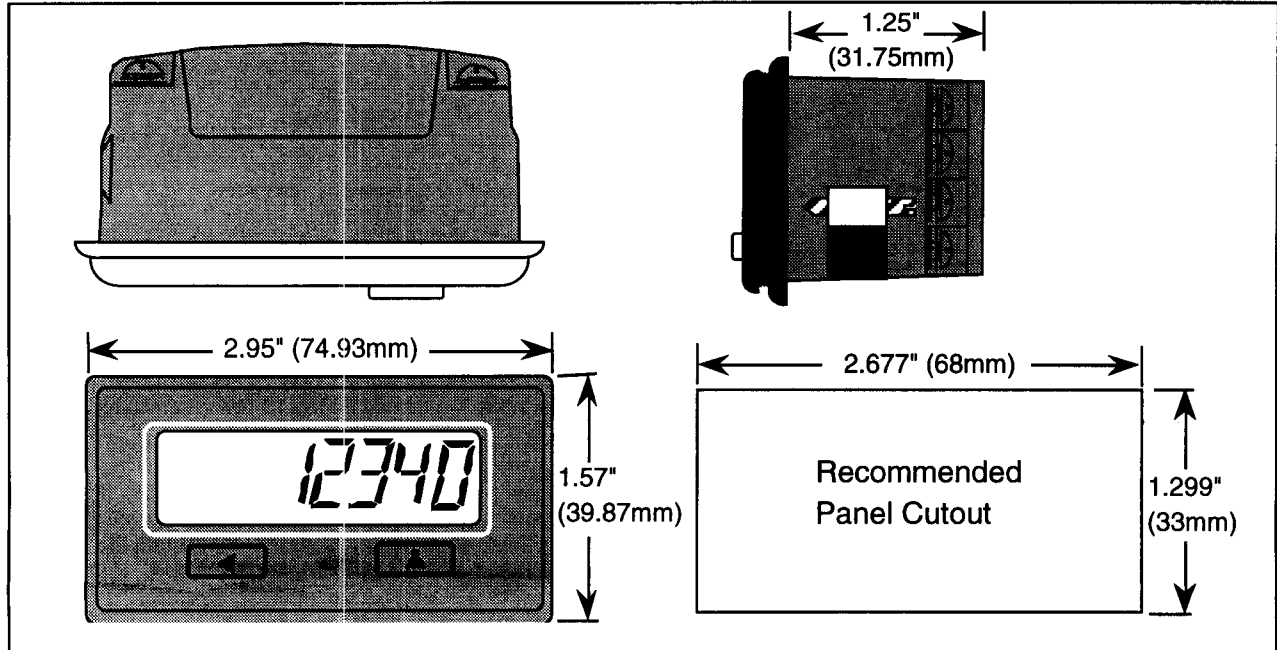




DPC10-RM Ratemeter

M1665/0693



POWER

Internal battery: 3V, lithium
Life expectancy: 5 years +
Replacement Part: DPC10-BAT

PHYSICAL

Operation Temperature: 0° - 55°C
Storage Temperature: -20° - 70°C
Operating Humidity: 90% Non-condensing
Weight: 2.2 oz. net
Display Size: .43" high
Front Panel Rating: NEMA-4X when mounted with gasket provided
Case Material: Cyclocac X-17

RATE INDICATOR

Type: 1/Tau
Digits: 4/5 (4 calculated, 5 displayed with fixed 0 in LSD)
Scaler Range: .001 to 9999
Decimal Point: 5 positions, programmable
Accuracy: ±0.2%
Update Time: .7 sec
Zero Time: 10 seconds

DC COMMON (Terminal 1)

RATE INPUTS

Input B (Terminal 2) Low speed input designed for contact closures to DC common

Speed: 0-20 Hz
Minimum Low Time: 10 milliseconds
Minimum High Time: 40 milliseconds
Impedance: 101 kΩ
Voltage Thresholds: Low 0 to 0.4 V dc
High 2.0 to 28 V dc
Maximum High 28 V dc

Input A (Terminal 3) High Speed Input requiring a voltage source such as a current sourcing sensor or a current sinking sensor used with the provided pull up resistors.

