Terminal Solutions

Honeywell Terminal Solutions delivers **high-end radar and servo tank gauging systems that combine proven measurement technology with advanced software algorithms** for superior performance. Integrated with **ENTIS Experion Tank Inventory Systems**, our solutions enable precise inventory control, custody transfer, oil movement, and tank operations for refineries and storage terminals worldwide.

Key Highlights

- Advanced Tank Gauging: Radar and servo gauges for unmatched measurement accuracy.
- Integrated Control: ENTIS Experion system for inventory management and operational efficiency.
- Precision Calibration: Small Volume Prover exceeds API uncertainty requirements with 1200:1 turndown ratio.
- High Versatility: Compatible with Coriolis, ultrasonic, PD, and turbine meters.
- Comprehensive Sampling: HERMetic portable gauging and sampling solutions for closed and open applications.

See the brochures attached for full product information.

TABLE OF CONTENTS

Scroll Down for More

TERMINAL AUTOMATION SOLUTIONS

Safe, Reliable and Profitable Operations

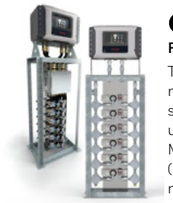
Honeywell

ADDITIVE INJECTION SYSTEMS

2 14 16

MeQ-Pak Additive Injector

The MeQ-Pak turbine-driven injector is a rugged, low maintenance mechanical device capable of injecting from 0.2 to 2500 ppm. The self-powered turbine produces the energy to drive the injection system, therefore the MeQ-Pak requires no additional power supplies or boost pump systems.



3 6 8 9

Fusion4 MultiPak

The MultiPak is designed to control multiple stream additive injection systems capable of managing up to twelve Monoblock III or Monoblock II+ devices. The MSC-A (Multi Stream Controller - Additive) monitors the flow of the wild stream and uses this flow rate to accurately pace the flow of the additive stream to a pre-determined target ratio in parts per million (ppm).

3 6 8 9

Fusion4 Minipak

The MiniPak additive solution utilizes Honeywell's state-of-the-art Fusion4 SSC-A in conjunction with Monoblock III / Monoblock II+ for control of Single Stream additive injection. The pacing of the additive stream is achieved through accurate, rapid injections of very small volumes of additive into the process, at frequently and evenly spaced intervals.

5 10

Fusion4 Microdose

The Fusion4 Micro-Dose is a complete and self-contained additive injection system, including an electronic controller, pump, and closed-loop calibrator. The Micro-Dose Injection System is designed for those ultra-small dosage applications that are hard to achieve with conventional additive injector systems. It is ideal for Mercaptan injection and many other application ranging for 1 to 10PPM injections.

BLENDING SYSTEMS

6 8 14

Fusion4 SSC-B

Fusion4 SSC-B is designed for biofuel blending applications at the load rack where accuracy, audit trail, customer, and regulatory compliance requirements are mission-critical. It is the most technologically advanced single-stream blending system available on the market, helping customers "Zero in on Accuracy." Legacy V2 Controllers can be seamlessly migrated to Fusion4 SSC-B.

6 8 14

Fusion4 BioBlend

A complete solution package for those requiring secure, precision blending capabilities for biofuel and petrochemical products. This compact solution permits the hazardous area control of up to four blend streams simultaneously to exacting custody transfer accuracy standards. Fusion4 brings advanced features such as rapid start-up and zero downtime firmware upgrades to the BioBlend solution to reduce operational cost.

Honeywell Enraf Product Overview

LOADING AUTOMATION

3 6 8

Fusion4 MSC-L

Fusion4 MSC-L, the multi stream controller for loading, provides precise, safe and reliable custody transfer approved loading control in hazardous environments. Can manage simultaneous up to 6 arm loading with internal additive control along with precise pre-defined blend ratios and the transfer of high value product at road loading, rail, and marine terminals, as well as tank farms applications.

2 7

Terminal Manager

Honeywell's Terminal manager provides an integrated solution for bulk liquid terminals by combining traditional loading/ unloading applications with security, video systems and safety solutions into one package. It directly interfaces with typical terminal instrumentation and high-level ERP systems.

3 6 8 9 11

SecuritaireGrounding System

This provides safe, effective grounding of road and rail tanker vehicles during the loading and unloading of flammable liquids.

GAS DETECTION

5 12 13 15

Gas Detector

Infrared (IR) gas detector for challenging terminal applications.

5 8 12 13 15

Hyper-Spectral Gas Imaging

Rebellion Gas Cloud Imaging (GCI) for gas detection and measuring.

TANK GAUGING SYSTEMS

3 12 13 15

Enraf Smart Servo 954

The Enraf Smart Servo 954 gauge provides safe, reliable, and extremely accurate level measurement. These multi-functional devices integrate liquid level, density, and free water interface measurements for a complete tank gauging solution.

3 12 13 15

Enraf SmartRadar FlexLine 990

The SmartRadar FlexLine automatic tank gauge (ATG) combines innovative software algorithms with our proven planar antenna technology for the precision you need in custody transfer and inventory applications.

3 4 11

Communication Interface Unit

The Enraf Tank Farm Gateway (CIU 888) provides the operator with reliable, accurate, real-time tank inventory data according to international standardized calculation methods, such as the API, ASTM, GPA, and many others.

2 7

ENTIS Inventory Management

Honeywell's ENTIS Inventory System is built on the proven Experion® platform to put you in control for a better operation.

3 12 13 15

Vito Temperature

Vito is a range of temperature measurement products for bulk storage tanks.

VERIFICATION PRODUCTS

1 6 14 16

Small Volume Prover

The Honeywell Small Volume Prover (SVP) is a high accuracy, low pressure drop device used for verifying the accuracy of custody transfer-approved flow meters. The small volume prover is the number one choice for proving Coriolis mass flow meters, Ultrasonic, positive displacement (PD), and turbine meters.

1 12

Onecal

The Onecal is an intrinsically safe, portable digital thermometer.

1 3 12

UTI2000

The UTI2000 is a portable, gas tight, liquid level gauge designed to operate on top of closed petroleum and chemical tanks.

Portable Gauging & Sampling Solutions

Honeywell

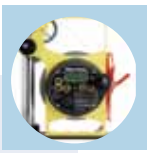
Product Overview for Land-Based Applications

Honeywell

ENRAF TANKSYSTEM SA

HERMetic portable level gauging and sampling equipment for land based applications

OPEN ELECTRONIC GAUGE



CLOSED ELECTRONIC GAUGE

SAMPLING EQUIPMENT

VAPOUR LOCK VALVES

PORTABLE DIGITAL THERMOMETER

SERVICE STATION NETWORK

Honeywell Tanksystem is the world's leading supplier of portable level gauging and sampling equipment for marine applications as well as for the oil and petrochemical industry.

Honeywell Tanksystem has supplied equipment for more than 7,500 tankers, barges and tank farms. With headquarters in Switzerland since 1985, Honeywell Tanksystem has a network of 60 agents and 16 service stations worldwide.

Our goal is to build up a long-term relationship with our customers and to put their needs in the centre of all our activities.

All our equipment is intrinsically safe and manufactured for use in classified hazardous environments (Zone 0) onboard vessels or in storage tank farms.

As an ISO 9001 certified company, we are dedicated to fulfilling the needs of customers who operate in classified areas according to high standards regarding safety, reliability and accuracy.

We help you to protect the operator and the environment.

MED-D
DNV
Certified Company

Certified System
ISO 9001
QMI-SAI Global

Our main product lines are:

- HERMetic portable level gauging equipment, an important tool for inventory control, cargo inspection during custody transfer and verification or calibration of automatic gauging systems.
- HERMetic portable sampling equipment, an important tool designed to sample liquids from tanks under closed or restricted conditions.
- HERMetic Onecal intrinsically safe portable digital thermometer for use in hazardous environments.

Measurement accuracy is essential for the sale, purchase and handling of petroleum products. It reduces the likelihood of disputes between buyer and seller and facilitates control of losses. Accurate measurement demands the use of standard equipment and procedures.

Although automatic level gauging systems are in widespread use in the petroleum industry for the measurement of petroleum liquids in storage tanks, manual tank gauging is still widely applied as the normal technique for level measurement in non-pressurized and vapour tight tanks. It is highly accurate provided the correct procedures are carefully observed.

Manual tank gauging is the method that shall be applied for the calibration (setting) and periodic verification of automatic level gauging (ALG) systems. It is also normally selected as the reference method for the measurement of the level of liquid in a tank, should a dispute arise between the parties in a commercial transaction.

PORTABLE ELECTRONIC GAUGING DEVICES (PEGDs)

Portable electronic gauging devices are multi-functional in that they may measure other functions such as the level of any oil/water interface, temperature, in addition to measuring ullage.

Portable electronic gauging devices are available for either open, restricted, or closed gauging applications. Closed and restricted gauging operations will generally require the portable electronic gauging device to be used in conjunction with a compatible vapour lock valve. Alternatively, a suitable adapter will be required when it is necessary to use a PEGD (that is designed to be used with one particular type of valve fitting) with a different vapour lock valve fitting.

Representative measurements of the temperature of the tank contents are also required to convert the observed volume to a standard volume measurement. When the tank contains free water in addition to the petroleum liquid, it will gene-rally be necessary to measure the level of the oil/water interface. If the oil also contains suspended water and/or sediment, representative samples and analysis will normally be required to enable the calculation of the net standard volume of the oil.

OPEN, CLOSED AND RESTRICTED GAUGING

Safety and environmental regulations may restrict tank gauging operations which can result in the release of hydrocarbons or other volatile organic compounds (VOCs) into the atmosphere. In these circumstances, it will not normally be feasible to use traditional open gauging procedures via an open gauge hatch or gauging access point.

When the tank ullage space is pressurised, and/or the tank forms part of a vapour balancing/ recovery system, it will normally be necessary to use closed or restricted gauging procedures to avoid de-pressurising the tank and minimise the consequent loss of VOCs. If the vapour from the tank contents is hazardous, it will also normally be necessary to use closed or restricted gauging procedures to minimise the risk of environmental impact.

Closed gauging is the process of taking measurements within a tank using closed gauging devices under closed system conditions. A closed system exists when the operations do not permit the direct exposure and/or release of any tank contents to atmosphere. Manual closed gauging measurements are therefore normally made via a vapour lock valve, using a closed measurement device that provides a gas-tight seal when in use. Restricted gauging is the process of taking measurements within a tank using a restricted gauging device that is operated via a vapour lock valve. Restricted equipment is designed to substantially reduce or minimise the vapour losses that would occur during open gauging, but may still allow some small quantity of vapour to escape because the equipment is not completely gas tight.

HERMetic portable tank measuring solutions for land based applications

CLOSED / GAS TIGHT OPERATIONS

HERMetic UTImeter Gtex 2000

HERMetic sampler GT & GT Chem

HERMetic sampler GTX Chem

HERMetic sampler GTN Chem

HERMetic Valve LC2

HERMetic Valve LC2 Female

HERMetic Compact Valve C2-SS-BL

HERMetic Compact Valve C2-SS-BL Female

*2 Inch ball valves for gauging and sampling access

TANK TOP

COMPLIANCE RULES

Equipment type	Function	Complies with
PEGD Portable electronic gauging device	Ullage level Temperature gauging Oil - water interface level	Length: ISO 4512, API Standard, IP Standard, GB/T 13236 Temperature: ISO 4268, API Standard, IP Standard, GB/T 8927
Portable liquid sampling device	Liquid sampling	ISO 3170, API STANDARD
PET Portable electronic thermometer	Temperature measurement	Temperature: ISO 4268, API Standard, IP Standard, GB/T 8927

OPEN OPERATIONS

DIP HATCH WITH COVER

TANK TOP

HERMetic UTImeter Otex

The HERMetic UTImeter Otex is a portable liquid level gauge designed to be operated under open conditions on petroleum and chemical storage tanks where open gauging is permitted. The unit is used for custody transfer, inventory control measurement and free water detection on shore tanks. The HERMetic UTImeter Otex is set on the open gauging hatch.

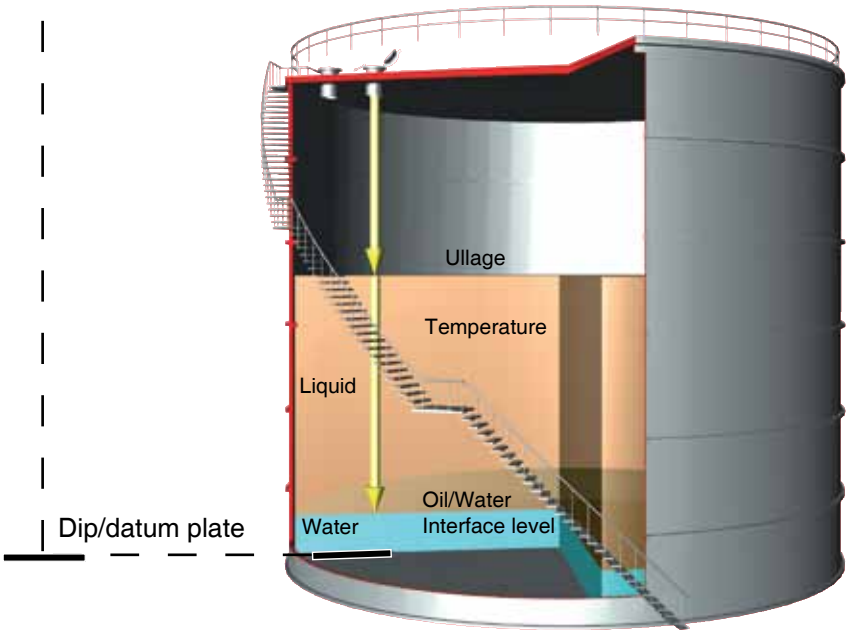
The unit enables 3, optionally 4 measurements in one single operation:

- Ullage
- Temperature
- Oil-Water interface level
- Innage, Reference height (Visc version)

Complies with:

- ISO, API, IP
- EC Directive 89/336/EEC
- EC Directive 94/9/EC
- ATEX, Factory Mutual, CQST
- GB/T 13236, 8927

Visc version:
With load 500 gr. for high viscous products or manual detection of dip/datum plate. Reference height measurement



FM APPROVED

- **ISO**
  - 4512
  - 3170
  - 4268
- **API**
  - MPMS Chap 3.1A
  - MPMS Chap 7
  - MPMS Chap 8.1
- **IP**
  - PMM Part III-1
  - PMM Part IV"

All HERMetic UTImeters are now equipped with the sensor **“ ULTRA “** for use in low and high viscous liquids.The ULTRA sensing probe consists of a stainless steel tube terminated by a PEEK head. The sensing probe includes an ultrasonic liquid level sensor, a temperature sensor and a conductivity electrode. The sensitivity for ullage and interface measurement does not require any adjustment. The sensor is calibrated once at the factory and does not require subsequent calibration. The temperature transducer is a RTD element. The characteristics of the RTD element are stored inside the sensor. The sensor is sending true temperature values to the electronic box and display.

Low maintenance costs:

Fully modular unit. Change tape, sensor or instrument unit yourself. Easy and detailed instructions in Operation and Service Manual.

Benefits

- 100% repeatability of measures.
- No adjustment of the sensitivity required.
- Small diameter.
- Chemically resistant to corrosive liquids (Chem version).
- High mechanical stability.
- No degradation of the sensitivity due to ageing of the sensor.

A GAUGE DEDICATED TO YOUR APPLICATION

HERMetic UTImeter Otex

with 1 Inch sensing probe and FKM tape connector for the main applications in hydrocarbons.

HERMetic UTImeter Otex Visc

with 2 Inch load on the sensing probe, recommended for operation in high viscous products or for innage measurements in hydrocarbons or in corrosive liquids. Manual detection of dip datum plate.

