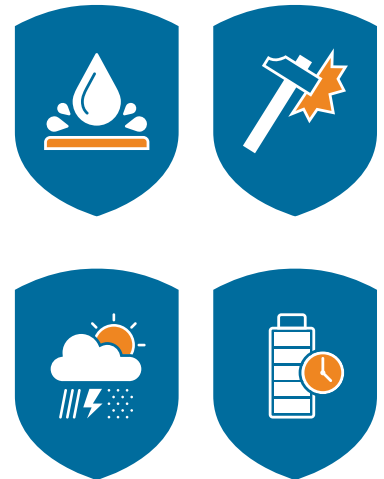
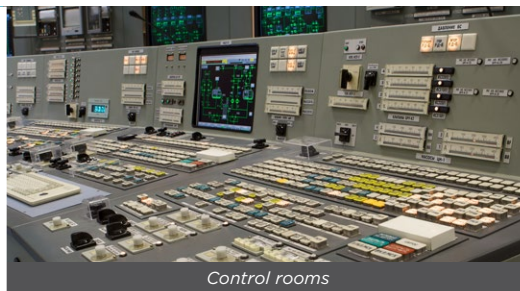


## Level Monitor

with linearization and one high / low alarm output



*Application examples: Marine applications*



*Control rooms*



*Red flashing LED backlight in case of a level alarm.*

**The D-Series is a front panel mount indicator, controller and monitoring system for measurement applications in industrial environments. It is the robust alternative for your existing, not waterproof, panel meters.**

### Advantages

- Unique, robust IP66, IP67 (NEMA Type4X) panel mount front enclosure made of die cast aluminum, allowing even big jets of water and total immersion.
- Intuitive "Know one, know them all!" configuration menu, saving time, cost and aggravation.
- Resistant to harsh weather conditions: rain, snow, salty atmospheres.
- Only a few inches depth clearance for smaller, low cost panels and panel doors.

### Features

- Eight point linearization of the tank shape - with interpolation.
- Displays level, height and percentage filled.
- Two alarm values can be entered: low and high level alarm.
- Large 17mm (0.67") digits.
- Red flashing LED backlight in case of a level alarm.
- LED backlight option.
- Selectable on-screen engineering units; volumetric or mass.
- Ability to process (0)4-20mA or 0-10V DC signals.
- One free configurable alarm output, available as passive signal, active signal or a robust, highly isolated (NO/NC) relay.
- Power requirements: Input loop powered, battery powered or 8 - 30V DC, 24V AC and 115 - 230V AC.
- Sensor supply: 8.2 / 12 / 24V DC.
- Auto backup of all settings.
- Ambient temperature -40°C up to +80°C (-40°F up to 176°F).

## Introduction

The D077 is a versatile, panel mount level monitor with linearization and continuous level monitoring feature. In addition to the average Span, eight linearization points can be entered to compensate for the shape of the tank. The unit will interpolate between these points to increase the accuracy. This linearization affects all displayed information as well as the alarm output. With the level monitoring feature, one low level and one high level alarm value can be set.

## Configuration

All configuration settings are accessed via a simple operator menu which can be password 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.

## Display

The display has large 17mm (0.67") and 8mm (0.31") digits which can be set to show level, height or percentage and alarm values. The display is a transfective type, which means that a high contrast reading is guaranteed, even in full sunlight. The D077 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.

## Alarm output

One alarm output is available to transmit the level alarm. It can be set to switch for a low, high or both alarms! The output signal can be a passive NPN, active PNP or a robust, highly isolated electro-mechanical relay (NO/NC).



## Backlight

The white backlight in combination with the D077 offers a unique feature: in case of a level alarm, the backlight can be set to be red or flashing red. The intensity can be adjusted in the configuration menu.



All info at a glance



Easy to install



Easy to program



Know one know them all!



Reliable



User-friendly

## Overview application D077

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 D077 fits in level measurement applications where continuous level monitoring and linearization due to the shape of the tank is important. Alternative basic models D070, D073, D074 or the F-Series level indicators.



## Signal input

The D077 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 requirements

The basic power supply for the D077 is 8 - 30V DC. Several other power supplies are possible: 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.



