



REFRIGERATION SERVICES LTD.

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Canadian Hunter Exploration
Skid Mounted Booster Gas Compressor
3306 ATAAC XRV 204/165

SGC 2019

Operating Conditions

Drawings

Bill of Materials

Cooler

Control Panel

Vessel Data



PERFORMANCE CURVE HOWDEN COMPRESSOR MODEL XRV 204/165

Information based on:

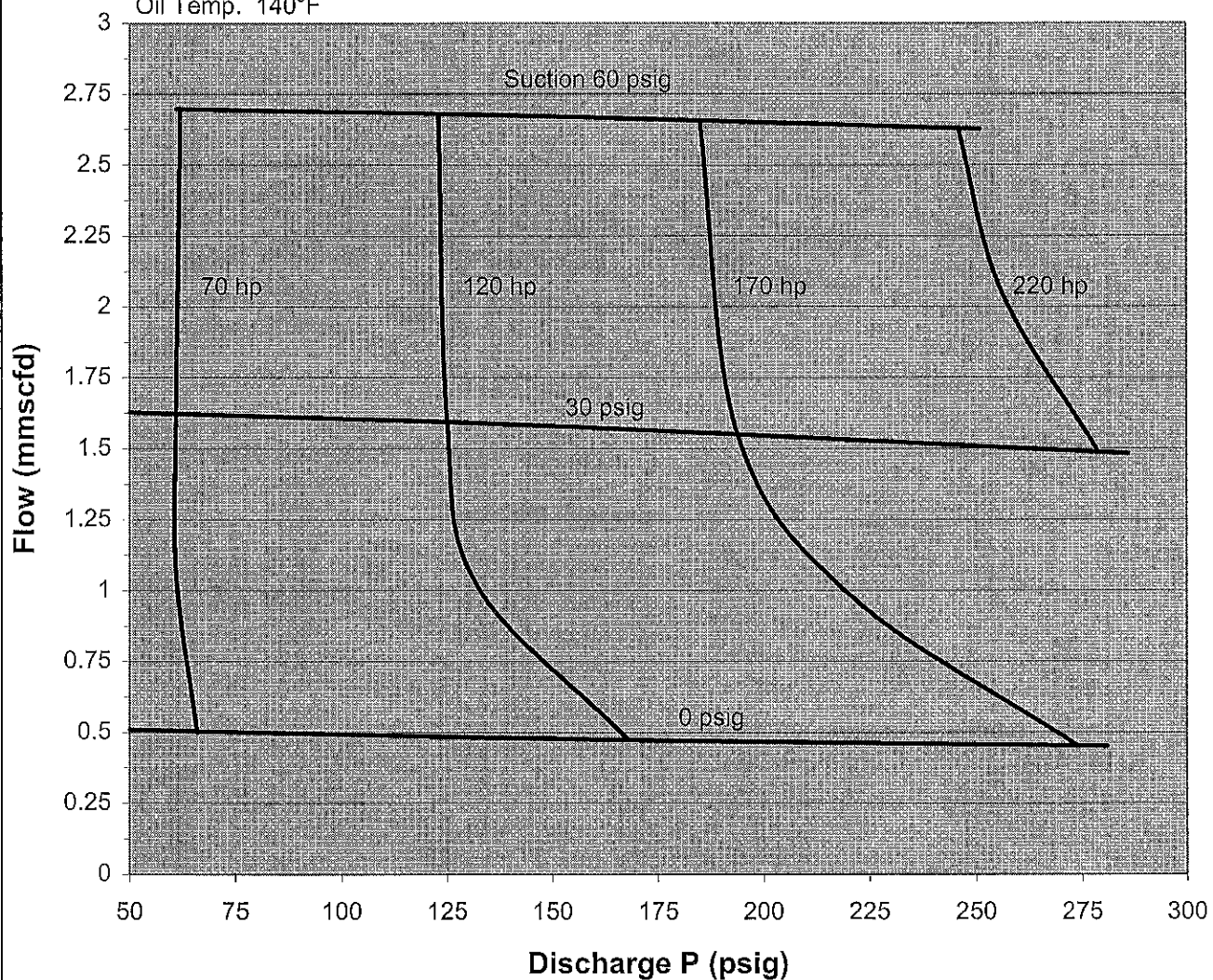
Mole Wt. 17.5

K-Value 1.26

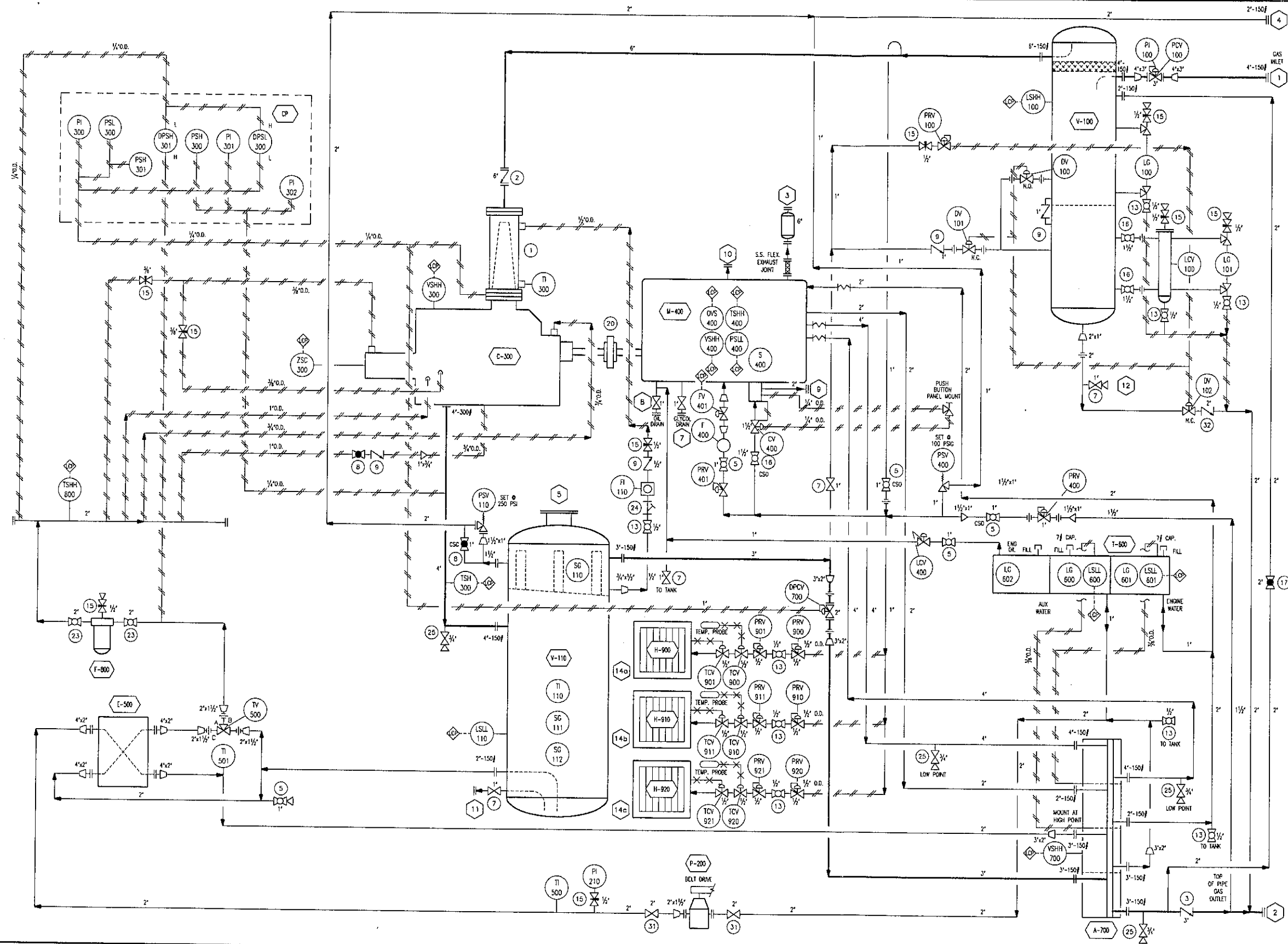
Inlet Temp. 60°F

RPM - 1800

Oil Temp. 140°F



The information on this curve is subject to change without notice. Startec Compression Services reserves the right to final verification of all rating results.



- UNIT EQUIPMENT**
- A-700 AIR COOLER: FMH-X FX72-9
 - C-300 COMPRESSOR: HOWDEN XRV 204/165
 - CP CONTROL PANEL: MURPHY/MAT CLASS I, INTRINSICALLY SAFE
 - E-500 OIL COOLER: PLATE TYPE III, PF35-650
 - F-800 OIL FILTER: 10 MICRON, REPLACEABLE CARTRIDGE
 - H-900/910/920 UNIT HEATERS: CATADYNE 18000 BTU/HR (12 VDC)
 - M-400 DRIVER: CATERPILLAR C3306 ATAC @ 1800 RPM
 - T-600 EXPANSION TANK
 - V-100 SUCTION SCRUBBER: 30" O.D. x 8'-0" S/S DWP 250 PSIG @ DWT -20/150°F C/W BLOW CASE
 - V-110 OIL SEPARATOR: 24" O.D. x 8'-0" O.A. DWP 250 PSIG @ DWT -20/230°F
 - P-200 GLYCOL PUMP: WIKING 1-1/2 A-540, BELT DRIVEN

- NOTES**
- 1) TUBING & FITTINGS TO BE MIN. 1/2" O.D. CAD PLATED PARKER FIGS. C/W S.S. FERRULES.
 - 2) GLYCOL PIPING AND OTHER PIPING TO BE WELDED WHERE POSSIBLE. OIL PIPING TO COMPRESSOR TO BE PICKLED.
 - 3) PIPING & FITTINGS:
2" & LARGER - SCH 40, SMLS, A-106B; FITTINGS A234 WPB BUTTWELD; FLANGES A105.
1 1/2" & SMALLER - SCH 80, SMLS, A-106B; FITTINGS 3000F F.S. A105 S.W. OR SCRD.
 - 4) ALBERTA QUALITY CONTROL PROGRAM REGISTERED - AQP-2311.
 - 5) ALL INTRINSICALLY SAFE WIRING TO BE NEMA 4 CLASSIFIED
 - 6) GAS PIPING DWP 250 PSI @ DWT -20/230°F, HYDROTEST @ 2586 kPa (375 PSI)
FUEL GAS DWP 100 PSI @ DWT 150°F, HYDROTEST @ 1034 kPa (150 PSI)
OIL SYSTEM DWP 250 PSI @ DWT -20/230°F, HYDROTEST @ 2586 kPa (375 PSI)


- LEGEND**
- Ball Valve
 - Gate Valve
 - Globe Valve
 - Needle Valve
 - Check Valve
 - Butterfly Valve
 - Angle Valve
 - Tubing

- CUSTOMER CONNECTIONS**
- 1 SUCTION 4"-150/
 - 2 DISCHARGE 3"-150/
 - 3 ENGINE EXHAUST 6"-150/
 - 4 FLARE HEADER 2"-150/
 - 5 COALESCING ELEMENT ACCESS 12" x 10" ELLIPTICAL
 - 6 ENGINE GLYCOL DRAIN 1" NPT
 - 7 ENGINE OIL DRAIN 1" NPT
 - 8 STARTER EXHAUST 2"-150/
 - 9 CRANKCASE VENT 1" NPT
 - 10 COMPRESSOR OIL DRAIN 1" NPT
 - 11 MANUAL DRAIN 1" NPT
 - 12 OIL MAKE-UP 1" NPT
 - 14a,b,c CATADYNE START 12 VDC

**CERTIFIED
AS BUILT DWG.**

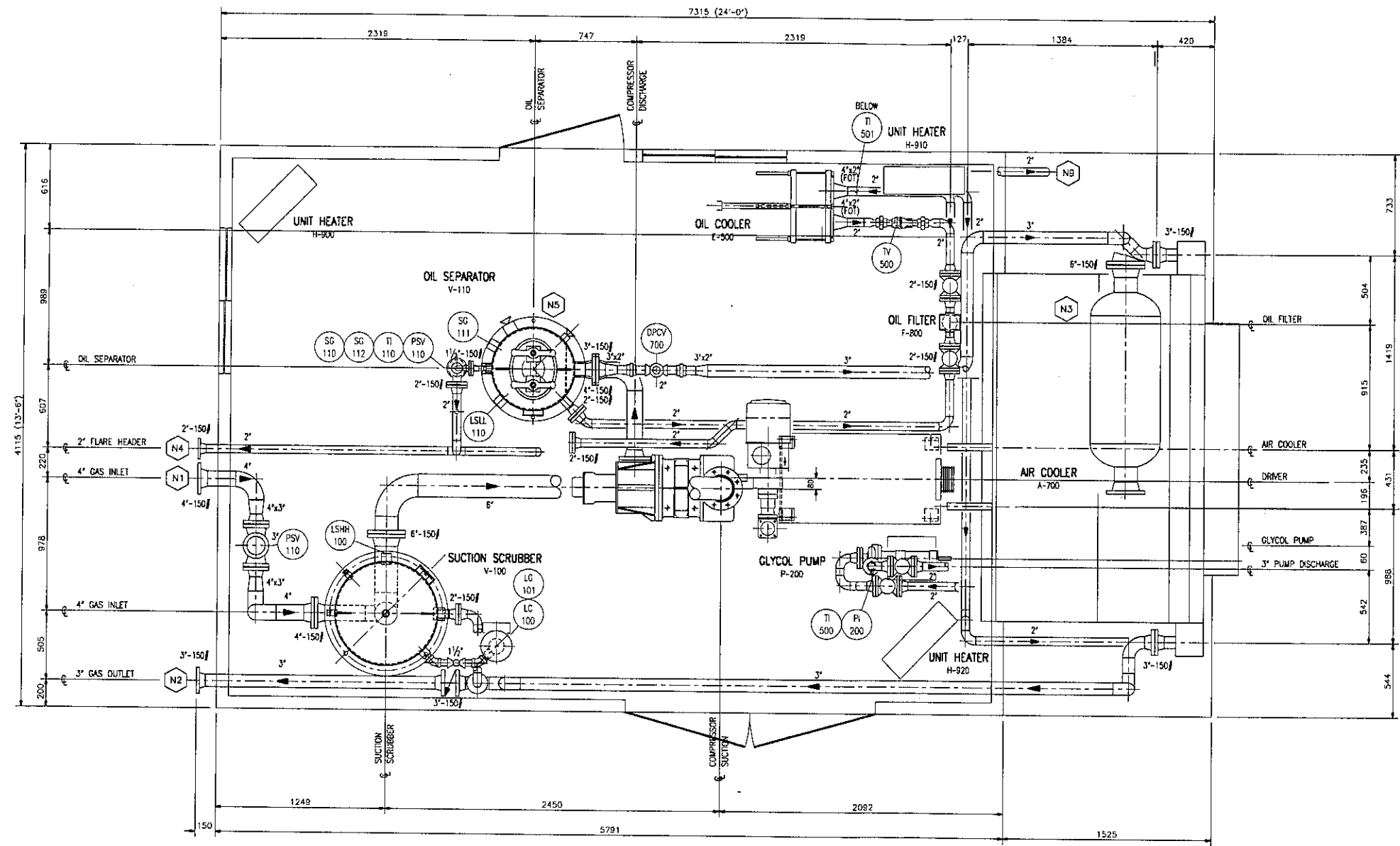
REFERENCE DRAWINGS				REVISIONS															
DWG. NO	DESCRIPTION	DWG. NO.	DESCRIPTION	NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE	NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE	SHIPPING WEIGHT			
38999-2A	GENERAL ARRANGEMENT			A	99-11-17	AMP		FOR APPROVAL	/						/				
38999-2B	GEN. ARR'G'T - ELEVATION			B	99-12-06	AMP		FOR APPROVAL	/						/		SANDBLAST		
38999-3A	STEEL BASE			C	99-12-10	RG		FOR APPROVAL	/						/				
38999-3B	STEEL DETAILS			D	99-12-13	RG		FOR APPROVAL	/						/		PRIMER		
				O	99-12-16	PO		FOR CONSTRUCTION	/						/				
				1	00-01-13	MT		TUBING SIZE REVISED	/						/		PAINT		
				2	00-01-31	MT		AS BUILT	/						/				

DRAWN	ACAD/ STARTEC	DATE	99-11-17	CUSTOMER/PROJECT/LOCATION	CANADIAN HUNTER LSD b-26-1 / 93-P-7		
CHECKED	STARTEC	DATE					
ENG. APPL.		DATE					
PROD. APPL.		DATE					
JOB NO.	18000	SCALE	N.T.S.	DRAWING NO.	38999-1	REV.	



