9- flash vessel (V-327)

9-a: UIA.

(A) 646898

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

(Alternative Form for Single Chamber, Completely Shop or Field Fabricated Vessels Only)
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by Spectrum Process Systems Inc. 285175 Kleysen Way, Rocky View , Alberta. T1X 0K1 Canada
(Name and address of manufacturer)

2. Manufactured for Husky Energy. 707-8th Avenue SW. Box 6525, Station "D" Calgary, Alberta T2P 3G7
(Name and address of manufacturer)

3. Location of installation LSD: 02-20-050-18 W5M
(Name and address)

4. Type Vertical Flash Vessel (Horizontal or virtical, tank) | 14-05110-33 (Manufacturer's serial number) | W7305.21 (CRN) | V-14-05110-33-001 R.0 (Drawing numbers) | - (National Board number) | 2014 (Year built)

5. ASME Code, Section VIII, Division 1 2013 Ed. [Edition and Addenda, it applicable (date)] | N/A (Code Case numbers) | N/A (Special service per UG 120(d)I

6. Shell SA-106B (Material spec. number, grade) | 3/8" (Nominal thickness) | .0625" (Corr. allow) | 1'-7 1/4" (Inner diameter) | 5'-0" [Length overall])

Body Flange on Shell

No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting: Num & Size	Bolting: Bolting Material	Bolting: Washer (OD, ID, thik)	Bolting: Washer Material
-	-	-	-	-	-	-	-	-	-	-	-	-

7. Seams Seamless [Long .(welded dbl,sngl.,lap,butt)] | N/A (R.T.(spot or full)) | 100% (Eff.,%) | N/A (H.T. temp.) | N/A (Time, hr) | Type1 (Girth (welded, dbl, sngl, lap, butt)) | Spot R.T. (spot or full)) | 70% (Eff.,%) | 1 (No. of courses)

8. Heads: (a) Material SA-516-70N (Spec. no., grade) (b) Material SA-516-70N (Spec. no., grade)

	Location (Top, Bottom, End)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side Pressure (Convex or Concave)
(a)	Top Head	.3125"	.0625"	-	-	2:1	-	-	-	Concave
(b)	Bot Head	.3125"	.0625"	-	-	2:1	-	-	-	Concave

Body Flange on Head

No.	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting: Num & Size	Bolting: Bolting Material	Bolting: Washer (OD, ID, thik)	Bolting: Washer Material
(a)	-	-	-	-	-	-	-	-	-	-	-	-
(b)												

9. MAWP 270 PSIG (Internal) | 15 PSIG External | at max. temp. 150 F (Internal) | 150 F External

Min. design metal temp. -20 F at 270 PSIG Hydro., ~~pneu., or comb~~. test pressure 405 PSIG

Proof test N/A

10. Nozzles, inspection, and safety valve opening:

Purpose (Inlet, Outlet, Drain etc.)	No.	Diameter or Size	Type	Material: Nozzle	Material: Flange	Nozzle thickness: Nom.	Nozzle thickness: Corr.	Reinforcement Material	Attachment Details: Nozzle	Attachment Details: Flange	Location (Insp. Open.)
LSHH/LC/LSLL/Insp.	3	4"	RFWN/CL150	SA-106B	SA-105N	.337"	.0625"	Integral	UW16.1(c)	Type1	Shell
Gas outlet/Insp.	1	3"	RFWN/CL150	SA-106B	SA-105N	.300"	.0625"	Integral	UW16.1(c)	Type1	Head
Gly In/Skim out/Skim LG/TI	5	2"	RFWN/CL150	SA-106B	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Shell
Gly LG/Gly out/PSV/Gas in	5	2"	RFWN/CL150	SA-106B	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Shell
Drain	1	2"	RFWN/CL150	SA-106B	SA-105N	.344"	.0625"	Integral	UW16.1(c)	Type1	Head

11. Supports: Skirt Yes (Yes or No) Lugs N/A (Number) Legs N/A (Number) Other N/A (Describe) Attached Welded to Bot. Head (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 Manufacturer's name and identifying stamp)

-20 F All Materials Exempt from impact test per UG-20(f)(1-5). Tag # V-327

Volume: 11.9 Cu.ft (.34 Cu.M) PSV Installed by other as per UG-125 Construction DWG. NO: V-14-05110-33-001 R.0

