

# BATCH CONTROLLER

WITH ONE STAGE CONTROL



## D-Series advantages

- Unique, robust IP66, IP67 (NEMA4X) panel mount front enclosure made of die cast aluminum, allowing even **big jets** of water and **total immersion**.
- Programming can be done by your own crew with the exact same, plain and sensible menu-driven structure like the F-Series, saving cost and irritation. **Know one, know them all!**

## Features

- Large display shows preset value and running batch value simultaneously.
- Self-learning overrun correction.
- Easy operation to enter a batch value and to control the process.
- Count-up and count-down function available.
- Selectable on-screen engineering units; volumetric or mass.
- Operational temperature -40°C up to +80°C (-40°F up to 176°F).
- LED backlight option.
- Input loop powered, battery powered or 8 - 30V DC, 24V AC and 115 - 230V AC.
- Sensor supply 1.2 / 3 / 8.2 / 12 / 24V DC.

## Signal output

- One control output for one-stage batching, available as passive signal, active signal or a robust, highly isolated (NO/NC) relay.

## Signal input

### Flow

- Reed-switch.
- NAMUR.
- NPN/PNP pulse.
- Sine wave (coil).
- Active pulse signals.
- (o)4 - 20mA / 0 - 10V DC.

## Applications

- The D-Series is a DIN-sized display and the **better alternative** for your existing, not waterproof, front panel mount indicators in extreme weather outdoor applications or e.g. in food industries where working environments are often cleaned with powerful water jets.
- The D030 fits in batching applications of small up to very large quantities with single or repeating batches. Alternative models: F-Series batch

## General information

### Introduction

The Do30 is a straight forward but basic, panel mount batch controller. The operator can enter a batch quantity easily or execute repeating batches. During the batch, the preset value is displayed as well as the batched (or remaining) quantity and the units of measurement. The automatic self-learning overrun correction will ensure an accurate result each batch again.

### Display

The display has large 17mm (0.67") and 8mm (0.31") digits which are used to display the batched quantity and the preset value simultaneously. On-screen engineering units are easily configured from a comprehensive menu. A seven digit resettable "day total" is available as well as an eleven digit non-resettable accumulated total. All are backed-up in EEPROM memory every minute. The display is a transfective type, which means that a high contrast reading is guaranteed, even in full sunlight. The Do30 has a smart display update function incorporated. Related to the lower temperatures, the update frequency of the LCD is tuned automatically to achieve a readable display even at -40°C / -40°F.

### Backlight

For those applications where readability during day and night is an issue, a bi-color backlight is available. The background color green or amber and the intensity can be adjusted in the configuration menu.

### Configuration

All configuration settings are accessed via a simple operator menu which can be pass-code protected. Each setting is clearly indicated with an alphanumerical description, which avoids confusing abbreviations. Once familiar with one D-series product, you will be able to program **all models in all series** without a manual. All settings are safely stored in EEPROM memory in the event of sudden power failure.

### Control output

One output is available for one stage control of smaller batch volumes. The output signal can be a passive NPN, active PNP or a robust, highly isolated electro-mechanical relay (NO/NC).

### Signal input

The Do30 accepts most pulse and analog input signals for volumetric flow or mass flow measurement. The input signal type can be selected by the user in the configuration menu without having to adjust any sensitive mechanical dip-switches, jumpers or trimmers. The analog input version is even available as 4 - 20mA input loop powered display.