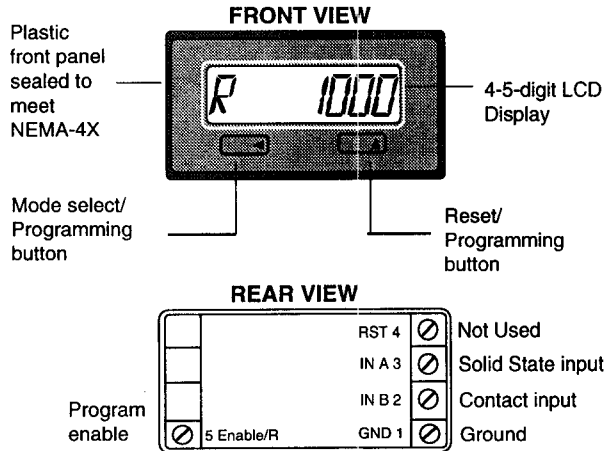
Speed: 0 to 10 kHz
Minimum Low Time: 80 microseconds
Minimum High Time: 20 microseconds
(The above times are with a 0 to 5.0 V swing)
Input Impedance: 2KΩ above 5 V dc
Voltage Thresholds: Low 0 to 1.2 V dc
High 2.0 to 28 V dc
Maximum High 28 V dc

PROGRAM ENABLE INPUT (Terminal 5)

Operation: Level sensitive (maintained)

INTRODUCTION

Your OMEGA DPC10-RM is a ratemeter with a 4-5 digit LCD display. The four most significant digits are calculated; five digits will be displayed with fixed 0 in the least significant digit. A programmable rate scaler and decimal point allow for display of rate in any engineering term.



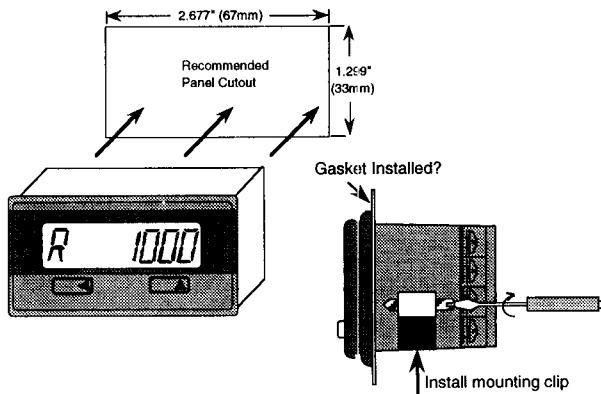
APPLICATIONS

The DPC10-RM is designed to show you process rate. You must make certain programming and wiring choices to accomplish your application. We recommend the following sequence:

1. Answer the following questions:
 - What type of sensor will be used?
 - What engineering units should the ratemeter be scaled to?
 - How many pulses per item is the sensor providing?
 - Is a decimal point needed on the rate display?

2. Calculate the rate scale factor.

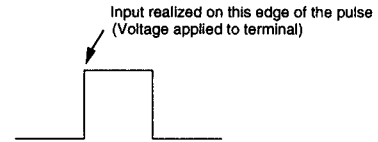
MOUNTING



OPERATION

Rate Inputs

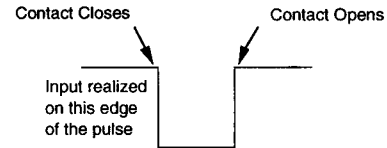
Separate contact and solid state inputs are provided. The solid state input (terminal 3) requires a current-sourcing sensor and can accept inputs up to 10 kHz. Inputs into this terminal are realized on the positive-going edge.



Terminal 3 is pulled down to common. When a sensor output supplies voltage to this terminal, one count is registered on the display. The sourcing signal must supply at least +2.0 V dc but no more than +28 V dc.

Note: When a sourcing signal is applied to terminal 3, a power assist feature of the DPC10-RM extends the life of the battery.

Terminal 2 is the low-speed, current-sinking rate input designed to be used with a contact closure to ground. It has a maximum count speed of 20 Hz. Inputs into this terminal are counted on the negative-going edge.



