OMEGA
An OMEGA Technologies Company
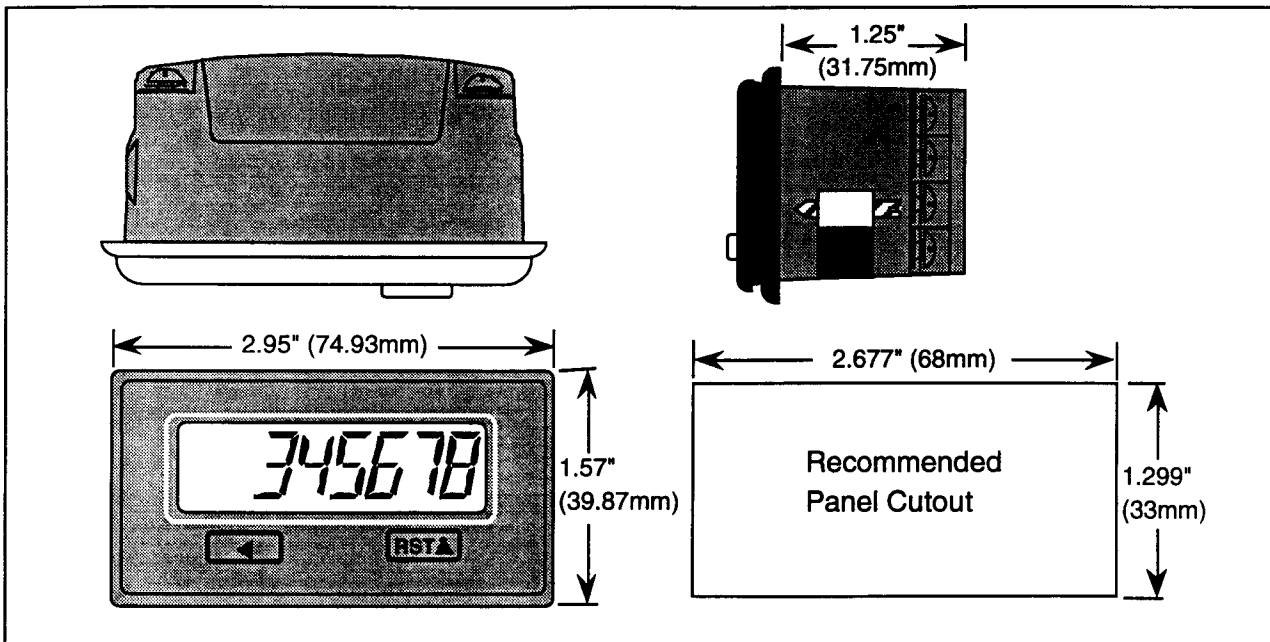
DPC10-CS Add/Subtract Totalizer (Solid State Inputs)
DPC10-CC Add/Subtract Totalizer (Contact Inputs)
M1663/0693

1.25" (31.75mm)

2.95" (74.93mm)

1.57" (39.87mm)

2.677" (68mm)

Recommended Panel Cutout

1.299" (33mm)

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

PHYSICAL
Operation Temperature: 0° - 55°C
Storage Temperature: -20 to 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: Cycolac X-17

TOTALIZER
Type: Up/Down Counting
Digits: 8 digits positive/minus sign and 7 digits negative
Scaler: 0.0001 - 100.0000
(0.0000 scales by 100)
Decimal Point: 5 positions, programmable

DC COMMON (Terminal 1)
EXTERNAL RESET INPUT (Terminal 4)
Resets totalizer when connected to dc common.
Minimum Low Time: 0.25 to 1.0 sec. (maintained)
The required pulse width varies with count speed, scale
factor and number of digits displayed.
Voltage Thresholds: Low 0 to 0.4 V dc
High 2.0 to 28 V dc

COUNT INPUT A (SUBTRACT); COUNT INPUT B (ADD) (TERMINALS 2&3)
DPC10-CS
Inputs A& B require 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
(These times are with a 0.0V 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