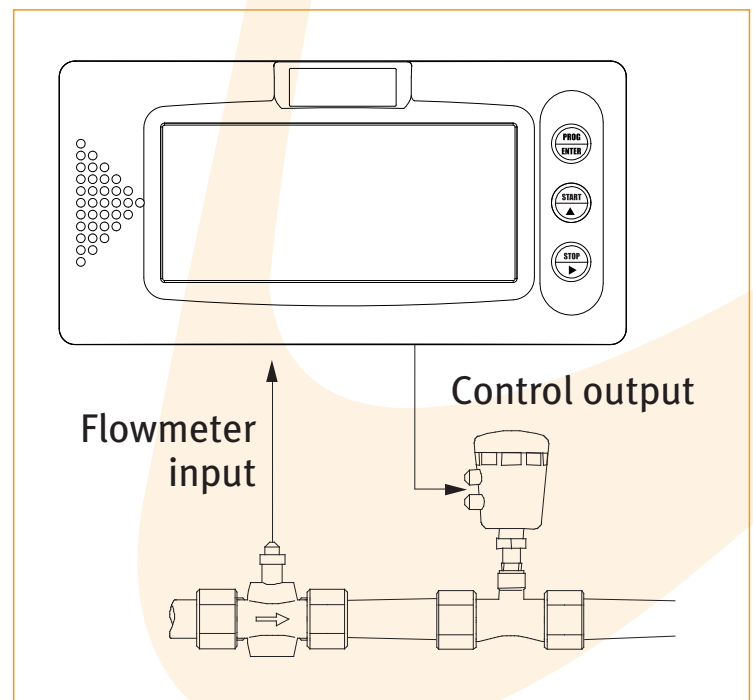
### Power supply

The basic power supply for the Do30 is 8 - 30V DC. Several other power supplies are available: With the 24V AC/DC and 115 - 230V AC power supplies, an 8.2 / 12 / 24V DC sensor supply is offered. For analog sensors, a 4 - 20mA input loop powered version is available. Finally we offer a long life lithium battery with a life expectancy that will last up to five years.

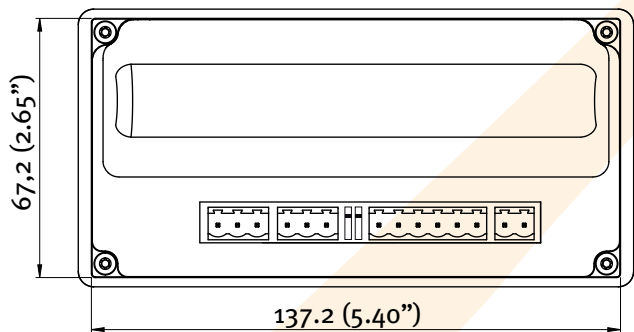
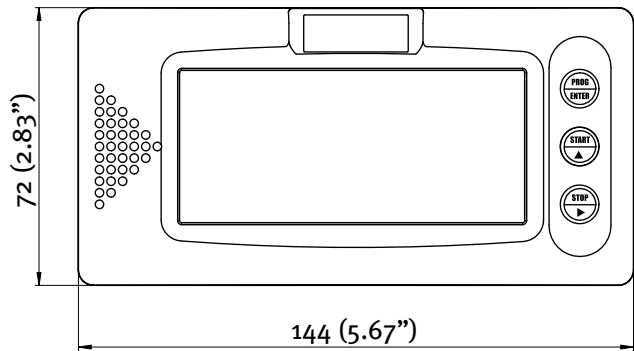
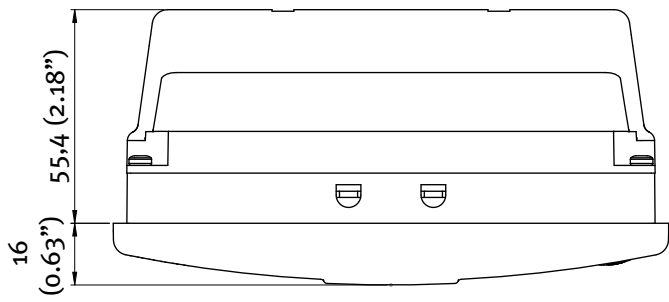
### Enclosure

The Do30 is supplied in a unique, robust IP66, IP67 (NEMA4X) class panel mount front enclosure made of die cast aluminum, based on a popular DIN sized enclosure of 144 x 72mm. The front enclosure withstands powerful water jets and even total immersion. The maximum thickness of the panel is 6mm (1/4"). The D-Series is the better alternative for your existing, not waterproof, front panel mounted indicators.