FORM U-1A (Back)

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. 'U" Certificate of Authorization Number 21,356 expires July 21,2016

Date December 15, 2014 Co. name Spectrum Process Systems Inc. (Manufacturer) Signed Hassan (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

Vessel constructed by Spectrum Process Systems Inc. 285175 Kleysen Way, Rocky View , Alberta. T1X 0K1 Canada

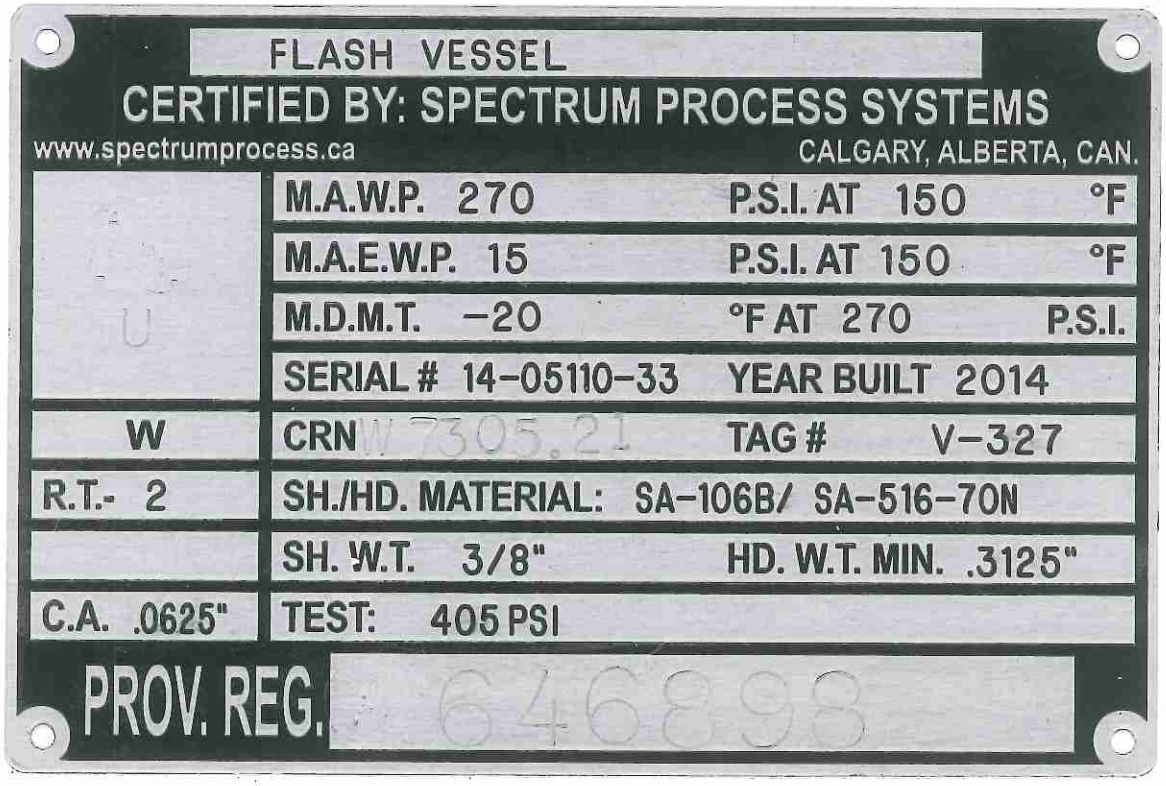
I, the undersigned holding valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by ABSA, Calgary, Alberta, Canada

have inspected the component described in this Manufacturer's Data Report on DEC 17/14 , and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall liable in any manner for any personal injury, property damage or a loss of any kind arising from or connected with this inspection,

Date DEC 17/14 Signed (Authorized Inspector) Commissions NB 11039 AB-61 (National Board (incl. endorsements))

(04/14)

9_b: NIP + CRN


FLASH VESSEL
CERTIFIED BY: SPECTRUM PROCESS SYSTEMS
www.spectrumprocess.ca
CALGARY, ALBERTA, CAN.
M.A.W.P. 270 P.S.I. AT 150 °F
M.A.E.W.P. 15 P.S.I. AT 150 °F
M.D.M.T. −20 °F AT 270 P.S.I.
SERIAL # 14-05110-33 YEAR BUILT 2014
U
W
CRN W7305.21 TAG # V-327
R.T.- 2
SH./HD. MATERIAL: SA-106B/ SA-516-70N
SH. W.T. 3/8" HD. W.T. MIN. .3125"
C.A. .0625"
TEST: 405 PSI
PROV. REG. 646898

