGULATOR	35-245 KPa
16A-D	WIKI 111.10/300 2 1/2" GAUGE	0-200 KPa
15A-B	WIKI 111.10/600 2 1/2" GAUGE	0-400 KPa
14A	ASCO SB10D/TN10B42 PRESS SWITCH	SET 12135 KPa
13A	STATIC-O-RING 102WI-KA105-S1-C1A	8755 KPa DIFF
12A	STATIC-O-RING 16RB-KA5-M4-C1A	3415 KPa DIFF
11A	STATIC-O-RING 13RB-KA5-M4-C1A	1227 KPa DIFF
10A	ASCO SB10D/TH10A11 PRESS SWITCH	SET 152 KPa F
9A	WEIDMULLER SAK R DISCONNECT SWITCH	BY S.M.L.
8A-D	ISOLATION VALVE - 1/4" CARBON STEEL	BY S.M.L.
7A	KILLARK GRK X.P. ENCLOSURE	BY S.M.L.
6A-D	WIKI 910.12/9091262 PULSATION DAMPENER	
5A	MERIAM 10A255M 50" MANOMETER C/W 924K50	50" Hg
4A	WEIDMULLER 11016.1 RELAY-24VDC	BY S.M.L.
3A	ISOLATION VALVE-3/8" CARBON STEEL	
	2D-AMOT MICROGUARD 8017A3-AA SENSOR	
	2C-AMOT MICROGUARD 64064X CABLE ASSEMBLY	
	2B-AMOT MICROGUARD 8612B1-24 VDC P.S.	
	2A-AMOT MICROGUARD 8602B0 ANNUNCIATOR	
2A,B,C,D	AMOT MICROGUARD SYSTEM 10638X001	
1A-D	WIKI 233.53 4" S.S. LIQUID FILLED GAUGE	
I.S. TB	WEIDMULLER DK 4 TERM. BLK.(QTY. 29)	BY S.M.L.
X.P. TB	WEIDMULLER SAK4 TERM. BLK.(QTY. 6)	BY S.M.L.

ITEM	DESCRIPTION	RANGE: SET	
3	SPARTAN AS BUILT	AW	94/03/04
2	ADD IQ500 POWER DISCONNECT LOGIC, ITEM 29A	AW	94/01/20
1	DEL SLCT ST1&ACTION PAC SPD X'MIT,1/P'S 8E;ADD 28A-B,27A,26A,25D,20A-B,19B,15B	PEM	93/12/17
REV.	DESCRIPTION	BY	DATE



**SPARTAN
CONTROLS LTD.**

ELECTRONIC COMPRESSOR PROTECTION
AND CONTROL SYSTEM FOR
ENERFLEX SYSTEMS LTD.

