INSTALLATION & OPERATION MANUAL

MODEL SP1200
Flo-Calibration System

DOC#: MN-1200

LIQUID CONTROLS SPONSLER, INC.
FLOW MEASURING DEVICES AND CONTROLS
A Unit of the IDEX Corporation
105 Albrecht Drive • Lake Bluff, IL 60044
(847) 295- 1050 • www.sponsler.com
IDEX LIQUID CONTROLS GROUP

METER PROVER OPERATION-COMPREHENSIVE

WARNING

Never drop any component of the prover system-carefully place each component in desired location.

The Temperature Probe MUST be removed before installation or removal of transition piping. The probe is easily damaged by any type of shock.

All prover runs are to be made using temperature compensation.

PROCEDURES

Assemble prover piping on the discharge of the trailer to be proved. The prover MUST be supported.

Install the temperature probe.

Connect all wiring to the prover.

Cool down piping by allowing liquid to flow. You may pump off for a short period of time to complete cool down.

DURING COOL DOWN

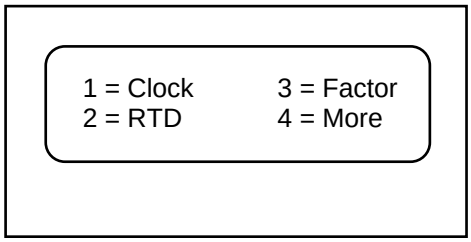
Note the calibration factor entered on the trailer's totalizer.

Set up the SP1200 for the prover run.

NOTE: Numerical data will be typed by pressing the desired digit keys. If a mistake is made, press the "**CLEAR/FEED**" key to erase the entire line typed, or press the " ← " key to erase the last number typed. Press the "**ENTER**" key when the number is correct.

INITIAL SET-UP MODE

Hold down **"RESET"** key and turn power **"ON"**
The prover **"SET-UP"** menu will be displayed.



Press **"PRINT"** key
Set-up ticket will be printed.

Example:

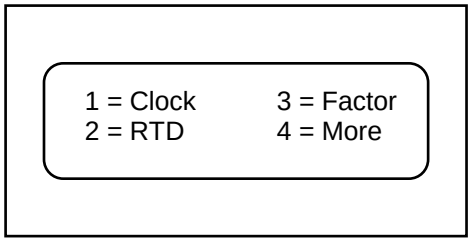
```
      <<<<<<<<>>>>>>>>
              >
        Flo-cal  set up
      03:35P  14-Jul-
              97

Product          = Factor
0 - LOX       R = .4063
              T = .779419
1 - LIN       R = .4063
              T = .63051
2 - LAR       R = .4063
              T = .761813
3 - LCO2      R = .4063
              T = .057356
4 - LN20      R =  0
              T =  0
5 - CO2       R = .4063
              T = .057356
6 - MAPP      R =  0
              T =  0
7 - LPG       R =  0
              T =  0
```

Note: Each SP1200 is factory calibrated for products and engineering units of total as specified by user.

Calibration Factors

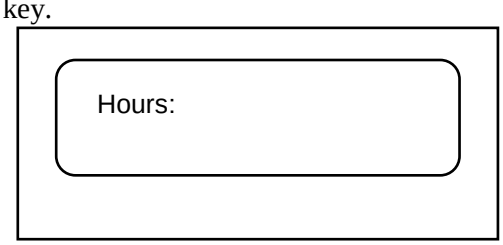
Rate is always Gallons per minute (Gm)
Rfactor = 60/K
Totalization may be any engineering units.
Tfactor - Engineering Units/K

The prover **"SET-UP"** menu will be displayed.

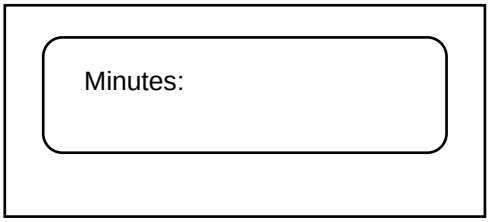


NOTE: If prover was factory calibrated DO NOT select Set-up option **"3-Factor"**. If printed set-up data is incorrect, incomplete or missing call factory.

