

FRAC SHACK™

HAND OVER AGREEMENT		DATE: 06-20-19
FRAC SHACK UNIT: E127	TRAILER: T116	PLATE: STF956
GENERATOR UNIT:	TRAILER:	PLATE:
RT UNIT:	TRAILER:	PLATE:
OTHER:	OTHER:	OTHER:

FROM: FRAC SHACK <u>Inc</u>	TO: FRAC SHACK <u>FSI</u>
<u>Rob Metzinger</u> RESPONSIBLE REPRESENTATIVE	<u>Dustin Neubauer</u> RESPONSIBLE REPRESENTATIVE

✓	Production documentation provided by FSH	✓	Reviewed by FSI/FSA
✓	Initial demob documentation provided by FSH	✓	Reviewed by FSI/FSA
		✓	Demob verified by FSI/FSA
✓	Frac Shack unit visually inspected by FSH	✓	Visually inspected by FSI/FSH
N/A	Generator unit tested/visually inspected by FSH	N/A	Inspected by FSI/FSA
N/A	NG Reel trailer inspected by FSH (if applicable)	N/A	Inspected by FSI/FSA

NOTES AND DEFICIENCIES:
Turbine Meters Calibrated based on numbers provided by Rob Metzinger, Test Sheet included

ACTIONS TAKEN OR REQUIRED:
COMPLETED _____
COMPLETED _____
COMPLETED _____
COMPLETED _____

APPROVED FOR HAND-OVER

FS # APPROVAL STAMP OR	
	6/28/19
SIGNATURE:	DATE:

FS I APPROVAL STAMP OR	
	6/28/19
SIGNATURE:	DATE:

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

SKID DELIVERY AND INSPECTION RECORD

VISUAL CHECKLIST

☒ 3" Butterfly valve on pump inlet is installed
☒ 10HP Motor, Gearbox and Pump assembly mounted and aligned
☒ Gear pinch point cover installed between pump and motor
☒ 3/4" TOL for temperature switch is present on pipe spool between pump and 3-way ball valve
☒ 3 Port 2-Way ball valve installed on pipe spool
☒ Cimtek triple filter housing installed on pipe spool
☒ 2 Winter Gauges 4" 300LB Pressure gauges mounted on pipe spool, one on each side of flow meter
☒ 567LPM flow meter mounted, bolted to stand and facing towards the inside of the skid
☒ Flow direction of flow meter confirmed to be correct and flowing towards fuel manifold
☒ 3" Butterfly valve installed in pipe spool for each fuel rail manifold (one upper and one lower)
☒ Upper and lower manifolds have 3" flange blinds installed on pipe spool
☒ Hose reel guide brackets shipped with skid and have been placed on skid platform
☒ Anti-slip coating present on flooring
☒ Secondary containment ball valve is present, with handle installed.
☒ Plug installed in the secondary containment valve.
☒ Hose rack hanger brackets shipped with skid and placed on skid platform
☒ 1 Dixon hose hangers installed and mounted on stand support
☒ 2 head holders and trays installed and mounted on stand supports
IF ANY OF THE ITEMS ABOVE ARE NON-CONFORMING AND THE ACTION ITEM DOES NOT OR WILL NOT CORRECT THE NON-CONFORMANCE, PLEASE NOTE THE ISSUE IN COMPLETE DETAIL BELOW AND INFORM YOUR SUPERVISOR FOR CORRECTION AND FOLLOW UP.

ASSEMBLER NOTES

INSPECTOR OR SUPERVISOR NOTES

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

PHYSICAL CHECKLIST

☒	All nuts and studs on piping and manifold flanges have been checked for tightness with wrenches
☒	All threaded unions have been checked for tightness with pipe wrench
☒	Install 3" cap on pump inlet if not already present
☒	Install 2" cap on two-way ball valve if not already present
☒	Install plugs into all TOL ports on the fuel manifolds with thread tape and pipe dope
☒	Remove triple filter canisters to confirm filter elements have been installed
☒	Reset flow meter to all zeros.
☒	Apply pinch point decal to gear box/pump guard.

EQUIPMENT RECORD

Equipment	Manufacturer	Model #	Serial #
Motor Record	marathon	LVA 215 TTFND 6527-00002 AAI	75660288-1-11
Gearbox Record	Bonfiglioli	cod 2E151106Q1	1116009139175001
Pump Record	Blackmer	440A 01510000N	2188692
Flow Meter Record	TCS	700-25SPA2AL2	834262

ASSEMBLER NOTES

INSPECTOR OR SUPERVISOR NOTES

CW		
Assembler Print	Assembler Signature	Date
Scott Jensen	Scott Jensen	May 23/19
Inspector Print	Inspector Signature	Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

REEL INSTALLATION RECORD

PRE-INSTALLATION CHECKLIST

☒ All reels inspected for damage and operation	☒ Tools are available, clean and inspected
☒ Properly trained and comfortable to perform this task	
STOP – If all the above are not checked stop this task and see your area supervisor or manager.	

INSTALL CHECKLIST

	1	2	3	4	5	6	7	8	9	10	11	12	Initial
No visible signs of damage on reel	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	SJ
Reel spins/turns freely without contacting	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	SJ
Swivel is not equipped with grease nipple	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	SJ
Reel is equipped with left hand crank	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	SJ
All bolts installed with a washer on each side and nylock nuts have been used	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	SJ
Reel number label applied to reel on bottom left corner	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	SJ

COMPONENT RECORDS

	HANNAY REEL MODEL #	HANNAY REEL SERIAL #	Initial
Line 1	6018-33-34LB	2779889	SJ
Line 2	6018-33-34LB	2779888	SJ
Line 3	6018-33-34LB	2779887	SJ
Line 4	6018-33-34LB	2779945	SJ
Line 5	6018-33-34LB	2779964	SJ
Line 6	6018-33-34LB	2779963	SJ
Line 7	6018-33-34LB	2779946	SJ
Line 8	6018-33-34LB	2779886	SJ
Line 9	6018-33-34LB	2779999	SJ
Line 10	6018-33-34LB	2779983	SJ
Line 11	6018-33-34LB	2779982	SJ
Line 12	6018-33-34LB	2779981	SJ

CW
Assembler Print

Assembler Signature

Date

Inspector Print

Inspector Signature

Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

FUEL RAIL BUILD RECORD

PRE-BUILD CHECKLIST

☒ Workbench is clear from unnecessary clutter	☒ Tools are available, clean and inspected
☒ Properly trained and comfortable to perform this task	
STOP – If all the above are not checked stop this task and see your area supervisor or manager.	

BUILD CHECKLIST

	1	2	3	4	5	6	7	8	9	10	11	12	Initial
Thread tape & dope used on all threads	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	PL
Ball valve packing tightened and tested	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	PL
Solenoid valve arrows pointing in direction of flow	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	PL
Turbine meter arrows pointing in direction of flow	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	PL
Fuel rail has been installed, tightened and numbered	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	PL

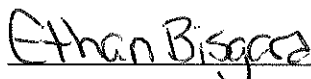
COMPONENT RECORDS

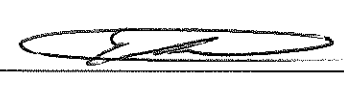
	Turbine Serial	Calibration Factor	Initial
Line 1	137642	870.59	PL
Line 2	138256	848.85	PL
Line 3	138202	862.29	PL
Line 4	137628	848.86	PL
Line 5	137632	853.97	PL
Line 6	~~137632~~ 138214	~~853.97~~ 873.47	PL
Line 7	~~138214~~ 137525	~~873.47~~ 862.58	PL
Line 8	~~137525~~ 137530	~~862.58~~ 853.20	PL
Line 9	~~137530~~ 137528	~~853.20~~ 864.63	PL
Line 10	~~137528~~ 138337	~~864.63~~ 859.86	PL
Line 11	~~138337~~ 138341	~~859.86~~ 854.69	PL
Line 12	137426	844.69	PL


Assembler Print


Assembler Signature

May/23/2019
Date


Inspector Print


Inspector Signature

June 18/19
Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

FUEL RAIL INSTALLATION RECORD

PRE-INSTALL CHECKLIST

☒ Unit is clear from unnecessary clutter	☒ Tools are available, clean and inspected
☒ Properly trained and comfortable to perform this task	
STOP – If all the above are not checked stop this task and see your area supervisor or manager.	

FS

DURING INSTALL CHECKLIST

	1	2	3	4	5	6	7	8	9	10	11	12	Initial
Thread tape & dope used on all threads	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Ball valve packing tightened and tested	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Solenoid valve arrows pointing in direction of flow	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Turbine meter arrows pointing in direction of flow	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Fuel rail has been installed, tightened and numbered	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Serial numbers and K factors recorded in Fuel rail build sheet.	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Flow meter sheets are hole punched and in binder	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Ball valves facing correct way and tight	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	

FS

Assembler Print

Assembler Signature

Date

R. Lett Ellingson
Inspector Print

[Signature]
Inspector Signature

JUNE 18/19
Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

HOSE INSTALLATION RECORD

PRE-INSTALLATION CHECKLIST

☒ Work area is clean and uncongested	☒ Tools are available, clean and inspected
☒ Properly trained and comfortable to perform this task	
STOP – If all the above are not checked stop this task and see your area supervisor or manager.	