Waterproof IP66 / 67 (Type4X)

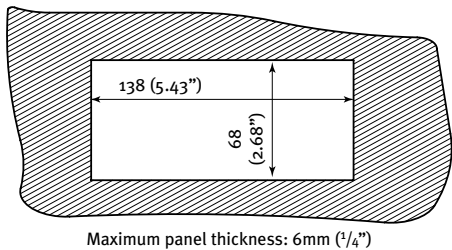


Only a few inches depth clearance

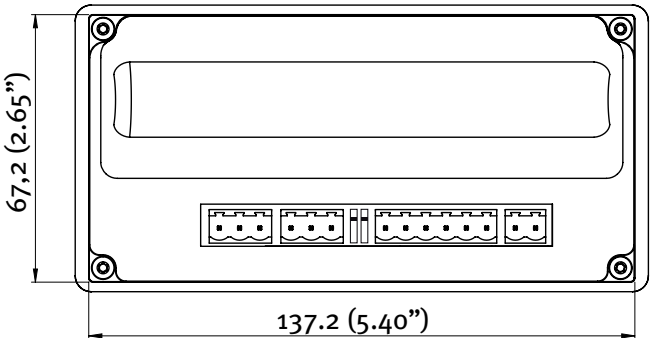
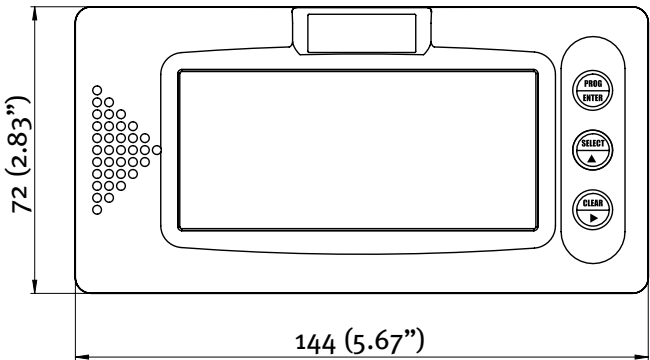
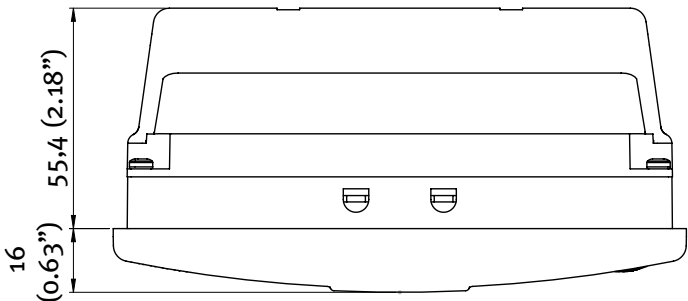
Enclosures

The D077 is supplied in a unique, robust IP66, IP67 (NEMA Type4X) 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.