PINNACLE RESOURCES
JOB #93089/90

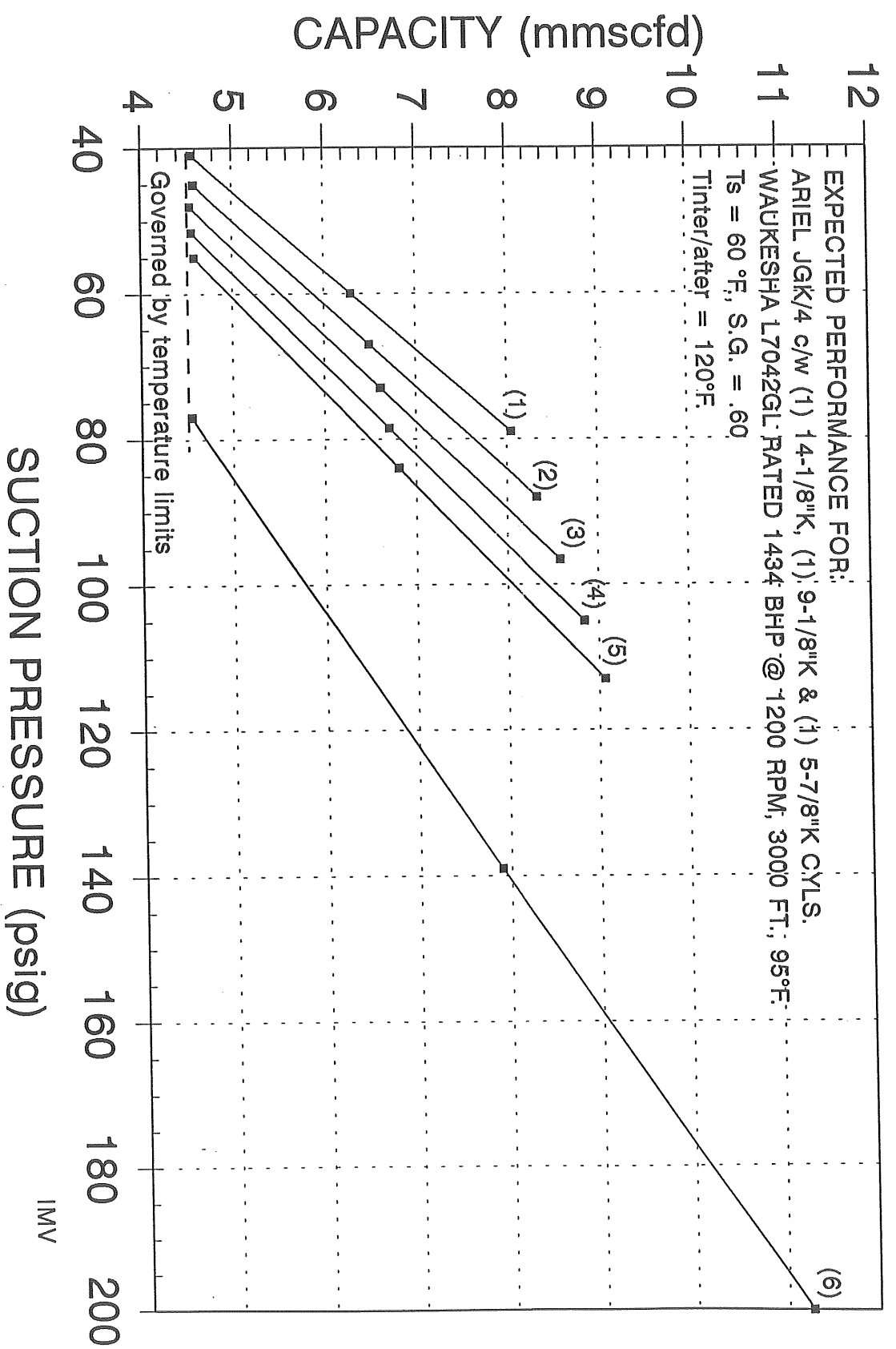
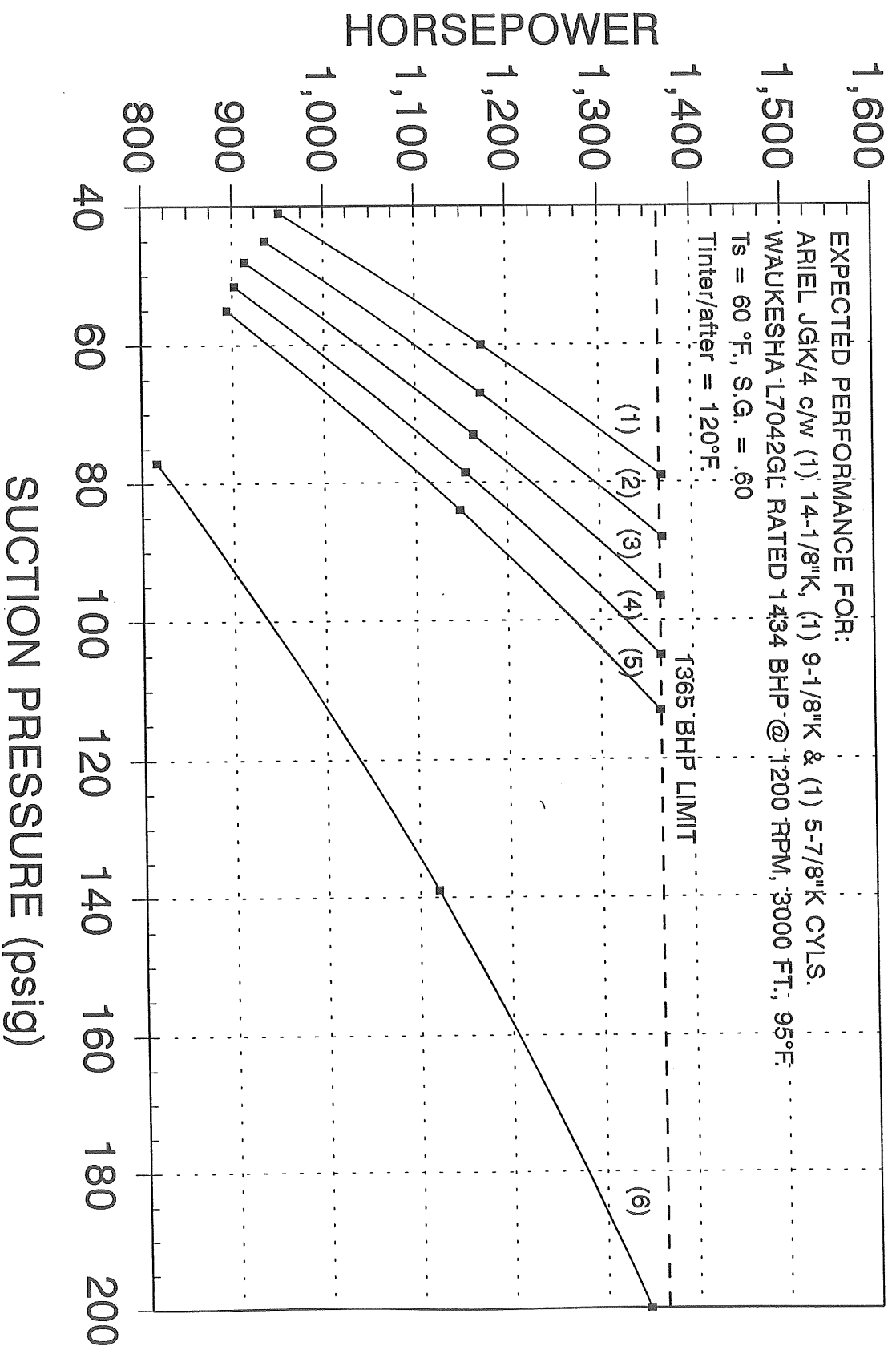
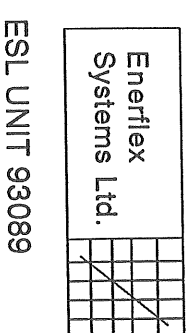
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DATE	93/10/21	DATE	COORDINATOR	
ENERFLEX DWG. NO. CPS93089/90		DWG. NO.	DM-2638B,C	
			SHT 2/2	REV 3

