ForeSite® EDGE

Variable Speed Drive
RPC Manual

Contents

	Description	Date
A	Initial Release	December 2020
B		July 2024

1. Purpose

1.1 The purpose of this Running Program (RP) is to install reciprocating rod lift (RRL) VSD at a non-conventional well site.

2. Scope

2.1 This running procedure includes instruction to safely install Weatherford ForeSite EDGE VSD on a conventional pumping unit. A mobile gripper unit, cranes, and suitable well control equipment (rated to 10k) will be used.

3. Site Mobilization of VSD Equipment

3.1 Pass Inspection

4. Safety

4.1 Statement of Compliance

4.2 Specific hazard identification (JHA) shall be conducted prior to commencing work to determine potential hazards which necessitate the implementation of controls including personal protective equipment (PPE).

4.3 Document the JHA using Toolbox Safety Meeting/Job Hazard Analysis Form, list the control measures required to reduce remaining hazards to As Low as Reasonably Practicable (ALARP), and identify the personnel responsible for ensuring the controls are in place.

4.4 Communicate the work process and JHA with all personnel during the Toolbox Talk

4.5 Field HAZID tools (if applicable) can be used as reference materials, pre-completed JHA's in the field are not permitted due to the dynamic environment.

4.6 Employees and sub-contractors, regardless of position or qualification, not only have the right but the obligation to stop any work if conditions are deemed to be unsafe or if a hazardous situation arises.

4.7 Management of Change (MOC) applies to this TWI/SOP; deviation is prohibited without authorization from an approved MOC.

4.8 Personal Protection Requirements (PPE)

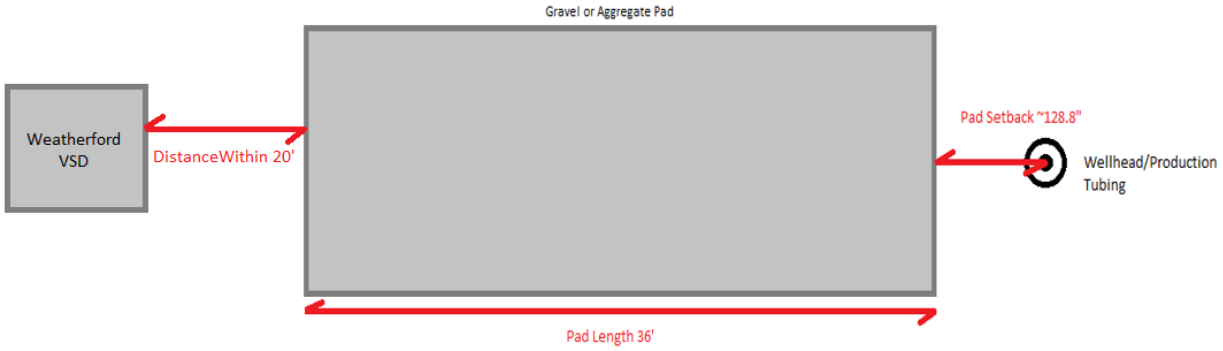
4.9 Unless a risk assessment determines the need for additional specialized PPE, the following approved equipment is required; steel-toed footwear, safety glasses/eye wear, hardhat/helmet, gloves suitable for the task, coveralls and hearing protection.

4.10 Attain necessary permit to work

5. VSD Installation Location

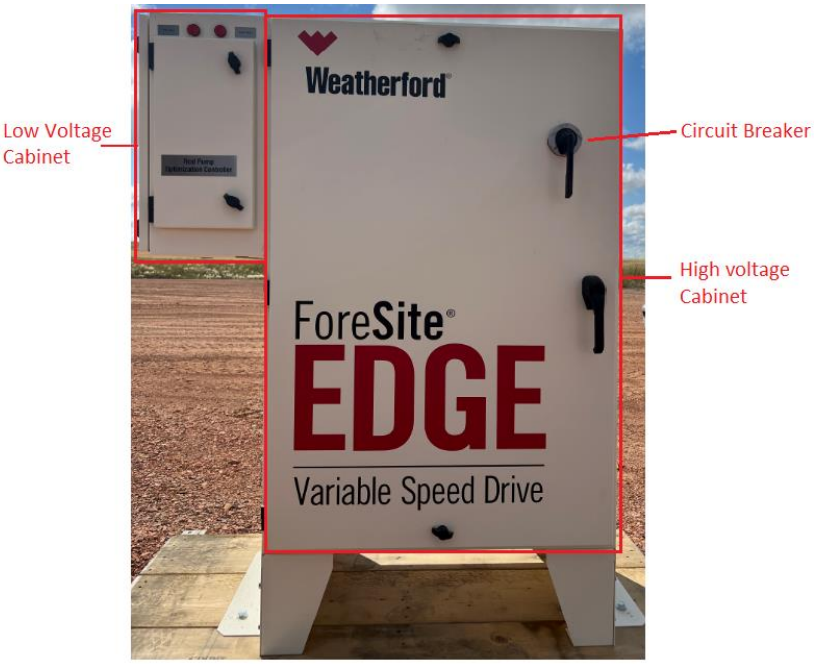
5.1 This location should be leveled, secure, and within close proximity to the motor of the pumping unit.

5.2 VSD comes already installed on a skid base. Place the VSD front door or RPC HMI facing the pumping unit motor.



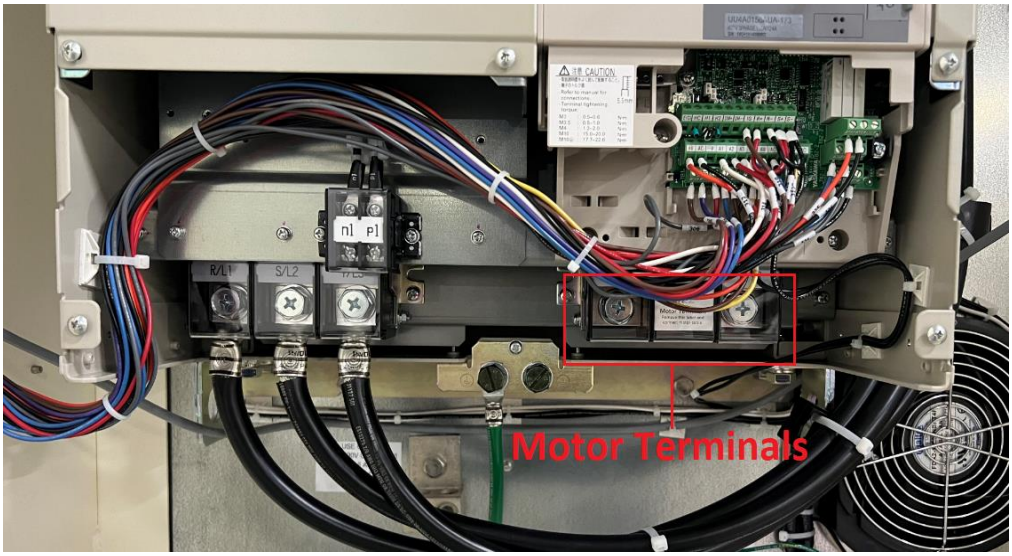
6. Electrical Installation

6.1 VSD cabinet main power inlet and outlet are located on the right side of the VSD.



6.2 Ensure the VSD circuit breaker is powered off.

6.3 Open the high voltage cabinet to access the terminals for VSD inlet and outlet (motor terminals)



6.4 Ensure proper energy isolation on the 3 phase power supply that feeds the VSD before wiring the VSD input and output terminals.

6.5 Drill holes and install proper sized glands for power cables inlet and motor cable outlet.

6.6 Remove the protective cover on the incoming terminals. Connect the 3 phase power inlet 480Vac/60Hz to the incoming terminals.

6.7 Connect the VSD ground bus bar to the earth ground bar.

6.8 Remove the protective cover on the outgoing terminals. Motor should be wired to the VSD output terminals in Delta connection. Connect the motor leads to the Outgoing terminals are marked. Motor ground wiring terminal is properly terminated on the VSD end.

6.9 Add the protective covers once incoming and outgoing terminal wiring is complete.

7. Rod Pump Controller Sensor Installation – Position Sensor

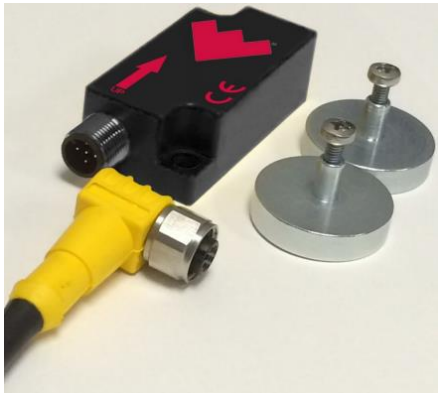
7.1 The inclinometer is an accelerometer-based, angular position sensor. The inclinometer needs to be installed in the vertical place.

7.2 To assemble the inclinometer, complete the following steps:

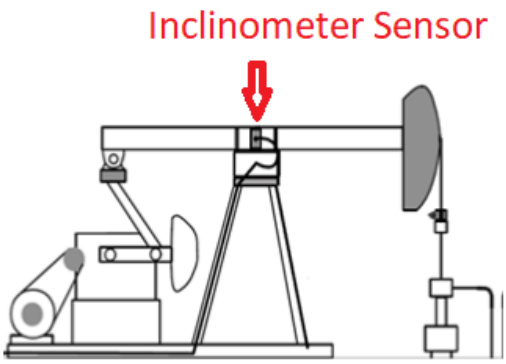
7.2.1 Remove the position sensor from its packaging.

7.2.2 Connect the sensor to the sensor cable.

7.2.3 Assemble the sensor with magnets using the screws provided in the packaging.

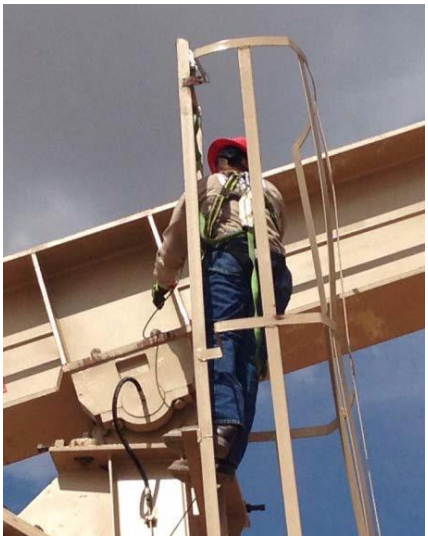


7.3 The sensors must be installed perpendicular to the walking beam and above or on the saddle bearing of a conventional rod pumping unit.

