

Pump / Level Controller & Open channel Flow Monitor

with configurable analog and control/alarm outputs



Application examples: Pump control application



Level monitoring by triggering an acoustic or visual device



Open channel flow measurement

The F-Series is your first and safest choice for field mount indicators in challenging industrial applications. Especially in harsh weather conditions like rain, snow, salty atmospheres and temperatures between -40°C to +70°C (-40°F to 158°F).

Advantages

- Versatile pump / level controller with continuous level and/or open channel flow measurement monitoring.
- Robust aluminum or stainless steel 316L field enclosure (IP67 / Type4X). It is so rugged, even a truck can stand on it!
- Programming can be done by your own crew, with the sensible menu-driven structure, saving cost and irritation. Know one, know them all!
- Very diverse mounting possibilities: walls, pipes or panels!
- Clear dual line display to show level/height, volume, flow rate, total, percentage filled, 4-20mA input or alarm values.

Features

- Accurate pump / level control with 4 set- and resetpoints.
- Level / flow monitoring with 4 alarm values: low-low, low, high and high-high level alarms, with configurable hysteresis.
- Two open channel flows: linear, table or weir/flume formulas.
- Bargraph according the level/height, volume or flow rate.
- Red flashing LED backlight in case of an alarm condition.
- Custom measurement units for level/height and volume.
- 1 level input signal: (0)4 - 20mA (HART transparent).
- 48 pt. linearization for tank shape/weir/flume compensation.
- 3 remote control inputs to trigger an action or define a status.
- Active or isolated (passive) analog output according to the actual level/height, volume, flow rate or input retransmission.
- Up to 4 heavy duty, mechanical relay outputs.
- Full Modbus communication RS485, isolated RS485 or RS232.
- Easy programming with PC/laptop via Modbus or USB-C.
- Isolated power supply: 12-24V AC / 12-30V DC or 115-230V AC.
- Auto backup of all setting.

The F175 is the versatile topmodel in the next generation of F-Series level indicators, monitors, and controllers! These four powerful products that not only include the features of our previous F1-level-Series, but also bring a broad range of enhanced capabilities. The new F-Series level indicators take performance, functionality, and reliability to the next level!

Next Level F-Series	F170	F173	F174	F175
Level Monitor <i>with alarms</i>	Yes			
Level Controller <i>with hysteresis & strapping table</i>	No	Yes		
Advanced Pump Controller <i>with alternating functions</i>	No		Yes, individual setpoints, pump groups, manual & automatic pump switching (pump order or running hours)	
Open Channel Flow Monitor & Totalizer	No			Yes, Dual Flow A/B (linear, table, weir / flume formula)

Introduction

The F175 is a versatile and powerful pump / level controller with continuous level monitoring and dual open channel flow measurement features. Its primary **level indicator** function is to display the measured level input with level/height or volume indication and a dedicated bargraph. For **pump / level controlling**, individual set- and resetpoints with hysteresis can activate up to 4 pumps (standalone or group function) to control the desired levels. Extra pump control features like pump groups, pump selection based on running hours, small pump (fair weather) support, flow & error detection and delay times, make the F175 a powerful level computer suitable for the most demanding pump / level control applications. For **level monitoring**, it offers two low and two high level alarm values with hysteresis and ignore function to monitor the level. It can also be used for open channel **flow measurement**, incl. flow monitoring and totalizing.

Display

The display has six large 18mm (0.71") and eleven 8mm (0.31") digits which can be set to show level/height, volume, flow rate, total, percentage filled, 4-20mA input, running pump hours or alarm values. The 20 segment bargraph can be set to level/ height, volume or flow rate. On-screen engineering units are easily configured from a comprehensive menu. It is even possible to create your own custom measuring units for level/height and volume. For each level alarm value, there is an alarm flag indication beside the bargraph. When a control or alarm output is triggered it wil be indicated with an R1, R2, R3 and R4 flags on the screen. When both pump control and level monitoring functions are activated, a lot of different screens can toggle on the display. A smart submenu function allows you to enable/ disable the screens for a user-friendly operation. The bright backlight can be set to be red or flashing red in case of an alarm.



All info at a glance



Easy to install



Easy to program



Know one know them all!



Reliable



User-friendly

Signal input

The F175 accepts input signals from any type of (0)4 - 20mA analog level measurement device and it is HART transparent. The input signal is easy to calibrate, no multimeter required. Namur NE43 sensor fault detection can be enabled in the setup menu.

Linearization / Conversion strapping table

- Level measurement: to compensate a non linear tankshape.
- Open Channel Flow: to compensate non linear weirs or flumes.

A conversion strapping table with 48 linearization points is available to calculate the volume / flow from the measured input signal for level / height. Enter as % or value at each point for the measured level / height and a corresponding % or value for the calculated volume. Inbetween the volume / flow, % or values are calculated by interpolation.

Remote control inputs

3 digital inputs with delay time and test mode, to show a screen indication without selected action trigger. Configurable functions:

- External alarm
- Retransmit to control output
- Clear level alarm outputs
- Clear input latches
- Relays ON
- Relays OFF
- Emergency Shut Down (E.S.D.)
- Pump alarm detection
- Pump flow detection
- Pump change
- Clear totalizer A / B / A & B
- Keyboard lock
- Pulse (sampling)
- Enable flow A / B / A & B

Communication

All process data and settings can be read and modified through the Modbus communication ((isolated) RS485/RS232). Easy plug-and-play connection with USB-C for programming with PC/laptop at your desktop when Modbus is not required in the field.

