

On-Vehicle Delivery System

Model 1040

Trac



Features

- One or two line measurement
- Designed for truck installation
- Cenelec and USA/Canadian Hazardous Area Approval
- Temperature compensation to API Tables
- Stores last 200 transaction reports
- Prints delivery ticket
- Fully programmable with a sealable metrology switch

Overview

Designed to withstand harsh vehicle environments, the 1040 on-board metering system will measure and control the delivery of liquids from tanker trucks, rail cars and barges.

Both single line and dual line systems are available that will accept input signals from positive displacement, turbine or coriolis flowmeters and temperature compensate quantities according to API tables.

The 1040 systems are designed to operate as stand-alone controllers and interface to printers via an RS232 link.

Up to 200 transactions can be stored in the 1040 system for retrieval by RF modem or GSM cellular communications.

The 1040 is available in an explosionproof enclosure that is weatherproof to Nema 4X and IP65 and features a rugged keyboard which can withstand the toughest use.

The 1040 is also available in an attractive weatherproof enclosure that can be mounted in the cab or on the back of the truck.

A wide range of features and programmable options makes the 1040 systems flexible enough to handle most delivery applications.

Applications

- ▶ Petroleum tankers with metered deliveries
- ▶ Heating oil trucks
- ▶ LPG trucks
- ▶ Service vehicles
- ▶ Chemical trucks

Customer & Driver Authorisation

For applications where the customer and/or driver needs to be identified on the delivery note, a PIN number or unique Touch Key can be used to authorise the delivery.

Up to 500 customer and 50 driver PIN numbers or Touch Key numbers can be stored in the 1040 system and, before the driver can unload, the correct customer and driver identification must be entered.

Preset or Start/Stop Mode

The 1040 can be programmed to operate as either a Preset system where the required quantity is entered prior to a delivery, or as a Start/Stop system where an unspecified quantity can be delivered.

Both modes have relay outputs which can be used to control pumps and tank valves.

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Driver Entered Data

The driver can be prompted to enter a range of information prior to commencing the delivery including:

- ▶ Receiving tank number
- ▶ Invoice number
- ▶ Odometer number
- ▶ Load number

These prompts can be individually enabled or disabled and the data is printed on the ticket and stored as part of the transaction reports.

Custody Transfer Approval

The 1040 includes dual pulse integrity check of the input signal and temperature compensation to API Tables as required for custody transfer.

Temperature compensation is selectable for general petroleum, LPG or heating oil. If temperature compensation is not required it can also be disabled.

Security

Multi-level password protection provides security over set up parameters and a weights & measures seal can be attached to a switch located on the side of the instrument.

Truck Interlocks

Because the 1040 is designed for truck applications, special features, unique to truck applications, are incorporated into the system including:

- ▶ A **low frequency input cutoff** which will ignore spurious flowmeter pulses which may be caused by pipe vibration as the vehicle travels between deliveries.

- ▶ A **transaction timeout** which is incorporated into the software to prevent a partial delivery at one location and then a continued delivery at a second location without resetting the register (termed "riding the ticket").

- ▶ A **printer integrity test** to ensure a ticket is always printed or, if there is a print problem, an error message is stored as part of the transaction report.

- ▶ 12 Volt dc and 24 Volt dc operation.

Transaction Memory

The 1040 has sufficient memory to store up to 200 transactions (deliveries), which can be reprinted or downloaded to a computer on return to the base.

Communications

The 1040 can operate in one of the following modes:

1. Printer only

Interfaces to an industry standard slip printer or standard line printers.

2. On-board computer

With an on-board computer running a Windows based program, prescheduled delivery information can be downloaded to the 1040 prior to each delivery and the transaction results uploaded to the computer at the end of the delivery.

3. Upload stored transactions

Stored transaction records for each delivery can be uploaded to an office computer for reporting and billing purposes. Records can be uploaded via laptop computers, RF modems or RAM Tags as well as via cell phone networks.

DELIVERY DOCKET

ACME OIL
BAY ROAD
SUNNYVALE

Date 28/4/1998
Time Started 14:54
Time Stopped 15:01
Transaction No. 156

Driver Index 54
Customer Index 26
Vehicle number 125
Load number 211
Invoice number 102
Odometer 125854

Line 1 (ULP)
Line number 1
Tank Qty. (Gross) 1000 litres
Unconverted (Net) 1000 litres
Converted (Gross) 988.3 litres
Accumulated (Gross) 253887 litres
Average Temp. 24.5 C
Status 0

Line 2 (PLD)
Line number 2
Tank Qty. (Gross) 500 litres
Unconverted (Net) 500 litres
Converted (Gross) 495.8 litres
Accumulated (Gross) 185796 litres
Average Temp. 24.6 C
Status 0

Converted volumes corrected to 15 C
Line 1 density at 15 C: 728 kg/m³
Line 2 density at 15 C: 840 kg/m³

Specifications

Physical - Explosionproof Enclosure

Displays

Alphanumeric: 2 line x 16 character backlit matrix LCD.