Panel cut out

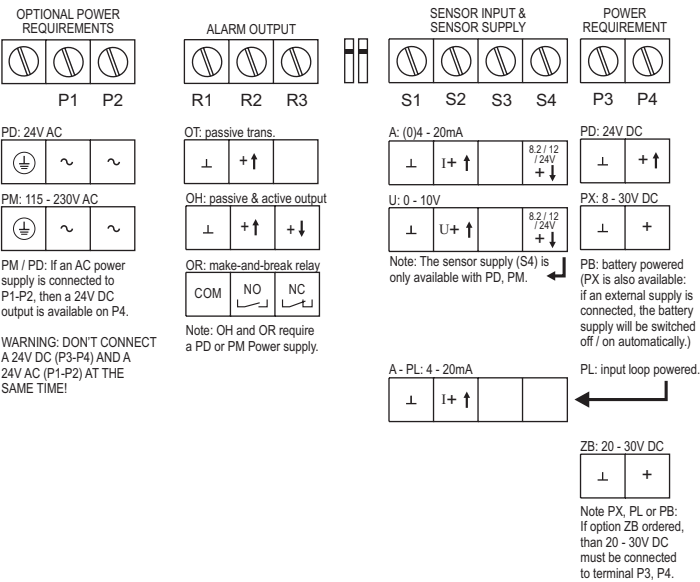


Dimensions enclosure



Dimensions according DIN 43700 / IEC 61554

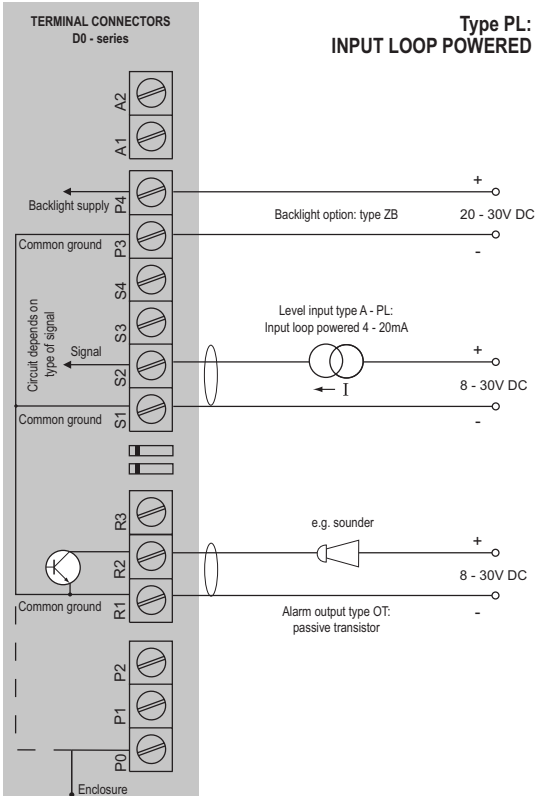
Terminal connections D077



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

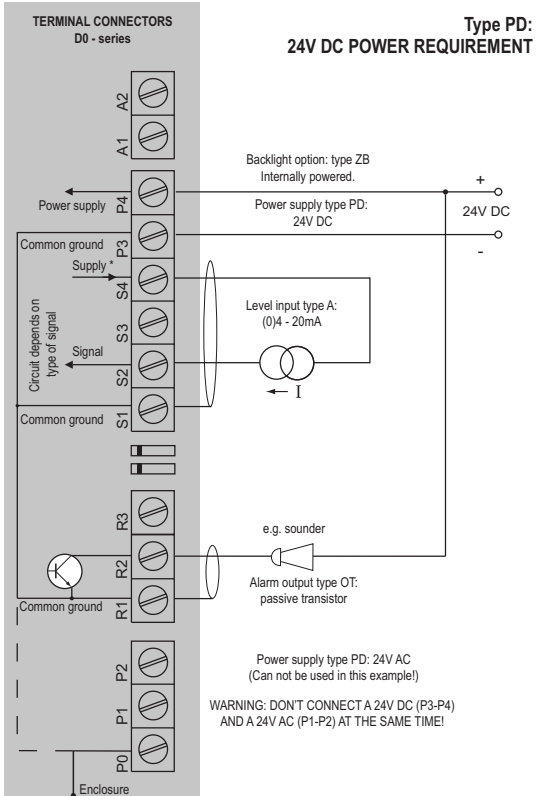


Configuration example D077-A-OT-PL-XX-ZB



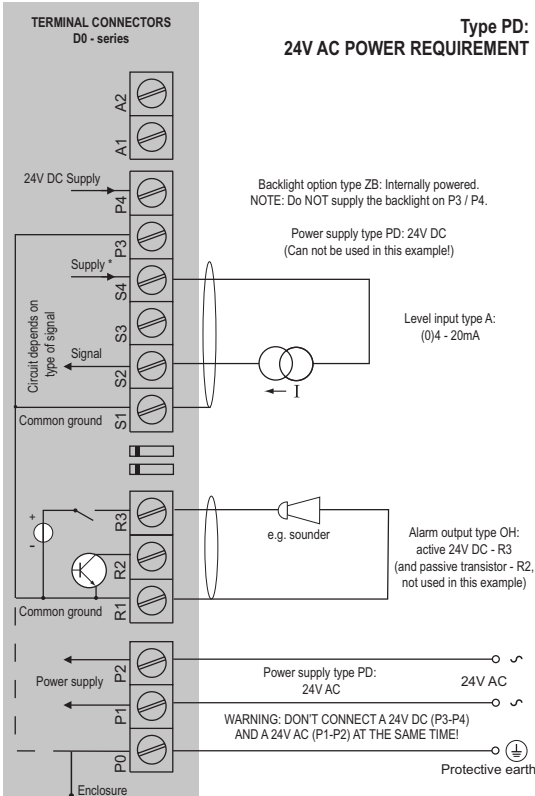
Sensor supply: sensor is externally powered.

