

Fisher™ HF340 Filter

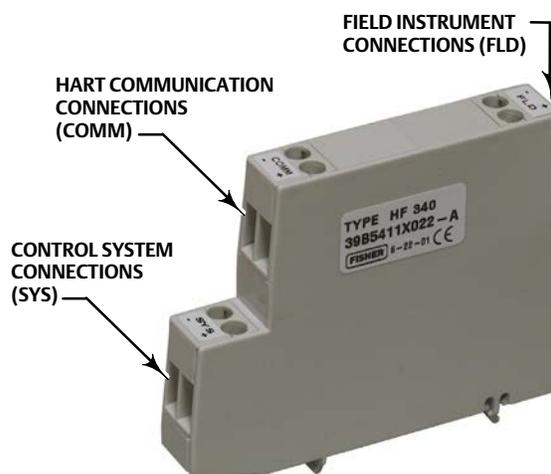
This instruction manual includes installation and maintenance information for the HF340 HART® filter (see figure 1). Refer to separate manuals for additional information on other products used with the HART filters, such as FIELDVUE™ DVC6200, DVC6000, or DVC2000 digital valve controllers.

Control system refers to a distributed control system (DCS), programmable logic controller (PLC), or a stand-alone controller that provides a control signal to the FIELDVUE instrument.



Do not install, operate, or maintain an HF340 filter without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all of the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions contact your [Emerson sales office](#) before proceeding.

Figure 1. Fisher HF340 HART Filter



W8283-1

Description

The HF340 filter is used with HART communicating FIELDVUE instruments, such as DVC6200, DVC6000, or DVC2000 digital valve controllers. HART filters are used when the instrument is connected to a 4 to 20 mA DC control system output not designed for the HART (Highway Addressable Remote Transducer) communication protocol. The HF340 provides filtering and isolation between the control system and FIELDVUE instrument.

The HF340 HART filter is a passive device that is inserted in-line with both wires of a HART 4 to 20 mA DC output loop. The purpose of the filter is to effectively isolate the control system analog output from modulated HART communication signals. The filter receives a 4 to 20 mA DC current signal from the control system, which it shunts with a capacitor and then passes through an inductor. The low AC impedance of the capacitor prevents sudden changes in the control system current output from interfering with the HART communication. The high AC impedance of the inductor permits HART communication on the instrument side of the filter. It also prevents the voltage modulation in the HART loop from being seen by, or having an affect on, the control system output. The filter introduces a maximum input-to-output voltage drop of 2 volts DC at 20 mA.

Table 1. Specifications

<p>Mounting Standard 35 mm DIN rail mounting with filtering components.</p> <p>Connections Three 2-pin cage-clamp style connectors accept up to 12 AWG wire</p> <p>Power Requirements Input Current: 4-20 mA DC (nominal) Input Voltage: At 20 milliamps DC, 2 volts above input voltage required by the field instrument (2 volt drop across filter at 20 milliamps DC)</p> <p>Ambient Operating Temperature -40 to 85°C (-40 to 185°F)</p> <p>Ambient Relative Humidity 5 to 95%</p> <p>Electromagnetic Compatibility Meets EN 61326-1:2013 Immunity—Industrial locations per Table 2 of the EN 61326-1 standard. Performance is shown in table below 2. Emissions—Class A ISM equipment rating: Group 1, Class A</p>	<p>EU Declaration of Conformity Click or scan code to access Declaration of Conformity FCS_69 by language</p>  <p>Literature & Certifications</p> <p>Dimensions 75 mm (3 inches) long by 12.5 mm (0.5 inches) wide by 60 mm (2.4 inches) deep</p> <p>Approximate Weight 0.1 kg (4 oz)</p> <p>Option HF341: Standard 35 mm DIN rail mounting <i>without</i> filtering components (straight through with capacitor blocking on COMM terminals)</p>
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Table 2. EMC Summary Results; Immunity

Port	Phenomenon	Basic Standard	Test Level	Performance Criteria
Enclosure	Electrostatic discharge (ESD)	IEC 61000-4-2	4 kV contact 8 kV air	A
	EM field	IEC 61000-4-3	80 to 100 MHz @ 10V/m with 1 kHz at 80% 1400 to 2000 MHz @ 3V/m with 1 kHz at 80% 2000 to 2700 MHz @ 1V/m with 1 kHz at 80%	A
	Rated power frequency magnetic field	IEC 61000-4-8	N/A ⁽¹⁾	N/A ⁽¹⁾
I/O signal/control	Burst	IEC 61000-4-4	1 kV	A
	Surge	IEC 61000-4-5	1 kV (line to ground only, each)	A
	Conducted RF	IEC 61000-4-6	150 kHz to 80 MHz at 3 Vrms	A

A = During testing, normal performance within the specification limits.
1. Not applicable; only applicable to magnetically sensitive equipment.

The filter is normally installed near the field wiring terminals of the control system I/O. HART communication is only possible between the filter and the field instrument and at the filter COMM terminals, but not on the control system side of the filter. The filter is not designed or intended for use in the process environment. Neither the filter nor its outputs are approved for hazardous areas. However, a recommended intrinsic safety barrier can be connected between the FIELDVUE instrument and the filter in intrinsically safe installations. In most cases, if an IS barrier is used, the filter will not be needed.