INSTALL CHECKLIST

Task List	1	2	3	4	5	6	7	8	9	10	11	12	Initial
Install 1" to 3/4" bushing	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Install 3/4" hose swivel fitting into reel bushing	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Reel 250ft of 3/4" BC Cold flex hose on to each hose reel.	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Install 3/4" male DNP fitting on the end of each line.	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
All connections were made using thread tape and pipe dope	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Ensure the reel number label is applied to the reel identifying the reel number in lower left-hand corner.	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Use grease / paint marker/etcher to label hose end and quick connect identifying the line/reel number.	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	

Notes:

Field Staff

Assembler Print

Assembler Signature

Date

Ethan Bisgard

Inspector Print

Inspector Signature

Date

June 18/19

WALL STRUCTURE ASSEMBLY RECORD

PRE-BUILD CHECKLIST

☒ Work area is clear from clutter	☒ Tools are available, clean and inspected
☒ Two people required for this task	☒ Additional PPE and Hazards identified
☒ Power tools inspected for cleanliness, condition and operation. Failed components replaced.	
☒ Main builder is properly trained and comfortable to perform this task and offer mentoring and instruction to secondary builder if required.	
☒ Secondary builder understands task, risks and hazards and is comfortable to proceed.	
STOP – If all the above are not checked stop this task and see your supervisor or manager.	

BUILD CHECKLIST

☒ Bottom "C" channel installed with self-tapping screws used every 8 inches into skid floor.
☒ Excess screw threads removed with grinder, leaving no sharp edges.
☒ Vertical panels secured in bottom channel every 6 inches with rivets.
☒ All wall panels installed between tongue and grooves and secured to each other on the seams every 8 inches with self-sealing rivets on exterior.
☒ Wall panels secured to each other on the seams every 8 inches on interior with self-sealing rivets.
☒ Corner flashing installed on each corner between panels and secured to panels on each side every 8 inches with self-sealing rivets.
☒ Roof flashing fastened to walls every 6 inches with self-sealing rivets.
☒ Roof flashing fastened to roof panels every 8 inches with self-sealing rivets.
☒ Roof panels secured to each other on seams every 8 inches except for centre 3 ft with self-sealing rivets.
☒ Seam tape applied and rolled securely on to all roof panel seems and flashing edges.
☒ First coating of liquid rubber applied in a thick, heavy coating using one full bucket.
☒ Doorway cut out (verify cut-out size and location by reviewing equipment drawings)
☒ Door mounted in door frame
☒ Door check chain outfitted with clip for quick disconnection
☒ Door handle hardware installed and tested

CUT OUTS

☒ Four cut outs for exterior light fixtures	☒ One cut out for 3" line inlet
☒ One cut out for exhaust fan	☒ Three hose distribution cut outs
☒ One power receptacle cut out	☒ One vent cut out
☒ One operator window cut out	☒ One door window cut out
(verify cut-out size and location for all above by reviewing equipment drawings)	

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

COMPONENT MOUNTING

☒	Exhaust fan unit has been installed
☒	Four exterior light fixture housings have been installed and sealed with caulking on exterior
☒	Fresh air vent louvres installed and sealed with caulking on exterior
☒	Operator window installed and sealed with silicone
☒	Door window installed and sealed with silicone

FLASHING

☒	All cut-outs have been flashed
☒	Man door cut out has been flashed
☒	Both operator and door windows have been flashed
☒	Four exterior light fixtures have been flashed on the interior to cover bottom gap
☒	Exhaust fan cut out has been flashed on exterior
☒	Interior vent cut out have been flashed on interior side

SEALING / CAULKING

☒	Exterior light fixtures have been caulked on the interior of building
☒	Exterior of exhaust fan has been caulked
☒	Exterior and Interior of vent cut-out has been caulked

ACCESS DOORS

☒	3" Inlet access door has been built, flashed and installed with barrel bolt and rubber tie
☒	3 x Hose distribution access doors have been built, flashed and installed with barrel bolts and ties

EQUIPMENT RECORD

Exhaust Fan Manufacturer	Exhaust Fan Model #	Exhaust Fan Serial #
Marathon Electric	C 96931 702	TQN58C17G5524JP

ASSEMBLER NOTES

DATE:

Kean Taylor
Assembler Print

[Signature]
Assembler Signature

May 29 2017
Date

Inspector Print

Inspector Signature

Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

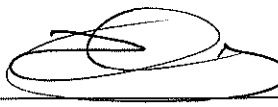
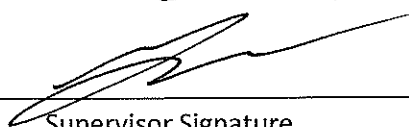
STAGE GATE – REVIEW AND SIGN OFF

INSPECTIONS

DATE:

☒ All rivets installed and appropriately positioned in wall and roof structure	☐ REWORK REQUIRED
☒ Door handles and locks are installed properly and functional	
☒ All cut-outs have been properly flashed and caulked	
☒ Seam tape properly applied	
☒ All windows installed and properly sealed/caulked and flashed/Screen on emergency ladder side	
☒ Sensor head holders mounted on brackets	

ACTION ITEMS	COMPLETE DATE / INITIAL
- Interior door handle missing.	June 18, 18/MG
- ~~Door trim needs to be filed down.~~	
- Door trim needs to be filed down.	June 18, 19/MG
- Reel 6 roller loose.	June 18, 19/MG

<u>Kevan Taylor</u>		<u>May 29 2019</u>
Main Assembler Print	Main Assembler Signature	Date
<u>Mohamed Aden</u>	<u>MLA</u>	<u>May 29, 2019</u>
Secondary Assembler Print	Secondary Assembler Signature	Date
<u>Mike Grandef</u>		<u>July 2nd, 2019</u>
Supervisor Print	Supervisor Signature	Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

FILLER HEAD ASSEMBLY RECORD

PRE-BUILD CHECKLIST

☒ Workbench is clear from unnecessary clutter	☒ Tools are available, clean and inspected
☒ Properly trained and comfortable to perform this task	
STOP – If all the above are not checked stop this task and see your area supervisor or manager.	

FILLER COMPONENTS

Each Patented fuel filler head contains	
☒ 3" Machined Filler Head	☒ Breather with 90° elbow
☒ Ball Valve to 45° elbow for fill inlet	☒ Male Camlock ¾" on Breather
☒ Female Dry-disconnect	☒ 48" Fuel Overflow / Vent Hose "Spit Tube"
☒ 24" Fuel Stinger Hose	

BUILD CHECKLIST

	1	2	3	4	5	6	7	8	9	10	11	12	Initial
Thread tape & dope used on all threads	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Ball valve packing tightened and tested	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Ball valve is facing up towards operator and the handle points down when open	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Accutech sensors installed and programmed appropriately based on shack unit number	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	
Fuel head labelled with shack number and unit ID number	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	

COMPONENT RECORDS

Line 1 Accutech Serial #	5278646	Line 8 Accutech Serial #	5281138	Initial
Line 2 Accutech Serial #	5276384	Line 9 Accutech Serial #	5278659	
Line 3 Accutech Serial #	5276328	Line 10 Accutech Serial #	5281125	
Line 4 Accutech Serial #	5279539	Line 11 Accutech Serial #	5281122	
Line 5 Accutech Serial #	5271484	Line 12 Accutech Serial #	5278620	
Line 6 Accutech Serial #	5279555	Spare Accutech Serial #	5276483	
Line 7 Accutech Serial #	5279541	Daytank Accutech Serial #	5279486	

Field Staff

Assembler Print

Ethan Bisgera

Inspector Print

Assembler Signature

Inspector Signature

Date

June 18/19

Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST**ELECTRICAL INSPECTION RECORD****ELECTRICAL INSPECTION AND PROGRAMMING**

Electrical installation is to be preformed by a journeyman electrician or registered apprentice working off the electrical drawings and design layout as work instructions. This is a skilled trade subject to external regulations and requirements thus outside the scope of this check list. Work instructions for the electricians are provided by the electrical drawings for each project. The below are items to be inspected after the electrical installation has been completed for quality assurance only.