REFRIGERATION SERVICES LTD.

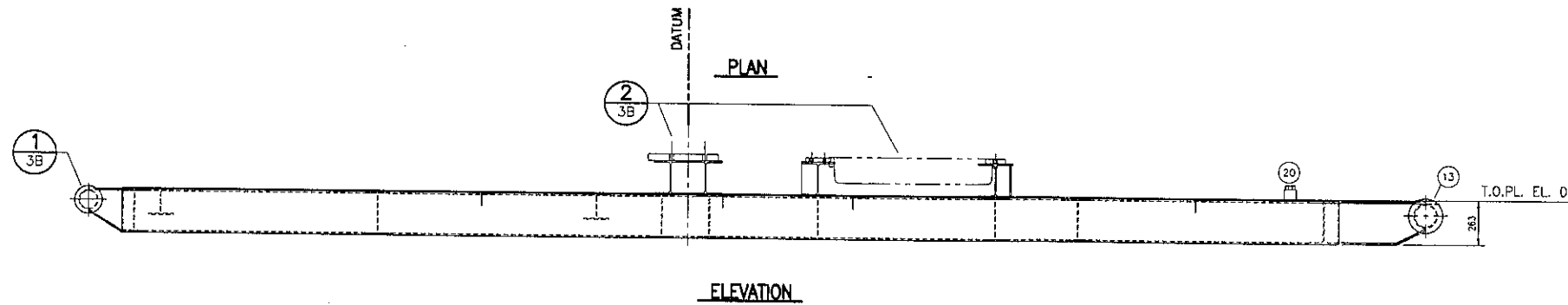
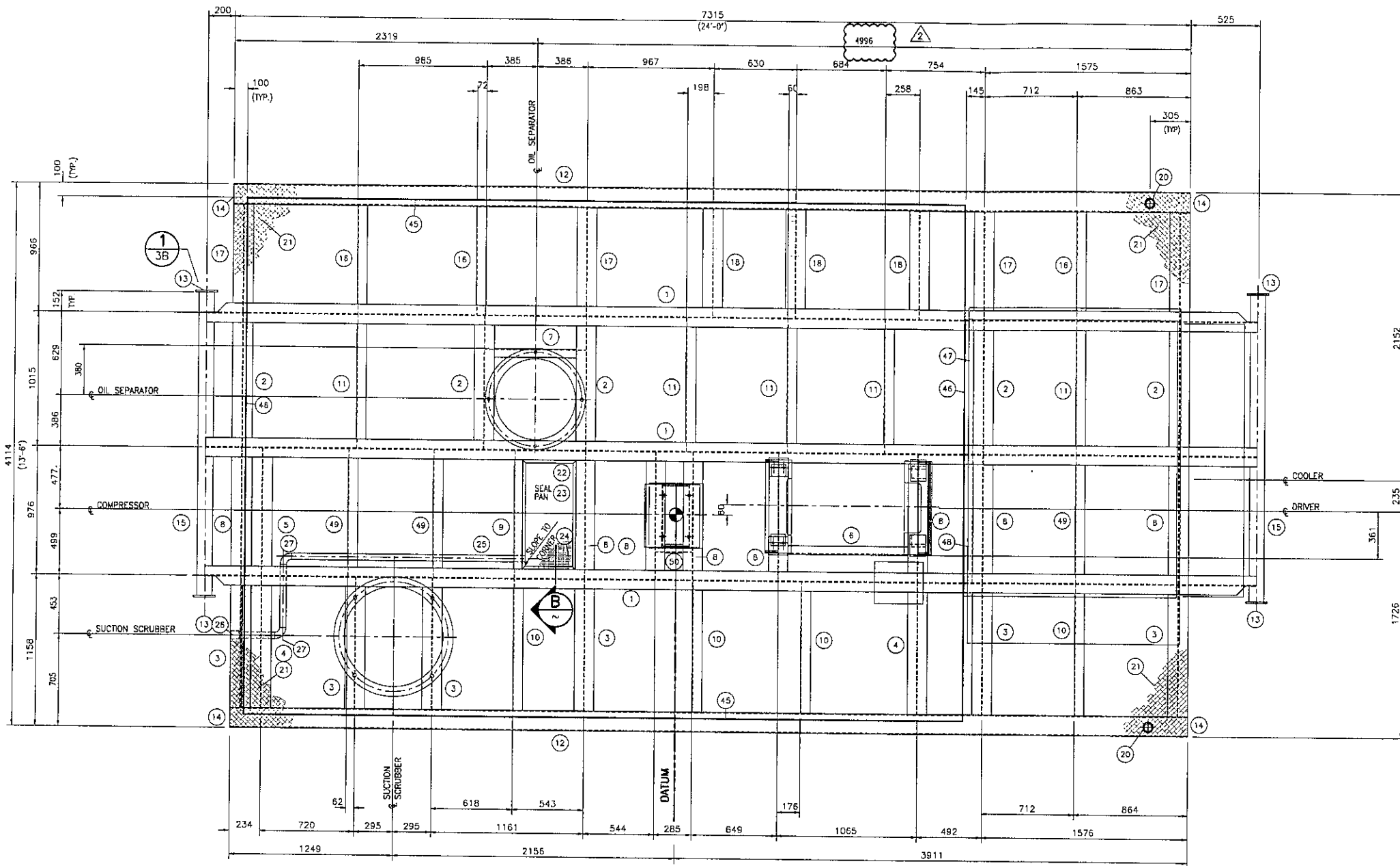
NOZZLE CHART					
P&ID CONN. REF.	M.K. #	SIZE	TYPE	RATING	DESCRIPTION
1	N1	4" (114.3)	RFWN	150#	INLET
2	N2	3" (88.9)	RFWN	150#	OUTLET
3	N4	8" (168.3)	RF	150#	ENGINE EXHAUST
4	N4	2" (60.3)	RFWN	150#	FLARE HEADER
5	N5	12"x18"	ELPTICAL		COALESCING EL. ACCESS
9	N9	2" (60.3)	RFWN	150#	STARTER EXHAUST



PLAN

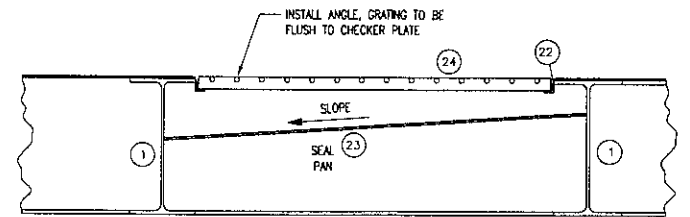
CERTIFIED
AS BUILT DWG.

REFERENCE DRAWINGS				REVISIONS										SHIPPING WEIGHT	SANDBLAST	PRIMER	PAINT	JOB NO.	SCALE	DRAWING NO.	REV.
DWG. NO	DESCRIPTION	DWG. NO.	DESCRIPTION	NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE	NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE						
8999-1	P. & I.D.			A	99-11-24	AMP		FOR APPROVAL													
9999-2B	GEN. ARR'G'T - ELEVATIONS			B	99-12-10	AMP		FOR APPROVAL													
38999-3A	STEEL BASE			C	99-12-15	RC		FOR APPROVAL													
38999-3B	STEEL DETAILS			D	99-12-16	PO		FOR CONSTRUCTION													
				1	00-01-31	MT		AS BUILT													
DRAWN ACAD/ STARTEC																		CUSTOMER/PROJECT/LOCATION			
CHECKED																		CANADIAN HUNTER			
ENG. APPL.																		LSD b-26-1 / 93-P-7			
PROD. APP'L.																		HOWDEN SCREW COMPRESSOR			
																		XR204/165 - G3306 ATAAC			
																		GENERAL ARRANGEMENT			



BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	3	W250 x 33 (W10 x 22) x 8040 LG.
2	5	W250 x 33 (W10 x 22) x 1009 LG.
3	6	W250 x 33 (W10 x 22) x 1003 LG.
4	2	W150 x 22 (W6 x 15) x 1003 LG.
5	1	W150 x 22 (W6 x 15) x 970 LG.
6	1	C250 x 23 (C10 x 15.3) x 1059 LG.
7	1	C250 x 23 (C10 x 15.3) x 770 LG.
8	8	W250 x 33 (W10 x 22) x 970 LG.
9	1	C250 x 23 (C10 x 15.3) x 970 LG.
10	4	L75 x 75 x 6 (L3 x 3 x 1/4) x 1003 LG.
11	5	L75 x 75 x 6 (L3 x 3 x 1/4) x 1009 LG.
12	2	HSS 254 x 152 x 6 (10' x 6' x 1/4') x 7315 LG.
13	4	PL 12.7 (1/2') x 165 O.D.
14	4	PL 6 (1/4') x 242 x 140
15	2	4" SCH.80 PIPE x 2438 LG.
16	3	L75 x 75 x 6 (L3 x 3 x 1/4) x 810 LG.
17	4	W250 x 33 (W10 x 22) x 810 LG.
18	3	W150 x 22 (W6 x 15) x 810 LG.
19		
20	2	60.3 (2") - 3000# NPT. FULL CPLG C/W HEX. PLUG
21	1	4.76 (3/16") CHECKERED PL. x ±4100 x ±7300 (CUT TO SUIT)
22	AS REQD	L25 x 25 x 5 (L1 x 1 x 3/16)
23	1	PL 6 (1/4') x 970 x 550 (SEAL WELD)
24	1	WELDED STEEL GRATING, TYPE 30-102, 32x5 BB 820 x 550
25	AS REQD	48.3 (1 1/2") SCH 40 SMLS PIPE (CUT TO SUIT)
26	1	48.3 (1 1/2") - 3000# NPT. FULL CPLG C/W HEX PLUG
27	2	48.3 (1 1/2") - SCH 40 BW LR ELBOW
28	2	W200 x 46 (W8 x 31) x 495 LG.
29	2	W200 x 46 (W8 x 31) x 712 LG.
30	1	PL 38 (1 1/2") x 480 x 420
31	2	PL 9.5 (3/8") x 180 x 200
32	2	PL 25 (1") x 140 x 150
33	2	PL 25 (1") x 165 x 115
34	2	PL 9.5 (3/8") x 180 x 97
35	2	PL 9.5 (3/8") x 180 x 75
36	1	PL 9.5 (3/8") x 180 x 712
37		
38		
39		
40		
41		
42		
43		
44		
45	2	FLAT BAR 6 (1/4") x 76 x 5495 LG.
46	2	FLAT BAR 6 (1/4") x 76 x 4055 LG.
47	1	C250 x 23 (C10 x 15.3) x 1009 LG.
48	1	C250 x 23 (C10 x 15.3) x 970 LG.
49	3	L75 x 75 x 6 (L3 x 3 x 1/4) x 970 LG.
50	1	C250 x 23 (C10 x 15.3) x 278 LG.



DETAIL
1:20

CERTIFIED
AS BUILT DWG.

NOTES:

1. ALL WELDS 6mm CONTINUOUS FILLET UNLESS NOTED OTHERWISE.

REFERENCE DRAWINGS

DWG. NO	DESCRIPTION	DWG. NO.	DESCRIPTION
38999-1A	P. & I.D.		
38999-2A	GEN. ARRGT - PLAN		
38999-2B	GEN. ARRGT. - ELEVATION		
38999-3B	STEEL BASE - DETAILS		

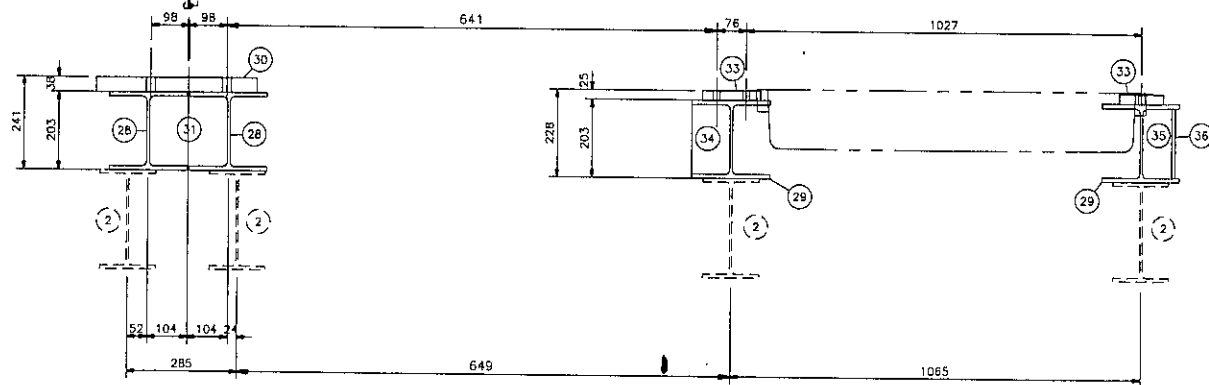
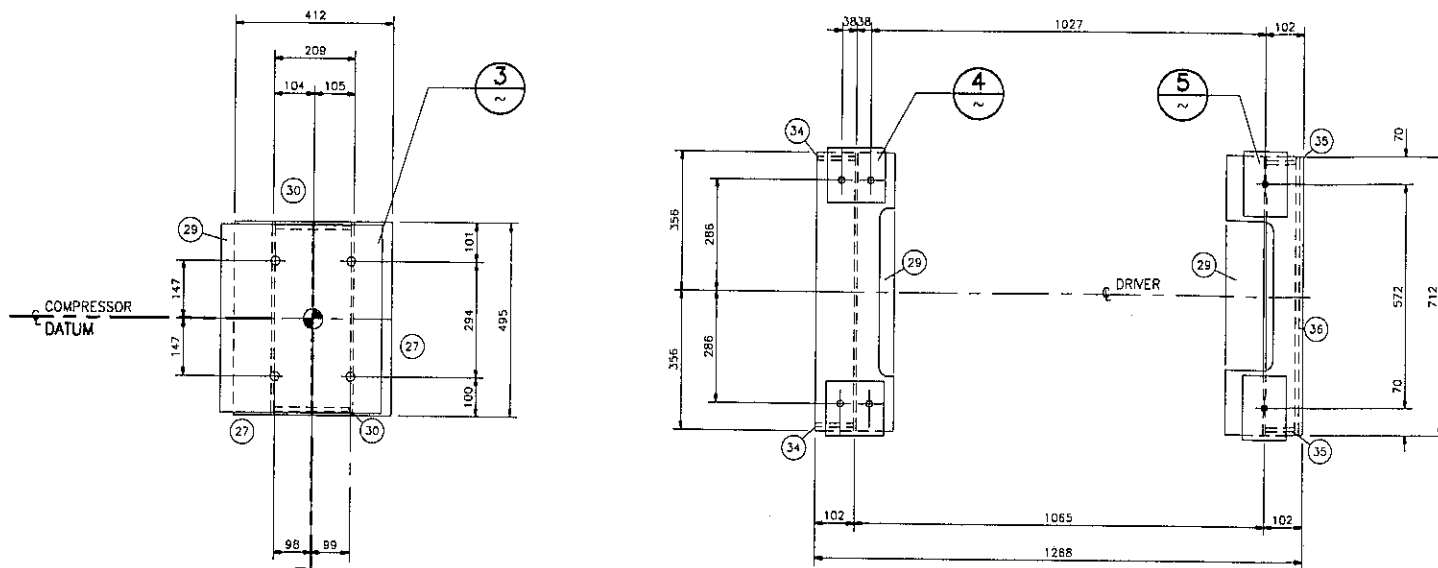
REVISIONS

NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE	NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE
A	99-12-10	AMP		FOR APPROVAL							
0	99-12-16	PO		FOR CONSTRUCTION							
1	99-12-17	AMP		REVISED MAIN BEAMS							
2	99-12-29	AMP		REVISED DIMENSION							
3	00-01-31	MT		AS BUILT							

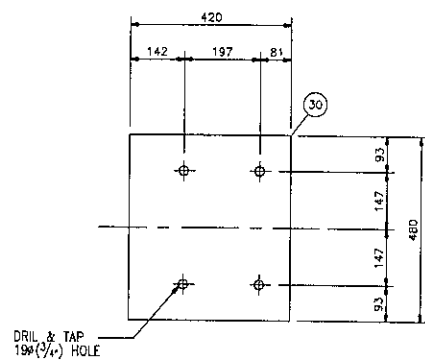
SHIPPING WEIGHT	4546 kg (10102 lb)
SANDBLAST	
PRIMER	
PAINT	

DRAWN	ACAD/STARTEC	DATE	99-12-10
CHECKED		DATE	
ENG. APP'L.		DATE	
PROD. APP'L.		DATE	
JOB NO.	38999	SCALE	1:20

CUSTOMER/PROJECT/LOCATION	CANADIAN HUNTER LSD b-26-1 / 93-P-7
TITLE	HOWDEN SCREW COMPRESSOR MODEL XRV 204/165 - G3306 ATAAC STEEL BASE
DRAWING NO.	38999-1A



DETAIL 2
1:10



DETAIL 3
1:10

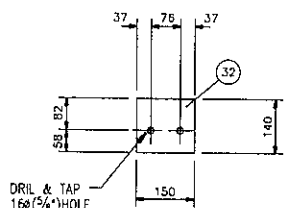


PLATE DETAIL
TYP. 2

DETAIL 4
1:10

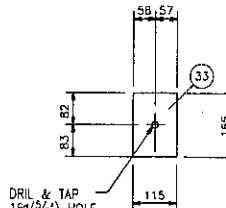
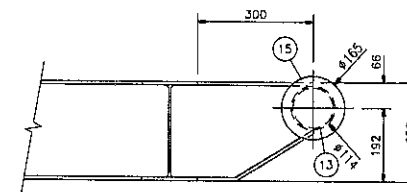


PLATE DETAIL
TYP. 2

DETAIL 5
1:10



DETAIL 1
1:10

**CERTIFIED
AS BUILT DWG.**

NOTES:

1. ALL WELDS 6mm CONTINUOUS FILLET UNLESS NOTED OTHERWISE.
2. ADD 6mm SHIMS UNDER COMPRESSOR AND DRIVER.



CUSTOMER/PROJECT/LOCATION
CANADIAN HUNTER
LSD b-26-1 / 93-P-7

TITLE
HOWDEN SCREW COMPRESSOR
XRV 204/165 - G3306 ATAAC
STEEL BASE

DRAWN
ACAD/ STARTEC
CHECKED
ENG. APPL.
PROD. APPL.

DATE
99-12-06
DATE
DATE
DATE

JOB NO. **38999**

SCALE **1:10**

DRAWING NO. **38999-3A**

REV. **1**

REFERENCE DRAWINGS

DWG. NO	DESCRIPTION	DWG. NO.	DESCRIPTION
38999-1	P. & I.D.		
38999-2A	GEN. ARR'G'T - PLAN		
38999-2B	GEN. ARR'G'T. - ELEVATION		
38999-3A	STEEL BASE		

REVISIONS

NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE	NO.	DATE	BY	AP'D.	DESCRIPTION	ISSUE
A	99-12-06	AMP		FOR APPROVAL							
O	99-12-16	PO		FOR CONSTRUCTION							
1	00-01-31	MT		AS BUILT							

SGC 2019

CAN HUNT 38999

20-Jul-98

Page 1

MATERIAL ITEM TAG #	MAJOR EQUIPMENT No.	ITEM DESCRIPTION	SUPPLIER: COST EACH	STARTEC EQUIP. SUPPLIER	PO#	TOTAL COST
C-300	1	HOWDEN MODEL XRV 204/165 COMPRESSOR	\$21,079	HOWDEN	57607	\$21,079
M-400	1	CATERPILLAR G3306 ATAAC RATED AT 1800 RPM C/W AIR FILTER, LP REGULATOR, GOVERNOR THROTTLE	\$36,085	FINING	57627	\$36,085
CP	1	MURPHYMATIC PANEL, C/W BARRIER, INST. pi/psl/psh-300, dpsl/dpsh/pi/psh-301, pi-302, and temp guages	\$6,022	PIC	57842	\$6,022
E-500	1	ITT PLATE EXCHANGER MODEL PF35-650 C/W 51 PLATES	\$8,842	JOULE	57714	\$8,842
A-700	1	FINN-X FX 72-9 C/W HAIL GUARDS AND LOUVERS OIL & TURBO SECTION AND AFTERCOOLER	\$21,000	FINN	57715	\$21,000
	0		\$0			\$0
V-110	1	24" DIA X 8' OAL VERTICAL OIL SEPARATOR DWP 250 PSIG @ DWT -20/230 F	\$8,850	E&D	57708	\$8,850
V-100	1	30" DIA X 8' OAL VERTICAL SUCTION SCRUBBER C/W BLOW CASE DWP 250 PSIG @ DWT -20/150 F	\$10,900	E&D	57708	\$10,900
F-800	1	PARKER 80CN-2-10Q-N-25-F1F1 -11 FILTER, 10 MICRON 2" NPT CONNECTIONS, 800 PSI RATED	\$489	WAINBEE	58007	\$489
20	1	220 HP, 1800 RPM COUPLING BY TSL	\$2,200	TSL	57746	\$2,200
P-200	1	VIKING MODEL 1-11/2 540 @ 1800 RPM, 68 usgpm @ 50 ftdh	\$1,081	VIKING	57821	\$1,081
T-600	1	ENGINE JW WATER EXPANSION TANK AND AUX TANK	\$100	STARTEC		\$100
S-400	1	TDI STARTERS, LOW PRESSURE	\$1,706	DETROIT	57965	\$1,706
1	1	COMPRESSOR SUCTION STRAINER 6"-150#, 150% OPEN, 40 MESH	\$200	RADAFAB	57988	\$200
TCV-900/1						
H-900/10/20	3	CATODYNE 18000 BTU/HR GAS HEATER, 12 VDC	\$827	CISCAN	57968	\$2,480
PRV-900/1		C/W REGULATOR, FILTER AND TEMP CONTROLLER				
					TOTAL:	\$121,034

Costed

JWO		CAN HUNT 38999	20-Jul-98			Page 2
MATERIAL	INSTRUMENTATION		SUPPLIER:	STARTEC		
ITEM		ITEM	COST	EQUIP.	PO#	TOTAL
TAG #	No.	DESCRIPTION	EACH	SUPPLIER		COST
PCV-100	1	3" - 150# KIMRAY 327 - FGT-PR-S REGULATOR	\$1,454	HALLI	57984	\$1,454
LSHH-100	1	MURPHY L-1100 STAB IN FLOAT	\$205	PIC	57842	\$205
LG-100	1	PENBERTHY 2RL5 C/W COCKS	\$313	PEN	57972	\$313
FI-110	1	HENRY 1/2" FLOW INDICATOR	\$92	STOCK	38925	\$92
PRV-400/1	2	FISHER 1" 627R, 1/2", 15-40, 35-80	\$250	SPARTAN	57964	\$500
FV-401	1	MURPHY FUEL GAS SOLENOID VALVE, 45-M5081CM1	\$789	PIC	57482	\$789
LSLL-600/601	2	MURPHY 45-EL150K1	\$92	PIC	57482	\$184
TV-500	1	AMOT ELCT-140-01, 1-1/2", NPT	\$235	SPARTAN	57964	\$235
F-400	1	PARKER FUEL GAS FILTER 4HS-CN	\$314	PEACOCK	57972	\$314
VSHH-300	3	MURPHY VS2 VIB SWITCH	\$140	PIC	57482	\$420
400/700						
OVS-400	1	OVERSPEED IN PANEL (SET @ 2000 RPM)		PIC	57482	
TSHH-400	1	JW HIGH TEMP IN PANEL (SET @ 225 F RISING)		PIC	57482	
PSLL-400	1	OIL PRESS IN PANEL (SET @ 30 PSI FALLING)		PIC	57482	
PSV-110	1	AXELSON HF46027 "F" SET @ 250#	\$2,025	AIR-X	57937	\$2,025
LSLL-110	1	MURPHY L-1100 STAB IN FLOAT	\$211	PIC	57842	\$211
TSH-300	1	HIGH DISH. TEMP IN PANEL (SET @ 225 F RISING)		PIC	57842	
DPCV-700	1	KIMRAY MODEL 230-SGT-PD-S, 2" - NPT	\$500	HALLI	57984	\$500
DV/LC/LV-100	1	FISHER (3)128 DUMP AND 2680A 1NO, 2NC	\$2,183	SPARTAN	57964	\$2,183
LCV-400	1	KENCO LCE-9 LEVEL CONTROLLER	\$255	ZIMCO	57984	\$255
TSHH-800	1	HIGH OIL TEMP SHUTDOWN IN PANEL (SET @ 167 F RISE)		PIC	57842	
PRV-200	1	FISHER 67 AFR REGULATORS ON LC-100	\$0	SPARTAN	57984	\$0
SG-110/111/112	3	PHILLIPS SIGHT GLASS L1100-ARN	\$194	STOCK	1211	\$582
PSV-400	1	1" X 1" TAYLOR RELIEF SET @ 100# MODEL 8200	\$195	STOCK	57981	\$195
TI-110/300/500/501	4	TREND OR EQUAL, 0-200 F C/W 3/4" NPT WELL	\$32	ZIMCO	57994	\$128
LG-600/601/602	3	COMBRACO LG'SC/W GAUGE COCKS FOR DAY TANKS	\$24	CRANE	57930	\$72
					TOTAL;	\$10,657

JWO		CAN HUNT 38999		20-Jul-98		Page 3	
MATERIAL	INSTRUMENTATION		SUPPLIER:	STARTEC			
ITEM		ITEM	COST	EQUIP.	PO#	DEL.	TOTAL
TAG #	No.	DESCRIPTION	EACH	SUPPLIER			COST
PI-210	1	WIKA OR EQUAL 0-50 PSI GAUGE	\$52	ZIMCO	57980		\$52
CV-400	1	1-1/2" NPT GAS CONTROL VALVE C/W START BUTTON	\$ 470	DETROIT	57965		\$470
ZSC-300	1	UNLOAD LIMIT SOLENOID	\$ -	HOWDEN	57607		\$ -
LG-101	1	PENBERTHY 14" VISIBLE C/W GUAGE COCKS 1RL7	250	PEN	57972		\$ 250
	3	THERMOWELLS	25	PIC	57842		\$ 75
							TOTAL \$ 847

[illegible]

[illegible]

CANADIAN HUNTER			Page 6		
QUOTE SUMMARY					
PAGE	TOTAL COST	MATERIAL	SUPPLIER	STARTEC	
1	\$ 121,034	MAJOR EQUIPMENT			
2	\$ 10,657	INSTRUMENTATION			
3	\$ 847	INSTRUMENTATION			
4	\$ 3,796	VALVES			
5	\$ 67,806	MISC.			
Total Cost:		\$ 204,140			
15% Mark-up - Eng' g & O/H		\$ 30,621			
10% Mark-up - Profit		\$ 20,414			
TOTAL SELLING:		\$ 255,174			

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by FIN-X, INC. 402 WEST 2ND AVENUE OWASSO, OKLAHOMA 74055
(Name and address of manufacturer)
Canada T2E 8K6
2. Manufactured for STARTEC REFRIGERATION SERVICES LTD, 6700 - 9th Street N. E., Calgary, Alberta,
(Name and address of purchaser)
3. Location of Installation UNKNOWN
(Name and address)

4. Type Vert. J 693.3 K1251.21 J 693 1567 1999
(Height, or vert., tank) (Mfg's serial No.) (CRN) (Drawing No.) (Natl. Bd. No.) (Year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1, 1998
Year

to 1998
Addenda (Date) Code Case No. Special Service per UG-120(d)

6. Shell: NO SHELL
Matl. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

7. Seams: SINGLE WELDED
Long. (Welded, Dbl., Sppl., Lap, Butt) R.T. (Spot or Full) EN. (N) H.T. Temp. (°F) Time (hr) Girth (Welded, Dbl., Sppl., Lap, Butt) R.T. (Spot, Partial, or Full) No. of Courses

8. Heads: (a) Matl. SA516-70 (Spec. No., Grade) (b) Matl. SA516-70 (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	MAX SPAN	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	T&P SHEET	.75	0	---	5.75	---	---	---	---	FLAT
(b)	WRAP & ENDS	.625	0	---	4.00	---	---	---	---	FLAT

If removable, bolts used (describe other fastenings) _____
(Matl., Spec. No., Gr., Size, No.)

9. MAWP 250 psi at max. temp. 230 °F
Min. design metal temp. -20 °F at 250 psi. Hydro. 375 psi.

10. Nozzles, inspection and safety valve openings: SAFETY VALVE OPENINGS INSTALLED BY OTHERS.

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
INLET/OUTLET	1	3"	150RF	SA105/SA106 B	SCH 80	WELD	WELDED	WRAPPER

11. Supports: Skirt _____ Lugs _____ Legs _____ Other _____ Attached _____
(Yes or no) (No.) (No.) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: _____

(Name of part, item number, Mfg's name and identifying stamp)

RECTANGULAR BOX HEADERS: 4 ROW 1 PASS, "CONSTRUCTED IN CONFORMANCE WITH APPENDIX 26" DIMENSIONS: 7" X 4" X 8.125"
TUBES: .75 OD, 16 BWG, 9 FT LONG 14 PIECES, MATERIAL: SA214
NO IMPACT TESTING REQUIRED PER UG20F [PLUGS] SA105 SERVICE: AFTERCOOLER

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1, "U" Certificate of Authorization No. 18,989 expires 11-10, 2001
Date 12-10-99 Co. name FIN-X, INC. Signed Walter R. Day
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by FIN-X, INC. at OWASSO, OKLAHOMA
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of OKLAHOMA and employed by COMMERCIAL UNION INSURANCE COMPANY

have inspected the component described in this Manufacturer's Data Report on 12-10-99, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 12-10-99 Signed E. L. Courtney Commissioned NB 5745 "A" OKLA # 251
(Authorized Inspector) (National Board (and, if appropriate), State, Prov. and No.)