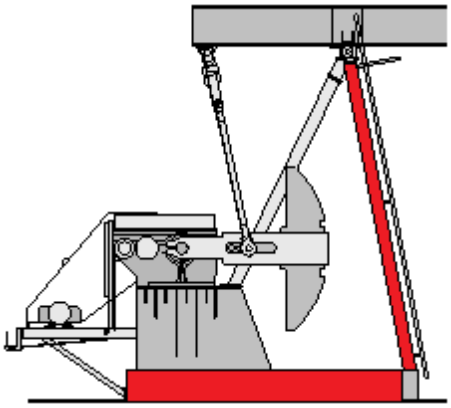


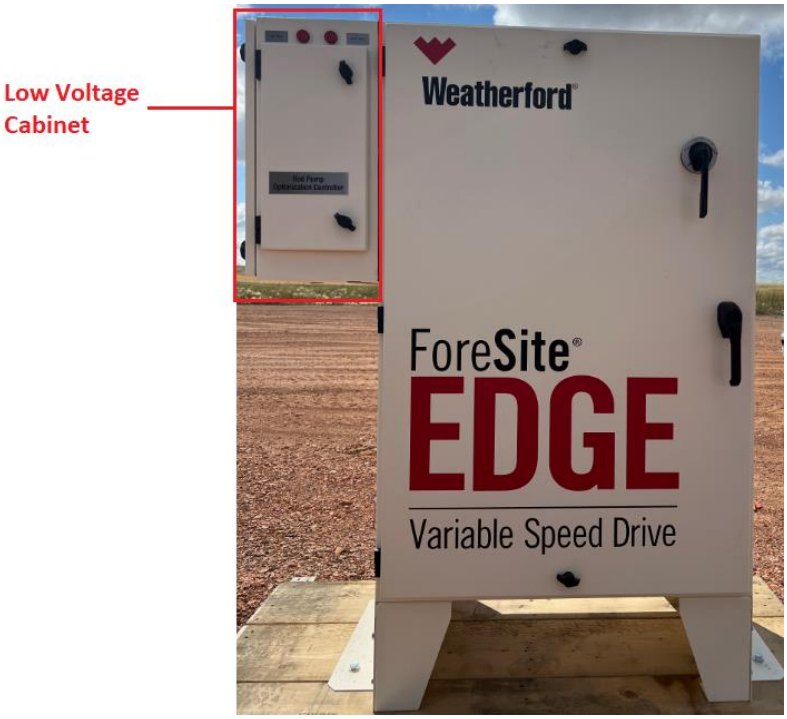
7.4 Set the brake on the pumping unit by firmly, but gradually, pulling down on the brake lever, located toward the rear of most pumping units.

7.5 Using fall protection, mount the sensor on the walking beam or on the saddle bearing in the orientation perpendicular to the beam. Ensure that the sensor has enough slack in the cable to move freely and unhindered once the unit is operational.



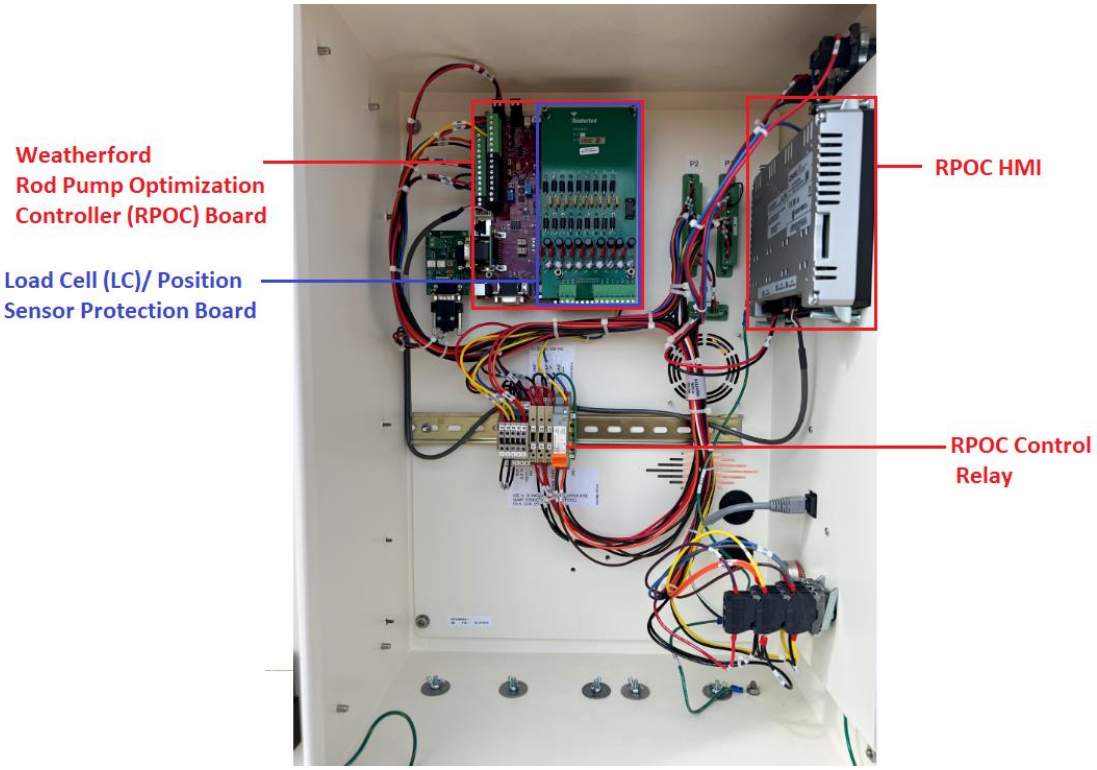
7.6 Use beam clamps with hook and zip tie to fasten the sensor cable along the Samson post closest to the ladder or use beam clamps with hooks to route the cable back to the VSD low voltage cabinet.

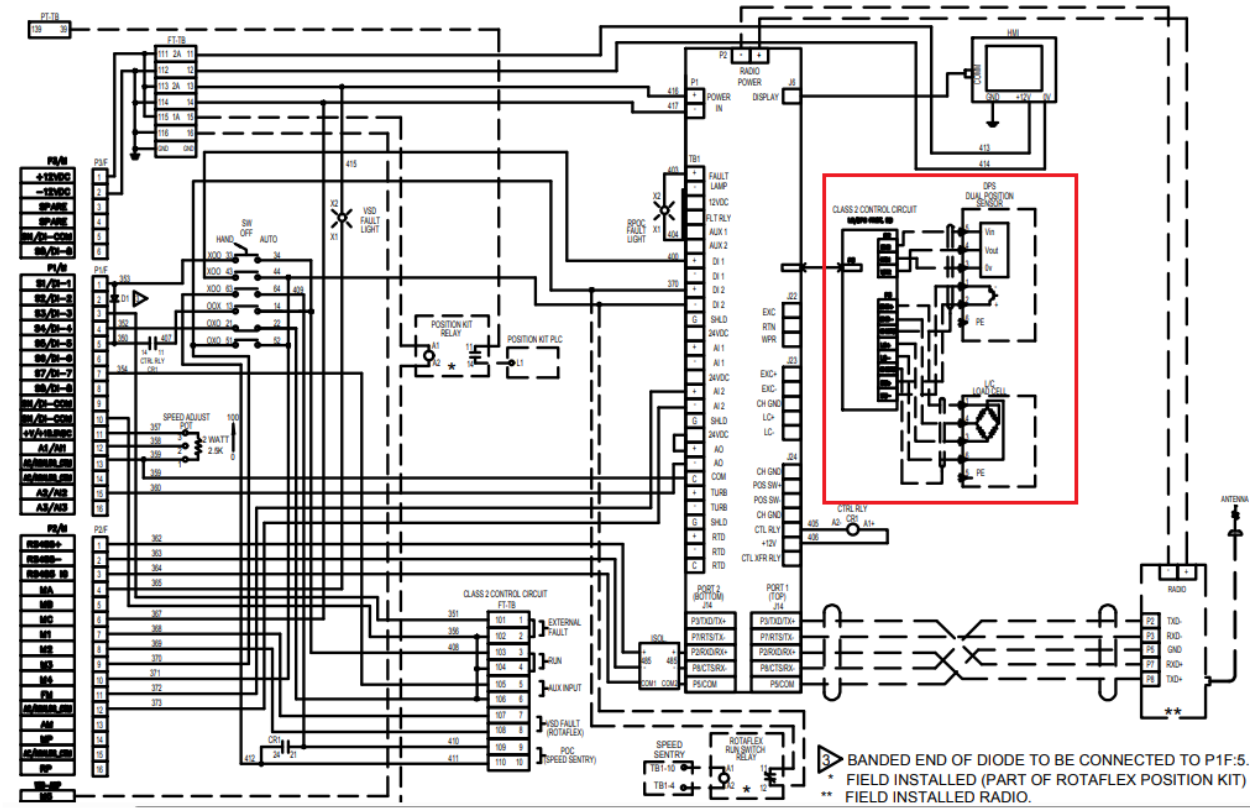


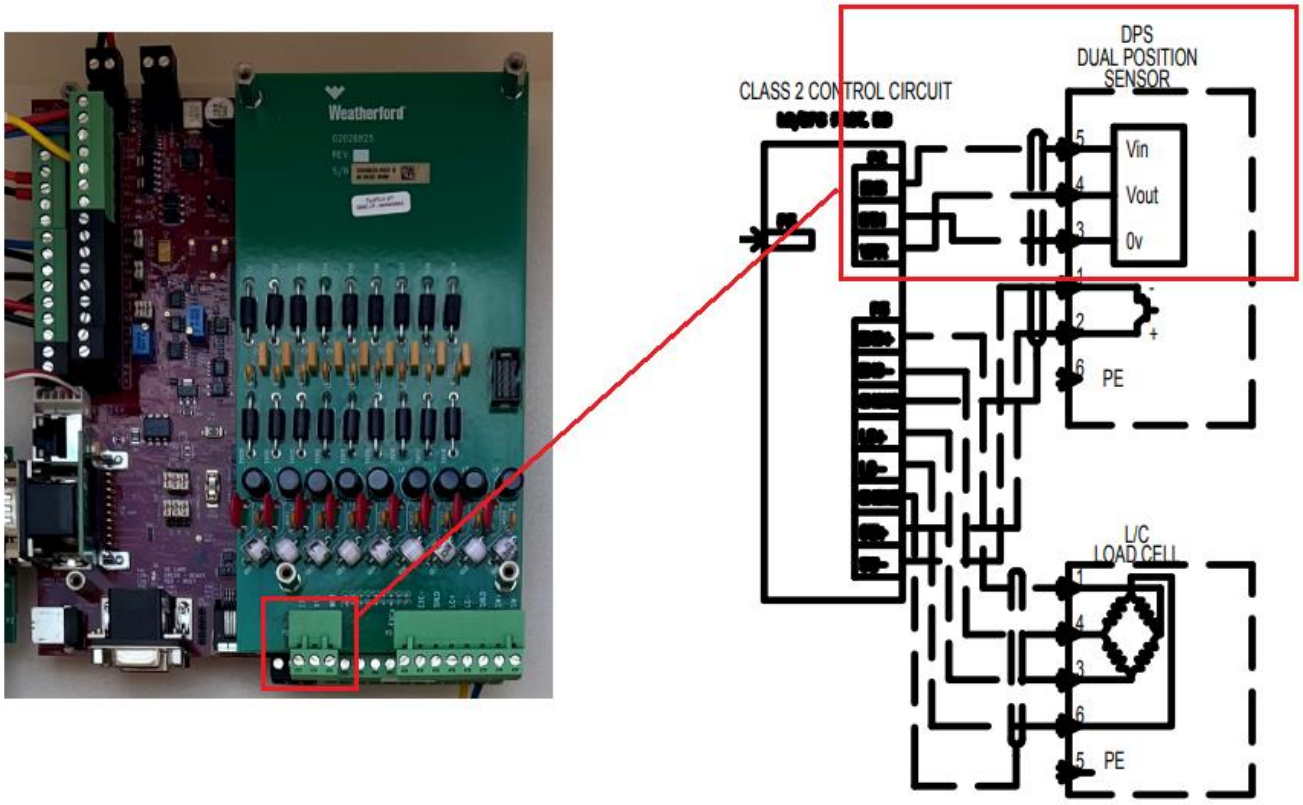


7.7 Drill holes and install proper glands for load cell and position sensor cable entry into the VSD low voltage cabinet.