Configuration example D077-A-OT-PD-XX-ZB



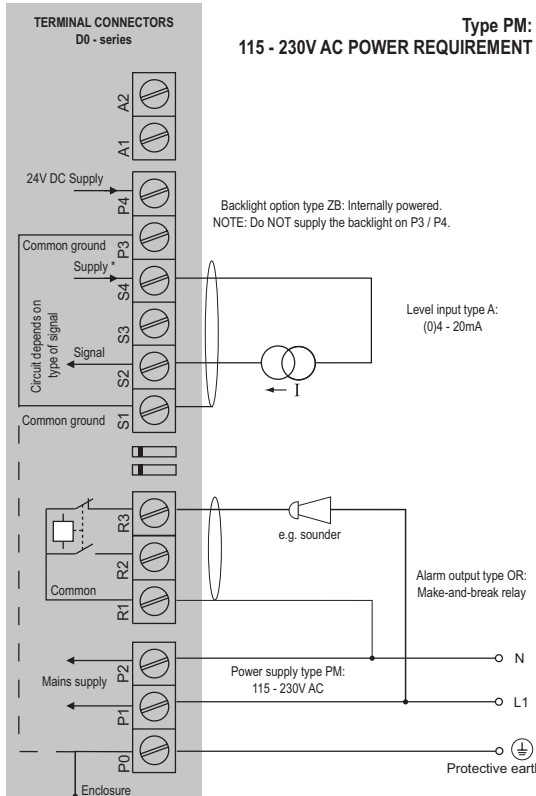
\* Sensor supply voltage for analog sensor type A / U:  
Terminal S4: 8.2 / 12 / 24V DC.

Configuration example D077-A-OH-PD-XX-ZB



\* Sensor supply voltage for analog sensor type A / U:  
Terminal S4: 8.2 / 12 / 24V DC.

Configuration example D077-A-OR-PM-XX-ZB



\* Sensor supply voltage for analog sensor type A / U:  
Terminal S4: 8.2 / 12 / 24V DC.



## Display

<b>Type</b>	High intensity reflective numeric and alphanumeric LCD, UV-resistant.
<b>Dimensions</b>	90 x 40mm (3.5" x 1.6").
<b>Digits</b>	Seven 17mm (0.67") and eleven 8mm (0.31") digits. Various symbols and measuring units.
<b>Refresh rate</b>	User definable: fast, 1sec, 3sec, 15sec, 30sec, off.
<b>Option ZB</b>	Transflective LCD with white LED-backlight. Red (flashing) backlight during alarm conditions. Intensity and alarm response can be adjusted in the configuration menu.

## Ambient temperature

<b>Safe areas</b>	-40°C to +80°C (-40°F to +176°F).
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## Power requirements

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

## Sensor excitation

<b>Type PB / PX</b>	Not available.
<b>Type PD / PM</b>	Dipswitch adjustable sensor supply: 8.2V DC, $I_{out}$ max. 35mA @ 20°C. 12V DC, $I_{out}$ max. 50mA @ 20°C. 24V DC, $I_{out}$ max. 75mA @ 20°C. (this voltage can vary depending on the input supply voltage)
<b>Note PD / PM</b>	Total consumption of sensor, active output OH and backlight may not exceed 75mA @ 24V DC @ 20°C.

## Directives & Standards

<b>EMC</b>	Directive 2014/30/EU, FCC 47 CFR part 15.
<b>Low voltage</b>	Directive 2014/35/EU
<b>RoHS</b>	Directive 2011/65/EU
<b>IP &amp; NEMA</b>	EN 60529 & NEMA 250.