Note: Contrast can be adjusted via keypad.

Batch Total: 6 digit (10mm high) backlit LCD with automatic ranging.

Keypad Buttons

Switches: Flameproof with heavy duty actuators.

11 alphanumeric and 7 function keys.

Materials: Nickel plated brass.

Enclosure

Dimensions: 302mm (w) x 288mm (h) x 326mm (d).

Material: Powder coated aluminium.

Sealing: IP66 (Nema 4X) weatherproof, fully O-ring sealed.

Mounting: Four 8 x 1.5mm metric or 5/16" UNF threaded holes top and bottom.

Weight: Single enclosure - 22.5 kg (approx).

Shipping weight - 23.0 kg (approx).

Cable Connection: Five 25mm x 1.5mm metric threaded holes or 2 x 1¼" and 1 x 1" NPT holes.

Touch Key Reader

Material: Stainless Steel & Delrin.

Physical - Weatherproof Enclosure

Keypad Buttons

Switches: Double actuator switches behind a membrane

overlay. 11 numeric and 7 function keys.

Enclosure

Dimensions: 270.5mm (w) x 270mm (h) x 268.5mm (d).

Material: Powder coated mild steel.

Sealing: IP66 (Nema 4X) weatherproof, fully O-ring sealed.

Mounting: Two 14mm diameter metric holes on the bottom.

Weight: Single enclosure - 9.4 kg (approx).

Shipping weight - 14.0 kg (approx).

Cable Connection: Removable gland plate can be drilled to suit.

Operational

Power Requirements 12 Vdc or 24 Vdc.

Operating Temperature (Ambient)

-10 to 60°C (-40°C with optional heater).

Communications

Computer/Printer: RS232/RS422/RS485.

Expansion Port: RS232/RS422/RS485.

Interference CE Compliance.

Inputs and Outputs

Flow Inputs

Input Frequency: 0 to 2000Hz. Single or dual (quadrature) inputs on each channel.

0 to 8000Hz optional (non OIML units only).

Note: Dual pulse is for pulse verification only and does not detect reverse flow.

Pulse Integrity (Dual pulse only): If a pulse failure is detected the system will alarm and stop flow on that channel.

Note: This is in accord with API Standards Chapter 5, Section 5, AS2702 and ISO6551.

K-factor - Linear: Single point 0.001 to 50000.0.

- **Non-linear:** 5 points 0.001 to 50000.0.

Temperature Inputs

Input Signal: 4-20mA or 4 wire RTD.

Range: -10 to 60°C.

Input Circuit: 12 Bit A/D converter.

Correction: To API Table 24B/54B for gasoline, diesel, jet fuel and Table 24A/54A for crude oil. Also correction for anhydrous ammonia is available.

Overfill and Ground Inputs

Switched input from floating contact.

Note: Relays on the overfill and ground systems must be floating (ie. not connected to other circuits) and suitable for switching low voltage signals.

Specifications (con'd)

On-Vehicle Delivery System

Inputs and Outputs (con'd)

Emergency Stop Inputs

Switched input from floating contact.

Note: Switches or relays on this input must be floating (ie. not connected to other circuits) and suitable for switching low voltage signals.

Valve Control Outputs (2 stage on/off)

Electromechanical relays rated at:

Min. contact voltage: 28V dc.

Max. current: 3 A.

Additive Outputs (one per line)

Open collector transistor. 100mA (max) and 28 Volt dc (max).

Pump Control Outputs (one per line)

Electromechanical relay rated at 1A @ 240V ac or 28V dc.

Alarm Outputs

1 x Electromechanical relay rated at 1A @ 240V ac or 28V dc.

Approvals

The Model 1040 complies with international metrology approvals including:

- ▶ European approvals to the OIML R117 standards with certification through NMI and PTB
- ▶ US NIST approval
- ▶ Canadian approval
- ▶ South African SABS
- ▶ Australian NSC

Hazardous area approvals for the explosionproof enclosure include:

- ▶ **European Approval:** Cenelec EEx d IIB T6
- ▶ **USA & Canadian:** CSA_{USC} for Class 1, Groups C & D