## Overview application Do30

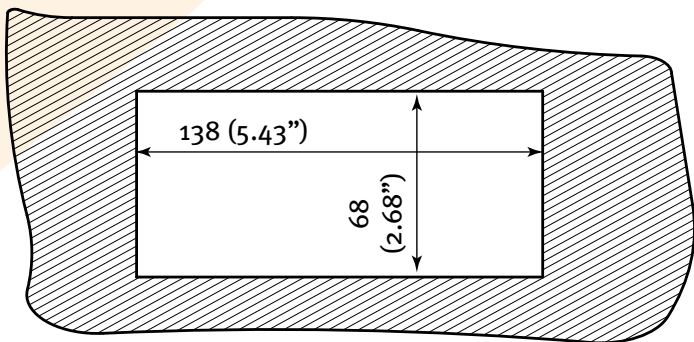


## Dimensions enclosure



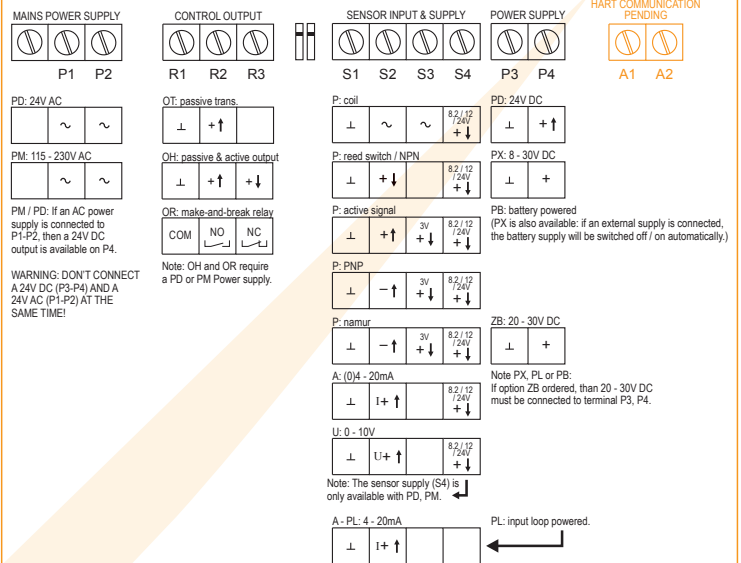
Dimensions according DIN 43700 / IEC 61554

## Dimensions panel cut-out

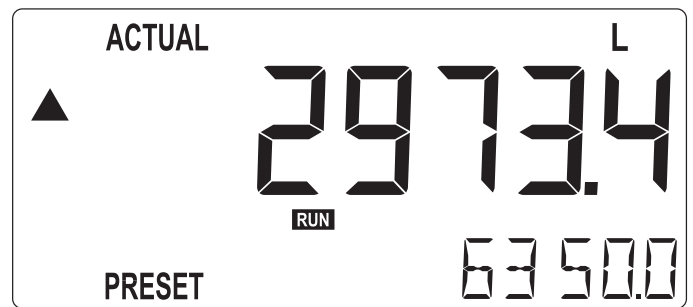


Maximum panel thickness: 6mm (1/4")

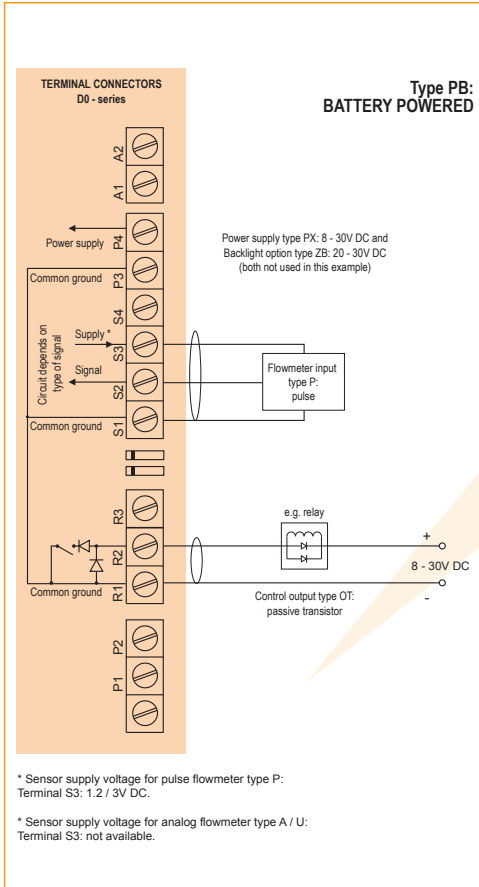
## Terminal connections Do30



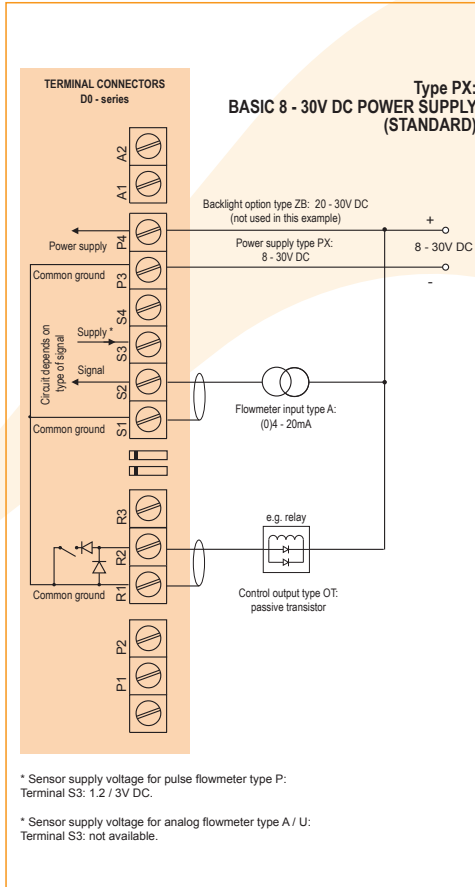
## Display example - 90 x 40mm (3.5" x 1.6")