ELECTRICIAN SIGN OFF

☒	All conduits/flexes/cables are properly installed (5 threads) and straight
☒	All conduit/flex/cable straps are tight and within proper distance
☒	All terminations in CP are tight and properly tagged
☒	All terminations in Distribution panel are tight and properly tagged
☒	All terminations in devices are tight and properly tagged
☒	Screw-on fittings and covers are properly lubricated with STL or HTL

EG ONLY

☐	All terminations in ESD panel are tight and properly tagged
☐	ESD panel has all bolts in place and tightened
☐	Screen & lens on LEL detector is free from cracks, scratches, and damage
☐	Lens on Fire Eye is free from cracks, scratches, and damage
☐	Sealing fitting for sounder is packed, poured, and plugged
☐	Secondary seals for gas detection are packed, poured, and plugged (2)
☐	Secondary seals for fire detection are packed, poured, and plugged (2)
☐	Secondary seals into ESD panel are packed, poured, and plugged (4)
☐	Fire Detection functions properly and is aimed appropriately
☐	Gas Detection functions properly
☐	15 Amp NG Control Panel breaker installed

VISUAL ELECTRICAL INSPECTION

☒	2 Interior lights installed and functional
☒	4 Exterior lights installed and functional
☒	Service Receptacle installed and wired properly
☒	All panels hung properly and are secured
☒	Exterior ESD button installed
☒	Interior ESD button installed
☒	All devices installed correctly and secured
☒	All conduit/flex/cable connectors, fittings, and hubs are tight
☒	All fittings have covers installed and tightened

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

☒	No visible scarring or damage to cables, wires, or conduits
☒	Holes around conduits and fittings exiting shack are sealed
☒	Breaker panel (load center) secured to wall with cover installed
☒	60AMP 3 POLE VFD breaker installed
☒	20AMP 3 POLE Heater breaker installed
☒	15AMP Exhaust fan breaker installed
☒	15AMP Receptacle breaker installed
☒	15AMP Control Panel breaker installed
☒	15AMP Lighting breaker installed
☒	2 Spare 15A breakers installed
☒	All breakers are properly labeled.
☒	Tray installed, secure and covered
☒	Main Flow Meter installed and properly wired

COMPONENT POWER UP

☒	Power to UPS
☒	UPS Battery Charging System OK
☒	Power to PLC
☒	Power to BR20
☒	Power to Base Engineering unit
☒	Power to CP Ventilation fan and thermostat set to 20C
☒	Power to VFD
☒	Heater functions properly (correct rotation and provides heat)
☒	Exhaust Fan's Manual/Auto switch functions properly and fan operates in correct rotation (Manual Switch Only if E-Series)
☒	Manual Interior light switch installed and functioning properly (E-Series Only)
☒	Utility GFCI receptacle functions properly and protects both receptacles

GROUND CONNECTIVITY TESTING

☒ Performed on hoses <u>AC</u>	☒ Performed on Bonding Bar <u>AC</u>
☒ Performed on Reels <u>AC</u>	☐ Bonding conductor installed between XP and E/EG

ACCESSORIES

☒ Included Electrical Service Kit consisting of:		
5 x ATM 10A Fuses	10 x GMA 100mA Fuses	10 x GMA 500mA Fuses
5 x GMA 1A Fuses	5 x GMA 2A Fuses	10 x 5A Fuses
5 x GMA 6A Fuses	1 x Suppressor Gas Fuse	1 x Multimeter
1 x Terminating Screwdriver	1 x Philips Screwdriver	5 x GMA 250 mA Fuses
2 x Battery Blade Fuses		

Travis Thompson
Electrician Print

[Signature]
Electrician Signature

June 17/2019
Date

Kurt Munn
Inspector Print

[Signature]
Inspector Signature

June 17/2019
Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

EQUIPMENT PROGRAMMING

☒ PLC Programmed and functional	
Program Used	Version
<i>fdl lanes</i>	<i>1.19</i>

☒ HMI Programmed and functional	
Program Used	Version
<i>HPX:</i>	<i>Apr-22-19</i>

☐ GP-Viewer Key Code installed in HMI (7683-6990-8224)	<i>N/A</i>
☒ BR20 Radio Programmed and functional	
☒ VFD Programmed and functional	
☒ Modem installed and functional	
☒ Modem program uploaded (~~E-Series VIP4G~~)	
☒ Modem IP set to shack number (128.1.XX.10)	
☒ Modem shows "ONLINE" in HMI status	
☒ Information Labels Affixed to inside of Cabinet	

ELECTRICAL NOTES

Kurt Mante
Programmer Print

[Signature]
Programmer Signature

June 17, 2019
Date

Mike Gaudet
Inspector Print

[Signature]
Inspector Signature

June 18, 2019
Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

FINAL PREPARATION

BASIC FUNCTION TESTING

☒ Solenoid function testing via HMI (Line 1, Activates Solenoid 1, etc.)
☒ Pump turns on and operates with correct rotation
☒ Pump remote control functions and activates pump
☒ BR20 reports all heads online, all heads reporting online on HMI
☒ Interior and Exterior ESD buttons function properly
☒ HMI soft ESD button functions properly
☒ Temperature switch functions properly

ADVANCED FUNCTION TESTING

☒ Modem remote connectivity tested
☒ Remote connectivity to PLC tested
☒ Remote connectivity to HMI tested
☒ Manual remote pump operation tested (Base engineering receiver) (Min 100 ft away)
☒ Main flow meter reads and functions properly
☒ Data report polling check
☒ Distance test on sensor heads (Min 200ft away, through obstructions example go to front of building with all sensor heads)

SHACK PREPARATION

☒ Day tank fill and suction camlock installed, complete with caps
☒ 3" Female camlock installed on inlet with cap
☒ 3" double female short fuel hose from day tank to shack cut to fit complete with plugs
☒ 20' 3" fuel line with male/female ends complete with caps and plugs
☒ 2" male camlock installed on 3 port 2-way ball valve with cap
☒ Verify all holes in piping and manifold are filled / plugged
☒ 4 x BC Cold Flex 75ft extensions in shack, complete with male and female disconnects
☒ Verify all hose lines have 3/4" dry disconnect male ends installed
☒ Verify all lines are clearly labelled and easy to identify (Line 1, Line 2, Line 3, etc.)
☒ 2 x Fuelling nozzles with 3/4" female dry disconnect
☒ 20 lb. Fire Extinguisher Installed in Bracket (ABC)
☒ First Aid Kit installed
☒ Eyewash Station installed
☒ Exterior antenna plate has been mounted
☒ Fire resistant, insulated operator curtain installed
☒ Ear plug dispensing station installed
☒ Waterless hand soap station installed

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

Sensor head Check

- | |
|--|
| ☒ Spare sensor Serial number recorded on build sheet and is in demob, checked for it functions |
| ☒ Day tank sensor built, and serial number recorded ready to be tested |

TANK PREPARATION

- | |
|---|
| ☒ Check ladder for functionality |
| ☒ Check ladder cage for functionality |
| ☒ Safety bar present on top of walking platform |
| ☒ All ports are labelled |
| ☒ Check Interstitial space for dryness |
| ☒ Vent pipe present and installed for testing |
| ☒ Draw pipe for compatibility with pump line and valve operation |
| ☒ Fill pipe for valve operation |
| ☒ Rollup door for functionality, ensure it can be locked up and down |
| ☒ Ensure that the Tank Sensor has the correct adapter and fits properly on the tank |
| ☒ Ensure that dip chart conversion from liters to gallons supplied <i>N/A</i> |
| ☒ Check during operational testing with fuel, to listen for air leaks or fuel leaks |
| ☒ XP and 3" port adapter installed <i>Come's installed</i> |

EXTERIOR INSPECTION

- | |
|---|
| ☒ Frac Shack™ Logo and FracFueller™ Logo on both Diesel unit and daytank |
| ☒ Correct telephone number if shack is for US/Canada – If unknown, left blank |
| ☒ Canadian, US and Australian patent decal present |
| ☒ Unit Number |
| ☒ 1202 Decals on all four sides of tank |
| ☒ Trailer Plates and Registration/Insurance in Document Tube |
| ☒ Emergency Ladder – check operation |
| ☒ Lexan Window with Screen closest to Emergency Ladder |

Ethan Bisgard

Assembler Print

Assembler Signature

June 18/19

Date

Mike Grande

Inspector Print

Inspector Signature

June 18/19

Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

1. Turn "ON" Accutech sensor heads one at a time, starting with number 1.
2. Look at the HMI to ensure line 1 on the screen becomes enabled and shows online.
3. If correct, install sensor head into the test tank as required and repeat for the next head.
4. Continue procedure until all heads are online and tested as operational.
5. When successful and all heads are functioning as expected, initial each line number below.

LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	
EB	EB	EB	EB	EB	EB	
LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	DAYTANK
EB	EB	EB	EB	EB	EB	EB

TURBINE METER CALIBRATION

TURBINE CALIBRATION FACTORS

LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6
EB	EB	EB	EB	EB	EB
LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12
EB	EB	EB	EB	EB	EB

HMI "K" FACTOR ENTRY RECORD

The following values were entered into the HMI for volume calculations.

LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6
EB	EB	EB	EB	EB	EB
LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12
EB	EB	EB	EB	EB	EB

*USE COMMISSION TEST PROCEDURE 7.0 TURBINE CALIBRATION SPREADSHEET [FORM PA-6014] TO GENERATE APPROPRIATE HMI K FACTOR. ATTACH PRINTED SPREADSHEET WITH TURBINE CALIBRATIONS.

Ethan Bigard

Assembler Print



Assembler Signature

June 18/19

Date

Rhett Ellinger

Inspector Print



Inspector Signature

June 18/19

Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

PRIME FUEL PUMP

See Commission Test Procedure 2.0 for detail and procedure.

☒ This process followed appropriately as set out in instructions.**INITIATE ALL FUEL LINES**

See Commission Test Procedure 3.0 for detail and procedure.

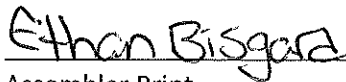
☒ This process followed appropriately as set out in instructions.**PRESSURE AND LEAK TEST**

See Commission Test Procedure 4.0 for detail and procedure.

☒ This process followed appropriately as set out in instructions.**MANUAL MODE TEST HH**

See Commission Test Procedure 6.0 for detail and procedure.

☒ This process followed appropriately as set out in instructions.**TEST BUZZER**☒ The buzzer is working**Notes:**



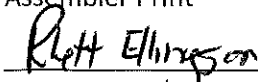
Assembler Print



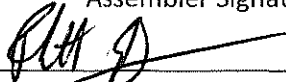
Assembler Signature

June 18/19

Date



Inspector Print



Inspector Signature

JUNE 13/19

Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

FUEL METER ACCURACY RECORD

Reset main inlet flow meter to 0, reset lines to 0, run a 100L flow test on each line and record the results below. Reset all meters back to 0 before testing the next line. HMI "k" factor must be entered before running this test.