<u>SERIAL NO</u>	<u>ESL WO#</u>	<u>P.O #</u>	<u>LOCATION</u>	<u>LSD</u>
DM-2638B	93089	306823	PORTAGE	
DM-2638C	93090	306825	STOCK	

APRIL 01/94

PINNACLE RESOURCES LTD. PORTAGE COMPRESSOR STATION

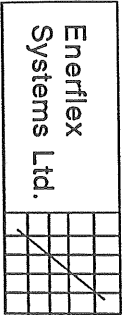
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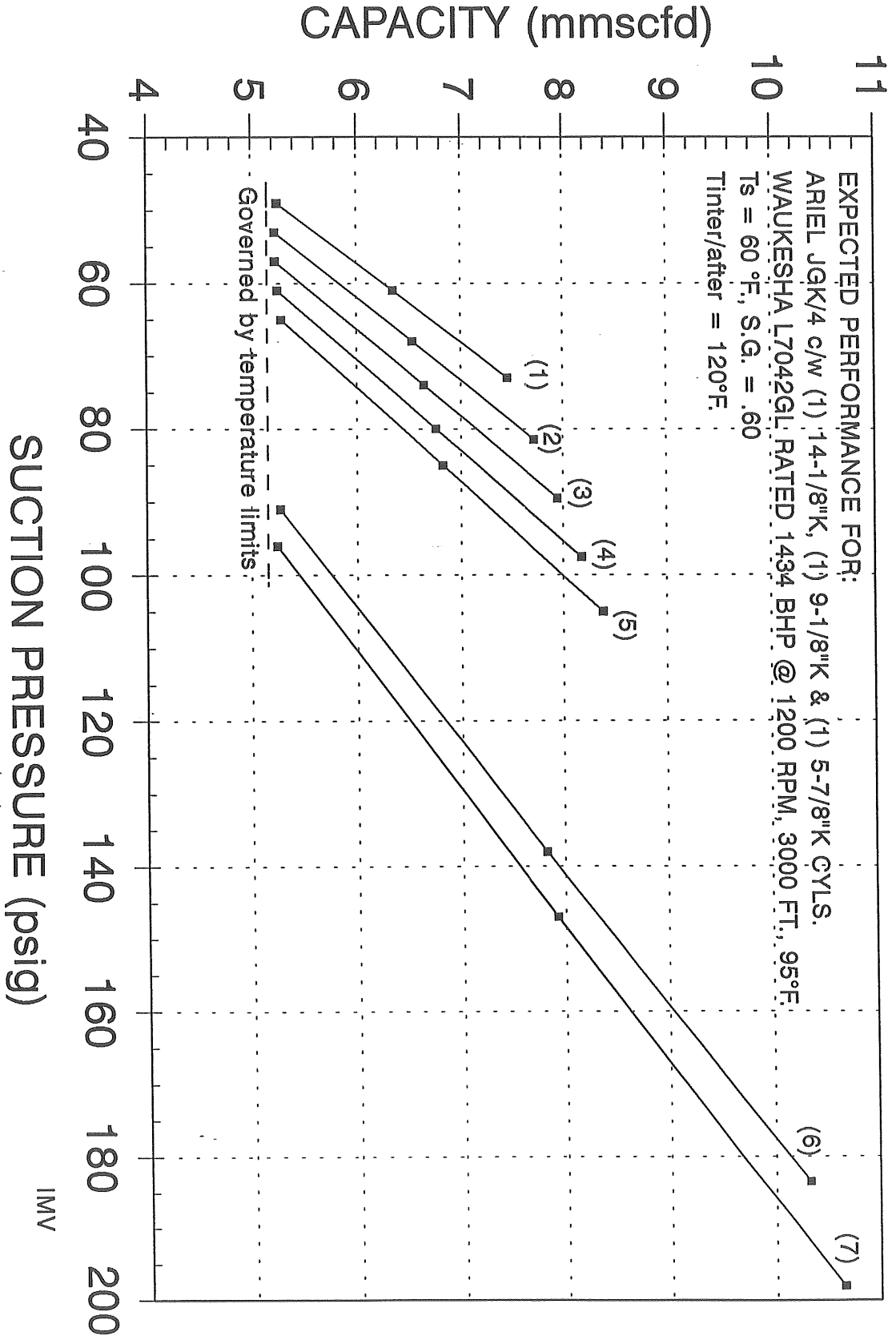
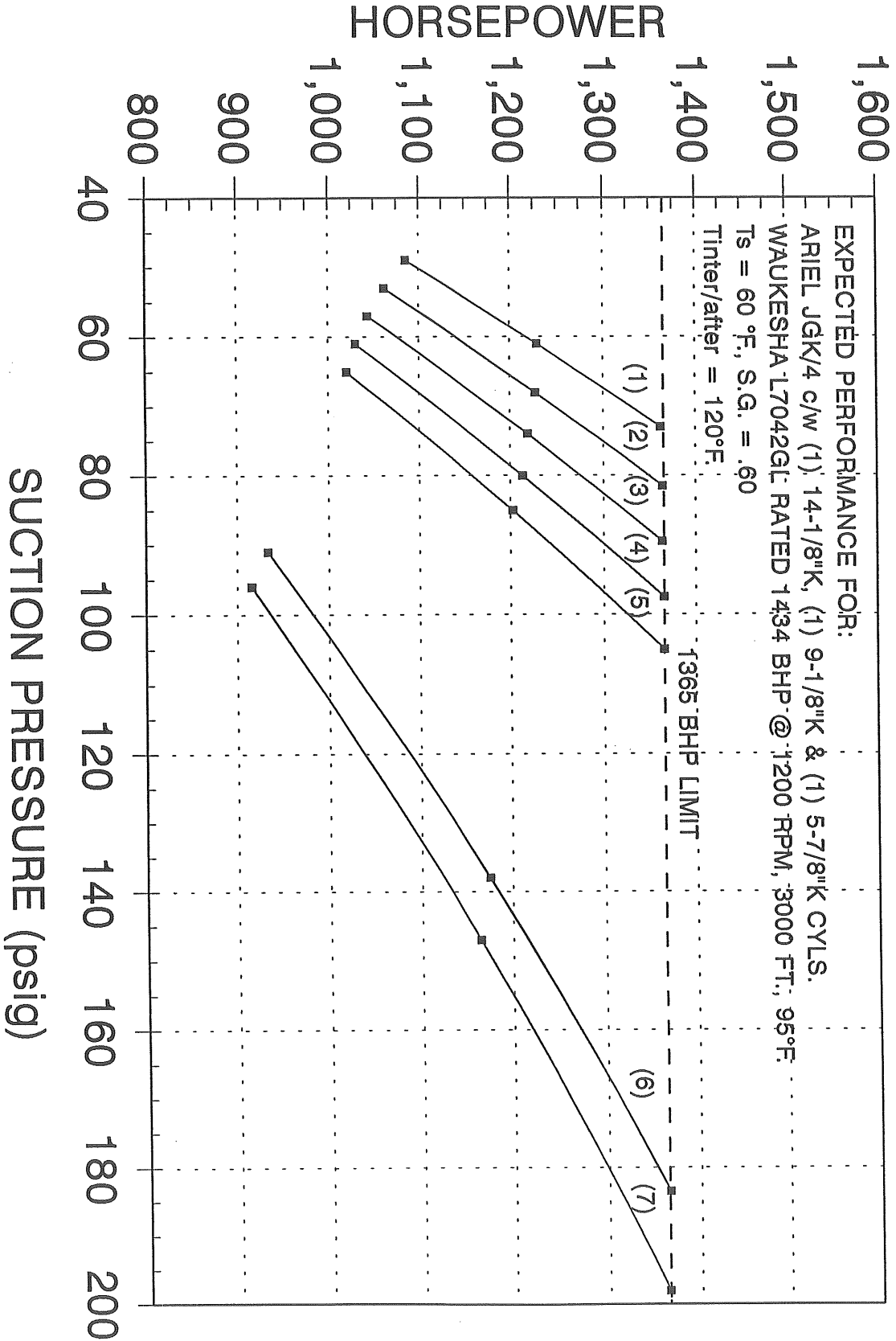
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PINNACLE RESOURCES LTD. PORTAGE COMPRESSOR STATION