Control / alarm / pulse outputs

Up to 4 configurable digital outputs with test mode, configurable hysteresis, fail-safe and NO/NC setting, to control the pump, transmit an alarm or send a scaled or sampling pulse. You can have e.g. 2 pump control outputs, 1 low alarm output and 1 high alarm output. There are 2 output options with mechanical relays:

- Type OM: 3 heavy duty, relay outputs NO-NC.
- Type OS: 4 heavy duty, relay outputs, 2 x NO-NC and 2 x NO.

Hysteresis modes

The hysteresis mode selects how the alarm set- and resetpoints are handled internally:

- Default (disabled): Alarm value = (re-)setpoint.
- Balanced: Alarm value $\pm$ 0.5 hysteresis value = (re-)setpoint.
- Unbalanced: Alarm value = setpoint.

Alarm value $\pm$ hysteresis value = resetpoint.

- Absolute: Alarm value = setpoint.

Programmable resetpoint = resetpoint.

Power requirements

Type PF (12 - 24V AC / 12 - 30V DC) or type PM (115 - 230V AC), both isolated, can power the F175, the backlight, activate the relay outputs and offer a regulated 24V DC sensor supply output.

Configuration

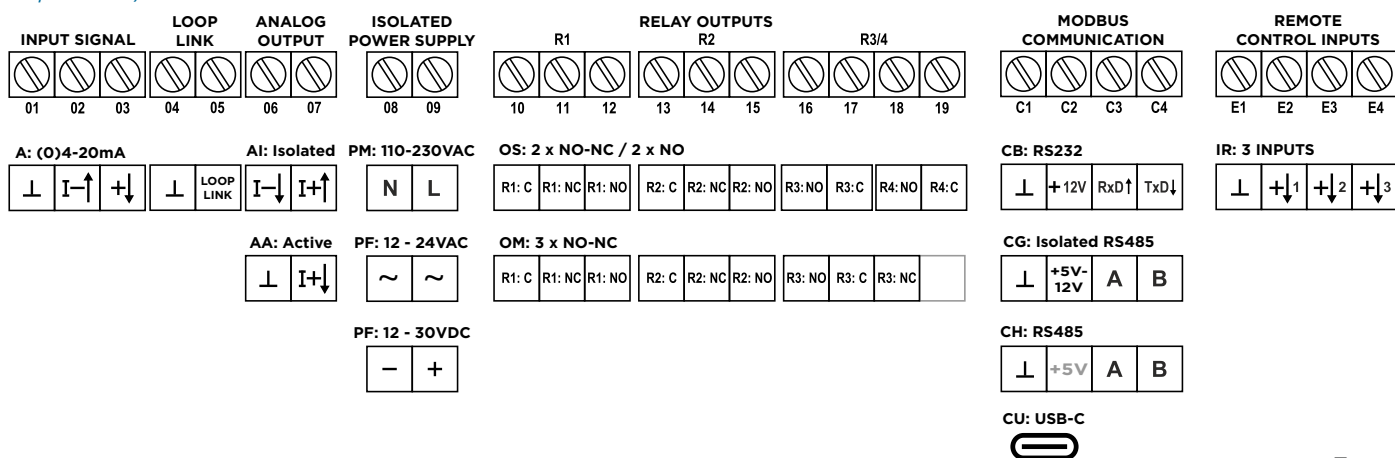
All configuration settings are accessed via a user-friendly operator menu which can be password protected. The settings are clearly indicated with an alphanumerical description, which avoids confusing abbreviations and baffling codes. Once familiar with one F-Series product, you will be able to program all models in the series without the need for a manual. All settings are safely stored in EEPROM memory in the event of sudden power failure.

Remote configuration

Quick and easy configuration via a PC connection using the free downloadable Configuration Software. Just connect the F175 to your PC/laptop via the USB-C or Modbus communication port. There are special Modbus to USB configuration cables available as accessory.

Terminal connections

For option PF / PM



Enclosures

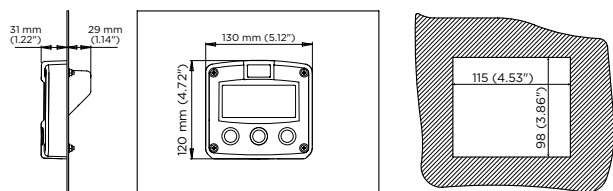
Various types of panel and field mount enclosures can be selected. As standard, the F175 is supplied in a GRP (polyamide) panel mount enclosure, which can be converted to a GRP field mount enclosure by the addition of a back cover. Most popular is our robust aluminum field mount enclosure which is also available with an extended back cover to allow more wire installation space. It is so rugged, even a truck can stand on it! For the most challenging environments we have a durable high grade Stainless Steel 316L enclosure. All field mount enclosures have an IP67 / Type 4X rating and various European or U.S. cable gland entry threads available.

Analog output signal

The output can be set to transmit the actual level/height, volume, flow rate or as analog input retransmission. The output signal is updated 8 times / second with a filter function being available to smoothen out the signal. It can be set to transmit the device status according to Namur NE43 error detection. The output value can be user defined, e.g. 4mA equals 5m³ and 20mA equals 20.000m³. A test mode is available including Namur NE43 error low and high currents. It is available as active or isolated (passive) output signal.