HERMetic UTImeter Otex *option French plate

with tightening mechanism to secure the units inside gauging pipes or dip hatches up to a diameter of 6 Inch. Special sensor protection to avoid damages of sensor head when touching the bottom of the tank.

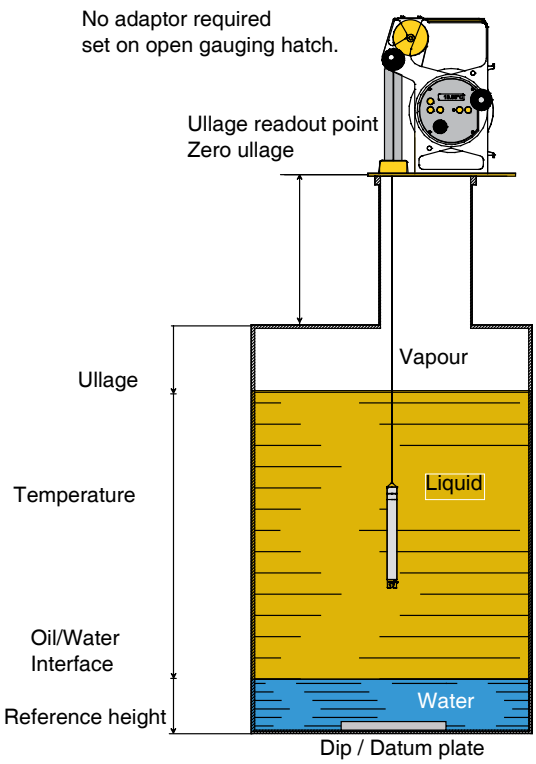
Gauging pipe up to 6 Inch

Level reading on high accurate graduated tape
+/- 1.5 mm over 30 meter

Mechanical tape cleaning device as
standard on all UTImeter

Protection tube to avoid spills and keep
working space clean

Principle of installation



TECHNICAL SPECIFICATIONS:

Accuracy of ullage-interface detection:	± 2 mm (± 0.08” approx.)
Ullage, interface indication:	Audible and Visible selectable
Tape length:	15 m/50 ft, 30 m/100 ft, 35 m/115 ft
Tape graduation:	Metric/English
Tape resolution:	1 mm / 1/16”
Tape accuracy:	± 1.5 mm/30 m (±1/16”/100 ft approx.)
Meets API MPMS Chap 3.1A and ISO 4512 requirements	
Temperature accuracy:	± 0.1°C (0°C to 70°C);
Meets API MPMS Chap 7 request	± 0.2°F (32°F to 158°F)
Meets ISO 4268 , IP PMM Part IV	
Ambient temperature range:	-20°C to 50°C / (-4°F to 122°F)
Temperature sensor measurement range:	-40°C to 90°C / (-40°F to 194°F)
Temperature measurement resolution:	0.01° or 0.1° selectable
Temperature reading:	°C or °F selectable
LCD Display:	8 characters with backlight
Power:	Approved 9V batteries
Weight with 15 meter / 50ft tape:	3.5 kg / 7.7 Lbs.
Hazardous environments approvals	
ATEX	II 1 G EEx ia IIB T4 / Tamb 50°C
Factory Mutual	CL I, DIV 1, C&D, T4 Tamb 50°C and CL I, ZN 0, AEx ia IIB T4 Tamb 50°C
China:	CQST ExiaIIBT4
IECEx:	Zone 0 Ex ia IIB T4 / Tamb 50°C

HERMetic UTImeter Gtex 2000

The HERMetic UTImeter Gtex 2000 is a portable gas tight liquid level gauge designed to operate on top of closed petroleum and chemical tanks. The unit is used for custody transfer, inventory control measurement and free water detection on shore tanks. Connected to a HERMetic vapour control valve fixed on the tank, the HERMetic UTImeter Gtex 2000 avoids any gas release during operation.

The unit enables 4 measurements in one single operation:

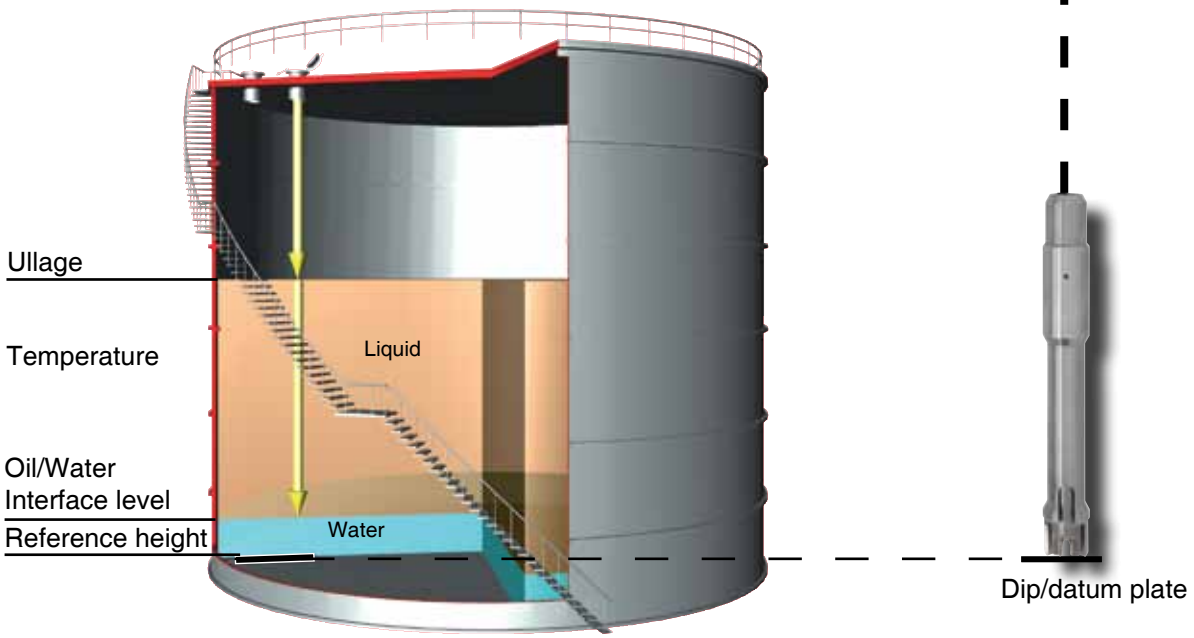
- Ullage
- Temperature
- Oil-Water interface level
- Innage, Reference height (manual detection of dip datum plate)

A GAUGE DEDICATED TO YOUR APPLICATION:

HERMetic UTImeter Gtex 2000

- with 2 Inch load on the sensing probe, recommended for operation in any kind of products. The weight of the probe permits a manual detection of the dip datum plate.
- The unit is fitted with FFKM gaskets and tape connector for use in any kind of corrosive liquids.

FM APPROVED



ULTRA SENSING PROBE

Benefits:

- Closed level gauging, no vapour escape
- Continuous temperature reading.
- 100 % repeatability of measures.
- High accuracy and stability.
- Chemically resistant to corrosive liquids.
- Easy access for battery exchange.
- Sensor exchange without need of new calibration.
- No temperature drift. No degradation of the sensitivity due to sensor ageing.
- Tape cleaning devices, window wiper and tape protection on all units as standard.
- Sensor fitted with load 500 gr. for high viscous products
- Heavy sensor permits manual detection of dip/datum plate. Reference height measurement

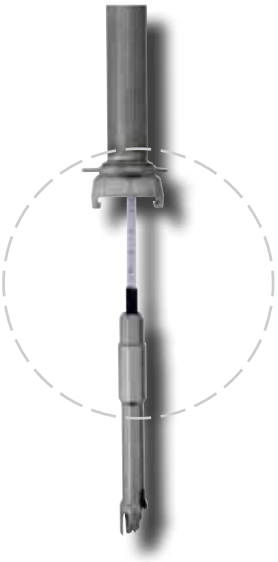
Low maintenance cost:

Fully modular unit. Change tape, storage tube, sensor or instrument unit yourself. Easy and detailed instructions in Operation and Service Manual.

All HERMetic portable level gauges are delivered with **a tailor made plywood carrying case as a standard.** This special box avoids any damage during transport and storage.

Level reading on graduated tape through window

Special tape protection to protect the tape from inadvertent cuts by closing the valve while the sensor is inside the tank. This mechanical safety device prevents damages on tape and reduces repair costs.



Complies with:

- ISO, API, IP
- EC Directive 89/336/EEC
- EC Directive 94/9/EC
- EC Directive 96/98/EC

Approved by:

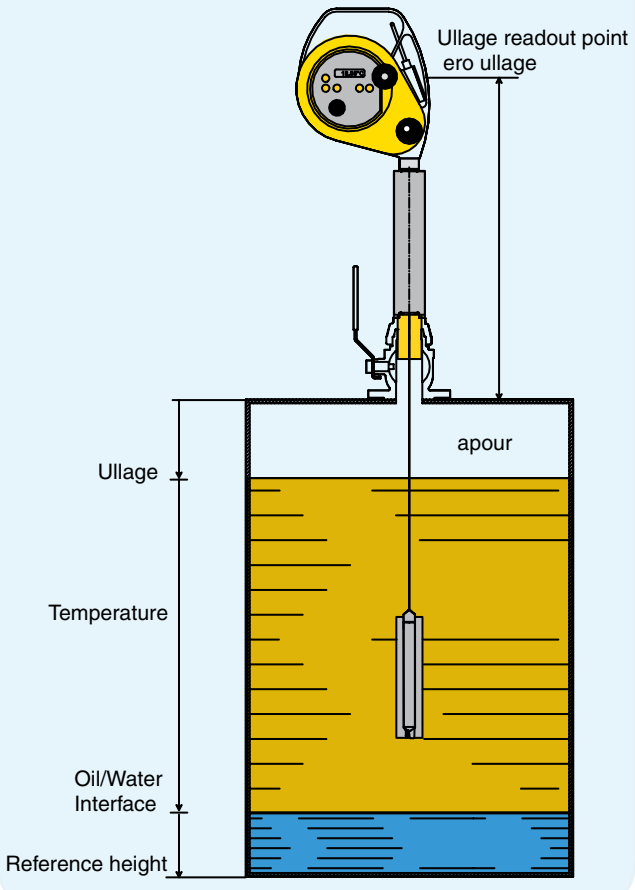
- ATEX, Factory Mutual, CQST
- National authorities, (USCG, MSA, ..)

- **ISO**
  - 4512
  - 3170
  - 4268
- **API**
  - MPMS Chap 3.1A
  - MPMS Chap 7
  - MPMS Chap 8.1
- **IP**
  - PMM Part III-1
  - PMM Part IV”

TECHNICAL SPECIFICATIONS:

Accuracy of ullage-interface detection:	± 2 mm (± 0.08” approx.)
Ullage, interface indication:	Audible and Visible selectable
Maximum tank overpressure:	0,3 bar (4,4 psi)
Tape length:	30 m/100 ft
Tape graduation:	Metric/English
Tape resolution:	1 mm / 1/16”
Tape accuracy:	± 1.5 mm/30 m (±1/16”/100 ft approx.)
Meets API MPMS Chap 3.1A and ISO 4512 requirements	
Temperature accuracy:	± 0.1°C (0°C to 70°C);
Meets API MPMS Chap 7 request	± 0.2°F (32°F to 158°F)
Meets ISO 4268 , IP PMM Part IV	
Ambient temperature range:	-20°C to 50°C / (-4°F to 122°F)
Temperature sensor measurement range:	-40°C to 90°C / (-40°F to 194°F)
Temperature measurement resolution:	0.01° or 0.1° selectable
Temperature reading:	°C or °F selectable
LCD Display:	8 characters with backlight
Power:	Approved 9V batteries
Weight with 30 meter / 100ft tape:	6.7 kg / 14.3 Lbs.
Hazardous environments approvals	
ATEX	II 1 G EEx ia IIB T4 / Tamb 50°C
Factory Mutual	CL I, DIV 1, C&D, T4 Tamb 50°C and CL I, ZN 0, AEx ia IIB T4 Tamb 50°C
China:	CQST ExiaIIBT4
IECEx:	Zone 0 Ex ia IIB T4 / Tamb 50°C

Principle of installation



HERMetic Sampler GT or Sampler GT Chem

The HERMetic Sampler GT or Sampler GT Chem are designed for closed sampling of liquids or chemicals, which present a fire, health or air pollution hazard. The gas tight construction of these units avoids a pressure release from the tank and exposure to fumes during operation.

For the HERMetic Sampler GT or Sampler GT Chem the transfer of the liquid from the sampling bottle to a laboratory bottle occurs by gravity through a special distribution block. The versions GT and GT Chem can be fitted to any kind of 2 Inch ball valve with special adapters.

HERMetic Sampler GT or Sampler GT Chem

HERMetic Sampler GT

- Available adaptors allowing a connection to any kind of foreign valves.
- With FKM gaskets for the main applications in hydrocarbons.

HERMetic Sampler GT Chem

- Available adaptors allowing a connection to any kind of foreign valves.
- With FFKM gaskets recommended for operation in corrosive liquids.
- All samplers are fitted with a quick connect coupling allowing easy installation on all 2 Inch HERMetic Compact Valves.
- The sampling height can be measured on the graduated tape.

TECHNICAL SPECIFICATIONS:

	HERMetic GT	HERMetic GT Chem
Maximum tank overpressure :	0,3 bar	0,3 bar
Unit height:	1016 mm	1016 mm
Weight :	8.8 kg	8.8 kg
Tape length :	30m / 100 ft	30m / 100 ft
Capacity of sampling bottle :	Approx. 0.5 l	Approx. 0.5 l
Type of gaskets:	FKM	FFKM
Materials:	Stainless steel AISI 316, PTFE, PVDF	
Hazardous environments approvals		
ATEX	II 1 G c IIB T6	II 1 G c IIB T6

HERMetic Sampler GTX Chem or Sampler GTN Chem

The HERMetic Sampler GTX Chem and HERMetic Sampler GTN Chem are designed for closed sampling of liquids or chemicals, which present a Fire-, Health- or Airpollution Hazard. The gas tight construction of these units avoids a pressure release from the tank and exposure to fumes during operation.

For the **HERMetic Sampler GTX Chem** the transfer of the liquid from the sampling bottle to a laboratory bottle occurs by overpressuring the upper chamber of the sampler with a pump.

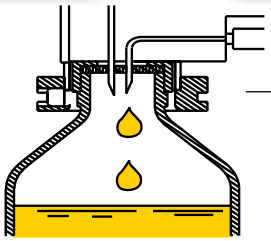
- After sampling, the liquid can be transfered into a laboratory bottle by opening the transfer valve and actuating the pressure pump.
- The graduated tape permits checking of sampling bottle height.
- The HERMetic Sampler GTX Chem is very easy to clean and fully compatible with all kind of non corrosive and corrosive liquids.

For the **HERMetic Sampler GTN Chem**, the sample can be transfered under closed condition. This transfer garantees the integrity of the sample, since the liquid is never in contact with the atmosphere. A closed vapour recovery system dispatches the vapours back into the tank during transfer of the liquid into the laboratory bottle.

- The HERMetic Sampler GTN Chem can be purged with inert gas before and/or after sampling.
- The sampled liquid is never in contact with the atmosphere.
- The sampling height can be measured on the graduated tape.

