

# FLOW RATE INDICATOR / TOTALIZER

DISPLAYS FLOW RATE AND TOTAL  
SIMULTANEOUSLY



## D-Series advantages

- Unique, robust IP66, IP67 (NEMA4X) class panel mount 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

- Displays flow rate, total and accumulated total.
- Large 17mm (0.67") digits for flow rate or total.
- Selectable on-screen engineering units.
- Ability to process all types of flowmeter signals.
- Auto backup of settings and running totals.
- 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 are pending.*
- Sensor supply 1.2 / 3 / 8.2 / 12 / 24V DC.

## 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, 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 Do12 fits in flow measurement applications where a local flow rate indication and totalizer function is required without re-transmission functionality. Alternative basic models Do10 and Do11 or more advanced Do13, Do14, Do16 or the F-Series flow rate indicators.

## General information

### Introduction

The Do12 is a local, panel mount indicator to display the actual flow rate, total and accumulated total. The total can be reset to zero by pressing the CLEAR button twice. The eleven digit accumulated total however can not be reset to zero.

The measuring unit to be displayed is simply selected through an alpha-numerical configuration menu. No adhesive labels have to be put on the outside of the enclosure: a weather proof and user-friendly solution!

### Display

The display has large 17mm (0.67") and 8mm (0.31") digits which can be set to show flow rate and / or totals. On-screen engineering units are easily configured from a comprehensive selection. The accumulated total can register up to 11 digits and is backed-up in EEPROM memory every minute, just as the running total. The display is a transfective type, which means that a high contrast reading is guaranteed, even in full sunlight. The Do12 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 can be set to 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 alphanumeric description, which avoids confusing abbreviations and baffling codes. 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.

### Signal input

The Do12 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.

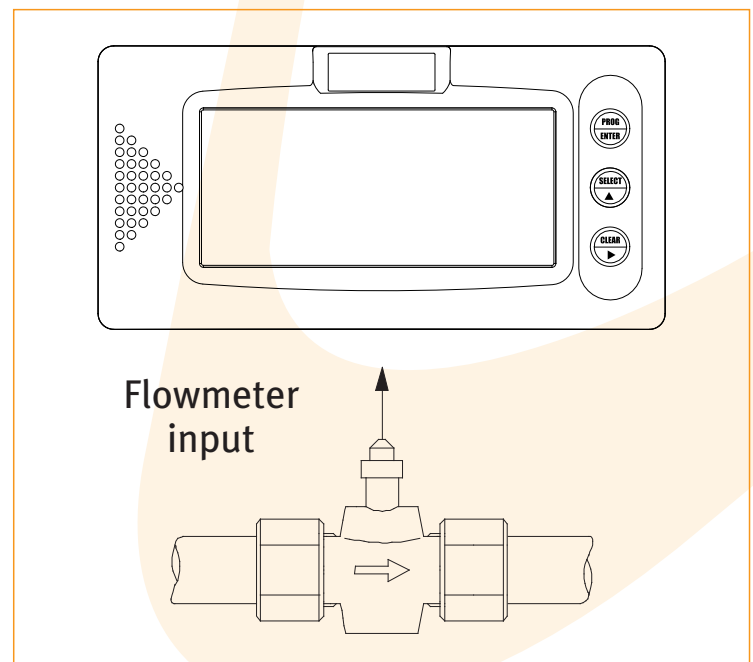
### Power supply

The basic power supply for the Do12 is 8 - 30V DC. Several other power supplies are available: With the 24V DC power supply, an 8.2 / 12 / 24V DC sensor supply is offered (**just as the pending 24V AC and 115 - 230V AC power supplies**). 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.