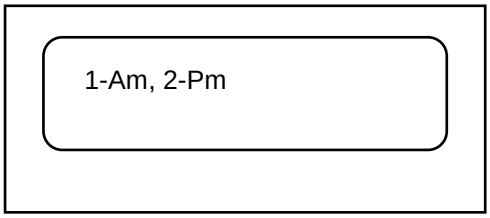
Select **“1-Clock”** by pressing **“1”** key.



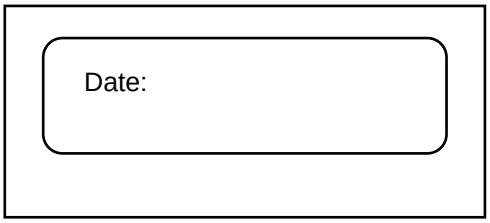
Enter the correct hour (1-12). The number entered will be displayed on the second line of the display.
Press **“ENTER”** key.



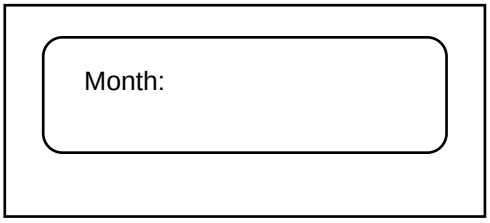
Enter the correct minutes (0-59). The minute entered will be displayed on the second line of the display.
Press **“ENTER”** key.



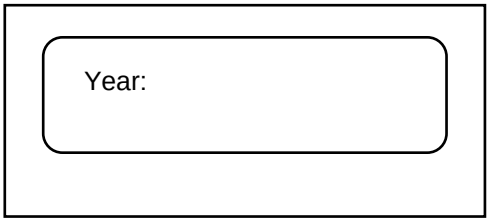
Press **“1”** key if correct time is **“AM”** or Press **“2”** key if correct time is **“PM”.**
Press **“ENTER”** key.



Enter the correct date (1-31).
Press **“ENTER”** key.

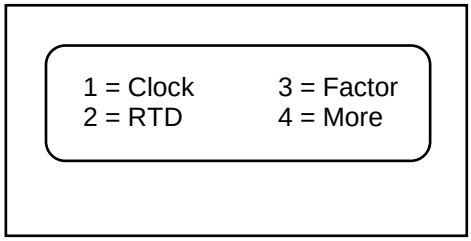


Enter the correct month (1-12).
Press **“ENTER”** key.



Enter the correct year (1-99).
Press **“ENTER”** key.

“SET-UP” menu will be displayed:

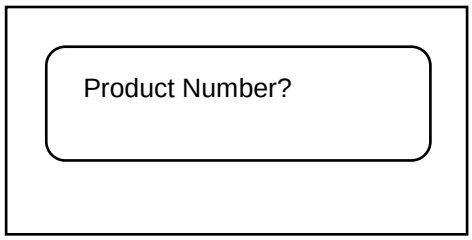


“2-RTD” should not be selected. This is a factory calibration function.

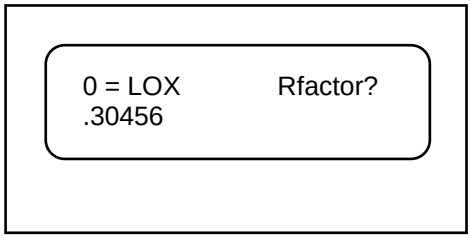
Select **“3-Factor”** by pressing **“3”** key.

