

## Introduction

Within the Danaher Controls A103 family you'll find a product to meet nearly every requirement for panel mounted control and indication. Housed in a DIN standard 36mm x 72mm case, the A103-002 with an input scale factor which allows input pulses to be displayed as meaningful engineering units, is an ideal choice for advanced count totalization and positioning applications.

The 8 digit supertwist LCD display provides easy viewing at a glance. For conditions where ambient light is poor, the display can be backlit by connecting an external DC (10-28 Volt) power supply. Designed primarily for use with encoder phase inputs, this unit can easily determine direction of movement and provide an accurate indication of position.

Powered by either one or two replaceable 3V Lithium batteries, this unique design allows for a new battery to be installed before removing the old one, thereby retaining count total and program data. A low battery indicator appears on the screen to provide a warning several weeks before the end of battery life. If two batteries are used simultaneously, the individual expected life doubles to 10 years.

Setup is quick and simple as the two front panel keys are used to scroll through 4 menu choices. A NEMA 4X front panel and noise immunity tested to IEC 801 level 3 makes this unit suitable for harsh environments.



## Features

- Large, easy to read 8-digit supertwist LCD with backlighting capability
- 3 Volt lithium battery provides long life and eliminates the need for external power
- Accepts low speed (30 Hz) NPN & dry contact inputs, and high speed (10 kHz) PNP signals or square wave signals
- Total value resettable remotely or from the front panel
- Input scale factors for displaying meaningful engineering units
- Option Modules provide added functionality and convenience
- Programmable reset value simplifies position readout.
- Simple menu-driven setup
- NEMA 4X rated front panel for use in washdown environments

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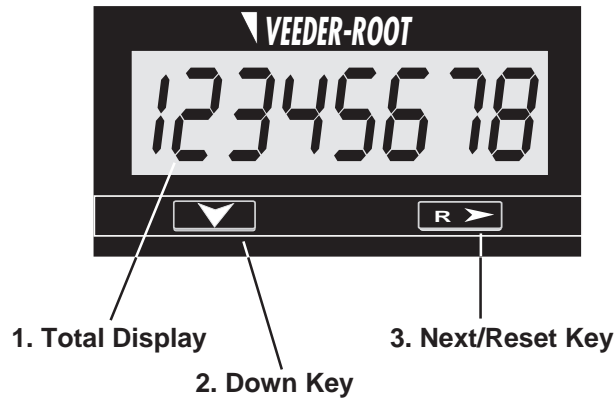
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**Technical Manual**  
**701954-0003**

**Veeder-Root brand**  
**A103-002**  
**Totalizer/  
Position  
Indicator**

# O V E R V I E W

## OPERATION

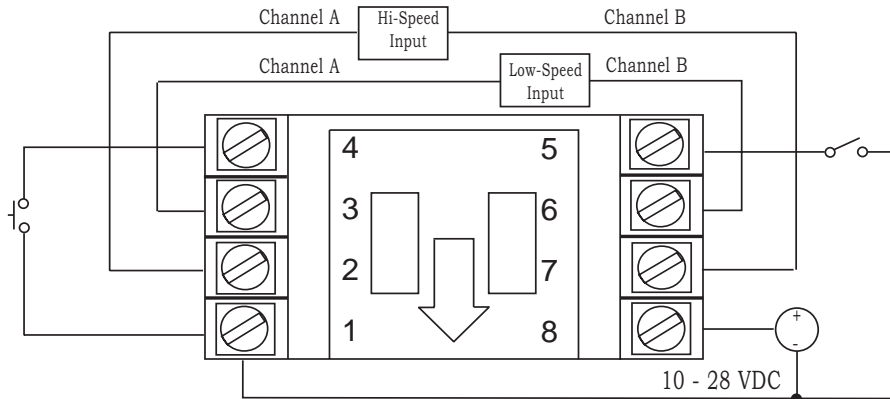


**1. Total Display:** Indicates the present count value, which is equal to the number of pulses received (since the last reset) multiplied by the Count Input Calibrator Value in Program mode.

**2. Down Key:** When the program input is active this key is used to scroll through the menu items. After a menu item has been chosen for editing, the down key is used to set the value for the currently selected (flashing) digit.

**3. Next/Reset Key:** If the total value is being displayed depressing this key will cause the value to be reset to 0. When the program input is active this key is used to select a menu item for editing (left most digit will begin to flash) and then move to the desired digit to be changed.

## REAR TERMINAL CONNECTIONS



**1. Common**

**2. High Speed Input A - PNP or square wave signals up to 10 kHz\* for incrementing the count value**

**3. Low Speed Input A - NPN or dry contact inputs up to 30 Hz for incrementing the count value**

**4. Remote Reset - Resets count value when switched to common**

**5. Front Panel Program Enable - Allows access to program mode when tied to common**

**6. Low Speed Input B - NPN or dry contact inputs up to 30 Hz for decrementing the count value**

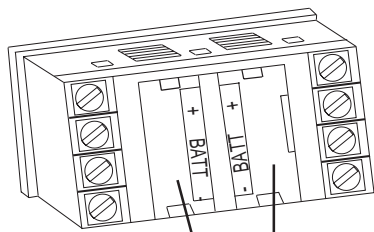
**7. High Speed Input B - PNP or square wave signals up to 10 kHz\* for decrementing the count value**

**8. DC Supply Input - For backlighting**

\* For high speed current sinking devices, provide a pull-up resistor from terminal 2 to a DC source