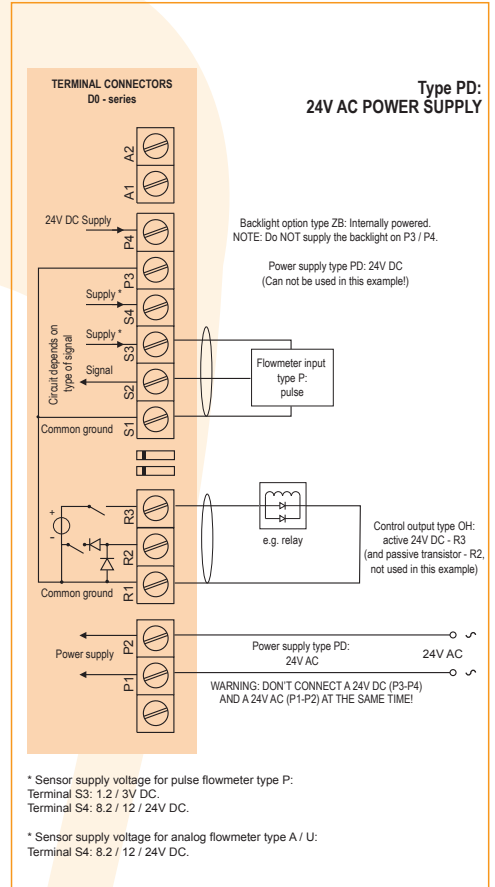
### Wiring diagram Do30-P-OT-PB-(PX)-(ZB)



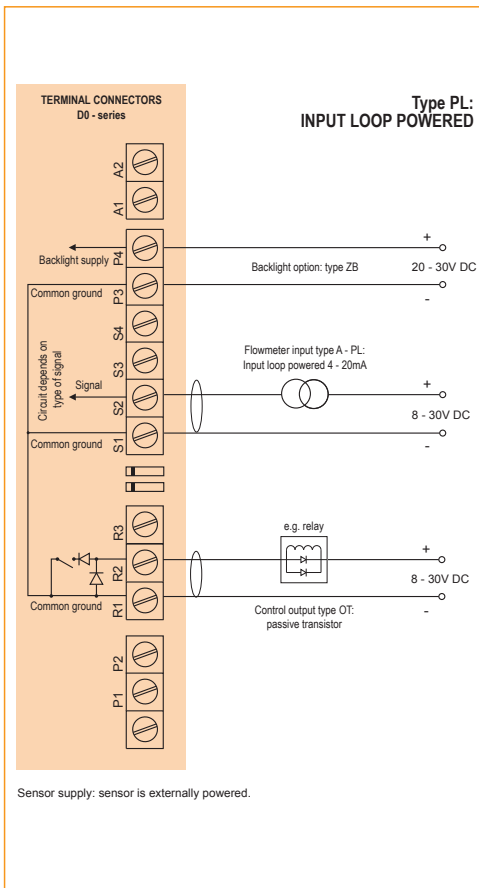
### Wiring diagram Do30-A-OT-PX-(ZB)