LINE 1		LINE 2		LINE 3	
FLOW METER	TURBINE	FLOW METER	TURBINE	FLOW METER	TURBINE
100	101.9	100	102.9	100	103.9

LINE 4		LINE 5		LINE 6	
FLOW METER	TURBINE	FLOW METER	TURBINE	FLOW METER	TURBINE
100	102.9	100	103.5	100	102.7

LINE 7		LINE 8		LINE 9	
FLOW METER	TURBINE	FLOW METER	TURBINE	FLOW METER	TURBINE
100	101.6	100	103.3	100	104.6

LINE 10		LINE 11		LINE 12	
FLOW METER	TURBINE	FLOW METER	TURBINE	FLOW METER	TURBINE
100	102.5	100	104.5	100	104.7

Ethan Bisgara
Assembler Print


Assembler Signature

June 18/19
Date

Rhett Ellingson
Inspector Print


Inspector Signature

JUNE 19/19
Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

DIESEL PRESSURE/FLOW TEST

LINE	OPERATING PRESSURE	DEADHEAD PRESSURE	FLOWMETER R L/PM	ISSUES FOUND AND ACTIONS REQUIRED IF NO ISSUES FOUND ON A LINE WRITE "GOOD" IN THIS FIELD THEN INITIAL AND DATE THE LAST COLUMN	ACTION COMPLETE	INITIAL & DATE
1	75	80	52.7	leak underneath ball valve (fixed)	✓	RE JUNE 18/19
2	75	80	51.4	leaking at ball valve (fixed)	✓	RE JUNE 18/19
3	75	80	50.9	GOOD		RE JUNE 18/19
4	75	80	52.2	GOOD		RE JUNE 18/19
5	75	80	52.0	changed battery (Fixed)	✓	RE JUNE 18/19
6	75	80	53.0	GOOD		RE JUNE 18/19
7	75	80	51.4	no leak ~~se~~ looks wet because line 1 leaked above line 7	✓	RE JUNE 18/19
8	75	80	51.4	GOOD		RE JUNE 18/19
9	75	80	52.5	GOOD		RE JUNE 18/19
10	75	80	50.9	leaking from top of ball valve replaced ball valve assembly and nipple (fixed)	✓	RE JUNE 18/19
11	75	80	52.0	bottom nipple to manifold is sweating diesel (Fixed)	✓	RE JUNE 18/19
12	75	80	51.7	Good		RE JUNE 18/19

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

PRESSURE AND LEAK TEST NOTES

FUNCTION TEST

- See Commission Test Procedure 5.0 for full detail and procedure.
- **REMINDER:** Set Time/Date and Start New Project in Site/Config

HH – HHH Level (Overfill)	H – HI Level (Stop)
LL – LOLO Level (Fill)	M – Manual Mode Test

LINE	HH	✓
1	H	✓
	LL	✓
	M	✓

LINE	HH	✓
2	H	✓
	LL	✓
	M	✓

LINE	HH	✓
3	H	✓
	LL	✓
	M	✓

LINE	HH	✓
4	H	✓
	LL	✓
	M	✓

LINE	HH	✓
5	H	✓
	LL	✓
	M	✓

LINE	HH	✓
6	H	✓
	LL	✓
	M	✓

LINE	HH	✓
7	H	✓
	LL	✓
	M	✓

LINE	HH	✓
8	H	✓
	LL	✓
	M	✓

LINE	HH	✓
9	H	✓
	LL	✓
	M	✓

LINE	HH	✓
10	H	✓
	LL	✓
	M	✓

LINE	HH	✓
11	H	✓
	LL	✓
	M	✓

LINE	HH	✓
12	H	✓
	LL	✓
	M	✓

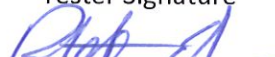
☒ Tested both manual fueling nozzles for operation.
☒ End Job 1/Stage 1, start stage 2, run 1000L through all lines at the same time.
☒ End stage 2, finish project and manually poll shack data and attach report to documentation.

Ethan Bisgarz
Tester Print


Tester Signature

June 18/19
Date

Plot Ellington
Inspector Print


Inspector Signature

JUNE 19/19
Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

INVENTORY PACKING/DEMOB

☒	Greggs EG Supply Skid
☒	Attach Greggs supply skid packing slip at the end of this document
☒	Attached completed demob at the end of this document
☒	Extra Black Hardhat, with ear muffs and face shield, for manual fuelling
☒	Spill Kit with granular absorbent – 1 keg Sphag Sorb
☒	2 Bundles of spill pads
☒	Micro-Blaze Sprayer & Product
☒	Grounding Rod Pounder
☒	1 x 25ft & 1 x 50ft ground cable with grounding connectors
MANUALS & FORMS	

Klara Molewa FA June 19, 2019
Demob Completed by: Date

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST**HAND OVER AND DOCUMENT PACKAGE**

- ☐ Reviewed production checklist for completeness and accuracy
- ☐ Completed hand over document (PA-6012) to transfer equipment to operating company

Form PA-6012 Handover

COMMISSION TEST PROCEDURES**1.0 ACCUTECH SENSOR HEAD TESTING**

1. Turn "ON" Accutech sensor heads one at a time, starting with number 1.
2. Look at the HMI to ensure line 1 on the screen becomes enabled and shows online.
3. If correct, install sensor head into the test tank as required and repeat for the next head.
4. Continue procedure until all heads are online and tested as operational.
5. When successful and all heads are functioning as expected, initial each line number below.
6. Load all Sensor heads onto a pallet and take them 200ft minimum and have obstacles such as going to the other side of a building, Check screen while sensor heads are away from shack ensure they still read on the HMI. If no signal inform supervisor, or manager and have electrician trouble shoot.

2.0 PRIME FUEL PUMP

1. Connect the fuel lines to the appropriate sensor heads (filler heads) E.G.: Line 1 to head 1, line 2 to head 2, etc.
2. Fill inlet hose to the pump with diesel from a Jerry can or other source as applicable. Pay close attention to not over fill the hose and have spill containment and absorbent pads near by.
3. Once you have put diesel in the inlet hose, pull the hose up to diesel the fuel into the pump. This will help lubricate the pump, vanes and seals. This helps the pump create suction and be able to pull fuel out of the daytank.
4. Carefully reconnect the inlet hose to the daytank suction port.
5. Ensure the suction valve is open, the pump inlet valve is open, manifold valves are open and the valve on sensor head 1 is open.
6. Put the shack into "Manual Mode" and enable line one.
7. Activate pump with the remote control to allow the pump to start sucking fuel from the daytank, this may take up to a minute until you have a smooth fuel flow.
8. Once the pump and line is primed, stop the pump.

3.0 INITIATE ALL FUEL LINES

1. Put the shack into "AUTO" mode and allow fuel to flow on all lines to remove the air out of the system and prime the entire manifold and all fuel lines.
2. Once steady flow on all lines is established put the shack into "PUMP DISABLED" mode.

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

4.0 PRESSURE AND LEAK TESTS

1. Put shack into "MANUAL" mode and enable line 1.
2. Press the start button on the remote to begin fueling.
3. Once steady flow is established;
 - a. Note the flow rate of the fuel line from the HMI and record it on the table below. **IF BELOW 45L/M INFORM SUPERVISOR.**
 - b. Note the operating pressure on the pressure gauges by the flow meter and record it on the table below.
4. Have an assistant close the sensor head valve on line 1.
 - a. Note the "Deadhead" pressure on the pressure gauges by the flow meter and record it on the table.
5. Close the valve on the fuel rail of line 1.
6. Press the stop button on the remote to stop the pump. You have now pressurized the fuel rail, reel and hose assembly.
7. Repeat this process (steps 1 – 5) on all remaining lines until every line has been completed and is pressurized.
8. Carefully look for leaks starting at the fuel rails for each line, check the reels and hose for leaks and then inspect the fuel sensor heads (filler heads).
9. Make a note of all issues found below, including as many details as you can then release the pressure by opening all the valves on the fuel rails and at the sensor heads.
10. Make repairs to the lines as necessary, noting the repairs made below and retest the faulty line(s) as required. Use the same procedure above until all lines are functional without any leaks.

5.0 FUNCTION TEST

1. Set time/date on HMI
2. On the HMI go to "VOLUME TOTALS" -> "CONFIGURE STAGE/JOB" and start a new project using these details below:
PROJECT NAME: EG##/XP## BOL ## is to be replaced by the unit number example (EG43/XP21 BOL).
CLIENT NAME: FSH
3. Select Job 1, Stage 1, press "CONFIRM" then "START TOTALIZING".
4. On HMI go to "TANK DETAIL" and ensure all tanks are set to default set points.

URV 25.0	HH 17.0	STOP 15.0	START 11.0	LL 9.0	LRV 0.0
----------	---------	-----------	------------	--------	---------
5. Ensure the test trailer tanks are empty, if not pump out the tanks and turn off the pump.
6. Put shack into "AUTO" mode and enable line 1.
7. You should see a "LO" alarm and the pump will kick in and begin filling.
8. Once the line hits 15" ensure line shuts down.
9. Empty the test trailer tanks again, once empty turn off the trailer pump and test the remaining lines (2 – 12) using the same steps above (step 5 -7).

