



V438-0000-1 (Indicator)
V438-1000-1 (2 relay outs)
V438-2000-1 (4-20mA out)
V438-3000-1 (4-20mA & 2 relay outs)

VISIPAK™ V438

DC Input Digital Indicator

Provides a Digital Display of Process Variables from DC Voltage and Current Inputs



- Field Configurable Input 4-20mA, 1-5V, 0-5V & 0-10V
- 4-1/2 Digit Display for +199990 Count Spans
- 4 Visual Alarm Points with Front Panel LED Status
- Optional 2 Relay Output & 4-20mA Transmitter Output
- NEMA 4 Front Panel
- Isolated 24VDC Excitation for 2-Wire Transmitter Inputs or Optional 4-20mA Output
- 11 Point Linearization & Square Root - Curve Fitting

Description

The V438 is a versatile, field configurable, DC current and voltage input LED indicator. The unit provides a NEMA 4X water tight front panel that fits 1/8 DIN cutouts. Four visual setpoint alarms are annunciated via individual front panel LEDs and are a standard feature of the indicator.

Two form C relays are available as optional outputs for the first two setpoints. They can be configured as high or low, failsafe or non-failsafe. Each setpoint has a 100% adjustable deadband (or reset point) which can be effectively used in on/off control applications, or as latching alarms. An isolated 4-20mA transmitter output is also available as an option.

The V438 accepts 4-20mA, 1-5V, 0-5V and 0-10V inputs which can be scaled as required between ± 199990 (with a minimum span of 501 counts). An isolated 24V excitation source is included to power a two-wire transmitter or transducer.

Field configuration of the input range, alarm function, and analog transmitter output scaling is simple. The indicator is factory calibrated to rated accuracy but can be field adjusted as necessary.

Latched alarms can be acknowledged via a front panel button or by wiring to the terminals provided for remote alarm acknowledgment.

A lockout jumper is used to limit access to configuration functions. With the lockout mode enabled, only alarm setpoints and output scaling functions are displayed and cannot be altered without moving the jumper. When in the lockout mode, the unit can be programmed to display only those variables required for operator use.

Application

The V438 is ideal for indication, control and alarming of process variables. It can be used to display whatever process variable is represented by the dc input signal: level, flow, temperature, pressure, speed, weight, etc.

Built-in linearization functions allow users to program the unit to solve non-linear equations, such as the volume of material in a horizontal cylindrical tank from the level signal, or linear flow from the square root of the differential pressure across an orifice plate.

The setpoint alarms can be used for level control on a tank in which the low setpoint starts the filling process and the high setpoint stops it. Alarms are also useful as annunciators, warning of a critical process variable.

In all applications, the highly visible 0.56 inch, eight-segment LEDs provide a clear reading of the measured variable. Constructed to withstand corrosion and moisture, the NEMA 4X rated V438 can be used in most industrial control panels, under harsh environmental conditions.

The field configurable design and wide selection of input and output types makes the V438 an excellent choice as a standard process meter and alarm.

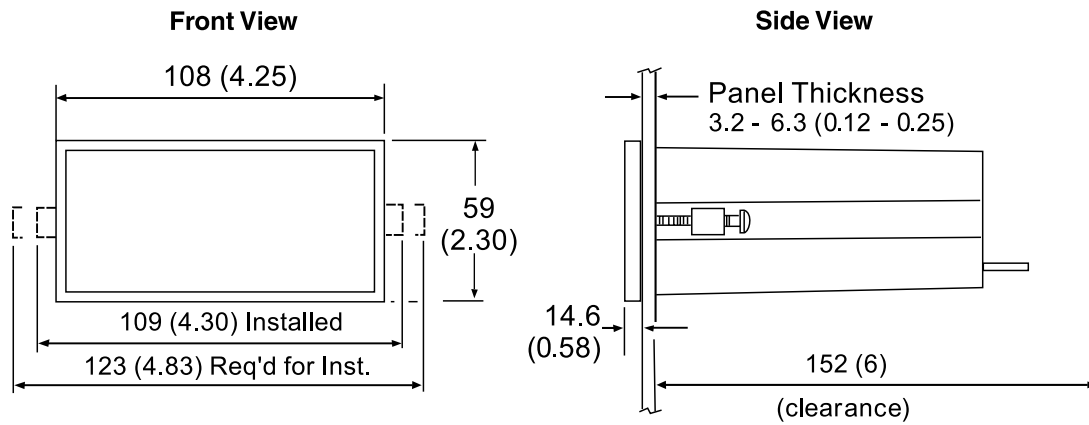
Table 1: V438 Input Spans

Input	Minimum Span
0 to 5V	0.16V
0 to 10V	0.32V
4 to 20mA	1.6mA

11 Point Linearization	Minimum Span
0 to 5V	0.16/(No. of pts -1V)
0 to 10V	0.32/(No. of pts -1V)
4 to 20mA	1.6/(No. of pts -1mA)