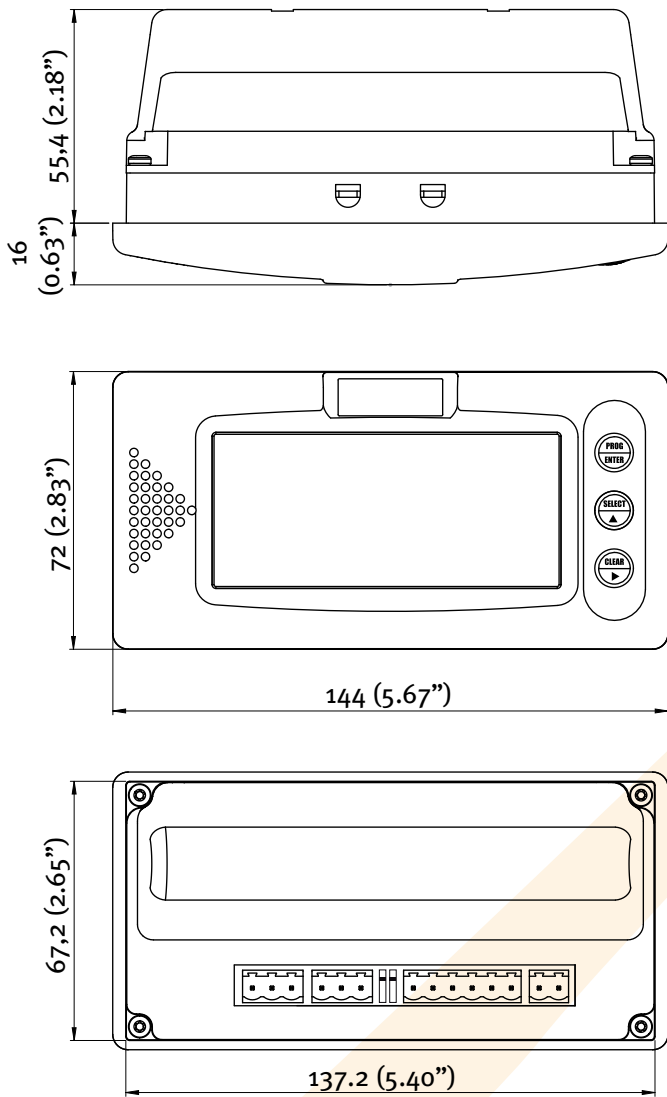
### Enclosure

The Do12 is supplied in a unique, robust IP66, IP67 (NEMA4X) class panel mount enclosure made of die cast aluminum,, based on a popular DIN sized enclosure with a 144 x 72mm front. The 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, panel mounted indicators.

## Overview application Do12

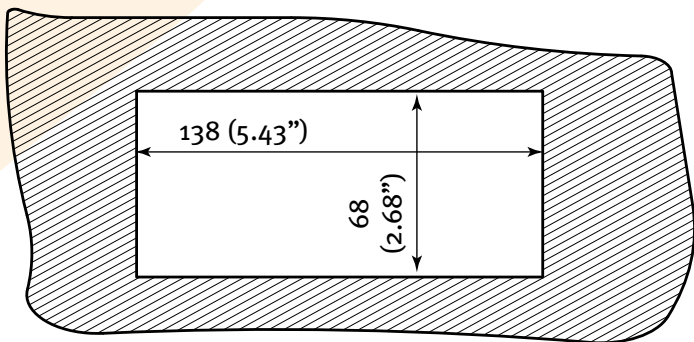


## Dimensions enclosure



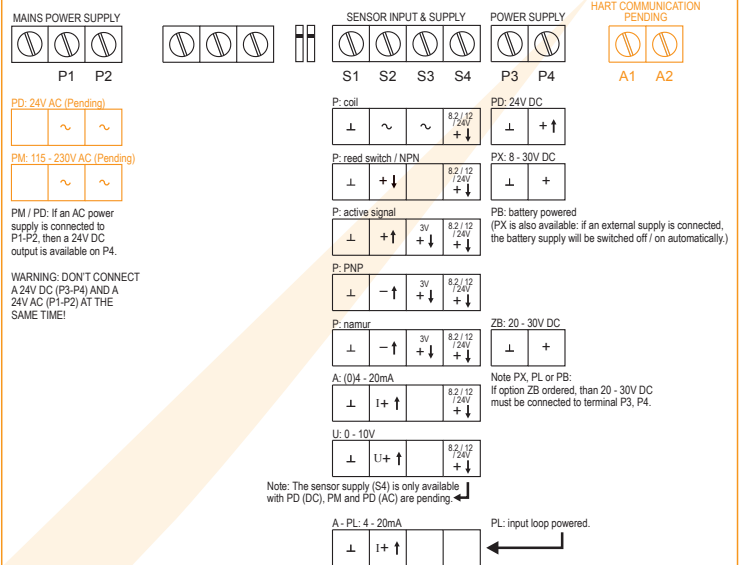
Dimensions according DIN 43700 / IEC 61554