HERMetic Sampler GTX Chem

HERMetic Sampler GTN Chem



ISO
- 3170

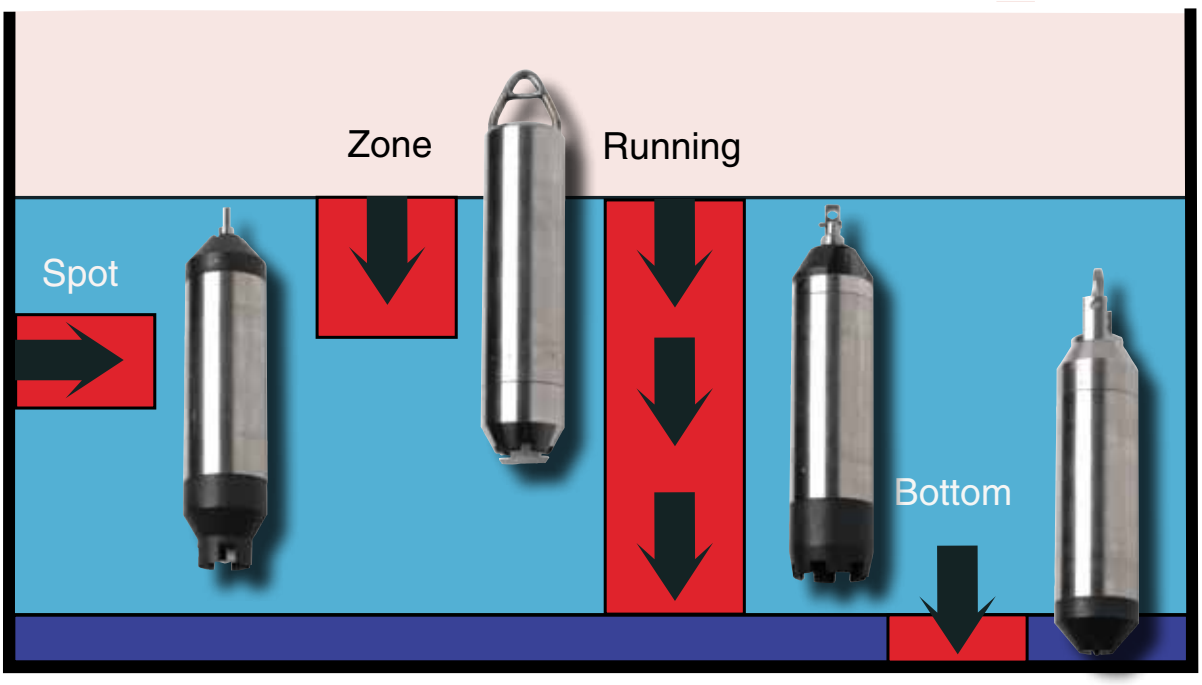
API
- MPMS Chap 8.1

TECHNICAL SPECIFICATIONS:

	HERMetic GTX Chem	HERMetic GTN Chem
Maximum tank overpressure :	0,3 bar	0,3 bar
Unit height:	800 mm	801 mm
Weight :	5.3 kg	7.5 kg
Tape length :	30m / 100 ft	30m / 100 ft
Capacity of sampling bottle :	Approx. 0.5 l	Approx. 0.5 l
Capacity of laboratory bottle :		0.47 l, 16 oz
Type of gaskets:	FFKM	FFKM
Materials:	Stainless steel AISI 316, PTFE, PVDF	
Hazardous environments approvals		
ATEX	II 1 G c IIB T6	II 1 G c IIB T6

Sampling bottles

All HERMetic samplers are available with different sampling bottles. A selection of zone, spot, bottom or running sampling bottles is available for 2 Inch and 4 Inch type of HERMetic samplers. Each sampler can be ordered with any type of available bottle.



Spot bottle | Zone bottle | Running bottle | Bottom bottle

Special adapters

Storage tubes and adapters for HERMetic equipment (gauges and samplers) designed for connection on existing non-Tanksystem valves on board. Honeywell Marine can deliver most of its gauges and samplers with the suitable adaptor to fit on already installed valves.

A grounding cable has to be installed if HERMetic gauges are used with competitor valves.

TS 55000
Used to connect all HERMetic units with 1Inch quick connect coupling to valves with UNF 2 1/2 Inch connection.

TS 55115
Used to connect all HERMetic units with 2 Inch quick connector to valves with UNF 2 1/2 Inch connection.

Other special adapters on request

Vapour lock valves

HERMetic Compact Valves for connection of portable HERMetic equipment.

The HERMetic Compact valves are specially designed to fit all portable HERMetic equipment with a HERMetic quick connector and represent the base for the zero-ullage reference when installed at the appropriate height. They ensure a safe and reliable operation of all portable HERMetic units certified for use in classified areas. The valves are available in three different sizes: 1 Inch, 2 Inch and 4 Inch.

Materials:
Stainless steel AISI 316 with minimal Mo content 2.7%, PTFE seats

C1-SS-W
TS 10055

HERMetic Compact valves C1-SS-W

1Inch full bore ball valve with 1Inch male BSP pipethread designed to support all portable HERMetic equipment with HERMetic 1Inch quick connector.

C1-SS-P
TS 10080

HERMetic Compact valves C1-SS-P

1Inch valve fitted with a special pressure cap cover. This cover is specially designed for use with hazardous chemicals and protect against inadvertent opening.

HERMetic Compact valves C2-SS-BL

2 Inch full bore ball valve made of corrosion resistant stainless steel with high Molybdenum content. The top part is designed to support HERMetic equipment with 2 Inch quick connector.
*Option: Special handle for pad lock.

Weight: 4,8 kg

C2-SS-BL
TS 10081

HERMetic Compact valves C2-SS-BL Female

This valve is also available with 2 Inch female thread

All HERMetic 2 Inch ball valve are available with 2 Inch female thread or with DUJ multistandard flange.

DUJ multistandard flange fits following standards:
DIN PN 10 DN 50
DIN PN 16 DN 50
DIN PN 25 DN 50
DIN PN 40 DN 50
JIS 5K 50
JIS 10K 50
ANSI 150 lbs 2 Inch

Materials:
Stainless steel AISI 316 with minimal Mo content 2.7%, PTFE seats

C2-SS-BL Female
TS 10085

HERMetic valves LC2 with flange

Specially designed 2 Inch bore ball valve for industrial application. The top part of the HERMetic Valve LC2 supports all portable HERMetic equipment fitted with 2 Inch quick connector. This valve is available with 2 Inch female thread or with DIN PN 10/16 DN 50 flange. Equipment connected to this valve have to be fitted with an earth strap to enable proper earthing of the gauge or sampler.

Materials: Brass Chromium plated, Brass Nickel plated, Brass
Weight: 5.5 kg

LC2 with flange
TS 10178

The HERMetic Valve LC2 fits on counter flange with following standards:

DIN PN 10 DN 50 (with screws M16)
DIN PN 16 DN 50 (with screws M16)
DIN PN 25 DN 50 (with screws M16)
DIN PN 40 DN 50 (with screws M16)
ANSI 300 lbs 2 Inch (with screws M12)
ANSI 600 lbs 2 Inch (with screws M12)

LC2 Female
TS 10179

HERMetic valves LC2 Female

This valve is also available with 2 Inch female thread

HERMetic Large Volume Samplers with 4 Inch Valves

The HERMetic Sampler A-4 is designed for restricted sampling and the HERMetic Sampler GT4 for closed, gas tight sampling of liquids which present a fire, health or air pollution hazard.

The sampler housing is mounted on top of the HERMetic 4 Inch deck valve. The sample is taken by a vertical move of the attached sampling bottle inside the liquid. The bottle is linked with a graduated tape. A reading window allows monitoring the bottle location. The opening of the bottle valve is realized by lowering the sampling bottle until it is sitting on the ball of the valve. The transfer of the liquid from the sampling bottle to a laboratory bottle occurs by opening the transfer valve at the bottom of the sampler. A pump can be connected to the winder to accelerate and complete the transfer of the sample. Pick the type of sampling bottle fitting your needs. See page 16.

The **HERMetic Sampler A-4** is dedicated for applications where restricted sampling is accepted and more than 0.5 litre of liquid is needed.

The **HERMetic Sampler GT4** is dedicated for closed sampling of liquids and where more than 0.5 litre of liquid is needed. Its gas tight construction avoids a pressure release from the tank and exposure to fumes during operation.

* Stainless steel construction on request

HERMetic Deck Valve A-4-2-1 SS

TECHNICAL SPECIFICATIONS:

	HERMetic Sampler A-4	HERMetic Sampler GT4
Maximum tank overpressure :	0,3 bar	0,3 bar
Unit height::	770 mm	770 mm
Weight :	7.4 kg	8.1 kg
Tape length:	30 m / 100 ft	30 m / 100 ft
On request:	40 m tape length	50 m tape length
Capacity of sampling bottle:	Approx. 1.8 l.	Approx. 1.8 l.
Materials:	AISI 316, Rilsan coated Aluminium	
Hazardous environments approvals		
ATEX	II 1 G c IIB T6	II 1 G c IIB T6

HERMetic Deck Valve A-4 SS

Specially designed heavy-duty compact ball valve totally made of stainless steel 316 and with Teflon gaskets. The deck flange is according to ANSI 150 lbs. standard. This 4 Inch deck valve is provided with a swing away cover fitted with a 1 Inch quick-connect male coupling. This coupling takes all HERMetic equipment fitted with a 1 Inch female quick connector. For sampling, open the cover and install the HERMetic Sampler A-4 or Sampler GT4 on top of the valve. Three wing nuts are used to secure the cover or alternatively the sampler chamber.

Weight: 24 kg
Materials: Stainless steel AISI 316, PTFE seats

A-4 SS
TS 10053

New

HERMetic Deck Valve A-4-2-1 SS

This valve has been specifically designed so that all the HERMetic equipment, with either 1”, 2”, or 4” connections, will be compatible. Organisations such as the American Petroleum Institute and the Energy Institute, recommend the size of the vapour valve to be 4” (100mm). The 4” valve will allow access to a larger number of gauging and sampling equipment than ever before, depending on the product and sample type required. Vapour valves smaller than 100mm in diameter are suitable for gauging but can severely limit the type of sampling equipment that can be used and, ultimately, the quality of the sample. The size and location of the vapour valve for closed system measurement and sampling is critical to the process. A valve of the proper size, located correctly, will allow more accurate measurements to be taken than one that is improperly located and of insufficient size. The new multi-purpose valve gives the flexibility to gauge products from crude to chemicals. Most importantly, it will allow the use of sampling equipment with the capabilities of retrieving sample quantities from 0.33 litres to 1.8 litres in one single operation.

Weight: 25 kg
Materials: Stainless steel AISI 316, PTFE seats

A-4-2-1 SS
TS 98172

HERMetic Onecal: Intrinsically safe portable digital thermometer

The **HERMetic Onecal** has been designed for use in hazardous environments with outstanding characteristics regarding safety, ease of operation, accuracy, reliability and cost efficient maintenance. Onecal stands for one reference point only for calibration. The reference point is the ice point which can easily be reproduced. The calibration is done by simply pushing a button. The characteristics of the RTD sensor are stored in the memory of the instrument and are the same for any individual sensor. Therefore a change of a sensor requires only an offset calibration. Replacing the cable only does not require a new calibration because of the built-in automatic cable compensation routine. Up to 9 individual values can be stored in the memory. An automatic average of the stored values can be achieved by entering the calculation menu. The ergonomic and rugged design of the housing allows for an easy and safe cable storage. The cable guides keeps the cable secured at all times. By counting the number of cable loops the fed cable length can be determined.

* Option Load 300 gr.

- **1 cable loop = 2 feet, 3 cable loops = 2 metres.**

- **Application**

Temperature measurement represents an important part in tank gauging since the density of petroleum products changes approximately by 0.1 % per degree Celsius. An error in the observed temperature will result in an error of the correction factor, which is used to calculate the standard volume. This electronic thermometer has been designed for field inspection of custody transfer of bulk liquids and meets all relevant standards in the industry.

* Option
Fully-cushioned carrying box
This special box protects against any damage during storage and daily use .

- **Ambient temperature drift**

SCS Surroundings Compensation System

In most cases, a PET will be checked or calibrated at room temperature ambient conditions, i.e. around +20°C/+68°F, although they can work in a wide range of operational ambient temperatures. From areas such as Alaska to equatorial climates, these conditions can vary over a range of around +100°C/+180°F. This difference can result in another form of drift error. The new concept named “SCS Surroundings Compensation System”(Registered) of the Onecal incorporates an internal reference that is constant and does not depend on the ambient temperature over a wide operational range, i.e. from -20°C / -4°F to +60°C / +96°F. This means, the accuracy of the measurements made with the Onecal is unaffected by the ambient temperature, and this error is avoided.

- **Re-calibration when exchanging the PET cable**

CRC Cable Resistance Compensation

A traditional PET needs to be re-calibrated each time the cable is renewed, as the intrinsic resistance of the cable is incorporated in the temperature measurement sequence and any change in its value can affect the accuracy of reading, unless the unit is properly re-calibrated. The new concept named “CRC Cable Resistance Compensation”(Registered) of the Onecal measures the actual resistance of the cable every time the PET is used, and compensates for any change to eliminate this source of error. Changing the cable, whatever length it has, will not affect the accuracy of the thermometer and therefore does not require a re-calibration in a laboratory.

With:

SCS® & CRC®

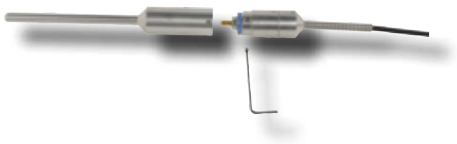
- **Response time**

This thermometer has a response time (time to achieve 90% of the final temperature) of 15 seconds in water and 35 seconds in lubrication oil under dynamic conditions.

- **Maintenance**

This instrument has been designed for users which require a high precision thermometer that is always ready to operate. Users can change the cable, the sensor or the display unit, and recalibrate it without the need of special tools or training. The unit cannot be calibrated incorrectly.

Cable replacement without new calibration



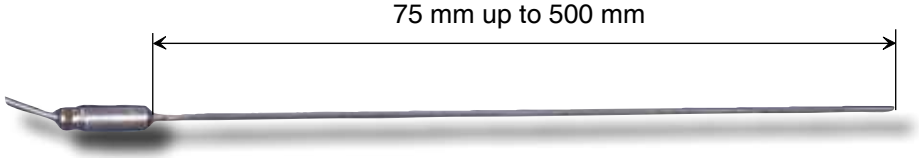
The modular design of the HERMetic makes the exchange of components extremely easy and cost efficient as no special training or tools are required.

HERMetic Onecal without frame, 2 m / 7 ft cable

The HERMetic Onecal can also be used in laboratories for verification of existing temperature measuring equipment. The high accuracy of this thermometer allows a reliable temperature reading. The HERMetic Onecal can be supplied without frame and with a 2 m / 7 ft cable. This type of unit can very well be used for temperature verification anywhere in a laboratory or on a railtrain tank if the opening is bigger than 16 mm / 5/8” in order to allow the penetration of the sensor.