***NOTE: To exit the **“SET-UP”** menu press **“RESET”** key.

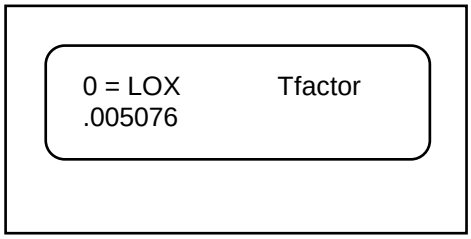
PRODUCT SELECTOR
0 = LOX
1 = LIN
2 = LAR
3 = LCO2
4 = N20
5 = CCO2
6 = MAPP
7 = LPG



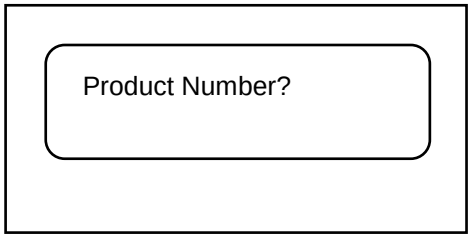
Select desired product and press corresponding key.



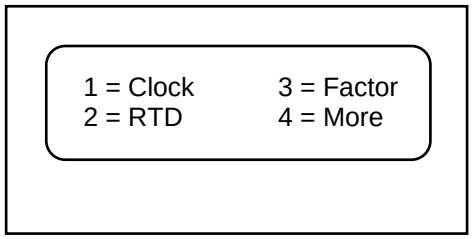
To retain displayed Rfactor: Press **“RESET”** key, display will advance.
To change displayed Rfactor: Press **“CLEAR/FEED”** key. Enter new Rfactor,
Press **“ENTER”** key, display will advance.



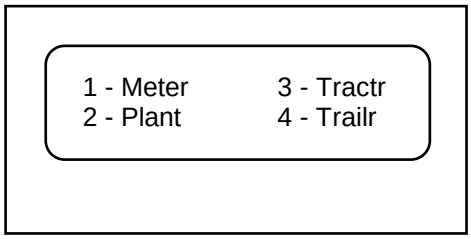
To retain displayed Tfactor: Press **“RESET”** key, display will advance.
To change displayed Tfactor: Press **“CLEAR/FEED”** key, Enter new Tfactor,
Press **“ENTER”** key, display will advance.



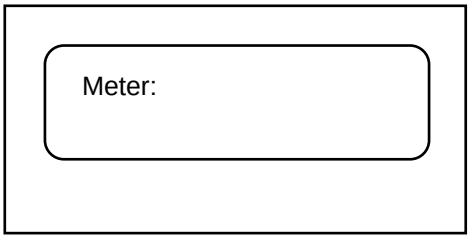
To continue **“FACTOR”:** Select desired product, press corresponding key. Repeat.
To exit the **“FACTOR”** menu: Press **“RESET”** key, **“SET-UP”** menu will be displayed:



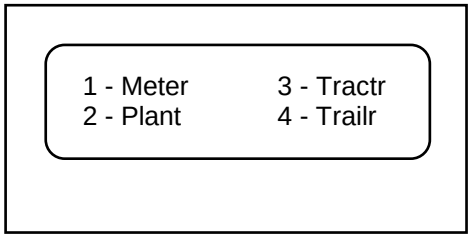
Select **“4=More”** by pressing **“4”** key. **“MORE”** menu will be displayed.



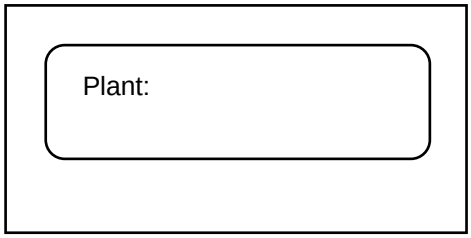
Select **“1-Meter”** by pressing **“1”** key.



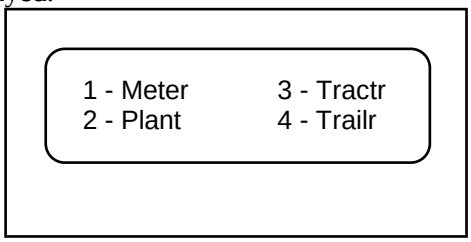
Press **“CLEAR/FEED”** key: Enter serial number of turbine meter under test,
Press **“ENTER”** key: **“MORE”** menu will again be displayed.