7.8 Below figure shows the position sensor terminals wiring inside the VSD low voltage cabinet.



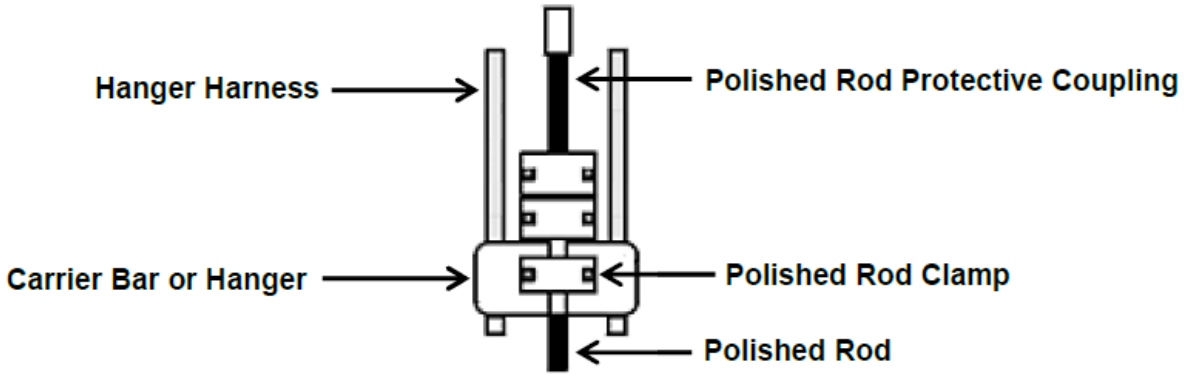




8. Rod Pump Controller Sensor Installation – Load Cell Sensor

8.1 Each polished rod load cell possesses a label that shows the model, serial, and lot numbers, which are useful in identifying each load cell (see below for examples of a 30K, 50K).

8.2 The polished rod load cell is attached to the polished rod of an applicable pumping unit between the polished rod clamps and the carrier bar or hanger (see below Figure).



8.3 The installation of the polished rod load cell and cable assembly may require two trained personnel, a crane, and a man lift. Always wear fall protection PPE before attempting to work at heights 6' or greater

8.4 Stop the unit and apply LOTO (Lockout, Tagout) and Energy Isolation.

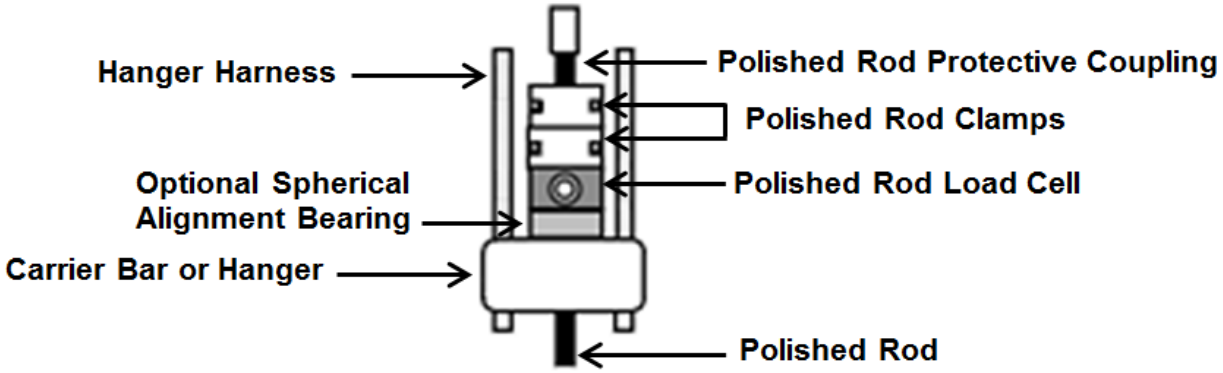
8.5 Set the brake on the pumping unit by firmly, but gradually, pulling down on the brake lever, located toward the rear of most pumping units.

8.6 Install the appropriately sized polished rod clamp above the stuffing box

8.7 Gradually release the brake and re-energize the prime mover of the pumping unit, allowing the horsehead or load belt to move and separate the carrier bar from the upper polished rod clamps.

8.8 Turn off the power to the pumping unit, set the brake.

8.9 Mark the location of the top of the existing polished rod clamp, and then remove the upper clamp and any polished rod coupling, if available.

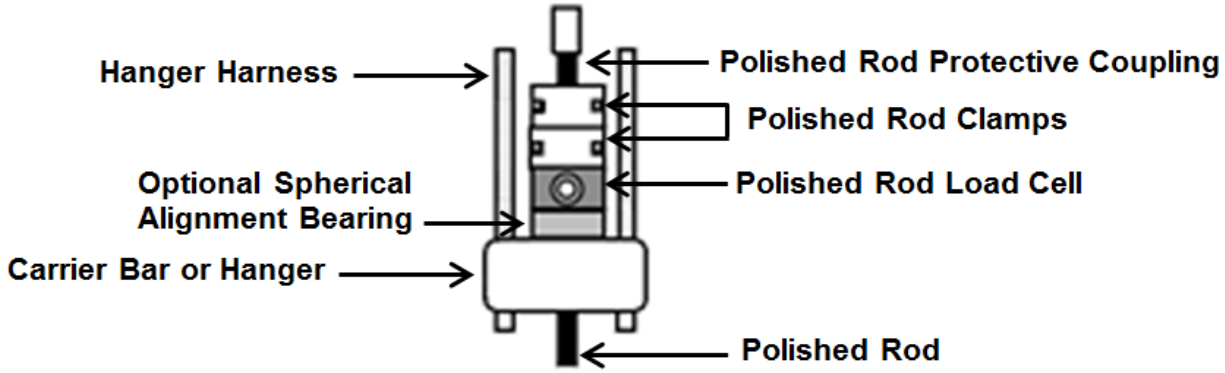


8.10 Remove the pony rod, if applicable, from the top of the polished rod, as well as the polished rod coupling.

8.11 Add the alignment bearing, slide the bearing onto the polished rod, allowing it to come to rest on top of the carrier bar.

8.12 Once the alignment bearing is installed on the polished rod, the load cell should be placed on top with the "UP" directional arrow on the load cell facing up and the connector opening facing toward the pumping unit on most units.

8.13 Reinstall the upper polished rod clamps at a distance that is above the previous polished rod clamp mark, in addition to the total height of the load cell and bearing or bearings.



8.14 Remove the load cell cable assembly from its packaging and unwind the entire cable assembly. The end with the exposed wires should be left close to the VSD low voltage cabinet and the connector end can be placed toward the front end of the pumping unit. The load cell cable used will be blue in color marking intrinsic safe cable.

8.15 Disassemble the load cell connector portion of the cable assembly and apply polytetrafluoroethylene (PTFE) thread tape to the threaded connector.

8.16 Insert the threaded connector into the load cell's threaded opening and tighten by hand and/or using an appropriate wrench. Hand tighten the weather tight cap. The use of tools will over torque the cap and cause damage to the grommet.

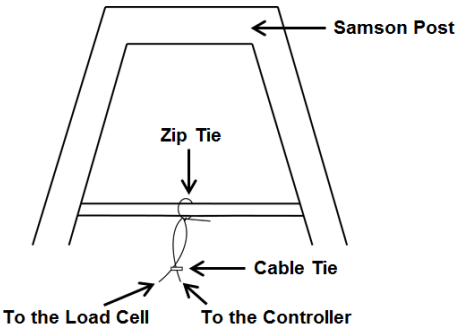
8.17 Insert the load cell electrical connector plug into the load cell opening. Ensure the orientation of the protruding pins in the load cell's connector is correct to prevent damage to the pins.

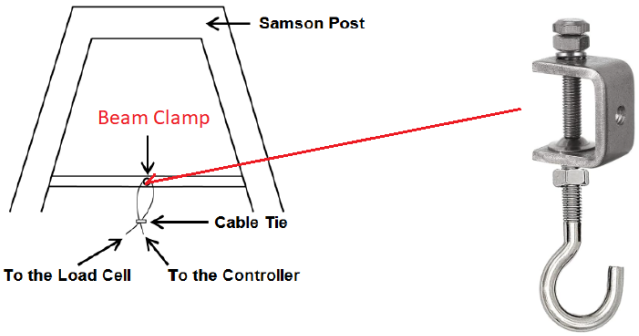
8.18 With the load cell cable's connector firmly inserted into the load cell's connector, tighten the weather tight cap over the grommet onto the threaded connector.

8.19 Load cell cables are assembled and packaged with a thimbled portion to assist with strain relief and that portion must therefore be attached to the S-hook on the load cell's arm. Use channel locks to crimp down on the S-hook once the thimble is inserted. If an S-hook is not provided, one must be added to the larger of the two holes on the load cell's arm.

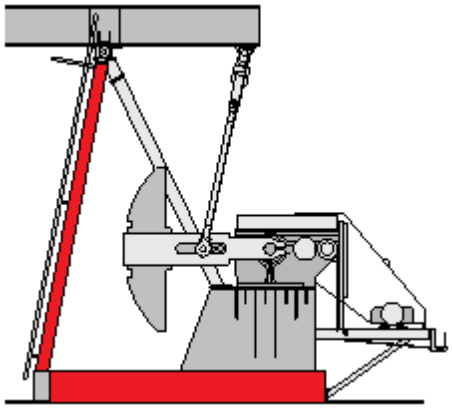
8.20 Route the load cell cable around the front cross member of the Samson post

8.21 Install a zip tie or beam clamp with hook on the front cross member, and then create a loop in the cable and attach either around the zip tie or beam clamp.





8.22 Using beam clamps, along the base of the pumping unit, and then install two to three evenly spaced beam clamps with hooks up the Samson post closest to the ladder.



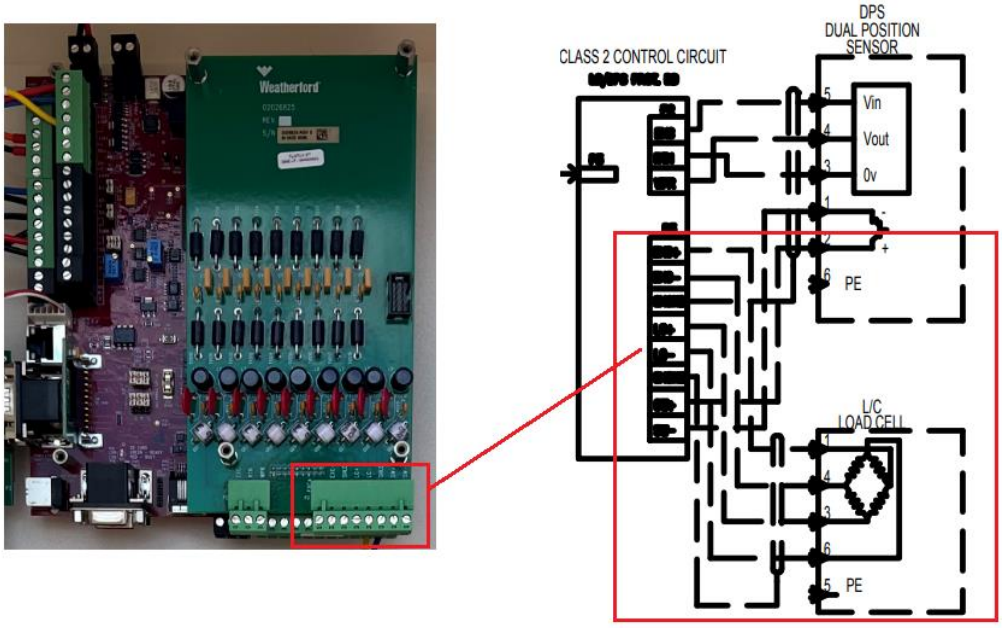
8.23 Moving from the top of the unit to the bottom of the unit, use the cable/zip ties to fasten load cell cable along the outline of the pumping unit.

