

ONE (1) GENERATOR PACKAGE
FOR: ENCANA CAVALIER
CAVALIER POWER STATION
STRATHMORE
LSD: NE-32-023-23W4

ENERFLEX LTD.
CALGARY, ALBERTA, CANADA

WASTE OIL:	T4102 - 298 US GALLONS
WASTE GLYCOL:	T6101 - 298 US GALLONS
FRESH OIL DAYTANK:	T4101 - 144 US GALLONS
FRESH OIL DAYTANK:	T4103 - 144 US GALLONS

ECP 8006E PANEL: CP2101 VOL: 24 VDC @ 9.2 AMPS
BUILDING HEATERS: BH2101/BH2102 VOL: 480 @ 24.1 AMPS

ENGINE CRANKCASE LUBE OIL:	250 GALLONS, SAE 40, LOW ASH 50% ETHYLENE INHIBITED GLYCOL/WATER SOLUTION IN ENGINE & AUXILIARY JACKED WATER SYSTEMS
EJW CAPACITY:	115 GALLON ENGINE 60 GALLON EXPANSION TANK 74 GALLON HEAT EXCHANGER
PIPING:	115 GALLONS
AJW CAPACITY:	16 GALLON ENGINE 25 GALLON EXPANSION TANK 48 GALLON HEAT EXCHANGER
PIPING:	23 GALLONS

ENERFLEX LTD. (EFX) SCOPE OF SUPPLY ON THIS PROJECT CONSISTS OF ONE GENERATOR PACKAGE.

PRIMER: -CAC-ENG-SPC-001, FIN-2A, RED OXIDE
 GENERATOR PAINT: -CAC-ENG-SPC-001, FIN-2A, 20-F "WAUKESHA ORANGE"
 SUB SKID PAINT: -CAC-ENG-SPC-001, FIN-2A, 20-F "WAUKESHA ORANGE"
 MAIN SKID PAINT: -CAC-ENG-SPC-001, FIN-2A, 20-F, "WARM GREY"

SITE ELEVATION:	3500 FT ABOVE MEAN SEA LEVEL
BAROMETRIC PRESSURE:	13.4 PSIA
AMBIENT TEMPERATURE:	104°F
	MAXIMUM
	MINIMUM
SEISMIC:	ZONE
APPLICABLE CODE:	CODE PIPING
	NON-CODE PIPING
	EXCHANGER
	STRUCTURAL
	ELECTRICAL
REGISTRATION:	VESSEL
MISCELLANEOUS:	GASKETS
	BOLTING
	UTILITY PIPE
	FLANGES
	3
	B31.3 – 2010 EDITION
	EFX C01, 1mm CA
	ASME SECTION VIII
	CWB
	CEC
	N/A
	CG TYPE, SPIRAL WOUND, GRAPHITE FILLED, 316SS
	STUDS – SA-193-B7, NUTS – SA-194-2H
	CARBON STEEL
	RAISED FACE (UNLESS OTHERWISE NOTED)
ELECTRICAL:	EMT CONDUIT C/W LIQUID TIGHT FLEX
SUITABLE FOR USE IN:	GENERAL CLASSIFICATION

						DATE OCT 16/13	SCALE NTS	ENCANA CAVALIER 1600 KW GENERATOR PACKAGE	ENERFLEX Calgary, Alberta, Canada	P&I DIAGRAM PROJECT DESCRIPTION AND OVERVIEW
D	TUBING SPEC	MAY 06/14	TW	JG	DRAWN BY C.SMITH	CHECKED BY J.GARCIA	APPROVED BY A. TRAN			
C	ISSUED FOR APPROVAL	FEB 14/14	CS	JG	PROJECT MANAGER K.ROBERTSON	PROJECT ENGINEER J.GARCIA				
B	ISSUED FOR APPROVAL	DEC 04/13	CS	JG	CUST PO	GD 2013-008				
A	ISSUED FOR APPROVAL	OCT 18/13	AT	JG						
REV	DESCRIPTION		DATE	BY	APR	APEGA PERMIT No: P8651	OPER. CNF. WORK ORDER PPA000029	DWG NO E000873-099	SHT 1	REV D

PROCESS & UTILITY	
TUBING SPECIFICATION	—
TUBING MATERIAL	316SS
FITTING MATERIAL	316SS C/W BACK FERRULE
TUBING TRAYS	—
OD	MINIMUM WALL THICKNESS*
1/4"	0.035"
3/8"	0.035"
1/2"	0.049"
3/4"	0.065"
1"	0.083"
INSTRUMENT AIR	
TUBING SPECIFICATION	—
TUBING MATERIAL	316SS
FITTING MATERIAL	316SS C/W BACK FERRULE
TUBING TRAYS	—
OD	MINIMUM WALL THICKNESS*
1/4"	0.035"
3/8"	0.035"
1/2"	0.049"
3/4"	0.065"
1"	0.083"

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BHM-2101/2102
BUILDING HEATER MOTOR