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

10. Once complete, pick two lines (each line must be in a separate tank of the test trailer) and switch them for the cross over line test. Example: connect line 1 to filler head 5.
11. Enable line 1 to begin filling. The HMI will not show an increasing fuel level on line 1, but it will show an increasing level on line 5.
12. When line 5 hits the HH level (17") you will receive an HH alarm, and the pump will shut down. This test was successful.
13. Record the testing results on the table.
14. Move job to the next stage and test XP (if applicable)
15. Move job to the next stage and then end the job (after XP is tested if applicable)
16. Inform data poller (or supervisor) once the job is completed. Do not shut shack down until you receive confirmation that the service has been restarted and the data is polled.

7.0 MANUAL MODE HIGH HIGH TEST

1. Drain fuel tanks below preset High High level of 17".
2. Turn on Sensor head and put into tank.
3. In manual mode use demob manual nozzle to fill tank until High High alarm sounds.

8.0 TURBINE CALIBRATION

1. Gather all calibration sheets for all lines, numbered to correspond with Fuel rail it is installed in, record in check sheet.
2. Verify K-Factor on actual meters to ensure meter # and calibration sheets match.
3. Use a computer to pull up Excel sheet called "Calibration Factor Calculator" in the Master Document List.
4. Type the K factors found on the sheet to the boxes assigned to them in the excel sheet. Repeat until all lines calculated. Print sheet. (See Image 1)
5. Take "calibration Factor" that was calculated and record on K factor sheet in the check sheets binder.
6. Log into shack as admin on HMI, in "meter Details" screen where calibration factor listed, change each line to the new factor that has been calculated. (Image 2)
7. Save changes log out. shut down control panel, Power back up, confirm changes saved.

FRAC SHACK™

UNIT NUMBER E127

PA-6004 – E/EG PRODUCTION AND ASSEMBLY CHECKLIST

8. Include sheet in build binder.

Image 1

Turbine "K" Factor Calculator

	Meter K Factor	HMI Input
Line 1	847.33	0.004467445
Line 2	900.21	0.004205019
Line 3	875.33	0.004324540
Line 4	847.33	0.004467445
Line 5	900.21	0.004205019
Line 6	875.33	0.004324540
Line 7	847.33	0.004467445
Line 8	900.21	0.004205019
Line 9	875.33	0.004324540
Line 10	847.33	0.004467445
Line 11	900.21	0.004205019
Line 12	875.33	0.004324540
Line 13	847.33	0.004467445
Line 14	900.21	0.004205019
Line 15	875.33	0.004324540
Line 16	847.33	0.004467445
Line 17	900.21	0.004205019
Line 18	875.33	0.004324540
Line 19	847.33	0.004467445
Line 20	900.21	0.004205019
Line 21	875.33	0.004324540
Line 22	847.33	0.004467445
Line 23	900.21	0.004205019
Line 24	875.33	0.004324540
Line 25	847.33	0.004467445
Line 26	900.21	0.004205019
Line 27	875.33	0.004324540
Line 28	847.33	0.004467445

Image 2

1	Channel OK Valid Data Frequency OK 0 Hz 0.0 GAL/MIN 30 CUTOFF 1.000 MULT. 0.00433600 K	2	Channel OK Valid Data Frequency OK 0 Hz 0.0 GAL/MIN 30 CUTOFF 1.000 MULT. 0.00433600 K	3	Channel OK Valid Data Frequency OK 0 Hz 0.0 GAL/MIN 30 CUTOFF 1.000 MULT. 0.00433600 K	4	Channel OK Valid Data Frequency OK 0 Hz 0.0 GAL/MIN 30 CUTOFF 1.000 MULT. 0.00433600 K
---	---	---	---	---	---	---	---



Electronic Data Devices

P.O. Box 12128
Odessa, TX 79768
P - 432-366-8699
F - 432-366-106
sales@eddevices.com

1" X 1" THD METER

870.59

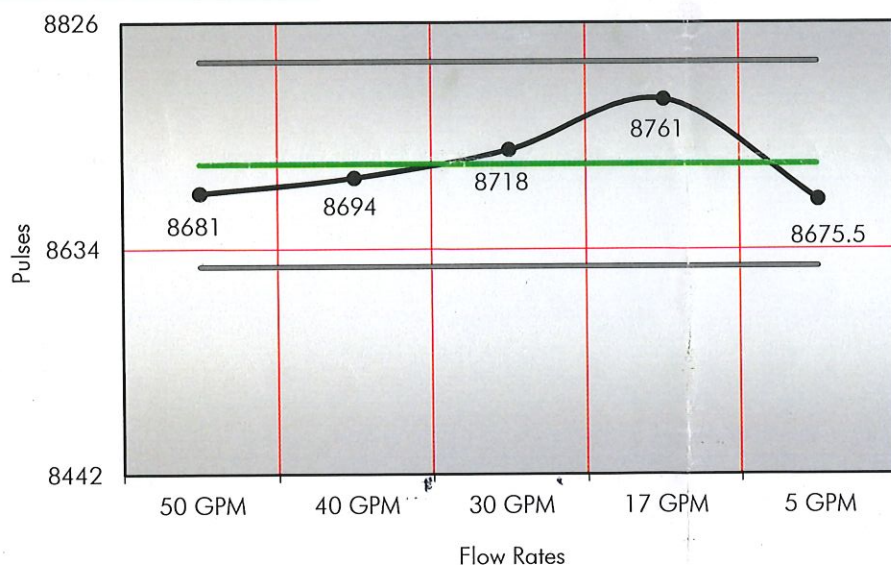
18-Feb-19

Calibration Data & Inspection Sheet

Calibration Factor : **870.59**

Serial Number :	137642
Calibrated Item :	1" X 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	18-Feb-19
Flow Range :	5 - 50 GPM

Flow Rate	Pulses
50 GPM	8682
50 GPM	8680
40 GPM	8691
40 GPM	8697
30 GPM	8717
30 GPM	8719
17 GPM	8759
17 GPM	8763
5 GPM	8670
5 GPM	8681



Total Pulses	87059
1%	8792.96
-1%	8618.84
Min. Value	8670
Max. Value	8763

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -A05426

HK

#1



Electronic Data Devices

P.O. Box 12128
Odessa, TX 79768
P - 432-366-8699
F - 432-366-106
sales@eddevices.com

1" x 1" THD METER

848.85

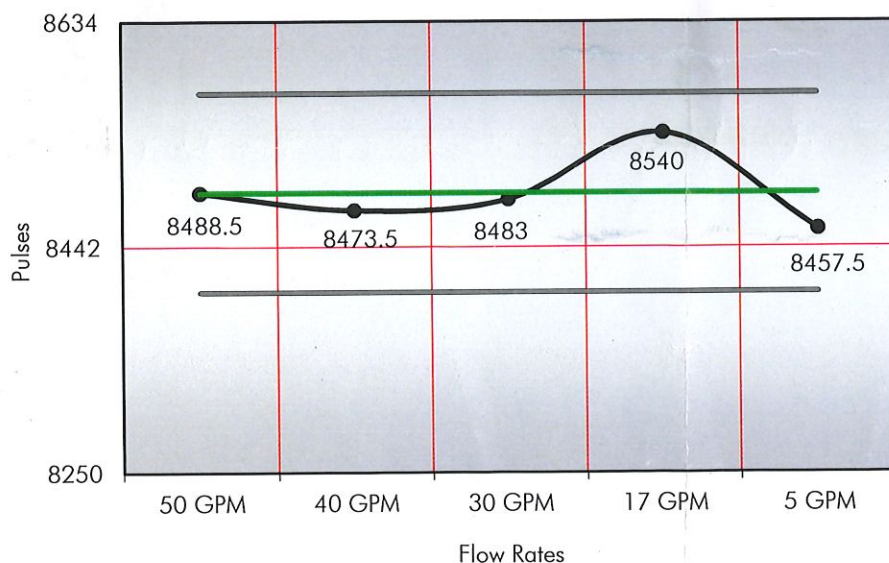
21-Mar-19

Calibration Data & Inspection Sheet

Calibration Factor : **848.85**

Serial Number :	138256
Calibrated Item :	1" x 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	21-Mar-19
Flow Range :	5 - 50 GPM

Flow Rate	Pulses
50 GPM	8488
50 GPM	8489
40 GPM	8475
40 GPM	8472
30 GPM	8476
30 GPM	8490
17 GPM	8539
17 GPM	8541
5 GPM	8456
5 GPM	8459



Total Pulses	84885
1%	8573.39
-1%	8403.62
Min. Value	8456
Max. Value	8541

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -992D

#2
#4



Electronic Data Devices

P.O. Box 12128
Odessa, TX 79768
P - 432-366-8699
F - 432-366-106
sales@eddevices.com