## Dimensions panel cut-out



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

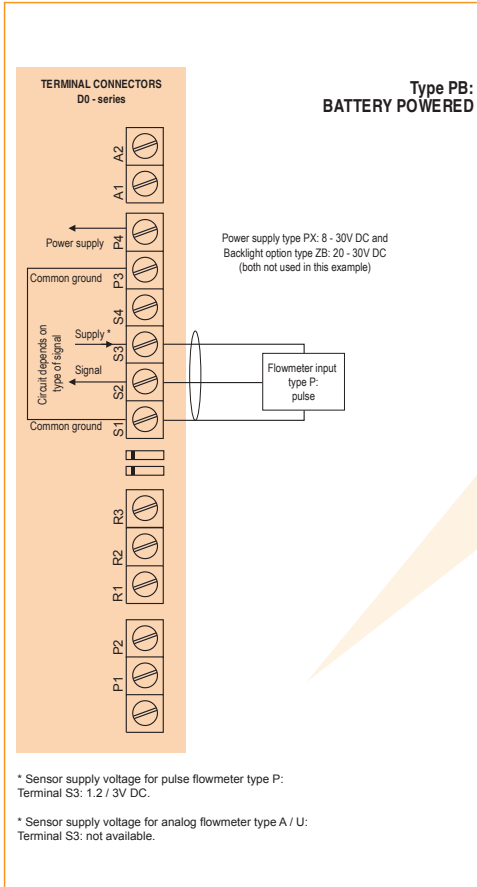
## Terminal connections Do12



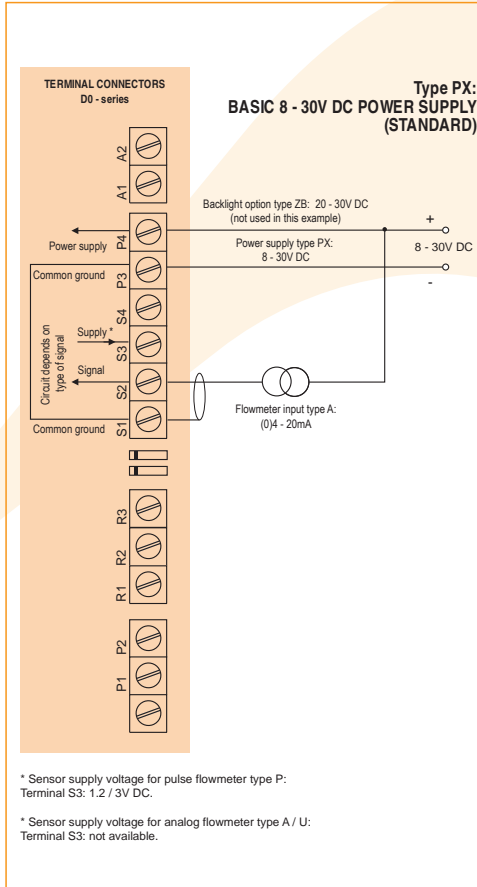
## Display example - 90 x 40mm (3.5" x 1.6")