Dimensions

Dimensions in millimeters (inches)



Notes:

1. Panel cutout required: 45mm x 92mm (1.77" X 3.62") 1/8 DIN
2. Panel thickness: 3.2mm - 6.3mm (0.12" - 0.25")
3. Allow 152mm (6 inches) behind the panel
4. Weight 16oz. (454g)

Model V438 Wiring Diagrams

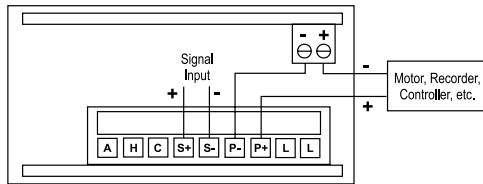
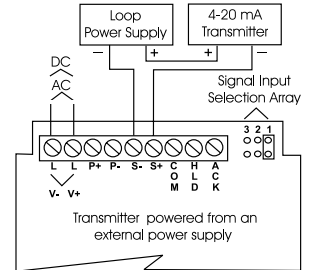
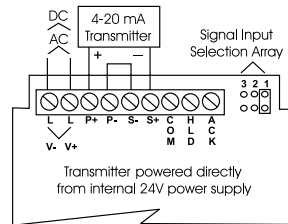
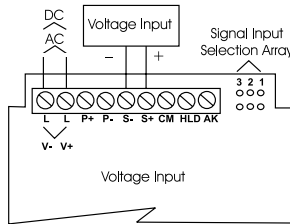
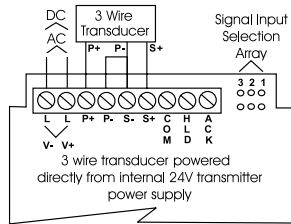
DC Input Digital Indicator

Wiring Instructions

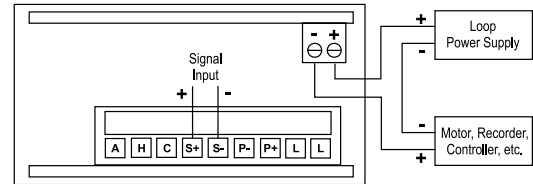
- All field connections to be made with insulated copper wire, either solid or stranded. Tighten all screw terminals to 7 in/lb. (0.8Nm). Strip length = 1/4 in (7mm). **DO NOT** pre-treat wire with solder.
- Terminals L & L:** Use AWG #12-18 wire, 600 volt, 60°C. Only one wire to each terminal.
- Terminals P+, P-, S-, S+, COM, HLD & ACK:** Use AWG #12-22 wire, 150 volt, 60°C. If using AWG #20 or smaller wire, up to 2 wires can be connected to each terminal. If using AWG #18 or larger wire, only 1 wire can be connected to each terminal.

Program the Signal Input Selection Array according to chart below. This jumper array is located at the rear of the instrument, next to the screw terminal block. Remove J3 to disable lockout feature.

Input Signal	Jumper 1:	Jumper 2:
1-5, 0-5 V	OFF	OFF
0-10V	OFF	ON
0-20, 4-20mA	ON	OFF



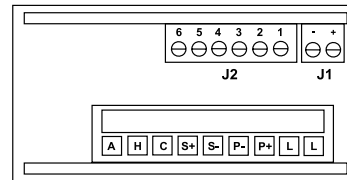
4-20mA output signal powered by internal 24V power supply (AC powered units only).



4-20mA output signal being powered by external 24V power supply.

Terminal Assignments

PIN	Function	Screw Terminal Block
1	Transmitter	J1
2	Transmitter	J1
1	Relay #1 Common	J2
2	Relay #1 NC	J2
3	Relay #1 NO	J2
4	Relay #2 Common	J2
5	Relay #2 NC	J2
6	Relay #2 NO	J2



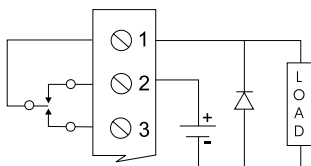
Notes:

- External alarm acknowledgment terminals (ACK and COM) are located on the meter main board.
- In the alarm condition, the NC contact is connected to common in the failsafe mode.