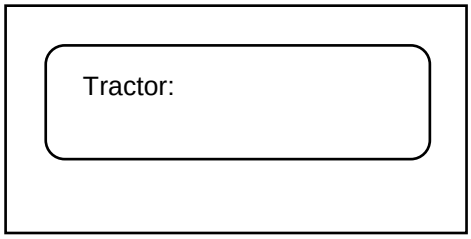
Select **“2=Plant”** by pressing **“2”** key



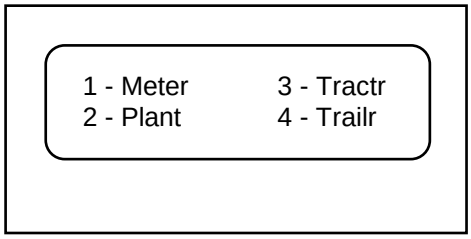
Press **“CLEAR/FEED”** key. Enter Plant number, Press **“ENTER”** key.
“MORE” menu will again be displayed.



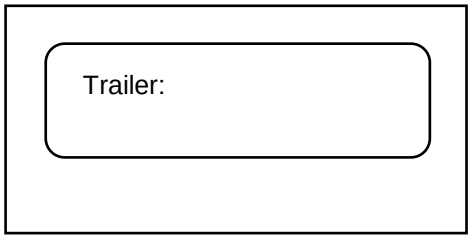
Select **“3 - Tractr”** by pressing **“3”** key.



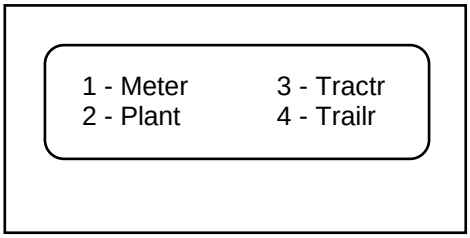
Press **“CLEAR/FEED”** key. Enter Tractor number, Press **“ENTER”** key. **“MORE”** menu will again be displayed.



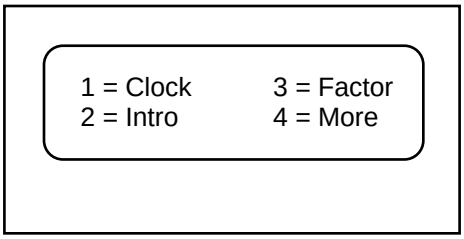
Select **“4 - Trailr”** by pressing **“4”** key.



Press **“CLEAR/FEED”** key. Enter Trailer number, Press **“ENTER”** key. **“MORE”** menu will again be displayed.

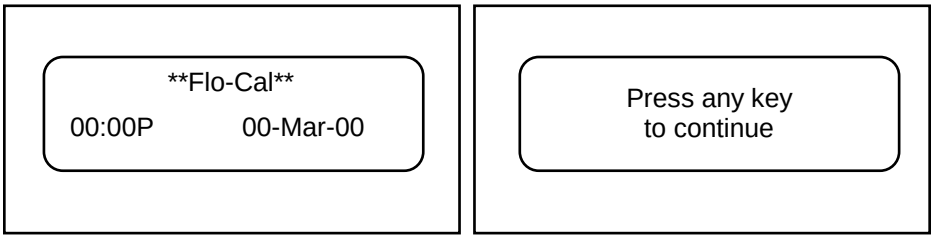


Press **“RESET”. “SET-UP”** menu will again be displayed:

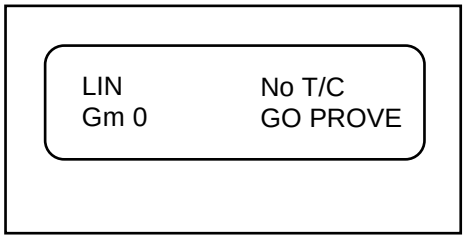


Initial set-up is complete, Press **“RESET”** key to change to the **OPERATING SET-UP MODE**.

