SCC Inc.

Technical Instructions

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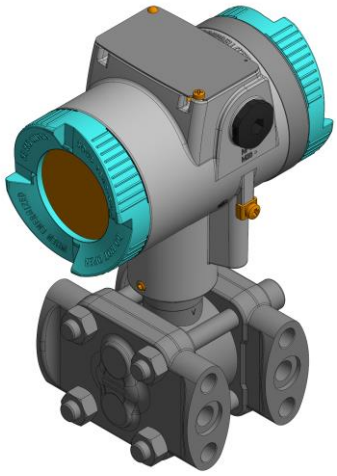
7MF Series

Differential Pressure Transmitters for Level Measurement



Description	The 7MF0340… differential pressure transmitters accurately measure differential pressure for use as a level controller.
Features	• Measuring accuracy of 0.065% of full scale • NEMA 4X housing • Local display shows real-time measurements • Simple push button navigation and programming
Application	The 7MF0340… differential pressure transmitters reliably measure the differential pressure of liquids and gases. This differential pressure is commonly used for level control applications. The 7MF0340… produces a 4-20mA output signal linearly proportional to the measured differential pressure reading.

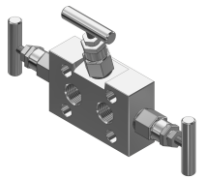
Product Part Numbers

Table 1: Available 7MF0340… Differential Pressure Transmitters

Part Number	Differential Pressure Range	Display
7MF0340-NODISP	0-100'' WC	Hidden Behind Cover
7MF0340-DISP	0-100'' WC	Viewable Through Window
7MF0340-DISPR2	0-240'' WC	Viewable Through Window

Accessories

A6X30004061



A three-valve manifold that can be attached directly to the 7MF0340… differential pressure transmitter. There is a valve for the working leg, reference leg, and atmosphere. Using a three-valve manifold makes setup, calibration, and troubleshooting more convenient. A three-valve manifold is highly recommended for water level applications.

Specifications

Physical Characteristics	Materials	
	-Housing	Aluminum
	-Diaphragm	Stainless steel
	-O-Ring	Viton
	-Measuring cell	Stainless steel
	-Process flange	Stainless steel
	Media	For gases and liquids in fluid group 1
	Electrical connections	½'' NPT
	Process connections	¼'' NPT
	NEMA rating	NEMA 4X
	Accuracy	0.065% of full scale
	Process temperature	-40 to 212°F (-40 to 100°C)
	Ambient temperature	-4 to 176°F (-20 to 80°C)
	Weight	8.5 lb. (3.9 kg)

Piping and Installation

The 7MF0340… must be mounted below the minimum water level of the system. It is recommended that the reference leg of the system is piped into the (-) port on the 7MF0340… transmitter. During initial setup it is important to ensure that the reference leg has been filled manually. The reference leg must remain full during operation. When used in a steam vessel this is achieved with a condensate pot which remains completely full due to the condensing steam. It is necessary to have an accessible location at the top of the reference leg and condensation pot system to manually fill the reference leg if necessary. The 7MF0340… should be mounted in the vertical position. For easy installation and setup, it is highly recommended to use a three-valve manifold.

During the startup process the 7MF0340… should be bled of air. This can be done by loosening the plugs opposite of the process connections when the vessel is not under pressure. Once a steady stream of liquid is visible the plugs can be retightened. Since some water may have been drained it is important to refill the reference leg to replace any lost liquid.