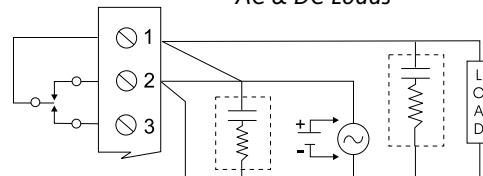
Switching Inductive Loads

To minimize the effect of electrical noise and also prolong the life of the relay contacts, the use of a suppression network is recommended. RC networks can be purchased as an assembly. Refer to the following circuits for RC network assembly and installation:

Low Voltage DC Loads



AC & DC Loads



Choose R and C as follows

R: 0.5 to 1 Ohm for each volt across the contacts

C: 0.5 to 1 microfarad for each 1A through closed contacts

Notes:

- Use connectors rated for 240 VAC.
- Snubbers may affect load release time of solenoid loads, check to confirm proper operational mode.
- Install the RC network at the V438's relay screw terminals. An RC network can also be installed across the load. Experiment for best results.

Use a diode with a reverse breakdown voltage two to three times the circuit voltage and forward current at least as large as the load current.

Specifications

BASIC METER

Inputs:

Field selectable:

4 to 20mA, 1 to 5V, 0 to 5V and 0 to 10V

Display:

0.56" (14.2mm) high efficiency red LED, 4-1/2 digits + extra zero can be switched on to display $\pm 19999(0)$. Programmable decimal 501 count min.

Calibration:

Can be calibrated using internal calibration (I-CAL) or by external calibration signal (E-CAL).

Calibration Range:

4mA (1V) input can be set anywhere in range of the meter. 20mA (5V) can be set above or below the 4mA (1V) input. An error message will appear if input 1 signal and input 2 signal are too close together (see Input Spans table). Corresponds to any range (larger or smaller)

Loop Power (AC powered units only):

Isolated 24VDC @ 20mA regulated $\pm 5\%$. Noise less than 10mV p-p. Max. loop resistance of 1200 Ohms. Available for either signal input or 4-20mA output option, but not both.

Hold Reading:

Connect terminals HLD and COM.

Accuracy:

0.05% of calibrated span, ± 1 count.

Lockout:

Jumper JP3 restricts modification of cal values.

Input Impedance:

Voltage ranges: greater than 300k Ohms.
Current ranges: 100 Ohms.

Power:

115 VAC $\pm 10\%$, 50/60Hz, 10VA.

Isolation:

500VDC or peak AC, input-to-output or input/output-to-power line.

Common/Normal Mode Rejection:

110dB/64dB at 50-60Hz

Temperature/Humidity:

Operating range: 0 to 65°C

Storage range: -40 to 85°C

RH: 0 to 90% RH non-condensing

Front Panel/Enclosure:

NEMA 4X, panel gasket provided/1/8 DIN, high impact plastic, UL 94V-0.

Connections:

Removable screw terminal block (provided), accepts 22 to 12 AWG.

Alarm Points:

4, any combination of high or low alarms, front panel LED indicated

Alarm Deadband:

0-100% of full scale, user selectable.

11 Point Linearization:

See minimum Input Spans table. Example, min. span for a 11 point 4-20mA calibration is 0.16mA between inputs.

SQUARE ROOT EXTRACTION

Accuracy:

$\pm 0.1\%$ F.S. ± 1 count from 10 to 100% of flow. Low flow cut-off, 0 to 100% of full scale, user selectable.

RELAYS (OPTIONAL)

Rating:

2 SPDT (form C); rated 2Amp @ 30VDC or 2 Amp @ 250VAC resistive load; 1/14 HP @ 125/250VAC for inductive loads.

Deadband:

0-100%, User selectable.

TRANSMITTER (OPTIONAL)

Calibration Range:

The transmitter output (4-20mA) can be calibrated so that a 4mA output is produced for any rate displayed on the meter. The 20mA output must correspond to any rate that is at least 501 counts greater than or 501 counts less than the rate corresponding to 4mA (for example, 4mA = 0, 20mA = 501). If the span from 4 to 20mA is less than 501 counts, an error message will appear.

Output Loop Resistance:

Power Supply

24VDC: min 10 Ohms, max 600 Ohms

35VDC (external): min 600 Ohms, max 1k Ohms

External Loop Power Supply:

35V max.

Accuracy:

$\pm 0.1\%$ F.S., $\pm .004$ mA

Ordering Information

Specify:

1. Model number:
 - V438-0000-1 (indicator only)
 - V438-1000-1 (2 relays)
 - V438-2000-1 (4-20mA output)
 - V438-3000-1 (4-20mA and 2 relays)
2. Power: 115VAC (standard)
3. Optional Factory Configuration, specify C620 with the desired configuration information.



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Factory Assistance

For additional information on calibration, operation and installation contact our Technical Services Group:

703-669-1318

actionsupport@eurotherm.com

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