Terminal 2 is pulled up to +3 V dc. When a contact closes, pulling the voltage down to .4 V dc or less, one count is registered.

PROGRAM MODE

NOTE: To enter the program mode, you must connect a jumper between terminals 1 and 5. To leave the program mode, disconnect the jumper.

Screens

There are three program-mode screens in the DPC10-RM. Press and hold the key while repeatedly pressing the key to advance to successive screens.

Programming Screens	
Screen	Function
1	Rate Scale Factor
2	Ratemeter Decimal Point
3	Rate x1/x10

RATE SCALER

Calculating the Rate Scale Factor

This 1/Tau ratemeter calculates rate by measuring the time interval between input pulses, converting to a frequency ($F = 1/\text{Tau}$), and multiplying the product by the rate scaler. The rate scaler is user programmed to convert the count input frequency into the desired rate units for display (feet/minute, inches/second, gallons/hour, etc.)

Rate Scaler Range: 0.001 to 9999

Rate Scaler (RS) formula:

$$RS = \frac{\text{SEC} \times \text{DPF}}{\text{PPI}}$$

where:

SEC is the number of seconds in the rate time unit (items/second = 1, items/minute = 60, items/hour = 3600, etc.)

DPF is the decimal point factor corresponding to the desired decimal point location on the run mode screen:

Display	DPF
XXXX	1
XXX.X	10
XX.XX	100
X.XXX	1000

Use the rate display decimal point screen to program the desired decimal point position.

PPI is the number of pulses per item from the sensor.

Example 1: A sensor produces 10 pulses per foot of material travel. Display rate in whole feet per minute (XXXX).

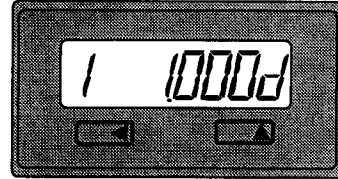
$$RS = \frac{60 \times 1}{10} = \frac{60}{10} = 6$$

Example 2: A flow sensor produces 400 pulses per gallon. Display flow rate in tenths of gallons per hour (XXX.X).

$$RS = \frac{3600 \times 10}{400} = \frac{36,000}{400} = 90$$

Programming Rate Scale Factor

The first program mode screen allows you to enter the rate scale factor.



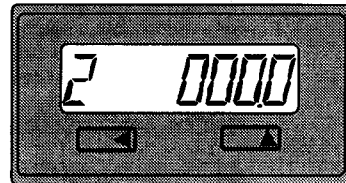
The lower case "d" appears on the right of the display when it is time to enter the decimal point position for the rate scaler.

Note: This decimal point is used for the rate scaler only and will not appear on the ratemeter screen.

Press the key to change the first digit to the correct value. Press the key to select the next digit to be changed. Repeat this process until all the digits are correct. When the "d" appears, press the key until the decimal point is in the desired location.

Ratemeter Decimal Point

The second program mode screen is used to enter the decimal point position for the ratemeter run-mode display.

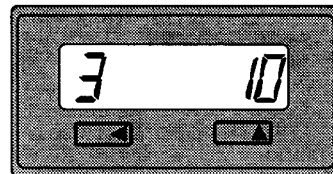


Press the key until the decimal point is in the correct position.

Rate x1 or x10

The third screen is used to select the rate display multiplier of one or ten. Selecting rate x10 will add a zero to the far right of the display. This zero will not change value and does not affect the decimal point position.

Press the key to select 1 or 10.



Note: To exit the program mode, disconnect the jumper between terminals 1 and 5.

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- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
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- Flexible Heaters
- Laboratory Heaters



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Stamford CT 06907
Tel: (203) 359-1660
Telex: 996404 Cable OMEGA
Fax: (203) 359-7700

WIRING RECOMMENDATIONS

Following these suggestions will increase noise immunity and lengthen unit life.

Cable: Make the connection between the count source and the ratemeter with a two-conductor shielded cable. Connect the shield to earth ground at one end only.

Relay Coil Suppression: If a relay contact is used as a count source, suppress the relay coil. This can be accomplished with an RC network for AC coils or a diode for DC coils.