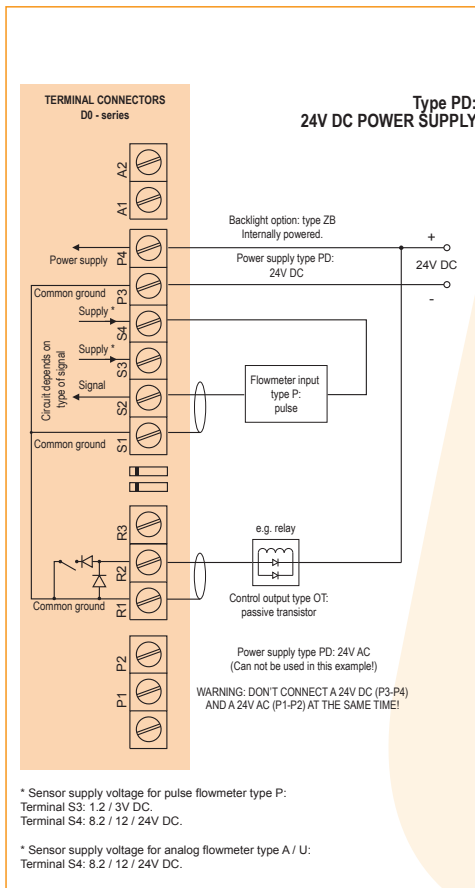
### Wiring diagram Do30-P-OH-PD-ZB



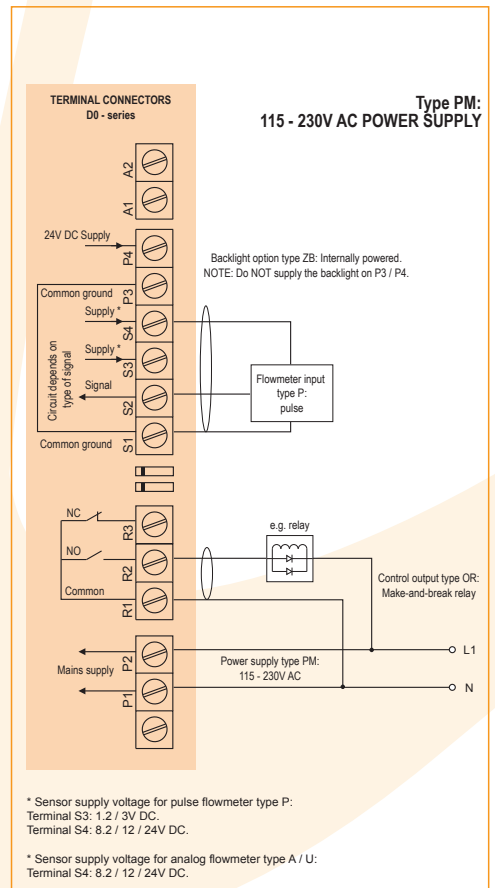
### Wiring diagram Do30-A-OT-PL-ZB



### Wiring diagram Do30-P-OT-PD-ZB



### Wiring diagram Do30-P-OR-PM-ZB



## Technical specification

### General

Display	
Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
Dimensions	90 x 40mm (3.5" x 1.6").
Digits	Seven 17mm (0.67") and eleven 8mm (0.31") digits. Various symbols and measuring units.
Refresh rate	User definable: fast, 1sec, 3sec, 15sec, 30sec, off.
Option ZB	Transflective LCD with bi-color LED-backlight; green / amber. Intensity and color can be adjusted in the configuration menu. Good readings in full sunlight and darkness.

### Operating temperature

Standard unit	-40°C to +80°C (-40°F to +176°F).
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### Environment

Electromagnetic compatibility	Compliant ref: EN 61326 (1997), EN 61010-1 (1993).
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### Power requirements

Type PB	Long life Lithium battery - life-time depends upon settings and configuration - up to 5 years.
Type PD	24V AC/DC $\pm 10\%$ . Power consumption max. 10 Watt.
Type PL	Input loop powered from sensor signal 4 - 20mA (requires type A).
Type PM	115 - 230V AC $\pm 10\%$ . Power consumption max. 15 Watt.
Type PX	8 - 30V DC. Power consumption max. 0.3 Watt.
Type ZB	20 - 30V DC. Power consumption max. 1 Watt. With type PD / PM: internally powered.

### Sensor excitation

Type PB/PX	3V DC for pulse signals and 1.2V DC for coil pick-up.
Note	This is not a real sensor supply. Only suitable for sensors with a very low power consumption like coils (sine wave) and reed-switches.
Type PD / PM	for pulse signals: 1.2 / 3 / 8.2 / 12 / 24V DC For analog signals: 8.2 / 12 / 24V DC 8.2V DC, I <sub>out</sub> max. 35mA @ 20°C. 12V DC, I <sub>out</sub> max. 50mA @ 20°C. 24V DC, I <sub>out</sub> max. 75mA @ 20°C. (this voltage can vary depending on the input supply voltage)
Note PD/PM	Total consumption of sensor, active output OH and backlight may not exceed 75mA @ 24V DC @ 20°C.

### Data protection

Type	EEPROM backup of all settings. Data retention at least 10 years.
Pass-code	Configuration settings can be pass-code protected.