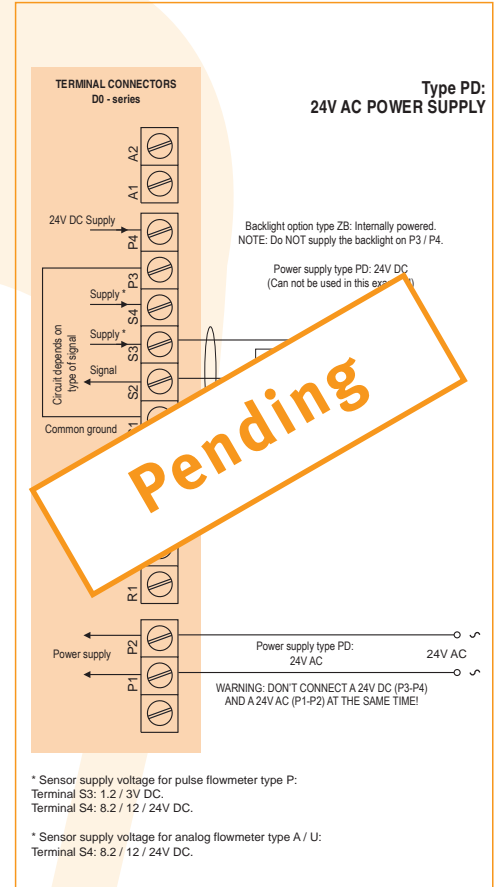
### Wiring diagram Do12-P-PB-(PX)-(ZB)