Alternative to next page specifications

Measurement range:	- 40°C to 100°C
Probe size:	up to 500 mm long
Tip diameter:	5 mm



TECHNICAL SPECIFICATIONS:

Measurement range :	-40°C to 163°C / -40°F to 325°F
Sensor temperature range:	-40°C to 200°C / -40°F to 392°F
Ambient temperature range:	-20°C to 40°C / -4°F to 104°F
Resolution :	0.1° or 0.01° selectable
Temperature scale :	°C or °F selectable
Temperature accuracy :	
-40°C to -30°C / -40°F to -22°F	± 0.25°C / ± 0.4°F
-30°C to 100°C / -22°F to 212°F	± 0.1 °C / ± 0.2°F
100°C to 163°C / 212°F to 325°F /	± 0.25°C / ± 0.4°F
Repeatability:	exceeds API MPMS Chapter 7
-40°C to 163°C / -40°F to 325°F	+/- 0.1°C / +/- 0.2°F
Calibration :	Digital, one point only 0°C / 32°F
Memory :	up to 9 individuals
Display :	LCD 8 digits, 10 mm character height
Power :	Approved 9 Volt battery
Battery saving:	aut. shut off /10 minutes after last action
Battery life :	Approximately 100 hours
Low battery indication:	On LCD display
Overall dim. length x width x depth:	336 x 202 x 94 mm/13.2” x 8” x 3.7”
Weight with 22.8 m / 75 ft cable :	< 1.4 kg / < 3 lbs
Probe size :	diam. 16 mm , 150 mm long / diam.5/8 “ , 6” long
Probe material :	Stainless steel 316L
Cable length :	7.6 m / 25 ft , 22.8 m / 75 ft, 33.5 m / 110 ft
Cable material :	FEP Teflon jacket
Instrument protection :	IP 54
Frame material :	Antistatic Polyamide base
Electronic box material:	Coated aluminium
Temperature sensor:	PT 1000 element

Hazardous environment Approvals:

ATEX	II 1 G EEx ia IIB T4
Factory Mutual	CL I, DIV 1, C&D, T4 and CL I, ZN 0, AEx ia IIB T4
China:	CQST ExiaIIBT4

Metrology approval:

Germany:	PTB, portable electronic thermometer
China:	Pattern approval
Russia:	Pattern approval

Complies with:

EMC	EC directive 89/336/EEC
ATEX	EC directive 94/9/EC

Worldwide customer support

Honeywell Tanksystem has service stations placed strategically around the globe to provide the broadest possible service network. Our broad network will save you transport costs and time. Visit www.tanksystem.com for service locations.

Honeywell Marine has the most complete global network of agents in our industry. This allows us to be as close as possible to our customers and fulfil their needs and demands. With over 60 agents, we can quickly address all your gauging and sampling requirements.

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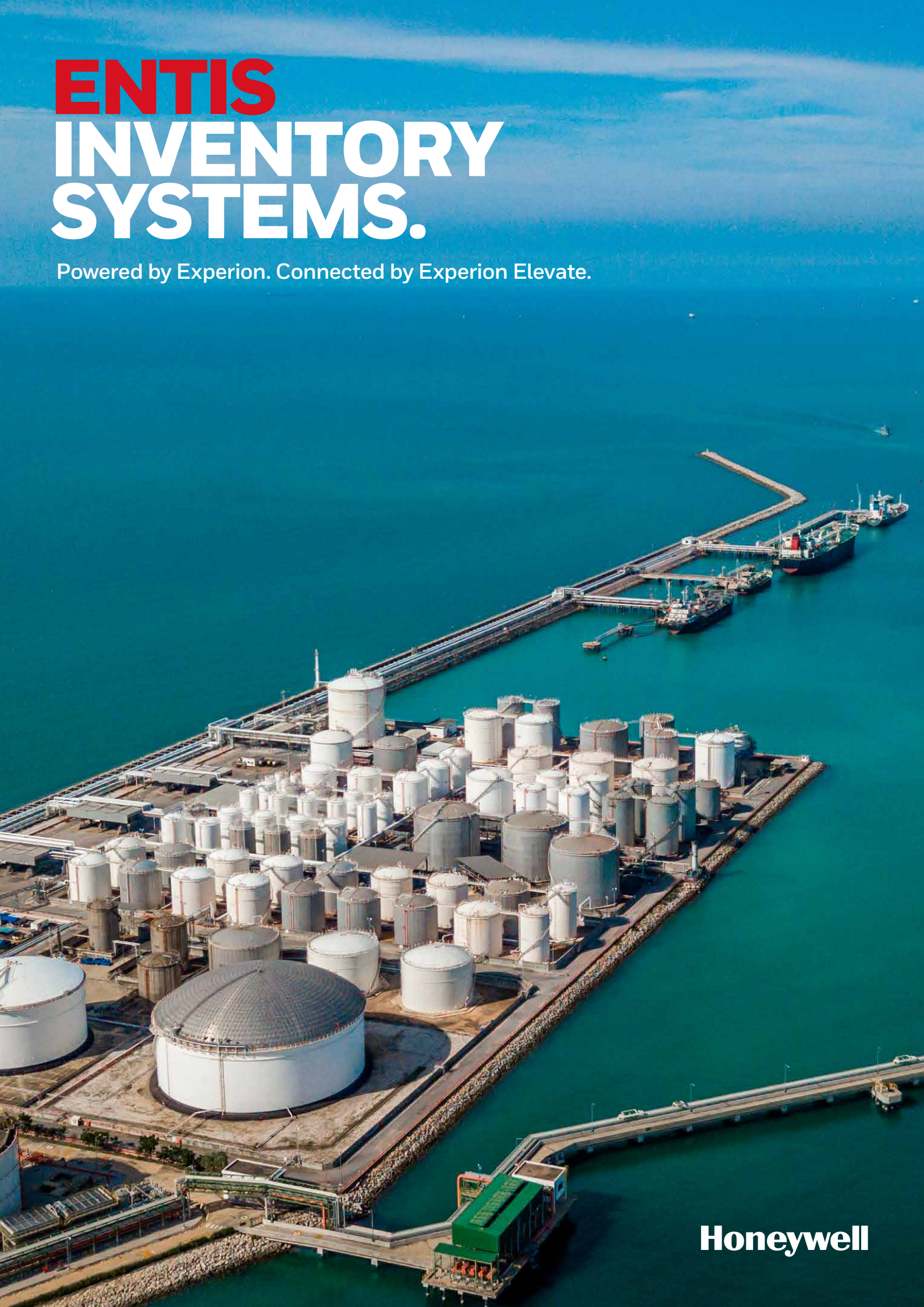
Honeywell

ENTIS
INVENTORY SYSTEMS.

Powered by Experion. Connected by Experion Elevate.



Honeywell

EXPERIENCE MAKES THE DIFFERENCE

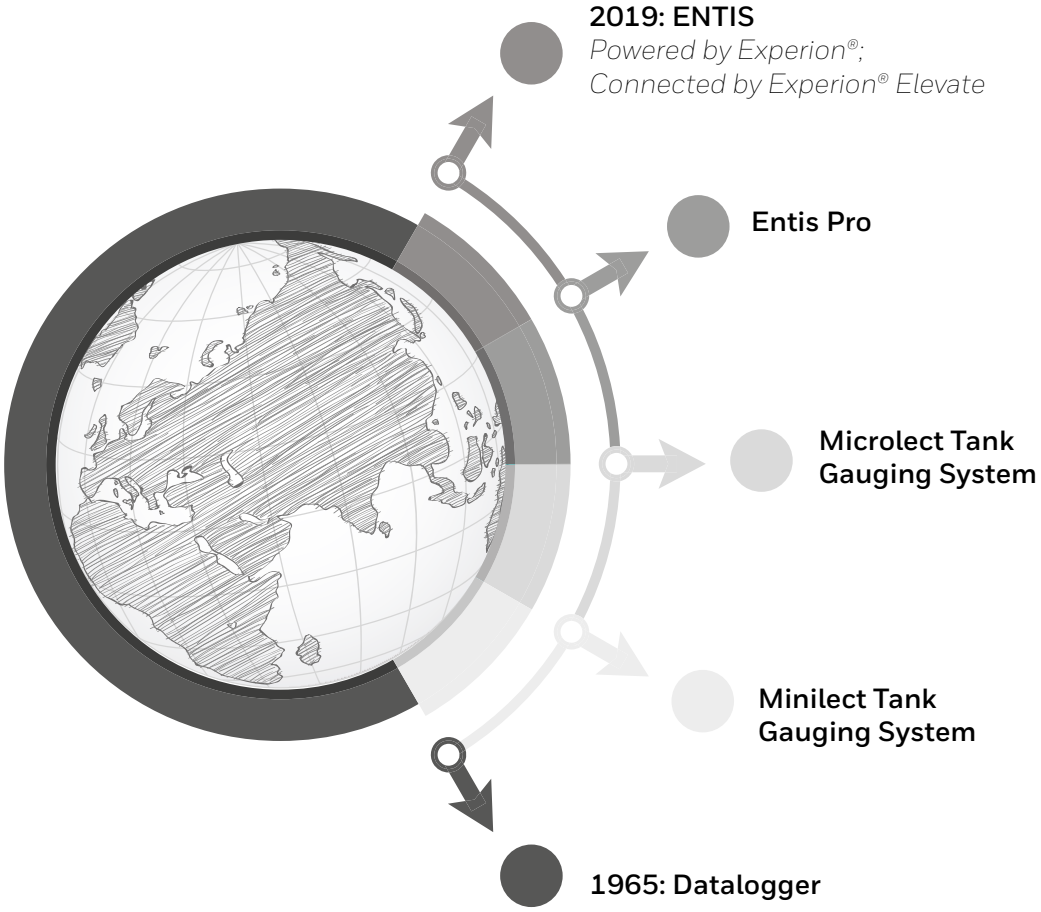
Pressure on margins, regulatory demands and skills shortages create a challenging environment for terminal operators. They need accurate data on hand to manage their liquid inventory and support decisions to improve performance and drive down costs.

Best-in-class tank management and custody transfer technology is indispensable to help reduce inventory uncertainties, increase operator efficiency and reduce product losses.

Our brand new ENTIS Inventory System is built on the proven Experion® platform to put you in control for a better operation. The Honeywell solution is supported by more than half a century's experience in tank gauging and inventory management.

ENTIS is among the industry's most trusted solutions, with more than 2,000 installations worldwide. Powerful, modular, and easy to use, ENTIS is suitable for all kinds of distribution and bulk terminals. It provides industry-leading accuracy, flexible options and advanced security features.

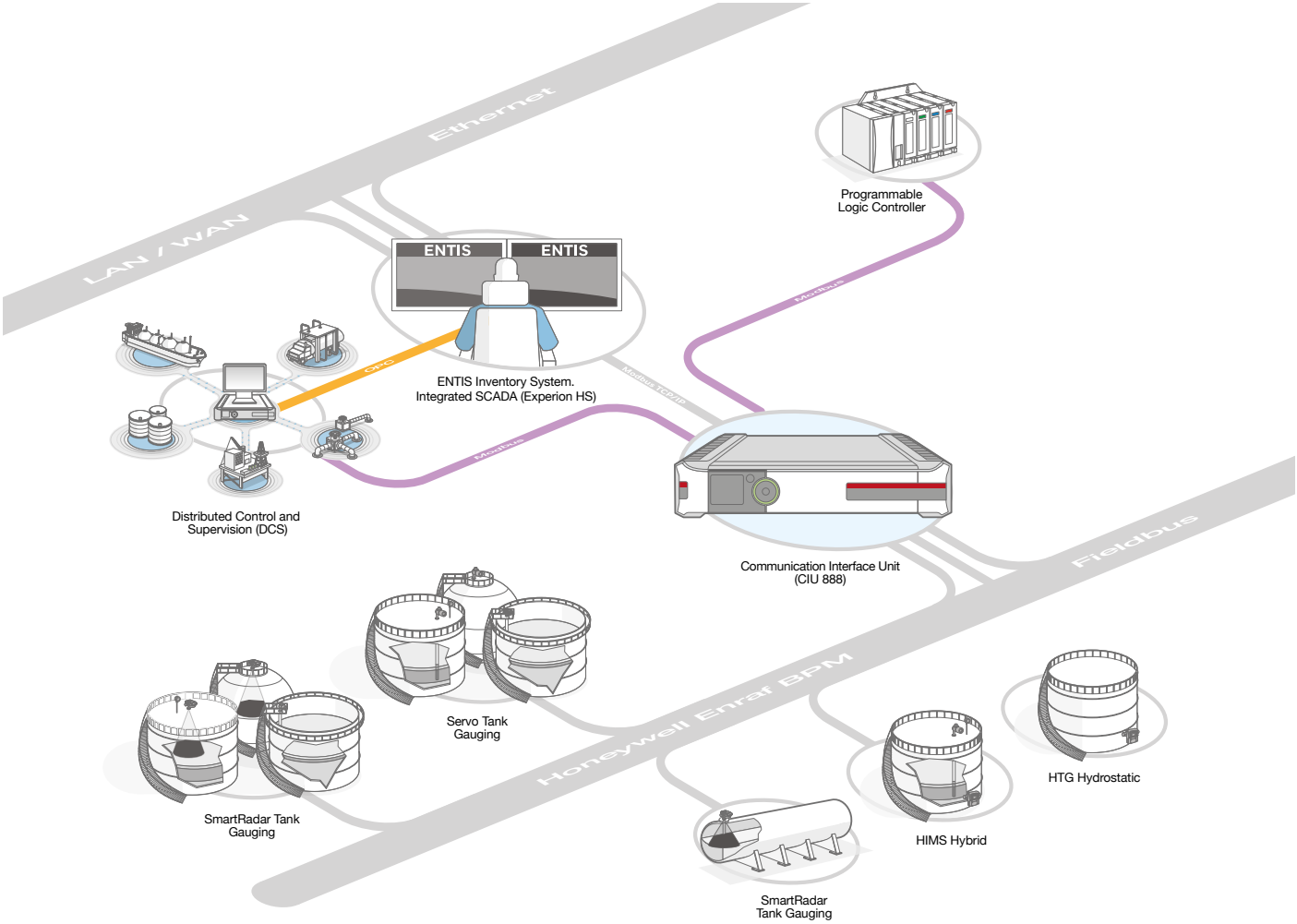
MORE THAN 2000 INSTALLATIONS WORLDWIDE.



FLEXIBLE ARCHITECTURE FOR STREAMLINED OPERATIONS

The ENTIS unique, flexible system architecture ensures faultless operation. ENTIS integrates with the dedicated Communication Interface Unit, CIU 888 via Modbus TCP/IP. CIU 888 retrieves and processes data from field devices and systems, constantly scanning, calculating and monitoring.

Reliable data is continuously provided to a wide range of applications supporting operators with dedicated tasks in ENTIS. This allows them to operate the tank farm safely and efficiently.



INVENTORY MANAGEMENT THAT WORKS FOR YOU

Operating an oil storage terminal requires a constant focus on safety and efficiency. Honeywell's ENTIS system provides accurate and secure inventory data at all times, allowing overfill, leak detection and alarm to prevent potential disasters, and save people as well as the environment. Also, it allows users to reduce costs, increase efficiency and improve profits.

A FLEXIBLE ANSWER

Based on a modular approach, ENTIS provides a wide range of capabilities, customizable displays and report templates to fit operators' needs. In addition to the broad set of standard tools, reports and views included, you can request bespoke functions that can be developed to your specifications. Providing an efficient solution for a single tank or up to 400 tanks on a tank farm, ENTIS offers a single solution for multiple locations and a wide variety of gauges and interfaces. Easily accommodating expansions or changes to the operation, it provides a flexible answer to deliver performance and value over the entire life cycle.

AN INTEGRATED APPROACH

Honeywell Enraf's tank inventory systems use open standards for better integration. Open connectivity enables seamless integration of existing field equipment, while standardized host interfaces can link to your control systems and business domain packages for advanced resource planning and asset management.

DESIGNED FOR HUMANS

Technology should make operations easier. Intuitive and easy-to-use right out of the box, ENTIS is a web-based solution that employs a logical, self-explanatory interface.

Clear color-coded tank displays immediately inform operators whether tanks are being filled or emptied; graphical displays provide quick overviews of tank status; and high resolution numerical read-outs provide accurate real-time data. Simple to configure, and with several graphical interfaces available, you can even customize displays for individual tanks.

ENTIS offers a simple but powerful approach to reduce installation costs and cut your time spent on training, while boosting efficiency and safety.