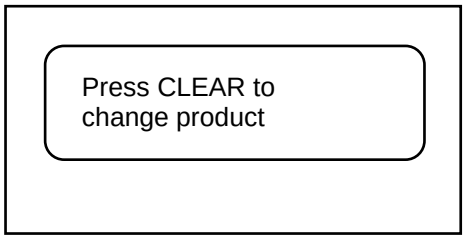
SET-UP OPERATING MODE



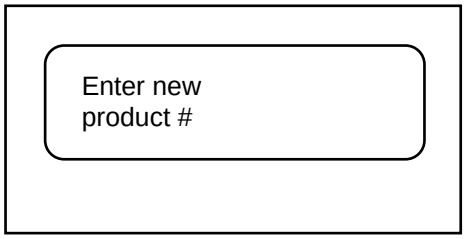
SP1200 will alternate these 2 displays until **"RESET"** is pressed.
Correct product must be displayed in the upper left hand corner.



To change product, press **"←"** key.



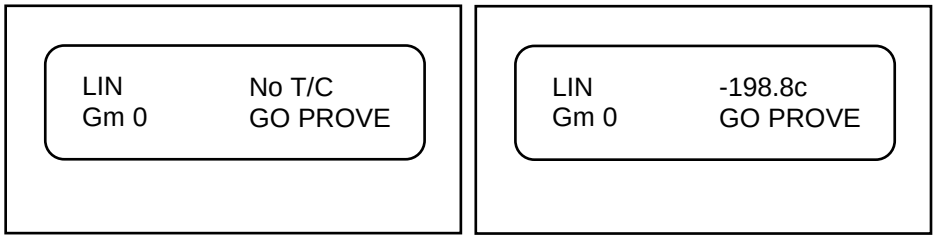
Press **"CLEAR/FEED"** key.



Enter product number desired:

PRODUCT SELECTOR
0 = LOX
1 = LIN
2 = LAR
3 = LCO2
4 = N20
5 = CCO2
6 = MAPP
7 = LPG

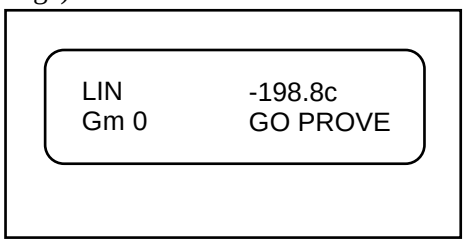
With correct product displayed, check in upper right hand corner of the display for a temperature reading or the words **"No T/C".** If **"No T/C"** is displayed, press the **"TC TOGGLE"** key to switch on the temperature compensation.



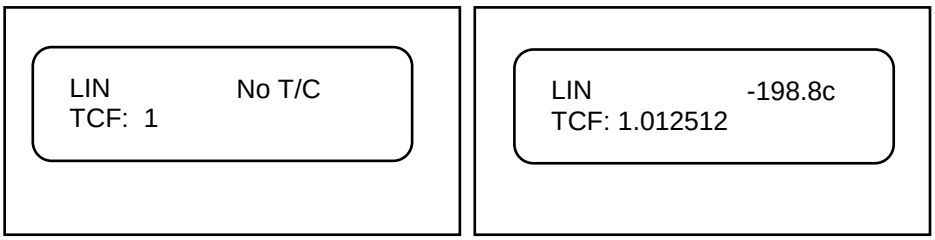
**All prover runs are to be made using temperature compensation.
If **"+426H" is displayed, the temperature probe or cable is open.
If **"-270.9L" is displayed, the temperature probe or cable is shorted.

PROVING MODE

Cool down is verified by the temperature display. The temperature displayed along with a small **"c"** indicates the prover piping is cooled down. The temperature displayed with **"H"** indicates temperature is high; with **"L"** indicates temperature is low (out of range).

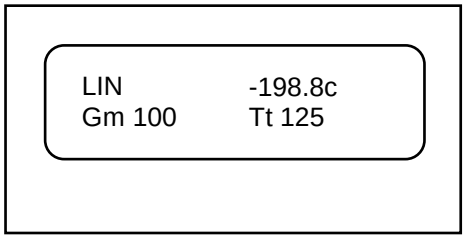


NOTE: The temperature correction factor **(TCF**) may be viewed by pressing & holding the **"ENTER"** key.