8.24 Remove the temporary polished rod clamps using appropriate tooling

8.25 Remove energy isolation equipment and LOTO (Lockout, Tagout)

8.26 Release the brake and inspect the load cell cable to ensure that enough length is available to allow the cable to move freely and unhindered as the head of the pumping unit rises. It may be necessary to reenergize the pumping unit to allow movement of the counterweights. Extreme caution must be taken whenever the unit is energized.

8.27 Below figure shows wiring of load cell cable terminals on the VSD low voltage cabinet.

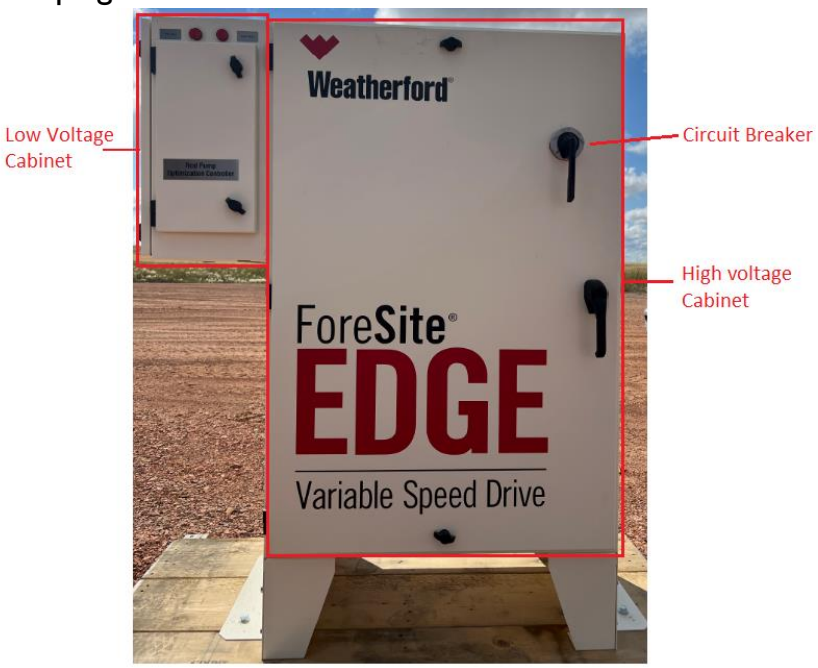


9. Powering Up the VSD

9.1 Remove LOTO (Lockout, Tagout) and energy isolation on the 3 phase power supply that powers the VSD.

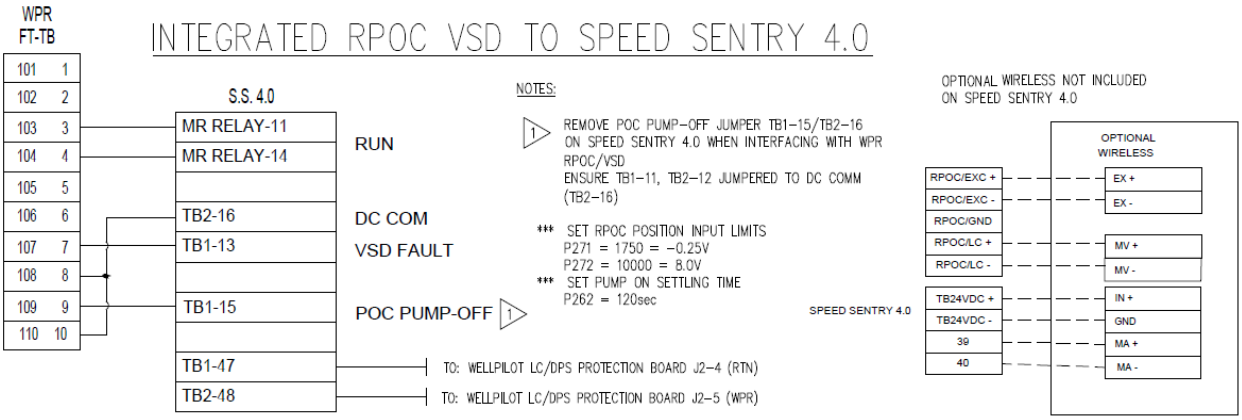
9.2 Prior to energizing the VSD, open the high voltage cabinet and verify that the line voltage on the inlet phase to phase on top side of the circuit breaker does not exceed 480VAC+3%. If it does, the incoming voltage must be lowered at the utility transformer before the VSD.

9.3 Rotate the external breaker handle clockwise to turn on the VSD and POC, and then energize the pumping unit.



9.4 Verify the Rod Pump Controller HMI powers up and drive digital keypad comes ON.

10. Rotaflex Sensor Connection

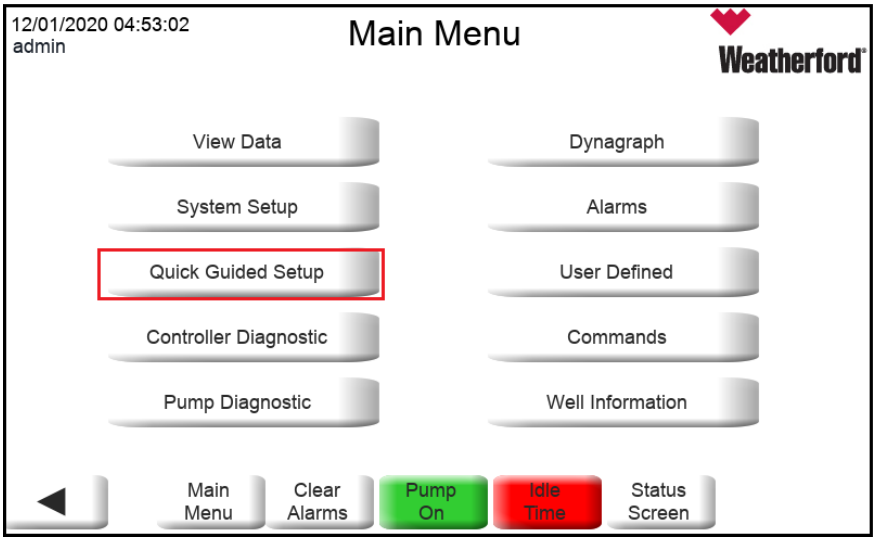


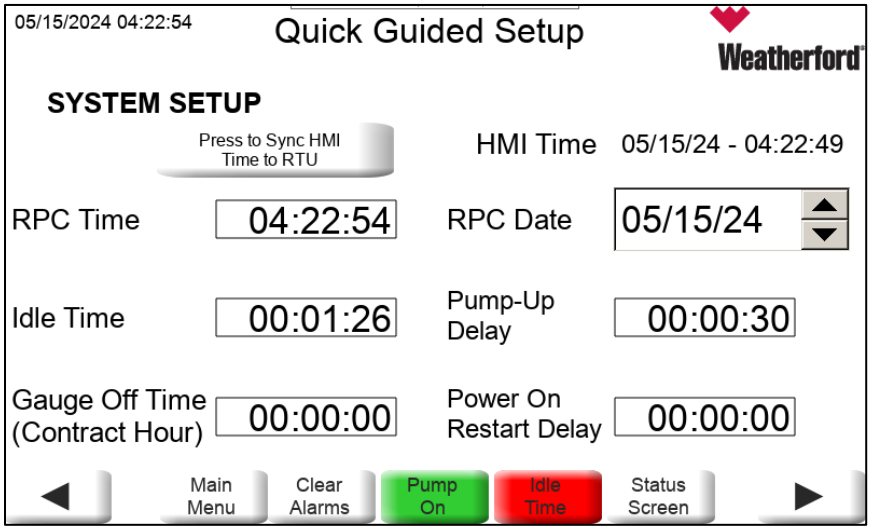
11. Weatherford Rod Pump Controller Programming

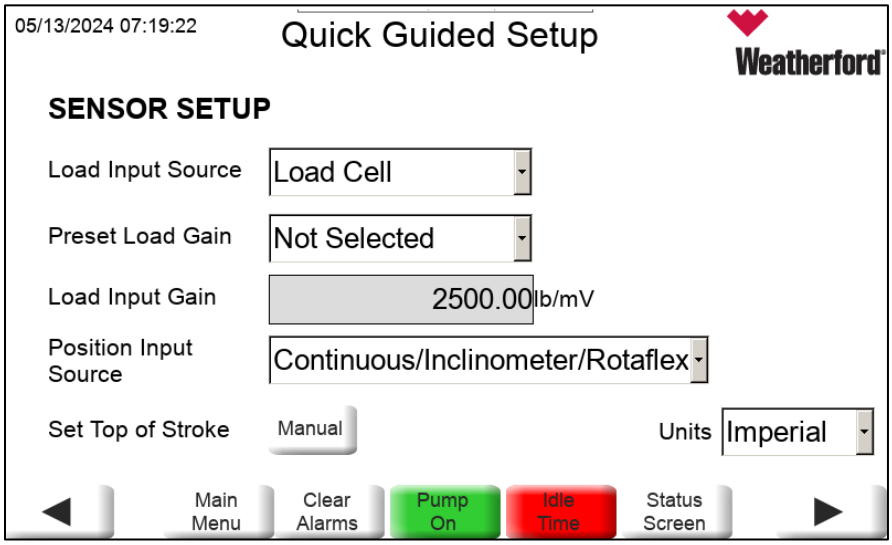
11.1 Quick Guided Setup Menu- Is a basic menu that is primarily used when initially commissioning well. The Quick Guided Setup Menu is also useful in terms of allowing access to settings that are need regular adjustment.