HP: 1/2
KW: 0.373

BH-2101/2102
BUILDING HEATER

MFG: RUFFNECK
MODEL: FX5
VOLTAGE: 480V/3PH/60HZ
BTU/HR: 68,250

CP-2101
CONTROL PANEL

MFG: WAUKESHA
MODEL: ECP 8006E
EST WEIGHT: 2200 LBS

C2101
GENERATOR

MFG: STAMFORD
MODEL: LS661-06
WEIGHT: TBA
POWER: 1673KW, 2093.3KVA, 0.8 P.F

CE2101
ENGINE

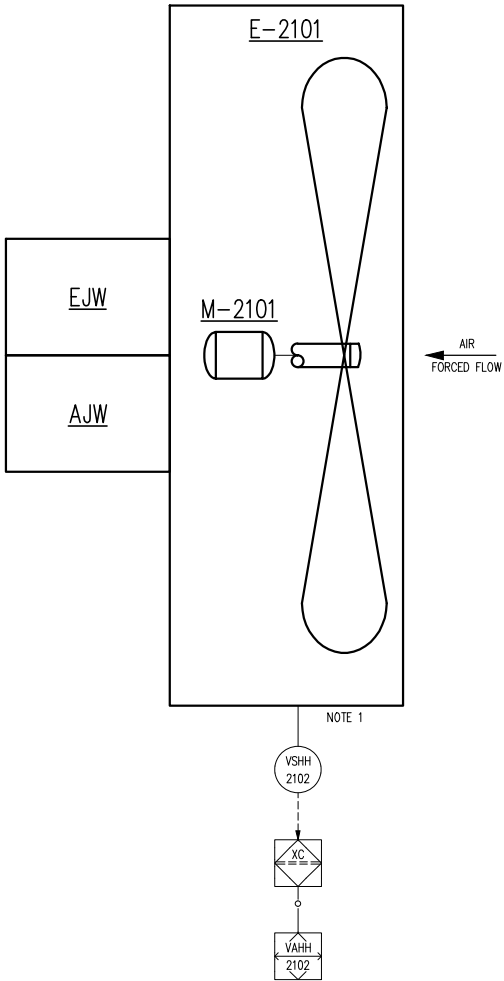
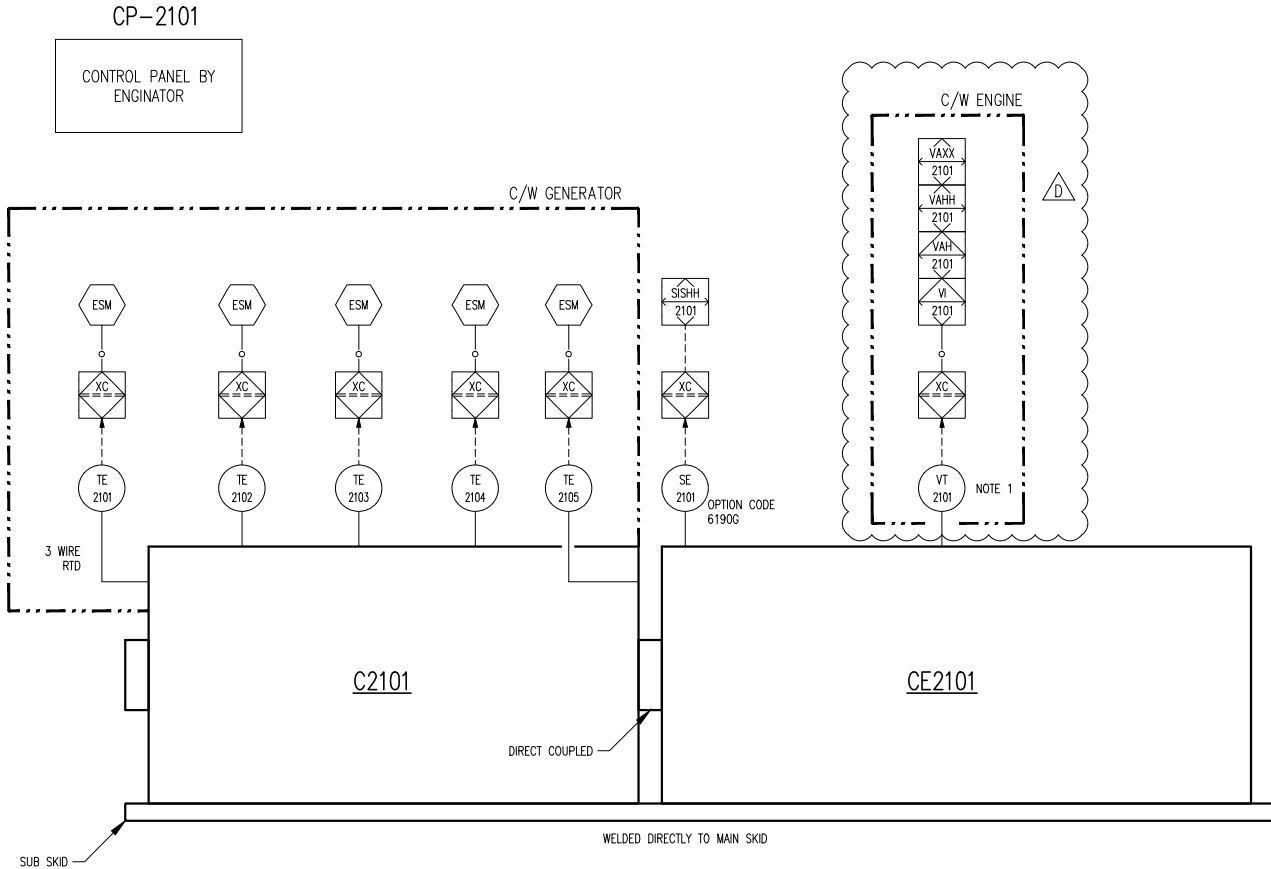
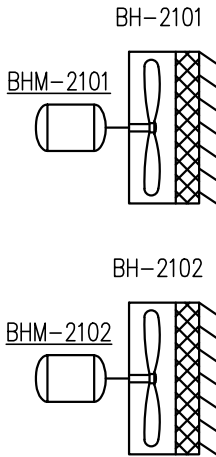
MFG: WAUKESHA
MODEL: P9394 GSI V16
POWER: 2250 BHP @ 1200 RPM
DRY WEIGHT: 57,200 LBS

M-2101
COOLER

TEFC CHEM DUTY
POWER: 40HP @ 1800 RPM
460V/3PH/60HZ
VFD COMPATIBLE

E-2101
COOLER

MFG: AIR-X-CHANGERS
MODEL: AXC 132EH
ELECTRIC MOTOR DRIVEN FAN
EST. WEIGHT: 17,380 LBS



- SP 2102 LEL
- SP 2103 UV/IR
- SP 2104 TROLLEY
- SP 2105 HOIST
- SP 2106 BUILDING
- SP 2107 3" FIRE RATED FOAM

NOTES:

- VIBRATION SWITCHES AND TRANSMITTERS TO BE FIRMLY MOUNTED TO THE MACHINE SURFACE, ORIENTED SO THE SENSITIVE AXIS POINTS INTO THE DIRECTION OF ROTATION NEAR CRANKSHAFT HEIGHT. (THE SENSITIVE AXIS FOR TRANSMITTERS IS INLINE WITH THE STUD, FOR SWITCHES IT IS THE DIRECTION THE RESET BUTTON POINTS).

FOR APPROVAL

PLEASE SUBMIT ONE SET OF

APPROVED DRAWINGS BY

NAME T.WELSH DATE MAY 06/14

REV	DESCRIPTION	DATE	BY	APR	DATE	SCALE	OPER. CODE	WORK ORDER	DWG NO	SHT	REV
D	VIBRATION TRANSMITTER	MAY 06/14	TW	JG	OCT 16/13	NTS	490 511 591	PPA000029	E000873-112	1	D
C	ISSUED FOR APPROVAL	FEB 14/14	CS	JG	DRAWN BY A.TRAN	CHECKED BY J.GARCIA					
B	ISSUED FOR APPROVAL	DEC 04/13	CS	JG	PROJECT MANAGER K.ROBERTSON	PROJECT ENGINEER J.GARCIA					
A	ISSUED FOR APPROVAL	OCT 18/13	AT	JG	CUST PO GD 2013-008						
					APEGGA PERMIT No: P8651						
					ENCANA CAVALIER		1600 KW GENERATOR PACKAGE				
					ENERFLEX		Calgary, Alberta, Canada				
					P&I DIAGRAM		MAJOR EQUIPMENT				
					WAUKESHA VHP P9394 GSI						

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F4103
OIL STRAINER (C/W ENGINE)

F4102
ENGINE OIL FILTER (C/W ENGINE)