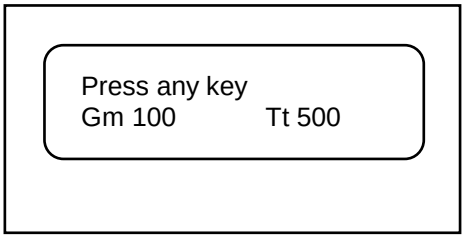
Start trailer product pump. Once primed, turn on the trailer totalizer. After pumping 50 gallons, note the trailer totalizer reading as the **START/STOP** switch is pressed & released. This starts the prover run. Continue to pump another 500 gallons according to the trailer totalizer.

As the prover progresses, check the prover flow rate display (Gm). With 1 1/2" prover system, pump off rate should be at a normal 100 gallons per minute (Gm) and 180 gallons per minute (Gm) for a 2" system.

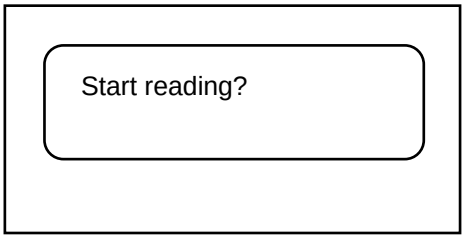


After pumping at least 500 gallons or equivalent according to the trailer totalizer, depress and release the **START/STOP** switch. Note the trailer totalizer reading. The prover will display:

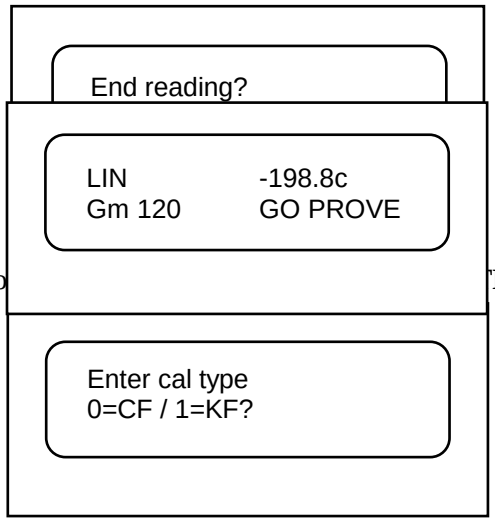
NOTE: The **"Tt"** will display the actual TOTAL for the prover run.



Press any key. Enter data as prompted by the display:

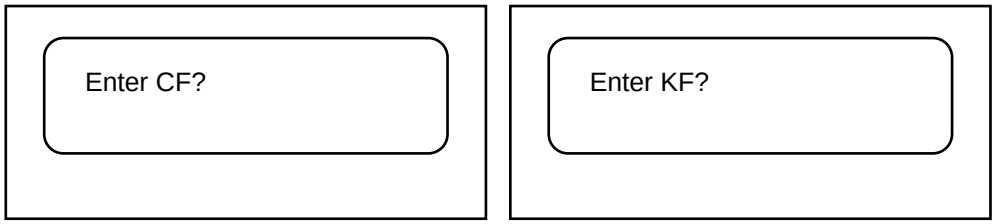


Enter the trailer totalizer reading noted at the start of the prover. Press **"ENTER"** key.



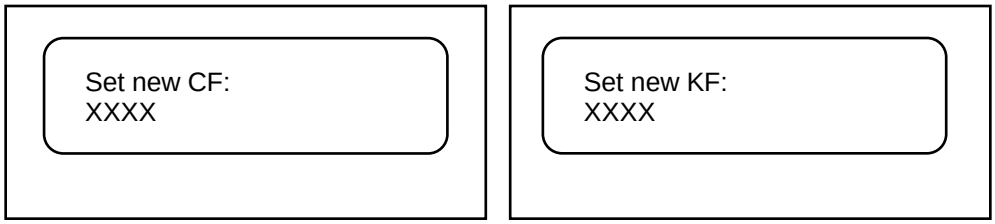
Enter the trailer totalizer reading no **ER"** key