11.2 QUICK GUIDED SETUP MENU STRUCTURE

10.1 Quick Guided Setup	
11.2.1 System Setup Page 1	11.2.29 VSD Control
11.2.2 Press To Sync HMI Time to RTU	11.2.30 SPM Min
11.2.3 Time	11.2.31 SPM Max
11.2.4 Date	11.2.32 SPM Start-Up
11.2.5 Idle Time	11.2.33 VSD Target Fillage
11.2.6 Gauge Off Time	11.2.34 Min Fillage Action
11.2.7 Pump-Up Delay	11.2.35 Min Fillage
11.2.8 Power on Restart Delay	11.2.36 Min Fillage Strokes
11.2.9 Sensor Setup	11.2.37 Surface Tol%
11.2.10 Load Input Source	11.2.38 Downhole Tol%
11.2.11 Preset Load Gain	11.2.39 Enable
11.2.12 Load Input Gain	11.2.40 Rotaflex Control
11.2.13 Position Input Source	11.2.41 Position Min Input
11.2.14 Set Top of Stroke	11.2.42 Position Max Input
11.2.15 Units	11.2.43 Pump on Settling Time
11.2.16 Surface Control	11.2.44 Sensor Failure Action
11.2.17 Pump-Off POS%	11.2.45 # Cycles to Average
11.2.18 Pump-Off Load%	11.2.46 Manual Cycle Runtime
11.2.19 Pump-Off Strokes	11.2.47 Weatherford Rotaflex Model
11.2.20 POC Method	11.2.48 STA Enable
11.2.21 Pump Fillage Control	11.2.49 Trim Speed Diff
11.2.22 VSD Target Fillage	11.2.50 Max Trans Speed
11.2.23 Pump-Off Position Fillage	11.2.51 STA Segment Setup
[Min Fillage]	11.2.52 Well Setup
11.2.24 Pump-Off Strokes [Min Fillage Stroke]	11.2.53 Pump Depth
11.2.25 Pump-Off Action [Min Fillage Action]	11.2.54 Bore Dia
11.2.26 Downhole Enable	11.2.55 Fluid Depth
11.2.27 POC Control Source	11.2.56 Surface Stroke
11.2.28 Load Violation Setup	11.2.57 Fluid Calc Method
	11.2.58 Pump Efficiency
	11.2.59 Rod Tapers
	11.2.60 Pump Intake Pressure (PIP) Setup
	11.2.61 8500/Modbus Slave
	11.2.62 Modbus Scanner
	11.2.63 Save and Restart


12/01/2020 04:53:02
admin
Main Menu
Weatherford
View Data
Dynagraph
System Setup
Alarms
Quick Guided Setup
User Defined
Controller Diagnostic
Commands
Pump Diagnostic
Well Information
Main Menu
Clear Alarms
Pump On
Idle Time
Status Screen

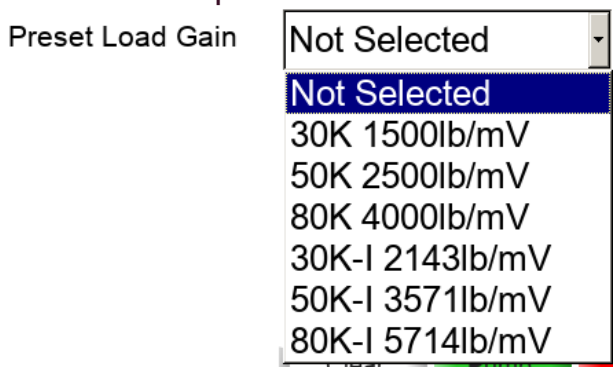

05/15/2024 04:22:54
Quick Guided Setup
Weatherford
SYSTEM SETUP
Press to Sync HMI Time to RTU
HMI Time 05/15/24 - 04:22:49
RPC Time 04:22:54
RPC Date 05/15/24
Idle Time 00:01:26
Pump-Up Delay 00:00:30
Gauge Off Time (Contract Hour) 00:00:00
Power On Restart Delay 00:00:00
Main Menu
Clear Alarms
Pump On
Idle Time
Status Screen


05/13/2024 07:19:22
Quick Guided Setup
Weatherford
SENSOR SETUP
Load Input Source Load Cell
Preset Load Gain Not Selected
Load Input Gain 2500.00 lb/mV
Position Input Source Continuous/Inclinometer/Rotaflex
Set Top of Stroke Manual
Units Imperial
Main Menu
Clear Alarms
Pump On
Idle Time
Status Screen

11.3 Load Input Source

- Load cell – Wired Load cell
- Strain Gauge
- Wireless Load cell

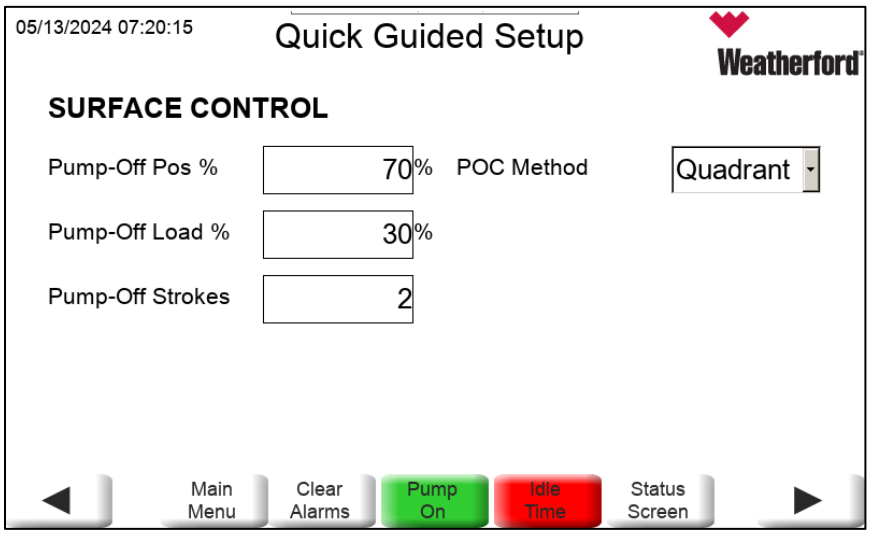
11.4 Preset Load Gain – Allows to choose the load cell gain. Selected load cell gain will be displayed under Load Input Gain.



- Choose 50K-I for load cell connected to RPOC through IS barriers.

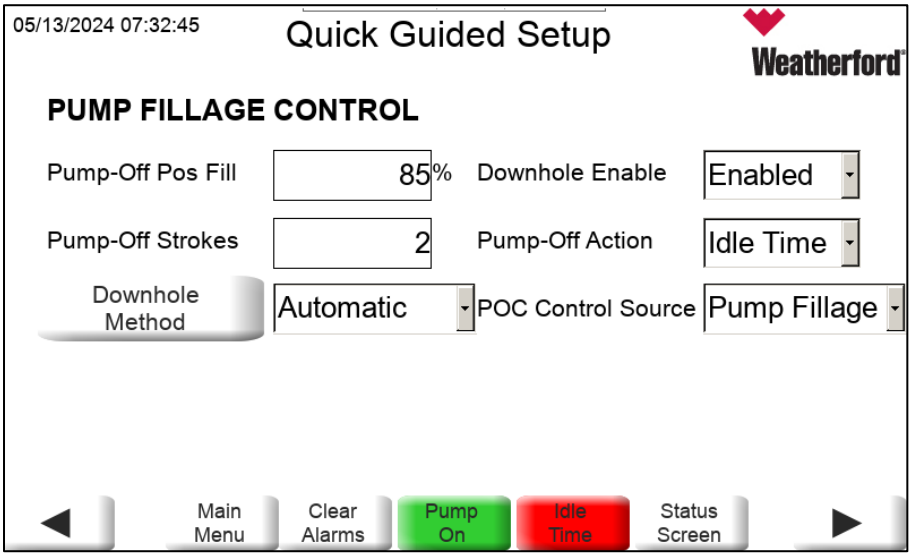
11.5 Position Input Source – Continuous/Inclinometer/Rotaflex when using inclinometer position sensor or Speed Sentry Aux position kit output on Rotaflex.

11.6 To operate VSD, position input source should be Continuos/Inclinometer/Rotaflex.



11.7 In case of Surface POC method, choose Quadrant when operating in VSD mode. Well will be controlled in Surface Quadrant pump fillage when downhole control fails.

11.8 Pump Fillage Control page is dynamic and below is the screen layout when VSD Enable flag is disabled.



11.9 Source of POC control - Downhole or Surface

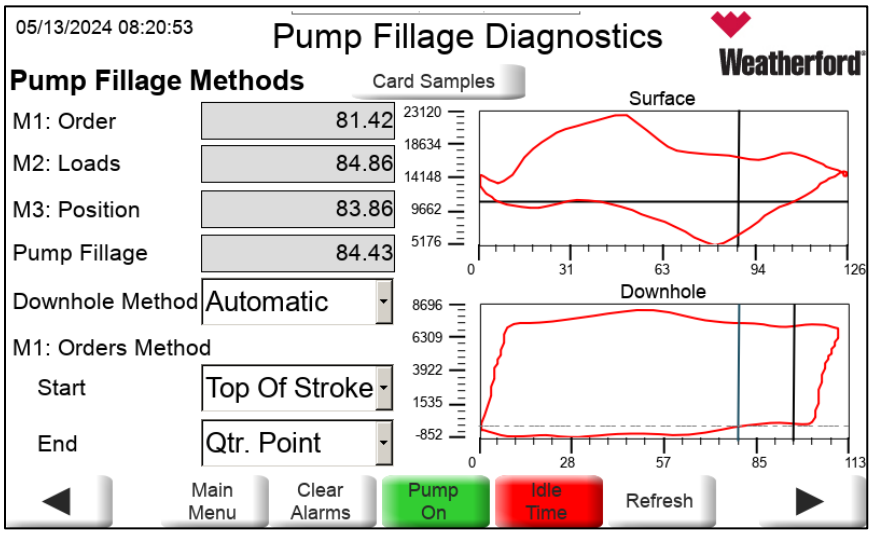
0 = Surface

1 = Pump Fillage (When DH is enabled)

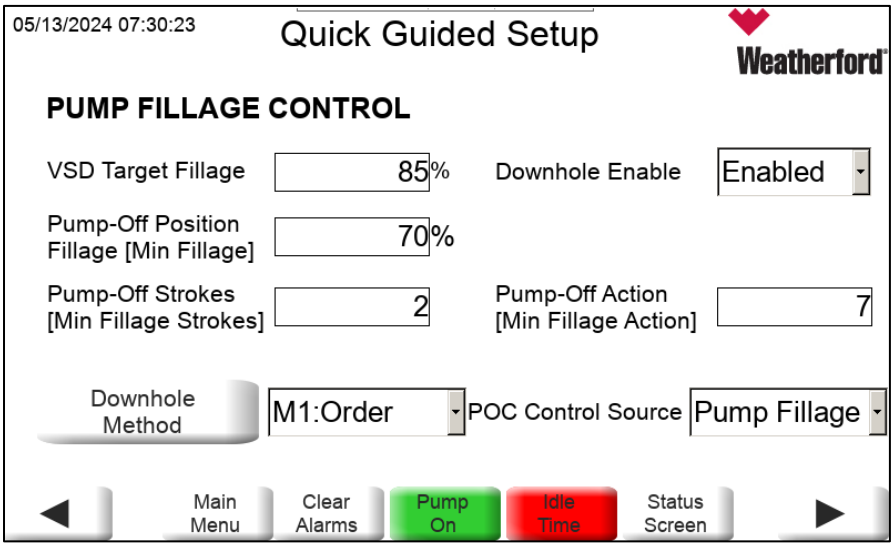
11.10 Downhole Method button allows user to choose the right pump fillage method.

11.11 Choose "M1:Order" method for downhole cards that show gas interference and downhole friction.

- Modified Orders Method for severe downhole friction, fluid acceleration and Rotaflex cards with load drop at bottom of stroke running in racetrack mode.
- To enable Modified orders method.
  - Choose Downhole Method to M1: Order
  - Start: Top stroke
  - End: Qtr. Point



11.12 Pump Fillage Control page changes to below layout when VSD enable flag is enabled by the drive model under VSD CONTROL page.