DPC10-CC
Inputs A & B are designed for contact closures to dc common.
Speed: 0 to 20 Hz
Minimum Low Time: 10 milliseconds
Minimum High Time: 40 milliseconds
Input Impedance: 101 kΩ
Voltage Thresholds: Low 0 to 0.4 V dc
High 2.0 to 28 V dc
Maximum High 28 V dc
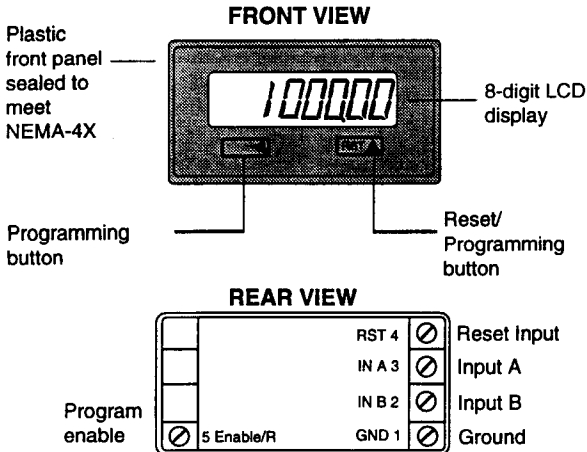
PROGRAM ENABLE INPUT (Terminal 5)
Operation: Level sensitive (maintained)

COUNT ACCURACY
Absolute when operated within specifications.

INTRODUCTION

Your OMEGA DPC10-CS or DPC10-CC is a counter with an eight-digit LCD display. A programmable scaler and decimal point allow for display in any engineering unit.

FRONT VIEW

Plastic front panel sealed to meet NEMA-4X

8-digit LCD display

Programming button

Reset/ Programming button

REAR VIEW

Program enable

RST 4 ⊘	Reset Input
IN A 3 ⊘	Input A
IN B 2 ⊘	Input B
⊘ 5 Enable/R GND 1 ⊘	Ground

APPLICATION

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 counter be scaled to?
   • How many pulses per item is the sensor providing?
   • Is a decimal point needed on the display?

2. Calculate the scale factor.

MOUNTING

2.677" (67mm)

Recommended Panel Cutout

1.299" (33mm)

Gasket Installed?

Install mounting clip
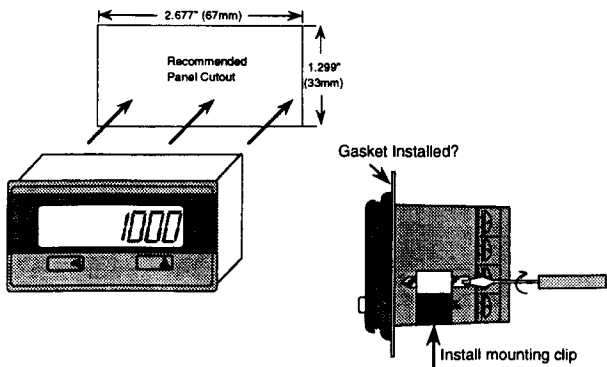
PROGRAM MODE

NOTE: To enter the program mode, you must connect a jumper between terminals 1 and 5 (see page 4). To leave the program mode, disconnect the jumper.

Screens

There are four program-mode screens in the DPC10-CS and DPC10-CC. Upon entering the setup mode, the counter will display screen 1. Press and hold the [◀] key while repeatedly pressing the [▲] key to advance to successive screens.

Programming Screens	
Screen	**Function**
1	Count Scale Factor
2	Count Decimal Point
3	Reset to Offset Value
4	Reset Key Enable / Disable

OPERATION

Add/Subtract Counting

There are two count input terminals on the rear of the totalizer. Count pulses entering Input A (terminal 3) cause the total to decrement (count down). Count pulses entering Input B (terminal 2) cause the total to increment (count up). The totalizer may start counting from zero, when reset, or may start from a user-programmed offset value. The offset value is a positive number and may be up to six digits.

If only one of the count inputs is used, the totalizer becomes an up counter with a range of zero to 99,999,999, or a down counter with a range of zero to -9,999,999. If both inputs are used, the totalizer displays the difference count between the two inputs - counts at Input B are added, counts at Input A are subtracted. In this mode of operation, the totalizer's range is -9,999,999 to 99,999,999. Positive numbers are not indicated with a plus sign(+). Both inputs may occur simultaneously, in which case the displayed total does not change.

Count Inputs

The DPC10-CS has hi-speed inputs and can accept pulses from solid state, current sourcing sensors at up to 10 kHz per input. The sensor must supply at least +2.0 V dc, but not more than +28 V dc to the input. Counts are entered on the positive-going edge of the pulse.

The DPC10-CC has low speed inputs and can accept pulses from solid state, current sinking sensors or contact closures to ground at up to 20 Hz per input. These inputs are internally pulled up to +3 V dc. The sensor must be capable of sinking current from the input to bring the input voltage down to +0.4 V dc or less. Counts are entered on the negative-going edge of the pulse.