Enter the type of Factor used to calibrate the trailer totalizer.
Press **"0"** if CF (Calibration Factor = 1/K) or press **"1"** if KF (K-Factor direct entry for calibration)
Press **"ENTER"** key



Enter the CF from the trailer totalizer.
Press **"ENTER"**

Enter the KF from the trailer totalizer.
Press **"ENTER"**



Examples ONLY!

```
**********************
Calibration information
10:19A  11-Mar-97
Meter   :  44795
Plant   :  815
Tractor :  456
Trailer :  789

LIN       -198.8c
Delivry GPM:  100.
Calib total:  101
Delivry TCF:  1.012512
   -    -    -
Truck start:  0
Truck stop :  100
Truck total:  100
Truck C/K  :  CF
Truck Factr:  .1
   -    -    -
Truck % err:  -.990
Set  new CF:  .1010
```

Press **"PRINT"** key

Additional prove tickets may be printed by pressing the **"PRINT"** key.

```
**********************
Calibration information
10:19A  11-Mar-97
Meter   :  44795
Plant   :  815
Tractor :  456
Trailer :  789

LIN       -198.8c
Delivry GPM:  100.
Calib total:  101
Delivry TCF:  1.012512
   -    -    -
Truck start:  0
Truck stop :  100
Truck total:  100
Truck C/K  :  KF
Truck Factr:  1
   -    -    -
Truck % err:  -.990
Set  new KF:  .9901
```

***NOTE: If incorrect data was entered press **"ENTER"** & reinsert prove data. Dial the **"New CF"** or **"New KF"** into the trailer totalizer. Press **"RESET"** key.

Reprove the trailer.

Compare the prover totalizer reading to the trailer totalizer.

Truck % error should be within specified tolerance.

Repeat as necessary.

Proceed with sealing the trailer meter box.

Affix calibration decal.

Complete documentation. (Work order)

If several trailers will be proved, the prover piping should be assembled and cooled within 15 minutes. If this cannot be done, the piping will need to be blown dry using nitrogen. DO NOT USE SHOP AIR.

WARNING: Condensation will quickly form inside piping left unattended. This will cause ice to form on the turbine bearings, preventing rotation and rendering the prover inoperable.

When all proving has been completed, CLEAN and DRY prover system. Place all components including temperature probe and all cables in proper case for storage.

LIQUID CONTROLS GROUP

IDEAL SOLUTIONS INTEGRATED SYSTEMS

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LIQUID CONTROLS · LIQUID CONTROLS INDIA
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CORKEN · SAMPI

IDEX
LIQUID CONTROLS GROUP

LIQUID CONTROLS
105 Albrecht Drive
Lake Bluff, IL 60044
(847) 295-1050

LIQUID CONTROLS EUROPE/SAMPI
Via Amerigo Vespucci 1
55011 Altopascio (Lucca), Italy
+39 0583 24751

LIQUID CONTROLS INDIA
808 VCCI Complex
GIDC Makarpura
Vadodara-390 101
Gujarat, India
+91 265 2631855

LIQUID CONTROLS SPONSLER
105 Albrecht Drive
Lake Bluff, IL 60044
(847) 295-1050

TOPTECH SYSTEMS
280 Hunt Park Cove
Longwood, FL 32750
(407) 332-1774

Nateus Business Park
Nieuwe Weg 1-Haven 1053
B-2070 Zwijndrecht (Antwerp), Belgium
+32 (0)3 250 60 60

FAURE HERMAN
Route de Bonnetable
B.P. 20154
72406 La Ferté-Bernard Cedex, France
+33 (0)2 43 60 28 60

6961 Brookhollow West Drive
Houston, TX 77040
(713) 623-0808

CORKEN
3805 Northwest 36th St.
Oklahoma City, OK 73112
(405) 946-5576

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(09/09)