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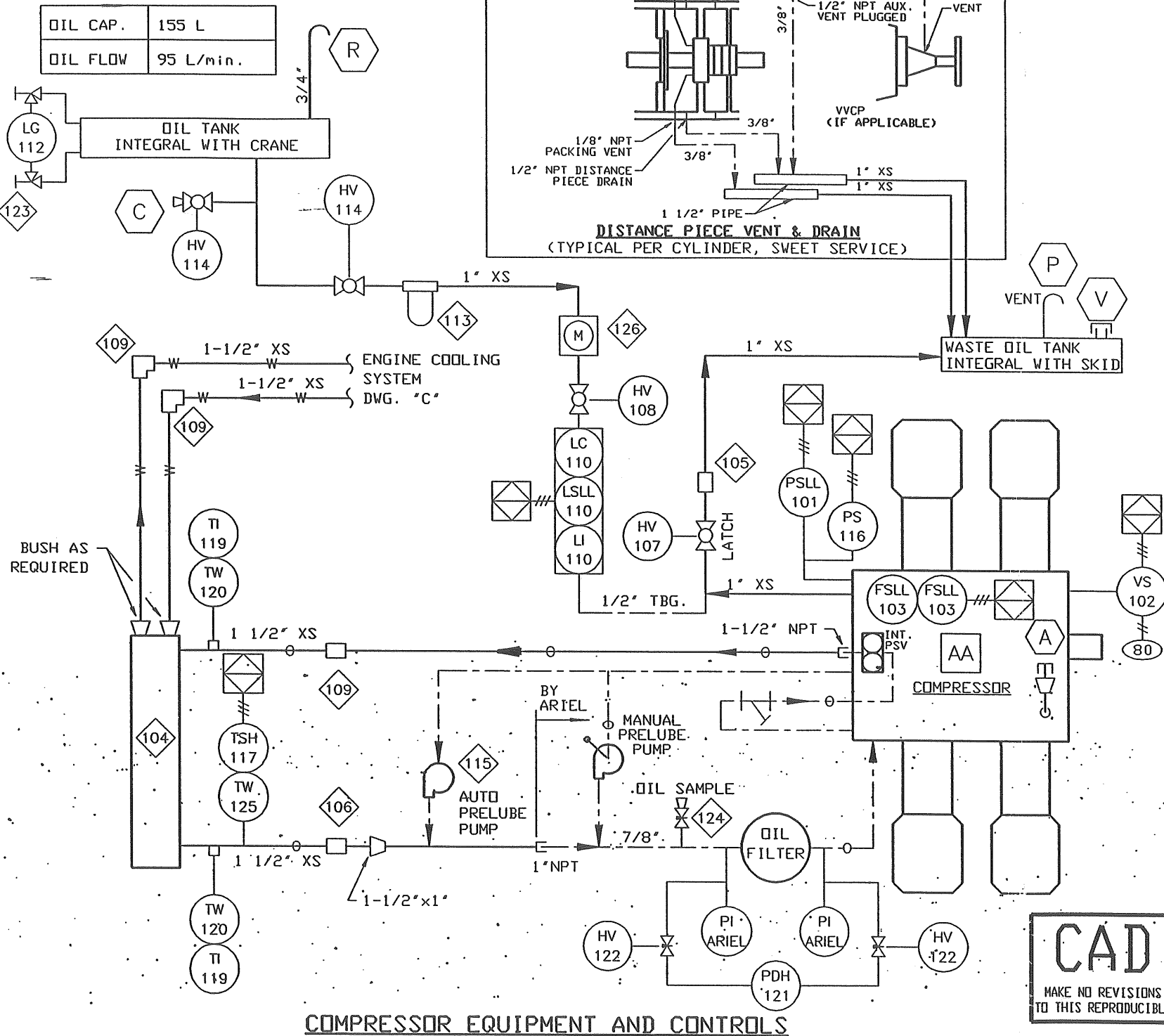


ESL UNIT 93089



IMV

NOTE:
1. SEE THE GENERAL ARRANGEMENT DRAWING
FOR THE CORRECT CYLINDER ORIENTATION.



