

Level Monitor

Model 220



Features

- Powered by 4-20mA loop
- Non-linear tank correction
- Four level alarms
- Level bar graph display
- Tank contents display
- Density correction
- Intrinsically safe
- Watertight to IP67 (Nema 4X)
- Wall, pipe and panel mounting
- CE compliant



Overview

The Model 220 Level Monitor accepts a 4-20mA signal from a wide range of level sensors, including pressure transmitters, ultrasonic sensors or capacitance probes, and displays both level and tank contents on a large LCD display.

Solid state relay outputs provide up to four level alarms and a 25 point non-linearity correction table allows the instrument to be programmed to fit most tanks.

The Level Monitor is powered entirely from the 4-20mA current loop and, therefore, requires no external power or batteries.

The instrument is fully programmable with setup parameters such as span, offset, alarm levels, etc, stored in a non-volatile memory which will retain all data for more than 10 years without power.

The Model 220 is housed in an attractive IP67 (Nema 4X) polycarbonate enclosure which is completely watertight.

A wall mounting bracket is supplied as standard, while a 2" pipe mounting bracket is available as an option.

Alternatively, the Model 220 can be supplied as a panel mount instrument.



Model 220

Level Monitor

The Model 220 is powered entirely from the 4-20mA current loop and therefore requires no external power or batteries.

Display

Level bar graph

Displays measured level as a percentage (0-100%).

Contents

7 digit numeric display of contents with programmable span. An offset can be programmed to account for contents remaining in the tank when the measured level is 0%.

The contents are displayed with 4½ digit resolution so that larger values are displayed with trailing zeros (for example, 1437765 would be displayed as 1437700 and 5467289 would be displayed as 5467000).

Filter

A programmable filter will filter out fluctuations in readings caused by agitation in the tank.

Density

Density correction is provided for level devices which are density sensitive. Should the density change, a correction factor can be programmed via the front panel.

Relays

Type

Four solid state opto-isolated dc relays arranged as high-high, high, low and low-low.

An optional DIN rail mounted relay module is available which incorporates mains operated relays.

Acknowledgement

Alarms can be programmed for continuous operation or for an Acknowledge mode of operation where the Display key is pressed to acknowledge and cancel the relay alarm output.

Normally energised or de-energised relay

Relays are programmable to alarm in either mode.

Non-Linearity Correction

A 25 point non-linear correction table can be programmed to handle any shaped tank. Up to 25 points on both the x and y axis can be programmed and the Model 220 will perform linear interpolation between points.

The curve enables the contents of vessels, such as cylindrical tanks, bullet shaped tanks or hoppers to be displayed directly in engineering units as a volume or mass.

A conversion program which runs under Windows 95 is available to calculate theoretical values for the conversion program based on tank dimensions.

Mains Powered Relay Module

A DIN rail mounted module is available as an option which provides:

- ▶ 24Vdc at 50mA max for powering the 4-20mA current loop.
- ▶ Four relays rated at 240Vac, 3A max.

The module is designed such that it can be mounted remotely from the Model 220, but easily wired to the instrument.

Intrinsic Safety

The Model 220 is certified as intrinsically safe to European ATEX standards, and CSA_{US/IC} standards covering both the USA and Canada.



Specifications



General

Display: LCD.

Level: 20 segment bar graph.

Level Span: 0...100% proportional to input signal.
For non-inverting tanks 0% is 4mA and 100% is 20mA.
For inverting tanks 0% equals 20mA and 100% is 4mA.

Contents: 7 digits with 12mm (0.48") high digits on the LCD.
Contents are displayed with 4½ digit resolution and trailing zeros.

Contents Span: The contents span is programmable in the range of 0.001...9,999,999 and can be any unit of measure.

Contents Zero: The contents zero is programmable in the range of 0.000...9,999,999. The contents zero is the contents in the tank at 0% level.

Decimal Points: Decimal point position for contents is programmable in range of 0...3 decimal point places.

4-20mA Input

Resolution and Linearity: 0.05% of span.

Accuracy: 0.05% of span @ 25°C. 0.1% (typ) of span, full temperature range.

Update Time: 0.5 second.

Connection: Two wire.

Voltage Drop: 2.5 volts maximum.

Alarm/Pulse Outputs

Type: Four open collector outputs suitable for driving DC solenoids or external relays. The outputs provide high, high-high, low and low-low flow alarms.

Switching Power: 200mA. 30 Vdc maximum.

Saturation Voltage: 0.8 Vdc typical across the output in the "on" state.

Isolation: Outputs are separately opto-isolated.

Physical

Temperature: Operating temperature: -20°C to 60°C.

Dimensions:
98mm (3.9") (h) x 152mm (6.0") (w) x 43mm (1.7") (d)
(cable glands not included).

Protection: Sealed to Nema 4X or IP67 standards.

Mounting Options

Wall: Universal mounting bracket supplied as standard.

Pipe: A galvanised metal bracket is available which enables the Model 220 to be attached to a 2" vertical or horizontal pipe.

Panel: Supplied with mounting brackets. Terminals accessible from rear. *(Note that the panel mount version is not watertight.)*

Intrinsically Safe Parameters

Type of Approval:

- ▶ ATEX Type II 2G EEx ia IIB T4.
- ▶ CSA_{USC} Type Class 1, Groups C & D.

4-20mA Input: U_i = 28V max
I_i = 93mA max
P_i = 653mW max

Relay Outputs: U_i = 28V max
I_i = 93mA max
P_i = 653mW max

Terminal Descriptions

Number		Number	
1	Low-low Alarm (-)	6	Low Alarm (+)
2	Low-low Alarm (+)	7	High Alarm (-)
3	4-20mA (-) Input	8	High Alarm (+)
4	4-20mA (+) Input	9	High-high Alarm (-)
5	Low Alarm (-)	10	High-high Alarm (+)

Important: Specifications are subject to change without notice.

Relay and Power Module

The Model RPS24 Relay & Power Module is a DIN rail mounted module that provides a 24 Vdc loop power supply which can be used to power both the transmitter and Model 220.

In addition, the RPS24 has four electromechanical relays which can be connected directly to the open collector outputs in the Model 220 to provide switchable ac outputs.



Specifications

Power Supply Out: 24 Volts dc. 50mA maximum.

Relays (4): 250 Vac, 30 Vdc max. 3A max.

Dimensions: 80mm H x 107mm D x 40mm W.
3.1" H x 4.2" D x 1.6" W.

Product Codes

Product Codes			
220	.		Level Monitor
Intrinsic Safety	i		Intrinsically safe Not intrinsically safe
Enclosure and Mounting	0 1 2 6		Wall Mounting (no gland holes) Pipe Mount Wall Mounting (Standard glands) Pipe Mount
Hazardous Approvals		C M S	CSA US and Canadian Approval ATEX Approval SAA Australian Approval No Approvals

Typical Part Number: 220I.0C

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