

LEVEL INDICATOR

WITH VERY LARGE DIGITS



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 level and height or percentage filled.
- Very large 26mm (1") digits.
- Piegraph indication: ten segments.
- Number of digits for level: 5 1/2.
- Selectable on-screen engineering units; volumetric or mass.
- Operational temperature -40°C up to +80°C (-40°F up to 176°F).
- Auto backup of all settings.
- LED backlight option.
- Input loop powered, battery powered or 8 - 30V DC.
24V AC and 115 - 230V AC are pending.
- Sensor supply 8.2 / 12 / 24V DC.

Signal input

Level

- (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 D070 fits in applications where a basic level measurement display is required without level monitoring and linearisation. More sophisticated models: D073, D074, D077 or the **F-Series** level indicators.

General information

Introduction

The Do70 is a straight forward, panel mount level indicator. The measuring unit to be displayed is simply selected through an alfa-numerical configuration menu. No adhesive labels have to be put on the outside of the enclosure: a weather proof and user friendly solution!

The configuration of the Span, off-set and number of decimals is done through software functions, without any sensitive dip-switches or trimmers.

Display

The display has very large 26mm (1") digits which can be set to show level and height or percentage filled. The display is a transfective type, which means that a high contrast reading is guaranteed, even in full sunlight. The Do70 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 alphanumeric 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.

Signal input

The Do70 does accept (0)4 - 20mA and 0 - 10V input signals from any type of level measurement device. 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. Also a 4 - 20mA input loop powered model is available.

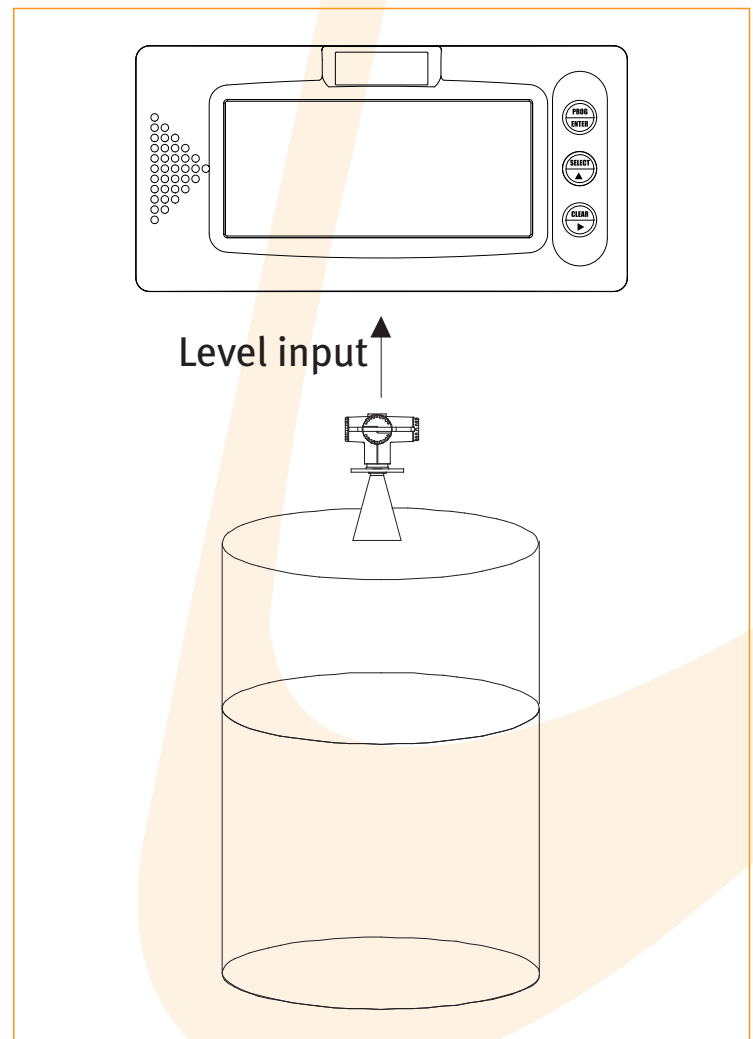
Power supply

The basic power supply for the Do70 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.

