



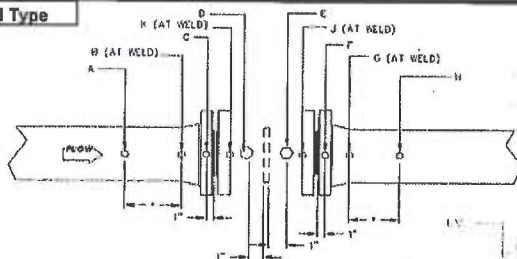
MEASUREMENT SYSTEMS

Meter Tube Calibration Record

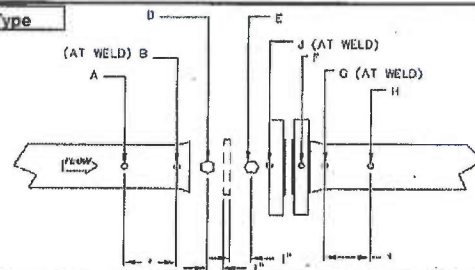
General Specifications

| | | | |
|-------------------------|---------------------------------------|---------------------|-----------------|
| Customer: | RJV Gas Field Services | Date: | January 7, 2014 |
| Location: | Husky Oil Operations | P.O. Number: | 130524 |
| Serial No. | 12016646510 | Work Order No. | 120166465 |
| Assembly Part No. | 9A-MR_53_0128C | Part No. | 40553-33221 |
| Orifice Fitting: | 3" 600# Sch 80 Dual Chamber Meter Run | Meter Tube Type No. | 2 |
| Str. Vane / Flow Cond.: | | Yes | X No |

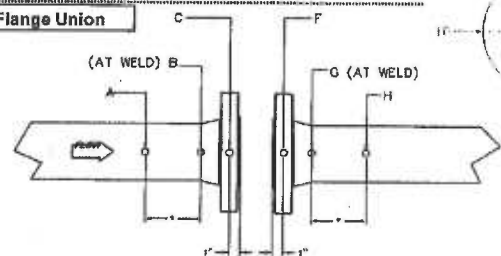
Type 1 Flanged Type



Type 2 Flangeweld Type



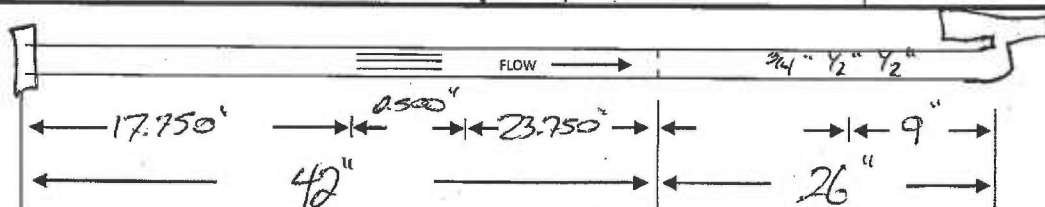
Type 3 Orifice Flange Union



Type 4 weldneck Type Valve or Door
Check Location Point A-B-D on Upstream Tube,
Point E-G-H on Downstream Tube

*Cross section 'A' and 'H' shall be one pipe diameter
except if such Cross Section falls within the lifting or weld
it shall be made 1" inside the pipe

| Location | Upstream Meter Tube | | | | | Downstream Meter Tube | | | | |
|---|---------------------|-------|-------|-------|---|---|-------|-------|-------|-------|
| | A | B | C | D | K | E | F | G | H | J |
| V | 2.900 | 2.900 | | 2.899 | | 2.899 | 2.912 | 2.908 | 2.902 | 2.897 |
| LV | 2.900 | 2.905 | | 2.898 | | 2.898 | 2.914 | 2.905 | 2.900 | 2.894 |
| RV | 2.899 | 2.898 | | 2.900 | | 2.903 | 2.915 | 2.915 | 2.903 | 2.897 |
| H | 2.901 | 2.891 | | 2.902 | | 2.900 | 2.915 | 2.897 | 2.898 | 2.901 |
| Average | 2.900 | 2.899 | | 2.900 | | 2.900 | 2.915 | 2.906 | 2.901 | 2.897 |
| Upstream Mean Average to Stamp on I.D. Plate | | | 2.900 | | | Downstream Mean Average to Stamp on I.D. Plate | | | 2.900 | |



| | | | | | | |
|----------------------------|------|--------------------|-----------------|-----|------------|-----|
| AGA/API Figure 3 (2000) | 0.70 | Meter Tap Location | Upstream | N/A | Downstream | N/A |
| Remarks: 68* | | Inspector: | Chris Robertson | | | |



www.c-a-m.com
Tel.: 403-291-4818
Calgary, AB
NQS-01 Rev.6
01/07/2014



Cameron Measurement Systems
3707 - 97th Street
Edmonton, Alberta, Canada T6E 6J2

**QUALITY CONTROL
INSPECTION REPORT**

Customer: RJV Gas Field Svcs.