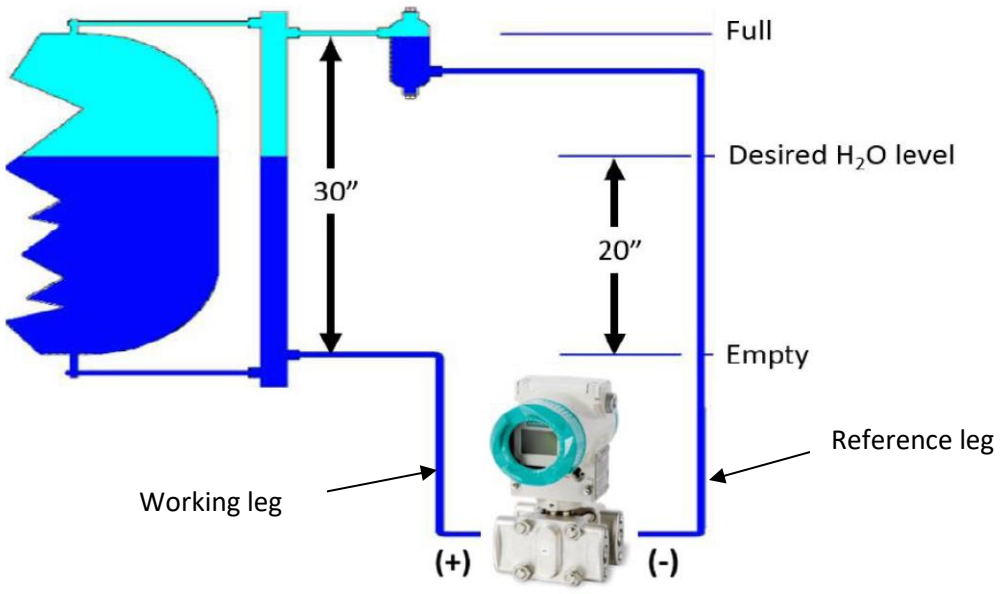
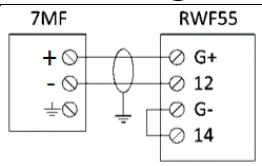
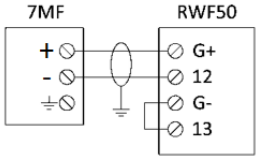


Figure 1: Example Piping Setup

Wiring

In most level control applications, the 7MF0340… is connected to a Siemens RWF5x… PID controller. For these applications, the 7MF0340… is loop powered from the RWF5x… controller. The 7MF0340… will also send a 4-20mA output to the RWF5x… controller. Below are examples of how the 7MF0340… is wired to different models of the RWF5x… controller. It is important to use watertight electrical connections to ensure the 7MF0340… keeps its NEMA 4X rating.

Table 2: 7MF0340… Differential Pressure Transmitter Wiring

Controller Type	Wiring
RWF55…	
RWF50…	

Parameter Setup

The settings on the 7MF0340… are navigated using the four buttons located under the swiveling name plate on the top of the device. The buttons are labeled with left, up, down, and right arrows. When the transmitter is first powered, the measured value screen is displayed. To view the display on the 7MF0340-NODISP the front cover must be removed. The measured value screen shows various real-time measurements. To cycle through the measured value screen, use the up and down arrow buttons.

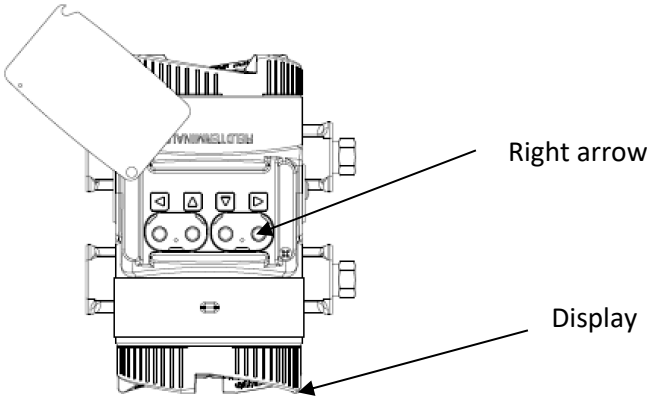


Figure 2. Button Layout

Parameter Setup (Continued)

① Name and unit of the measured value (alternating)
② Measured value
③ Measured value ID
④ Bar display