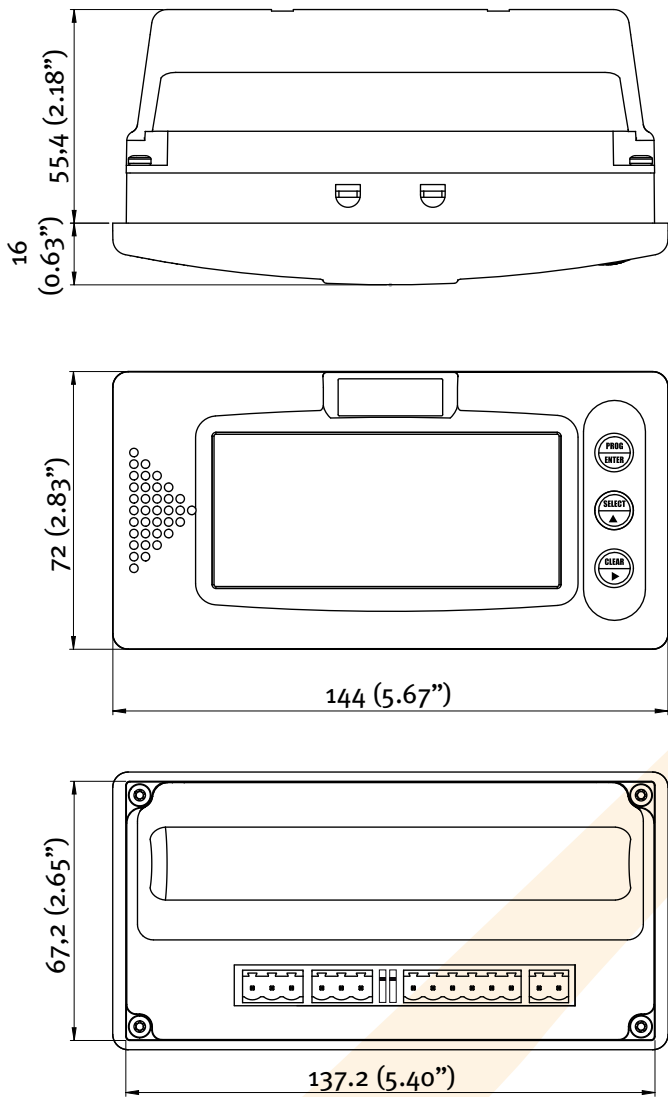
Enclosure

The Do70 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 Do70

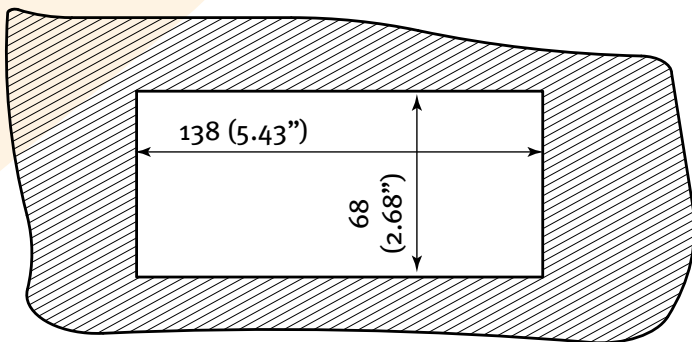


Dimensions enclosure



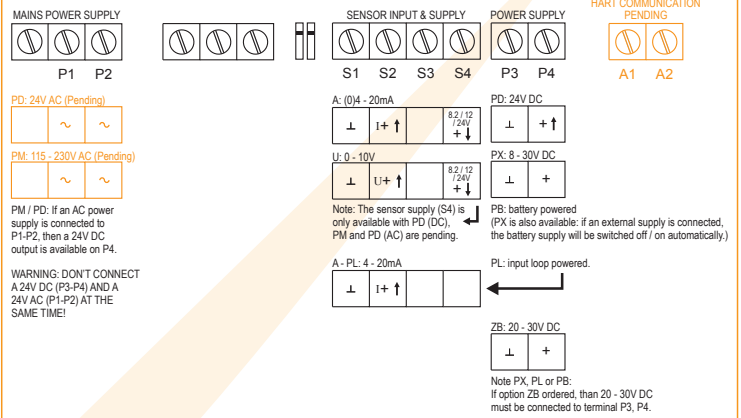
Dimensions according DIN 43700 / IEC 61554

