

# **DFT-220 Product Overview**

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Digital Fluid-Trac<sup>®</sup> Model DFT-220 multi unit drum gauge is a cost competitive non-contact liquid level drum gauge with 4-20 mA output. The output has 2.5% accuracy over its output range.

The DFT-220 drum gauge was designed for usage on standard ANSI MH2-2004 vertical drums ( $\leq$  32 inch depths). The DFT-220 drum gauge allows the user to easily select between the following vertical drum settings: 15 gallon, 30 gallon, 55 gallon, 57 liter, 114 liter, and 208 liter.

## **Product Features**

- Display Resolution: ± 0.5 gallon or ± 1 liter\*
- 4-20 mA output accuracy: ± 2.5% of current output span\*
- Two Modes of Level Measurement:
  - a) External 24 Vdc Supply Continuous level monitoring display and 4-20 mA current output
  - b) Two standalone 9 Volt batteries Point level monitoring display
- NEMA 4 Packaging
- Low Level Warning Light: A red LED will flash once every second when the volume is at 10% or below the maximum volume.
- **Easy to install:** Digital Fluid-Trac<sup>®</sup> DFT-220 has no components to protrude into the drum.
- Standard: Fits 2" NPT opening or 3/4" NPS opening
- **Deadband:** 6" measured from top of barrel when using the optional <sup>3</sup>/<sub>4</sub>" adaptor
- More Reliable: No components to chemically corrode inside liquid media.
- **Chemical compatibility:** Digital Fluid-Trac<sup>®</sup> DFT-220 drum gauge works with a wide variety of media such as water, waste water, motor oil, hydraulic fluid and diesel fuel.

**Note:** The Digital Fluid-Trac<sup>®</sup> DFT-220 drum level gauge is NOT intended for use with gasoline or other volatile liquids that produce a vapor pressure under normal operating temperature (0 °C - 50°C).

\* Outside of stated dead band.

## **Measurement Technology**

The Digital Fluid-Trac<sup>®</sup> DFT-220 drum level gauge uses ultrasonic technology to generate a high frequency sound wave and measures the time for the echo to reflect off the target fluid's surface and return. The distance from the Digital Fluid-Trac<sup>®</sup>'s sensor to the liquid is calculated based on the speed of sound.

The Digital Fluid-Trac<sup>®</sup> DFT-220 has a LCD which displays the liquid level pictorially as well as in gallon (or liter) units.

When externally powered by 24 Vdc, the DFT-220 will continuously monitor the drum's liquid level and report the level readings in two forms – LCD digital display and 4-20 mA current output. The 4-20 mA electrical output can be used to interface to external controllers and test equipment.

When powered using two 9 V batteries depressing the Reset/Select button will initiate a 7 second level measurement. This measurement is then displayed for 5 minutes then the DFT-220 goes into battery power saver mode and shuts off.

Note: The 4-20 mA output does not function when the unit is operating with 9 V batteries.

**Note:** The Reset/Select button has to be depressed again to come out of the battery power saver mode.

A low-level warning light (red LED located on the bottom left of the LCD display), will flash once every second when the liquid level is  $\leq$  10% the maximum volume.

## **Electrical Interface**

The Digital Fluid-Trac<sup>®</sup> DFT-220 drum gauge can be powered by either 24 Vdc external power supply or by two 9 V batteries.

The 4-20 mA electrical output can be interfaced to external controllers and test equipment. Refer to the figure and table below for harness connections.



Figure 1: DFT-220 Connector

Pin Number	Harness Color	Interface Signal
1	White	DC Power (18-26 Vdc)
2	Black	Ground
3	Blue	No Connection
4	Brown	4-20 mA Output

## Mounting

Digital Fluid-Trac<sup>®</sup> DFT-220 works well on ANSI MH2 standard drums as it mates on top with standardized 3/4" bunghole. An optional <sup>3</sup>/<sub>4</sub>" NPS threaded adaptor is shipped with the product.

When using the Digital Fluid-Trac<sup>®</sup>, it is important to keep the mounting perpendicular to the liquid level by storing the drums in an upright position.



# **Displaying the DFT-220 Settings**

- **1. Press and hold the Refresh/Select button down for 7 seconds.** The drum size will be displayed. And the selected units (Liter or Gallon) will be flashing.
- 2. Release the Refresh/Select button and the unit will automatically go back into test mode (indicated by 8.8.8) in 20 seconds.