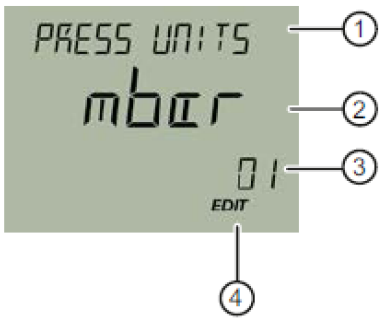
Figure 3: Measured Value Screen

Table 3: Table of Measured Valves for Level Control Application

Measured Value ID	Measured Value Name	Description
P1	PRESSURE	Pressure
P2	SENSOR TEMP	Sensor temperature
P3	ELECTR TEMP	Electronics temperature
P4	LEVEL	Level
P8	USER DEFINED	Customized characteristic curve
P9	% OF RANGE	Percent of range
PA	LOOP CURRENT	Loop current
PB	CURR VOLTAGE	Terminal voltage

Parameter Setup (Continued)

To access the parameters of the 7MF0340…, push the right arrow button. Once in the parameter screen, use the up and down buttons to scroll through the available parameters. To edit a parameter, push the right arrow button on that parameter. The “EDIT” symbol in the bottom right-hand corner will begin to flash, indicating that the device is in edit mode and the parameter value can be changed. Once the correct value is selected, push the right arrow button again. The “EDIT” symbol will now be solid, indicating that the parameter has been stored. If in edit mode but a parameter does not need to be changed, push the left arrow button to cancel the selection. To go back to the measured values screen, simply push the left arrow button. Note that not all parameters are visible and will only appear depending on the application setting (parameter 05).



① Name and unit of the parameter (alternating)
② Parameter value
③ Parameter ID
④ "EDIT" symbol

Figure 4: Parameter Screen

Parameter Setup (Continued)

Table 4: Parameter List for Level Control Setup

Parameter Name	Parameter	Example Setting	Function	Comment
PRESS UNITS	1	inW68	Units for pressure measurement	Selecting inW68 will give pressure readings in inches of water column.
LOWER RANGE	2	0	Lower range value	Differential pressure when the tank is full resulting in a 4mA output.
UPPER RANGE	3	-30[1]	Upper range value	Differential pressure when the tank is empty resulting in a 20mA output.
DAMPING	4	2	Damping value	Influences reaction time of the device. A larger value results in a longer response time.
APPLICATION	5	LEVEL	Application	Sets the application of the device for level measurement.
ZERO POINT	7	0	Zero point adjustment	Using a 3-valve manifold, close both isolation valves, open the bypass valve, change parameter to 0, re-close bypass valve, re-open isolation valves.
APPLY LRV	8		Live lower range value setting	(Not Recommended) Live setting when the tank is full. Only set this parameter if the tank and reference leg are full. This parameter will overwrite parameter 2.
APPLY URV	9		Live upper range value setting	(Not Recommended) Live setting when the tank is empty. Only set this parameter if the tank is empty and the reference leg is full. This parameter will overwrite parameter 3.
FAULT CURR	10		Select fault current	In the case of a fault the setting of UPPER gives an output of 20.5mA and a setting of LOWER gives an output of 3.8mA.
LEVEL UNITS	16	in	Units for level measurement	Selecting in will give level readings in inches.
LOWER SCALING	18	30[1]	Lower scaling point	Scales top of water level value.
UPPER SCALING	19	0	Upper scaling point	Scales bottom of water level value.
LOOP TEST	31		Set output current for testing	Force an output of 3.55, 4, 12, 20 or 22.8mA. Selecting USER will let the user manually select an output current to test.
START VIEW	32	LEVEL	Main screen view	With a setting of LEVEL the actual water level will be displayed on the main screen.

Note: Shaded parameters must be set for level control.

1) The value of parameter 3 corresponds to the example in Figure 1. This value should reflect the distance between the two taps in the actual application. If the reference leg is tapped into the (-) side of the transmitter this value should be negative. If the reference leg is tapped into the (+) side of the transmitter this value should be positive. The value of parameter 18 corresponds to the example in Figure 1. This value should reflect the distance between the two taps in the actual application.

Dimensions

Dimensions in inches; millimeters in brackets