Dimensions panel cut-out



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

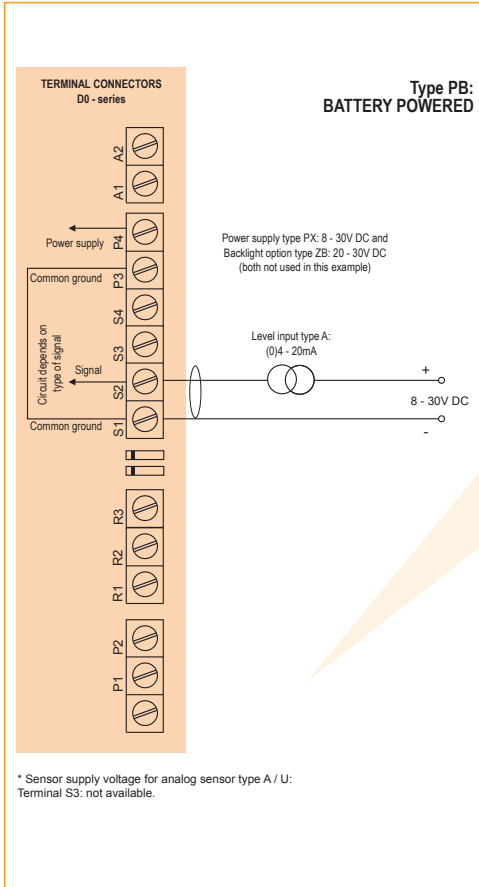
Terminal connections Do70



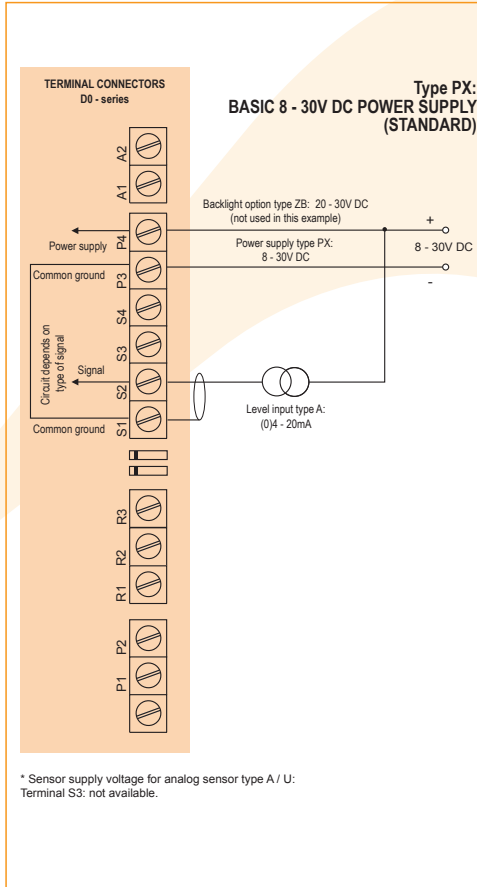
Display example - 90 x 40mm (3.5" x 1.6")



