

ALL INTERNAL LINEHEATER PIPING TO MEET ESL SPEC

LINE HEATER BUILDING EDGE

REV	DESCRIPTION	BY	APPR	DATE
1	ISSUED FOR P.ENG STAMP	MEW		17/03/11
0	ISSUED FOR CONSTRUCTION	MEW		15/03/11
D	CORRECTED EXPANSION TANK SIZE	MEW		14/03/11
C	REVISED AS PER CUSTOMER MARK-UPS	MEW		11/03/11
B	REVISED AS PER CUSTOMER MARK-UPS	MEW		10/03/11
A	ISSUED FOR APPROVAL	TY		11/01/11
REV				



info@evolutionequipment.com  
www.evolutionequipment.com

DATE	CLIENT	JOB #	SCALE
04/01/11	ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.	EV-10199	N.T.S.

DESIGNED BY	TITLE	CHECKED BY	APPROVED BY
M.E.W.	PROJECT: SUNRISE AREA DEVELOPMENT MECHANICAL FLOW DIAGRAM 2MM BTU/HR SOUR SERVICE LINEHEATER PACKAGE	TY	

DATE	CLIENT	JOB #	SCALE
04/01/11	ARC RESOURCES LTD. c/o XXL ENGINEERING LTD.	EV-10199	N.T.S.

THIS DESIGN IS THE PROPERTY OF EVOLUTION PRODUCTION EQUIPMENT LTD. AND IS SUBJECT TO AUTHORIZED USE.

**BILL OF MATERIALS**

TAG	QTY	MAKE	DESCRIPTION
PSV-200	1	TAYLOR	PRESSURE SAFETY VALVE, MODEL 8200-1, 1" NPT INLET x 1" NPT OUTLET, STD. PRESSURE SERVICE TRIM, WCB BODY, SET@150psig, 1.25MM CAPACITY
LSLL-100	1	SOR	MODEL 1510B-G2A-C-W-E-S-CS-CV, ELECTRIC LEVEL SWITCH, 2" NPT CONNECTION, STEM, 6" EXTENSION-ES-1500 (SS FLOAT) STD. SERVICE
PCV-200	1	FISHER	627 PRESSURE REGULATOR, 1" FNPT CONNECTIONS, WCB BODY, SST TRIM, NITRILE DISC, 75-150psig S.R., 1/4" ORIFICE, STD. SERVICE, 1500psig MAWP
PCV-150	1	FISHER	67CFR-362 INSTRUMENT GAS REGULATOR, 1/2" FNPT CONNECTIONS, STANDARD SERVICE TRIM, 0 TO 35psig SPRING RANGE, 250psig MAWP
TC-100	1	KIMRAY	T-12T TEMPERATURE CONTROLLER, INDIRECT THROTTLING, CAT. No.: HA1, TEMP. RANGE -30F to 750F MAX
TSHE-100	1	TELEMATIC CONTROLS	CCS 6900TE-14 TEMPERATURE SWITCH, 1/2" MNPT CONNECTION, XPROOF, 300°F MAX PROBE TEMP., 80°F-205°F ON INCR, 60°F-198°F ON DECR. TEMP.
TI-100	1	WIKA	TEMPERATURE INDICATOR, 1/2" BCM x 3" FACE x 6" STEM, 0 TO 250°F TEMP. RANGE, DUAL SCALE, c/w 1/2" FNPT x 3/4" MNPT x 6" U" DIMENSION LENGTH, 316SST THERMOWELL
PI-100 PI-110	2	WIKA	PRESSURE GAUGE, LF, 1/4" NPT BTM x 2 1/2" FACE, 0-30psig RANGE, DUAL SCALE, STD. SERVICE
PI-200	1	WIKA	PRESSURE GAUGE, LF, 1/2" NPT BTM x 4" FACE, 0-150psig RANGE, DUAL SCALE, MOUNTED ON FUEL GAS LINE, STD. SERVICE
PI-150	1	WIKA	PRESSURE GAUGE, LF, 1/4" NPT BTM x 2 1/2" FACE, 0-150psig RANGE, DUAL SCALE, MOUNTED ON INSTRUMENT AIR LINE
LG-100	1	ZIMCO	LEVEL GAUGE, QUES-TEC SIGHT GLASS, (1) ONE 1/2" NPT x 5/8" TUBE GLASS, ITC VALVE c/w INTERNAL BALL CHECK AND ACRYLIC SIGHT GLASS c/w GAUGE GLASS GAURDS
CSC-100	1	ACL	5100 COMBUSTION SAFETY CONTROLLER, 12/24 VDC c/w MOUNTING HARDWARE ACL M-50 PILOT MIXER AND NOZZLE, 10'-0" HIGH VOLTAGE GROUND WIRE, 6'-6" NONMETALLIC FLEX w/ CONNECTORS, IGNITOR FLAME/ROD c/w MOUNTING HARDWARE, SPEED CONTROL VALVE 1/2" CONDUIT SEALS, FLAME CURRENT TEST LEADS, OPERATIONS MANUALS, NIOXXLE B10016 VENTURI BARREL, M100 MIXER