ABSA
the pressure equipment safety authority

9410 - 20 Ave N.W.
Edmonton, Alberta, Canada T6N 0A4
Tel: (780) 437-9100 / Fax: (780) 437-7787

November 20, 2014

Attention: Joe Laing
SPECTRUM PROCESS SYSTEMS INC
285175 KLEYSEN WAY SE
ROCKYVIEW COUNTY, AB

The design submission, tracking number 2014-06646, originally received on August 15, 2014 was surveyed and accepted for registration as follows:

CRN : W7305.2 **Accepted on:** November 20, 2014

Reg Type: New Design

Drawing No. : V-14-05110-33-001 Rev 0 As Noted

Description	MAWP	Design Temperature	MDMT
Internal Pressure	1862kPa	66 °C	-29 °C
External Pressure	103kPa	66 °C	-29 °C

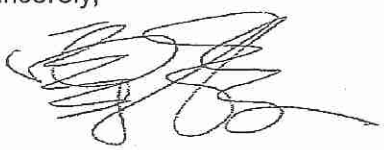
The registration is conditional on your compliance with the following notes:

This design is accepted for registration based on the understanding that:
- In accordance to UG-99 (d), we are issuing the following note: the requirement of UG-99 does not specify an upper limit for hydrostatic test pressure. However, if the hydrostatic test pressure is allowed to exceed, either intentionally or accidently, the value determined to a degree that the vessel is subjected to visible permanent distortion, the Inspector shall reserve the right to reject the vessel.

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

If you have any question don't hesitate to contact me by phone at (780) 433-0281 or fax (780) 437-7787 or e-mail su@absa.ca.

Sincerely,



SU, YI, E.I.T.

9 - C: Travel sheet.

TRAVEL SHEET

A.I. REVIEW Dough	REVIEW DATE: 12. August. 2014							
VES. TYPE: Flash Vessel	SERIAL # 14-05110-33	JOB #:		Final Dstn.			
DESCRIPTION	FAB DWG#V-14-05110-33-001 R.0	CRN		TASK COMPLETION DATES			
20" OD60" S/S X3/8" WT	CRN# V-14-05110-33-001 R.0			AND INSPECTORS INITIALS			
ITEM	TAG#:V-327	Q.C.I.	DATE	A.I.	DATE	3RD Party	DATE
1) Calclations in file			Aug11,14				
2) Release of approved Constuction Dwgs		Howe	Aug11,14	DB 13 Aug 2014		AY	16 OCT 14
3) Weld /Mat'l Impact Test	EXEMPT to -20 F	Asher	8/6/14				
4) Heat Numbers recorded on Travel Sheet (backside)		Asher	9/10/14	OCT 2 8 2014		AY	13/Jan/15
5) M.T.R.'s checked		Asher	9/9/14			AY	13/Jan/15
6) Weld Procedures Checked		Howe	Aug 12/14	DB 13 Aug 2014.		AY	16 OCT 14
7) Shell and Head Thicknesses Measured		Asher	9/5/14			AY	13/Jan/15
8) Nozzles and Fittings Fitted		Asher				AY	13/Jan/15
9) Nozzle orientation Checked		Asher				AY	13/Jan/15
10) Noz/Flg/TOL/CPLG rating checked		Asher				AY	↓
11) Noz/Flg/TOL/CPLG Mat'l Spec./Grade checked		Asher	↓			AY	↓
Material Inspection		Asher	9/10/14				
13.1) Internals- Final or Progress	**13) Final Internal Inspection**	Asher	8/28/14	LGB	Aug28/14		
Top Head	14) Shell and Head Fitted	Asher	9/9/14	~~OCT 2 8 2014~~		AY	13/Jan/15
Top Sec	15) Weld size checked	Asher	9/10/14	~~OCT 2 8 2014~~ OCT 2 8 2014		AY	
Mid-Top Sec	16) Welder I.D.& Welder Qualification checked	Asher	8/28/14			AY	
Mid-Mid Sec	17)ATTACHMENTS	Nplate Brkt	9/10/14			AY	
Mid-Btm Sec	18) Attachments I.D.	Asher	9/10/14			AY	
Btm Sec	**19) Radiography**	**RT-2**	9/7/14			AY	↓
Btm Head	20) Other NDT	VISUAL/UT(9/9/14)	9/10/14				
	21) Serial # Hard Stamped by NP Brkt.	Asher	8/28/14	LGB	Aug28/14	AY	13/Jan/15
	22)Full Dia. Break Flgs. Stamped as per UG-116(L)					AY	13/Jan/15
	23)Btm Head HT# trans. to Straight Flg.	Asher	9/10/14			AY	13/Jan/15
	24) Final External Insp. Prior to PWHT	**PWHT - NO**					
	25) Stress Chart checked						
	26) Final External with Hydro		Howe	OCT 2 8 2014			
	27)HYDROTESTING/ VESSEL Water temp. min. 40°F	405 psi Ga# F20/T414	OCT 28/14	~~OCT 2 8 2014~~ OCT 2 8 2014		AY	28 OCT 14
	HECI/HECO(Non-B & PV Code)	kPa psi Ga#					
	28) Nameplate Stamped	Howe	OCT 28/14	M	DB 13 Aug 2014	AY	13/Jan/15
	29) Accepted CRN drawing	Howe	V	A	DB 13 Aug 2014	AY	13/Jan/15
	30) Manuf. Data Report	Howe	L	A	DB 13 Aug 2014	AY	13/Jan/15
	31) Partial Data Reports						
	32) Nameplate Installed	Howe	L				
	33) NCR Cleared						