11.13 VSD Target fillage – Well speed controlled between Min SPM and Max SPM based on the target fillage/

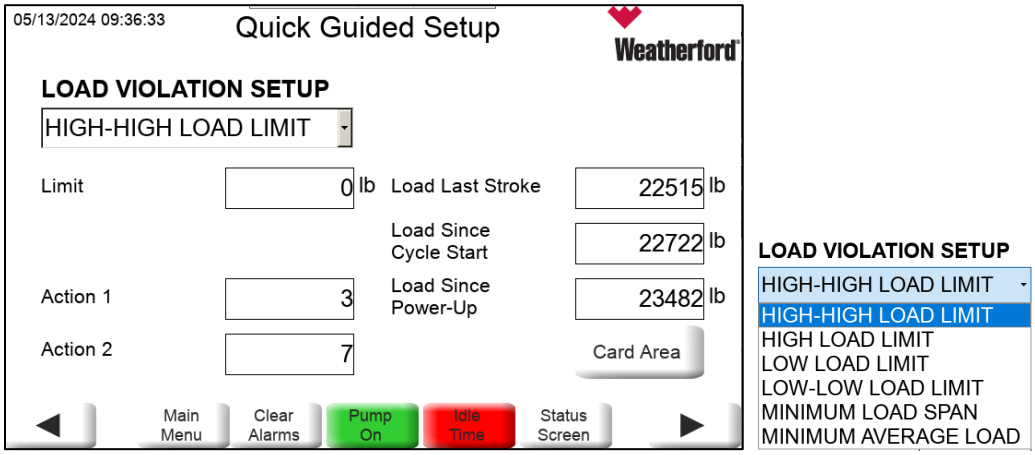
11.14 Pump Off Position Fillage – When fillage drops below pump off position for the pump off strokes, well can be stopped on idle time and started back by setting pump-off action to 4 = Idle time.

11.15 Downhole Enable – Allows to enable downhole calculation based on the downhole information entered (well depth and rod string information).

11.16 POC Control Source –

- Surface Fillage – Control the well pump off from Surface Pump-Off Pos & Pump-Off Load in case of fixed speed or standard operation. Control well speed from surface fillage when VSD is enabled.

- Pump Fillage – Control the well pump off from Pump-Off Position Fillage in case of fixed speed or standard operation. Control well speed from VSD Target fillage when VSD is enabled.



11.17 High-High Load Limit – Well shutdowns on Off/Reset when load value goes above the limit set under High-High Load limit page.

11.18 Load Last Stroke, Load Since Cycle Start and Load Since Power up shows the peak load captured.

11.19 High Load Limit – Well keeps running with RPOC fault lamp ON when value goes above the limit set under High Load Limit page.

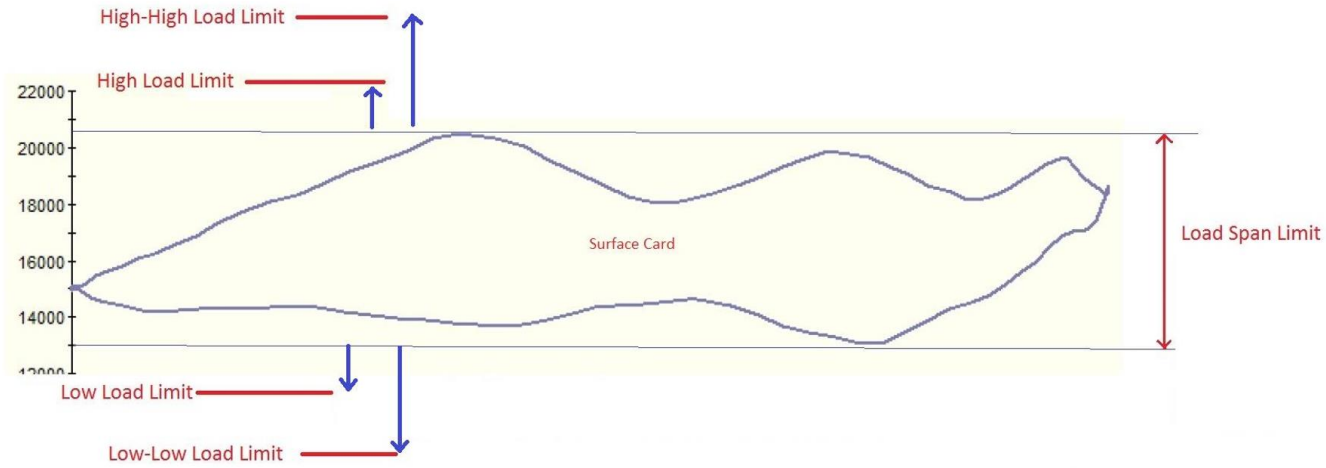
11.20 Low Load Limit - Well keeps running with RPOC fault lamp ON when value goes below the limit set under High Load Limit page.

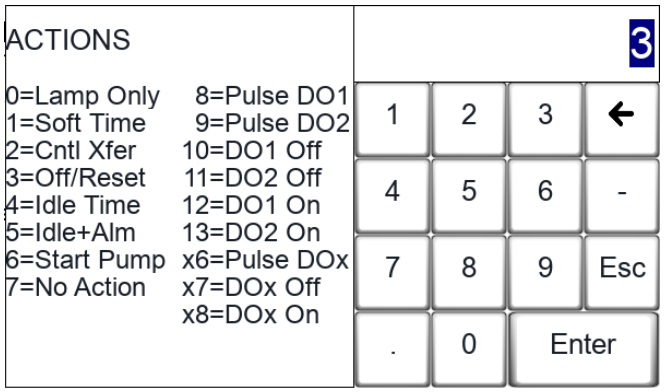
11.21 Low-Low Load Limit - Well shutdowns on Off/Reset when load value goes below the limit set under High-High Load limit page.

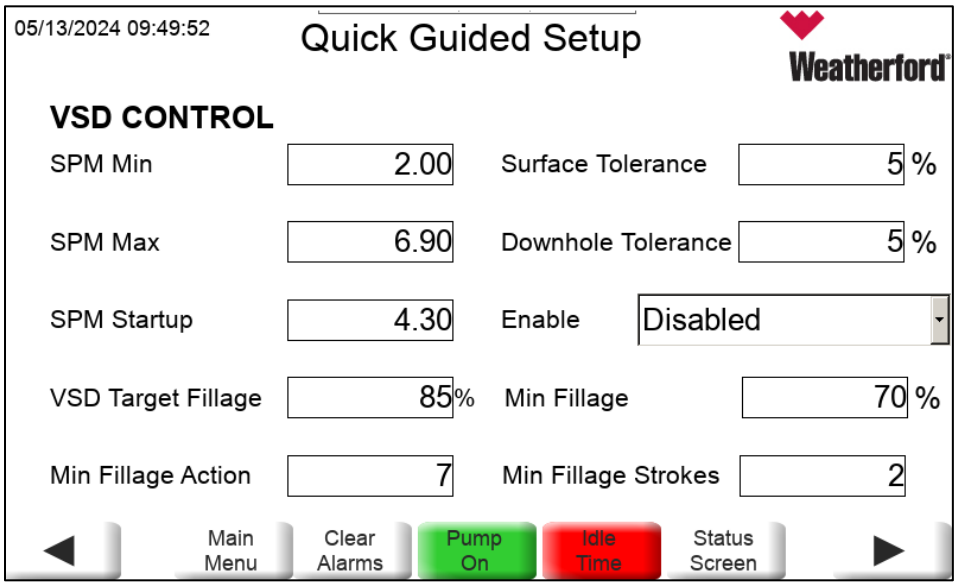
11.22 Load Last Stroke, Load Since Cycle Start and Load Since Power up shows the minimum load captured.

11.23 Minimum Load Span – Allows to detect malfunctioning downhole pump valves.

11.24 Card Area – Allows to detect delayed travelling valve closure and pump issues.

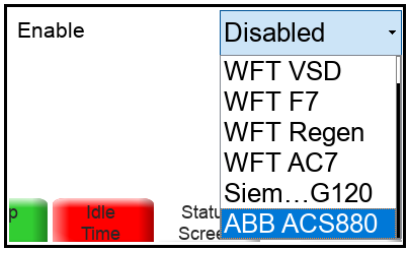


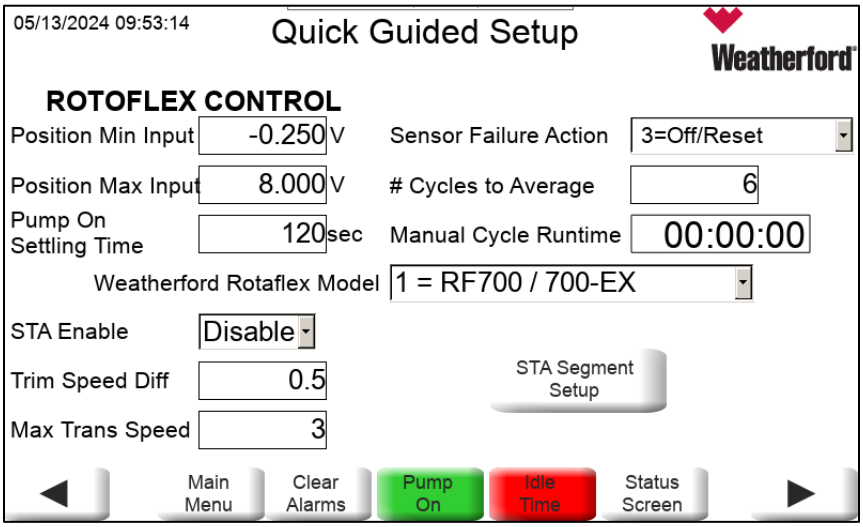




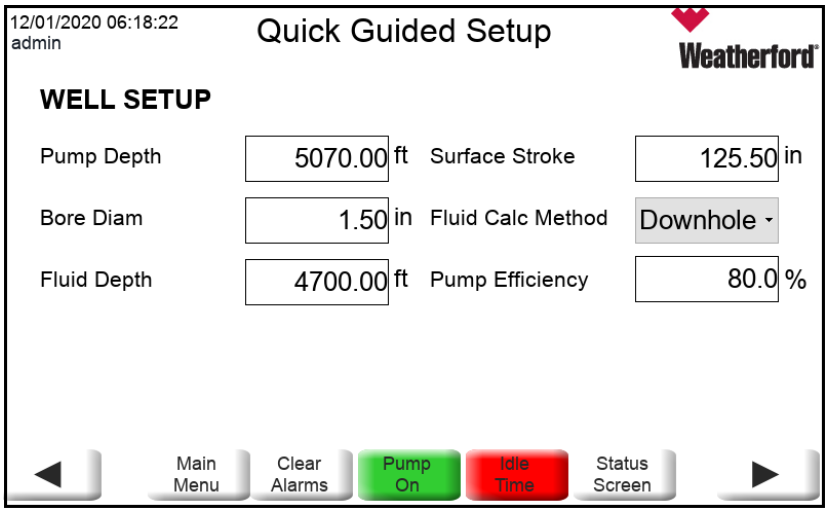
11.25 VSD Enable (P1250)