BILL OF MATERIAL

ITEM	SEC	QTY.	CODE No.	DESCRIPTION
101	03	1	BTE-69GE14	PRES SW, CCS 6900GE14, 500 MWP 6-75R, 2-71F, XP, ALUM. SET @ 20 PSIG FALLING
102	03	1	BAM-4109E	VIBRATION SWITCH, AMOT 4109B11B CSA MICROSWITCH PNEUMATIC RESET CONN
103	01	2	AAR-527E	LUBE NO FLOW SD, TRABON 527-100-180
104	01	1	AAR-K7120	OIL COOLER, THERMAL TRANSFER K-712-0 (ARIEL STD) (US)
105	02	1	BDR-C10L	SLEEVE COUPLING, 1" DRESSER STYLE 90 90EL
106	02	1	BDR-C14	SLEEVE COUPLING, 1-1/2" DRESSER STYLE 90 STRAIGHT
107	02	1	BNI-T5610	BALL VALVE, 1" NPT NIBCO T560-CS-R-25 2000# WDG RP WI LATCH HANDLE
108	02	1	BGR-391104	BALL VALVE, GRINNELL 1/2" NPT, FIG 3911, 2000 WDG, RP, CS
109	02	3	BDR-C14L	SLEEVE COUPLING, 1-1/2" DRESSER STYLE 90, 90°EL.
110	03	1	BKE-LCE9	LEVEL CONTROLLER WI SWITCH, KENCO LCE-9, C.S.A., XP
112	02	1	BPE-G07	GAUGE GLASS, PENBERTHY 5/8" OD X 7 1/4" OAL
113	02	1	BBA-BF914	FILTER, BALDWIN BF914 1" NPT WI BF915 ELEMENT
114	02	2	BGR-391110	BALL VALVE, GRINNELL, 1" NPT, FIG 3911, 2000# WDG, CS, RP
115	02	1	BWI-M100	PUMP, WILDEN M100
116	02	1	BTE-69GE12	PRES SW, CCS 6900GE12, 500 MWP 3-20R, 1-18F, XP, ALUM. SET @ 3 PSI RISING
117	03	1	BTE-69TU14	TEMP SW, CCS 6900TU14, 300F GP 80-205R, 60-198F SS 5'CAP SET @ 180°F RISING
119	16	2	BTR-30251	TEMPERATURE INDICATOR, TREND 33025, 2 1/2" STEM, BACK MOUNT, 3" DIAL, DUAL SCALE 0-250 DEG. F
120	16	2	BTW-062	THERMOWELL, 1/2" X 3/4" NPTM X 2-1/2" LONG 304SS
121	16	1	BDR-1A30	DP GAUGE, ORANGE RESEARCH MDL 1201-PG-1A-2.5L, 0-30 PSID
122	16	2	BWH-2NVS	NEEDLE VALVE, WHITEY S-1VS4, 1/4" TBG CS
123	20	1	BPE-70A	SET GAUGE VALVES, PENBERTHY 70A 1/2" NPT MI
124	16	1	NPN3-8806	NEEDLE VALVE, CENTURY #CM2-3-M22T-B-16V, 1/4" NPTM X 1/4" NPTF, 6000#, C.S.
125	03	1	BTE-TW7525	T'WELL, CCS 3/4", 2 1/2" U, 304SS # 6509TW34025204 C/W 2" T LAC
126	02	1	BRE-MRM	SLOW FLOW METER, REN MRM (METRIC)