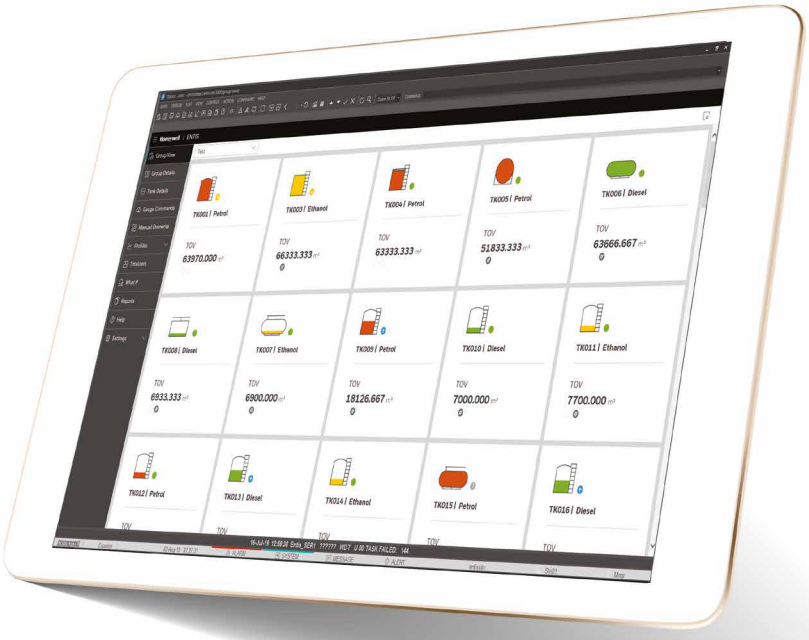
PROTECTING YOUR PEOPLE

Use our terminal solutions to keep the operation safe, protecting personnel, assets and the environment. Accurate and secure inventory data avoids overfills, facilitates leak detection and prevents disasters.

ENTIS includes a reliable, proven alarm system, allowing users to program set points and create their own custom alarms. Alarm suppression also prevents operators being overwhelmed by alarm avalanches caused by a single failure. A leak detection mode monitors tanks during inactive periods, with temperature-corrected volume measurement for accurate readings, increasing plant safety and reducing operating costs caused by false alarms.

KEEPING YOU COMPLIANT

ENTIS visualizes API and ASTM compliant inventory data that is measured and calculated from CIU. Weights and Measures-certified applications for custody transfer, accounting and duties come with a comprehensive set of reporting functions to provide data in the right format and frequency. ENTIS keeps records straight and cuts the burden of compliance. Plus, ENTIS is compliant with Cyber Security standards.



UNIQUE INTEGRATED CONCEPT

ENTIS simultaneously interfaces with a wide range of commonly used field protocols. The system provides data from across your terminal, or even different sites throughout the world. All data is effortlessly accessible at the click of a mouse.

ENTIS GIVES YOU THE DATA YOU NEED:

- Detailed: Data presented according to your needs and site policy.
- Available: In real-time from across the terminal and effortlessly accessible.
- Transparent: Secure and instantly verifiable for auditors and others.
- Accurate: Precise data for efficient and confident planning and better use of resources.

ENDLESSLY ADAPTABLE

ENTIS offers an extensive set of functionalities to meet the day-to-day needs of Terminal Inventory Operations. A huge variety of different screens provide dynamic tank level, tabular details, tank icons, density profiling and temperature profiling for powerful trending, reports and tank calculators. Vital information is always just one click away.

WHY HONEYWELL ENRAF

A Trusted Brand: Honeywell Enraf combines more than 60 years' experience in terminal operations with the global resources of Honeywell Process Solutions.

Domain Knowledge: A niche focus and unrivalled depth of knowledge is demonstrated in more than 2,000 installations worldwide.

Market Leading Technology: Our tank management and custody transfer solutions are best in class and certified by the world's most recognized authorities, such as NMI.

Working Together: We have partnerships with a wide range of best-in-class product and service suppliers to ensure you always get the perfect solution.

Local Support: 2,700 certified project managers, engineers and designers means we always have experts near you to help.

End-to-end Solutions: Use us as your single source for terminal solutions to draw on a comprehensive and integrated portfolio of products, systems and services that add value.

TAKE YOUR TERMINAL TO THE NEXT LEVEL

ENTIS systems offer proven, demonstrable benefits for terminal management to promote a safer, more profitable operation.

INCREASE OPERATOR EFFICIENCY

Developed to present the real-time information operators need clearly and orderly, ENTIS packages enable quicker decisions and troubleshooting, while reducing the need for manual inputs through integrated, automated processes

OPTIMIZE YOUR PROCESS

Alarms, acknowledgments and all tank information are recorded and stored for future review and traceability. With historic trending, operators can check tank usage quickly and easily to increase efficiency.

REDUCE ADMINISTRATION

Powerful, automated and customizable reports for regulators, customers and internal use cut the burden of paper-work and lead to a more informed workforce.

LOWER INSTALLATION COSTS

Designed for open connectivity, easy configuration and ease of use, ENTIS inventory management systems are quick to install, simple to maintain and fast to adapt to any change that might occur in the process.

ZERO IN ON ACCURACY

With precise, reliable data delivered in the required formats, terminals can reduce inventory uncertainty and maximize capacity for a more profitable operation.

BRING THE PLANT TOGETHER

Windows networking facilities allow users to integrate ENTIS into the plant's system, with local and wide-area networking. Even wireless and fiber optic communications are seamlessly integrated. Data can be shared securely across the plant – or across the globe.

ROBUST SAFETY AND SECURITY

ENTIS ensures robust safety and security in compliance with the following requirements: Cyber Secured, Tamper proof Audit Trails, Defense-in-depth security, Windows Integrated Security, Integration with Honeywell safety manager and Digital Video manager.

WE KNOW TERMINALS

Safe, accurate and efficient: for more than six decades and up to the present day Honeywell Enraf has proved the single source for terminal solutions. Our integrated, scaleable offerings help terminal operators stay competitive, compliant and safe.

Combining innovative solutions, field-proven products, and unrivalled experience, Honeywell Enraf solutions meet the needs of all types of bulk terminals. For your refinery off-sites, biofuel storage and distribution, petrochemical storage and loading facilities, or marine, rail and truck loading terminals, we will help you achieve your objectives.

Whether it's a Greenfield project or minor update, you can benefit from our global expertise, local support and a flexible approach to increase safety, prioritize accuracy, boost profits, and keep compliant.

HONEYWELL'S FULLY INTEGRATED TERMINAL OPERATIONS SERVICE PLATFORM

ENTIS is part of Terminal IQ, a fully integrated software service platform that addresses the challenges terminal operators are facing today.

The Honeywell solution provides an integrated approach to facilitate, monitor, and control the storage and distribution of Oil and Gas products. The platform enables guaranteed outcomes for safe, reliable, and profitable small and medium terminal operations.Terminal IQ enables operators to manage Tank Inventory, Loading, and Terminal Automation workflows.

The Honeywell platform ensures superior users experience through seamless data management. Plus, it facilitates easy adoption, thanks to a user-friendly subscription model.

For More Information
To learn more about Honeywell Enraf's ENTIS Inventory Systems, visit www.honeywellenraf.com or contact your Honeywell Enraf account manager.

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BR-19-33-ENG | 10 / 2019

THE FUTURE IS WHAT WE MAKE IT

Honeywell

HONEYWELL ENRAF ENTIS R140

INVENTORY MANAGEMENT SYSTEM

Honeywell

CONTENTS

PAGE

INTRODUCTION TO ENTIS R140

Pressure on margins, regulatory demands and skills shortages create a challenging environment for terminal operators. Operating an oil storage terminal requires a constant focus on safety and efficiency.

Terminal operators need real-time and accurate data on hand to manage their liquid inventory and take decisions which improve the terminal's performance and drive down costs. For meeting this need, the best-in-class tank management and custody transfer technology is indispensable to help reduce inventory uncertainties, increase operator efficiency and reduce product losses.

Honeywell's ENTIS R140 system provides accurate and secure inventory data at all times, allowing overfill prevention, leak detection and alarms to prevent potential disasters, and save people as well as the environment. It allows users to reduce costs, increase efficiency and improve profits.

WHAT IS ENTIS R140

Honeywell ENTIS is a powerful and user-friendly software solution designed specifically for the management and optimization of liquid bulk storage terminal operations. It provides a comprehensive platform that integrates various functionalities aimed at enhancing efficiency, safety, and regulatory compliance.

The ENTIS R140 system is built on the proven Experion® platform to put you in control for a better operational experience. The Honeywell solution is supported by more than half a century's experience in tank gauging and inventory management.

ENTIS simultaneously interfaces with a wide range of commonly used field protocols. The system provides data from across your terminal, or even different sites throughout the world. All data is effortlessly accessible at the click of a mouse.

ENTIS gives you the data you need as:

— Detailed: Data presented according to your needs and site policy.

— Available: In real-time from across the terminal and effortlessly accessible.

— Transparent: Secure and instantly verifiable for auditors and others.

— Accurate: Precise data for efficient an confident planning and better use of resources

HOW ENTIS R140 SOLVES OPERATIONAL CHALLENGES?

For commercial success of terminal operations, the ENTIS R140 system is the best business-friendly investment which tackles many issues like:

CHALLENGE

Complex Inventory Tracking

Terminals handle many types of liquid products, each with different storage requirements. Tracking the specific quantities, locations, and handling requirements for multiple products can be complex and time-consuming.

SOLUTION

Honeywell ENTIS offers extensive set of functionalities meeting day-to-day needs of Terminal Inventory Operations.

CHALLENGE

Variability in stored product Characteristics

Liquid products can have varying densities and viscosities depending on temperature and composition, making it difficult to maintain accurate stock measurements. Temperature fluctuations can alter volume calculations, leading to discrepancies in inventory levels.

SOLUTION

The feature rich ENTIS provides dynamic tank level, tabular details, tank icons, density profiling and temperature profiling for powerful trending, reports and tank volume calculations.

CHALLENGE

Cross-Contamination Risks

Maintaining separate storage for incompatible liquids is crucial to prevent cross-contamination, which adds logistical complexity and requires careful management of inventory rotation.

SOLUTION

Clear color-coded tank displays immediately inform operators whether tanks are being filled or emptied; graphical displays provide quick overviews of tank status; and high-resolution numerical read-outs provide accurate real-time data.

CHALLENGE

Volumetric losses due to evaporation and leakages

Liquids stored in tanks could get evaporated, especially with volatile substances, as well as leak out due to faulty tank seals or equipment failures. These losses may not always be accounted for in inventory systems, resulting in inaccurate stock levels.

SOLUTION

The ENTIS R140.1 provides accurate and secure inventory data which avoids overfills and facilitates leak detection. The leak detection mode monitors tanks during inactive periods using temperature-corrected volume measurements.

CHALLENGE

Inaccurate Measurement Techniques

The accuracy of inventory levels in tanks has a strong linkage with choice of right gauging instrument which prioritizes accuracy suitable for application and regulations where gauge is deployed. If these devices fail or are behave inaccurately, it can lead to erroneous inventory data and financial losses.

SOLUTION

The industry-leading accuracy provided by the Enraf tank gauging system hardware delivers precise and reliable data to ENTIS R140.1, which can be used by terminals to reduce inventory uncertainty and maximize capacity for more profitable operations.

CHALLENGE

Operational workflow limitations and reporting challenges

Terminals handle many types of liquid products, each with different storage requirements. Tracking the specific quantities, locations, and handling requirements for multiple products can be complex and time-consuming.

SOLUTION

The networking facilities allow users to integrate ENTIS into the plant's system, with local and wide-area networking. Data can be shared securely across the plant – or across the globe in the form of powerful, automated and customizable reports which reduce administrative activitiesof Terminal Inventory Operations.

CHALLENGE

Aligning with upgrades to regulatory and compliance norms

The updates to regulatory norms linked with inventory management and custody transfer operations at Terminals may lead to expensive modification or overhaul of inventory management assets at site.

SOLUTION

The ENTIS R140.1 from Honeywell keeps records straight and cuts the burden of compliance. ENTIS visualizes API and ASTM compliant inventory data that is measured and calculated from CIU. Weights and Measures-certified applications for custody transfer along with comprehensive sevt of reporting functions to provide data in the right format and frequency.

FEATURES AND BENEFIT OF ENTIS R140

ENTIS R140 provides a comprehensive and feature rich platform that integrates various functionalities aimed at enhancing efficiency, safety, and regulatory compliance.

THE FEATURES OF ENTIS R140 ARE DESIGNED AROUND 6 KEY FOCUS AREAS FOR THE TERMINAL OPERATOR:

1.

REAL-TIME MONITORING
View operational data of terminal for single site, multiple sites at same location or spread geographically, Manage alarm in customized manner. Support up to 400 tanks.

2.

ADVANCED ANALYTICS
Generate Temperature & Density profiles. View historic trend analysis. Extract reports in customizable format for audit purpose.

3.

CERTIFICATIONS & STANDARDS
Certified by Legal Metrology and Cyber Security approved by Honeywell CoE.

4.

INTEGRATION CAPABILITIES
OPCUA, Modbus, Enraf & 3rd party gauges, SCADA Integration

5.

SECURE AND USER-FRIENDLY
Hierarchal access control features, 9 different language packs, highly customizable to user requirements.

6.

INCIDENT MANAGEMENT
Unplanned flow alarms, Floating roof monitoring, Station filtering of alarms, audit of alarm logs.

ENTIS R140 FEATURES LIBRARY

The following is a list of all features available in ENTIS R140

SUPPORTS 400 TANKS

- 8 CIU pairs
- 80 tanks per CIU
- Configuration from CIU888 database

BENEFITS FROM EXPERION R520.2 & R530.1

- Audits & Events
- SCADA Integration
- Data Logging
- Data History
- Trending
- Server Redundancy

BENEFITS FROM CIU 888 VERSION R220.1

- OPCUA
- Latest tank calculations
- Enraf Gauges & 3rd party Gauges
- Product Database
- Product Editor Interface

DUAL GAUGES

- Product Level 2
- Deviation Alarm

ALARMS

- Programmable Alarms
- Alarm management screen
- Alarm Notification popup
- 20 Programmable Alarms per data entity (ex. Level, Volume),
  20 Entities per tank
- Hi, Hi Hi, Low, Low Low types
- Configurable priority
- Station based alarm filtering
- Alarm privilege setting to control editing rights

GROUP VIEW

- Tank icons
- Info icons and bar graph and product colors
- Selectable Entities (up to 5)
- Menu for simple gauge commands and movement

GROUP DETAILS

- Tabular view up to 80 tanks per page
- Delta function
- Dynamic filters
- Alarm view and columns
- “Notes” column for quick notes on a tank
- Configurable columns for each view and custom view creation per station
- Menu for simple gauge commands and movement
- Export to CSV
  - Export view and group, or single tank, to CSV
  - Setup Scheduled Export of a group and view, or a single tank

GAUGE COMMANDS

- Execute commands on Gauges (depending on type Servo or Radar)
  - Dipping
  - Displacer
  - Test Gauge Alarms

PROFILES

- Density (interface and tank)
  - Up to 50 points using 954 Servo gauge
- Temperature profiles from probes
- Graphical or tabular view of profile data

MANUAL OVERWRITE

- Measured values
  - Product Level
  - Temperature
- Density calculation data
- Product data
- Product Name
- Product Specification (from Database)

WHATIF

- Tank calculator for hypothetical inventory changes
- Forward and back calculations
- Report of calculation

TOTALIZERS

- Get totals of a group (or all) of a specific data
- GOV – Gross Observed Volume
- GSV – Gross Standard Volume
- TGSV – Total Gross Standard Volume
- NTSM – Net Tank Standard Measurement
- TOV – Total Observed Volume
- Available TOV – Available Total Observed Volume

SIMPLE MOVEMENT

- Simple UI calculator
- Configuration
  - One-to-One
  - Tanks Only
- Group details Movement view
  - View movements on tanks
  - Movement reports