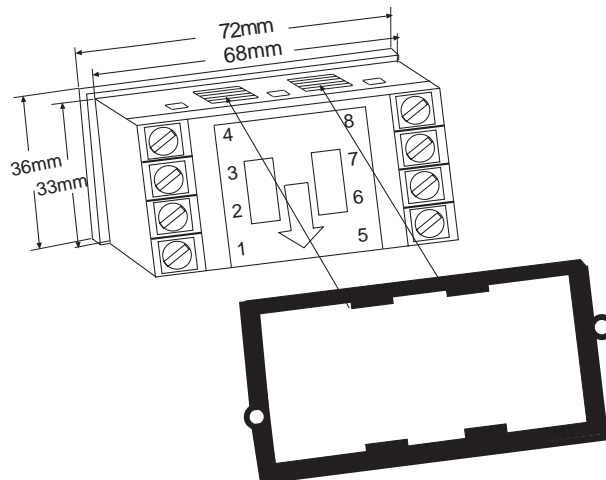
# SETUP

## INSTALLATION



Battery Slots

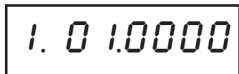
**Battery Installation** - The unit is shipped with one battery, which is not installed. Remove the battery cover by pushing inward and down. Install the battery in either of the two slots. The unit runs on a single battery, and the second slot is provided to allow for installing a new battery before removing the old one, retaining count total and program data. The unit can also be run on two batteries to extend the battery life to 10 years. Once the battery is in place the unit will go into a self test mode, and all the segments on the LCD display will be illuminated. The self test mode is exited by depressing the Next key, which will then display the model number (2). Depress the Next key again to ready the unit for operation.



**Front Panel Installation** - Place the unit in the panel through the 33mm x 68mm cutout. Slide the included gasket over the rear of the unit, then slide the panel mount bracket into place so that the 4 tabs catch in the grooves on the top and the bottom of the unit (the bracket should be oriented so that the tabs are on the side nearest the panel). Used the provided panel mount screws to tighten the bracket until there is a secure seal against the gasket.

## PROGRAMMING

Programming parameters can be accessed, when the Program Enable input is active, by pressing the Down key. To edit a parameter use the Down key to scroll until the desired parameter appears on the screen. Pressing the Next key will cause the leftmost digit of that value to begin to flash. Use the Next and Down keys in combination to choose individual digits and change their value.



**Count Input Calibrator:** Multiplies the input pulses by a value settable from 0.0001 to 99.9999, and displays the results as the count value.



**Display Decimal Point:** Sets the decimal point on the count display from Off to 0.00000. The Next key is used to scroll through the choices.



**Count Offset** - Enables the counter to be reset to a value other than 0. Settable in a range from -999999 to 999999.



**Front Panel Reset Enable:** When active (ON) the count value, when being displayed, can be reset by pressing the Next/Reset key. If set to OFF, the total value can only be reset through the remote input.

# GENERAL

## SPECIFICATIONS

### High Speed Input (Terminals 2 and 7):

Type: Line Driver or square wave pulse (A leading B for up counting)

Count Speed: 10 kHz max (50% duty cycle),

Logic: Low < 1.0 VDC, High > 2.0 VDC

Minimum Pulse Width: 45 µsecond

Maximum Input: 28VDC

Impedance: 1 MΩ to battery

### Low Speed Input (Terminals 3 and 6):

Type: NPN Signal, Contact Closure

Count Speed: 30 Hz max (50% duty cycle)

Logic: Low < 1.0 VDC, High > 2.0 VDC

Minimum Pulse Width: 12 ms

Maximum Input 28VDC

Impedance: 1 MΩ to battery

### Front Panel Enable Input (Terminal 5)

Type: NPN Signal, Contact Closure; level sensitive

Maximum Input: 28 VDC

### Remote Reset Input (Terminal 4)

Type: NPN Signal, Contact Closure; edge sensitive

Frequency Response: 30 Hz (50% duty cycle)

Maximum input: 28 VDC

### Power Source:

Type: Single or dual 3V Lithium battery

Expected Life: 5 years typical-single battery, 10 years typical-dual batteries

Low Power Indicator: "Low Bat" flashes on display approx. 2 weeks prior to end of battery life

### Display:

Type: Supertwist LCD for use with or without backlighting

Number: 8 digits

Height: 12mm

Backlighting: Green Illumination over whole viewable area with a 10 to 28 VDC supply (Terminal 8)

### Physical:

Dimensions: 36mm x 72mm, 38mm deep

Mounting: Panel Mount (mounting bracket supplied)  
33mm x 68mm (+ 0.3mm) panel cutout

Connections: Up to 8 screw terminals

Weight: Approximately 2.25 ounces

## WARRANTY

Standard products manufactured by the Company are warranted to be free from defects in workmanship and material for a period of one year from the date of shipment, and products which are defective in workmanship or material will be repaired or replaced, at the option of the Company, at no charge to the Buyer. Final determination as to whether a product is actually defective rests with the Company. The obligation of the Company hereunder shall be limited solely to repair and replacement of products that fall within the foregoing limitations, and shall be conditioned upon receipt by the Company of written notice of any alleged defects or deficiency promptly after discovery within the warranty period, and in the case of components or units purchased by the Company, the obligation of the Company shall not exceed the settlement that the Company is able to obtain from the supplier thereof. No products shall be returned to the Company

without its prior consent. Products which the Company consents to have returned shall be shipped F.O.B. the Company's factory. The Company cannot assume responsibility or accept invoices for unauthorized repairs to its components, even though defective. The life of the products of the Company depends, to a large extent, upon the type of usage thereof, and THE COMPANY MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR SPECIFIC APPLICATIONS BY THE BUYER NOR AS TO PERIOD OF SERVICE UNLESS THE COMPANY SPECIFICALLY AGREES OTHERWISE IN WRITING AFTER THE PROPOSED USAGE HAS BEEN MADE KNOWN TO IT.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.