1" x 1" THD METER

862.29

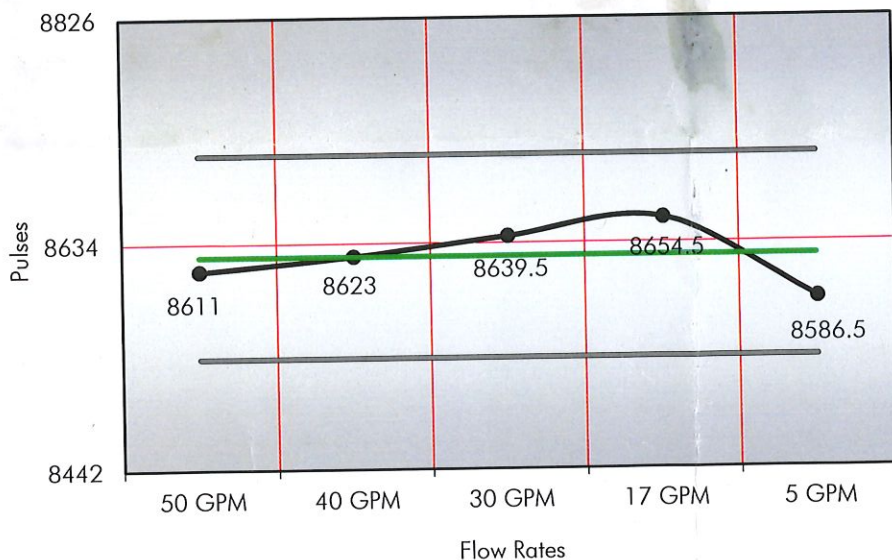
21-Mar-19

Calibration Data & Inspection Sheet

Calibration Factor : **862.29**

Serial Number :	138202
Calibrated Item :	1" x 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	21-Mar-19
Flow Range :	5 - 50 GPM

Flow Rate	Pulses
50 GPM	8610
50 GPM	8612
40 GPM	8618
40 GPM	8628
30 GPM	8639
30 GPM	8640
17 GPM	8655
17 GPM	8654
5 GPM	8580
5 GPM	8593



Total Pulses	86229
1%	8709.13
-1%	8536.67
Min. Value	8580
Max. Value	8655

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -992D

Wetter

3



Electronic Data Devices

P.O. Box 12128
Odessa, TX 79768
P - 432-366-8699
F - 432-366-106
sales@eddevices.com

1" X 1" THD METER

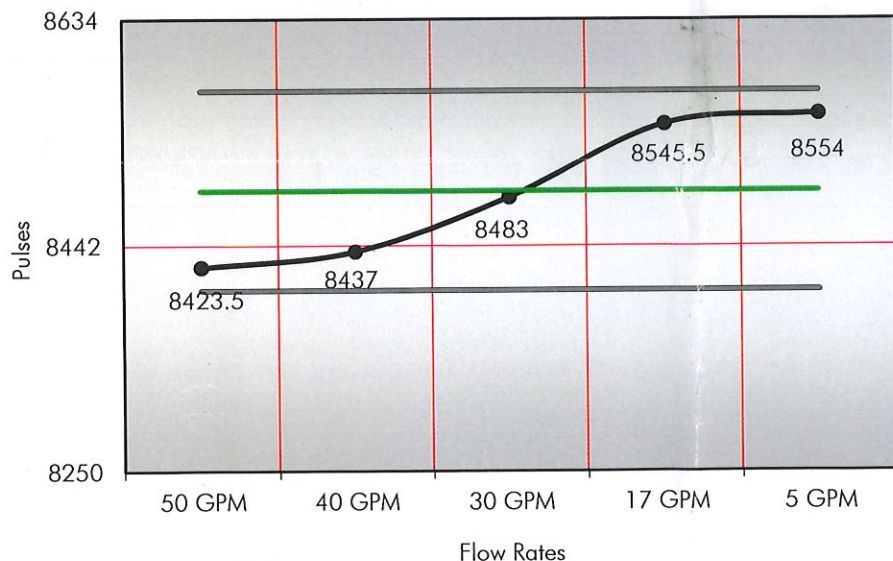
848.86

18-Feb-19

Calibration Data & Inspection Sheet

Calibration Factor : **848.86**

Serial Number :	137628
Calibrated Item :	1" X 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	18-Feb-19
Flow Range :	5 - 50 GPM



Flow Rate	Pulses
50 GPM	8425
50 GPM	8422
40 GPM	8433
40 GPM	8441
30 GPM	8484
30 GPM	8482
17 GPM	8543
17 GPM	8548
5 GPM	8538
5 GPM	8570

Total Pulses	84886
1%	8573.49
-1%	8403.71
Min. Value	8422
Max. Value	8570

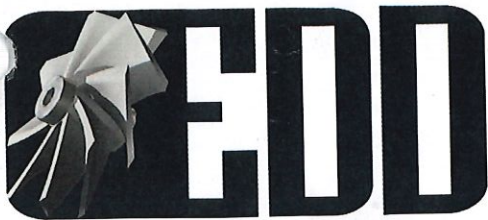
This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -A05426

Walter

④



Electronic Data Devices

P.O. Box 12128
Odessa, TX 79768
P - 432-366-8699
F - 432-366-106
sales@eddevices.com

1" X 1" THD METER

853.97

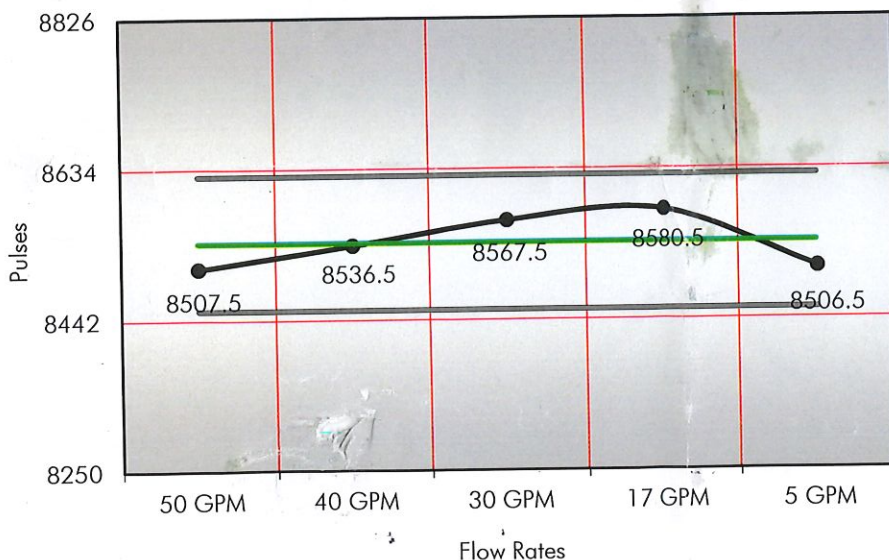
18-Feb-19

Calibration Data & Inspection Sheet

Calibration Factor : **853.97**

Serial Number :	137632
Calibrated Item :	1" X 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	18-Feb-19
Flow Range :	50 GPM

Flow Rate	Pulses
50 GPM	8513
50 GPM	8502
40 GPM	8535
40 GPM	8538
30 GPM	8568
30 GPM	8567
17 GPM	8581
17 GPM	8580
5 GPM	8484
5 GPM	8529



Total Pulses	85397
1%	8625.10
-1%	8454.30
Min. Value	8484
Max. Value	8581

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -A05426

HK
#5



Electronic Data Devices

P.O. Box 12128
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P - 432-366-8699
F - 432-366-106
sales@eddevices.com

1" x 1" THD METER

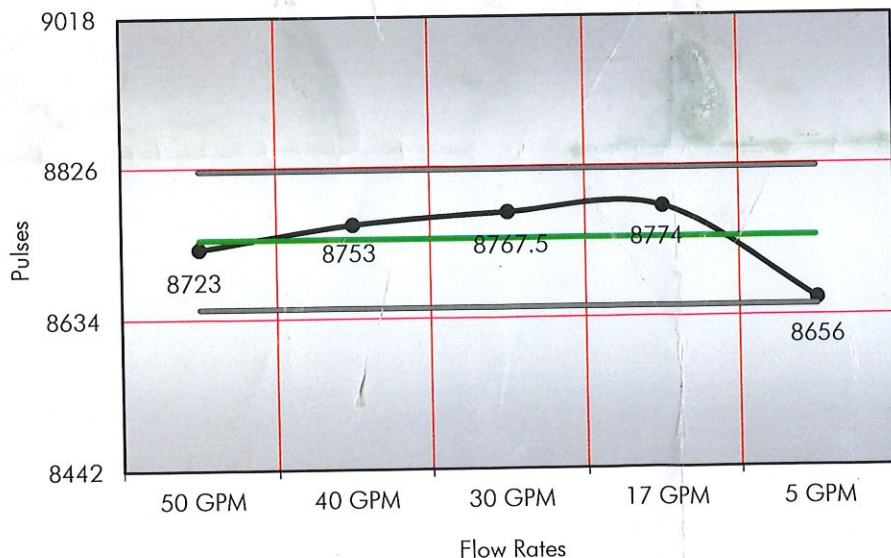
873.47

21-Mar-19

Calibration Data & Inspection Sheet

Calibration Factor : **873.47**

Serial Number :	138214
Calibrated Item :	1" x 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	21-Mar-19
Flow Range :	5 - 50 GPM



Flow Rate	Pulses
50 GPM	8728
50 GPM	8718
40 GPM	8748
40 GPM	8758
30 GPM	8767
30 GPM	8768
17 GPM	8774
17 GPM	8774
5 GPM	8648
5 GPM	8664

