

Bi-Directional Pipe prover TRG-BDP-XX



Products:

- 1- Bi-Directional Pipe Prover
- 2- 4Way Valve
- 3- Detector Switch for Prover Application
- 4- Prover Sphere
- 5- Basket Type Strainer
- 6- Straightener
- 7- Sampling System
- 8- Automatic Backwash Strainer
- 9- Air Eliminator
- 10- Flow Switch
- 11- High Frequency Pulse Generator
- 12- Master Meter Prover Package
- 13- Inflation Pump
- 14- Removal Tools
- 15- Static Mixer

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Bi-Directional Pipe Prover

By far the most readily used Prover in the industry for many years. The Bi-Directional Pipe Prover has proven itself over and over again as one of the most reliable means available to verify meter readings and establish meter factors. It is still the most recommended and used Prover design in the world today. By definition the Bi-Directional Pipe Prover is a positive displacement type prover with flow and displacer traveling in both directions by means of a 4-way diverter valve. The Bi-Directional Prover is constructed of pipe, which can be configured in many ways. Probably the most influential advantage of the Pipe Prover is its ability to allow the full flow of the stream through the meter being proved to pass through the prover. In this regard the Bi-Directional Pipe Prover offers a history of long-term reliability with minimum maintenance.

TRG Engineering Company established itself over 20 years ago as one of the leaders in Bi-Directional Pipe Prover design, engineering and manufacturing.

With **TRG Engineering** you will be working with one of the most professional staffs and highly skilled manufacturing forces in the business. This assures that your projects will run smoothly and on schedule. Our people will do everything within their power to accommodate the needs and desires of our customers.



TRG Engineering Bidirectional Provers are stationary or portable displacement-type meter proving devices. When connected in series with a meter, the number of meter pulses generated during the round trip displacement of the prover-calibrated (water drawn) volume yields accurate meter factor.

Features

- **Precisely Calibrated Volume** - Traceable to NIST
- **Highly Compatible Materials of Construction** – For use on a wide range of products.
- **Tight-Shut off Diverter Valve Sealing** - Two seals and monitoring device assure positive sealing under low differential pressure proving conditions.
- **Local or Remote Control** - Instrument duplications eliminated.

(For more information concerning this and other types of Provers, please see our Conventional Liquid Meter Prover Design and Construction Section in this catalog.)

Typical Prover Specifications

Design and Construction:

API Manual of Petroleum Measurement Standards, Chapter 4 Proving Systems, ASME/ANSI B31.4, ASME/ANSI B31.3, or ASME Section VIII.

Radiography:

Spot or 100% in accordance with API 1104.

Hydrotest:

1.5 times design pressure with chart recording.

Inspection Flanges:

Match bored, dowel pinned and O-ring groove for metal to metal seat.

Materials:

Pipe - ASTM A-106/53-Gr B Seamless
Flanges and threaded fittings -
ASTM A-105
Weld fittings - ASTM A-234 WPB
Studs - ASTM A-193-B7
Nuts - ASTM A-194-2H
Gaskets - Spiralwound, 304SS
O-Rings – Viton

Calibration:

Water draw method, repeatability within 0.02 percent per API Chapter 4, Chapter 11.2.3 and Chapter 12, Section 2

Internal Coating:

Sandblast to white metal and 5 to 7 mils Flexkote 707 air dried epoxy or Phenoxyl 109 baked on phenolic.

External Coating:

Sandblast to white metal and one coat zinc chromate primer.

Standard Equipment and Trim:

Four way diverter valve with viton seals and differential pressure gauge

Detector switches - Mag-Tek M-5, SS construction with viton seals

Valve actuator - Electric Class I Group D Div II or manual handwheel

Sphere - Inflatable polyurethane, nitrile, or neoprene with accessories (pump and sizing ring)

Quick opening closure, hinged or davit type

Thermometers - mercury in glass with 0.20°F divisions and SS thermowells

Pressure gauges with isolation valves

Pressure relief valve

Vent valves

Drain valves

Semi-skid beam supports

All materials and equipment selected for TRG provers are of the highest quality and consistency. Selection is based on proven

industry standards. We accept no substitute.

Other materials and options available.