Dimensions enclosures

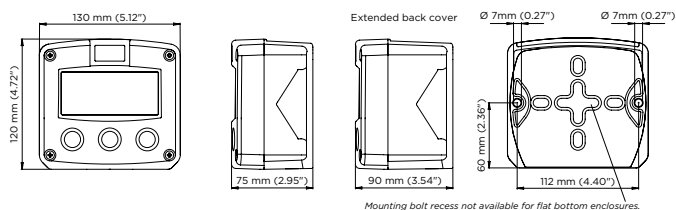
Aluminum & GRP panel mount enclosure



HSB, HB & HGC enclosures

panel cut-out

Aluminum, GRP & Stainless steel 316L field mount enclosures



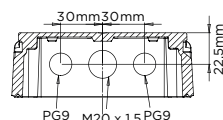
Mounting bolt recess not available for flat bottom enclosures.



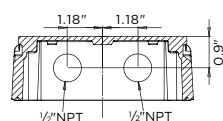
Red flashing LED backlight in case of an alarm (level / pump)

Cable entries

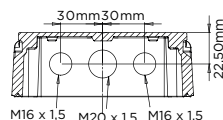
Aluminum / Stainless Steel



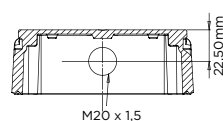
HA



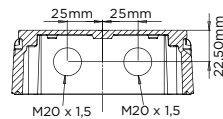
HL



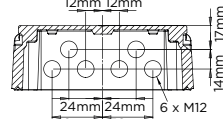
HM
MSM



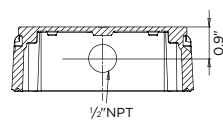
HN



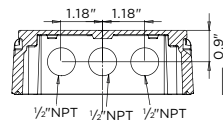
HO
HSO



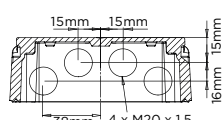
HP



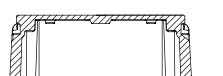
HT



HU
HSU

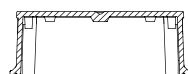


HV

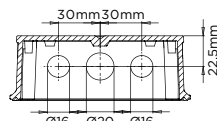


HZ

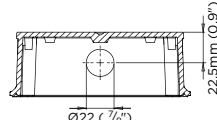
GRP



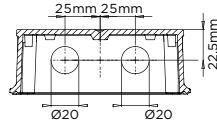
HGD



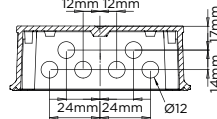
HGE



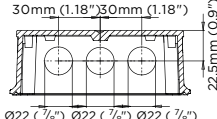
HGF



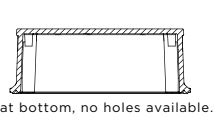
HGG



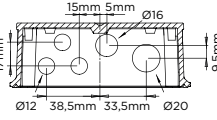
HGH



HGJ

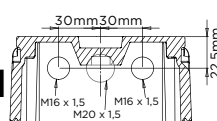


HGK

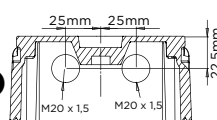


HGQ

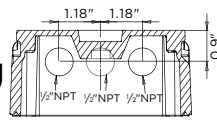
Extended Aluminum



HBM

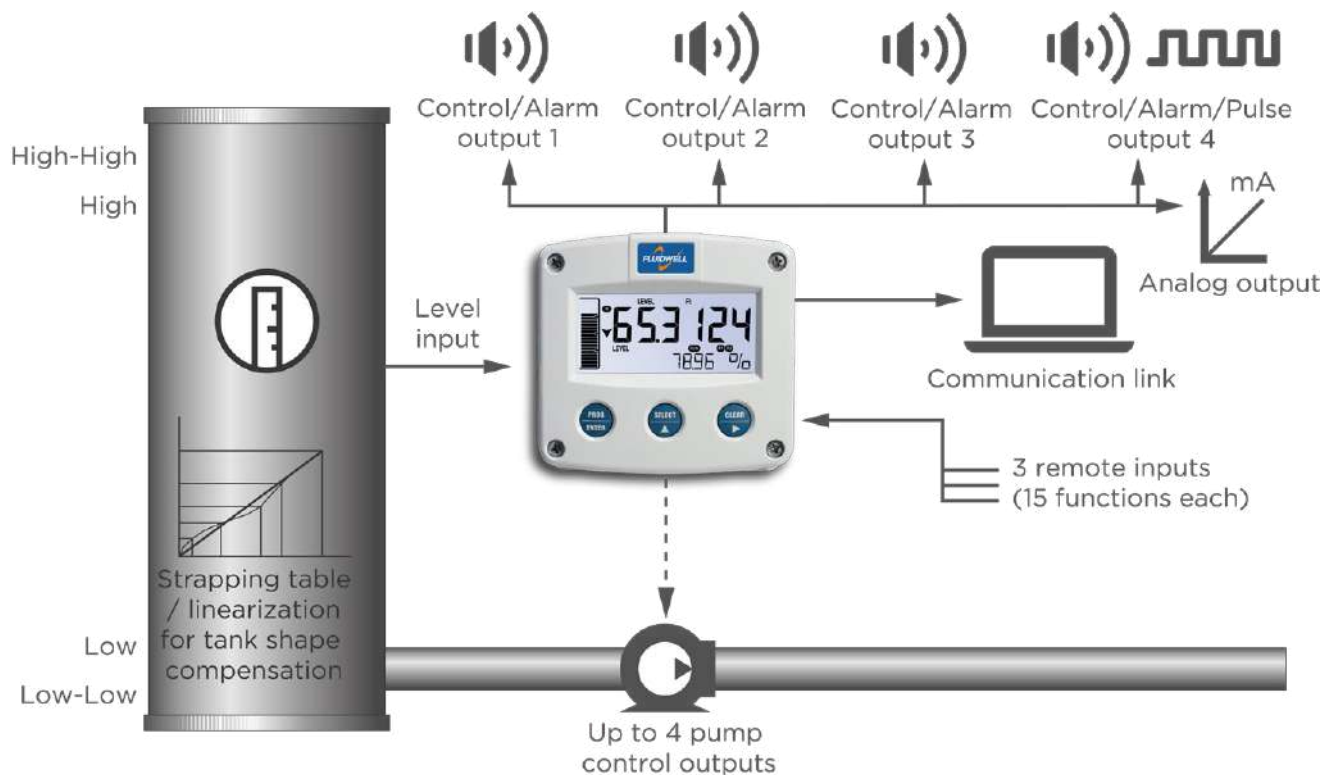


HBO



HBU

Input / Output overview F175



Application examples F175

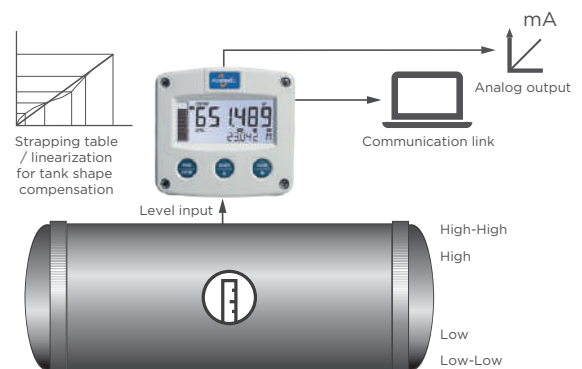
The F175 provides a versatile and reliable package in a strong and weatherproof, field mount enclosure, especially in harsh weather conditions like rain, snow, salty atmospheres and temperatures from -40°C up to +70°C (-40°F up to 158°F).