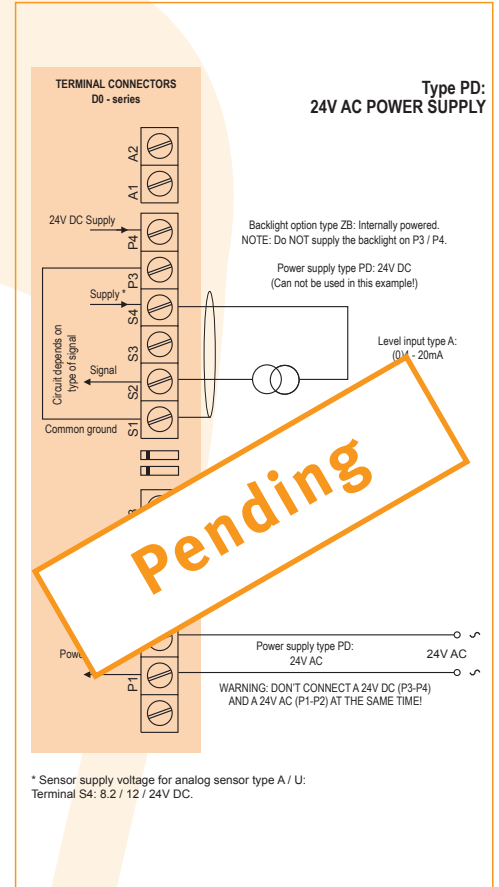
Wiring diagram Do70-A-PB-(PX)-(ZB)



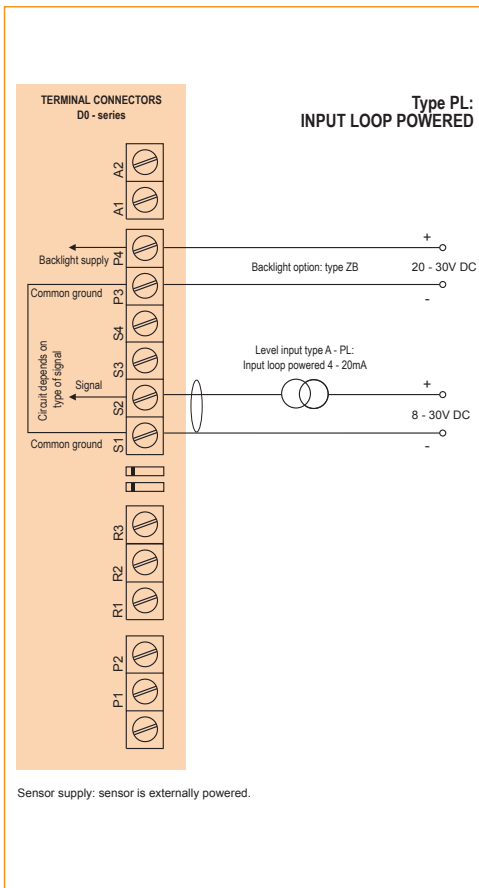
Wiring diagram Do70-A-PX-(ZB)