## Data protection

<b>Type</b>	EEPROM backup of all settings. Data retention at least 10 years.
<b>Password</b>	Configuration settings can be password protected.

## Enclosure

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

## Panel mount enclosure

<b>Dimensions</b>	144 x 72 x 71.4mm (5.67" x 2.83" x 2.81") - W x H x D according DIN 43700 / IEC 61554.
<b>Panel cut-out</b>	138 x 68mm (5.43" x 2.68") L x H.
<b>Material</b>	Die-cast aluminum front panel + GRP back enclosure.
<b>Protection</b>	IP66, IP67 (NEMA Type4X) at the front-side.
<b>Weight</b>	325 gr.
<b>Panel thickness</b>	Max. 6mm ( $\frac{1}{4}$ ").

## Signal inputs - Level sensor

<b>Type A</b>	(0)4 - 20mA. Analog input signal can be scaled to any desired range within 0 - 20mA.
<b>Type U</b>	0 - 10V DC. Analog input signal can be scaled to any desired range within 0 - 10V DC.
<b>Accuracy</b>	Resolution: 16 bit. Error < 0.01mA / $\pm$ 0.05% FS. Low level cut-off programmable.
<b>Span</b>	0.001 - 999,999 with variable decimal position.
<b>Offset</b>	-999,999 / +999,999 units.
<b>Update time</b>	Four times per second.
<b>Voltage drop</b>	Type A: max. 1V DC @ 20mA.
<b>Voltage drop</b>	Type A - PL (loop powered): max. 2.6V DC @ 20mA.
<b>Load impedance</b>	Type U: 3k $\Omega$ .
<b>Relationship</b>	Linear and square root calculation.
<b>Note A / U</b>	For signal type A and U: external power to sensor is required; e.g. type PD / PM.

## Signal output - Digital output

<b>Function</b>	User defined: low, high or both alarms output.
<b>Type OH</b>	<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>
<b>Type OR</b>	Isolated electro-mechanical relay (NO/NC). Requires PD/PM. Maximum resistive load: 2A @ 250V AC / 30V DC. Maximum inductive load: 0.5A (pilot duty applications)
<b>Note OR</b>	In case of inductive load, use RC snubbers.
<b>Type OT</b>	Passive transistor output (NPN) - not isolated. Max. 50V DC - 300mA per output.

## Operator functions

<b>Displayed info</b>	<ul style="list-style-type: none"> <li>Level.</li> <li>Height or percentage (or no indication).</li> <li>Low alarm value.</li> <li>High alarm value.</li> <li>Alarm values can be set (or only displayed).</li> </ul>
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Level

Digits	7 digits.
Units	L, m³, 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.

Alarm values

Digits	7 digits.
Units	According to the settings for level.
Decimals	According to the settings for level.
Time units	According to the settings for level.
Type of alarm	Low and high level alarm. Includes alarm delay time and configurable alarm output.

Description		
Model	<b>D077</b>	<b>Level monitor with linearization and one high / low alarm output.</b>
Input	<b>A</b>	<b>(0)4 - 20mA input.</b>
	U	0 - 10V DC input.
Enclosure	<b>HB</b>	<b>Aluminum panel mount front enclosure.</b>
Digital output	OH	Active and passive transistor output - requires PD / PM.
	OR	Highly isolated mechanical relay output - requires PD / PM.
	<b>OT</b>	<b>Passive transistor output.</b>
Power	PD	24V AC / DC + sensor supply.
	PL	Input loop powered from sensor signal 4 - 20mA - requires type A.
	PM	115 - 230V AC + sensor supply.
	<b>PX</b>	<b>Basic power supply 8 - 30V DC (no real sensor supply).</b>
Battery	PB	Additional lithium battery (optional) - requires PL or PX.
Hazardous	<b>XX</b>	<b>Safe area only, according CE and UKCA.</b>
Options	ZB	Backlight.
	<b>ZX</b>	<b>No options.</b>

The **bold** marked text contains the standard configuration: D077-A-HB-OT-PX-XX-ZX.