Total Pulses	87347
1%	8822.05
-1%	8647.35
Min. Value	8648
Max. Value	8774

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -992D

6



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1" X 1" THD METER

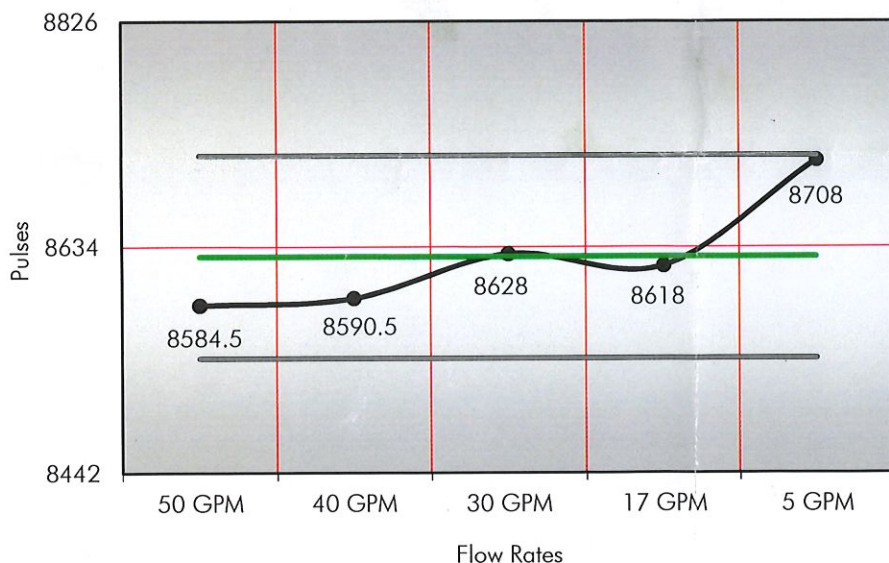
862.58

13-Feb-19

Calibration Data & Inspection Sheet

Calibration Factor : **862.58**

Serial Number :	137525
Calibrated Item :	1" X 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	13-Feb-19
Flow Range :	5 - 50 GPM



Flow Rate	Pulses
50 GPM	8590
50 GPM	8579
40 GPM	8592
40 GPM	8589
30 GPM	8626
30 GPM	8630
17 GPM	8612
17 GPM	8624
5 GPM	8707
5 GPM	8709

Total Pulses	86258
1%	8712.06
-1%	8539.54
Min. Value	8579
Max. Value	8709

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JWR

Notes : WELDED BY MIKE JOLLY
HEAT No. -A05426

HK

#7



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1 X 1 THD METER

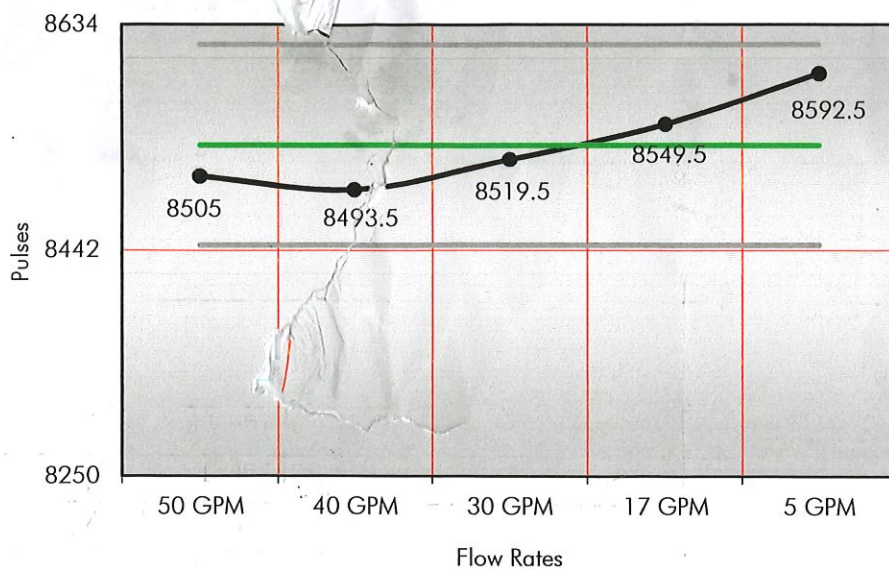
853.20

8-Feb-19

Calibration Data & Inspection Sheet

Calibration Factor : **853.20**

Serial Number :	137530
Calibrated Item :	1 X 1 THD METER
Part Number :	NPT0100101
Material Grade :	A 479316
Date :	8 Feb-19
Flow Range :	5 - 50 GPM



Flow Rate	Pulses
50 GPM	8492
50 GPM	8518
40 GPM	8497
40 GPM	8490
30 GPM	8521
30 GPM	8518
17 GPM	8552
17 GPM	8547
5 GPM	8590
5 GPM	8595

Total Pulses	85320
1%	8617.32
-1%	8446.68
Min. Value	8490
Max. Value	8595

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By :	JWR
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Notes :	WELDED BY MIKE JOLLY HEAT No. - A05426
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Walter 8





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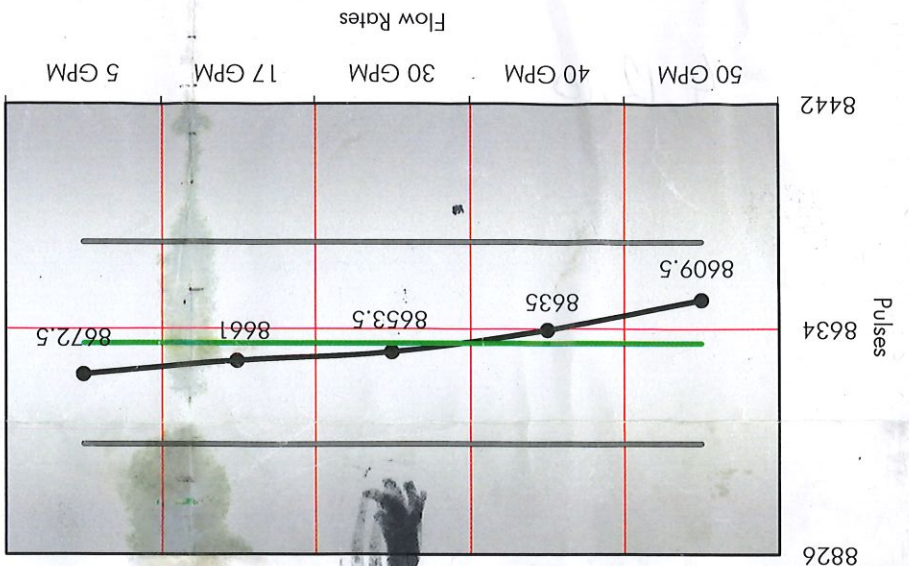
Calibration Data & Inspection Sheet

Calibration Factor : **864.63**

#9
E-127

1" X 1" THD METER
864.63
13-Feb-19

Serial Number : 137528	Calibrated Item : 1" X 1" THD METER	Part Number : NPT0100101	Material Grade : A479316	Date : 13-Feb-19	Flow Range : 5 - 50 GPM
------------------------	-------------------------------------	--------------------------	--------------------------	------------------	-------------------------



This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JWR

Notes : WELDED BY MIKE JOLLY
HEAT No. -A05426

Total Pulses	86463
1%	8732.76
-1%	8559.84
Min. Value	8604
Max. Value	8684

Flow Rate	Pulses
50 GPM	8604
50 GPM	8615
40 GPM	8644
40 GPM	8626
30 GPM	8640
30 GPM	8667
17 GPM	8660
17 GPM	8662
5 GPM	8661
5 GPM	8684

4,12,10

~~#6 300
T~~
~~#5 F 300 305.7
T~~

Walter

9



#6 300 301.7

#5 300 300.8

#6 100 100.9

#5 100 100.9



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1" x 1" THD METER

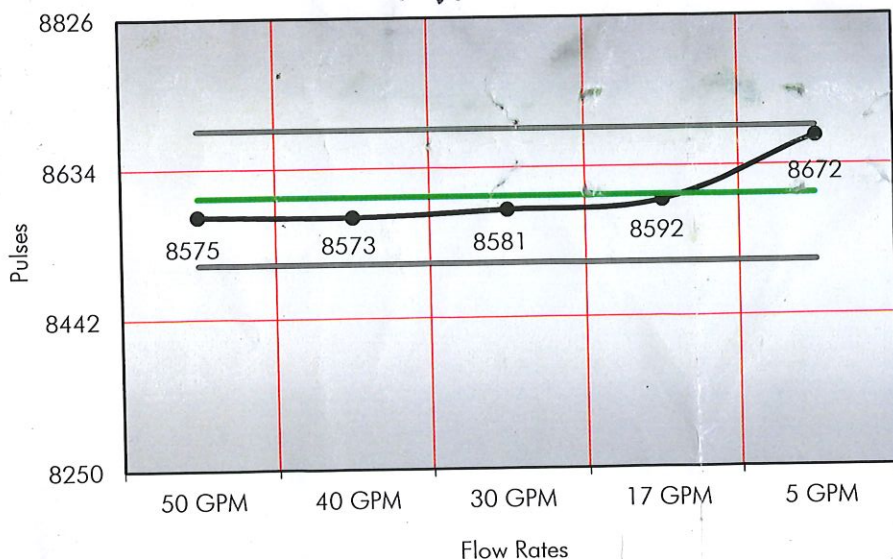
859.86

21-Mar-19

Calibration Data & Inspection Sheet

Calibration Factor : **859.86**

Serial Number :	138337
Calibrated Item :	1" x 1" THD METER
Part Number :	NPT0100101
Material Grade :	A479316
Date :	21-Mar-19
Flow Range :	5 - 50 GPM