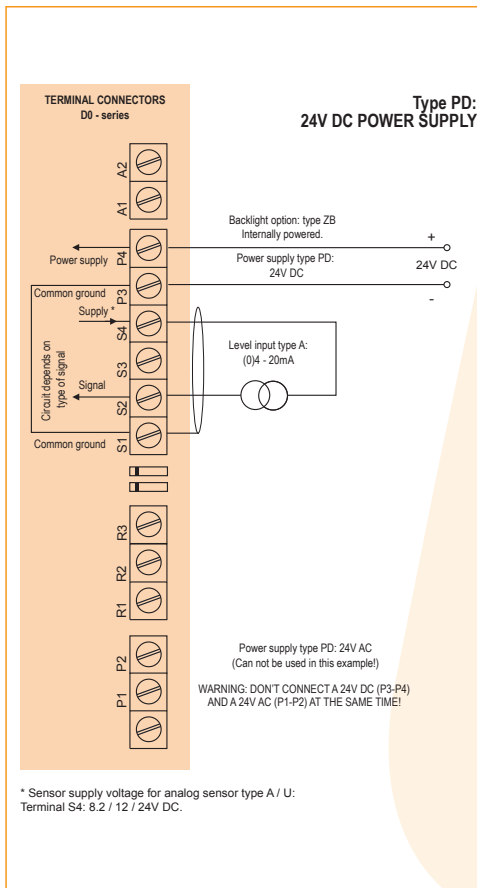
Wiring diagram Do70-A-PD-ZB



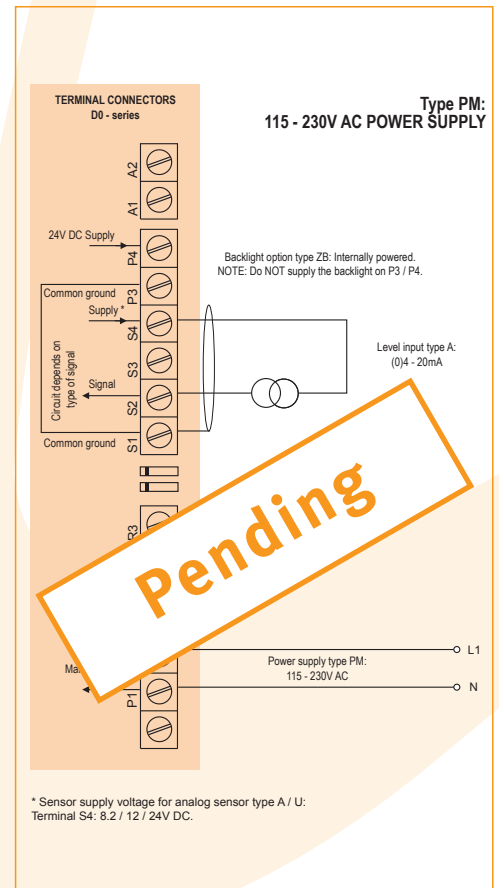
Wiring diagram Do70-A-PL-ZB



Wiring diagram Do70-A-PD-ZB



Wiring diagram Do70-A-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	5½ very large 26mm (1") digits. Various symbols and measuring units.
Piegraph	Ten segments - related to the input signal.
Refresh rate	User definable: 8 times/sec. - 1 time/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).

Environment

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

Power requirements

Type PB	Long life Lithium battery - life-time depends upon settings and configuration - up to 5 years.
Type PD	24V DC ± 10%. Power consumption max. 1 Watt. <i>24V AC is pending.</i>
Type PL	Input loop powered from sensor signal 4 - 20mA (requires type A).
Type PM	<i>115 - 230V AC ± 10% is pending.</i> <i>Power consumption max. 1 Watt.</i>
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	Not available.
Type PD (DC)	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 ² and 2.5mm ² .
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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 (¼").

Signal input

Level sensor	
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 / ± 0.05% FS. Low level cut-off programmable.
Span	0.001 / 199,999 with variable decimal position.
Offset	-99,999 / +199,999 units.
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: 3kΩ.
Relationship	Linear and square root calculation.
Note	For signal type A and U: external power to sensor is required; e.g. type PD / PM.
Note	Span for height is 0.01 / 199,999 with variable decimal position.

Operational

Operator functions	
Displayed functions	<ul style="list-style-type: none"> Level. Height or percentage (or no indication).

Level	
Digits	5½ digits.
Units	L, m ³ , GAL, USGAL, kg, lb, bbl, no unit.
Decimals	0 - 1 - 2 or 3.

Height	
Digits	6 digits.
Units	mm, cm, m, mtr, inch, ft, mmwk, mmwc, cmwk, cmwc, mwk, mwc, inwc, ftwc, mbar, bar, psi, no unit.
Decimals	0 - 1 or 2.

Percentage	
Digits	3 digits.
Decimals	1.

Ordering information

Standard configuration: D070-A-HB-PX-ZX.

ordering information:		D070	-	-HB	-P	-Z
Level input signal						
A	(0)4 - 20mA input.					
U	0 - 10V DC input.					
Panel mount enclosure - IP66, IP67 (NEMA4X)						
HB	Aluminum DIN 43700 / IEC 61554 front panel.					
Power supply						
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	Basic power supply 8 - 30V DC (no real sensor supply).					
Other options						
ZB	Backlight.					
ZX	No options.					

The bold marked text contains the standard configuration.