* DENOTES AN A.I. INSPECTION POINT
* * DENOTES AN A.I. HOLD POINT
AUTHORIZED INSPECTOR SHALL BE GIVEN TRAVEL SHEET PRIOR TO CONSTRUCTION SO THAT HE CAN DESIGNATE INSP. AND HOLD POINTS

Vessel Travel Sheet

DESCRIBTION			THICK. SHELL&HEAD							WELD SYMBOLS CATEGORY							
ITEM	LOC	DIAMETER	NOM	MEAS HDS MIN	DWG HDS MIN	MATERIAL SPEC	HEAT NUMBER			LOC.	A	FIT UP	B	HEAT #'S			TYPE 1 JOINT
SHELL#1		20"	3/8"	.376		SA-106B	934528					✓			TOLS	CPLGS	
SHELL#2														.5"			
SHELL#3														.75"			
SHELL#4														1"			
SHELL#5														1.5"			
SHELL#6														1.75"			
HEAD #1		20"	3/8"	.376	.3125"	SA-516-70N	90640-670100106			C1		✓	JJ	2"			
HEAD #2		20"	3/8"	.382	.3125"	SA-516-70N	90640 670100107			C2		✓	JJ	MISC HEAT #'S			
BLIND														MISC HEAT #'S			
BOOT HEAD #1																	
MANWAY NECK																	
BRK. FLG. (TOP)														POISON PADS			
BRK. FLG. (BTM)																	
														SADDLE WEAR PADS			
														SKIRT 934528 (SA106B)			