CAD
MAKE NO REVISIONS
TO THIS REPRODUCIBLE

AS-BUILT
DATE 4661 5 1 80

LAST DRAWING SAVE DATE:
93/10/06 13:14

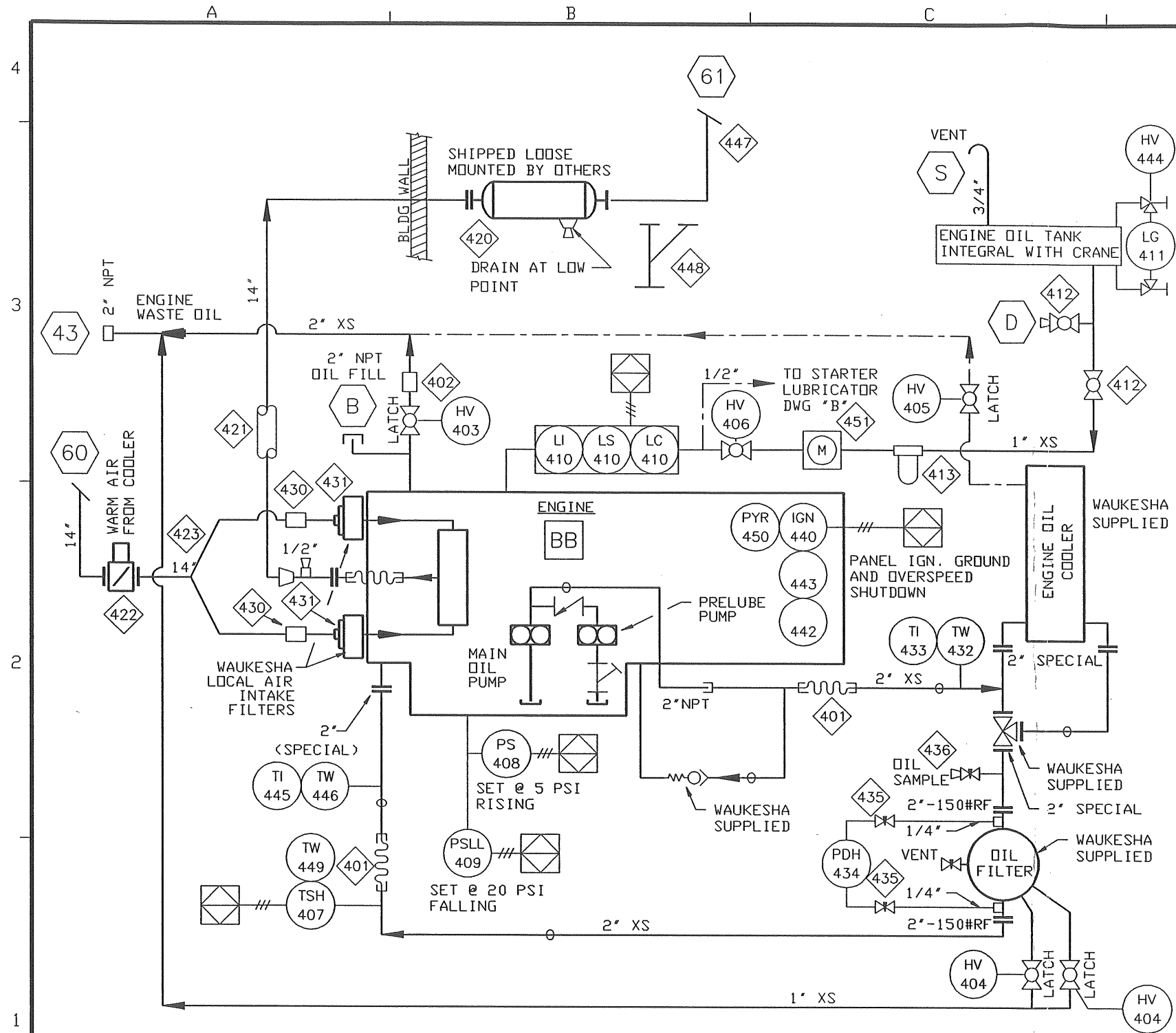


CUSTOMER:
PINNACLE RESOURCES LTD.
PORTAGE COMPRESSOR STATION/STOCK
JOB No.: 93089/90

Rev.	Description	By	Date
2	AS BUILT	GJK	94/03/10
1	FOR CONSTRUCTION	GJK	94/01/15
0	FOR APPROVAL	GJK	93/11/26