Thanks to its outstanding versatility, the F175 can be used across a broad range of applications. Here follow some typical examples, combinations between the various application examples are possible, with respect to the number outputs.



Example 1: Level Measurement

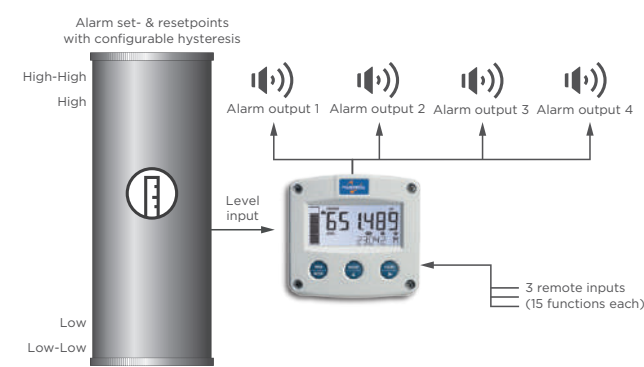
Basic level measurement to display the actual level/height or linearized volumetric content of the tank/silo. The process information on the display can be configured according your preferences: level/height, volume, percentage filled or the 4-20mA input signal. A clear bargraph indicates the level/height, volume or flow rate.



Example 2: Linearized Level Transmitting

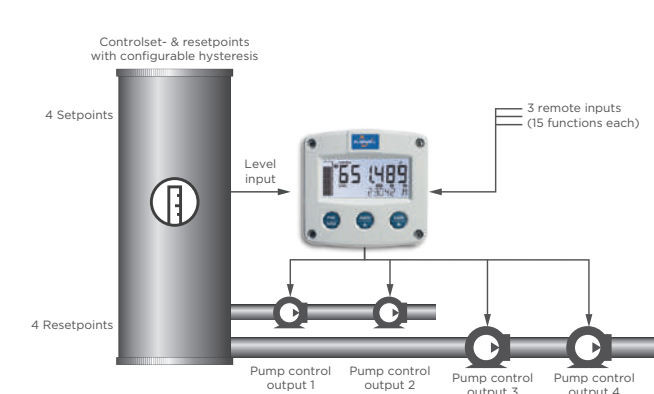
Level measurement where a strapping table / linearization of the tank shape and re-transmission of the level via the analog output or serial communication to an automation network is required. It can be set to transmit the actual level/height, volume, as analog input retransmission or it can be set to response according NAMUR NE43 error detection. All process data and settings can be read and modified through the Modbus communication.

Application examples F175 (continued)



Example 3: Level Monitoring

Level measurement where continuous level monitoring of high and low values is important. The configurable hysteresis modes allow full control of the set- and resetpoints of the alarm outputs. Up to 4 heavy duty, relay outputs are available to control the alarms devices. In case of an alarm condition, the bright backlight can be set to be red or flashing red.