ADVANCED MOVEMENT

— Available Configurations
  • One-to-many
  • Many-to-one
  • Objects: Tanks, pipes, train, truck, ship or Custom creation
  • Absolute and relative measurement types
  • Infrastructure pipelines
  • Configuration report
  • Alerts on progress toward level/volume/mass
— Main Screen
  • Overview of all movements
  • Views: Armed, Active and Closed
  • Closed Movement reports

ALARM MANAGEMENT

— Unified screen for all alarm configurations
— Filter for Tank Group
— Programmable alarms
  • Editable columns
  • Add/edit configure alarms
  • Ack and disable or enable
— Unplanned Flow Alarms
  • Tanks not planned for Movements and are expected to be static
  • Triggers on changes in Mass, Volume or Level
— Floating Roof monitoring
  • Immersion, elevation and tilt per tank (Floating roof tanks only)
  • Show sensors FRL1-3
  • Threshold/setpoints to be found by customer using logged FRL1-3 data during “normal” conditions
— Alarms configurable for one or all tanks in the group

ALARMS NOTIFICATION

Popup

— Always on top of ENTIS screens
  • Can be minimized, snoozed and auto popup disabled
— Alarms show latest on top
— Acknowledge one or all
— Filter based on Tank Group
— Station based filtering
— Snooze
— Tab for Acknowledged / Unacknowledged alarms

REPORTS

— PDF reports with static templates
  • Group detail: Crudes, CTL, General Products, Inventory, Measured, Tank Totals
  • Tank detail - Legal Metrology approved if sealed
— Custom Group report templates
  • Select from Group and View defined in Group details
— Can be Printed to paper
— Scheduled (both PDF and Printer)
— Custom group reports

ALARMS SETTINGS

— Deviation Alarms
  • Based on second gauge level
— Age Alarms
— Popup behavior
— Station filtering behavior

CIU888

— Clock sync
— Status
— Manual switchover

CALCULATIONS & STANDARDS

— New tank calculations data and standards
— New Legal Metrology standards implemented

USER CAPABILITIES

— Enhanced configuration capabilities
— Migration enhancements

SCADA INTEGRATION

— ENTIS data sent to Experion via SCADA points
  • Tank data – Analog points
  • Alarms – Status points
— 40 SCADA points per tank

SERVER REDUNDANCY

— File and data synchronization of ENTIS data
— Server failover detection and automatic switchover

USER ACCESS CONTROL

— Experion access levels
  • View only, Ack only, Operator, Supervisor, Engineer, Manager
— Station based or Operator (login) based

EVENTS

— Audit Events and Events from ENTIS are logged in Experion Event log
— Experion Event viewer screen

TRENDING

— Preconfigured trends
  • Accessible via Experion Station Equipment view
— Experion Trends
— Trend Graphs displayed in Experion (for historized data and live data)

DATA HISTORIZATION

— Data points from ENTIS historized for up to 1 year

PANEL PC

— Experion Panel PC touch screen support

MULTISCREEN

— Experion SafeView
— Single screen (with multi windows)
— Dual screen
— 4 x 1 horizontal
— 2 x 2

ENTIS R140 STRUCTURE AND FUNCTION

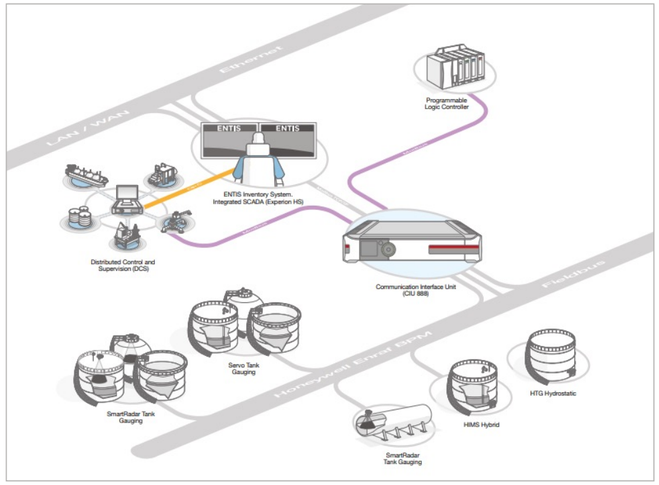
The unique and flexible system architecture of ENTIS ensures faultless operation. ENTIS integrates with the dedicated Communication Interface Unit, CIU 888 via OPC UA communication protocol.

Enraf Smart Servo 954

Enraf SmarRadar FlexLine 990

CIU 888 retrieves and processes data from field devices and systems fitted to the tank like the Enraf Smart Servo 954, Enraf SmarRadar FlexLine 990, VITO Multiple Thermosensor Thermometers for single and multi-point temperature measurement. By constantly scanning, calculating and monitoring data across many field devices, CIU888 ensures non-stop access to operation critical data for the terminal in both standalone and redundant configurations. This allows the operators to operate the tank terminals safely and efficiently.

CIU 888



HARDWARE	Dell Tower PC T5860XL with 32GB RAM
OPERATING SYSTEM	Windows 10 IoT Enterprise 2021 LTSC Version
EXPERION VERSION	Experion HS R530.1 with SHU2

SUPPORT FOR LEGACY ENTIS VERSIONS:

For ENTIS R121 and below versions

	CURRENT VERSION	CHANGES NEEDED TO MIGRATE
HARDWARE	Dell Tower PC T5820XL	Upgrade existing PC RAM from 16GB to 32GB
OPERATING SYSTEM	Windows 10 Enterprise 2016 LTSC Version	Windows 10 Enterprise 2019 LTSC Version
ENTIS VERSION	Experion HS R511.3	Experion HS R520.2 with SHU10

For Existing ENTIS 130.1 versions

	CURRENT VERSION	CHANGES NEEDED TO MIGRATE
HARDWARE	DELL Tower PC T5820XL	Upgrade existing PC RAM from 16GB to 32GB
OPERATING SYSTEM	Windows 10 Enterprise 2016 LTSC Version	Windows 10 Enterprise 2019 LTSC Version
ENTIS VERSION	Experion HS R511.3	Experion HS R520.2 with SHU10

For Existing ENTIS 130.2 versions

	CURRENT VERSION	CHANGES NEEDED TO MIGRATE
HARDWARE	DELL Tower PC T5820XL	Upgrade existing PC RAM from 16GB to 32GB
OPERATING SYSTEM	Windows 10 IoT Enterprise 2019 LTSC Version	Reuse existing operating system
ENTIS VERSION	Experion HS R520.2	Update with Experion HS R520.2 HMI web SHU10

HOW TO ORDER ENTIS R140

Honeywell ENTIS R140 is customized for meeting requirements at the Terminal.

Kindly visit the link provided below for submitting an enquiry with basic site information. Alternatively, you can also scan the QR code and fill in the enquiry from a mobile device.

Our team will connect with you soon.

Contact us

A CENTURY OF INNOVATION

Since 1925, Honeywell Enraf has revolutionized measurement in the oil and gas sector with intelligent solutions that promote best practices aimed at increasing reliability and performance. With a focus on reliability, accuracy, and performance, Enraf has positioned itself strongly in global markets by continuously adapting and upgrading its products meeting changing regulatory norms, thus becoming a trusted name in measurement technology. Our global installed base of 120,000 gauges is testimony to the trust shown by customers in our tank gauging solutions.

To learn more about our 100 years journey, visit us on

100 Years of Enraf

For More Information on our solutions, visit

www.process.honeywell.com/us/en/products/terminals

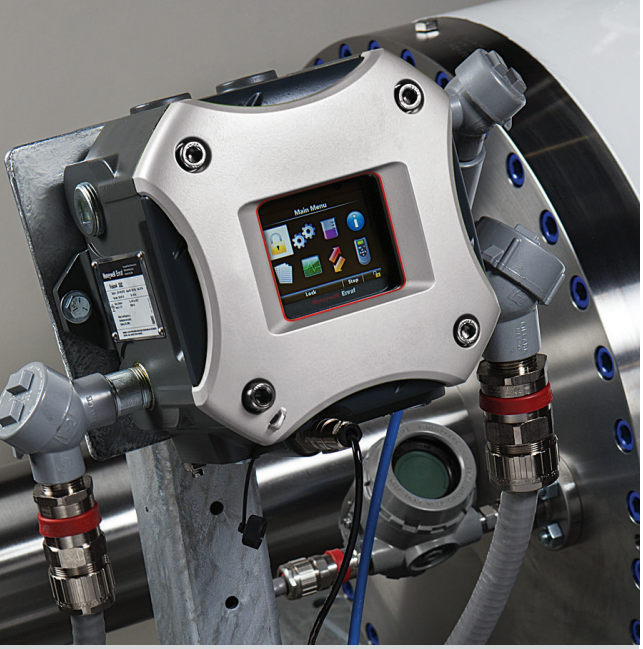
THE FUTURE IS WHAT WE MAKE IT.

Honeywell

ENRAF
SMALL VOLUME PROVER

Meets the most stringent repeatability requirements for meter proving

Honeywell



The small volume prover (SVP) meets the most stringent uncertainty requirements for meter proving to provide consistent results in every onshore or offshore environment. With repeatability equal to or exceeding 0.02% and unparalleled reliability, the SVP is the first choice for proving positive displacement (PD), turbine, ultrasonic and coriolis flow meters.

Global Experience. Locally Applied.

How the SVP Compares

Small Volume Provers alone overcome the disadvantages and problems with existing proving solutions for establishing flow metering accuracy in custody transfer applications:

- Master meters, while less expensive to purchase, require flow calibration and their tendency to drift increases system uncertainty. A smaller turndown ratio than the SVP also means that covering the same range of flow rates requires several master meters of different sizes, increasing ownership and maintenance costs.
- Pipe provers, once the market standard, are now known for low turndown ratios, frequent maintenance requirements and very large footprints. Contractors and systems integrators often ignore potential for longer-term issues around maintenance, safety and repeatability. Over time these can make pipe provers an inefficient solution, poorly adapted for changing process requirements.
- Seraphin can provers, common in downstream rail and truck terminals, are extremely limited in size and flow rates, and require the interruption of the flow to perform the meter proving. Portable SVPs, meanwhile, eliminate open air handling of hydrocarbons, and avoid any product disposal concerns because proving is done in line; They offer a faster, safer alternative. And the battery-powered model is a popular replacement.

A Proven History of Continuous Improvement

With its founding principle in double chronometry established in 1964, the SVP has a track record of more than half a century, combined with decades of continuous improvements for ever more versatile, more reliable and more user-friendly proving solutions.

Honeywell Enraf's latest SVP draws on this experience and a deep domain knowledge for the best solution yet, leading the way in design, quality and manufacturing with a rage of improvements:

- Alignment upgrades on the drive system
- Ekonol® or Carbon filled PTFE seals providing unrivalled chemical compatibility and seal integrity
- A portable handheld controller, the Local Access Device (LAD), to access and control all SVP controller functions in the field
- An innovative design for greater strength for large provers
- A new SVP Controller, offering a 3.5", 6-line, multifunction display for real-time visual monitoring and control of the operation, as well as data logging, full text error messaging, diagnostics and water draw control functions.

Field-proven, Honeywell Enraf's SVP uses a precision-machined, stainless steel smooth bore cylinder and measurement piston with an integral bypass valve to minimize flow stream disturbance. It ensures constant proving results with a repeatability equal to or exceeding the industry standard of 0.02%, making it the perfect choice for all stationary, portable or offshore applications. It maintains optimum performance over a wide range of conditions, including high and low temperatures, high pressures, and many types of fluids.

The Honeywell Enraf Small Volume Prover can be used for all types of flow meters, including PD, Turbine, Coriolis and Ultrasonic meters.

Honeywell's SVP is designed from the ground-up to provide the most precise, reliable and user-friendly proving solution available. Unique features set it apart from the competition.

An intuitive user interface with easy-to-read LCD color display provides information on piston position, motor status, error status, cycle value, prover date and sweep time. The handheld Local Access Device (LAD), meanwhile, offers a menu-driven display for complete programming of system settings and optional data display, including a programmable motor stop delay, prover cycle counter, sweep time display, multiple readable alarms, alarm acknowledgement and clearing, and water draw functionality.

Electromechanical piston return through our patented electromechanical chain drive system offers a much better longevity than other materials. During proving runs, the piston follows the flow stream in full freedom for minimal effect on the flow stream and improved repeatability even for low flow rates and light products. A drive assembly aligned and completely secured in the factory, prevents any misalignment that could become the cause of a failure for the optical switches.

Enhanced poppet valve and piston seal designs minimize resistance to the flow stream, decreasing the need for traction, motor power consumption and stress on mechanical components. No adjustment of the poppet valve is required even with large pressure changes in the system.

Exceptional corrosion resistance results from a hard chrome lined measurement cylinder, and use of 304L or 316L stainless steel for all wetted parts such as the flow tube, the entire piston assembly and the end flanges. Whether facing external corrosion in offshore applications or internal corrosion such as pitting or stress cracking corrosion, the SVP is built to last.

Compliant with most stringent international standards and certifications for both mechanical and electrical components, SVPs are ready to use globally:

- Mechanical requirements are met with components designed in accordance with API MPMS Chapter 4.2 and OIML R119. All prover materials meet ASTM, ANSI piping and fittings, ASME pressure containment design, CRN for Canada and PED for Europe requirements.
- Electrical components meet global requirements, including CSA-us, ATEX and IECEx electrical certification
- Pressure containing welds are welded by a certified welder as per ASME BPV code section IX
- Our prover calibration laboratory is VSL accredited, with calibration instruments traceable to NIST standards.

Suitable for a wide range of working conditions, the SVP maintains optimum performance even in high and low ambient temperatures, at high pressures and across a wide range of fluid types including liquid gas, fine chemicals, and crude oil. Flow rate rangeability is better than 1200:1, and the SVP is equally suitable for volumetric and mass meter proving.

Easy to maintain, the SVP offers easy access to internal parts and seals. With a piston supported at both ends by the double-shaft, it does not need to be mounted vertically, eliminating the need for machinery to lower the prover to the horizontal position or to disconnect process piping. As the drive alignment is factory secured, and there are no hydraulics or pneumatics systems, the maintenance operations are reduced to the minimum, for significant savings over time.

Extend your SVP lifetime by sending aged provers back to the factory to be refurbished and upgraded to the latest design. Honeywell Enraf's engineering review determines which main components (shafts, tube, piston etc) can be reused and delivers a refurbished prover complete with factory warranty at a fraction of the cost and in a fraction of the time compared to a new prover. Increasing the useful life of the asset and decreasing the total cost of ownership will ensure you get the very best return on your investment.

Model Selection

Our model selection guide makes choosing the right model of prover for the right application easy. Just provide the minimum required information:

- Maximum flow rate
- Pressure, temperature, fluid requirements
- Electrical approvals and power supply type
- Extra corrosion resistance needs
- Mobile (trailer mounted model requirements and options, including flexible hoses, swivel and/or hydraulic arms)

Available models are described in the technical data section.

A Field-proven Operating Principle

In the stand-by mode the SVP piston is downstream and stationary. The piston's inner flow-through valve is open (slightly upstream of the main piston body), allowing product to flow freely through the prover's measurement cylinder without significant pressure loss.

When the operator starts a proving run (Figure 1), the proving computer signals the SVP Controller to engage the motor to draw the piston assembly to the upstream start position. The piston is then released by the chain driven return mechanism, allowing it to travel freely downstream with the fluid. As the piston is released, the flow through valve closes with assistance of a spring (Figure 2), synchronizing the piston velocity with the fluid velocity as it travels through the smooth-bore section of the prover body with minimal effect on the flow stream.