- 1 = WFT VSD



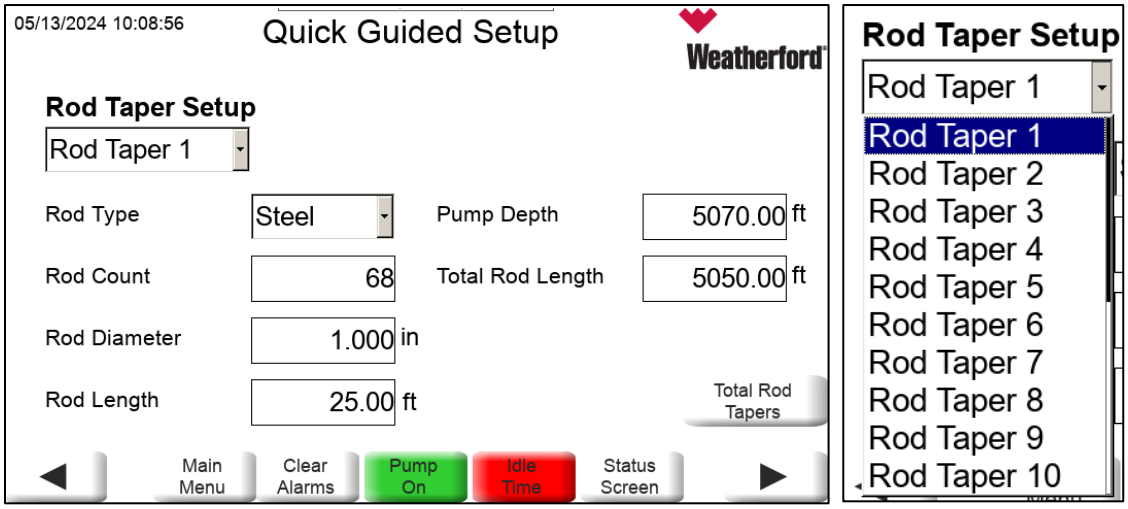


11.26 Rotaflex Control Page – Above page setup can be skipped for beam pumps

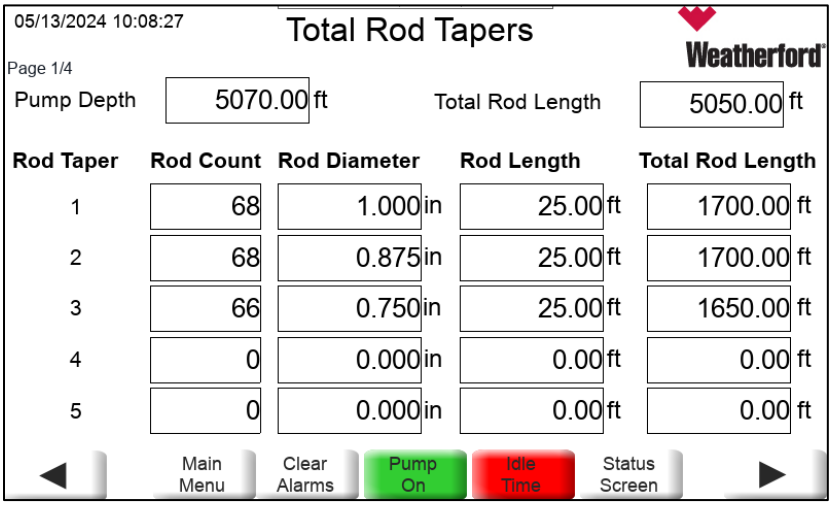


11.27 Fluid Stroke Calculation Method

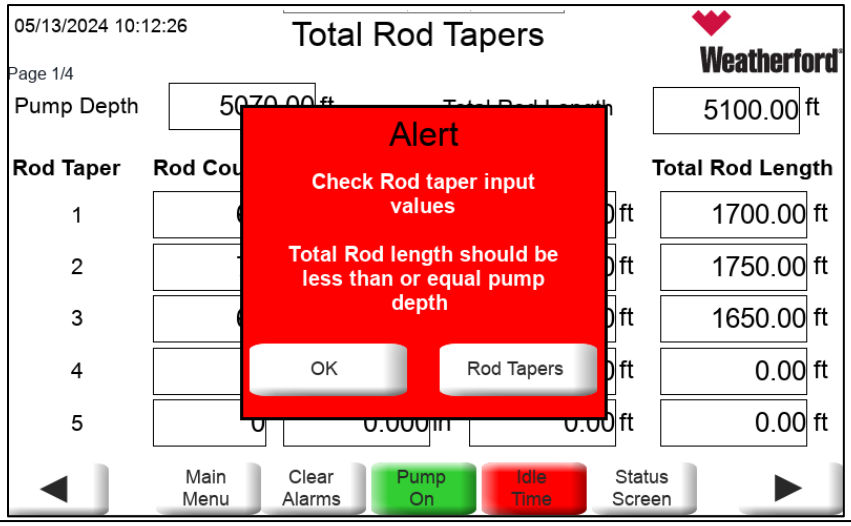
0= Disabled
1 = Short Method (Used in surface control)
2 = Long Method (used in surface control)
3 = Downhole stroke (Should be set when downhole enabled)

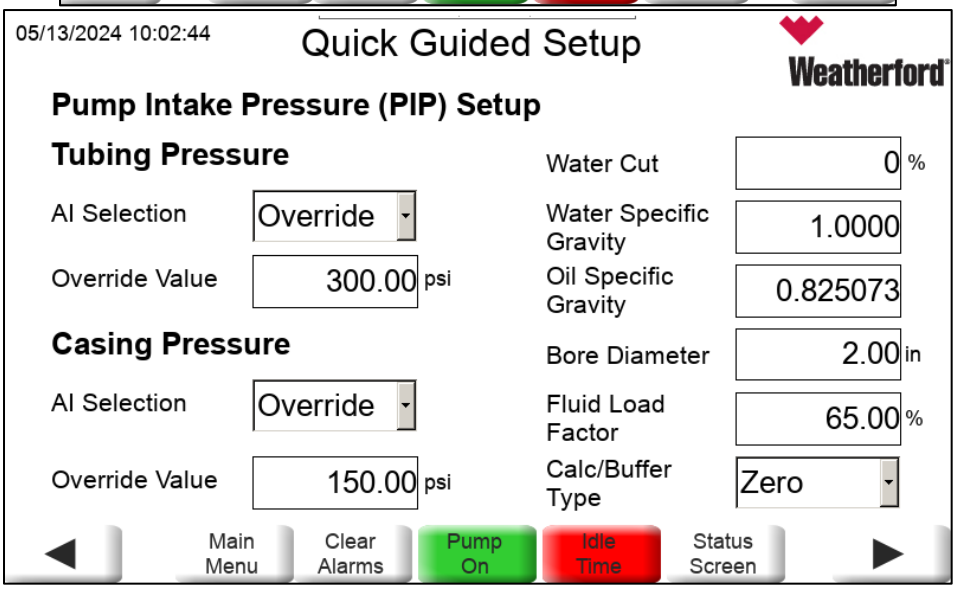


11.28 Total Rod Tapers screen shows the complete list of each rod tapers with count, diameter, length and total Rod Length of each taper.



11.29 Alert pop-up will show up when total rod length exceeds the pump depth. Verify each taper inputs with the well design downhole information.



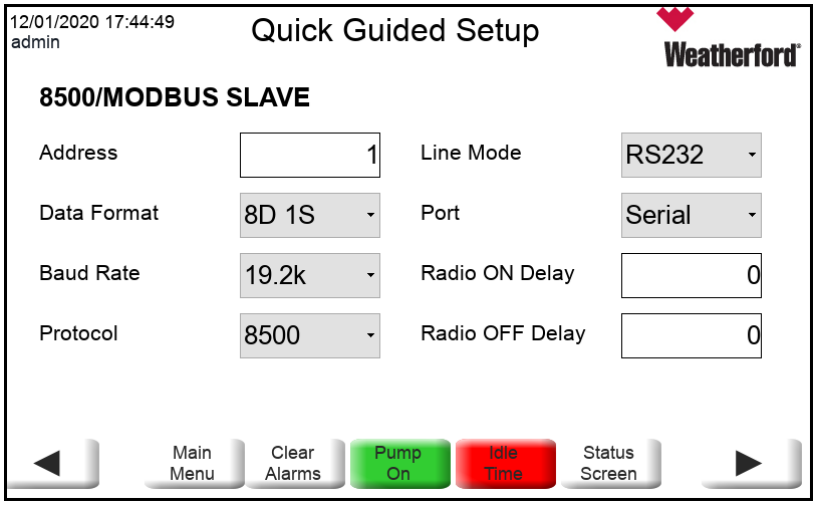


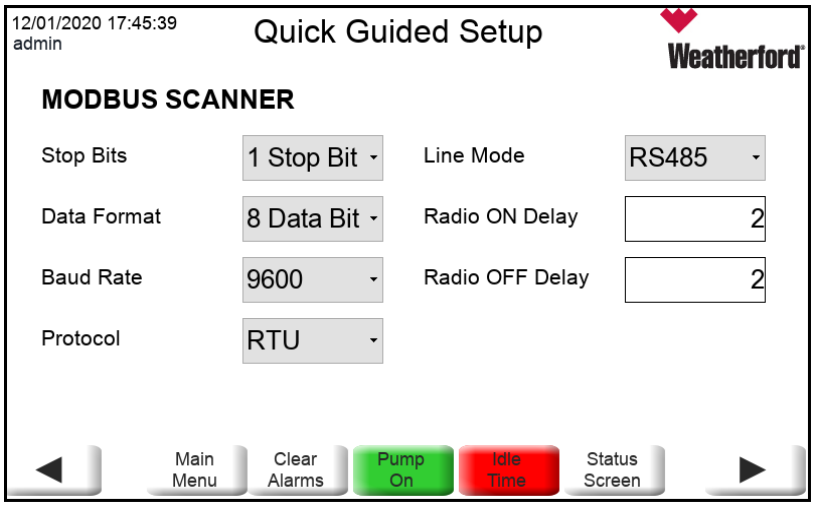
11.30 Tubing pressure and casing pressure transmitters analog points can be reference under AI selection.

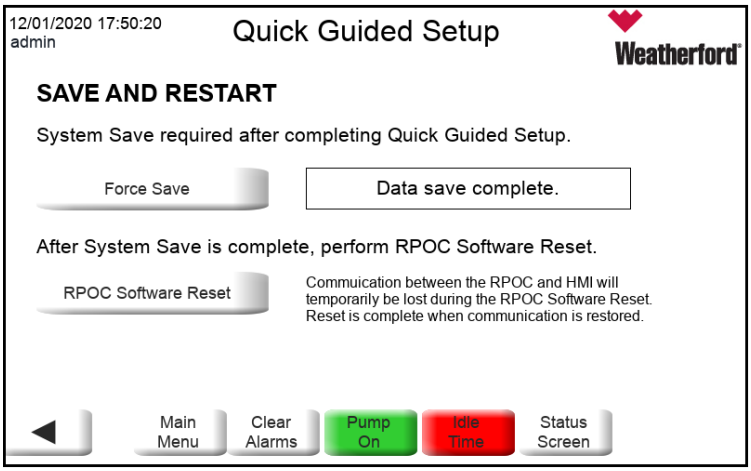
11.31 Example: Tubing pressure is connected to RPOC AI1, set AI selection to AI1.

11.32 If the location doesn't have a transmitter and has a murphy gauge, then set the AI selection to override and under Override value enter the manual gauge value read at field site.

11.33 Fluid Load Factor is a manual input that represents the fluid load taken into PIP calculation considering downhole friction.