### Wiring diagram Do12-A-PX-(ZB)

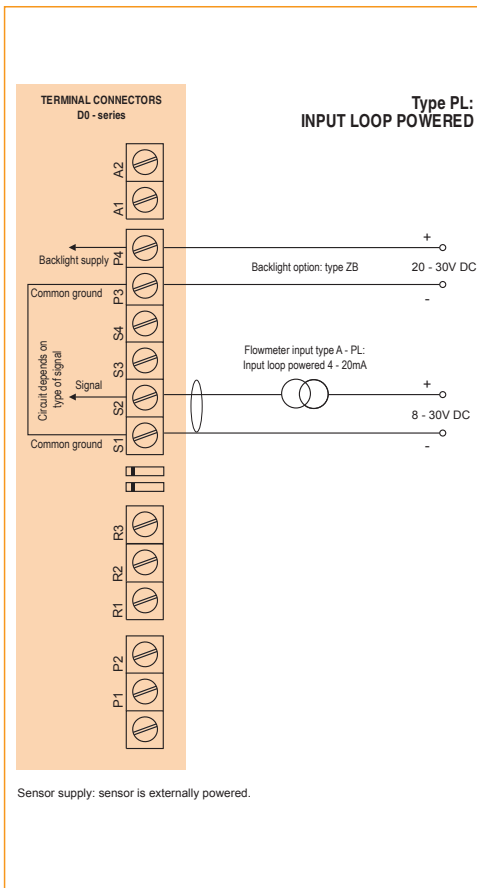


### Wiring diagram Do12-P-PD-ZB

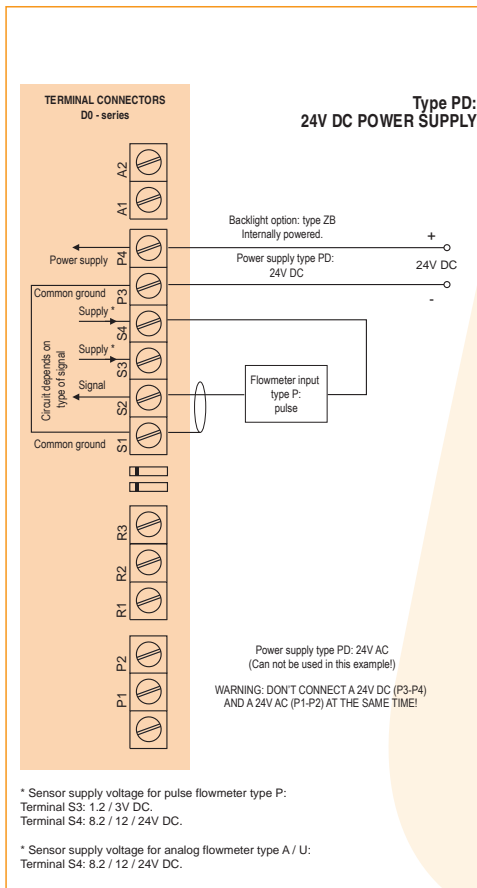


Pending

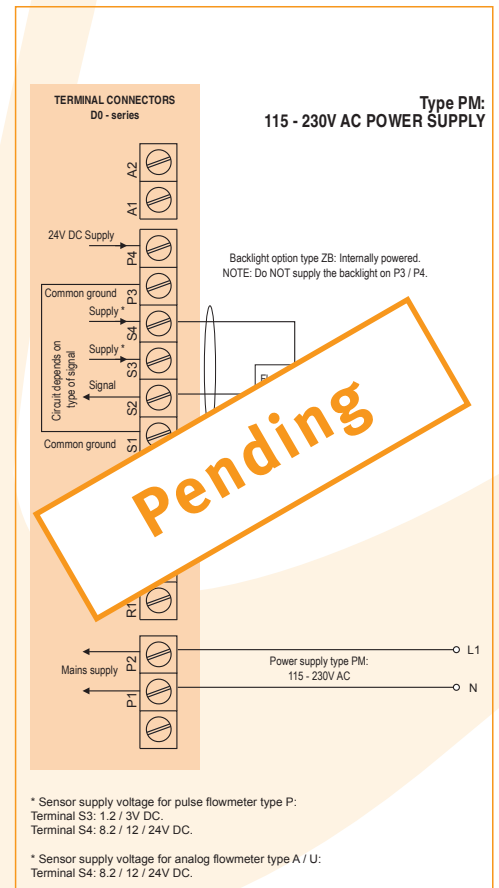
### Wiring diagram Do12-A-PL-ZB



### Wiring diagram Do12-P-PD-ZB



### Wiring diagram Do12-P-PM-ZB



Pending

## 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: 8 times/sec. - 1time/30 secs - 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 DC $\pm$ 10%. Power consumption max. 1 Watt. <b>24V AC is pending.</b>
Type PL	Input loop powered from sensor signal 4 - 20mA (requires type A).
Type PM	<b>115 - 230V AC <math>\pm</math> 10% is pending.</b> Power consumption max. 1 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 (DC)	for pulse signals: 1.2 / 3 / 8.2 / 12 / 24V DC For analog signals: 8.2 / 12 / 24V DC max. 35mA @ 8.2V DC @ 20°C. max. 50mA @ 12V DC @ 20°C. max. 75mA @ 24V DC @ 20°C.
Note	The PD (AC) and PM are pending.

### Terminal connections

Type	Removable plug-in terminal strip. Wire max. 1.5mm <sup>2</sup> and 2.5mm <sup>2</sup> .
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### 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).
Weight	325 gr.
Panel thickness	Max. 6mm (1/4").

### CSignal 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 - 12 and 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. 2V 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.

### Operational

Operator functions	
Displayed functions	<ul style="list-style-type: none"> <li>Flow rate and / or total.</li> <li>Total and accumulated total.</li> <li>Total can be reset to zero by pressing the CLEAR-key twice.</li> </ul>

### 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.

### Flow rate

Digits	7 digits.
Units	mL, L, m <sup>3</sup> , Gallons, kg, Ton, lb, bl, cf, RND, ft <sup>3</sup> , scf, Nm <sup>3</sup> , NL, ical - no units.
Decimals	0 - 1 - 2 or 3.
Time units	/sec - /min - /hr - /day.

## Ordering information

Standard configuration: D012-P-HB-PX-ZX.

ordering information:		D012	-	-HB	-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 enclosure - IP66, IP67 (NEMA4X)</b>						
HB	<b>Aluminum DIN 43700 / IEC 61554 front panel.</b>					
<b>Power supply</b>						
PB	Lithium battery powered.					
PD	24V DC + sensor supply. (24V AC is pending)					
PL	Input loop powered from sensor signal 4 - 20mA - requires type A.					
PM	115 - 230V AC + sensor supply. (Pending)					
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.