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by FIN-X, INC. 402 WEST 2ND AVENUE OWASSO, OKLAHOMA 74055
(Name and address of manufacturer) Canada T2E 8K6

2. Manufactured for STARTEC REFRIGERATION SERVICES LTD, 6700 - 9th Street N. E., Calgary, Alberta,
(Name and address of purchaser)

3. Location of installation UNKNOWN
(Name and address)

4. Type Vert. J 693.1 A2594.312 J 693 1566- 1999
(Horiz. or vert., tank) (Mfg's serial No.) (CRN) (Drawing No.) (Mater. Bd. No.) (Year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1, 1998
Year

to 1998
Addenda (Date) Code Case Nos. Special Services per UG-120(d)

6. Shell: NO SHELL
Matl. (Spec. No., Grade) Nom. Thk. (in.) Cor. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

7. Seams: SINGLE WELDED
Long. (Welded, Dbl., Singl., Lap, Butt) R.T. (Spot or Full) EH (in.) H.T. Temp. (°F) Time (hr) Dirth (Welded, Dbl., Singl., Lap, Butt) R.T. (Spot, Partial, or Full) No. of Courses

8. Heads: (a) Matl. SA516-70 (b) Matl. SA516-70
(Spec. No., Grade) (Spec. No., Grade)

Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	MAX SPAN.	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a) T&P SHEET	.75	0	---	6.25	---	---	---	---	FLAT
(b) WRAP & ENDS	.375	0	---	4.00	---	---	---	---	FLAT

If removable, bolts used (describe other fastenings):

9. MAWP 50 psi at max. temp. 350 °F
Min. design metal temp. -20 °F at 50 psi. Hydro. 150 psi.

10. Nozzles, inspection and safety valve openings: SAFETY VALVE OPENINGS INSTALLED BY OTHERS.

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
INLET/OUTLET	1	4"	150RF	SA105/SA106 B	SCH 80	WELD	WELDED	WRAPPER

11. Supports: Skirt --- Lugs --- Legs --- Other --- Attached ---
(Yes or no) (No.) (No.) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

(Name of part, item number, Mfg's name and identifying stamp)

7" X 4" X

RECTANGULAR BOX HEADERS: 4 ROW 1 PASS, "CONSTRUCTED IN CONFORMANCE WITH APPENDIX 28" DIMENSIONS: 19.50"

TUBES: .75 OD. 18 BWG. 9 FT LONG 42 PIECES. MATERIAL: SA249-TP304

NO IMPACT TESTING REQUIRED PER UG20F [PLUGS] SA105 SERVICE: AIR-TO-AIR

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1. "U" Certificate of Authorization No. 18,989 expires 11-10, 2001
Date 12-10-99 Co. name FIN-X, INC. Signed Walter R. Hume
(Manufacturer) (Inspector)

CERTIFICATE OF SHOP INSPECTION

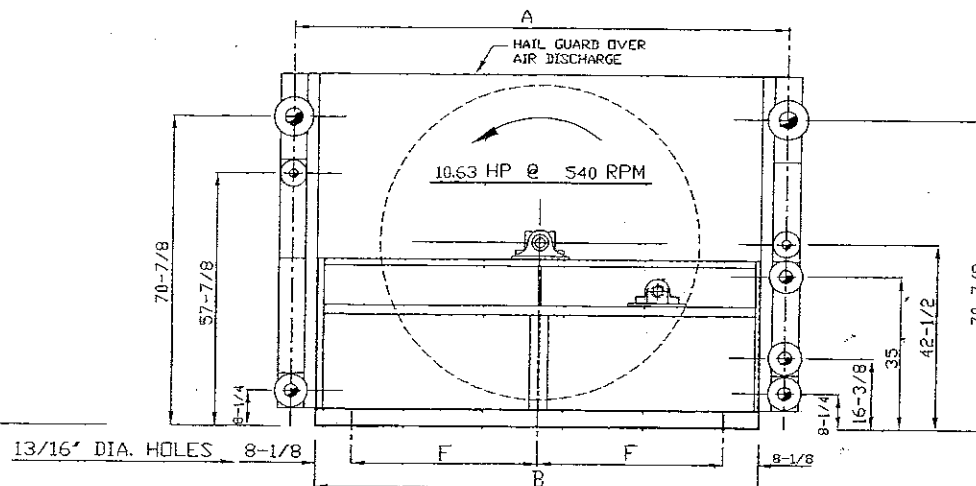
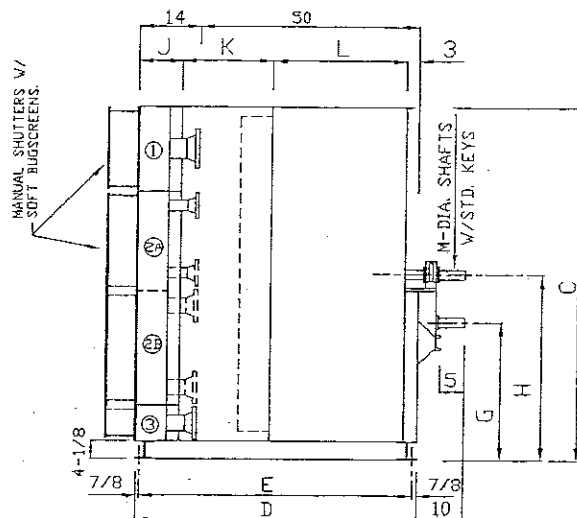
Vessel constructed by FIN-X, INC. at OWASSO, OKLAHOMA
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of OKLAHOMA and employed by COMMERCIAL UNION INSURANCE COMPANY
have inspected the component described in this Manufacturer's Data Report on 12-10-99, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date 12-10-99 Signed Walter R. Hume Commission NB 5745 "A" OKLA. #251
(Authorized Inspector) (National Board (Inc.), Requirements, State, Prov. and No.)



AUTHORIZED REPRESENTATIVE
JOULE TECHNICAL SALES INC.
 Ph. (403) 239-3477 Fax (403) 241-0148
CALGARY, ALBERTA
 SPECIFICATION SHEET

FIN-X, Inc.
 P.O. Box 1048
 Owasso, OK 74055-1048
 (918) 272-9546
 Fax: 272-5901

CUSTOMER		STARTEC REFRIGERATION SERVICES LTD		DATE	November 10, 1999
REFERENCE NUMBER		FX6273S1 REV. 1		ITEM NUMBER	1
MODEL		FX 72 - 9		NUMBER REQUIRED	1
PERFORMANCE OF ONE UNIT					
1	FLUID	AIR-TO-AIR	EJW	CLOW	AC
2	FLOW	1527 #/hr	48 gpm	68 gpm	2 mmscfd
3			50% GLYCOL	50% GLYCOL	SG=0.65
4					
5	TEMPERATURE IN, °F	318	190	130	178
6	TEMPERATURE OUT, °F	100	159.949	120	140
7	INLET PRESSURE, PSIA	21.7	NOMINAL	NOMINAL	200
8	PRESSURE DROP, PSI	.2	7.5	6.2	1.8
9	DUTY, BTU/HOUR	79944	638093	300000	89669
10	CORRECTED MTD	62.51	56.12	23.91	54.7
11	BARE TUBE RATE	17.24	130.93	119.06	67.91
12	FOULING	.002	.0005	.0005	.002
13	BARE TUBE SURFACE, SQ. FT.	74.2	88.34	106	24.73
14	TOTAL SURFACE, SQ. FT.	1187	1413	1696	396
CONSTRUCTION					
15	NUMBER OF SECTIONS	1	1 - COMBINED - 1		1
16	TUBES / SECTIONS	42	50	60	14
17	LENGTH	9	9	9	9
18	ROWS - PASSES	4-1	4-5	4-4	4-1
19	TUBE O.D. AND BWG	3/4X18	3/4X16	3/4X16	3/4X16
20	TUBE MATERIAL	SA249-TP304	SA214	SA214	SA214
21	INSERTS	-	-	-	-
22	DESIGN PRESSURE, PSI	50	14	14	250
23	DESIGN TEMPERATURE, °F	-20/350	300	300	-20/230
24	NOZZLES	4-150RF	2-150RF	3-150RF	3-150RF
25	HEADERS	<input checked="" type="checkbox"/> BOX TYPE WITH REMOVABLE PLUGS, CARBON STEEL			
26	ASME STAMP, CRN&NB	YES	NO	NO	YES
27	PLUGS, TYPE	SHOULDER	TAPER	TAPER	SHOULDER
28	PLUGS, MATERIAL	STEEL	STEEL	STEEL	STEEL
29	FINS	<input checked="" type="checkbox"/> ALUMINUM, ANGLE BASE, MECHANICALLY BONDED			
30					
31					
32					
AIR DATA					
33	INLET AIR, °F	90	ELEVATION, FT.		2500
34	OUTLET AIR, °F	115.8	TOTAL SCFM		39596
MECHANICAL EQUIPMENT					
35	FAN	DRIVE		DRIVER	
36	NUMBER 1	<input type="checkbox"/> V-BELT	<input type="checkbox"/> DIRECT	TYPE	
37	HP / FAN 10.63	SIZE		MAKE	
38	RPM 540	NUMBER		SIZE	
39	DIAMETER 72*	LARGE SHV.		HP / DRIVER	
40	BLADES 5	SMALL SHV.		RPM	
41	PITCH 6.1", CLEVIS			ENCLOSURE	
42	MAKE MOORE 27ED W/VT TIPS	<input type="checkbox"/> GEAR			
43	MATERIAL ALUMINUM	RATIO			
44	* 80.3 dBA/FAN @ 1m	AGMA HP		VOLTAGE	
45	BORE 1 15/16 INCHES	COUPLING		PHASE	
46	ROTATION LEFT			CYCLES	
FAN SHAFT - 1 15/16" X 52 1/2" CRS, WITH 5" STD. KEYS BOTH ENDS.					
1 15/16" X 15" CRS, WITH 5" STD. KEY ONE END.					
49	BEARINGS - (2) 1 15/16 DODGE DI, PB (1EXP;1NE) (2) 1 15/16 DODGE SCM, PB.				
50	REMARKS MOUNTED IDLER. DEEP MANUAL LOUVERS. SOFT BUGSCREENS. HAILGUARD: AIR-TO-AIR HEADERS GALVANIZED.				
					WEIGHT 5,500



- NOTE:
- 1) SECTIONS #1 & #3 TO HAVE ASME STAMP, NATIONAL BOARD NUMBER & CRN.
 - 2) HEADERS ON SECTION #1 TO BE HOT-DIPPED GALVANIZED. THE REMAINING UNIT IS PRIMED.
 - 3) SOFT BUGSCREENS SHIPPED LOOSE.

RELEASED FOR
FABRICATION
CERTIFIED CORRECT
By *Allen Robinson* DATE 11/29/99

SECTIONS	SERVICE	DESIGN PRESS.-PSI	DESIGN TEMP.-°F	CONNECTIONS
1	AIR-TO-AIR	50	-20/350	4"-150RF
2A	EJW	14	300	2"-150RF
2B	CLOW	14	300	3"-150RF
3	AC	250	-20/230	3"-150RF

TAG: JOB# 38999
EST. SHIPPING WEIGHT: 5,500#

FIN-X, INC.

SCALE: NONE DATE: 11-29-99 REV. 1

STARTEC P.O.# 57715

ONE MODEL FX72-9 NO. J693

MODEL	A	B	C	D	E	F	G	H	J	K	L	M
FX72-9	111-3/4	100-1/4	80-5/8	64	62-1/4	42	31-7/8	42-3/8	10	20-1/2	30-1/2	1-15/16

AUTHORIZED REPRESENTATIVE
JOULE TECHNICAL SALES INC.
Ph. (403) 239-3477 Fax (403) 241-0148
CALGARY, ALBERTA



THE MOORE COMPANY

INSTALLATION MANUAL

800 S. MISSOURI AVENUE
MARCELINE, MO 64658 USA
TELEPHONE: (660) 376-3575
FACSIMILE: (660) 376-2909

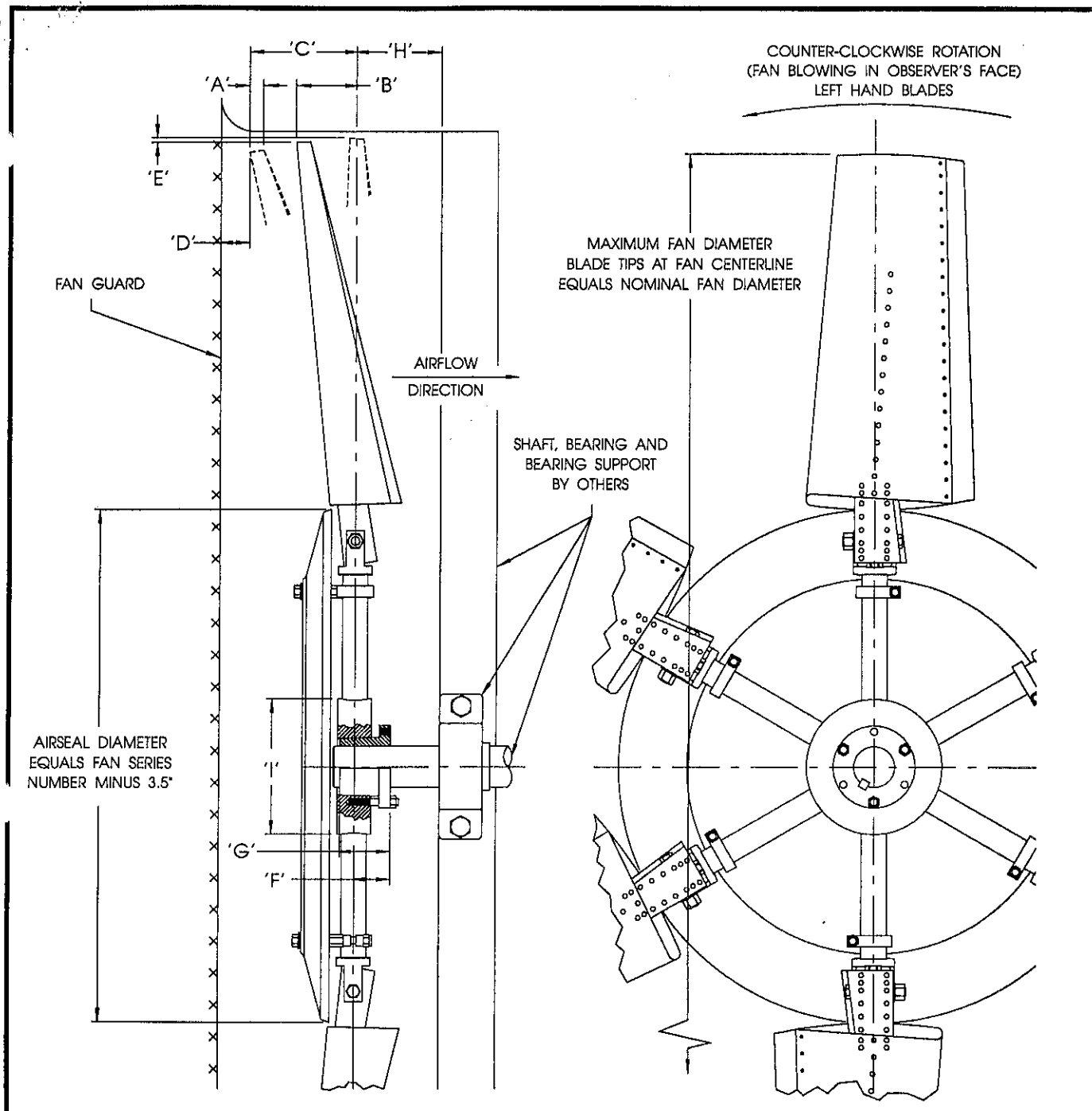
JOB NO.: 59914

SOLD TO FIN-X, INC.
PO BOX 1048
OWASSO OK 74055-1048


SHIP TO FIN-X, INC.
402 W. SECOND AVENUE
OWASSO OK 74055

INVOICE DATE:
MODEL NO.: 5427/8B-ED-6-A-5
PURCHASE ORDER NO: 13070
CUSTOMER JOB NO: J693
SHIP REQUIRED: 9-Dec-1999
PAYMENT TERMS: NET 30 DAYS
ROUTING: MOORE COMPANY
F.O.B. POINT: MARCELINE, MO.
FREIGHT: PREPAID
CRATING: STANDARD DOMESTIC