Two precision optical switches are mounted externally on the switch bar above the piston drive shaft to measure the travel time of the piston. With fast response times (5×10^{-6} sec), these are reliable and repeatable, showing a maximum deviation of ±0.0005% on repeatability of linear measurement. The first optical switch is actuated by a flag attached to the external piston shaft a short run after it is released, indicating the start of the timing sequence to the computer. The second optical switch is located downstream on the switch bar, allowing the flag to actuate the switch at the end of the calibrated displaced volume. At the same time, the controller sends a signal to the proving computer to stop the timing sequence.

Technical specifications

Unidirectional type piston prover, repeatability 0.02%, according to API MPMS Chapter 4.2.

Model Type	Displaced Volume U.S. Gallons	Max Flow Barrels per hour (BPH)	Max Flow U.S. Gallons per minute (GPM)	Max Flow Cubic meters per hour (m3/h)
05	5	715	500	114
15	20	2140	1498	340
25	20	3570	2499	568
35	25	5000	3500	795
50	40	7200	5040	1145
85	75	12500	8750	1987
120	120	17500	12249	2782

After passing the end volume switch, the piston shaft is stopped by a mechanical stop. Product flow continues to push the perimeter of the piston further downstream, opening the flow through valve, again allowing continued flow with minimal disturbance to the process condition. The proving computer will continue to signal the SVP Controller to start the motor run to engage the timing sequence until sufficient passes are completed within the repeatability and uncertainty specified for the flow meter.

Combining the pulses interpolation, the pressure and temperature information, and the double chronometry algorithm, the flow computer will then calculate the meter factor to be applied to the flow meter, and verify the repeatability of the proving runs.

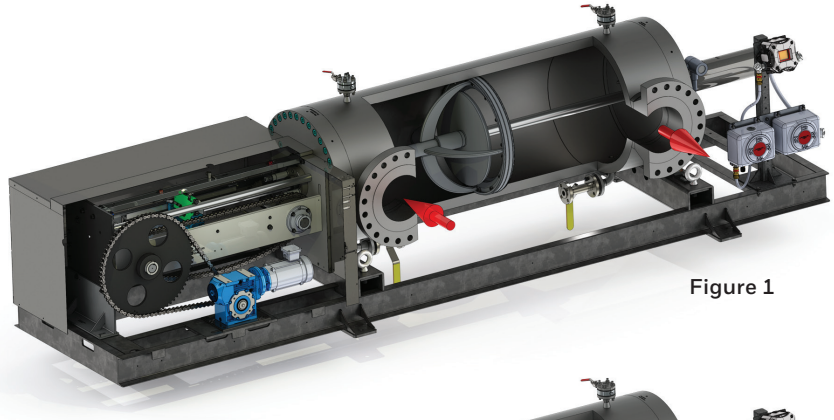


Figure 1

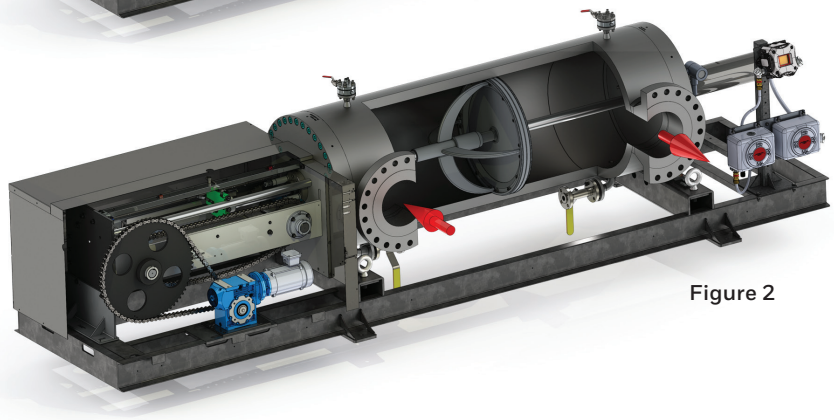
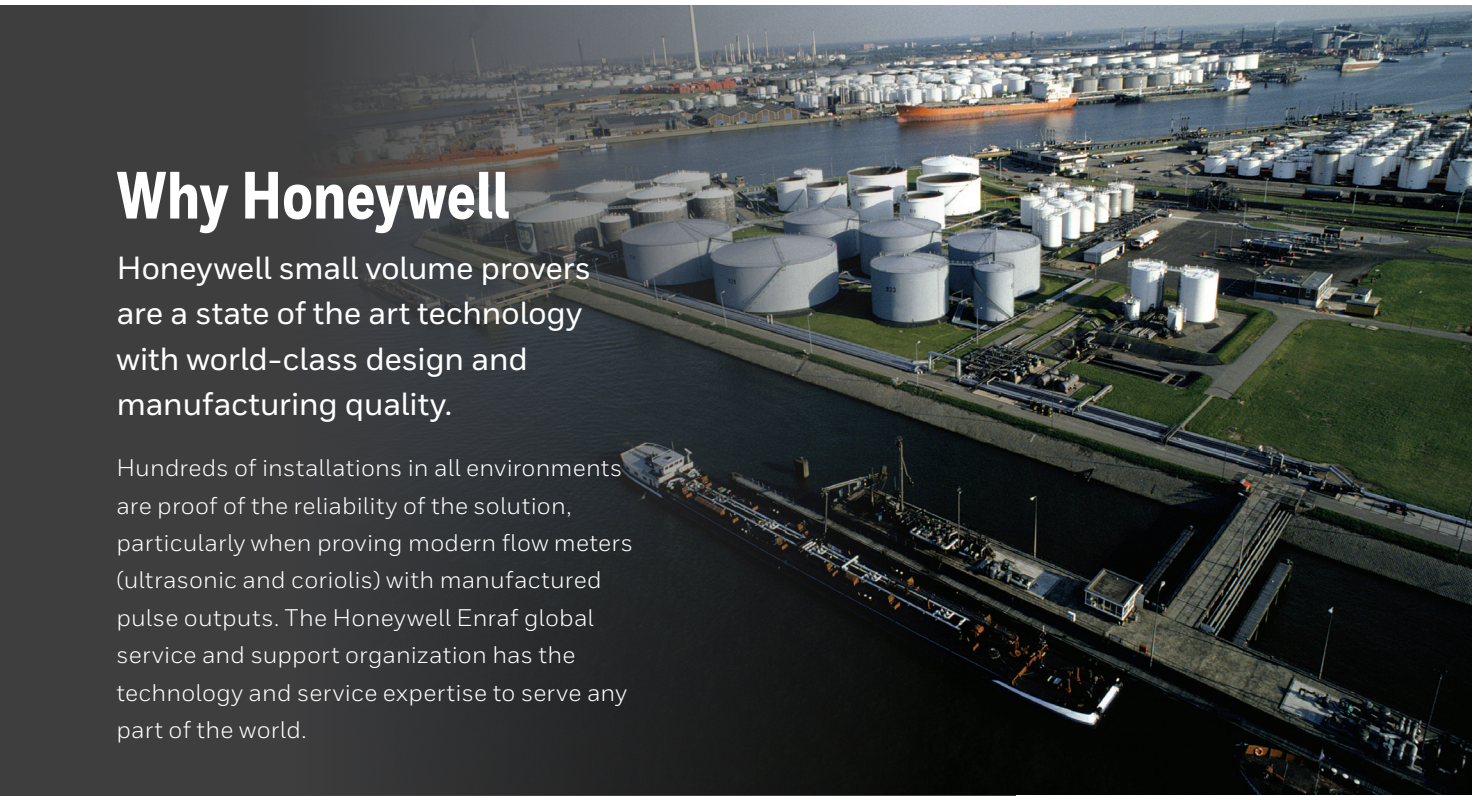


Figure 2



Why Honeywell

Honeywell small volume provers are a state of the art technology with world-class design and manufacturing quality.

Hundreds of installations in all environments are proof of the reliability of the solution, particularly when proving modern flow meters (ultrasonic and coriolis) with manufactured pulse outputs. The Honeywell Enraf global service and support organization has the technology and service expertise to serve any part of the world.

Operations

The prover controller is equipped with a full color display. Key process variables, alarms and device status can be displayed. Local configuration and maintenance are possible by the way of an intrinsically safe handheld device.

Materials

Material of process fluid wetted parts: AISI 304/304L (UNS30400/UNS30403) stainless steel or AISI 316/316L (UNS31600/UNS31603) stainless steel. Offshore provers use 316 Stainless Steel for wetted parts and for drive end mechanical components (chains, bars, sprockets etc).

Prover skid coating: Galvanized to ASTM123 specification for adverse atmospheric conditions.

Material of seals: Standard Ekonol® filled PTFE seal or Carbon Fiber Reinforced PTFE seal (for crude oil applications).

Junction boxes: Marine grade aluminum or AISI 316 stainless steel.

Flow tube finish: Stainless steel brushed or white paint.

Tubing size, connections, threads: US customary units/sizes.

Safety Ratings in Hazardous Areas

The SVP is designed to operate continuously and reliably within its domain of ambient temperature.

Safety Rating in Hazardus Areas	Ambient Temperature Range
CSA-us Class I, Div.1, Group D T2C *	-40 °C to +40 °C (-40 °F to 104 °F)
CSA-us Class I, Div.1, Group C T3B *	-40 °C to +40 °C (-40 °F to 104 °F)
ATEX II 2 (1) G Ex d [ia Ga] IIB T4 (T3) Gb, II 2 G c IIB T4 (T3)	-40 °C to +40 °C (-40 °F to 104 °F) -20 °C to +60 °C (-4 °F to 140 °F)
IECEx, Ex d [ia] IIB T4 Gb	-40 °C to +40 °C (-40 °F to 104 °F) -20 °C to +60 °C (-4 °F to 140 °F)

** Not available on offshore provers*

Technical Specifications

Traditionally, micro-processor based flow meters have been considered as difficult to prove with small volume provers, due to irregularities in the pulses, and sensitivity to the closing of the poppet valve. The common countermeasure, in compliance to API MPMS chapter 4.2, has been to specify Provers of larger size. Which meant, at constant size, "de-rate" the maximum flow rate usable with Ultrasonic and Coriolis flow meters.

In recent years, flow meter manufacturers have brought several improvements in the performance of the meters, putting electronic meters on par with mechanical ones. The maximum flow rate usable with these new generation meters depends on its pulse quality, its damping factor and response time. Consult the flow meter manufacturer for information on maximum flow rates.

Lifting and Positioning

Mounted horizontally to the steel skid base.The prover is equipped with four lifting lugs and four anchor points.

Trailer: Ball and hitch or goose-neck trailer including mounting of SVP. Power supply of the trailer itself is 24 Vdc (Prover power may be AC or DC as required). The trailer comes with a USA-DOT road license. Includes level jacks, electric running lights, spare tire, electric brakes, toolbox (empty).

Environmental Conditions

Ingress Protection(IP) rating: IP56
Relative humidity: 5% to 95% non-condensing

Drains and Vents

Vent and drain at top and bottom of the barrel or flow tube.

Drains: Ball valves flanged 1" or 1.5" ANSI, class matching in- and outlet rating.

Vents: 1/2" ball valves class 3000. RF connection flanges used for vents & drains.

Fluid Types

Crude oil, hydrocarbons, fine chemicals, liquid gases, condensates, water.
Fluid temperature: -40 °C to +80 °C (-40 °F to 176 °F)
Pressure drop: <= 10 psig (using water as process fluid)

Pressure and Temperature Measurements

Two temperature transmitters with 4-wire high precision RTDs and one pressure transmitter mounted on prover, plumbed and wired to a common junction box. Calibrated temperature transmitter range to customer's specifications. Pressure transmitter calibrated for the appropriate range. Pressure and temperature transmitters are of smart design and explosion proof rated with 4-20 mA output and digital displays.

Operating Temperature and Motor Voltages

CSA-us	005	015	025	035	050	085	120
24 V_{dc}	Y	Y	Y	Y			
120 V_{ac}, 60 Hz	Y^1	Y^1	Y^1	Y^1	Y^1		
220 V_{ac}, 60 Hz	Y^1	Y^1	Y^1	Y^1	Y^1	Y^1	
220/240 V_{ac}, 60 Hz, 3 phase	Y	Y	Y	Y	Y	Y	Y
460/480 V_{ac}, 60 Hz, 3 phase	Y	Y	Y	Y	Y	Y	Y
Motor Power	0.5 HP	1 HP	1 HP	1 HP	1 HP	2 HP	5 HP

Y - Available from -40 °C to +40 °C (-40 °F to 104 °F)
Y 1 - Only available from -20 °C to +40 °C (-4 °F to 104 °F)

ATEX or IECEx	005	015	025	035	050	085	120
24 V_{dc}	Z^2	Z^2	Z^2	Z^2			
220 V_{ac}, 50 Hz	Z	Z	Z	Z	Z		
220/240 V_{ac}, 50 Hz, 3 phase	Z^1	Z^1	Z^1	Z^1	Z^1	Z^1	
380/400/415 V_{ac}, 50 Hz, 3 phase	Z	Z	Z	Z	Z	Z	Z
460/480 V_{ac}, 60 Hz, 3 phase	Z	Z	Z	Z	Z	Z	Z
690 V_{ac}, 60 Hz, 3 phase						Z	Z
Motor Power	0.5 HP	1 HP	1 HP	1 HP	1 HP	2 HP	5 HP

Z - Available -20 °C to +60 °C (-4 °F to 140 °F) or -40 °C to +40 °C (-40 °F to 104 °F)
Z^1 - Only available -20 °C to +60 °C (-4 °F to 140 °F)
Z^2 - Only ATEX, no IECEx available

ANSI B16.5 Flange Rating

Class 150, 300, 600, 900, 1500 RF, or class 150, 300, 600, 900, 1500 RJ connection flanges.

ANSI B16.5 Flange Rating	Pressure Rating Up to 100°F	
Class 150	275 psi	19 bar
Class 300	720 psi	49 bar
Class 600	1440 psi	99 bar
Class 900	2160 psi	148 bar
Class 1500	3600 psi	248 bar

Note: All pressure containing welds welded per ASME section IX by certified welder.

Note: All pressure containing welds NDT tested per ANSI B31.3.