### Casing

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

### Panel mount enclosure

Dimensions	144 x 72 x 71.4mm (5.67" x 2.83" x 2.81") - W x H x D according DIN 43700 / IEC 61554.
Panel cut-out	138 x 68mm (5.43" x 2.68") L x H.
Material	Die-cast aluminum front panel + GRP back enclosure
Protection	IP66, IP67 (NEMA 4X) at the front-side.
Weight	325 gr.
Panel thickness	Max. 6mm (1/4").

### Signal input

Flowmeter sensor	
Type P	Coil / sine wave (minimum 20mVpp or 80mVpp - sensitivity selectable), NPN/PNP, open collector, reed-switch, Namur, active pulse signals 8.2 - 12 - 24V DC.
Frequency	Minimum 0Hz - maximum 7kHz for total and flow rate. Maximum frequency depends on signal type and internal low-pass filter. E.g. reed switch with low-pass filter: max. frequency 120Hz.
K-Factor	0.000010 - 9,999,999 with variable decimal position.
Low-pass filter	Available for all pulse signals.
Option ZF	coil sensitivity 10mVpp.
Option ZG	coil sensitivity 5mVpp.
Type A	(0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA.
Type U	0 - 10V DC. Analog input signal can be scaled to any desired range within 0 - 10V DC.
Accuracy	Resolution: 16 bit. Error < 0.01mA / $\pm 0.05\%$ FS. Low level cut-off programmable.
Span	0.001 / 999,999 with variable decimal position.
Update time	Four times per second.
Voltage drop	Type A: max. 1V DC @ 20mA.
Voltage drop	Type A - PL (loop powered): max. 2.6V DC @ 20mA.
Load impedance	Type U: 3k $\Omega$ .
Relationship	Linear and square root calculation.
Note	For signal type A and U: external power to sensor is required; e.g. type PD / PM.

### Signal output

Control output	
Function	Control output according the batch process.
Type OH	<ul style="list-style-type: none"> <li>Active 24V DC transistor output (PNP); Load max. 75mA. Requires PD/PM.</li> <li>Passive transistor output (NPN) - not isolated; Max. 24V DC - 300mA per output. Requires PD/PM.</li> </ul>
Type OR	Isolated electro-mechanical relay (NO/NC). Req. PD/PM. Maximum resistive load: 2A @ 250V AC / 30V DC. Maximum inductive load: 0.5A (pilot duty applications)
Note OR	In case of inductive load, use RC snubbers.
Type OT	Passive transistor output (NPN) - not isolated. Max. 50V DC - 300mA per output.

### Operational

Operator functions	
Displayed functions	<ul style="list-style-type: none"> <li>Preset value - can be entered by the operator.</li> <li>Batched quantity or remaining quantity.</li> <li>Total and accumulated total.</li> <li>Total can be reset to zero by pressing the STOP-key twice.</li> </ul>

### Preset and total

Digits	7 digits.
Units	L, m <sup>3</sup> , GAL, USGAL, kg, lb, bbl, no unit.
Decimals	0 - 1 - 2 or 3.
Note	Total can be reset to zero.

### Accumulated total

Digits	11 digits.
Units / decimals	According to selection for total.
Note	Can not be reset to zero.

## Ordering information

Standard configuration: D030-P-HB-OT-PX-ZX.

ordering information:	D030	-	-	-HB	-O	-	-P	-	-Z	-
<b>Flowmeter input signal</b>										
A	(0)4 - 20mA input.									
P	<b>Pulse input: coil, npn, pnp, namur, reed-switch.</b>									
U	0 - 10V DC input.									
<b>Panel mount front enclosure - IP66, IP67 (NEMA4X)</b>										
HB	<b>Aluminum DIN 43700 / IEC 61554 front panel.</b>									
<b>Control output</b>										
OH	Active and passive transistor output - requires PD / PM.									
OR	Highly isolated mechanical relay output - requires PD / PM.									
OT	<b>Passive transistor output - standard configuration.</b>									
<b>Power supply</b>										
PB	Lithium battery powered.									
PD	24V AC / DC + sensor supply.									
PL	Input loop powered from sensor signal 4 - 20mA - requires type A.									
PM	115 - 230V AC + sensor supply.									
PX	<b>Basic power supply 8 - 30V DC (no real sensor supply).</b>									
<b>Other options</b>										
ZB	Backlight.									
ZF	Coil input 10mVpp - requires type P.									
ZG	Coil input 5mVpp - requires type P.									
ZX	<b>No options.</b>									

The bold marked text contains the standard configuration.

Specifications are subject to change without notice.