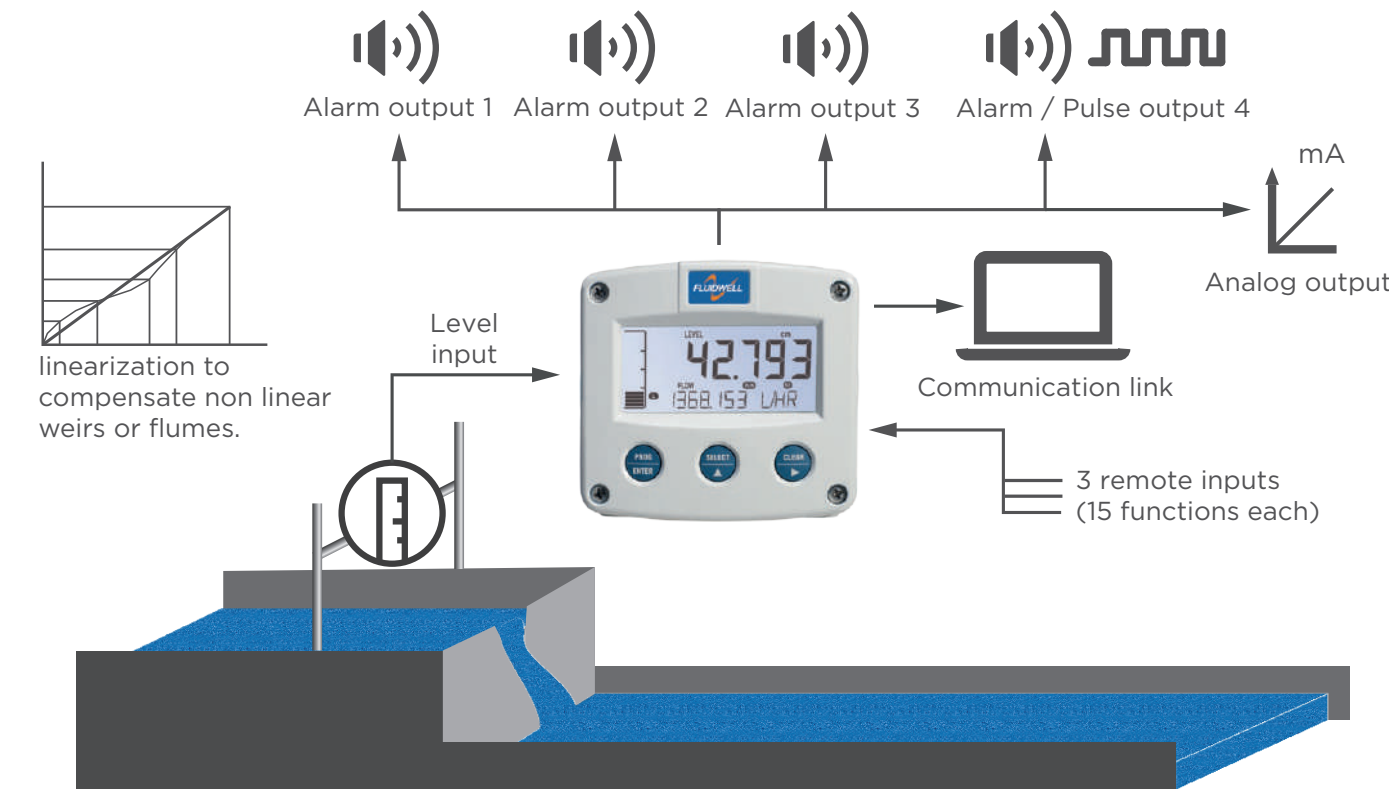


Example 4: Pump Controlling

Pump controller with 4 setpoints, 4 resetpoints and up to 4 heavy duty, relay pump control outputs to maintain the desired levels. **Advanced pump functions:** Fill and drain functions, pump group selections, alternating pump control on order or running hours, running hours displayed at the screen.

Example 5: Open Channel Flow rate Monitor / Totalizer

Flow rate monitoring with level instrumentation like open channel measurement. When the level input information is combined with the known physical characteristics of the channel the flow rate and total can be calculated, displayed and monitored with alarm values. Two flows (A / B) can be set from 1 level signal input. The channel characteristics can be set as a linear relationship, according a 48 point linearization table or with a calculation factor (often used for standard flumes / weirs). In addition to the alarm and control output functionality, one output can also be configured as a pulse and/or sampling pulse output.



Display

Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Dimensions	90 x 40mm (3.5" x 1.6").
Digits	Six 18mm (0.71") and eleven 8mm (0.31") digits. Various symbols and measuring units.
Bargraph	20 segments for level/height, volume or flow rate.
Refresh rate	User definable: fast, 1sec, 3sec, 15sec, 30sec, off.
Type ZB	Transflective LCD with bright LED-backlight. Intensity can be adjusted in the configuration menu. Red (flashing) backlight during alarm conditions. Improved readability in full sunlight and darkness.

Ambient temperature

Safe areas	-40°C to +70°C (-40°F to +158°F).
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Terminal connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm ² and 1.5mm ² .
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Data protection

Type	EEPROM backup of all settings. Backup of running totals every minute. Data retention at least 10 years.
Password	Configuration settings can be password protected.

Directives & Standards

EMC	EN 61326-1, EN 61000-6-2, EN 61000-6-3, 47 CFR Part 15
Low voltage	CSA/UL/IEC 61010-1 + A1
RoHS	EN IEC 63000
IP & NEMA	CSA C22.2 No. 94.2-15; UL 50E

Enclosure

Window	Polycarbonate window.
Sealing	Silicone.
Control keys	Three industrial micro-switch keys. UV-resistant silicone keypad.