QTY	DESCRIPTION
1	5427/8B-ED-6-A-5
Serial Nos.: F90569	
CLASS 5000 ASSEMBLY DATA MATERIAL: ALUMINUM	
SERIES: 27 DIA.: 6.00 BUSHING: SF H DIM.: 2.155" BLADES: 5 TYPE: MANUAL KEYWAY: 0.500" X 0.250" BORE: 1.938" ARRANGEMENT: 8B MOUNTS: 3 In STD. BORE TOL.: +.001" -.000" CLEVIS ANGLE: 6.1° WEIGHT: AIR OFF: HUB TRAVEL: ° Engine Drive Left Hand Low Noise STOP DROOP: 4.0 CUT DROOP 0.0 HUB LENGTH C/L TO BASE: 2.5 CH TO TIP: 26.90 4 INCH HOLE IN AIR SEAL: NO BALANCE WT.: COLOR CODE:	
AIR PERFORMANCE DATA	
ELEVATION: Ft. AIR TEMPERATURE: ° DENSITY RATIO: ACFM/FAN: RPM: PHUD: INLET CORRECTION: STATIC PRESSURE: "WG VELOCITY PRESSURE: "WG TOTAL PRESSURE: "WG VELOCITY THROUGH FAN: FPM TIP CLEARANCE: " EFFICIENCY: BHP REQUIRED: *MOTOR HP: *MAXIMUM APPLIED TORQUE: FT.LBS. THEORETICAL NO. OF BLADES: BLADE LOAD FACTOR:	
CAUTION: * MAXIMUM APPLIED TORQUE USING FACTOR OF NOMINAL TIMES (FACTORY SHOULD BE NOTIFIED IF MAX. APPLIED TORQUE OR MOTOR HP IS GREATER THAN THE VALUE SHOWN.)	
ADDITIONAL NOTES:	MARKS: P.O. NO. 13070 JOB NO. J693



NOTES			
THE MOORE COMPANY JOB NO. 59914			
FIN-X, INC. P.O. NO. 13070			
FIN-X, INC. JOB NO. J693			

							BUSHING	F	G	MAX BORE
							SF	2.5"	2.1"	2.688"
BLADE LOAD 100% 75%										
DIA.	A	B		C	D	E	H	I	MAX BLDS	BUSHING
4'	3.6"	1.5"	1.3"	3.5"	2.0"	0.04"	7.0"		6	SF
5'	3.0"	1.6"	1.4"	4.0"	2.0"	0.05"	7.0"			
6'	2.4"	1.9"	1.5"	4.0"	2.0"	0.06"	7.0"			
7'	1.8"	2.2"	1.8"	4.5"	2.0"	0.07"	7.0"			
8'	1.4"	2.8"	2.1"	5.0"	2.0"	0.10"	7.0"			

INDICATOR READOUTS

- 01 LOW SUCTION PRESSURE
- 02 LOW ENGINE OIL PRESSURE
- 03 HIGH ENGINE JACKET WATER TEMPERATURE
- 04 LOW COMPRESSOR OIL DIFFERENTIAL PRESSURE
- 05 HIGH SUCTION PRESSURE
- 06-07 SPARE
- 08 LOSS OF IGNITION POWER
- 09-23 SPARE
- 24 HIGH COMPRESSOR DISCHARGE PRESSURE
- 25 HIGH COMPRESSOR OIL TEMPERATURE
- 26 HIGH COMPRESSOR DISCHARGE TEMPERATURE
- 27 ENGINE VIBRATION
- 28 HIGH SUCTION SCRUBBER LEVEL
- 29 ENGINE LOW WATER LEVEL
- 30 LOW ENGINE OIL LEVEL
- 31 EMERGENCY STOP
- 32 LOW COMPRESSOR OIL LEVEL
- 33 LOW AUXILIARY WATER LEVEL
- 34 INCORRECT COMPRESSOR LOADING
- 35 HIGH OIL FILTER DIFFERENTIAL PRESSURE
- 36 COOLER VIBRATION
- 37 FIRE LOOP
- 38 COMPRESSOR VIBRATION
- 39-44 SPARE
- 45 ENGINE OVERSPEED
- 47 MANUAL STOP

NOTES:

- FUNCTIONS 1-15 ARE TIMED FOR START-UP.
- TUBING: STAINLESS STEEL
FITTINGS: STEEL
- FACTORY WIRING: _____
CUSTOMER WIRING: - - - - -
- DO NOT CONNECT SENSOR LEADS TO #48 OR #49.
- RUN A GROUND STRAP TO BACKPLATE OF POWER SUPPLY.
- INSTALL A JUMPER BETWEEN ANY UNUSED TERMINALS (SEE EXAMPLE ON TERMINAL BLOCK PIN #15).
- INSTALL A JUMPER BETWEEN ANY TERMINALS WIRED TO A NORMALLY OPEN SENSOR.
- ALL WIRING 18AWG, UNLESS OTHERWISE NOTED.
- PANEL IS SUITABLE FOR CLASS I, DIV. 1, GROUP D LOCATION.
- LAST WIRE NUMBER USED: 18-BL-S45

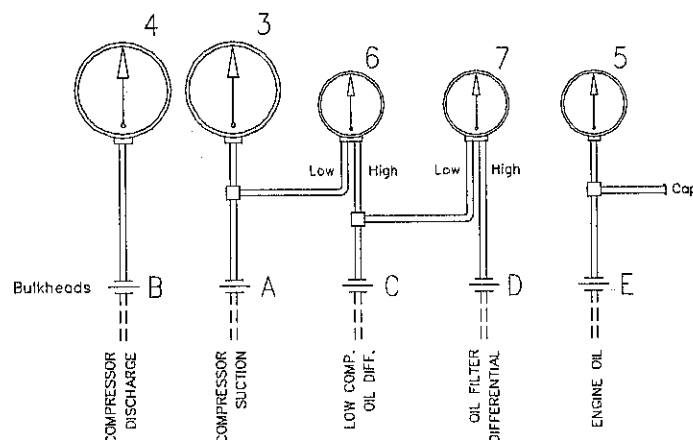
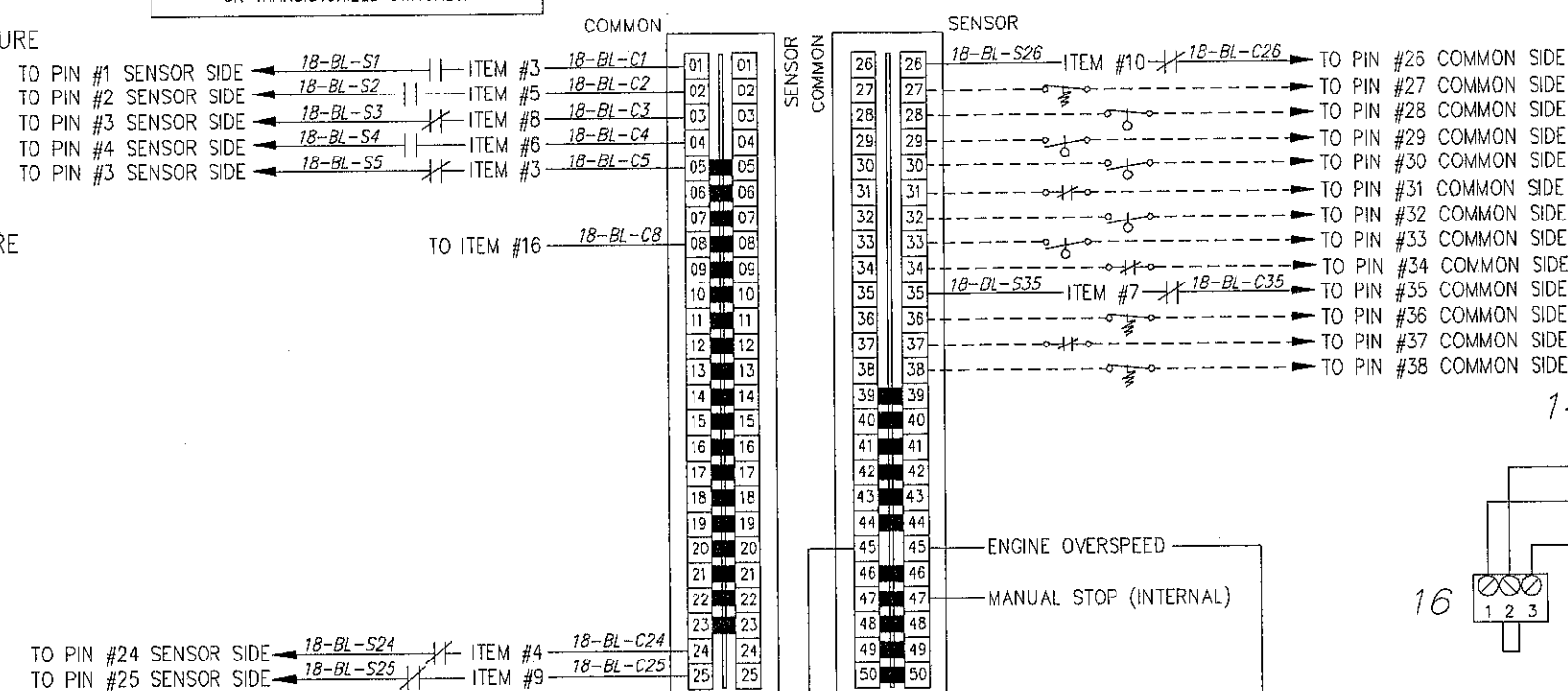
PANEL LEGEND

ITEM	MFR.	MODEL NO.	DESCRIPTION
1.	MURPHY	LCDT-NC-2	"SELECTRONIC TATTLETALE" ANNUNCIATOR W/2 MINUTE TIMER
2.	MURPHY	SHD45	DIGITAL TACHOMETER/HOURMETER W/OVERSPEED
3.	MURPHY	45PEF-R-200	SUCTION PRESSURE "SWICHGAGE"
4.	MURPHY	45PEF-R-400	DISCHARGE PRESSURE "SWICHGAGE"
5.	MURPHY	A25PEF-100	ENGINE OIL PRESSURE "SWICHGAGE"
6.	MURPHY	25CDPEF-200-SF60	LOW DIFFERENTIAL OIL PRESSURE "SWICHGAGE"
7.	MURPHY	25CDPEF-50-SR25	HIGH OIL FILTER DIFFERENTIAL "SWICHGAGE"
8.	MURPHY	A25TEF-250-16-SR220	HIGH ENGINE JACKET WATER TEMPERATURE "SWICHGAGE"
9.	MURPHY	A25TEF-250-16-SR167	HIGH COMPRESSOR OIL TEMPERATURE "SWICHGAGE"
10.	MURPHY	A25TEF-300-16-SR225	HIGH DISCHARGE TEMPERATURE "SWICHGAGE"
11.	MURPHY	LCDT-PS-CDN	POWER SUPPLY
12.	MURPHY	LCDT-100CA-36	TERMINAL BLOCK & CABLE ASSEMBLY
13.	ALTRONIC	690 107	BARRIER
14.	ALTRONIC	693-106-1	CABLE
15.	MURPHY	50230007	30 X 24 X 9 PAINTED ENCLOSURE
16.	ALTRONIC	691-029	LOSS OF IGNITION POWER ADAPTER

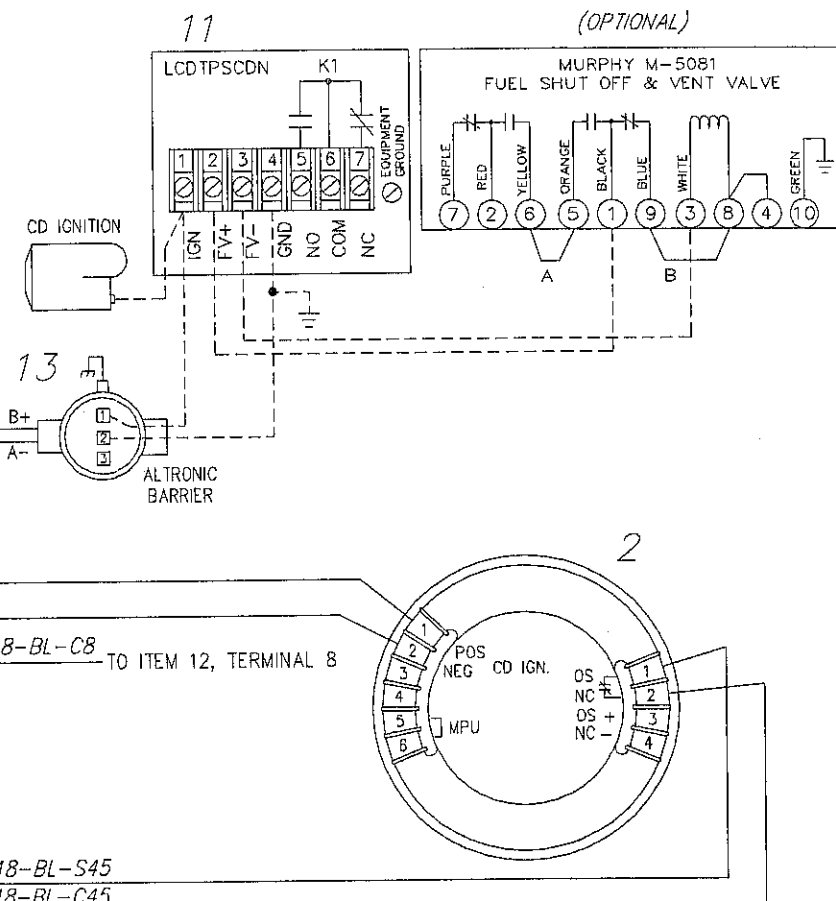
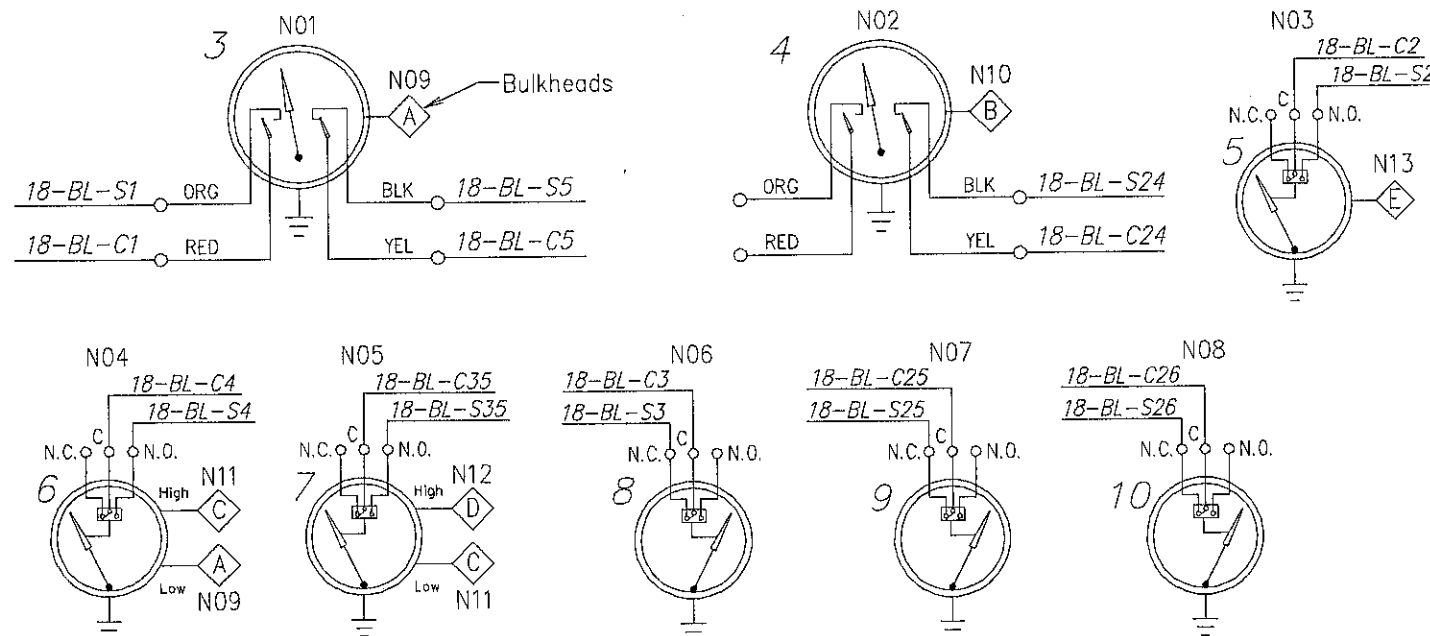
ALL SWITCHES CONNECTED TO THIS TERMINAL BLOCK MUST BE DRY CONTACT MECHANICAL SWITCHES. DO NOT USE RELAY CONTACTS OR TRANSISTORIZED SWITCHES.