CE2101
ENGINE OIL SUMP
CAPACITY: 250 GALLONS

P4101
ENGINE LUBE OIL PUMP
MFG: WAUKESHA
CAPACITY: TBA @ 1200 RPM

P4102
ENGINE PRE/POST LUBE OIL PUMP
(c/w ENGINE)
: AIR MOTOR DRIVEN PRELUBE
: 24V DC PILOT SOLENOID VALVE

T4103
ENGINE OIL DAY TANK
MFG: EFX (INTEGRAL WITH CRANE RAIL)
CAPACITY: 144 US GAL

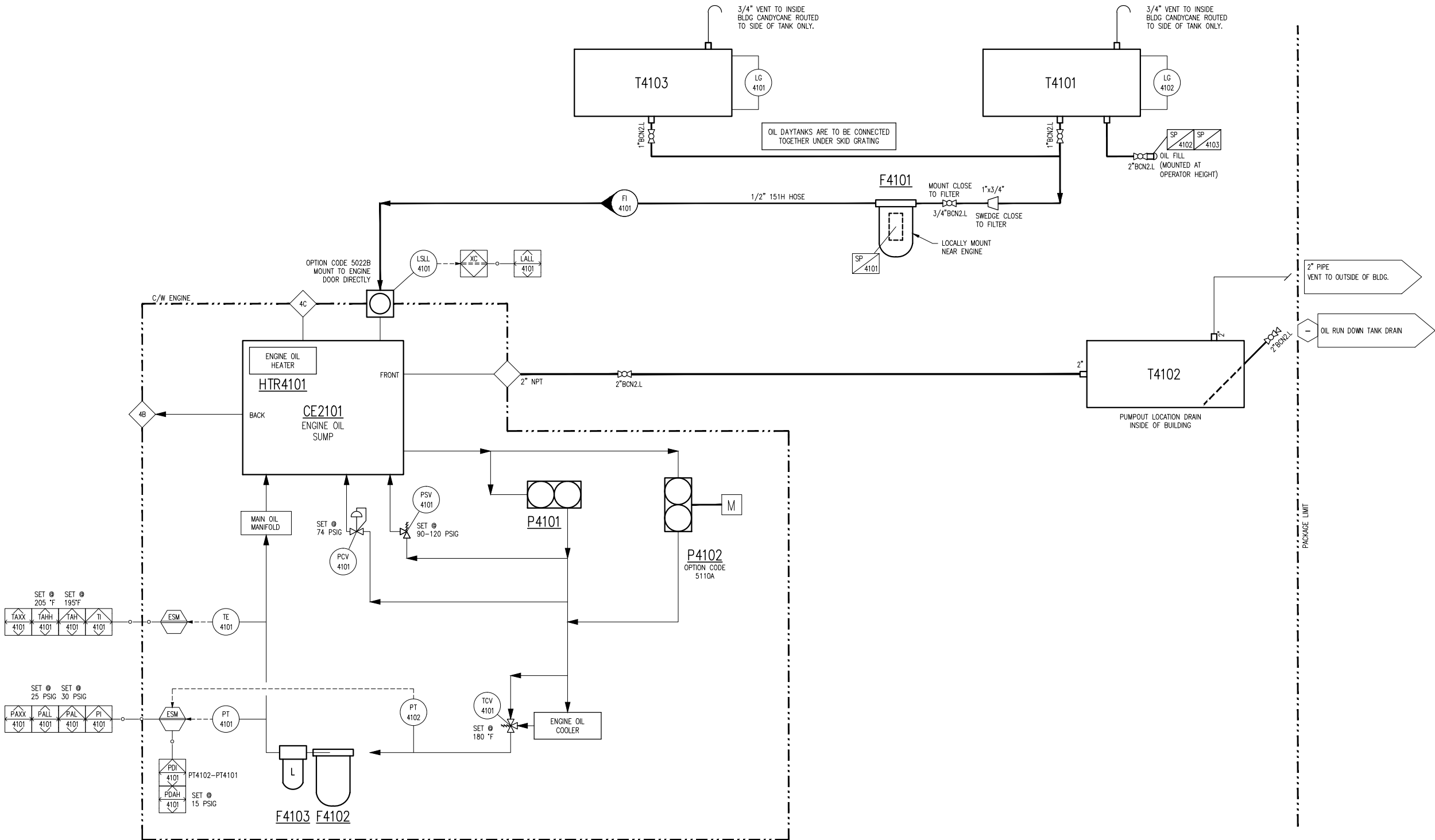
SP 4101
OIL FILTER ELEMENT
MFG: DONALDSON
MODEL: P167796
RATING < 4 MICRON

F4101
OIL FILTER ADAPTOR
MFG: DONALDSON
MODEL: P166418

T4101
ENGINE OIL DAY TANK
MFG: EFX (INTEGRAL WITH CRANE RAIL)
CAPACITY: 144 US GAL

T4102
WASTE TANK
MFG: EFX (INTEGRAL WITH MAIN SKID)
CAPACITY: 298 US GAL

PACKAGE LIMIT



PACKAGE LIMIT

FOR APPROVAL

PLEASE SUBMIT ONE SET OF
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NAME: C.SMITH DATE: MAR 18/14

REV	DESCRIPTION	DATE	BY	APR
D	OIL FILTER BRAND/FLOW INDICATOR	MAR 18/14	CS	JG
C	ISSUED FOR APPROVAL	FEB 14/14	CS	JG
B	ISSUED FOR APPROVAL	DEC 04/13	CS	JG
A	ISSUED FOR APPROVAL	OCT 18/13	AT	JG

DATE	OCT 18/13	SCALE	NTS
DRAWN BY	A.IRAN	CHECKED BY	J.GARCIA
PROJECT MANAGER	K.ROBERTSON	PROJECT ENGINEER	J.GARCIA
CUST PO	GD 2013-008		
APEGGA PERMIT No:	P8651	OPER. CODE	490 511 591

ENCANA CAVALIER 1600 KW GENERATOR PACKAGE
WORK ORDER PPA000029

ENERFLEX Calgary, Alberta, Canada
DWG NO E000873-114

P&I DIAGRAM ENGINE LUBE OIL SYSTEM WAUKESHA VHP P9394 GSI
SHT 1
REV D

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IMPORTANT

OVERPRESSURE PROTECTION
TO BE PROVIDED OFF-SKID BY
CUSTOMER

STARTER SYSTEM RATING
50-90 PSIG @ -20/120°F

2"-150# RF
AIR GAS INLET

1"-150# RF
INSTRUMENT AIR

SYSTEM RATING:
80 PSIG TO 275 PSIG

1" PIPE C/W BIRDSCREEN
VENT TO O/S BLDG
ABOVE EAVE

IMPORTANT

OVER PRESSURE PROTECTION
TO BE PROVIDED

OFF-SKID BY CUSTOMER

2"-150# RF
FUEL GAS INLET

ON-SKID
SYSTEM RATING

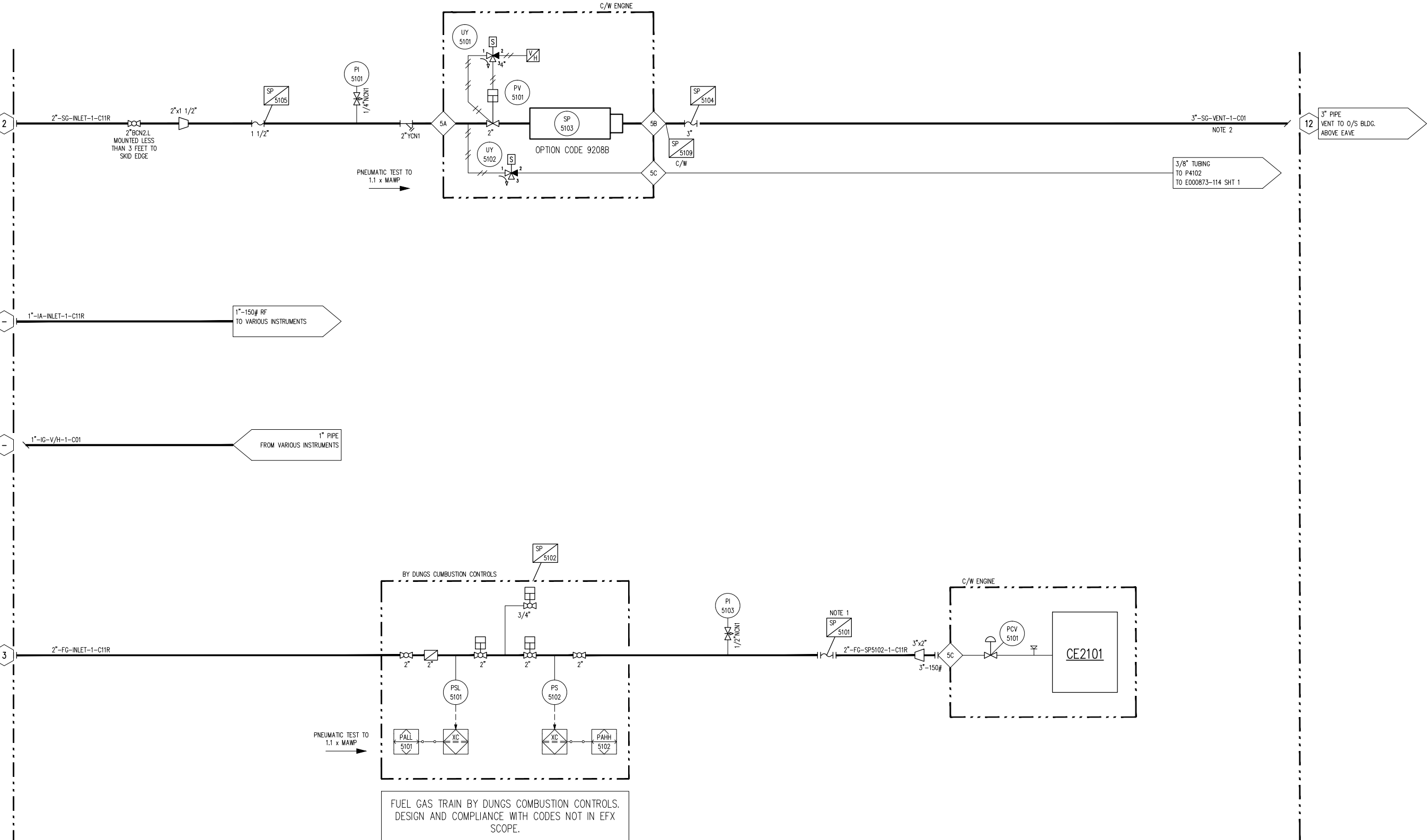
FUEL: NATURAL GAS @ 60°F
MAX. INLET: 65 PSIG
OUTLET: 30 TO 60 PSIG
FUEL FLOW DP: 2.1 PSIG
FLOW RATE: 17,100 SCFH
ELECTRICAL: 24 VDC
ELECTRICAL RATING: NEMA4

SP 5103
STARTER

HIGH PRESSURE AIR OR GAS TDI T121
MINIMUM PRESSURE: 50 PSIG
MAXIMUM PRESSURE: 90 PSIG
OPTION CODE: 9208B

CE2101
ENGINE

MFG: WAUKESHA
MODEL: VHP P9394 GSI
FUEL CONSUMPTION BTU/HRx1000(kW): TBA



- NOTES:
- STEEL BRAIDED HOSE MUST BE INSTALLED INLINE WITH ENGINE CRANK SHAFT.
 - DESIGNATED 3"-C01 NON-CODE AS VENT TO ABOVE EAVE.

FOR APPROVAL

PLEASE SUBMIT ONE SET OF
APPROVED DRAWINGS BY

NAME: C.SMITH DATE: FEB 14/14

							DATE	OCT 16/13	SCALE	NTS	ENCANA CAVALIER 1600 KW GENERATOR PACKAGE	ENERFLEX Calgary, Alberta, Canada	P&I DIAGRAM START/FUEL GAS SYSTEM WAUKESHA VHP P9394 GSI						
							DRAWN BY	A. TRAN	CHECKED BY	J. GARCIA						APPROVED BY	J. GARCIA		
							PROJECT MANAGER	K. ROBERTSON	PROJECT ENGINEER	J. GARCIA									
	C	ISSUED FOR APPROVAL				FEB 14/14	CS	JG	CUST PO							GD 2013-008			
	B	STARTER DETAILS				DEC 04/13	CS	JG											
	A	ISSUED FOR APPROVAL				OCT 18/13	AT	JG											
	REV	DESCRIPTION				DATE	BY	APR	APEGA PERMIT No:	P8651	OPER. CODE	490 511 591	WORK ORDER	PPA000029	DWG NO	E000873-115	SHT	1	REV

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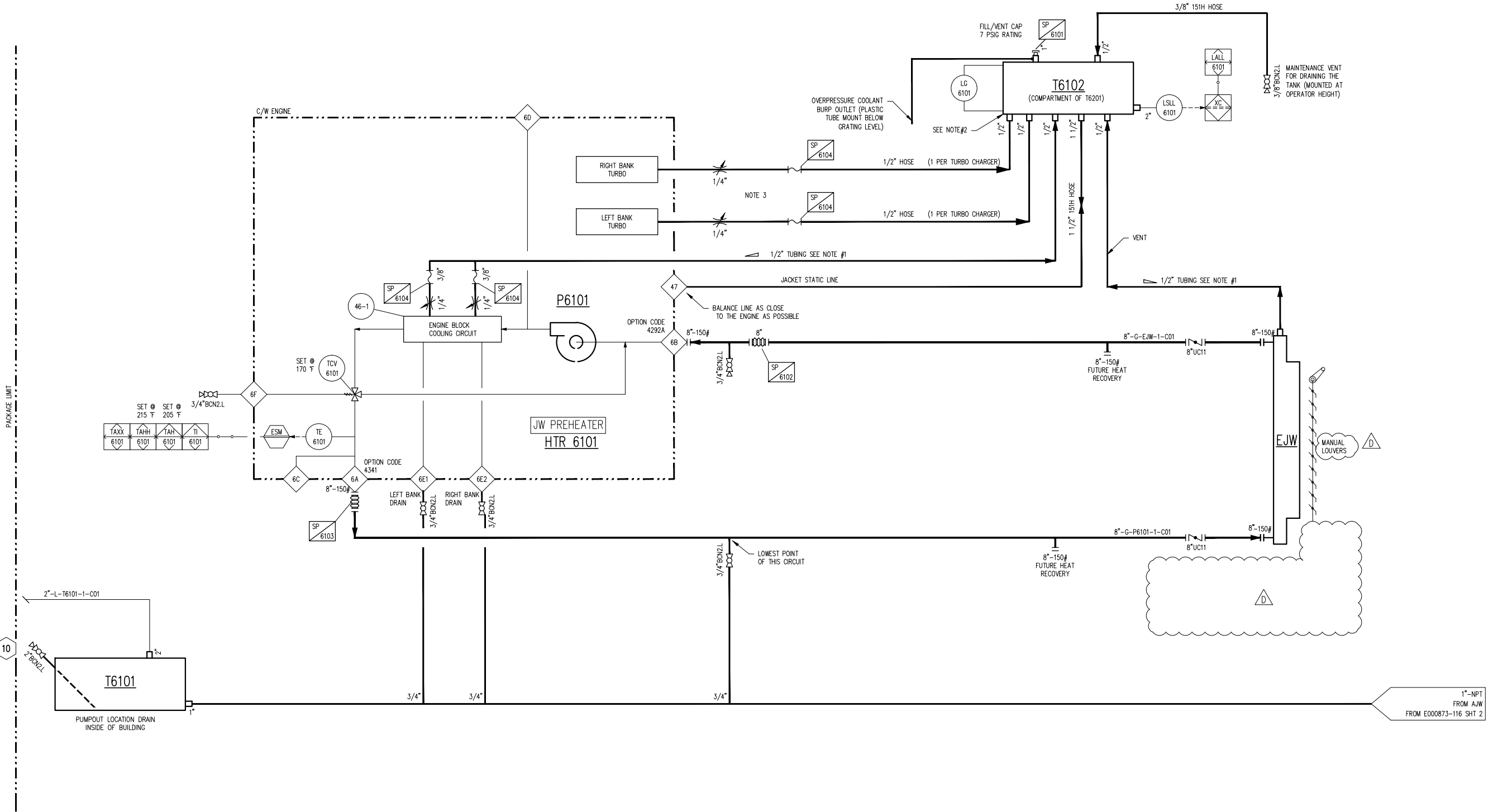
T6101
WASTE TANK
MFG: EFX (INTEGRAL WITH MAIN SKID)
CAPACITY: 298 US GAL

HTR 6101
JACKET WATER HEATER
POWER: TBA

P6101
ENGINE JACKET WATER PUMP
MFG: WAUKESHA
MAX. FLOW: 850 GALLONS

T6102
GLYCOL (EJW) SURGE TANK
MFG: EFX
CAPACITY: 60 GALLONS

EJW
ENGINE JACKET WATER COOLER SECTION
MFG: AIR-X-CHANGERS
EJW: 74 GALLONS
D.P: 14 PSIG @ 300°F/-40°F
NOZZLES: 8"-150# RF



- NOTES:**
1. SLOPE ALL VENTS UP & CONNECT TO THE BOTTOM OF THE SURGE TANK, 1/4"-1/2" PER FOOT NO TRAPS.
 2. BOTTOM OF SURGE TANK SHALL BE MINIMUM 6" (152mm) ABOVE HIGHEST POINT OF COOLER SECTION FOR PROPER VENTING; 5' (1520MM) ABOVE WATER PUMP INLET TO KEEP MINIMUM PRESSURE AT THE WATER PUMP INLET 2.5 PSI.
 3. THE FACTORY INSTALLED PETCOCKS LOCATED AT THE HIGHEST POSITION OF THE JACKET WATER CIRCUIT MUST BE REMOVED. INSTALL PERMANENT VENT LINES TO THE SURGE TANK.

FOR APPROVAL
PLEASE SUBMIT ONE SET OF
APPROVED DRAWINGS BY
NAME T.WELSH DATE MAY 06/14

						DATE	OCT 16/13	SCALE	NTS	ENCANA CAVALIER 1600 KW GENERATOR PACKAGE	ENERFLEX Calgary, Alberta, Canada	P&I DIAGRAM ENGINE JACKET WATER SYSTEM WAUKESHA VHP P9394 GSI					
D	AIR ACTUATOR LOUVRE NOT INCLUDED	MAY 06/14	TW	JG	DRAWN BY	A. TRAN	CHECKED BY	J. GARCIA	APPROVED BY				J. GARCIA				
C	ISSUED FOR APPROVAL	FEB 14/14	CS	JG	PROJECT MANAGER	K. ROBERTSON							PROJECT ENGINEER	J. GARCIA			
B	ISSUED FOR APPROVAL	DEC 04/13	CS	JG	CUST PO GD 2013-008												
A	ISSUED FOR APPROVAL	OCT 18/13	AT	JG													
REV	DESCRIPTION	DATE	BY	APR	APEGGA PERMIT No:		P8651	OPER. CODE	490 511 591	WORK ORDER	PPA000029	DWG NO	E000873-116	SHT	1 OF 2	REV	D

DWG NO E000873-116

SHT 1 OF 2

REV D

MFG: WAUKESHA
MAX. FLOW: 100 GALLON

MFG: EFX
CAPACITY: 25 GALLON

MFG: AIR-X-CHANGERS
AJW: 48 GALLONS
D.P: 14 PSIG @ 300°F/-40°F
NOZZELS: 3"-150# RF



1. SLOPE ALL VENTS UP & CONNECT TO THE BOTTOM OF THE SURGE TANK, 1/4"-1/2" PER FOOT NO TRAPS.
2. BOTTOM OF SURGE TANK SHALL BE MINIMUM 6" (150mm) ABOVE HIGHEST POINT OF COOLER SECTION FOR PROPER VENTING; 5' (1520mm) ABOVE WATER PUMP INLET TO KEEP MINIMUM PRESSURE AT THE WATER PUMP INLET 2.5 PSI.
3. THE FACTORY INSTALLED PETCOCKS LOCATED AT THE HIGHEST POSITION OF THE AUXILIARY WATER CIRCUIT MUST BE REMOVED. INSTALL PERMANENT VENT LINES TO THE SURGE TANK.

APPROVED DRAWINGS BY _____
NAME T.WELSH DATE MAY 06/14

						DATE	OCT 16/13	SCALE	NTS
D	AIR ACTUATOR LOUVRE NOT INCLUDED	MAY 06/14	TW	JG		DRAWN BY	C.SMITH	CHECKED BY	J.GARCIA
C	ISSUED FOR APPROVAL	FEB 14/14	CS	JG		APPROVED BY	J.GARCIA		
B	ISSUED FOR APPROVAL	DEC 04/13	CS	JG		PROJECT MANAGER	K.ROBERTSON	PROJECT ENGINEER	J.GARCIA
A	ISSUED FOR APPROVAL	OCT 18/13	AT	JG		CUST PO	GD 2013-008		
REV	DESCRIPTION	DATE	BY	APR		APEGA PERMIT No:	P8651	OPER. CODE	490 5

ENERFLEX
Calgary, Alberta,
Canada

P&I DIAGRAM
AUXILIARY JACKET WATER SYSTEM
WAUKESHA VHP P9394 GSI

DWG NO E000873-116

SHT 2 OF 2

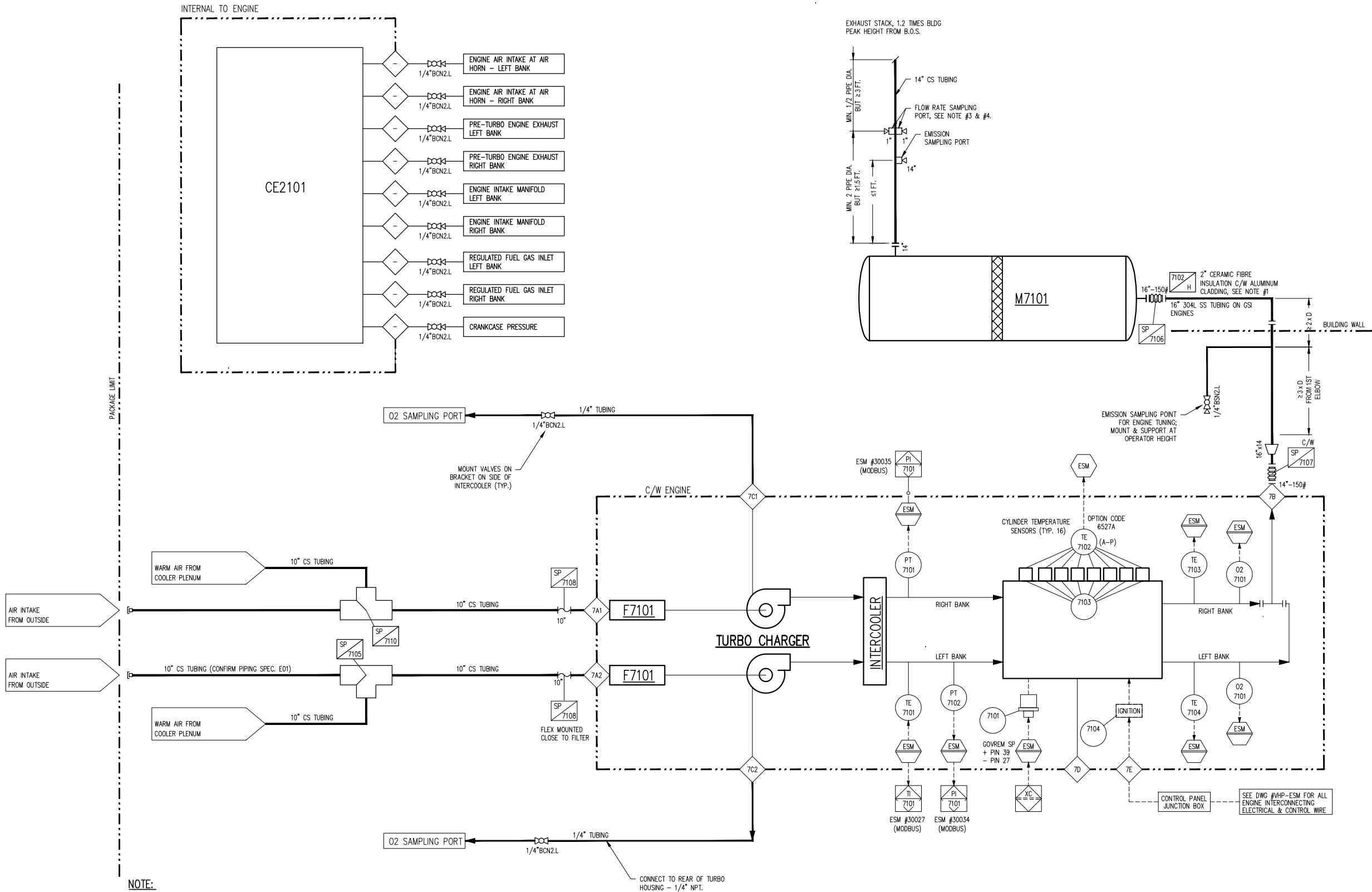
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F7101
AIR FILTER
MFG: WAUKESHA
QTY: 2

M7101
SILENCER
MFG: TBA
MODEL: TBA



NOTE:

1. INSULATION FROM ENGINE EXHAUST OUTLET TO OUTSIDE OF BUILDING WALL.
2. SAMPLING PORT TUBINGS AND VALVES SHALL BE POST MOUNTED.
3. TWO FLOW RATE SAMPLING PORTS SHALL BE PERPENDICULAR TO EACH OTHER.
4. EMISSION SAMPLE POINTS CONFIRM TO USA/CANADIAN REQUIREMENT.

WAUKESHA ESP PARAMETERS	
WKI FOR SHOP TEST RUN =	95
WKI FOR FIELD CONDITION =	____ (GAS ANALYSIS REQUIRED)
LOAD INERTIA =	____ lbf/in2
NOx =	____ g/BHP-HR

FOR APPROVAL
PLEASE SUBMIT ONE SET OF
APPROVED DRAWINGS BY
NAME: C.SMITH DATE: FEB 14/14

REV	DESCRIPTION	DATE	BY	APR	DATE	SCALE	NTS
C	ISSUED FOR APPROVAL	FEB 14/14	CS	JG			
B	CRANK CASE BREATHING REMOVED	DEC 04/13	CS	JG			
A	ISSUED FOR APPROVAL	OCT 18/13	AT	JG			
				DATE: OCT 16/13 SCALE: NTS			
				DRAWN BY: A.TRAN CHECKED BY: J.GARCIA APPROVED BY: J.GARCIA			
				PROJECT MANAGER: K.ROBERTSON PROJECT ENGINEER: J.GARCIA			
				CUST PO: GD 2013-008			
				OPER. CODE: 490 511 591			
				WORK ORDER: PPA000029			

ENCANA CAVALIER
1600 KW GENERATOR PACKAGE

ENERFLEX
Calgary, Alberta,
Canada

P&I DIAGRAM
AIR/EXHAUST SYSTEMS
WAUKESHA VHP P9394 GSI

DWG NO: E000873-117

SHT: 1

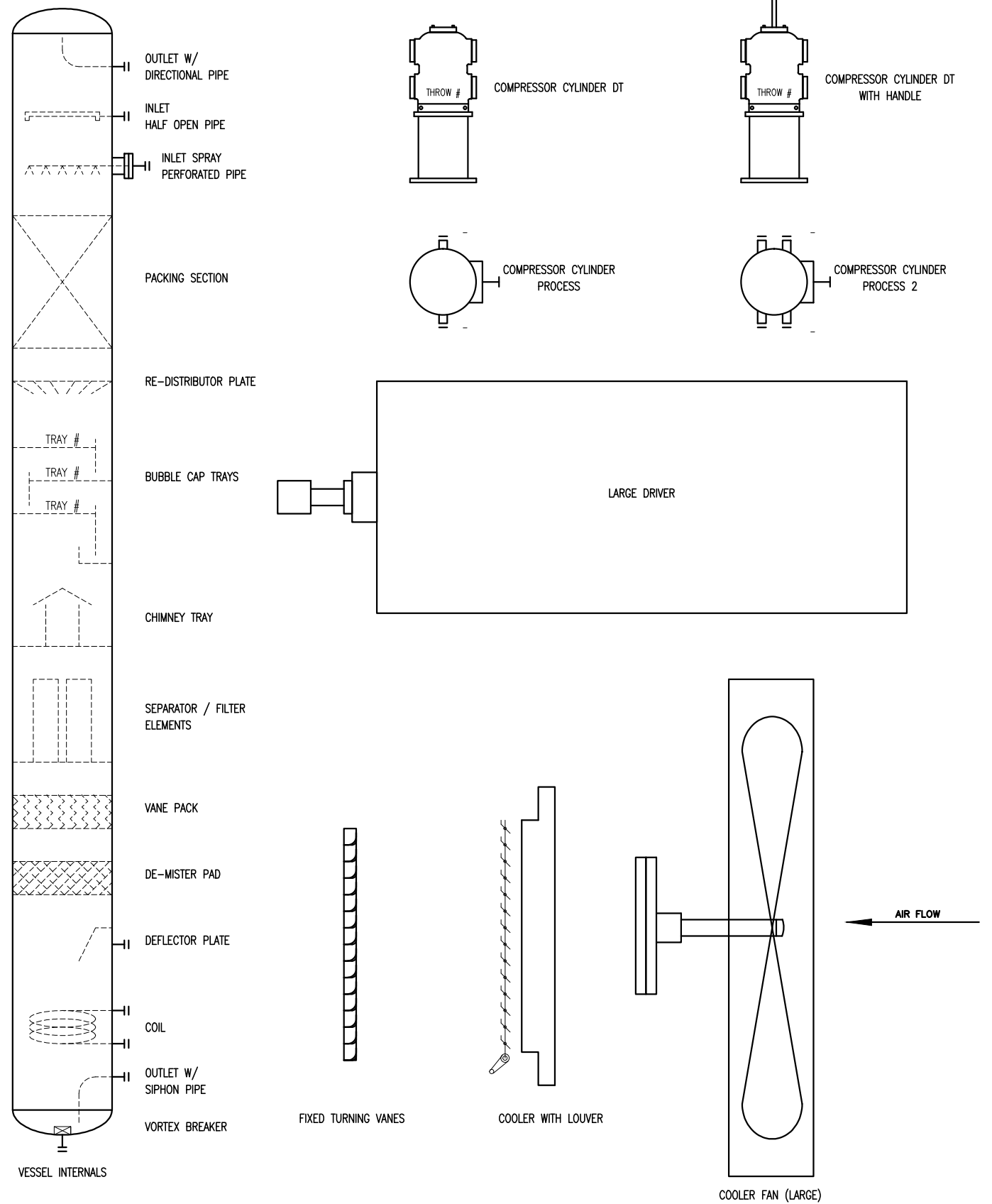
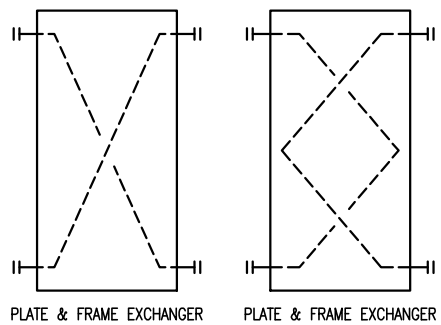
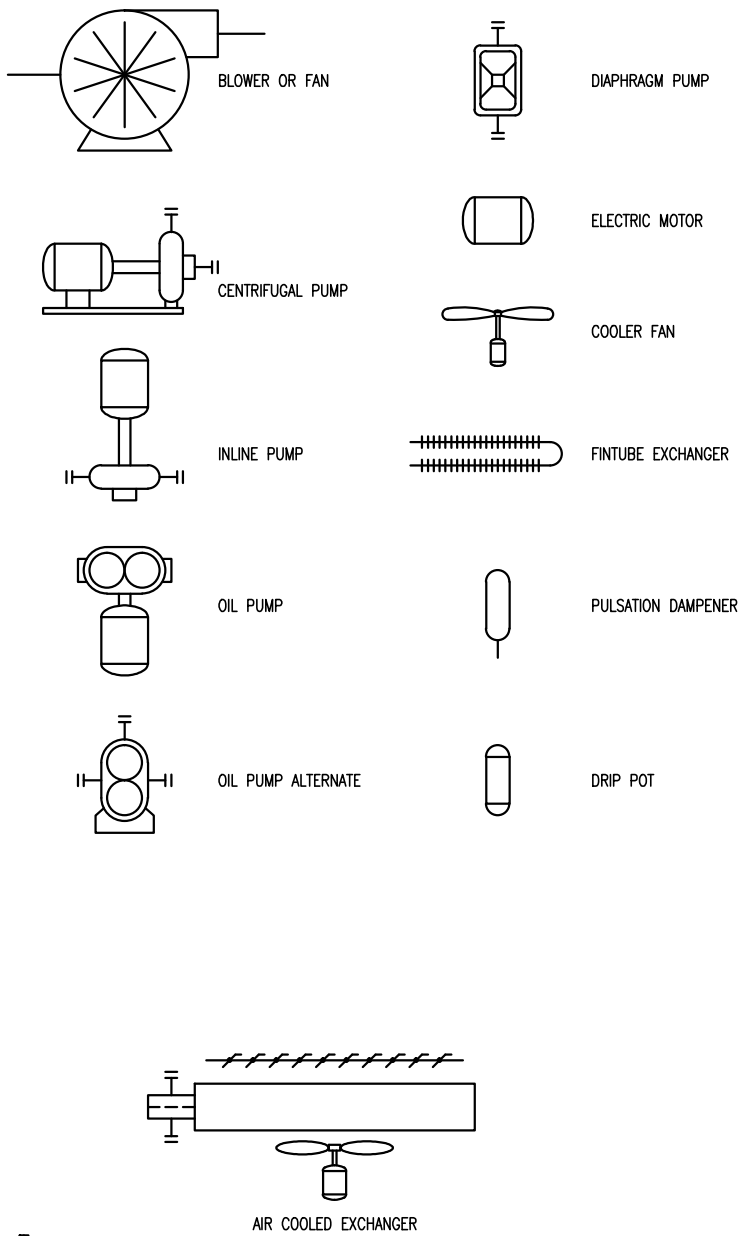
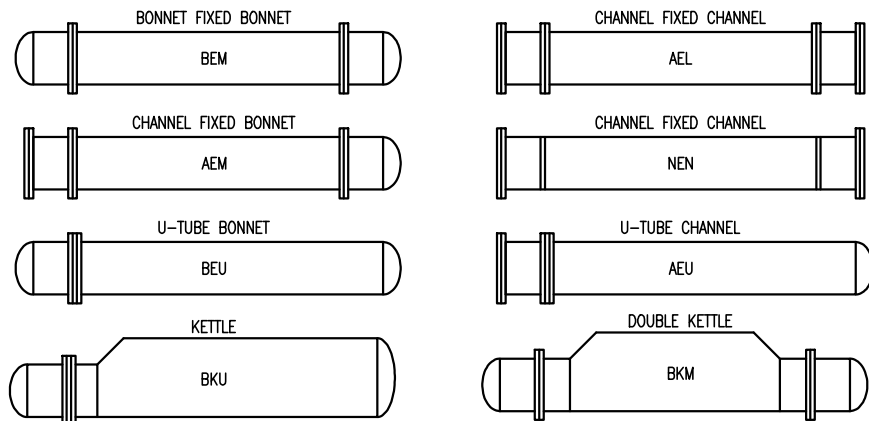
REV: C

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LINE IDENTIFICATION				VALVE IDENTIFICATION				LINE CODE				(MODIFIER)				INSTRUMENT IDENTIFICATION GENERAL REFERENCE (ISA – S5.1)													
A–B–CD–EF–GHIJ–KL,M–N				A"BCDE,F								FIRST LETTER				SUCCEEDING LETTERS		PRIMARY ELEMENT	INDICATOR	RECORDER	CONTROLLER			TRANS–MITTER	CONTROL		CONTROL VALVE OR REGULATOR	SELF–ACTIVATED VALVE	RELAY OR CONVERTOR
A : NOMINAL LINE SIZE IN INCHES				A : NOMINAL VALVE SIZE IN INCHES				PRIMARY PROCESS LINE				ALARM				AE	AI	AR	AC	AIC	ARC	AT	AS()	AA()	AV		AY		
B : FLUID / SERVICE				B : TYPE				SECONDARY PROCESS LINE																					
A	AMMONIA	IG	INSTRUMENT GAS	A	ANGLE GLOBE	N	NEEDLE																						
AM	AMINE	L	LUBE OIL	B	BALL	P	PLUG																						
C	CARBON DIOXIDE	N	NITROGEN	C	CHECK	S	START–UP STRAINER																						
CO	CARBON MONOXIDE	NG	NATURAL GAS	G	GATE	T	TEE STRAINER																						
CW	COOLING WATER	O	OXYGEN	L	GLOBE	U	BUTTERFLY																						
F	FREON	P	PROPANE	M	MANIFOLD	Y	Y PATTERN STRAINER																						
FG	FUEL GAS	PG	PURGE GAS																										
G	GLYCOL	R	REFRIGERANT																										
H	HYDROGEN	S	STEAM																										
HE	HELIUM	SG	SYNGAS																										
HG	HYDROCARBON GAS	V	PRODUCED WATER																										
HL	HYDROCARBON LIQUID	W	WATER																										
IA	INSTRUMENT AIR																												
C : EQUIPMENT TYPE / MODIFIER (IF REQUIRED)				D : END CONNECTIONS				INTERCONNECTING PIPING																					
B	BLOWER OR FAN	H	HEATER	1	FLANGED 150#	B	BUTT WELD																						
C	COMPRESSOR	JB	JUNCTION BOX	3	FLANGED 300#	C	SW BY NPT																						
CPL	CONTROL PANEL	P	PUMP	6	FLANGED 600#	F	NPT BY FLANGE (MANIFOLD)																						
D	DRIVER (MOTOR/ENGINE)	T	TOWER OR TANK	9	FLANGED 900#	M	NPT MALE BY NPT FEMALE																						
E	EXCHANGER	UH	UNIT HEATER	15	FLANGED 1500#	N	NPT (THREADED)																						
F	FILTER	V	PRESSURE VESSEL	25	FLANGED 2500#	S	SW (SOCKETWELD)																						
FS	FLARE STACK																												
D : EQUIPMENT NUMBER:				F : MODIFIER																									
101	TO 999 SEQUENTIAL NUMBERS			C	CHAIN OPERATOR	O	OXYGEN SERVICE/CLEANING																						
CD	LINES TO/FROM SKID CALLED UP AS INLET, OUTLET, HEADER, DRAIN, SUPPLY, ETC.			E	EXTENDED BONNET	P	FULL PORT DESIGN																						
EF	LINE NUMBER:			L	LOCKING DEVICE	S	SPRING HANDLE (CLOSE)																						
E	1 TO 9 SEQUENTIAL NUMBERS FROM EQUIPMENT			N	NACE TRIM	X	SPECIAL SPECIFICATIONS																						
1.1	FOR 1ST BRANCH CONNECTION FROM 1ST LINE																												
1.2	FOR 2ND BRANCH CONNECTION FROM 1ST LINE																												
F	SKID/AREA REFERENCE LETTER (A, B, C,...)																												
(X)	SIGNIFIES OFF SKID/INTERCONNECTING PIPE)																												
GHIJ : PIPING SPECIFICATION				VALVE TYPES																									
G	MATERIAL GROUP			ANGLE GLOBE VALVE			GATE VALVE			PLUG VALVE																			
C	CARBON STEEL			BALL VALVE			GAUGE VALVE			PINCH VALVE																			
L	LOW TEMPERATURE CARBON STEEL			BUTTERFLY VALVE			GLOBE VALVE			QUICK ACTING VALVE																			
S	STAINLESS STEEL			CHECK VALVE			NEEDLE VALVE			VALVE W/PLUG																			
H	ANSI 16.5 FLANGE CLASS			DIAPHRAGM VALVE			NEEDLE VALVE W/BLEED			3-WAY VALVE																			
0	NON CODE			DUMP VALVE			MANIFOLD VALVE			4-WAY VALVE																			
1	150#	6	600#																										
3	300#	9	900#																										
25	2500#																												
I : LINE MATERIAL SPECIFICATION REFERENCE:				CONTROL VALVES																									
J	R			DIAPHRAGM CONTROL VALVE			OUTLET PRESSURE REGULATOR			3-WAY SOLENOID VALVE																			
PIPING SPECIFICATION NUMBER				DIAPHRAGM CONTROL VALVE W/ POSITIONER			HYDRAULIC / PNEUMATIC PISTON OPERATED OR SPRING RETURN			THERMOSTATIC CONTROL VALVE																			
BLANK FOR PROCESS PACKAGE SPECIFICATION				INLET PRESSURE REGULATOR SELF-CONTAINED			PNEUMATIC RELAY VALVE			PRESSURE SAFETY /RELIEF VALVE																			
BLANK FOR PROCESS PACKAGE SPECIFICATION				OUTLET PRESSURE REGULATOR SELF-CONTAINED			2-WAY SOLENOID VALVE			DESIGNATES API ORIFICE SIZE																			
BLANK FOR PROCESS PACKAGE SPECIFICATION				DIFFERENTIAL PRESSURE REGULATOR SELF-CONTAINED			MOTOR ACTUATED			PRESSURE SAFETY /RELIEF VALVE PILOT OPERATED																			
BLANK FOR PROCESS PACKAGE SPECIFICATION				INLET PRESSURE REGULATOR			ROTARY MOTOR ACTUATED			DESIGNATES API ORIFICE SIZE																			
KL,M : INSULATION (IF REQUIRED)																													
K	INSULATION TYPE																												
C	COLD	HT	HEAT TRACING																										
H	HOT	PP	PERSONAL PROTECTION																										
HC	HOT/COLD																												
L : INSULATION THICKNESS IN MILLIMETERS OR INCHES (")																													
M	TRACING (IF REQUIRED)																												
ET	ELECTRICAL TRACING																												
GT	GLYCOL TRACING																												
ST	STEAM TRACING																												
N : PED PIPE IDENTIFICATION SUFFIX (IF REQUIRED)																													
SEP	SOUND ENGINEERING PRACTICE LINE																												
CATI	CATEGORY I LINE																												
CATII	CATEGORY II LINE																												
CATIII	CATEGORY III LINE																												
EXAMPLE:	3"–HG–V101–1A–C61R–HTXX,ET–CATII																												
3"	– NOMINAL LINE SIZE																												
HG	– HYDROCARBON GAS																												
V101	– PRESSURE VESSEL TAG NUMBER																												
1A	– 1 FIRST LINE FROM VESSEL																												
A	LOCATED ON SKID/AREA 'A'																												
C61R	– C CARBON STEEL LINE																												
6	600# ANSI FLANGE RATING																												
1	LINE MATERIAL SPECIFICATION REFERENCE																												
R	RECIPROCATING PACKAGE PIPE SPEC.																												

ABBREVIATIONS

AMB	AMBIENT	M2	SQUARE METERS
ATM	ATMOSPHERE	M3	CUBIC METERS
BW	BUTT WELD	MAX	MAXIMUM
BOP	BOTTOM OF PIPE	MAWP	MAXIMUM ALLOWABLE WORKING PRESSURE
CA	CORROSION ALLOWANCE	MCC	MOTOR CONTROL CENTER
CC	CORROSION COUPON	MDMT	MINIMUM DESIGN METAL TEMPERATURE
CS	CARBON STEEL	MIN	MINIMUM
CSC	CAR SEAL CLOSED	MM	MILLIMETER
CSO	CAR SEAL OPEN	NB	NATIONAL BOARD
CUST	CUSTOMER	NC	NORMALLY CLOSED
DB	DEADBAND	NLL	NORMAL LIQUID LEVEL
Δ	DELTA (DIFFERENTIAL)	NO	NORMALLY OPEN
DBB	DOUBLE BLOCK & BLEED	NPT	NATIONAL PIPE THREAD
DEG.C	DEGREES CELSIUS	OAL	OVERALL LENGTH
DEG.F	DEGREES FARENHEIT	OD	OUTSIDE DIAMETER
DIR	DIRECT ACTING	PB	PUSH BUTTON
EL	ELEVATION	PL	PILOT LIGHT
ESD	EMERGENCY SHUTDOWN	PLC	PROGRAMMABLE LOGIC CONTROLLER
ESDV	EMERGENCY SHUTDOWN VALVE	PPD	PINTS PER DAY
FC	FAIL CLOSED	PSIA	POUNDS / SQUARE INCH ABSOLUTE
FF	FLAT FACED	PSID	POUNDS / SQUARE INCH DIFFERENTIAL
FL	FAIL LAST	PSIG	POUNDS / SQUARE INCH GAUGE
FLG	FLANGED	REV	REVERSE ACTING
FO	FAIL OPEN	RF	RAISED FACE
F0B	FLAT ON BOTTOM	RFLX	REFLEX GAUGE
FOT	FLAT ON TOP	RO	RESTRICTION ORIFICE
FT2	SQUARE FEET	RTD	RESISTANCE TEMPERATURE DEVICE
FT3	CUBIC FEET	RTJ	RING TYPE JOINT
FV	FULL VACUUM	SCFM	STANDARD CUBIC FEET PER MINUTE
FVCP	FIXED VOLUME CLEARANCE POCKET	SCR	SILICON CONTROLLED RECTIFIER
FX	FROST EXTENSION	S/F	SEAM TO FACE OF FLANGE
HI	HIGH	SO	SLIP ON
HLL	HIGH LIQUID LEVEL	SP	SETPOINT
HP	HIGH POINT	SPC	CALCULATED SETPOINT
HPV	HIGH POINT VENT	SS	SELECTOR SWITCH
HTR	HEATER	S/S	SEAM TO SEAM
ID	INSIDE DIAMETER	SVU	SUCTION VALVE UNLOADER
KGS	KILOGRAMS	SW	SOCKET WELD
KPAA	KILOPASCAL ABSOLUTE	TC/K	THERMOCOUPLE / (TYPE)
KPAD	KILOPASCAL DIFFERENTIAL	T/L	TUBE LENGTH
KPAG	KILOPASCAL GAUGE	TS/TS	TUBESHEET TO TUBESHEET
KW	KILOWATTS	VB	VORTEX BREAKER
LBS	POUNDS	V/H	VENT HEADER
LC	LOCKED CLOSED	VTA	VENT TO ATMOSPHERE
LLL	LOW LIQUID LEVEL	VTH	VENT TO HEADER
LO	LOCKED OPEN	WCP	VARIABLE VOLUME CLEARANCE POCKET
LP	LOW POINT	W/	WITH
LPD	LOW POINT DRAIN	W/O	WITHOUT



FOR
REFERENCE
ONLY
NAME A. TRAN DATE OCT 18/13

						DATE	OCT 16/13	SCALE	NTS	ENCANA CAVALIER 1600 KW GENERATOR PACKAGE					
						DRAWN BY	A. TRAN	CHECKED BY	J. GARCIA					APPROVED BY	J. GARCIA
						PROJECT MANAGER	K. ROBERTSON	PROJECT ENGINEER	J. GARCIA						
						CUST PO	GD 2013 008								
A	ISSUED FOR REFERENCE				OCT 18/13	AT	JG								
REV	DESCRIPTION				DATE	BY	APR	APEGGA PERMIT No: P8651		STEP CODE	490 511 591	WORK ORDER	PPA000029		

ENERFLEX
Calgary, Alberta,
Canada

P&I DIAGRAM LEGENDS & SYMBOLS

DWG
NO E000873-199

SHT

V A