CE & EMC Approvals

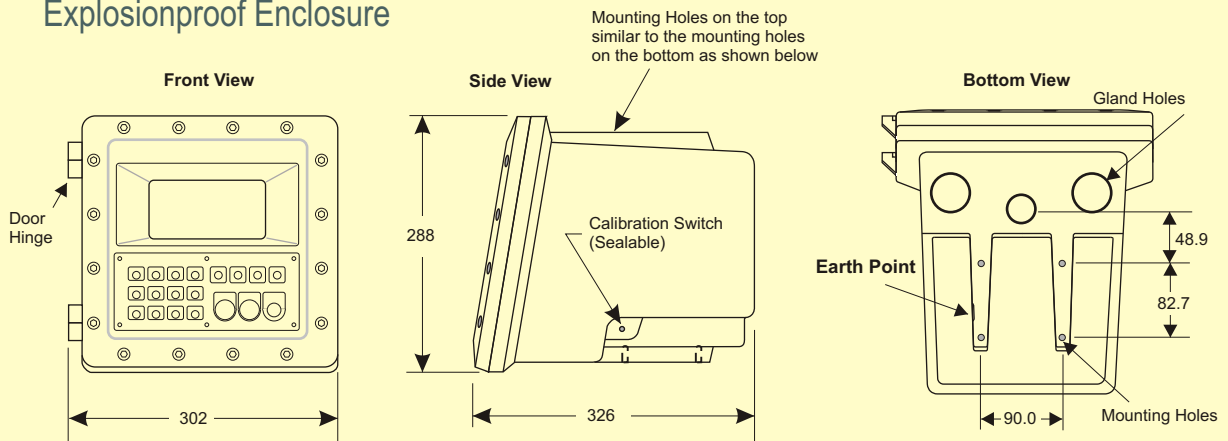
- ▶ EN50081-1 & EN50081-2, EN50082-1 & EN50082-2

Important: Specifications are subject to change without notice.



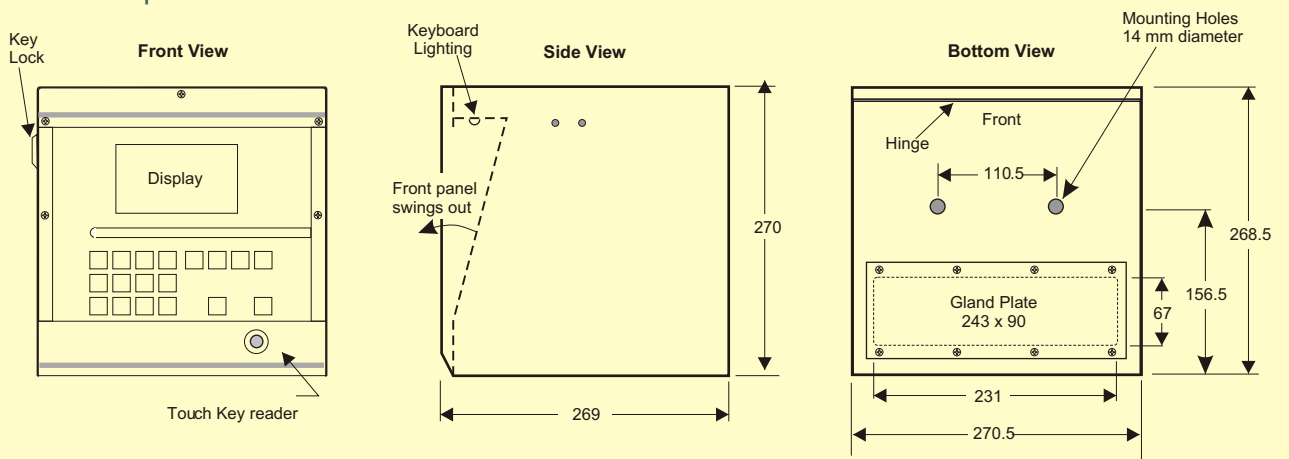
Dimensional Diagrams

Explosionproof Enclosure



Material: Cast Aluminium
 Finish: Light Beige Powder Coat

Weatherproof Enclosure



Material: Mild Steel (Zinc sealed)
 Finish: Powder Coating

Part Numbers

On-Vehicle Delivery System

Model		Supplementary Code						Description
1040		-						On-Vehicle Delivery System
Style	D H A W						Ex 800 enclosure with 5 x M25 glands Ex 810 enclosure with individual displays Ex 810, 18 alphanumeric keys, dot matrix display Weatherproof enclosure	
Lines	1 2						Number of loading arms or lines	
Application Pack		VA etc					Application Pack - refer to Application Pack Brief	
Authorisation			0 2				None or PIN Touch Key	
Glands, Approvals and Heater options for Enclosures				A C D M N			SAA approved with 5 x M25 CSA _{ASIC} 2 x 1.25" and 1 x 1" CSA as above with Heater Cenelec with 5 x M25 Cenelec as above with Heater	
Power Supply					3		DC Volts	
Display Type and Units of Measure						N L G K P A	Dot matrix display - programmable units Separate 7 segment displays with litres Separate 7 segment displays with gals Separate 7 segment displays with kg Separate 7 segment displays with lbs Alphanumeric only	
Metrology Approval							0 1 2 3 4 None Australian NSC Canadian Weights & Measures NMI OIML R117 USA NIST	

Note that the 1040D1-VM-xxxxx and 1040D2-VM-xxxxx are also referred to as Trac-1 and Trac-2

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