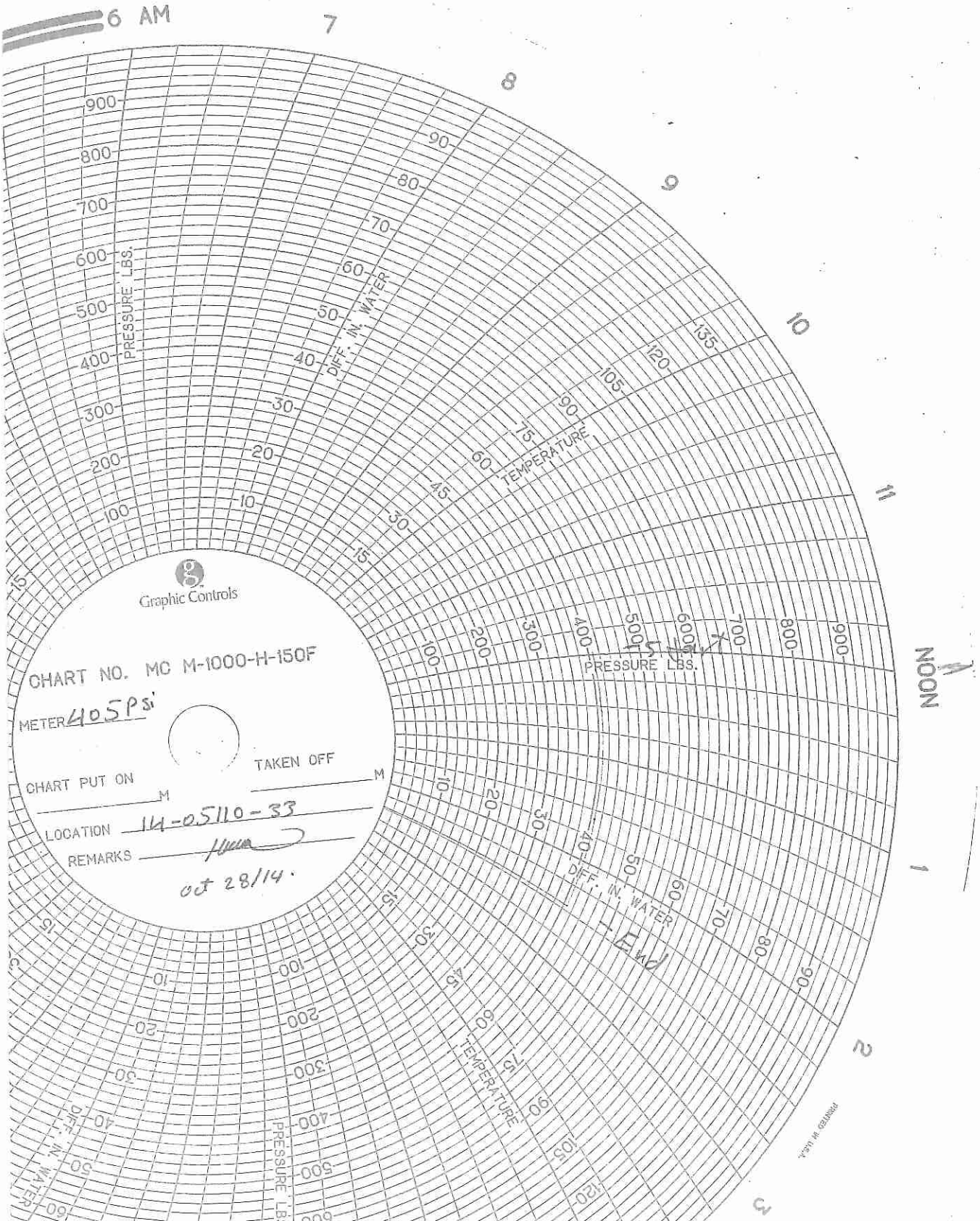
NOZ #	DIA	W.T.	PIPE CODE	MATERIAL SPEC	HEAT #	B	C	D	FIT UP	FLANGE/ FITTING HT #	FILLET WELD SIZES W41	W42	W43	INT. PROJ H	WPS #
N1	2"	.347	C	SA-105N/SA-106B	24718		JJ	JJ	✓	4625126	3/8"	-	BW	SF	6
N2	3"	.318	80	SA-105N/SA-~~106B~~ 333-6	574722		JJ	JJ	✓	12/33426	3/8"	-	BW	SF	6
N3	2"	.344	C	SA-105N/SA-~~106B~~ 333-6	24718		JJ	JJ	✓	14/79141	3/8"	-	BW	SF	6
N4A	2"	.343	C	SA-105N/SA-~~106B~~ 333-6	"		NN	JJ	✓	4625126	3/8"	-	BW	SF	6
N4B	2"	.345	C	SA-105N/SA-106B	"		NN	JJ	✓	14/79141	3/8"	-	BW	SF	6
N5A	2"	.343	C	SA-105N/SA-106B	"		JJ	JJ	✓	4625126	3/8"	-	BW	SF	6
N5B	2"	.346	C	SA-105N/SA-106B	"		JJ	JJ	✓	"	3/8"	-	BW	SF	6
N6	2"	.348	C	SA-105N/SA-~~106B~~ 333-6/WPB	24718 /826A		JJ	KK	✓	4625126	3/8"	-	BW	CF	6
N7	2"	.344	C	SA-105N/SA-~~106B~~ 333-6	24718		JJ	JJ	✓	"	3/8"	-	BW	SF	6
N8	4"	.335	80	SA-105N/SA-106B	W2103971		NN	JJ	✓	8518/13	3/8"	-	BW	SF	6
N9	4"	.337	80	SA-105N/SA-106B	"		NN	JJ	✓	"	3/8"	-	BW	SF	6
N10	2"	.343	C	SA-105N/SA-~~106B~~ 333-6	24718		JJ	JJ	✓	4625126	3/8"	-	BW	SF	6
N11	2"	.346	C	SA-105N/SA-106B	24718		NN	JJ	✓	4625126	3/8"	-	BW	SF	6
N12	2"	.345	C	SA-105N/SA-~~106B~~	24718		NN	JJ	✓	4625126	3/8"	-	BW	SF	6
N13	4"	.331	80	SA-105N/SA-106B	W2103971		JJ	JJ	✓	8518/13	3/8"	-	BW	SF	6