Flow Rate	Pulses
50 GPM	8571
50 GPM	8579
40 GPM	8575
40 GPM	8571
30 GPM	8582
30 GPM	8580
17 GPM	8591
17 GPM	8593
5 GPM	8675
5 GPM	8669

Total Pulses	85986
1%	8684.59
-1%	8512.61
Min. Value	8571
Max. Value	8675

This calibration data and inspection sheet certifies this meter's and/or repair kit's dimensions have been verified to be within drawing dimensions and tolerances, the product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELDED BY MIKE JOLLY
HEAT No. -992D

10

42
#

Electronic Data Devices



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Calibration Data & Inspection Sheet

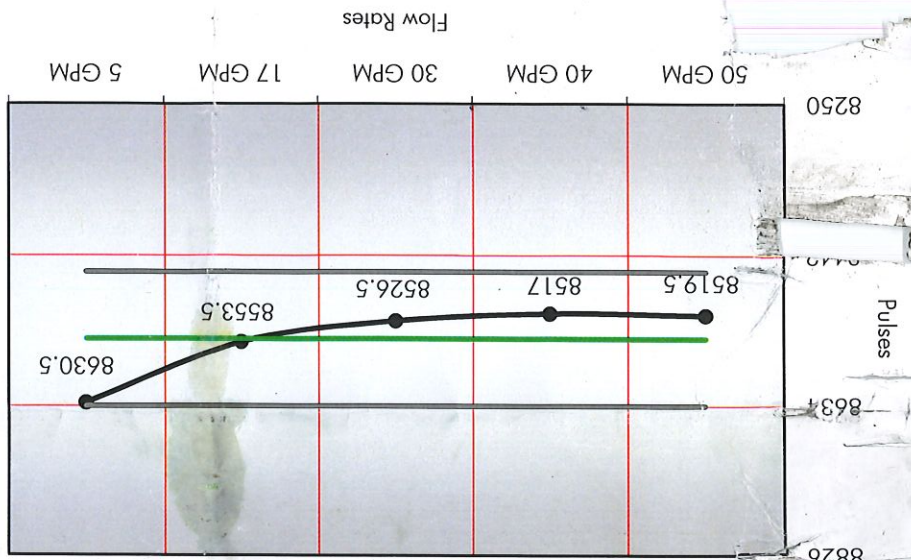
Calibration Factor : **854.94**

1" x 1" THD METER

854.94

21-Mar-19

Serial Number :	138341
Item :	1" x 1" THD METER
Number :	NPT0100101
Grade :	A479316
Date :	21-Mar-19
Range :	0 - 50 GPM



Flow Rate	Pulses
50 GPM	8520
50 GPM	8519
40 GPM	8517
40 GPM	8517
30 GPM	8526
30 GPM	8527
17 GPM	8559
5 GPM	8633
5 GPM	8628

Total Pulses	85494
1%	8634.89
-1%	846
Min. Value	85
Max. Value	8633

data and inspection sheet certifies this meter's and/or repair kits product is free from physical defects and all required markings are present and correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JOHN RIDENOUR

Notes : WELED BY MIKE JOLLY
HEAT No. -992D

~~SECRET~~ 11
No. 3

Calibrate

8-1-N



Electronic Data Devices

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P - 432-366-8699

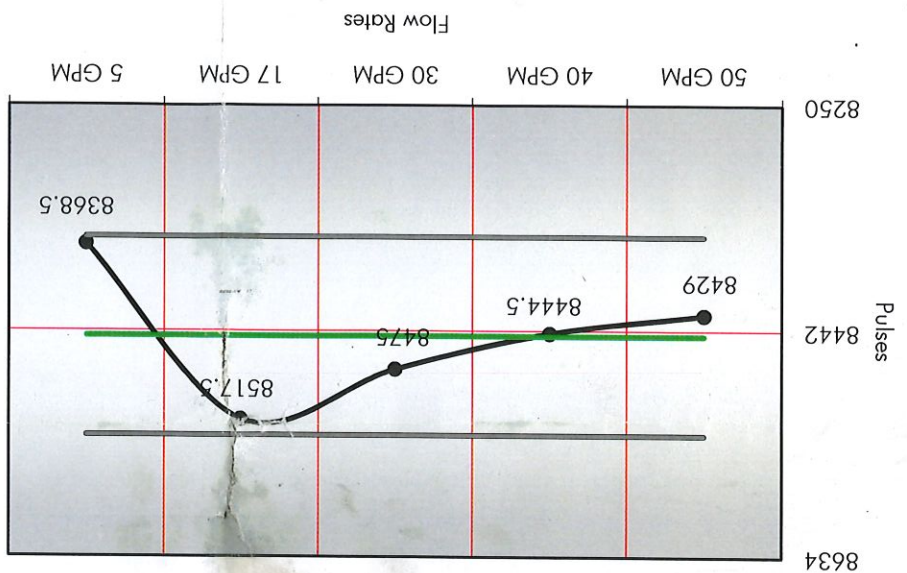
Odessa, TX 79768

P.O. Box 12128

Calibration Data & Inspection Sheet

Calibration Factor : **844.69**

Serial Number : 137426	Calibrated Item : 1" X 1" THD METER	Part Number : NPT0100101	Material Grade : A479316	Date : 8-Feb-19	Flow Range : 5 - 50 GPM
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This calibration data and inspection sheet certifies this meter's and/or repair kit's product is free from physical defects and all required markings are present and dimensions have been verified to be within drawing dimensions and tolerances, the correct. Welded in accordance to WPS: ED-GT-SS100. Hub material is A 479 316.

Calibrated By : JWR

Notes : WELDED BY MIKE JOLLY
HEAT No. -A05426

Total Pulses	84469
1%	8531.37
-1%	8362.43
Min. Value	8364
Max. Value	8519

Flow Rate	Pulses
50 GPM	8427
50 GPM	8431
40 GPM	8443
40 GPM	8446
30 GPM	8474
30 GPM	8476
17 GPM	8516
17 GPM	8519
5 GPM	8373
5 GPM	8364

1" X 1" THD METER
844.69
8-Feb-19

HK 12
#

FRAC SHACK™

Turbine "K" Factor Calculator

	Meter K Factor	HMI Input
Line 1	870.59	0.004348086
Line 2	848.85	0.004459445
Line 3	862.29	0.004389938
Line 4	848.86	0.004459393
Line 5	853.97	0.004432708
Line 6	873.47	0.004333749
Line 7	862.58	0.004388463
Line 8	853.2	0.004436709
Line 9	864.63	0.004378058
Line 10	859.86	0.004402345
Line 11	854.94	0.004427679
Line 12	844.69	0.004481407
Line 13	0	#DIV/0!
Line 14	0	#DIV/0!
Line 15	0	#DIV/0!
Line 16	0	#DIV/0!
Line 17	0	#DIV/0!
Line 18	0	#DIV/0!
Line 19	0	#DIV/0!
Line 20	0	#DIV/0!
Line 21	0	#DIV/0!
Line 22	0	#DIV/0!
Line 23	0	#DIV/0!
Line 24	0	#DIV/0!
Line 25	0	#DIV/0!
Line 26	0	#DIV/0!
Line 27	0	#DIV/0!
Line 28	0	#DIV/0!

Shack Number: _____ E-127 _____

Name: _____ Ethan Biscard _____

Signature: _____



Turbine "K" Factor Calculator w\ Meter Correction

	Meter K Factor	HMI Input	100 litre test result	New HMI Input	New 100 litre result	Result	
Line 1	870.59	0.004348086	101.9	0.004267013	100.8	#DIV/0!	#DIV/0!
Line 2	848.85	0.004459445	102.9	0.004333766	100.5	#DIV/0!	#DIV/0!
Line 3	862.29	0.004389938	103.9	0.004225157	100.4	#DIV/0!	#DIV/0!
Line 4	848.86	0.004459393	102.9	0.004333715	99.7	#DIV/0!	#DIV/0!
Line 5	853.97	0.004432708	103.5	0.00428281	99.7	#DIV/0!	#DIV/0!
Line 6	873.47	0.004333749	102.7	0.004219814	99.8	#DIV/0!	#DIV/0!
Line 7	862.58	0.004388463	101.6	0.004319353	100.0	#DIV/0!	#DIV/0!
Line 8	853.2	0.004436709	103.3	0.004294975	100.0	#DIV/0!	#DIV/0!
Line 9	864.63	0.004378058	104.6	0.004185524	100.2	#DIV/0!	#DIV/0!
Line 10	859.86	0.004402345	102.5	0.00429497	100.1	#DIV/0!	#DIV/0!
Line 11	854.94	0.004427679	104.5	0.004237014	100.0	#DIV/0!	#DIV/0!
Line 12	844.69	0.004481407	104.7	0.004280236	99.8	#DIV/0!	#DIV/0!
Line 13	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 14	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 15	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 16	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 17	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 18	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 19	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 20	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 21	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 22	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 23	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 24	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 25	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 26	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 27	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
Line 28	0	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!

Shack Number: E127

Name:

Signature:

