

Fisher® FIELDVUE™ DLC3020f Digital Level Controller for FOUNDATION™ fieldbus

The FIELDVUE DLC3020f digital level controller (figure 1) is a fieldbus communicating instrument used to measure liquid level or the level of interface between two liquids using displacement sensor technology.

In addition to the normal function of reporting process level PV, the DLC3020f, using FOUNDATION fieldbus protocol, gives easy access to information critical to process operation and will readily integrate into a new or existing control system. AMS Suite: Intelligent Device Manager or the 475 Field Communicator can be used to configure, calibrate, or test the digital level controller.

The DLC3020f is also designed to directly replace pneumatic, analog, or HART® transmitters/controllers. It can be mounted on a wide variety of 249 cageless and caged level sensors as well as on other displacer type level sensors through the use of mounting adaptors.

Features

- **Ease of Use** The DLC3020f, a fieldbus level or interface transmitter, features the latest in user interface technology. In addition to reporting the PV, the DLC3020f can act as a PID controller or level switch.

- **Guided Setup and Calibration** Leads you through instrument setup, process fluid selection, and calibration in an easy-to-use format.



Figure 1. FIELDVUE DLC3020f Digital Level Controller

- **Dynamic Temperature Compensation** Integration of process fluid temperature, when needed, enables density compensation to maintain PV accuracy.
- **Simple Process Fluid Configuration** The capability to easily select/define process fluids allows for fluid changes without requiring calibration.
- **Calibration/Setup Logs Saved in Instrument Logs** Logs, including calibration, instrument setup, and process fluid data, can be saved for future reference or re-use in batch or continuous applications. The instrument stores up to 30 logs.
- **Performance/Reliability** State-of-the-art Emerson advanced electronics provide increased performance and reliability.



Specifications

Available Configurations

Mounts on 249 caged and cageless sensors.
Refer to Fisher Bulletin 34.2:2500 for information on 249 sensors.

Function: Transmitter, Controller, Switch

Communications Protocol: FOUNDATION fieldbus

Digital Communication Protocol

FOUNDATION fieldbus registered device (ITK 5)

Physical Layer Type(s):

121—Low-power signaling, bus-powered, Entity Model I.S.

123—Low-power signaling, bus-powered, non I.S.

511 – Low-power signaling, bus-powered, FISCO I.S.

Supply Requirements

9 to 32 volts DC, 17.7 mA DC;
instrument is not polarity sensitive

Device Inputs

Level Sensor Input (required)

Rotary motion of torque tube shaft is proportional to buoyant force of the displacer caused by changes in liquid level or interface level

Process Temperature Compensation Input (optional)

RTD—interface for 2- or 3-wire 100 ohm platinum RTD

AO Block—FOUNDATION fieldbus temperature transmitter

Manual—compensation values manually entered in the device

LCD Meter Indications

Process Variable in engineering units

Process Variable in percent (%) only

Alternating Process Variable in engineering units and percent (%)

Optional: Alerts as configured

Function Block Suite

AI, PID, DI (two), AO (three), ISEL, and an ARTH function block

Block Execution Times

AI, PID, DI, AI, ISEL: 15 ms

ARTH: 25 ms

Fieldbus Device Capabilities

Backup Link Active Scheduler (BLAS)

Performance

Performance Criteria	DLC3020f ⁽¹⁾
Independent Linearity	±0.1% of output span
Accuracy	±0.15%
Repeatability	<0.1% of full scale output
Hysteresis	<0.10% of output span
Deadband	<0.05% of input span
Humidity	±0.10% (RH9.2% to 90%)

Note: At full design span, reference conditions.
1. To lever assembly rotation inputs.

Minimum Differential Specific Gravity

0.1 SGU with standard volume displacers

Ambient Temperature Effect

The combined temperature effect on zero and span is less than 0.01% of full scale per degree Celsius over the operating range -40 to 80°C (-40 to 176°F)

Process Temperature Effect

Temperature compensation can be implemented to correct for fluid density changes due to process temperature variations

Electromagnetic Compatibility

Meets EN 61326-1 (First Edition)

Immunity—Industrial locations per Table 2 of the EN 61326-1 standard.