TAG	QTY	DESCRIPTION
CSC-1	1	ACL-5100 or ACL-5500 COMBUSTION SAFETY CONTROLLER CSA C22.2 No. 199-M89 APPROVED CLASS 1 DIV 2
PSHH-1	1	UNITED ELECTRIC, UE-12SHSN9B (3-50psi) HIGH PRESSURE SHUT DOWN SWITCH, ELECTRIC, DRY CONTACTS, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASS.
PSLL-1	1	UNITED ELECTRIC, UE-12SHSN9A (1-15psi) LOW PRESSURE SHUT DOWN SWITCH, ELECTRIC, DRY CONTACTS, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASS.
V-1/2	2	1" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
V-3/4	2	1/4" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
NV-1/2	2	1/4" MULTI PORT NEEDLE VALVE
YS-1	1	1" Y-STRAINER
PI-1/2/3	3	WIKA 0-30 1/4" BM 2 1/2" LIQUID FILLED GAUGE OR EQUAL
PRV-1	1	1" PRESSURE REGULATOR SELF OPERATED POSITIVE SHUTOFF FISHER 627 OR EQUAL 1/2" YELLOW ORIFICE
PRV-2	1	1/4" PILOT GAS REGULATOR FISHER 67CFR OR EQUAL
SSV-1/2	2	1" NPT CERTIFIED GAS SAFETY SHUT OFF VALVE CSA 6.5-2005 C/1 OR EQUIVALENT
SSV-3	1	CERTIFIED PILOT GAS SAFETY SHUT OFF VALVE CSA 6.5-2005 C/1 OR EQUIVALENT
BA-1	1	ACL-HE-ON SERIES HIGH EFFICIENCY BURNER ASSY. DESIGN PRESSURE FROM 1 PSI TO 14 PSI. FIXED ORIFICE LIMITS BTU/H
BA-2	1	ACL-M50 PILOT ASSEMBLY. FIXED ORIFICE LIMITS BTU TO UNDER 20,000.
LSLL-1	1	FIELD SELECTION OF SUITABLE LOW LEVEL SWITCH IS ALLOWED
IA-1	1	ACL-IGNITOR ASSEMBLY
CV-1	1	1" FISHER 119 OR EQUIVALENT FOR SLOW OPENING OPERATION
SCV-1	1	SPEED CONTROL VALVE

