

HEATEC TEC-NOTE

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Setting Siemens pressure transmitters used on Heatec portable fuel tanks

This document provides information on setting Siemens Pressure Transmitter 7MF4033-1CA10-1NC7-Z-B21-Y01-Y22-A01 (**Figure 2**) used on Heatec portable fuel tanks (**Figure 1**). It applies to single-wall and double-wall tanks with capacities of 10,000, 15,000, 20,000 and 25,000 gallons.

The pressure transmitter indicates the *level* of fuel in the tank.

This document is included with all Heatec fuel tanks equipped with the Siemens transmitters. Siemens User's Manual UMSITRPDS3-1 is also furnished.

Information in these documents should enable users to set transmitters on Heatec fuel tanks in the field. Although the transmitters are preset at the Heatec factory before the tanks are shipped, users may need to change settings for different fuels.



Figure 1. Heatec portable fuel tank.



Figure 2. Siemens pressure transmitter.



Figure 3. Display on transmitter.

NOTICE

This document supplements the Siemens manual and should always be used along with the Siemens manual. Be sure to read all appropriate warnings and precautions in the Siemens manual before doing any work on Siemens transmitters. The following statement appears in the front of the Siemens manual and should be followed:

Qualified Persons

The described equipment should be installed, configured, operated, and serviced only by qualified persons thoroughly familiar with this User's Manual. A copy of this manual accompanies the equipment. The current version of the manual, in Portable Document Format (PDF), can be downloaded from www.sea.siemens.com/ia/.

FACTORY SETTINGS

Each transmitter is normally set at Heatec to display fuel level in *feet* (Figure 3). This setting *cannot* be changed in the field by plant personnel.

However, the *specific gravity* of fuel can be changed in the field by plant personnel.

Heatec normally sets the transmitter for a specific gravity of 0.880 before the tank is shipped. This is the specific gravity of waste oil. Other fuel oils have somewhat different specific gravities.

If the specific gravity of actual fuel in your tank is either higher or lower than 0.88 the *transmitter* will give incorrect indications of fuel level. Incorrect indications can either lead to overflowing the tank when it is being filled or unintentionally running out of fuel.

Specific gravity is the weight of fuel compared to an equal volume of water at the same temperature. Pure water weighs 8.333 pounds per gallon and has a specific gravity of 1.000. Thus, the specific gravity of fuel equals the weight of fuel divided by the weight of water.

DETERMINING SPECIFIC GRAVITY

If you don't know the specific gravity of the fuel you use, ask your supplier.

RESETTING THE TRANSMITTER

If your fuel has a specific gravity different from 0.880 you should change the specific gravity setting of the transmitter.

NOTE: you cannot directly enter the numerical value for fuel specific gravity when resetting the transmitter. The numbers you actually set on the transmitter are the numbers shown in Figure 5 for the **full scale blind settings**.

If you need to change the transmitter setting, compare the specific gravity of *your* fuel with those shown in Figure 5. Choose the specific gravity with a value closest to that of *your* fuel. Use the **full scale blind setting** shown for that value as the new setting of your transmitter.

The transmitter has a display window (Figure 3) and a set of magnetic pushbuttons (Figure 4). Use the magnetic pushbuttons on the transmitter to change the settings.



Figure 4. Magnetic pushbuttons.

First use pushbutton M to cause Mode 6 to show in the display window. Then use the other two pushbuttons to set the appropriate number from Figure 5. Press pushbutton M again to save your settings.

The only way that you can reset the fuel specific gravity is using the **full scale blind setting** or Mode 6. *Do not change any other parameter!*

FUEL LEVELS VS. GALLONS

As already noted the transmitter indicates fuel levels in feet. You may need to know how many gallons of fuel that various levels represent. Please refer to **Tech-Note 6-05-166** to convert levels to gallons of fuel.

NOTE: The pressure transmitter is set up to indicate levels in feet and tenths of a foot *above the level where the transmitter is installed*. The transmitter is *usually* installed 0.5 feet (6 inches) above the bottom of the tank. (This distance may vary plus or minus 1/4-inch.) Thus, when the level of fuel in the tank is 6 inches or less, the controller indicates 0.0 or zero feet.

IMPORTANT NOTE

When the transmitter is installed 6 inches above the bottom of the tank, you must add 0.5 to the values shown on the display of the pressure transmitter to get the correct level of fuel above the bottom of the tank.

TROUBLESHOOTING TRANSMITTERS

Pockets of air or trash trapped in the pipe where the transmitter is connected to the tank will cause erratic level readings. When filling an empty tank be sure to bleed the pipe connection at the transmitter to avoid this problem. Also bleed the connection if the tank is refilled after it was drained below the 6-inch level.

REPLACING A TRANSMITTER

All replacement transmitters need to be programmed at our factory before they are installed in a Heatec fuel tank. We pre-program all Siemens transmitters that we install in our tanks to make settings appropriate for fuel tanks. We use special Siemens software that we only use on computers at our factory.

Only two settings can be reset in the field. One is the **full scale blind setting**, which should be set according to the specific gravity of the fuel as explained earlier.

The other is the zero setting. This setting corrects for transmitter tilt. The transmitter is normally tilted upwards for easy reading when it is installed on the tank at Heatec. If you change this tilt, you should reset the zero setting according to instructions in the Siemens manual, under the heading **6.2.5 Zero Adjustment (Position Correction)**.

Figure 5. Specific gravities of fuels and transmitter settings		
Commercial fuels	Specific gravity at 60 degrees F	Transmitter full scale blind settings (Mode 6)
	0.970	116.4
No. 6 oil	0.965	115.8
	0.960	115.2
	0.955	114.6
	0.950	114.0
No. 5 oil	0.945	113.4
	0.940	112.8
	0.935	112.2
	0.930	111.6
	0.925	111.0
	0.920	110.4
	0.915	109.8
	0.910	109.2
	0.905	108.6
No. 4 oil	0.900	108.0
	0.895	107.4
	0.890	106.8
	0.885	106.2
Waste oil	0.880	105.6
	0.875	105.0
	0.870	104.4
	0.865	103.8
	0.860	103.2
	0.855	102.6
No. 2 oil	0.850	102.0
	0.845	101.4
	0.840	100.8
	0.835	100.2
	0.830	99.6
<small>Transmitter full scale blind settings are equal to the calibrated tank height multiplied by the specific gravity of the fuel. The calibrated tank height used for all Heatec portable fuel tanks is a diameter of 10.5 ft minus 0.5 ft = 10.0 ft. or 120 inches. The same settings are used for both single-wall and double-wall tanks even though they have different inside diameters.</small>		