# **Selecting The Display Units**

The Digital Fluid-Trac<sup>®</sup> DFT-220 multi-unit drum gauge can be set to display the level reading in one of six different configurations - gallons (15, 30, 55) or liters (57, 114, 208).

1. Enter the Select Mode: Press and hold the Refresh/Select button down for 7 seconds to enter the Select Mode. The unit will display Liter and Gallon. One of the units will be flashing.

**Note:** If you release the button too soon, the DFT-220 will be in test mode.

- 2. Switch the Desired Units: Press and release the Refresh/Select button to switch between the units.
- **3. Select the Desired Units:** When the units (Liter or Gallon) desired is flashing, press and hold the Refresh/Select button for 7 seconds to select the units. The units will stop flashing and the drum size will start flashing.
- 4. Switch the Desired Drum Size: Press and release the Refresh/Select button to switch between the drum sizes.
- **5. Select the Desired Drum Size:** When the drum size desired is flashing, press and hold the Refresh/Select button for 7 seconds to select the drum size. The drum size will stop flashing.
- 6. Return to Test Mode: Press and hold the button until 8.8.8. is displayed this indicates test mode.

# DFT-220 Operation and External Supply

When the DFT-220 is powered by an external 24 Vdc power supply, the display and 4-20 mA output are operational.

At power on, the back-light is illuminated and 8.8.8. is displayed for 4 seconds to indicate the unit is in test mode. The unit will continuously monitor the media in the vertical drum until the 24 Vdc supply is turned off. A low-level warning light (red LED located on the bottom left of the LCD display), will flash once every second when the liquid level is  $\leq$  10% the maximum volume.

**Note: It is recommended to leave batteries out of the unit when powering with a 24 Vdc supply.** If batteries are installed and the external supply shuts off – the unit will go into battery operation mode. The unit will display the last liquid level reading with no valid 4-20 mA output. After 5 minutes, the battery saver mode will turn the DFT-220 off. The Refresh/Select button must be depressed again to get out of battery saver mode.

Drum Setting	Current Conversion
55 gallon	Gallons = 3.4375 x (Current – 4)
30 gallon	Gallons = 1.875 x (Current – 4)
15 gallon	Gallons = 0.9375 x (Current – 4)

# **DFT-220 Operation With 9 V Batteries**

When the DFT-220 is powered by the 9 V batteries, only the display is operational (no 4-20 mA output).

- 1. After you have selected the proper units and drum size for your application, **Press and release the Refresh/Select button.**
- 2. The DFT-220's back-light is illuminated and 8.8.8. is displayed for 4 seconds to indicate the unit is in **test mode.**
- 3. The DFT-220 continuously monitors the media in the vertical drum for 7 seconds and then displays this liquid level.
- 4. Timed **Battery Saver Mode:** 20 seconds after the button was pressed, the back-light is shut off. The static liquid level reading will be displayed for 5 minutes before the unit turns off.

**Note:** This liquid level displayed is a static value. You must depress the Refresh/Select button to update the liquid level reading.

5. A **low-level warning light** (red LED located on the bottom left of the LCD display), will flash once every second when the liquid level is ≤ 10% the maximum volume.

**Note:** This warning light does not operate once the unit has powered down in battery saver mode.

4

# **Electrical Specifications**

Resolution (Gallons) **	0.5 gallons
Resolution (Liters) **	1 Liter
Accuracy (Current Output) **	2.5% of current output span
Input Supply Voltage	18 - 26 Vdc
Total Current Draw	Min = 60 mA, Max = 100 mA
Operating Temperature	0 °C to 50 °C
Battery Life*	6 months (Alkaline), 1 year (Lithium)
Low Level Warning Activation (Red LED)	≤ 10% Max Volume
Low Battery Level (Lob)	≤ 14.2 Volts Combines
Continuous Monitoring Mode Update Rate	4 seconds

- \* Battery life will vary dependant on operator's usage. Battery specification is based on two level readings per day.
- \*\* Outside of stated dead band

**Note:** If the battery life is low (voltage is below 14.2 V combined), "LoB "will continuously flash to notify the user to replace the batteries.

#### **Material Specifications**

Description	Material
Display Housing / threaded adaptor (blue plastic)	PBT (Polybutylene terephthalate), 15% glass filled
Transducer housing (black plastic inside threaded adaptor)	HDPE (High Density Polyethylene)



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