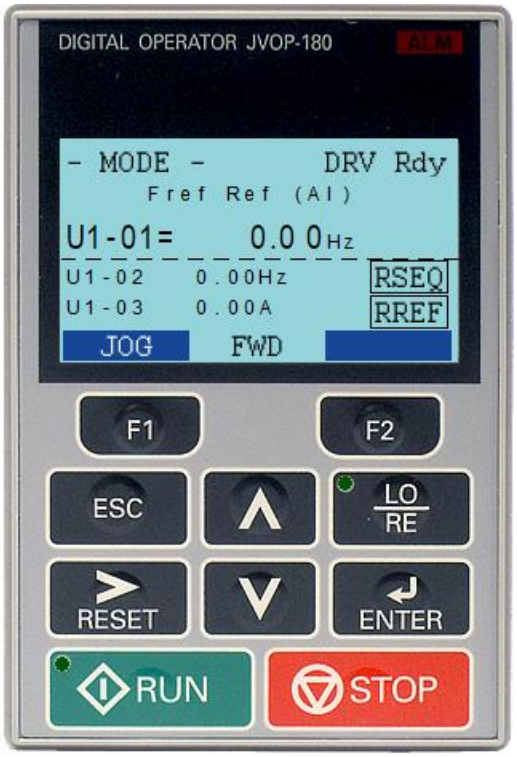




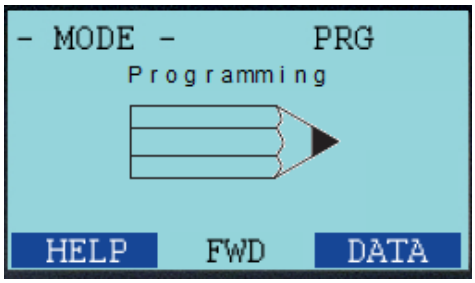


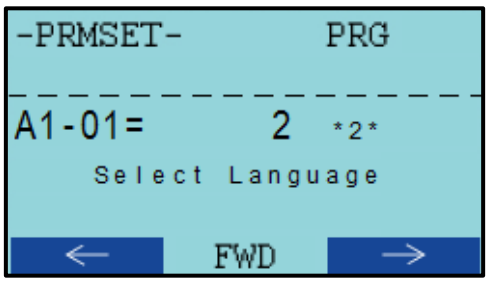
12. Weatherford VSD Programming

12.1 Below figure shows the Weatherford A1000 & U1000 model VSD's keypad

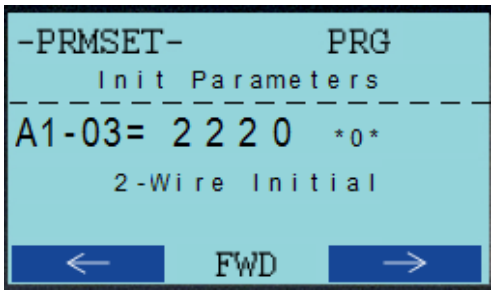


1.1.1 Begin by accessing the programming menu, using the Up Arrow key ( ), followed by the ENTER key ( ).

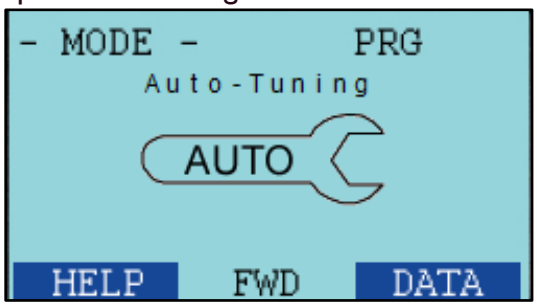




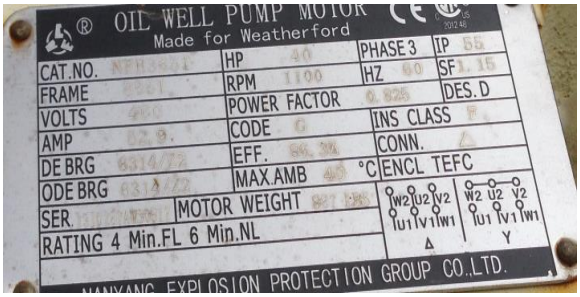
1.1.2 Use the RESET key ( ) and the Up Arrow key to first perform a two-wire initialization of the VSD.



1.1.3 Locate the motor name plate from the motor in use. Access the Auto-Tuning menu by pressing the ESC key (ESC) until the main menu displays, and then using the Up Arrow key, followed by the ENTER key. Enter the values located in **Error! Reference source not found.** in Section **Error! Reference source not found.** Additional Resources for the T parameters using the data found on the motor name plate.



12.2 It may be helpful to take a photograph of the name plate for reference (see example reference)



A1000			
AUTO TUNE AFTER VSD IS SET UP			**AUTO TUNE**
T1-01	1	1	TUNING MODE/W/ BELTS ON
T1-02	KW	KW	HP X 0.746=KW
T1-03	**	**	RATED VOLTAGE
T1-04	AMPS	AMPS	GET OFF OF MOTOR PLATE
T1-05	50	50	HERTZ
T1-06	**	**	# of poles = (Hz X 120)/ revolutions per minute (RPM)
T1-07	RPM	RPM	GET OFF OF MOTOR PLATE
HIT RUN FOR AUTO TUNE			

** - Enter information from Motor plate

VFD Programming Menu (settings to be changed)			
	CONVENTIONAL	**ROTAFLEX**	
B1-03	1	1	MOTOR STOPPING METHOD
C1-01	5	3	MOTOR ACCELERATION TIME
C1-02	5	3	MOTR DECELERATION TIME

E1-04	90	90	MOTOR MAX SPEED (Set 1.5* Motor Hertz, 1.5*60 =90Hz)
E2-02	(f-(n*p)/120)	(f-(n*p)/120)	SLIP FREQUENCY(f- base frequency, n-motor rpm, p - motor poles)
E2-03	(Motor FLA)/3	(Motor FLA)/3	MOTOR NO LOAD CURRENT
H1-05	4	4	AUTO SWITCH INPUT
H2-01	E	E	DIGITAL OUTPUT M1-M2 FUNCTION
H2-02	E	E	DIGITAL OUTPUT M3-M4 FUNCTION
H2-03	NA	37	M5-M6 /ROTAFLEX - POWER CYCLE SPEED SENTRY AUX POS PLC KIT (ONLY ON OLD AUX POSITION KIT model - 6ES7 212-1BB23-0XB0)
H3-03	100	100	HAND MODE SPEED GAIN (ANALOG 1)
H3-10	3	3	RPOC SPEED REFERENCE (ANALOG 2)
H4-01	109	109	FM ANALOG OUT
H5-01	7	7	RTU ADDRESS
H5-06	15	15	TRANSMIT WAIT TIME
H5-11	1	1	COMMUNICATION ENTER FUNCTION
L2-01	1	1	POWER LOSS RIDETHROUGH
L2-02	2.1	2.1	RIDETHROUGH TIME
L5-01	5	0	NO OF STARTS
L7-01	100	100	MAX FWD TORQUE (CLOCK WISE CRANK ROTATION)
L7-02	100	100	MAX REV TORQUE (COUNTER - CLOCK WISE CRANK ROTATION)
L7-03	15	100	Max Braking (CLOCK WISE CRANK ROTATION)
L7-04	15	100	Max Braking (COUNTER - CLOCK WISE CRANK ROTATION)
L8-55	0	0	INTERNAL BRAKING TRANSISTOR
O1-10	900	900	U1-01 DISPLAY (900 IF E1-04 =90Hz)
O1-11	1	1	U1-01 DISPLAY UNIT DECIMAL DISPLAY
P1-07	5	0	SPEED/TORQUE RESTARTS
P3-01	1	1	Wait between restarts
P3-03	1	1	A1 SPEED REF
HARMONIC FILTER ON FRONT END			
	Pump Jack	Rotaflex	
L4-01	8	8	Speed detection level to close DO to bring the harmonic caps in circuit
L4-02	5	5	DO will open when speed (L4-01) minus (L4-02) is detected
H2-03	5	5	DO closes when speed set in L4-01 is detected

Program the correct DO wired into Harmoic Filter when used with Rotaflex

U1000 Programming		
A1-03	**2220**	**INITIALIZES VFD**
AUTO TUNE AFTER VFD IS CONNECTED TO MOTOR		
AUTO TUNE MENU - PARAMETERS		
T1-01	4	TUNING MODE with BELTS ON
T1-02	KW	HP X 0.746=KW
T1-03	460(U.S.)	Motor RATED VOLTAGE
T1-04	AMPS	GET OFF OF MOTOR PLATE
T1-05	60(U.S.)	Motor HERTZ
T1-06	6	# of poles = (Hz X 120)/RPM
T1-07	RPM	GET OFF OF MOTOR PLATE
T1-09	No - load current	(Motor FLA)/3
T1-10	Motor Rated Slip	(f-(n*p)/120). Where f- base frequency, n-motor rpm, p - motor poles
HIT RUN FOR AUTO TUNE		

VFD Programming Menu (settings to be changed)			
	CONVENTIONAL	**ROTAFLEX**	
B1-03	1	1	MOTOR STOPPING METHOD
C1-01	5	3	MOTOR ACCELERATION TIME
C1-02	5	3	MOTR DECELERATION TIME
C7-60	1	1	Output Voltage Limit Selection. 1 = High Voltage mode
E1-04	90	90	MOTOR MAX SPEED (Set 1.5* Motor Hertz, 1.5*60 =90Hz)
E2-02	(f-(n*p)/120)	(f-(n*p)/120)	SLIP FREQUENCY(f- base frequency, n-motor rpm, p - motor poles)
E2-03	(Motor FLA)/3	(Motor FLA)/3	MOTOR NO LOAD CURRENT
H1-06	F	F	Not Used
H1-05	4	4	AUTO SWITCH INPUT
H1-08	25	25	TVSS FAULT INPUT (Normally closed)
H2-01	E	E	DIGITAL OUTPUT M1-M2 FUNCTION
H2-02	E	E	DIGITAL OUTPUT M3-M4 FUNCTION
H2-03	NA	37	M5-M6 /ROTAFLEX - POWER CYCLE SPEED SENTRY AUX POS PLC KIT (ONLY ON OLD AUX POSITION KIT model - 6ES7 212-1BB23-0XB0)
H3-03	100	100	HAND MODE SPEED GAIN (ANALOG 1)
H3-10	3	3	RPOC SPEED REFERENCE (ANALOG 2)

H4-01	109	109	FM ANALOG OUT
H5-11	1	1	COMMUNICATION ENTER FUNCTION
L2-01	1	1	POWER LOSS RIDETHROUGH
L2-02	2.1	2.1	RIDETHROUGH TIME
L2-03	4	4	MOMENTORY POWER LOSS MINIMUM BASEBLOCK TIME
L3-04	1	0	STALL PREVENTION
L5-01	5	0	NO OF STARTS
L7-01	100	100	MAX FWD TORQUE (CLOCK WISE CRANK ROTATION)
L7-02	100	100	MAX REV TORQUE (COUNTER - CLOCK WISE CRANK ROTATION)
L7-03	15	100	Max Braking (CLOCK WISE CRANK ROTATION)
L7-04	15	100	Max Braking (COUNTER - CLOCK WISE CRANK ROTATION)
N2-01	1	1	AFR GAIN
O1-10	900	900	U1-01 DISPLAY (900 IF E1-04 =90Hz)
O1-11	1	1	U1-01 DISPLAY UNIT DECIMAL DISPLAY
P3-01	1	1	Wait between restarts

VFD Programming Default Settings			
	CONVENTIONAL	**ROTAFLEX**	
A1-02	2	2	CONTROL METHOD
B5-01	0	0	PID MODE
B5-19	0	0	PID LOOP SETPOINT
C6-01	1	1	DRIVE OUTPUT SELECTION: HEAVY/NORMAL DUTY
H1-06	85	85	HAND CONTROL INPUT
H3-02	24	24	HAND SPEED REF (ANALOG 1)
H3-11	100	100	A2 MAX SPEED
H3-12	0	0	A2 MIN. SPEED
H4-07	0	0	FM SIGNAL
O1-03	3	3	DRIVE KEYPAD DISPLAY U1-01 (Hz)
O2-01	1	1	LOCAL/REMOTE KEY SELECTION
O2-06	0	0	DIGITAL OP DISCONNECT STATE
P1-08	2	2	LOW SPEED RESTART TIME