**VALVE TRAIN BOM (by OTHERS)**

TAG	QTY	DESCRIPTION
CSC-1	1	ACL-5100 or ACL-5500 COMBUSTION SAFETY CONTROLLER CSA C22.2 No. 199-M89 APPROVED CLASS 1 DIV 2
PSHH-1	1	UNITED ELECTRIC, UE-12SHSN9B (3-50psi) HIGH PRESSURE SHUT DOWN SWITCH, ELECTRIC, DRY CONTACTS, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASS.
PSLL-1	1	UNITED ELECTRIC, UE-12SHSN9A (1-15psi) LOW PRESSURE SHUT DOWN SWITCH, ELECTRIC, DRY CONTACTS, SWITCH TO BE CERTIFIED FOR APPROPRIATE ELECTRICAL AREA CLASS.
V-1/2	2	1" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
V-3/4	2	1/4" NPT MANUAL SHUTOFF VALVE, SOFT SEAT EMICO 720 SERIES UL/ULC OR EQUIVALENT
NV-1/2	2	1/4" MULTI PORT NEEDLE VALVE
YS-1	1	1" Y-STRAINER
PI-1/2/3	3	WIKA 0-30 1/4" BM 2 1/2" LIQUID FILLED GAUGE OR EQUAL
PRV-1	1	1" PRESSURE REGULATOR SELF OPERATED POSITIVE SHUTOFF FISHER 627 OR EQUAL 1/2" YELLOW ORIFICE
PRV-2	1	1/4" PILOT GAS REGULATOR FISHER 67CFR OR EQUAL
SSV-1/2	2	1" NPT CERTIFIED GAS SAFETY SHUT OFF VALVE CSA 6.5-2005 C/1 OR EQUIVALENT
SSV-3	1	CERTIFIED PILOT GAS SAFETY SHUT OFF VALVE CSA 6.5-2005 C/1 OR EQUIVALENT
BA-1	1	ACL-HE-ON SERIES HIGH EFFICIENCY BURNER ASSY. DESIGN PRESSURE FROM 1 PSI TO 14 PSI. FIXED ORIFICE LIMITS BTU/H
BA-2	1	ACL-M50 PILOT ASSEMBLY. FIXED ORIFICE LIMITS BTU TO UNDER 20,000.
LSLL-1	1	FIELD SELECTION OF SUITABLE LOW LEVEL SWITCH IS ALLOWED
IA-1	1	ACL-IGNITOR ASSEMBLY
CV-1	1	1" FISHER 119 OR EQUIVALENT FOR SLOW OPENING OPERATION
SCV-1	1	SPEED CONTROL VALVE

BL-100  
FLAME ARRESTOR  
2-PIECE BURNER HOUSING  
MODEL: FAH32/18-20A2  
TWO PIECE ALUMINUM CONSTRUCTION RATED FOR 2.0MM BTU/HR TO FIT A 20" FIRETUBE  
c/w (1) 1/2" ELECTRICAL CONNECTION (1) ACL-M200 MIXER (1) ACL-B20016 VENTURI BARREL (1) ACL-ON20018 HIGH EFFICIENCY BURNER NOZZLE

LH-100  
2MM BTU/HR LINEHEATER  
SIZE: 66" O.D. x 20'-0" S/S  
c/w 10 PASSES OF 4" 1500# SCH.160 RTJWN PREHEAT COIL 10 PASSES OF 4" 1500# SCH.160 RTJWN REHEAT COIL  
DESIGN PRESSURE: 3212 psig  
DESIGN TEMPERATURE: 200°F  
MDMT: -20°F  
PWHT: 1150F ± 50F FOR 1 HOUR MINIMUM  
CORROSION ALLOWANCE: 1/8"  
RADIOGRAPHY: 100%  
c/w 405gal EXPANSION TANK (32" O.D. x 120"lg)

TH-100  
ENARDO 330-AL THIEF HATCH (ZIRCO)  
SIZE: 8" THIEF HATCH  
PRESSURE: 16.0 OZ (16 OZ GALVANIZED WIRE PRESSURE SPRING)  
VACUUM: 0.4 OZ  
SPRING LOADED-SWEET SERVICE  
BUNA PRESSURE AND VACUUM GASKETS  
GALVANIZED STEEL PRESSURE AND VACUUM SPRINGS c/w BASE GASKET