DWN BY: JRM
DATE: 93-03-11
CHK'D BY: [Signature]
DATE: 14 MAR 94

TITLE:
STANDARD SCHEMATIC
COMPRESSOR EQUIPMENT AND CONTROLS
ARIEL JGH, JGE, JGK
DWG. SF93089A
REV. 2



ENGINE EQUIPMENT AND CONTROLS - OIL, IGNITION, AIR, EXHAUST

CAD
MAKE NO REVISIONS
TO THIS REPRODUCIBLE

BILL OF MATERIAL

ITEM	SEC.	QTY.	CODE No.	DESCRIPTION
401	05	2	BBH-2012	BRAIDED STEEL HOSE, 2" NPTM ENDS, 12' LONG
402	05	1	BDR-C20	SLEEVE COUPLING, 2" DRESSER STYLE 90
403	05	1	BNI-T5620	BALL VALVE, 2" NPT NIBCO T560-CS-R-25 2000# WDG RP WI LATCHING HANDLE
404	05	2	BNI-T5610	BALL VALVE, 1" NPT NIBCO T560-CS-R-25 2000# WDG RP WI LATCHING HANDLE
405	05	1	BNI-T5604	BALL VALVE, 1/2" NPT NIBCO T560-CS-R-25 2000# WDG RP WI LATCHING HANDLE
406	05	1	BGR-391104	BALL VALVE, GRINNELL 1/2" NPT, FIG 3911, 2000 WDG, RP, CS
407	06	1	BTE-69TU14	TEMP SW, CCS 6900TU14, 300F GP 80-205R, 60-198F SS 5'CAP SET @ 180°F RISING
408	05	1	BTE-69GE12	PRES SW, CCS 6900GE12, 500 MWP 3-20R, 1-18F, XP, ALUM. SET @ 5 PSI RISING
409	05	1	BTE-69GE14	PRES SW, CCS 6900GE14, 500 MWP 6-75R, 2-71F, XP, ALUM. SET @ 20 PSI FALLING
410	06	1	BKE-LCE17	LEVEL CONTROLLER WI SWITCH, KENCO LCE-17 CSA XP
411	02	1	BPE-G07	GAUGE GLASS, PENBERTHY 5/8" OD X 7 1/4" OAL
412	05	2	BGR-391110	BALL VALVE, GRINNELL, 1" NPT, FIG 3911, 2000# WDG, CS, RP
413	05	1	BBA-BF914	FILTER, BALDWIN BF914 1" NPT WI BF915 ELEMENT
420	05	1	BSI-JAT14EE	MUFFLER, SILEX JAT14 RES GR END IN/OUT 14"-150#
421	05	1	BEX-CF	EXHAUST LINE THERMAL BARRIER, ALUMINUM CLAD CERAMIC FIBRE BATTING WITH GALVANIZED STEEL LINER AND AIR RINGS
422	05	1	BEN-WAS14	WARM AIR SELECTOR, 14" PER STD. DWG. 05.1022
423		1	BLS-YM1014	AIR LINE Y-MANIFOLD, 16 G ST 10" D. IN/14" D. OUT
430	05	2	BDO-P11H10	RUBBER HUMP HOSE CONNECTOR, DONALDSON P11-1414, 10" STRAIGHT
431	05	2	BLS-AFA3T10	AIR FILTER ADAPTER, L&S HANDCRAFT 16 GA. STEEL FOR FLVHP "GL", 10" O.D.
432	16	1	BTW-062	THERMOWELL, 1/2" X 3/4" NPTM X 2-1/2" LONG 304SS
433	16	1	BTR-30251	TEMPERATURE INDICATOR, TREND 33025, 2 1/2" STEM, BACK MOUNT, 3" DIAL, DUAL SCALE 0-250 DEG. F
434	16	1	BDR-1A30	DP GAUGE, ORANGE RESEARCH MDL 1201-PG-1A-2.5L, 0-30 PSID
435	16	2	BWH-2NVS	NEEDLE VALVE, WHITEY S-1VS4, 1/4" TBG CS
436	16	1	NPN3-8806	NEEDLE VALVE, CENTURY #CM2-3-M22T-B-16V, 1/4" NPTM X 1/4" NPTF. 6000#, C.S.
440		1	BFM-IQ50012	IGN SYSTEM FAIRBANKS MORSE, IQ 500, MAG, 12VHP, CSA DIV II
442	05	13	BDM-2008	THERMOCOUPLE, TYPE "K", C/W SS ADAPT. FOR WAUK VHP G & GSI
443	05	1	BWH-LGL25	PYRO HARNESS, 13 POINT FOR L-SERIES GL, 25' LEADS
444	02	1	BPE-70A	SET GAUGE VALVES, PENBERTHY 70A 1/2" NPT MI
445	16	1	BTR-30251	TEMPERATURE INDICATOR, TREND 33025, 2 1/2" STEM, BACK MOUNT, 3" DIAL, DUAL SCALE 0-250 DEG. F
446	16	1	BTW-062	THERMOWELL, 1/2" X 3/4" NPTM X 2-1/2" LONG 304SS
447	05	1	XSTACK	EXHAUST STACK 1.5 X BLDG HEIGHT AS MANUFACTURED BY ESL
448	05	1	XSTACKSUPPORT	EXHAUST STACK SUPPORT
449	06	1	BTE-TW7525	T'WELL, CCS 3/4", 2 1/2" U, 304SS # 6509TW34025204 C/W 2" T LAG
450	05	1	BDY-TMP10014	PYROMETER, DYNALCO TMP 100-14, 19 POINT, TYPE K T'COUPLE
451	05	1	BRE-MRM	SLOW FLOW METER, REN MRM (METRIC)

LAST DRAWING SAVE DATE:
93/10/06 13:21

Enerflex
Systems Ltd.

CUSTOMER:
PINNACLE RESOURCES LTD.
PORTAGE COMPRESSOR STATION/STOCK

JOB No.: 93089/90

Rev.	Description	By	Date
2	AS BUILT	GJK	94/03/10
1	FOR CONSTRUCTION	GJK	94/01/15
0	FOR APPROVAL	GJK	93/11/26

By	Date
GJK	94/03/10
GJK	94/01/15
GJK	93/11/26

DWN BY: JRM
DATE: 93-03-15
CHK'D BY: [Signature]
DATE: 14 MAR 94

TITLE:
**STANDARD SCHEMATIC
ENGINE EQUIPMENT AND CONTROLS**
WAUKESHA L SERIES VHP-GL: OIL, IGNITION, AIR, EXHAUST
DWG. SF93089D
REV. 2