- WARNING -
DO NOT ROUTE HIGH VOLTAGE OR IGNITION LEADS IN CONDUIT RACEWAY OR CABLE WITH SENSOR LEADS

NOTE: ANY MODIFICATION OF THE PANEL MAY ALTER THE THIRD PARTY APPROVAL OF THE UNIT. PLEASE CONTACT POWER IGNITION CONTROLS FOR CLARIFICATION.



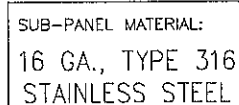
TUBING DIAGRAM



POWER IGNITION CONTROLS LTD.

DRAWN BY BF				 CONTROL SYSTEMS & SERVICES - ROSENBERG, TX FOR STARTEC REFRIGERATION WIRING DIAGRAM	
CHK'D BY					
APP'D BY					
DATE 11-12-99					
SCALE None				SHEET 1 OF 1	
REV. "A"				DESCRIPTION	
ECR #				DATE	
CHK				DATE	
THIS DOCUMENT, DRAWING, SKETCH, OR SCHEMATIC PLAN IS THE PROPERTY OF FRANK W. MURPHY MFR. AND COVERS SWICHGAGE®, CONTROLS AND/OR CIRCUIT ON WHICH U.S. & FOREIGN PATENTS HAVE BEEN ISSUED OR APPLIED FOR. NO PART MAY BE REPRODUCED OR USED WITHOUT THE CONSENT OF THE OWNER.					
MURPHY MFR. IS NOT RESPONSIBLE FOR COPIES OF THIS DRAWING NOT HAND SIGNED BY OUR ENGINEERS.					
YOUR NO. 38999		OUR NO. M99-161-013		REV.	
DWG. NO. 50-30-1881					

ITEM NUMBERS CORRESPOND TO PANEL LEGEND ON DRAWING NO. 50-30-1881



UNLESS OTHERWISE NOTED
DIMENSIONS ARE IN INCHES
.xx $\pm .030$ ANGLES $\pm 2^\circ$
.xxx $\pm .010$ $\sqrt{125}$
FRACTIONS $\pm 1/16$

CAUTION: Contains I.S. Circuits
WARNING: Disconnect power before servicing.
WARNING: Substitution of parts may impair
Classification.

QTY.	CLASS/DISP	DESCRIPTION	PART #
1	B 01	LOW SUCTION PRESSURE	50225282
	B 02	LOW ENGINE OIL PRESSURE	
	B 03	HIGH ENGINE JACKET WATER TEMP.	
	B 04	LOW COMPRESSOR OIL DIFF. PRESSURE	
	B 05	HIGH SUCTION PRESSURE	
	B 08	LOSS OF IGNITION POWER	
	A 24	HIGH COMPRESSOR DISCHARGE PRESSURE	
	A 25	HIGH COMPRESSOR OIL TEMPERATURE	
	A 26	HIGH COMPRESSOR DISCHARGE TEMPERATURE	
	A 27	ENGINE VIBRATION	
	A 28	HIGH SUCTION SCRUBBER LEVEL	
	A 29	ENGINE LOW WATER LEVEL	
	A 30	LOW ENGINE OIL LEVEL	
	A 31	EMERGENCY STOP	
	A 32	LOW COMPRESSOR OIL LEVEL	
	A 33	LOW AUXILIARY WATER LEVEL	
	A 34	INCORRECT COMPRESSOR LOADING	
	A 35	HIGH OIL FILTER DIFFERENTIAL PRESSURE	
	A 36	COOLER VIBRATION	
	A 37	FIRE LOOP	
	A 38	COMPRESSOR VIBRATION	
	A 45	ENGINE OVERSPEED	
	A 47	MANUAL STOP	

INDIVIDUAL NAMEPLATE SCHEDULE				
QTY.	TAG #	LETTERS/TAG	DESCRIPTION	PART #
1	N01	W/B	SUCTION PRESSURE	50225266
1	N02	W/B	DISCHARGE PRESSURE	50225266
1	N03	W/B	ENGINE OIL PRESSURE	50225266
1	N04	W/B	LOW DIFFERENTIAL OIL PRESSURE	50225266
1	N05	W/B	HIGH FILTER DIFFERENTIAL PRESSURE	50225266
1	N06	W/B	HIGH ENGINE JACKET WATER TEMPERATURE	50225266
1	N07	W/B	HIGH COMPRESSOR OIL TEMPERATURE	50225266
1	N08	W/B	HIGH DISCHARGE TEMPERATURE	50225266
1	N09	W/B	SUCTION	50225307
1	N10	W/B	DISCHARGE	50225307
1	N11	W/B	COMP OIL DIFFERENTIAL	50225307
1	N12	W/B	OIL FILTER DIFFERENTIAL	50225307
1	N13	W/B	ENGINE OIL	50225307
1	N15	W/B	M99-161-013	50225318



FRANK W.
murphy
MER

PANEL LAYOUT

YOUR NO.	38999	OUR NO.	M99-161-013
----------	-------	---------	-------------

50-29-1881

REV.

THIS DOCUMENT, DRAWING, SKETCH, OR SCHEMATIC PLAN IS THE PROPERTY OF FRANK W. MURPHY MFR. AND
COVERS SWITCHGAGE®, CONTROLS AND/OR CIRCUIT ON WHICH U.S. & FOREIGN PATENTS HAVE BEEN ISSUED
OR APPLIED FOR. NO PART MAY BE REPRODUCED OR USED WITHOUT THE CONSENT OF THE OWNER.

MURPHY MFR. IS NOT RESPONSIBLE FOR COPIES OF THIS DRAWING NOT HAND SIGNED BY OUR ENGINEERS.

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by Provisions of the ASME Code Rules, Section VIII, Division 1 A

1. Manufactured and certified by E & D PIPE AND PROCESS EQUIPMENT LTD., #2B, 624 BEAVERDAM ROAD N.E.
(Name and address of Manufacturer) CALGARY, AB. T2K 4W6

2. Manufactured for STARTEC REFRIGERATION SERVICES LTD., 6700-9TH STREET N.E., CALGARY, AB.
(Name and address of Purchaser)

3. Location of installation B26I93P7 (B.C.L.S.D.)
(Name and address)

4. Type: VERTICAL SUCTION SCRUBBER/BLOWCASE 9997
(Horizontal, vertical, or sphere) (Tank, separator, jacket, vessel, heat exch., etc.) (Mfg's serial No.)

L2936.21 D-8526-09-01-REV.2A 1999
(ICRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 1998 N/A N/A
Edition and Addenda (date) Code Case No. Special Service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6. Shell (a) No. of course(s): 1 (b) Overall length (ft & in.): 8'0"

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	2'-5 1/4"	6'-4"	SA-516-70N		.375	.063	1	SPOT	.85	1	SPOT	.85	N/A	N/A

7. Heads: (a) SA-516-70N (b) SA-516-70N
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp. (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	TOP	3.125	.063			2:1					CONCAVE			
(b)	BTM	2'-5"	.063						2'-5 1/4"		FLAT			

If removable, bolts used (describe other fastening) N/A
(Mat'l Spec. No., Grade, size, No.)

8. Type of jacket N/A Jacket closure N/A
(Describe as ogee & weld, bar, etc.)

bar, give dimensions N/A
9. MAWP 250 — psi at max. temp. 230 — °F Min. design metal temp. -20 °F at 250 psi.
(Internal) (external)

10. Impact test EXEMPT PER UG-20(f)
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. 375 PSI Proof test

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: N/A
Stationary (Mat'l Spec. No.) Dia., in. (subject to press.) Nom. thk., in. Corr. Allow., in. Attachment (welded or bolted)

Floating (Mat'l Spec. No.) Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes: N/A
Mat'l Spec. No., Grade or Type O.D., in. Nom. thk., in. or gauge Number Type (Straight or U)

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s) 1 (b) Overall length (ft & in.): 1'-8"

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	2'-5 1/4"	1'-8"	SA-516-70N		.375	.062	1	SPOT	.85	1	SPOT	.85	N/A	N/A

15. Heads: (a) SA-516-70N (b) SA-516-70N
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp. (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	TOP	2.5	0.63			2:1			2'-5 1/4"					
	BTM	.325	0.63								CONCAVE			

If removable, bolts used (describe other fastening) N/A
(Mat'l Spec. No., Grade, size, No.)

FORM U-1

16. MAWP 250 (Internal) (external) psi at m. amp. 230 (Internal) (external) °F. Min. design temp. -20 °F at 250 psi.

17. Impact test EXEMPT PER UG 20(F) (1-5)

(Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test press. 375 PSI Proof test _____

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Nom. Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
				SEE ATTACHED U-4 FORM							

20. Supports: Skirt YES (Yes or no) Lugs 2 (No.) Legs _____ (No.) Others _____ (Describe) Attached BTM/TOP/WELDED (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:
(List the name of part, item number, mfg's. name and identifying number)

22. Remarks: VOL. 43 CU. FT. VERT. SUCTION SCRUBBER/BLOWCASE V-100 UW-11(b) IMPACT TEST EXEMPT PER UG-20 (f)
PSV BY OTHERS UG-125(g) MANUFACTURERS DRAWING D-9997-09-01-REV. 1
INTERMEDIATE HEAD 2.5" SA-516-70N FLAT PLATE

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

U Certificate of Authorization No. 28,992 Expires JUNE 18th, 2002

Date 2000/01/04 Name E & D PIPE AND PROCESS EQUIPMENT LTD. Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ALBERTA and employed by ALBERTA BOILER SAFETY ASSOCIATION of ALBERTA have inspected the pressure vessel described in this Manufacturer's Data Report on JAN 6, 2000, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date JAN 6, 2000 Signed [Signature] Commissions ALBERTA #4
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1.

U Certificate of Authorization No. _____ Expires _____

Date _____ Name _____ Signed _____
(Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____ psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ Commissions _____
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by E & D Pipe & Process Equipment Ltd., 2, Bldg. B, 624 Beaverdam Rd, NE, Calgary, AB, T2K 4W6
(Name and address of Manufacturer)

2. Manufactured for Canadian Hunter Exploration, 2800, 605 5th Avenue SW, Calgary, Alberta
(Name and address of Purchaser)

3. Location of installation Canadian Hunter Stock
(Name and address)

4. Type: Vert. Suction Scrubber - Blowcase 9997
(Horiz., vert., or sphere) (Tank, separator, heat exh., etc.) (Mfg's. serial No.)

L 2936.21 D-9997-09-01 Rev 1 N/A 1999
(CRN) (Drawing No.) (Nat'l Bd. No.) (Year Built)

Data Report
 Item Number 10
 Continued from Form U1a

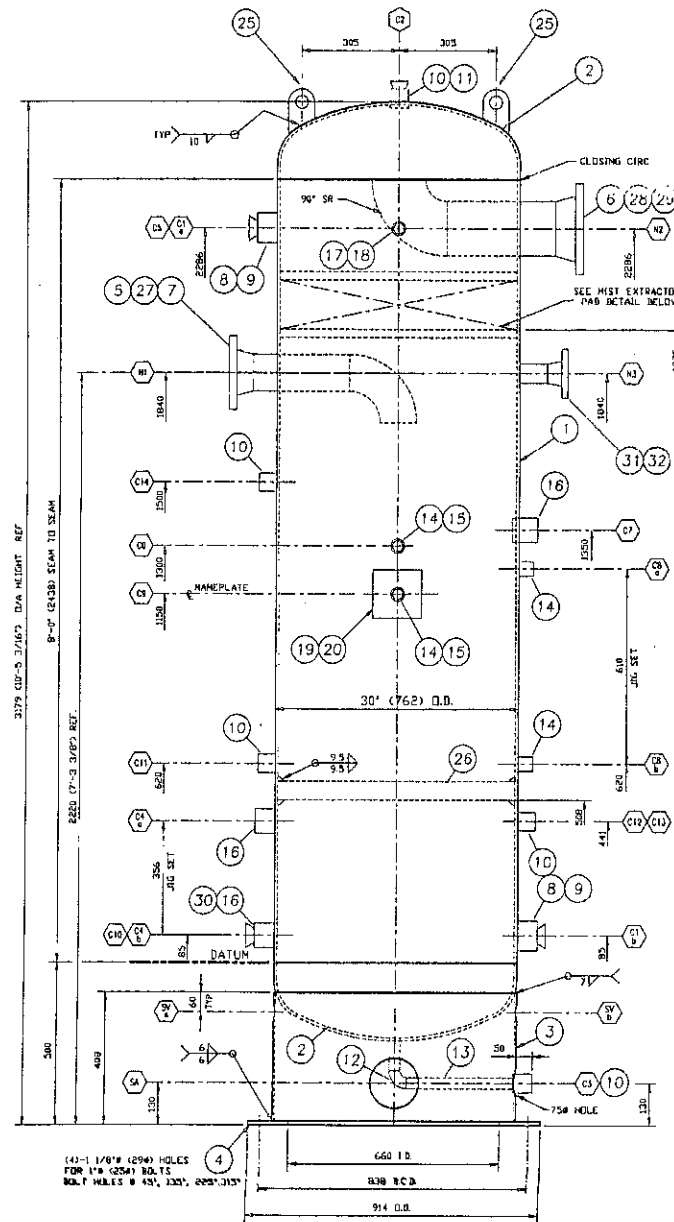
Remarks

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Mat'l	Nom. Thk.	Reinforcement Mat'l	How Attached	Location
INLET	1	4" 150#	RFWN	SA -106B	.337"	INHERENT	UW-16.1(C)	SHELL
GAS OUTLET	1	6" 150#	RFWN	SA -106B	.432"	INHERENT	UW-16.1(C)	SHELL
BYPASS	1	2" 150#	RFWN	SA -106B	.343"	INHERENT	UW-16.1(C)	SHELL
INSPECTION	2	2" 6000#	CPLG	SA -105N		INHERENT	UW-16.1(k)	SHELL
VENT	1	1" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	TOP HEAD
DRAIN	1	1" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	BOTT. HEAD
L.C.	2	1 1/2" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
P.I.	1	1/2" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
PSV	1	3/4" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
HLSD	1	1 1/2" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
LG	2	3/4" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
TI	1	3/4" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
LSHH	1	1-1/2" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
DRAIN	1	1" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
BLOWCASE INLET	1	1" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
BLOWCASE PRESS.	1	1" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL
VENT	1	1" 6000#	CPLG	SA -105 N		INHERENT	UW-16.2(k)	SHELL

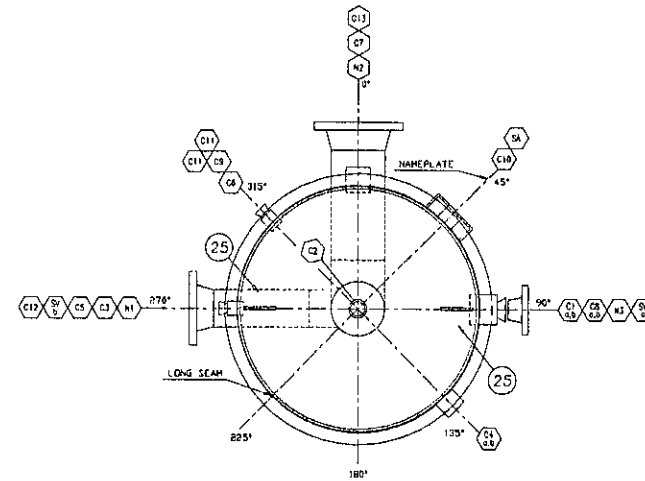
Certificate of Authorization: Type "U" No. 28.992 Expires JUN 18, 20 02

Date JAN 6, 2000 Name E & D Pipe & Process Equipment Ltd. Signed [Signature]
(Manufacturer) (Representative)

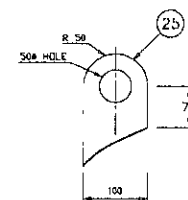
Date JAN 6, 2000 Name [Signature] Commission ALBERTA #4
(Authorized Inspector) (Nat'l Board incl. Endorsement, State, Province and No.)