- GENERAL NOTES:**  
1. QUANTITIES IN B.O.M. ARE FOR (1) UNIT.  
2. ALL PIPING TO BE IN ACCORDANCE WITH THE LATEST EDITION OF ASME B31.3 PRESSURE PIPING CODE.  
3. VESSEL TO BE FABRICATED TO THE LATEST EDITION OF ASME SECTION VIII, DIVISION 1 PRESSURE VESSELS.  
4. SPEC 'ES' SOCKETWELD PIPING: 1/2"-1 1/2" = SCH XXS  
SPEC 'ES' WELDED PIPING: 2", 3", 4" = SCH 160  
5" = SCH 160min (CALC WT & MDMT)  
6" = SCH XXSmin (CALC WT & MDMT)  
SCRD/SW (ASTM A333 Gr.6 SMLS)  
BW/RTJ (ASTM A333 Gr.6 SMLS)  
4" = SCH 160min BW/RTJ (ASTM A333 Gr.6 SMLS)  
6" = SCH XXSmin BW/RTJ (ASTM A333 Gr.6 SMLS)  
5. ALL FORGED STEEL FITTINGS TO BE: SA-105N, 6000# (min) RATING.  
FUEL GAS COIL TO BE: SA-105N, 3000# (min) RATING.  
ALL WELDED FITTINGS TO BE: SA-234-WPB NORMALIZED  
6. SPEC 'ESL' TUBING: 1/4"-3/8" = 0.035" (min) ASTM A269 TP316/316L SMLS, FULLY ANNEALED  
1/2" = 0.049" (min) ASTM A269 TP316/316L SMLS, FULLY ANNEALED  
7. SPEC 'A' THREADED PIPING: 1/2"-2" = SCH 60  
SPEC 'A' WELDED PIPING: 2"-10" = SCH 40  
12" = STD

8. ALL FORGED STEEL FITTINGS TO BE: SA-105N, 3000# (min) RATING (SPEC 'A').  
9. PAINTING SPEC:  
EXTERNAL SURFACE PREPARATION: SSPC-SP-6 (COMMERCIAL SAND BLAST) - (PIPING, HEATER SKID, BODY & STACK)  
EXTERNAL PRIMER: ONE (1) SHOP COAT OF COVERDALE FAST DRY PRIMER 5 mils  
VESSEL EXTERNAL FINISH PAINT: TWO (2) SHOP COATS OF COVERDALE GREY ENAMEL (HIGH HEAT STACK & L.H. BODY SKID FLOOR/STRUCTURAL STEEL)  
PIPING EXTERNAL FINISH: TWO (2) SHOP COATS OF COVERDALE BLACK ENAMEL  
INTERNAL SURFACE PREPARATION: NA  
INTERNAL COATING OF VESSEL: NA  
PROTECT ALL OPENINGS FOR SHIPMENT.

10. ALL INSTRUMENTS TO BE VENTED TO ATMOSPHERE.  
11. BOLTING TO BE SA-193-B7M STUDS w/ SA-194-2HM NUTS c/w 316SS FLEXITALLIC GASKET.  
12. BUILDING SIZE: 5'-4" LG x 2'-0" WIDE.  
BUILDING TYPE: FOAM PANEL, BOX STYLE/SIDE MOUNTED ENCLOSURE  
ROOF TYPE: SHED  
WALL HEIGHTS: 5'-6" EAVE  
EXTERIOR: 22 GAUGE GALVALUME PRE-PAINTED COOL GREY 6.  
INTERIOR: 22 GAUGE GALVALUME PRE-PAINTED WHITE  
DOORS & TRIM PRE-PAINTED RED (PANTONE 186)  
DOORS: ONE (1) 2'-6"x5'-4" DOUBLE DOOR WITH PANIC HARDWARE, CHECK CHAIN, WHITECOMB DOOR LATCH WEATHER STRIP, SPRING LOADED BARREL BOLT.  
VENTILATION: ONE (1) 8"x8" MANUAL LOUVER.  
13. PACKAGE IS HYDRO TESTED @ 1.5 TIMES MAWP FOR ONE (1) HOUR AT ROOM TEMPERATURE.  
14. VESSEL SHELL COVERED WITH 1 1/2" MINERAL WOOL HOT INSULATION, 0.20 STUCCO EMBOSSED ALUMINUM COVERING WITH STEEL BANDING (HEADS NOT INCLUDED)  
15. ALL INSTRUMENTS TO BE VENTED TO ATMOSPHERE.  
16. ALL PIPE, VALVES AND FITTINGS IN SOUR PROCESS LINES, EXCEPT INSTRUMENT AIR, TO BE NACE/ISO, LATEST EDITION ACCEPTABLE.  
17. ALL PIPING TO MEET ARC RESOURCES SPEC 'ES' AND 'A' PIPING SPECIFICATIONS.  
18. RUN INSTRUMENT TUBING UNDER LINE HEATER INSULATION WHERE POSSIBLE.  
19. ELECTRICAL INSTALLED BY 3RD PARTY CONTRACTOR.  
20. 5-PIECE MITRE FIRETUBE AND COILS TO BE STRESS RELIEVED  
21. ACL BURNER TO BE PRE-WIRED  
22. ENGINEER STAMPED DRAWINGS ON FUEL TRAIN