Emissions—Class A

ISM equipment rating: Group 1, Class A

-continued-

Specifications (continued)

Alerts and Diagnostics

Electronic Alerts advise when there is an electronic error in memory

Operational Range Alerts notify when PV range and sensor range changes might affect calibration

Rate Limit Alerts indicate rapid rise or fall in displacer, which can signify abnormal operating conditions

RTD Alerts show health and condition of connected RTD

Sensor Board Alerts indicate if the device is operating above or below maximum recommended limits; advises if the electronic sensor electronics cannot communicate properly

Input Compensation Error Alerts advise of "Bad" or "Uncertain" status of AO connection or setup.

Simulate Function

Simulate Active, when enabled, simulates an active alert without making it visible.

Operating Limits

Process Temperature: See figure 2

Ambient Temperature⁽¹⁾ and Humidity

Conditions	Normal Limits	Transport and Storage Limits	Nominal Reference
Ambient Temperature	-40 to 80°C (-40 to 176°F)	-40 to 85°C (-40 to 185°F)	25°C (77°F)
Ambient Relative Humidity	0 to 95% (non-condensing)		40%

Electrical Classification

Hazardous Area

CSA— Intrinsically Safe, Explosion-proof, Division 2, Dust Ignition-proof

FM— Intrinsically Safe, Explosion-proof, Non-Incendive, Dust Ignition-proof

ATEX— Intrinsically Safe & Dust, Flameproof & Dust, Type n & Dust

IECEX— Intrinsically Safe & Dust, Flameproof & Dust, Type n & Dust

Electrical Housing

CSA— Type 4X

FM— NEMA 4X, IP66

ATEX— IP66

IECEX— IP66

Mounting Positions

Digital level controllers can be mounted right- or left-of-displacer (the position of the instrument when you are looking at the LCD relative to the displacer)

Construction Materials

Case and Cover: Low-copper aluminum alloy

Internal: Plated steel, aluminum, and stainless steel; encapsulated printed wiring boards; Neodymium Iron Boron Magnets

Electrical Connections

Two 1/2-14 NPT internal conduit connections; one on bottom and one on back of terminal box. M20 adapters available.

Weight

Less than 2.7 Kg (6 lbs)

Dimensions

Refer to Fisher Bulletin 34.2:249 for sensor, level controller, and transmitter dimensions

Options

■ Heat insulator ■ Mountings for Masoneilan™, Yamatake, and Foxboro™ -Eckhardt sensors available

1. The pressure/temperature limits in this manual and any applicable standard or code limitation for valve should not be exceeded.

Ordering Information

When ordering, specify:

1. Type of measurement

- Level or Interface

2. Process fluid type

- Water, Saline water, Saturated water,
- Saturated steam, Crude oil, Refined product,
- Gas well condensate, or Customer specified fluid

Note: If Interface indicate both upper and lower fluid types

3. Process operating conditions

Temperature _____

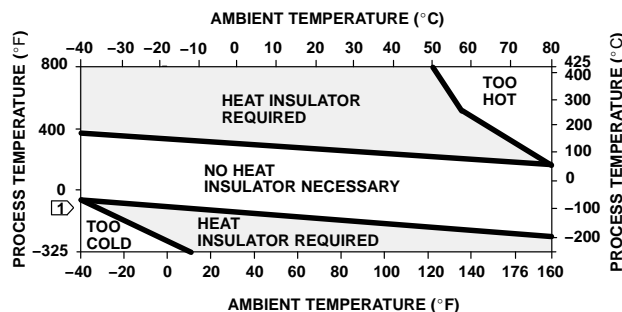
Fluid density or SG _____

Note: If Interface indicate fluid density or SG for both upper and lower fluids

4. Tag number, as required _____

Optional Heat Insulator

If the DLC3020f and a 249 sensor are ordered as an assembly, and a heat insulator is required for the application, order the heat insulator as a 249 sensor option. If the DLC3020f is ordered separately, the heat insulator is available as a kit. Figure 2 contains guidelines for use of the optional heat insulator.



NOTES:

1. FOR PROCESS TEMPERATURES BELOW -29° (C-20°F) AND ABOVE 204° C (400°F) SENSOR MATERIALS MUST BE APPROPRIATE FOR THE PROCESS (REFER TO FISHER BULLETIN 34.2:2500).
2. IF AMBIENT DEW POINT IS ABOVE PROCESS TEMPERATURE, ICE FORMATION MIGHT CAUSE INSTRUMENT MALFUNCTION AND REDUCE INSULATOR EFFECTIVENESS.

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Figure 2. Guidelines for Use of Optional Heat Insulator Assembly

Note

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