Panel mount enclosures

Dimensions	130 x 120 x 60mm (5.12" x 4.72" x 2.36") - W x H x D.
Panel cut-out	115 x 98mm (4.53" x 3.86") L x H.
Type HB	Die-cast aluminum panel mount enclosure IP65 / Type4X.
Weight	600 gr.
Type HGC	GRP panel mount enclosure IP65 / Type4X, UV-resistant and flame retardant.
Weight	450 gr.
Type HSB	Die-cast stainless steel 316L IP67 / Type4X.
Weight	1150gr.

GRP wall / field mount enclosures

General	GRP wall/field mount enclosure IP67 / Type4X, UV-resistant and flame retardant.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.
Weight	600 gr.
Type HGD	Cable entry: no holes.
Type HGE	Cable entry: 2 x Ø 16mm and 1 x Ø 20mm.
Type HGF	Cable entry: 1 x Ø 22mm (7/8").
Type HGG	Cable entry: 2 x Ø 20mm.
Type HGH	Cable entry: 6 x Ø 12mm.
Type HGJ	Cable entry: 3 x Ø 22mm (7/8").
Type HGK	Flat bottom, cable entry: no holes.
Type HGQ	Cable entry: 1xØ20mm, 1 x Ø16mm & 3 x Ø12mm.

Aluminum wall / field mount enclosures

General	Die-cast aluminum wall/field mount enclosure IP67 / Type4X with 2-component UV-resistant coating. Extended back cover available.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D. 130 x 120 x 90mm (5.12" x 4.72" x 3.54") - W x H x D.
Weight	1100 gr. / extended enclosure: 1310 gr.
Type HA	Cable entry: 2 x PG9 and 1 x M20.
Type HL	Cable entry: 2 x 1/2" NPT.
Type HM/HBM	Cable entry: 2 x M16 and 1 x M20.
Type HN	Cable entry: 1 x M20.
Type HO/HBO	Cable entry: 2 x M20.
Type HP	Cable entry: 6 x M12.
Type HT	Cable entry: 1 x 1/2" NPT.
Type HU/HBU	Cable entry: 3 x 1/2" NPT.
Type HV	Cable entry: 4 x M20.
Type HZ	Cable entry: no holes.

Stainless steel 316L wall / field mount enclosures

General	Die-cast stainless steel 316L wall / field mount enclosure with flat bottom. IP67 / Type4X.
Dimensions	130 x 120 x 75mm (5.12" x 4.72" x 2.95") - W x H x D.
Weight	2700 gr.
Type HSM	Cable entry: 2 x M16 and 1 x M20.
Type HSO	Cable entry: 2 x M20.
Type HSU	Cable entry: 3 x 1/2" NPT.

Signal inputs - Level sensor

Type A	(0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA. The input signal is HART transparent.
Accuracy	Resolution: <0.01mA / 16 bit. Error <0.01% @ 20°C. Low level cut-off programmable and digital filter.
Span	0.00001 - 999,999 with max. 3 decimals.
Offset	-999,999 to 999,999 with max. 3 decimals.
Update time	Four times per second.
Calibration	Easy 4 -20mA input calibration, no multimeter required.
Direction	Sensor direction can be reversed when the open space in a tank is measured rather than the occupied space.
Conversion strapping table/ Linearization	Linear calculation of the volume with 48 points interpolation function, points defined as: [% volume] = [% level] or [volume] = [level].
Voltage drop	1V @ 20mA.
NAMUR NE43	Error detection for both high ($\geq 20.7\text{mA}$) and low ($\leq 3.6\text{mA}$) error signal. Detection can be disabled in the configuration menu.
Loop Link	Terminal for HART communicator connection.

Signal inputs - Remote control inputs

Type IR	Three configurable digital inputs: Non-isolated; Internally pulled-up switch contact - NPN. Minimum pulse duration 200 msec. Connected switches must be passive, maximum contact resistance 1kOhm.
Selectable functions	Configurable inputs: <ul style="list-style-type: none"> • Test mode: Screen indication without action • External alarm • Retransmit to control output • Clear level alarm outputs • Clear input latches • Relays ON • Relays OFF • Emergency Shut Down (E.S.D.) • Pump alarm indication • Pump flow indication • Pump change • Clear totalizer A / B / A & B • Keyboard lock • Pulse (sampling) • Enable flow A / B / A & B

Signal outputs - Communication option

Function	Reading display information, reading / writing all configuration settings.
Protocol	Modbus ASCII / RTU.
Speed	1200, 2400, 4800, 9600, 9600HP, 19200, 38400, 57600.
Addressing	1 - 247.
Type CB	RS232
Type CG	Isolated RS485 2-wire
Type CH	RS485 2-wire
Type CU	USB-C for remote configuration only (registers as COM-port in Windows).