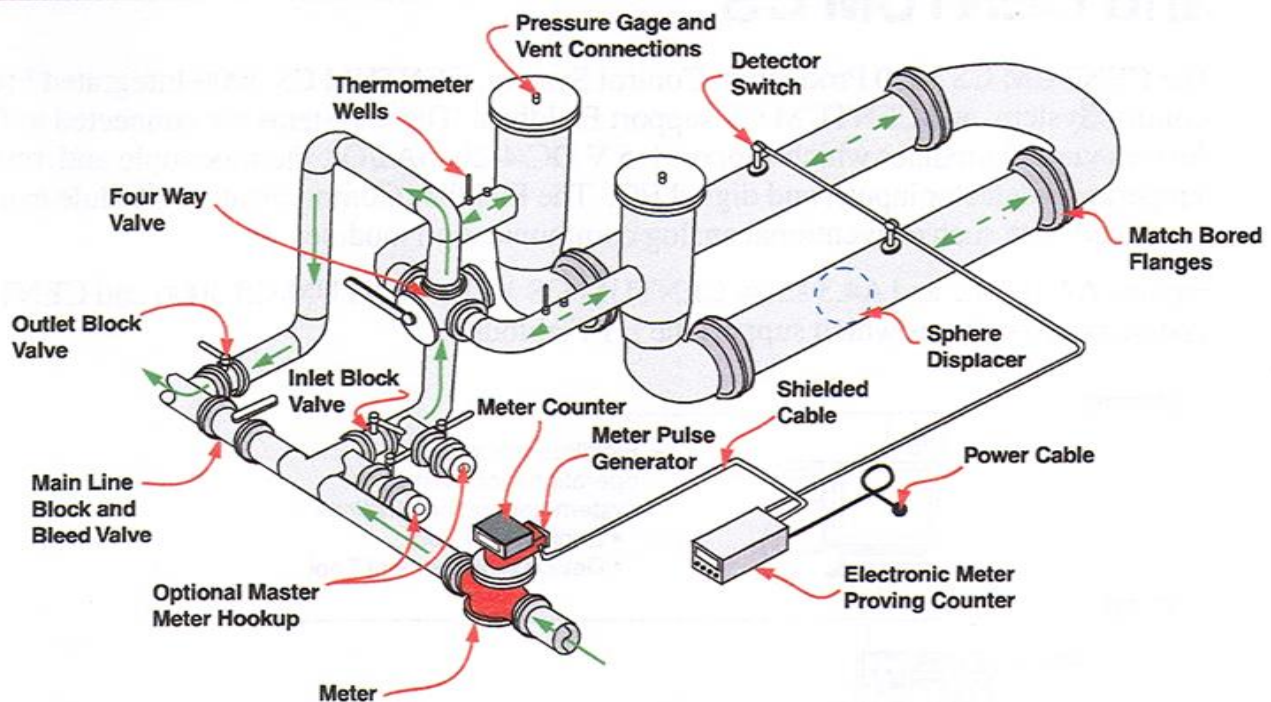
Principle of Operation

Flow passes through the meter, the diverter valve, and then down through the prover moving the spheroid out of the launch chamber. It then continues past the first detector switch, the calibrated section, the second detector switch, and eventually deposits the spheroid in the receiving launch chamber. The flow stream passes around the spheroid, out the diverter valve, and down the pipeline.

When the spheroid passes the first detector switch, the meter prover counter (totalizer) is triggered to totalize meter pulses until the

second detector switch is triggered. The number of pulses accumulated on the prover counter while the spheroid moves between detector switches is compared to the calibrated volume of the prover section to obtain meter factor.

The proving cycle of the bidirectional type prover is one round trip of the spheroid; equivalent to the sum of pulses accumulated on the prover counter as the spheroid travels in both directions between detector switches. The direction of travel of the spheroid is reversed by changing the direction of flow through the prover via the four-way diverter valve.



Calibration

Prover calibration is accomplished using water draw equipment and procedures in accordance with the National Institute of Standards and Technology (NIST) measures certification and the API Manuals of Petroleum Measurement Standards, Chapters 4 and 12. Prover volume accuracy is certified within 0.02% per the preceding standards.

Applications

The **TRG Engineering** Bidirectional Prover may be used to calibrate positive displacement or turbine meters in virtually any application including loading rack installations, pipelines, barge loading/unloading systems, etc. These provers may be used on most liquid petroleum products such as LPG, gasolines, and crude oils which have varying viscosities and lubricating qualities.