ELEVATION
(NOT TRUE ORIENTATION)



ORIENTATION
TRUE ORIENTATION



LIFT LUG
SCALE: 1:4

NOTE 1
SA-516-70N MAY BE SUBSTITUTED FOR SA-516-70
SA-333-6 MAY BE SUBSTITUTED FOR SA-105-8
SA-350-LF2 MAY BE SUBSTITUTED FOR SA-105
SA-420-WPL6 MAY BE SUBSTITUTED FOR SA-234-WPB

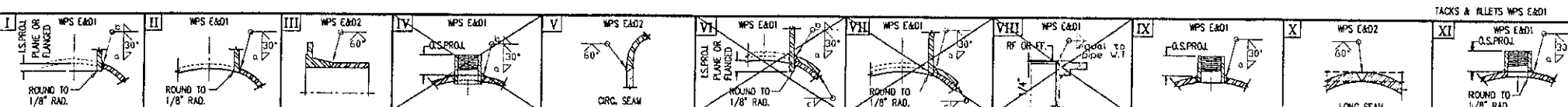
NOZZLE SCHEDULE											
MARK	SIZE	RATING	FACING	SCH	SERVICE	INT. PROC.	EXT. PROC.	WELD DET. DIM.	WELD SIZE	WELD WPS	
N1	4"	150#	RFVN	150	INLET	See Dwg	See Dwg	1/8"	3/8"	3/8"	
N2	6"	150#	RFVN	150	OUTLET	See Dwg	See Dwg	1/8"	3/8"	3/8"	
N3	2"	150#	RFVN	150	BYPASS	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C1A,B	2"	6000#	CPLG C/W PLUG	-	INSPECTION	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C2	2"	6000#	CPLG C/W PLUG	-	VENT	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C3	1"	6000#	CPLG	160	DRAIN	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C4A,B	1 1/2"	6000#	CPLG	-	LC	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C5	1 1/2"	6000#	CPLG C/W PLUG	-	PL	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C6	3/4"	6000#	CPLG C/W PLUG	-	PSV	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C7	1 1/2"	6000#	CPLG	-	ALSD	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C8A,B	3/4"	6000#	CPLG	-	LC	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C9	3/4"	6000#	CPLG C/W PLUG	-	LC	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C10	1 1/2"	6000#	CPLG C/W PLUG	-	LSH	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C11	1"	6000#	CPLG	-	DRAIN	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C12	1"	6000#	CPLG	-	BLOWCASE INLET	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C13	1"	6000#	CPLG	-	BLOWCASE PRESSURE	See Dwg	See Dwg	1/8"	3/8"	3/8"	
C14	1"	6000#	CPLG	-	VENT	See Dwg	See Dwg	1/8"	3/8"	3/8"	
SA	6"				ACCESS	See Dwg	See Dwg	1/8"	3/8"	3/8"	
SV A,B	2"				VENT	See Dwg	See Dwg	1/8"	3/8"	3/8"	

BILL OF MATERIAL					
ITEM	QTY	DESCRIPTION	MATERIAL	COMMENTS	
1	1	752 (30") O.D. x 9.5 (3/8") THK ROLLED PL. x 2438 (8'-0") S/S LG.	SA-516-70		
2	2	752 (30") O.D. x 7.62 (3/8") THK 2:1 SE HEAD C/W 2" STR. FLG. (MM. J1257)	SA-516-70		
3	1	752 (30") O.D. x 9.5 (3/8") THK ROLLED PL. (SEE DWG.)	SA-516-70		
4	1	914 (36") O.D. x 660 (26") LG. x 13 (1/2") THK GASK. RING (SEE DWG.)	SA-36		
5	1	114 (4") - 150# RFVN FLANGE - SCH 40	SA-105		
6	1	114 (4") - 150# RFVN FLANGE - SCH 40	SA-105		
7	1	114 (4") - SCH 40 90° ELB.	SA-234-WPB		
8	2	60 (2") - 6000# FULL COUPLING	SA-105		
9	2	60 (2") - 6000# FULL COUPLING	SA-105		
10	6	33 (1 1/2") - 6000# FULL COUPLING	SA-105		
11	1	33 (1 1/2") - 6000# FULL COUPLING	SA-105		
12	1	33 (1 1/2") - 3000# 90° SW ELB.	SA-105		
13	AS REQ'D	33 (1 1/2") - SCH 160 PIPE	SA-105B		
14	4	26 (3/4") - 6000# FULL COUPLING	SA-105		
15	2	26 (3/4") - 6000# FULL COUPLING	SA-105		
16	4	48 (1 1/2") - 6000# FULL COUPLING	SA-105		
17	1	21 (1/2") - 6000# FULL COUPLING	SA-105		
18	1	21 (1/2") - 6000# FULL COUPLING	SA-105		
19	1	NAME PLATE BRACKET	SA-516-70N		
20	1	NAME PLATE	SS		
21	2	EXPANDED METAL (STD 3/4" FS)	SA-36		
22	AS REQ'D	6 (1/4") x 25 (1 1/2") FS	SA-36		
23	1	151 (6") THK x 743W MESH PRO	304 SS		
24	2	PL 13 (1/2") x 100 (4") x 125 (5") CUT TO SIZE	SA-516-70N		
25	1	732 (28") O.D. x 57 (2 1/2") PLATE	SA-516-70N		
26	1	114 (4") - SCH 40 PIPE	SA-105-B		
27	1	114 (4") - SCH 40 PIPE	SA-105-B		
28	1	114 (4") - SCH 40 PIPE	SA-105-B		
29	1	114 (4") - SCH 40 90° SW ELB.	SA-234-WPB		
30	1	48 (1 1/2") - 6000# FULL COUPLING	SA-105		
31	1	2" 150# RFVN SCH 160	SA-105		
32	1	2" 150# SCH 160	SA-105B		

NAME PLATE DATA				DESIGN DATA			
CERTIFIED BY E&D Pipe and Process Equipment Ltd. CALGARY, ALBERTA ASME SECTION VIII DIV.1 MAX. ALL. W.P. 250 PSI AT 100 °F MIN. DES. MET. TEMP. -20 °F AT 250 PSI SERIAL NO. 1293621 CAN. REG. NO. 1293621 SHELL THK. 9.52 MM WT. 660 LB HEAD THK. 3/8 IN MAT'L 43 CULI CODE 02-001 CA 36.1 IN 16 MM VESSEL TYPE SUCTION SCRUBBER				NOMINAL CAPACITY 45/773 L21 / 4266 TYPE SUCTION SCRUBBER DIAMETER 752 / 30" O.D. SHELL LENGTH 2438 / 96' 5/8" SHRT 598 / 15' 5/8" DESIGN PRESSURE 150 / 10.34 MPa DESIGN TEMPERATURE 110 / 230 °F CORROSION ALLOWANCE 1.6 / 1/16" INTERVALS WIND VELOCITY 150 / 75 M/S SERVICE SUCTION SHOTS REQUIRED 10 2-BAY LONG SPOT CIRC. SPOT (V.V. IL. 02) CODE ASME SECT. VIII DIV. 1 1998 Addenda 1998 STAMP YES CERTIFICATE YES DRAWINGS YES MAX. OPER. PRESS. 150 / 10.34 MPa MAX. OPER. TEMP. 110 / 230 °F ALLOWABLE STRESS 17500 / 1207 MPa INSULATION TYPE 75% / 1665 MOISTS 1507 / 3322 PRODUCTS STORED			

- NOTES:
- FLANGE BOLT HOLES TO STRADDLE MAJOR C'S.
 - ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED
 - IMPACT TEST EXEMPT PER UG 20 (I)
 - CRN/IN - 12936.21
 - EXTERNAL PAINT: SANDBLAST TO SSPC-SP6, 1 S/C PRIMER
 - HYDROSTATIC TEST 375 PSIG (2586 KPA)
 - VESSEL TO BE DRIED AND OILED AFTER HYDROSTATIC TEST.
 - USE DEMISTER STD 0-STD-09-01 REV 0
 - HYDROTEST BLOWCASE AND SEPARATOR SEPARATELY

NO.	DATE	REVISION	NO.	DATE	REVISION	APPROVED FOR CONST'N.	
0	99-11-24	ISSUED FOR FABRICATION				BY: _____	
1	99-12-01	REVISED C/D/S DETAILS				DATE: _____	
E & D PIPE and PROCESS EQUIPMENT LTD.						P. E. STAMP	
CALGARY, ALBERTA						This drawing is the exclusive property of E & D, is confidential, must not be made public or copied without authorization, and is subject to return on demand. All rights of design are reserved.	
TITLE: SUCTION SCRUBBER / BLOWCASE						ENGINEER: STARTEC REFRIGERATION	
CUSTOMER P.O.: 57708						CUSTOMER: CANADIAN HUNTER 38999	
DRAWN BY: PG						EQUIPMENT NO.: V-100	
CHECKED BY: SHM						D-9997-09-01	
DATE: 99-11-24						REV. NO. 1	
DATE: 99-11-24							



FORM 1-1A MANUFACTURERS DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

(A) 427808

1. Manufactured and certified by E & D Pipe & Process Equipment Ltd., 2 Bldg. B, 624 Beaverdam Rd, NE, Calgary AB, T2K 4W6
(Name and Address of Manufacturer)

2. Manufactured for Canadian Hunter Exploration 2800, 605-5th Avenue SW, Calgary, Alberta
(Name and address of purchaser)

3. Location of installation B26I93P7 (B.C.L.S.D.)
(Name and address)

4. Type Vert. 9998 L1188.21 D-9998-09-01 Rev 1 N/A 1999
(Horiz. or vert., tank) (Mfr's serial No.) (CRN) (Drawing No.) (Nat'l Bd. No.) (Year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 1998
to 1998 N/A N/A
Year

6. Shell: SA-106 B .375" .063" 1' 11 1/4" 8' 0"
Addenda (Date) Code case Nos. Special Service per UG-120(d)
Matl. (Spec. No., Grade) Norm. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

7. Seams: N/A None 100 N/A N/A TYPE 1 Spot 1
Long (Welded, Dbl., Singl., Lap, Butt) R. T. (Spot or Full) Eff. (%) H.T. Temp. (° F) Time (hr) Girth (Welded, Dbl., Singl., Lap, Butt) R.T. (Spot, Partial, or Full) No. of Courses

8. Heads: (a) Matl. SA - 516-70N (b) Matl. SA- 516-70N
(Spec. No., Grade) (Spec. No., Grade)

	Location (Top Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	Top	.3125"	.063"			2:1				CONCAVE
(b)	Btm	.3125"	.063"			2:1				CONCAVE

If removable, bolts used (describe other fastenings) N/A
(Matl., Spec. No., Gr., Size, No.)

9. MAWP 250 psi at max. temp. 230 °F
Min. design metal temp. -20 °F at 250 psi. Hydro., pneu., or comb. test pressure 375 psi.

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
				SEE ATTACHED	U-4	FORM		

11. Supports: Skirt NO Lugs 2 Legs Other Base Ring Attached Btm/Top/Welded
(Yes or no) (No.) (No.) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: N/A

(Name of part, item number, Mfr's. name and identifying stamp)

Vol. 24.7 cu. ft. Vert Oil Separator V-110 UW-11(a)5(b)
Impact Test Exempt PER UG-20(f)

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1. "U" Certificate of Authorization No. 28,992 expires June 18, 20 02
Date DEC-23/99 Co. name E & D Pipe & Process Equipment Ltd. Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by E & D Pipe & Process Equipment Ltd. at 2 Bldg. B, 624 Beaverdam Rd, NE, Calgary, AB
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and / or the State or Province of Alberta and employed by Alberta Boiler Safety Association
Have inspected the component described in this Manufacturer's Data Report on DEC 23, 19 99, and state that, to the best of My knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date DEC 23, 99 Signed [Signature] Commissions ALBERTA #4
(Authorized Inspector) (Nat'l Board (incl. endorsements), State, Prov. and No.)

FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by E & D Pipe & Process Equipment Ltd., 2, Bldg. B, 624 Beaverdam Rd, NE, Calgary, AB, T2K 4W6
(Name and address of Manufacturer)

2. Manufactured for Canadian Hunter Exploration 2800, 605-5th Avenue SW, Calgary, Alberta
(Name and address of Purchaser)

3. Location of installation TBA
(Name and address)

4. Type: Vertical Oil Separator V-110 9998
(Horiz., vert., or sphere) (Tank, separator, heat exch., etc.) (Mfg's. serial No.)