Signal outputs - Control/alarm/pulse outputs

Function	<ul style="list-style-type: none"> • Alarm outputs: low-low, low, high, high-high or all. There is an optional clear alarm output function, e.g. to turn off an acoustic alarm. • Pump control outputs: Fill and drain function, group configuration and pump selection based on order or running pump hours. • Scaled pulse based on the totalizer value A/B. • Sampling pulse based on a time interval. • Remote control outputs: Retransmit the input signal or force outputs to be openen/closed.
Test mode	Each output can be activated in setup mode to test the wiring and performance of the outputs.
Hysteresis	A configurable hysteresis/deadband function for alarm values and control setpoints can be set: Balanced / Unbalanced / Absolute setpoints.
Error status	Activates outputs for certain alarms and errors.
Failure control	Override outputs to defined state in case of internal failure or sensor input failure.
Lockout	Lockout e.g. to put equipment into maintenance.
Signal generation	Inverted (fail-safe) operation and pulsing (0,5 Hz) possible.
Type OM	3 NO-NC (SPDT) heavy duty, mechanical relays. Max. switching power 230V AC / 30V DC, 4A per relay (resistive) / 2A per relay (inductive). Pilot duty: AC: B300, DC: R300.
Type OS	2 x NO-NC (SPDT) and 2 x NO (SPST), heavy duty, mechanical relays. Max. switching power 230V AC / 30V DC, 4A per relay (resistive) / 2A per relay (inductive). Pilot duty: AC: B300, DC: R300.

Signal outputs - Analog output

Function	Transmitting the actual level/height, volume, flow rate or analog input retransmission - it can be scaled to any range (e.g. 200m ³ to 1200m ³).
Accuracy	Resolution <0,001mA. 12 bit. Error < 0.03% @ 20°C (typical 45ppm/°C).
Update time	Eight times per second.
NAMUR NE43	Error signal generation for both high ($\geq 20.7\text{mA}$) and low ($\leq 3.6\text{mA}$) error signal. Sensor input retransmission incl. detected Namur errors. NAMUR NE43 can be disabled in the setup menu.
Test function	For testing during commissioning: Off - NAMUR error lo - 4 - 8 - 12 - 16 - 20mA - NAMUR error hi - full (max. current). Output will return to normal operation when operator leaves test function.
Type AA	Active 4 - 20mA output, max. 24V. Max. load 700 Ohm @ 24V.
Type AI	Isolated (passive) 4 - 20mA output.
Supply voltage	Type AI: 10V (lift-off voltage) - 27V DC

Power requirements

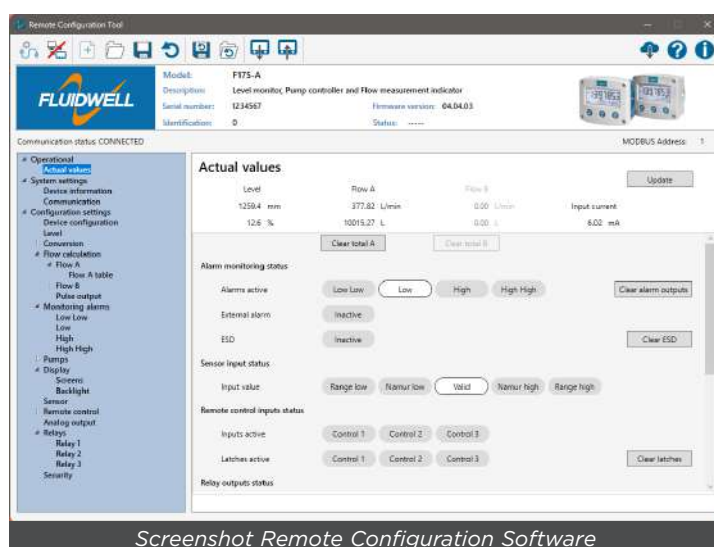
Type PF	12 - 24V AC $\pm$ 10%; Isolated; 12 - 30V DC $\pm$ 10%; Isolated; Power consumption max. 5 Watt.
Type PM	115 - 230V AC $\pm$ 10%; Isolated; Power consumption max. 5 Watt.

Sensor excitation

Type PF/PM	Regulated 24V DC - max. 50mA.
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Remote configuration

Function	Easy remote configuration with a special communication cable and our free software tool.
Type CB	Requires ACE07 cable with RS232 to USB plug.
Type CG/CH	Requires ACE06 cable with RS485 to USB plug.
Type CU	Requires a standard USB-C to USB-A/-C cable.



Screenshot Remote Configuration Software

Mounting accessories

ACF02	Stainless steel wall mounting kit.
ACF05	Stainless steel pipe mounting kit (worm gear clamps not included).
ACF06	Two stainless steel worm gear clamps $\varnothing$ 44 - 56mm.
ACF07	Two stainless steel worm gear clamps $\varnothing$ 58 - 75mm.
ACF08	Two stainless steel worm gear clamps $\varnothing$ 77 - 95mm.
ACF09	Two stainless steel worm gear clamps $\varnothing$ 106 - 138mm.

Remote configuration cable accessories

ACE06	Remote configuration cable (1.8m/5.9ft) for type CG and CH Modbus RS485 communication.
ACE07	Remote configuration cable (1.8m/5.9ft) for type CB Modbus RS232 communication.

Operator functions

Displayed info	<ul style="list-style-type: none"> Level / height (non-linearized). Volume (linearized / strapping table). Flow rate / Total. Percentage filled. Bargraph for level/height, volume or flow rate. 4 - 20mA input value. Alarm values: lo-lo / lo / hi / hi-hi. Alarm setpoints. Running pump control hours. Lockout status of digital outputs.
Additional functions	<ul style="list-style-type: none"> Configurable relay action for pump control. Pump control delay. Alarm value hysteresis. Configurable safety options: failsafe, test and loopfail options. Clearing activated alarm outputs.