Documentation (Supplied on CD):

- Drawings (outline, frame mounting, service clearance)
- Honeywell Enraf SVP Operation and Service Manual
- Hydrostatic pressure test certificate
- Ground bond and dielectric strength test certificates
- Seal leak detection test certificate
- Certificate of calibration using gravimetric method (or if requested volumetric method)
- Flow tube material certificate
- Major wetted parts material certificates
- Hazardous electrical component certificate
- Instrument calibration certificates (includes weights, thermometers, PI-tape, pressure gauge, ID micrometer, transmitters and ground bond testing)
- Specification worksheet
- Certificate of origin
- Conformity and quality certificate
- Transmitter Manuals
- Welder performance qualifications (WPQ)
- Welding procedure specifications (WPS)

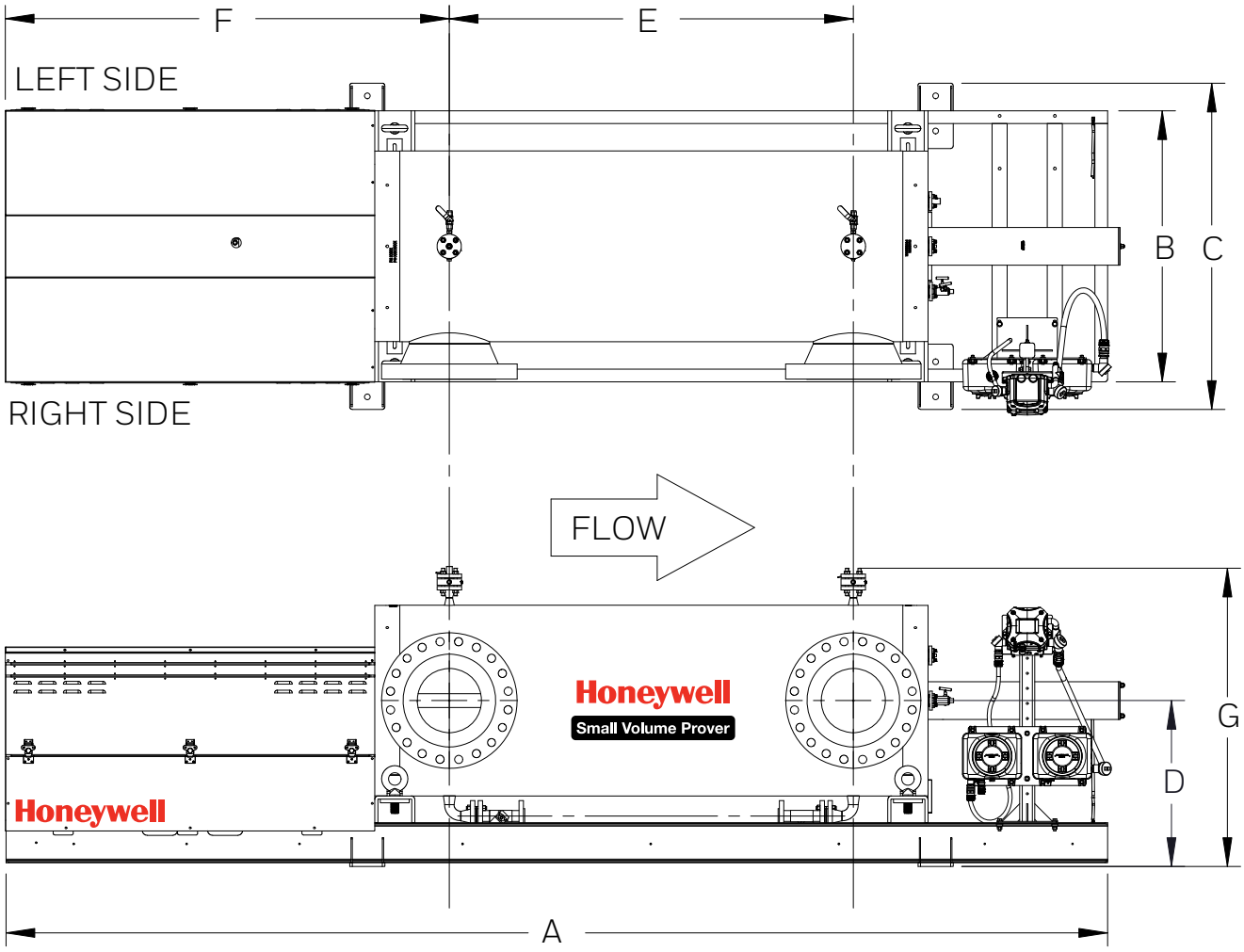
Options

- Nitrogen purge system
  - The purge covers consist of both a cover on the downstream shaft and a cover for the drive end and are needed to prevent icing of the shaft that can occur when the product temperature is below 0 °C (32 °F) when in operation. Covers are made of stainless steel and will have O-ring sealing. The kit includes a pressure relief valve. The drive end will also be purged via a purge control system. Purge system may be manual or automatic, but the automatic purge is not available below -20 °C (-4 °F) ambient temperature.
- High temperature insulation
  - This option is for applications on process fluid temperatures above 60 °C (140°F). It consist of two parts:
    1. An insulation plate between the drive unit and flow tube.
    2. An insulation jacket for the flow tube. This is model-dependent and not suited for tracing.
  - For low temperature applications the insulation plate is a minimum requirement to protect the drive end.
- Carbon fiber reinforced seal
  - Standard seals are made of Ekonol® filled PTFE. For crude oil applications it is advisable to use carbon-reinforced seals to increase their lifetime.
- Controller location
  - On the standard design the controller is facing right, as on the pictures. For constrained spaces it is possible to locate the controller facing left.
- Controller power supply
  - The SVP controller can be supplied in AC (100-240 VAC, Single Phase) or 24 VDC version. 70 Watts service recommended.
- Temperature and pressure transmitters
  - The prover is delivered as standard with Honeywell Smart transmitters ST800 and STT 250. Other brands, or delivery without transmitters, are available.
- PED (Pressure Equipment Directive) 97/23/EC, Europe models
  - Testing & material certificates can be provided according to PED Directive. Material certificates will be according to ISO EN10204: 2004 3.1 or ISO EN10204: 2004 2.2
- PMI (positive material identification) on welds and pressurized parts
  - Positive material identification on welds and pressurized parts will be performed according API 587 on the parts as these enter the factory.
- NACE ISO 15156 (MR-0175)
  - NACE MR-0175 conformity for wetted and pressurized parts (for use in corrosive environments in oil and gas production).
- Volumetric water draw
  - The standard factory test is water draw by gravimetric calibration (API MPMS Chapter 4.9.4). On request the factory can calibrate the prover with volumetric method water draw according to API MPMS 4.9.2.
- Leak detection instrumentation
  - All provers come with a pressurization tool. The Leak detection instrumentation kit consists of a differential pressure gauge for checking seal leakage.
- Water draw kit
  - Consists of a solenoid valve assembly: Refer to manual for further explanation.
- Water draw instrumentation kit
  - Consists of high accuracy temperature and pressure transmitters (NIST traceable): Refer to manual for further explanation. Available in US customary or metric version.

Recommended Spare Parts

On request the prover is delivered with a standard set of spare parts covering 2 years' common needs:

- Two spare detector switches
- One set of main shaft seals
- Motor stop switch
- Motor relay



Dimension Description	Model	005 ANSI 600	015 ANSI 150	025 ANSI 150	035 ANSI 150	050 ANSI 150	085 ANSI 150	120 ANSI 150
Length	A	2756 (108.5")	4089 (161.0")	4089 (161.0")	4089 (161.0")	4572 (180.0")	5258 (207.0")	5576 (219.5")
Width at Frame	B	813 (32.0")	986 (38.8")	986 (38.8")	1092 (43.0")	1245 (49.0")	1448 (57.0")	1549 (61.0")
Width at Feet	C	947 (37.3")	1118 (44.0")	1118 (44.0")	1227 (48.3")	1378 (54.3")	1588 (62.5")	1702 (67.0")
Inlet & Outlet Height	D	424 (16.7")	513 (20.2")	513 (20.2")	565 (22.3")	673 (26.5")	756 (29.8")	840 (33.1")
Inlet & Outlet Separation	E	780 (30.7")	1369 (53.9")	1369 (53.9")	1299 (51.2")	1473 (58.0")	1930 (76.0")	2045 (80.5")
Inlet Distance from End	F	955 (37.6")	1499 (59.0")	1499 (59.0")	1534 (60.4")	1873 (73.7")	2106 (82.9")	2244 (88.4")
Highest Point	G	1207 (47.5")	1257 (49.5")	1257 (49.5")	1257 (49.5")	1308 (51.5")	1316 (51.8")	1481 (58.3")
Inlet & Outlet Flange Size		3"	6"	6"	8"	8"	12"	16"
Prover Weight		544 Kg (1200 lb)	1588 Kg (3500 lb)	1973 Kg (4350 lb)	2381 Kg (5250 lb)	3561 Kg (7850 lb)	5670 Kg (12500 lb)	6577 kg (14500 lb)

Note: Dimensions mm (inch). Weight Kg (pound). Dimensions and Weight are indicative, without trailer, and correspond to the lowest pressure rating.

Identification Code

Key Number Model

- SVP 005 Volume 5 Gallons, Max. Flow 715 BPH, 500 GPM, 114 m^3/h
- SVP 015 Volume 20 Gallons, Max. Flow 2140 BPH, 1498 GPM, 340 m^3/h
- SVP 025 Volume 20 Gallons, Max. Flow 3570 BPH, 2499 GPM, 568 m^3/h
- SVP 035 Volume 25 Gallons, Max. Flow 5000 BPH, 3500 GPM, 795 m^3/h
- SVP 050 Volume 40 Gallons, Max. Flow 7200 BPH, 5040 GPM, 1145 m^3/h
- SVP 085 Volume 75 Gallons, Max. Flow 12500 BPH, 8750 GPM, 1987 m^3/h
- SVP 120 Volume 120 Gallons, Max. Flow 17500 BPH, 12249 GPM, 2782 m^3/h

Model

- S Standard Configuration*
- P Portable Applications (Supplied with trailer)*
- O Offshore and Marine, Coastal and Ship Application
- T Portable with Offshore combination

Table 1: Basic Configuration

Table 1.1 Process Fluid Wetted Parts

- C AISI 304/304L (UNS30400/UNS30403) Stainless Steel
- E AISI 316/316L (UNS31600/UNS31603) Stainless Steel

Table 1.2 ANSI B16.5 Flange Rating

- 1A Class 150 RF Connection Flanges*
- 2B Class 300 RF Connection Flanges*
- 3C Class 600 RF Connection Flanges
- 4D Class 900 RF Connection Flanges
- 4F Class 1500 RF Connection Flanges
- 5D Class 900 RJ Connection Flanges
- 6A Class 150 RJ Connection Flanges
- 7B Class 300 RJ Connection Flanges
- 8C Class 600 RJ Connection Flanges
- 9F Class 1500 RJ Connection Flanges

Table 1.3 Inlet and Outlet Configuration

- 00 Inlet Both Sides and Outlet Flange Left Side
- 01 Inlet and Outlet Flanges Opposite - Inlet Right Side*
- 02 Inlet and Outlet Flanges Same Side - Right Side*
- 03 Inlet and Outlet Flanges 90°, Inlet on Right Side and Outlet on Top
- 04 Inlet and Outlet Flanges Same Side - Left Side*
- 05 Inlet and Outlet Flanges Both Sides - Double Set
- 06 Inlet and Outlet Flanges Both on Top*
- 07 Inlet and Outlet Flanges Opposite - Inlet Left Side*
- 08 Inlet Flanges both Sides and Outlet on Top
- 09 Inlet Flange on Top and Outlet on Left
- 11 Inlet Flange on Top and Outlet on Right
- 12 Inlet Outlet 90 Degrees, Inlet Left Side, Outlet on Top
- 13 Inlet on Right, Outlet on Left, Outlet on Top
- 14 Inlet and Outlet Flanges Both at Bottom

Table 1.4 Motor Voltage

- D 24 V_{dc}
- A 120 V_{ac}, 60 Hz*
- G 120 V_{ac}, 50 Hz
- B 220 V_{ac}, 60 Hz
- C 220 V_{ac}, 50 Hz*
- H 220/240 V_{ac}, 60 Hz, 3 Phase*
- N 220/240 V_{ac}, 50 Hz, 3 Phase
- R 380/400/415 V_{ac}, 60 Hz, 3 Phase
- L 380/400/415 V_{ac}, 50 Hz, 3 Phase
- E 460/480 V_{ac}, 60 Hz, 3 Phase*
- O 460/480 V_{ac}, 50 Hz, 3 Phase
- W 690 V_{ac}, 60 Hz, 3 Phase

Table 1.5 Safety Ratings (Hazardous Areas)

- 3 CSA/us Class I, Div.1, Group D T2C*
- 4 CSA/us Class I, Div.1, Group C T3B
- 5 ATEX II 2 (1) G Ex d [ia Ga] IIB T4 (T3) Gb, II 2 G c IIB T4 (T3)*
- 6 IECEx, Ex d [ia] IIB T4 Gb

Table 1.6 Flow Tube Finish

- A Stainless Steel—Brushed*
- B Painted (White)*

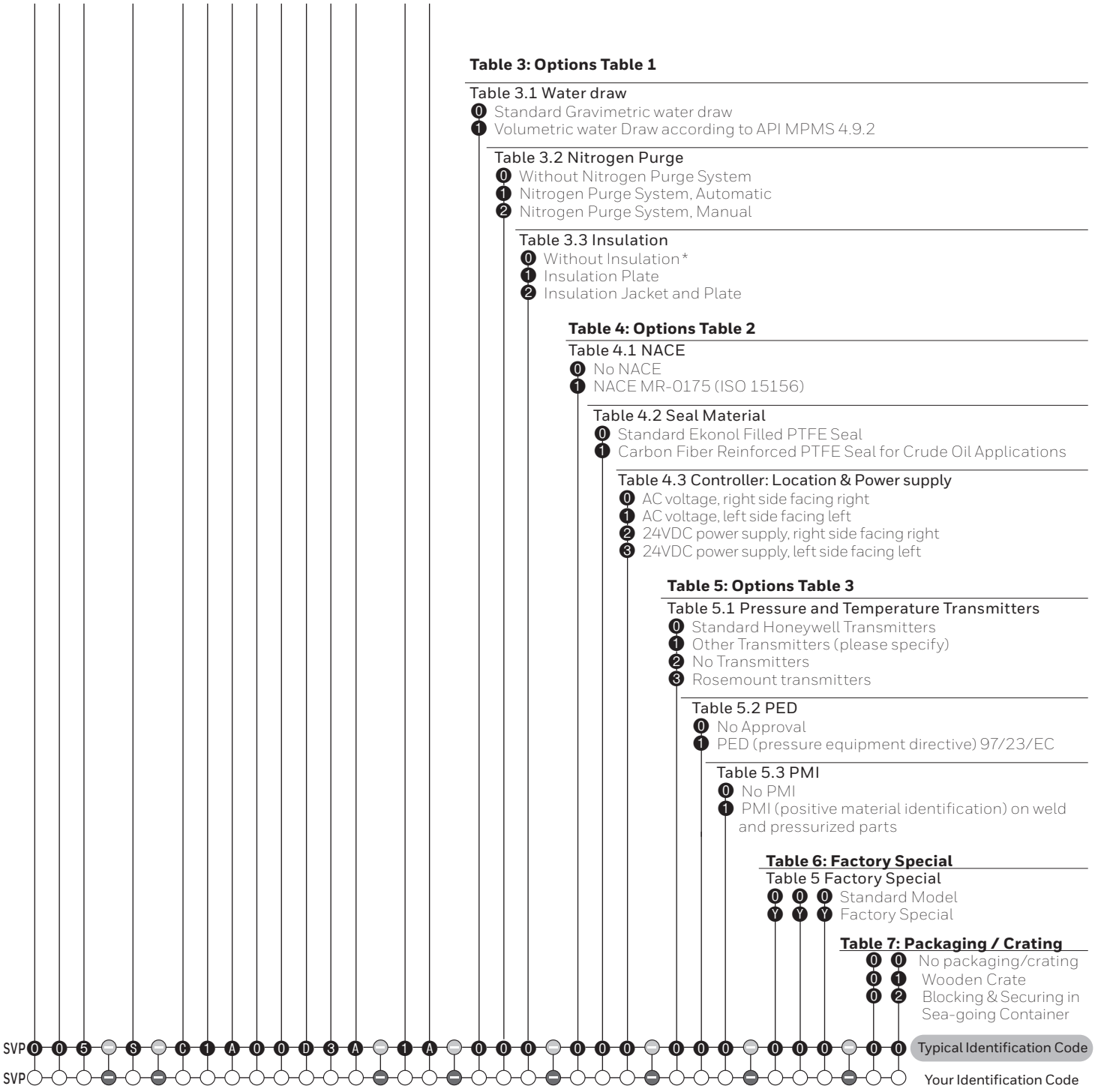
Table 2: Temperature Rating

Table 2.1 Ambiant Temperature

- 1 Low Ambient Range (-40 °C to +40 °C) (-40 °F to 104 °F)*
- 2 High Ambient Range (-20 °C to +60 °C) (-4 °F to 140 °F)*
- 3 Middle Range (-20 °C to +40 °C) (-4 °F to 104 °F)

Table 2.2 Process Temperature

- A Standard (-40 °C to +80 °C) (-40 °F to 176 °F)*



Note: Not all options are available on all models; consult the Model Selection Guide for the latest list of options and compatibilities.

Note: * Reduced delivery times.