Mounting: Do not mount the ratemeter near a solenoid or other inductive devices. Supply enough ventilation to keep the ratemeter operating within the temperature specifications. Do not mount this unit in a heavy vibration area.

BATTERY SAFETY

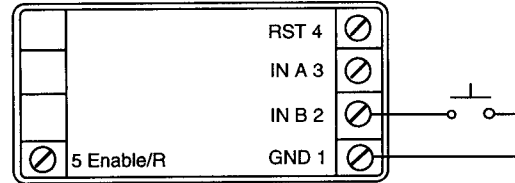
The lithium battery that powers your device contains inflammable materials such as lithium organic solvent, and other chemical ingredients. Explosion or fire may result if the battery is not handled correctly. To avoid an accident, follow these guidelines:

- Do not stack or jumble up batteries
- Do not heat batteries above 95°C
- Do not disassemble batteries
- Do not recharge lithium batteries
- Do not apply pressure to, or deform batteries
- Do not solder to batteries
- Do not dispose of batteries in fire
- Insert battery with correct polarity

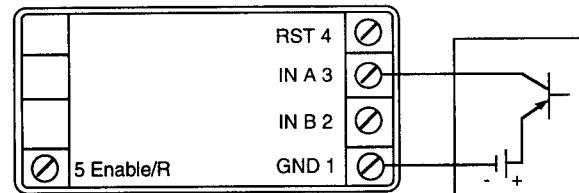
Terminal	Function	Operation
1	Ground	
2	Input B Rate Input	Use with Contact Closure to Ground Maximum 20 Hz Count Speed
3	Input A Rate Input	Use with Current Sourcing Sensor Maximum 10 kHz Count Speed
4	Not Used	
5	Program Enable	Connect to Ground to Enter Program Mode

WIRING DIAGRAMS

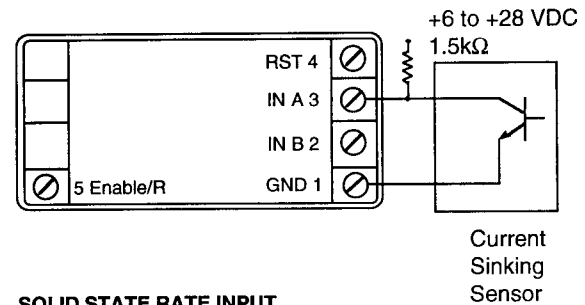
CONTACT CLOSURE RATE INPUT



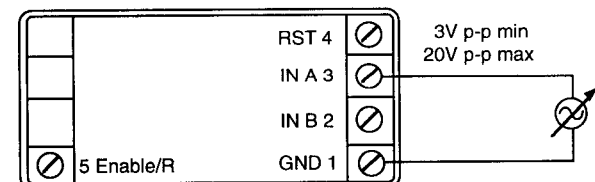
SOLID STATE RATE INPUT CURRENT SOURCING SENSOR



SOLID STATE RATE INPUT CURRENT SINKING SENSOR

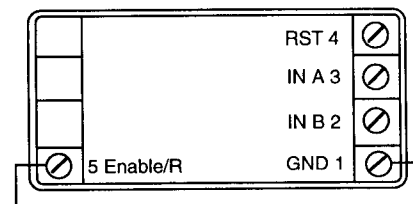


SOLID STATE RATE INPUT MAGNETIC PICKUP



* Not suitable for direct turbine meter or direct self-generating paddlewheel input.

PROGRAM MODE ENABLE



REPLACEMENT PARTS

DPC10-BAT Battery
46066-210 Gasket
53300-241 Mounting Clip
28772-200 Mounting Screw

OTHER OMEGA MINI COUNTER PRODUCTS

DPC10-TL Totalizer
DPC10-CS Add/Subtract Totalizer
 (Solid State Input)
DPC10-CC Add/Subtract Totalizer
 (Contact Input)
DPC10-QT Quadrature Indicator
DPC10-RT Ratemeter/Totalizer



WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that our customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. Our Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

We are glad to offer suggestions on the use of our various products. Nevertheless OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378, FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence. Please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems you are having with the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. That way our customers get the latest in technology and engineering.

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