Level / Height

Units	None, custom, in, Ft, Yd, mm, cm, dm, m or %.
Decimals	0 - 1 - 2 or 3.
Custom unit	Up to 5 characters.

Volume

Units	None, custom unit, in ³ , Ft ³ , Yd ³ , Qt, GAL, bbl, cm ³ , dm ³ , m ³ , cL, dL, L, hL or %.
Decimals	0 - 1 - 2 or 3.
Relationship Level/height	Linear calculation from level/height to volume with 48 points and interpolation.

Flow / Total

Units	None, in ³ , Ft ³ , Yd ³ , Qt, GAL, bbl, cm ³ , dm ³ , m ³ , cL, dL, L or hL.
Decimals	0 - 1 - 2 or 3.
Time units	/sec - /min - /hr - /day.
Relationship Level/height	Linear calculation from 1 x level/height to 2 x flow rate (A/B) with 48 points and interpolation.
Totalizer	Single or dual totalizer functions can be set. Total A and Total B can be reset to zero

Pump control

Function	Up to four pumps can be controlled.
Units	Like the settings for level/height/% or volume/%.
(Re)setpoints	-999.999 - 999.999 / 0.0% - 100.0%.
Pump functions	Tank filling, tank draining, small fill/drain pump selection, pump group selection on pump order or running hours, pump delays, no flow detection, recovery time delay.

Alarm values

Function	Four user defined alarm values to monitor the level/height, volume, percentage or flow A/B.
(Re)setpoints	-999.999 - 999.999 / 0.0% - 100.0%.
Type of alarm	Low-low, low, high, high-high or all level alarms. With alarm delay, ignore time and configurable alarm outputs.
Hysteresis types	Balanced / unbalanced / absolute setpoints.

	Description	
Model	F175	Level Monitor / Pump Controller / Open channel Flow Monitor with analog and control/alarm outputs.
Input	A	(0)4 - 20mA input.
Analog	AA	Active 4 - 20mA output.
	AI	Isolated (passive) 4 - 20 mA output.
Communication	CB	Communication RS 232 - Modbus ASCII / RTU.
	CG	Isolated communication RS 485 - 2wire - Modbus ASCII / RTU.
	CH	Communication RS 485 - 2wire - Modbus ASCII / RTU.
	CU	USB-C (for remote configuration only).
Enclosures	HB	Aluminum panel mount enclosure.
	HGC	GRP panel mount enclosure.
	HSB	Stainless steel 316L panel mount enclosure.
	HGD	GRP field mount - Cable entry: no holes.
	HGE	GRP field mount - Cable entry: 2 x Ø 16mm & 1 x Ø 20mm.
	HGF	GRP field mount - Cable entry: 1 x Ø 22mm ($\frac{7}{8}$ ").
	HGG	GRP field mount - Cable entry: 2 x Ø 20mm.
	HGH	GRP field mount - Cable entry: 6 x Ø 12mm.
	HGJ	GRP field mount - Cable entry: 3 x Ø 22mm ($\frac{7}{8}$ ").
	HGK	GRP field mount - Flat bottom, cable entry: no holes.
	HGQ	GRP field mount - Cable entry: 1 x Ø 20mm, 1 x Ø 16mm & 3 x Ø 12mm.
	HA	Aluminum field mount - Cable entry: 2 x PG9 + 1 x M20.
	HL	Aluminum field mount - Cable entry: 2 x $\frac{1}{2}$ "NPT.
	HM	Aluminum field mount - Cable entry: 2 x M16 + 1 x M20.
	HN	Aluminum field mount - Cable entry: 1 x M20.
	HO	Aluminum field mount - Cable entry: 2 x M20.
	HP	Aluminum field mount - Cable entry: 6 x M12.
	HT	Aluminum field mount - Cable entry: 1 x $\frac{1}{2}$ "NPT.
	HU	Aluminum field mount - Cable entry: 3 x $\frac{1}{2}$ "NPT.
	HV	Aluminum field mount - Cable entry: 4 x M20.
	HZ	Aluminum field mount - Cable entry: no holes.
	HBM	Extended Alu. field/meter mount - Cable entry: 2 x M16 + 1 x M20.
	HBO	Extended Alu. field/meter mount - Cable entry: 2 x M20.
	HBU	Extended Alu. field/meter mount - Cable entry: 3 x $\frac{1}{2}$ "NPT.
	HSM	Stainless steel 316L field mount - Cable entry: 2 x M16 + 1 x M20.
	HSO	Stainless steel 316L field mount - Cable entry: 2 x M20.
	HSU	Stainless steel 316L field mount - Cable entry: 3 x $\frac{1}{2}$ "NPT.
Additional	IR	Three configurable remote control inputs.
Digital	OM	Three NO-NC (SPDT) heavy duty, mechanical relays.
	OS	Two NO-NC (SPDT) and two NO (SPST), heavy duty, mechanical relays.
Power	PF	Isolated 12 - 30V DC / 12 - 24V AC + regulated 24V sensor supply.
	PM	Isolated 115 - 230V AC + regulated 24V sensor supply.
Hazardous	XX	Safe area only, according CE.
Options	ZB	Backlight is included as standard.

The **bold** marked text contains the standard configuration: F175-A-AI-CU-HGC-IR-OM-PM-XX-ZB.