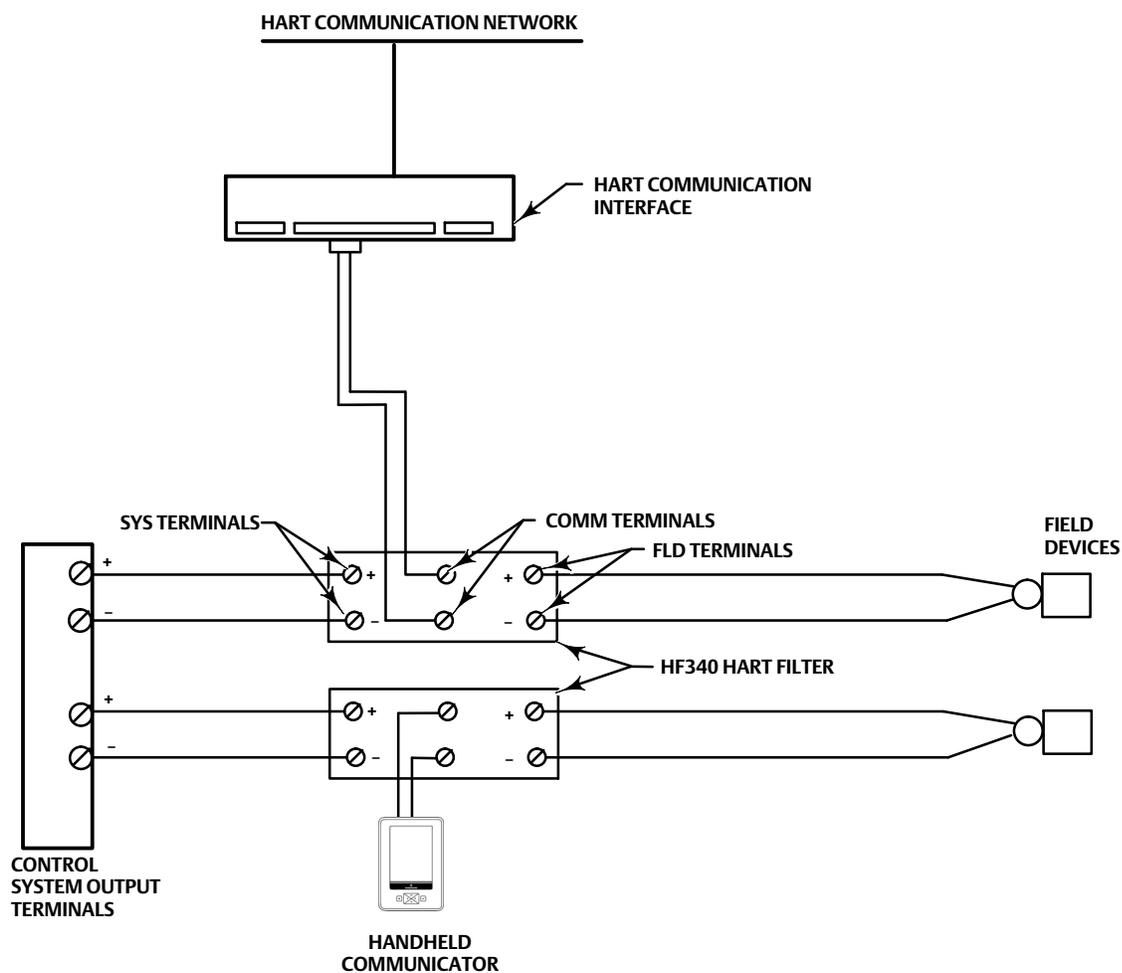
Specifications

Typical specifications for the HF340 filter are shown in table 1.

Installation

Refer to figure 2 for typical installations. The HF340 filter mounts on a type 35 DIN rail. To install the filter, provide a temporary means of process control, then take the loop out of service. Remove the DIN interconnect blocks from the rail without disconnecting existing wiring. Install the filter on the the rail. Disconnect the wires from the control system output side of the interconnect blocks and connect them to the SYS terminals on the filter, taking care to maintain correct polarity. Disconnect the wires from the field side of the interconnect blocks and connect them to the FLD terminals on the filter, taking care to maintain correct polarity.

Figure 2. Typical Fisher HF340 HART Filter Installation



Shields

If using shielded wiring on both sides of the filter, the shield should connect across the filter. If the filter connects directly to the control system output and shielded loop wiring is being used, connect the shield to system ground on the instrument side of the filter.

HART Wiring Connections

The COMM terminals on the filter provide a convenient means to tap into the loop wiring for HART communication. A HART communicating device, such as a multiplexer or an Emerson AMS Trex™ Device Communicator can be connected to these terminals, or they may be left with no connections.

Corrective Maintenance

The most likely malfunction of a loop containing an HF340 filter is reverse polarity installation of one of the wire pairs. The HF340 filter will work with either polarity, but misconnection could result in the wrong polarity reaching the field instrument. If the loop is not operating properly, check the polarity of the voltage at the inputs and outputs of the filter and at the inputs of the instrument.

If the instrument appears to operate properly in the loop, but communication with a non-isolated multiplexer or PC modem is not possible, it may help to reverse the wires to the COMM terminals. The HF340 filter inserts a high impedance in the + side of the loop only. A reversal of the connections to the SYS and FLD terminals of the filter will result in the control loop operating properly, but inoperative HART communication.

Inadequate control system compliance voltage will not support filter operation. This is an installation problem that may appear initially to be a filter malfunction. For the filter to operate properly, the control system must have a compliance voltage that is at least 2 volts higher than the voltage required to drive the loop to maximum current. Refer to the appropriate instrument instruction manual for information on determining the control system compliance voltage.

The HF340 filter is protected against accidental over-current from sources up to 30 volts DC. If an over-current condition occurs, the filter may be inoperative for several seconds thereafter.

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