Date: January 31, 2014

Location: Husky Oil Operations

Purchase Order No.: 130524

Serial No.: 12016646510

Orifice Fitting: 3" 600# Sch 80 Dual Chamber Meter Run

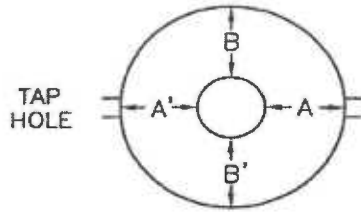
Assembly No.: 9A-MR_53_0128C

Hydrostatic Test Pressure: 2225

Meter Tube Design Standard API 14.3

Duration: 15 Minutes

ECCENTRICITY



Horizontal $(A - A')/2$

0.003"

0.005"

Vertical $(B - B')/2$

0.002"

0.003"

Measurement Instrument:

Mitutoyo Dial Indicator

PRESSURE TAP HOLE VARIATION

Distance from Plate & Hole Diameter

| Upstream | Hole | Downstream | Hole |
|----------|--------|------------|--------|
| 1.004" | 0.374" | 1.001" | 0.377" |

Measurement Instrument:

PAV Electronic Depth Gauge

SURFACE ROUGHNESS

Roughness Measurement Location

Upstream Tube, One Pipe Diameter from Weld

Upstream at Pressure Tap Hole

Downstream at Pressure Tap Hole

Downstream 1" from End of Flange

Microinches

44

54

102

101

Measurement Instrument:

Mitutoyo 212 Surftester

DIFFERENTIAL TEST

Water Hydrostatic Method at 50 psi

Duration 5 Minutes Minimum

Visual: No Leaks

Measurement Instrument:

McDaniels Gauge 0 -100 psi

Work Order #: 120166465

Lorne Dagg / Fiona O'Neill



the pressure equipment safety authority

Certificate of Authorization Permit

Quality Management System

Expiry Date: **December 9, 2016**

Reg. No.: **AQP-5046**

CAMERON MEASUREMENT SYSTEMS DIVISION

7944 - 10 STREET N.E.
CALGARY, ALBERTA

having complied with the provisions of the SAFETY CODES ACT, is hereby authorized to perform the activities identified in the following table:

| | <u>Construction</u> | <u>Repair</u> | <u>Alter</u> |
|-----------------|---------------------|---------------|--------------|
| Fittings | | | |
| Category F | Shop | Shop | Shop |



As a condition of this permit, the holder is required to participate in interim audits by a safety codes officer to verify that the quality management system is being maintained in a manner acceptable to a safety codes officer.

Dated at Edmonton, this 6th day of December, 2013

Chief Inspector and Administrator

Certificate No.: 9601

**NUFLO™ DUAL CHAMBER
ORIFICE FITTING**

PART NO. 40553-33221
SERIAL NO. 12016646510
SIZE 3.0 BORE 2.900
SWP 1480 FLG 600
TRIM SWEET

CRN (ASME CODE) 0F01120.2C



TO REMOVE PLATE FROM CHAMBER

1. CLOSE ORIFICE CHAMBER (INDEX ORIFICE OUT OF OPERATION)
2. OPEN BLEED VALVE.
3. OPEN CHAMBER LID (REMOVE TWO TOP NUTS ONLY).
4. REMOVE ORIFICE PLATE (PRY ON HOLES IN RETAINER HANDLE).

TO PLACE ORIFICE PLATE IN OPERATION

1. REPLACE ORIFICE WITH OUTLET ON PLATE AND SEAL ON RETAINER FACING UPWARD.
2. CLOSE LID.
3. CLOSE BLEED VALVE.
4. OPEN EQUALIZING VALVE.
5. OPEN ORIFICE CHAMBER (INDEX ORIFICE INTO OPERATION).
6. CLOSE EQUALIZING VALVE.

NUFLO™ METER RUN

ASSY
NO.

9A-MR_53_0128C

SERIAL NO. 12016646510
PIPE SIZE 3.0
AGA / API 3 (2000)
W.O. NO. 120166465

U/S DIA. 2.900 D/S DIA. 2.900
SCH 80 RATING 600
MAT'L WCB DATE 01/14

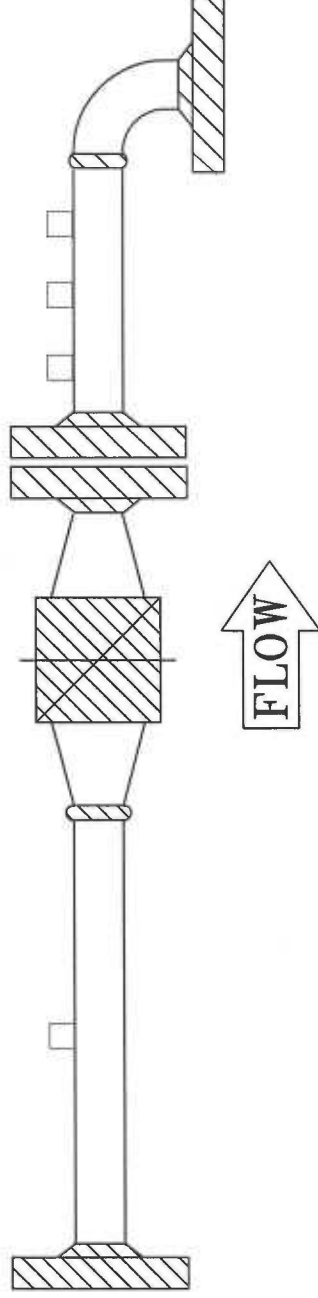
CALIBRATION
CERT'D BY

CAMERON

CRN (ASME CODE) 0F01120.2C



WELD AND RADIOGRAPHY IDENTIFICATION MAP



DESCRIPTION: 3" 600# Sch 80 Dual Chamber Meter Run

SERIAL No.: 12016646510

CUSTOMER: RJV Gas Field Services

P/O No.: 130524 TAG No.: N/A

W/O No.: 120166465 END USER: Husky Oil Operations

RADIOGRAPHY UNIT: N/A

WELDER: Jeff Harrington FILE No.: W-23651

DATE: January 2014 Lorne Dagg

SYMBOL: "T" QUALITY ASSURANCE INSPECTOR



CAMERON MEASUREMENT SYSTEMS

7944 - 10th STREET N.E.

CALGARY, AB. T2E 8W1