REPAD #	Req. WT	Act. WT	I.D.	OD	MAT'L SPEC	HEAT NUMBER				FIT UP			

SERIAL #: 14-05110-33

FINAL DSTN. JOB #:

9-d: Hydro.


6 AM
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NOON
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PRESSURE LBS.
DIFF. IN. WATER
TEMPERATURE
Graphic Controls
CHART NO. MC M-1000-H-150F
METER 405 psi
CHART PUT ON
TAKEN OFF
LOCATION 114-05110-33
REMARKS
oct 28/14.
PRINTED IN U.S.A.

CALIBRATION REPORT

SYSTECH INSTRUMENTATION INC.
#9, 1815 - 27 Avenue N.E.
Calgary, Alberta T2E 7E1
Phone (403) 291-3535
Fax (403) 291-3585

CALGARY
MEDICINE HAT
WAINWRIGHT

IM 57305

DATE: Oct 27/14. DATE LAST CALIBRATED: RENTAL.

OPERATING COMPANY: SPECTRUM PROCESS SYSTEMS P.O. #

LOCATION: SHOP ☐ WELL ☐ BATTERY ☐ PLANT AREA: Calgary

DEVICE TYPE: Barton SERIAL NUMBER: 545028. JOB NUMBER: 5110.

DIFFERENTIAL RANGE: — ☐ W.C. ☐ kPa STATIC RANGE: 1000 ☑ psig ☐ psia ☐ kPa ☐ kPaA

TEMPERATURE RANGE: 0-150 ☑ °F ☐ °C

METER READINGS

	DIFFERENTIAL	STATIC	TEMPERATURE
Before			
After			

ZERO READINGS: Found Left

Differential:

Static:

METER RUN SIZE;

Upstream: ☐ in. ☐ m.m.

Downstream: ☐ in. ☐ m.m.

ORIFICE FITTING;

Make: ☑ Slow ☐ Quick

☐ FLANGE ☐ Condition ☐ O.K.

☐

DIFFERENTIAL			STATIC		
Pressure Source	Output Found	Output Left	Pressure Source	Output Found	Output Left
			0		0
			200		200
			400		400
			600		600
			800		800
			1000		1000

TEMPERATURE		
Temperature Input	Found	Left
32		36
68		68
139		139

ORIFICE PLATE; Size: CONDITION: ☐ O.K. ☐ Rejected

SPECIFIC GAS GRAVITY: Sample Point: ☐ Meter Run ☐ Separator ☐ Treater

MANIFOLD; ☐ Over ☐ Under Properly in Service: ☐ Yes ☐ No Dampening: ☐ O.K. ☐ Adjusted

Valves: ☑ O.K. ☐ Leaking ☐ Seized ☐ Repaired DRIFLOW PENS; ☐ O.K. ☐ Adjusted Tension: ☑ O.K. ☐ Adjusted

Inking: ☑ O.K. ☐ Adjusted CLOCK ROTATION; ☐ 7 DAYS ☐ 24 HOURS ☑ ELECTRONIC

Comments:	Parts:		
INSPECT METER			
CLEAN & INSPECT LINKAGE			
CHECK ARC & PENS.			
CHECK CALIBRATION AS			
PER ATTACHED.			
		Labour	
		Vehicle	
		SUB TOTAL	

Calibration Standard S/N 10469. Traceable to NIST

Standard File No. 836/8366608

Approved By: Tech.:

Form: 04166004