L-1188.21 D-9998-09-01 Rev 1 N/A 1999
(CRN) (Drawing No.) (Nat'l Bd. No.) (Year Built)

Data Report
 Item Number 10
 Continued from Form U1a

Remarks

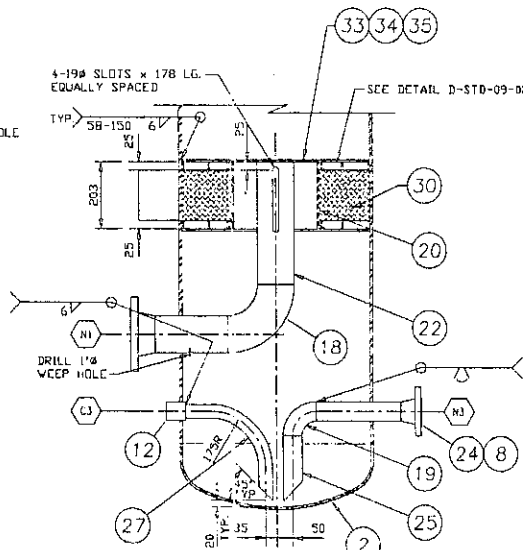
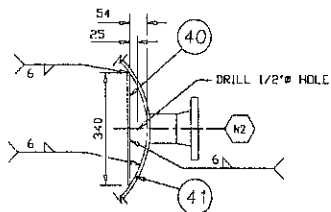
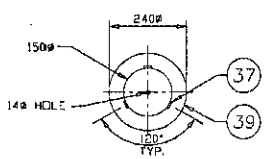
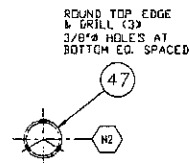
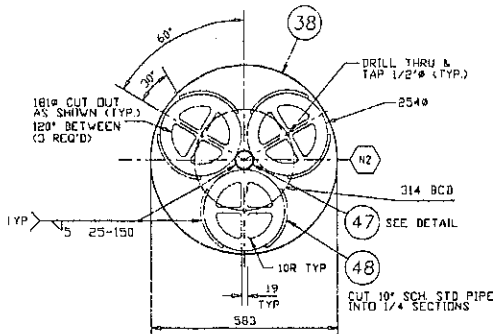
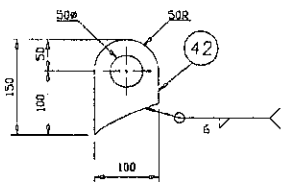
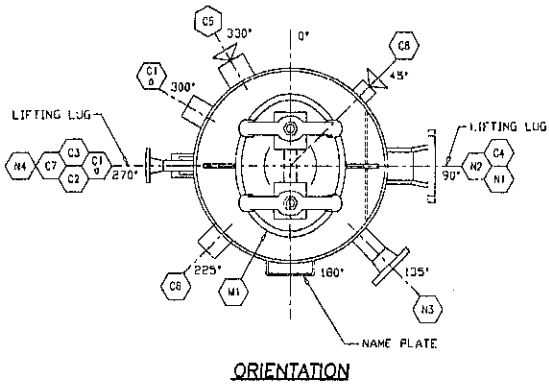
Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Mat'l	Nom. Thk.	Reinforcement Mat'l	How Attached	Location
Con't From	Form	U1A						
Item #10								
Inlet	1	4" 150#	RFWN	SA-106B	.337	INHERENT	UW 16.1(c)	Shell
Gas Outlet	1	3" 150#	RFWN	SA-106B	.300	INHERENT	UW 16.1(c)	Shell
Oil Outlet	1	2" 150#	RFWN	SA-106B	.344	INHERENT	UW 16.1(c)	Shell
PSV	1	1 1/2"	RFSO	SA-106B	.281	INHERENT	UW 16.1(c)	Shell
Oil Sight Glass	2	1 1/2"	CPLG	SA-105-N		INHERENT	UW 16.2(k)	Shell
Filter Sight Glass	1	1 1/2"	CPLG	SA-105-N		INHERENT	UW 16.2(k)	Shell
Siphon Drain	1	1"	CPLG	SA-105-N		INHERENT	UW 16.2(k)	Shell
Filter Drain	1	3/4"	CPLG	SA-105-N		INHERENT	UW 16.2(k)	Shell
Spare	1	1 1/2"	CPLG w/plug	SA-105-N		INHERENT	UW 16.2(k)	Shell
LLSD	1	1 1/2"	CPLG	SA-105-N		INHERENT	UW 16.2(k)	Shell
T1	1	3/4"	CPLG	SA-105-N		INHERENT	UW 16.2(k)	Shell
Spare	1	1"	CPLG w/plug	SA-105-N		INHERENT	UW 16.2(k)	Shell
Manway	1	16"X12"ID	Elliptical	SA-106 B/C	1"	INHERENT	UW 16.1(c)	Top Head

Certificate of Authorization: Type "U" No. 28,992 Expires JUN 18, 20 02

Date DEC 23/99 Name E & D Pipe & Proces Equipment Ltd Signed [Signature]
(Manufacturer) (Representative)

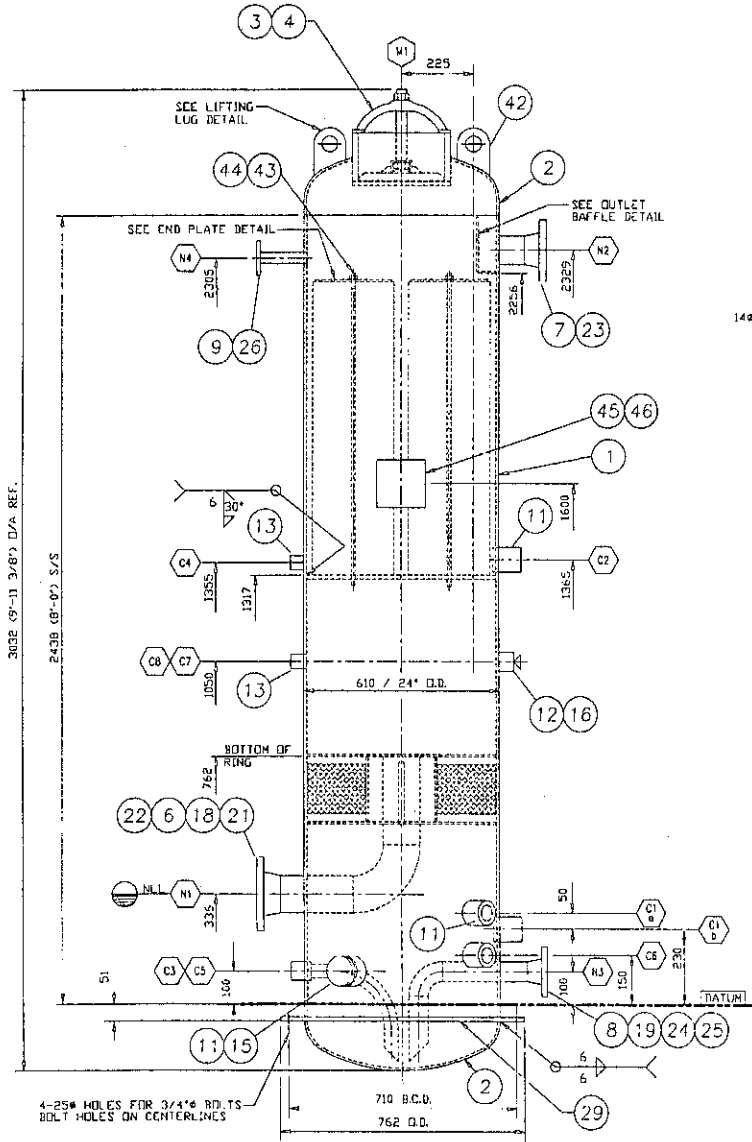
Date DEC 23, 99 Name [Signature] Commission ALBERTA #4
(Authorized Inspector) (Nat'l Board incl. Endorsement, State, Province and No.)

(12/91) This form (E00118) may be obtained from the ASME Order Dept., 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300



REV. 1 NOTES
ROTATED LIFTING LUGS
ADDED BCD

TACKS AND FILLET'S END 1



ITEM	QTY	DESCRIPTION	MATERIAL	COMMENTS
43	3	13 (1/2") ROUND BAR x 305 LG. THREADED 3/2 OMC SIDE/50 OTHER	SA-36	
44	3	13 (1/2") HEX NUT	SA-36	
45	1	NAME PLATE BRACKET	SA-516-70	
46	1	60 (3") SCH STD PIPE x 25 LG.	SA-106-B	
47	1	273 (10") SCH STD PIPE x 25 LG. (CUT INTO 1/4 SECTIONS)	SA-106-B	

WAVE	SIZE	RATING	FACTORS	SCH	SERVICE	HYPRO	EXT. PRO	WELD DET	WELD SIZE	WELD WPS
N1	4"	150	RFWN	3H	WLEY	SEE DWG	150	1/8	6.74	9
N2	3"	150	RFWN	3H	GAS OUTLET	0	150	1/8	6.03	
N3	2"	150	RFWN	3H	OIL OUTLET	SEE DWG	150	1/8	6.74	
N4	1 1/2"	150	RFWN	3H	PSY	0	150	1/8	5.54	
C1	1 1/2"	6000	CPLG		OIL SIGHT GLASS	MM	MAX	1/2"	5.74	
C2	1 1/2"	6000	CPLG		FILTER SIGHT GLASS	MM	MAX	1/2"	5.74	
C3	1 1/2"	6000	CPLG		SYNTHON GEAR	MM	MAX	1/2"	5.74	
C4	3/4"	6000	CPLG		FILTER GEAR	MM	MAX	1/2"	5.74	
C5	1 1/2"	6000	CPLG C/W PLUG		SPARE	MM	MAX	1/2"	5.74	
C6	1 1/2"	6000	CPLG		USO	MM	MAX	1/2"	5.74	
C7	3/4"	6000	CPLG		SPARE	MM	MAX	1/2"	5.74	
C8	1"	6000	CPLG C/W PLUG		SPARE	MM	MAX	1/2"	5.74	
M1	12" x 12" LG.			1" THK	WAYWAY	25	SPEC	1	6.35	8.62

ITEM	QTY	DESCRIPTION	MATERIAL	COMMENTS
1	1	610 (24") O.D. x 0.5 (3/8") WT SCH STD PIPE x 2438 (9'-0") S/S LG.	SA-106-B	
2	2	610 (24") O.D. x 0.5 (3/8") MIN. 7/8" x 31/32" THK 2:1 SE HEAD C/W 2" STL FLG.	SA-516-70	
3	1	ELLIPTICAL RING 25 (1") THK x 406 (16") x 305 (12")	SA-106-B OR C	
4	1	WAYWAY CORNER C/W FITTINGS & NEOPRENE GASKET	SA-516-70	
5				
6	1	114 (4") - 150# RFWN FLANGE - SCH 3H	SA-105	
7	1	86 (3") - 150# RFWN FLANGE - SCH 3H	SA-105	
8	1	86 (3") - 150# RFWN FLANGE - SCH 180	SA-105	
9	1	48 (1 1/2") - 150# RFSG FLANGE	SA-105	
10				
11	5	48 (1 1/2") - 6000# FULL COUPLING	SA-105	
12	2	33 (1") - 6000# FULL COUPLING	SA-105	
13	2	27 (3/4") - 6000# FULL COUPLING	SA-105	
14				
15	1	48 (1 1/2") - 6000# HEX PLUG	SA-105	
16	1	33 (1") - 6000# HEX PLUG	SA-105	
17				
18	1	114 (4") - SCH 3H 90° LR ELL	SA-234-WPB	
19	1	86 (3") - SCH 180 90° LR ELL	SA-234-WPB	
20	1	273 (10") - SCH STD PIPE x 203 LG.	SA-106-B	
21	1	114 (4") - SCH 3H PIPE x 221 LG.	SA-106-B	
22	1	114 (4") - SCH 3H PIPE x 273 LG.	SA-106-B	
23	1	86 (3") - SCH 3H PIPE x 96 LG.	SA-106-B	
24	1	86 (3") - SCH 180 PIPE x 256 LG.	SA-106-B	
25	1	86 (3") - SCH 180 PIPE x 293 LG.	SA-106-B	
26	1	48 (1 1/2") - SCH 180 PIPE x 160 LG.	SA-106-B	
27	1	33 (1") - SCH 180 PIPE x 455 LG.	SA-106-B	
28				
29	1	762 (30'0.0" x 613 (24 1/8") LG. x 13 (1/2") THK BASE RING	SA-36	
30	1	590 O.D. x 152 DEEP x 128/FT DENSITY ROLLED DEMISTER PAD	SA-36	
31	1	1/4" PLATE 46 (5 3/4") O.D.	SA-36	
32				
33	1	6 (1/4") x 273 (10 3/4") O.D. PLATE	SA-36	
34	AS REQ'D	6 (1/4") x 25 (1 1/2") FB (CUT TO SUIT)	SA-36	
35	AS REQ'D	EXPANDED METAL	SA-36	
36				
37	9	6 (1/4") x 25 (1 1/2") x 25 (1 1/2") LG FB	SA-36	
38	1	12 (1/2") x 563 (22 1/2") O.D. PLATE	SA-36	
39	3	6 (1/4") x 240 (9 1/2") O.D. PLATE	SA-36	
40	1	6 (1/4") x 170 (6 5/8") x 340 (13 3/8") PLATE	SA-36	
41	1	6 (1/4") x 34 (1 1/8") x 340 (13 3/8") PLATE (CUT TO SUIT)	SA-36	
42	2	10 (3/8") x 100 (4") x 150 (6") PLATE (CUT TO SUIT) (LIFTING LUGS)	SA-36	

NAME PLATE DATA

CERTIFIED BY
E&D Pipe and Process Equipment Ltd.
CALGARY, ALBERTA
ASME SECTION VIII DIV.1

MAX. ALL. W.P. 250 PSIG AT 250 °F
MIN. DES. W.P. 1724 KPa AT 250 °F
SERIAL NO. 110882
CAN. REG. NO. 110882
SHELL THK. 3/8" IN WALT
HEAD THK. 3/8" IN WALT
CODE UNK128 C.A. 353 IN 14 MM
VESSEL TYPE HIL. SEPARATOR

DESIGN DATA

NOMINAL CAPACITY	W/FT	0.69 / 24.7	TYPE	HTL. SEPARATOR
DIAMETER	MM/M	610 / 24" O.D.		
SHELL LENGTH	MM/M	2438 / 96' S/S		
DESIGN PRESSURE	MM/PSI MAX. & 1724 / 250		VACUUM	N/A
DESIGN TEMPERATURE	°C/°F	110 / 230		-29 / -20
CORROSION ALLOWANCE	MM/IN	1.6 / 1/16"		NO
WIND VELOCITY	M/S (FT/S)	1.6 / 1/16"		INTERMEDIATE
SERVICE			NO	NO
STRESS RELIEVED			NO	NO
E-RAV	E=1.0		LONG N/A	CIRC SPDT
CODE			ASME SECT. VIII DIV.1 1998	
STAMP			YES	
CERTIFICATE			YES	
DRAWINGS			YES	
WALDOPTPRESS	MM/PSI			
WALDOPTTEMP	°C/°F			
ALLOWABLE STRESS	MM/PSI	SHELL: 1500 / 103.4	HEAD: 17500 / 120.7	
INSULATION TYPE				
WEIGHTS	KG/LBS EMPTY	1006 / 2218		
		FLOODED	1696 / 3769	
PRODUCTS STORED				
HIGHEST PRESSURE	MM/PSI	2500 / 375 (H & C)		

NOTES:

- FLANGE BOLT HOLES TO STRADDLE MAJOR C'S.
- ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED
- IMPACT TEST EXEMPT PER UG 20 (I)
- CRN/M - L1108.2
- EXTERNAL PAINT: SANBLAST TO SSPC-SP6, 1 S/C PRIMER
- INTERNAL SURFACES TO BE PICKLED AFTER HYDROTEST

NO. DATE REVISION
0 95/11/24 ISSUED FOR FABRICATION
1 99/12/01 REVISED PLUS WELD DETAIL

NO. DATE REVISION
APPROVED
DATE: 11/1/99

E & D PIPE and PROCESS EQUIPMENT LTD.
CALGARY, ALBERTA CANADA

TITLE: VERTICAL OIL SEPARATOR
24" (610mm) O.D. x 8'-0" (2438) S/S
CUSTOMER P.O.: 57708
CONTRACT NO.: 9998-SK
EQUIPMENT NO.: V-110
DRAWN BY: PD
CHECKED BY: SMA
DATE: 99-08-21
SCALE: 1:10
DWG. NO.: D-9998-09-01
REV. NO.: 1

ENGINEER: STARTEC REFRIGERATION
CUSTOMER: CANADIAN HUNTER 38999

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P. E. STAMP