**E**

**B**

**D**

**B**

**B**

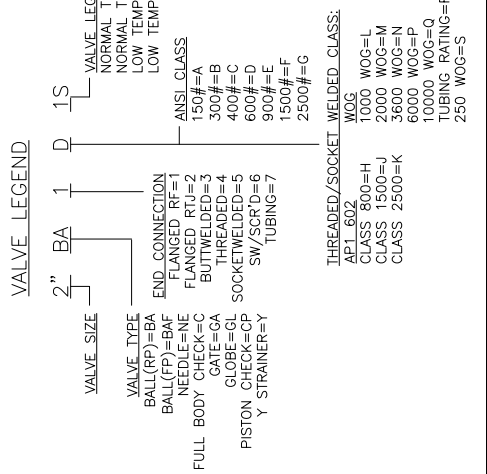
**B**

**B**

**B**

**VALVE LIST**

VALVE NUMBER	QTY.	MANUFACTURER	DESCRIPTION
1"BA4M1	2	WKM	1" NPT WOG 3000# REG. PORT BALL VALVE
1/2"BA4M1	2	WKM	1/2" NPT WOG 3000# R.P. BALL VALVE
1/4"BA4M1	1	WKM	1/4" NPT WOG 3000# R.P. BALL VALVE
1/4"NE4P1	1	CENTURY	1/2" NPT 6000# C.S. FxF NEEDLE VALVE
1/4"NE4P1	3	CENTURY	1/4" NPT 6000# C.S. FxF NEEDLE VALVE
2"GL4H1	1	VELAN	2" CL. 800# GLOBE VALVE



**Evolution**  
PRODUCTION EQUIPMENT LTD.

info@evolutionequipment.com  
www.evolutionequipment.com

DATE	CLIENT	ARC RESOURCES LTD. c/o
04/01/11	ARC RESOURCES LTD. c/o	ARC RESOURCES LTD. c/o
DESIGNED BY	M.E.W.	PROJECT: SUNRISE AREA DEVELOPMENT
DRAWN BY	TY	TITLE: BILL OF MATERIALS - FLOW DIAGRAM
CHECKED BY		2MM BTU/HR
APPROVED BY		SOUR SERVICE LINEHEATER PACKAGE
JOB #:	EV-10199	REF. NO.:
SHEET NO.	2 OF 2	DRAWING NO.
SCALE	N.T.S.	REV. NO.

REV	ISSUED FOR P/ENG STAMP	MEW	17/03/11
0	ISSUED FOR CONSTRUCTION	MEW	15/03/11
E	CORRECTED PSV RATING & ADDED 'ESL' SPEC	MEW	15/03/11
D	CORRECTED BUILDING COLORS & ADDED EXPANSION TANK SIZE	MEW	14/03/11
C	REVISED AS PER CUSTOMER MARK-UPS	MEW	11/03/11
B	REVISED AS PER CUSTOMER MARK-UPS	MEW	10/03/11
A	ISSUED FOR APPROVAL	TY	11/01/11
BY	REVISION	APPR	d/m/y