COUNT SCALER

Calculating the Count Scale Factor

The count scale factor is used to convert the incoming count pulses to the desired unit of measure to be displayed (feet, gallons, etc.) or to correct for a known amount of error (wheel wear, viscosity, etc.). This scaler has six digits available with a fixed decimal point.

Count Scaler Range: 0.0001 to 99.9999

(Setting the count scale factor to 0.0000 will allow scaling by 100)

Count Scaler (CS) Formula:

$$CS = \frac{DPF}{PPI}$$

where:

DPF is the decimal point factor corresponding to the desired decimal point location.

DISPLAY	DPF	DISPLAY	DPF
XXXXXX =	1	XXX.XXX =	1,000
XXXXX.X =	10	XX.XXXX =	10,000
XXXX.XX =	100		

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

Example 1: A sensor produces 20 pulses per inch of material travel. Calculate the count scaler required to indicate material used in whole inches(XXXXXX).

$$CS = \frac{1}{20} = 0.05000$$

Example 2: An encoder produces 120 pulses per foot. Calculate the count scaler required to indicate material usage in 1/100's of feet (XXXX.XX).

$$CS = \frac{100}{120} = 0.8333$$

(Select the XXXX.XX position on the totalizer decimal point menu).

Programming Count Scale Factor

The first screen in the program mode is used to enter the count scale factor.
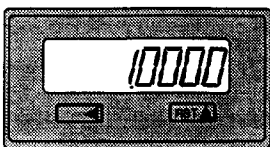
The far right digit will be flashing. Press the ⟨RST▲⟩ key until reaching the desired digit value.

Note: Pressing and holding the ⟨RST▲⟩ key will cause the numbers to autoscroll.

Next press the ⟨◀⟩ key to move the flashing digit one place to the left. Change this digit to the desired value with the ⟨RST▲⟩ key.

Repeat this process until all digits are set correctly.

Programming Decimal Point

The second screen is used to enter the decimal point display on the totalizer screen. Press and hold the ⟨◀⟩ key and then press the ⟨RST▲⟩ key to move from screen one to screen two.
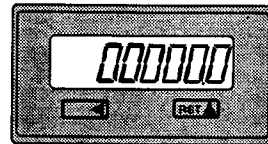
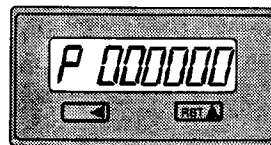Press the ⟨RST▲⟩ key to move the decimal point to the desired position.

Programming Offset Value

Programming an offset value allows the counter to reset to a value other than zero. The offset may be up to six digits. The offset cannot be a negative number.

The third screen in the program mode is used to enter the offset value.

The far right digit will be flashing. Press the ⟨RST▲⟩ key until reaching the desired digit value.

Note: Pressing and holding the ⟨RST▲⟩ key will cause the numbers to autoscroll.

Next press the ⟨◀⟩ key to move the flashing digit one place to the left. Change this digit to the desired value with the ⟨RST▲⟩ key. Repeat this process until all digits are set correctly.

Enabling the Front Panel Reset Key

The fourth screen in the program mode allows you to enable or disable the front panel reset key.

Press the RST▲ key to choose the option you want.

Note: The reset terminal on the rear panel is still active when the front reset button is disabled.

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

WIRING RECOMMENDATIONS

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

Cable: Make the connection between the count source and the totalizer 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 totalizer near a solenoid or other inductive devices. Supply enough ventilation to keep the totalizer 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 heat batteries above 95°C
• Do not recharge lithium batteries
• Do not dispose of batteries in fire
• Insert battery with correct polarity

WIRING DIAGRAMS

SOLID STATE ADD/SUBTRACT INPUT (DPC10-CS)
CURRENT SOURCING SENSOR
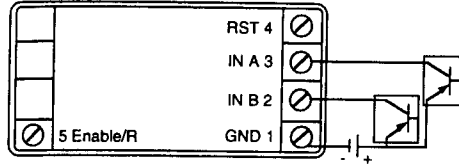
SOLID STATE ADD/SUBTRACT INPUT (DPC10-CS)
CURRENT SINKING SENSOR
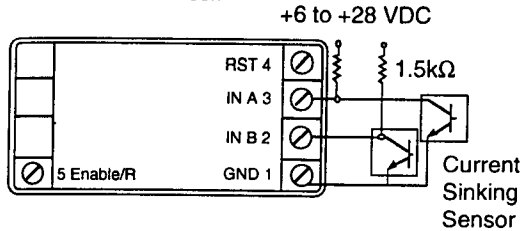
CONTACT CLOSURE COUNT INPUT (DPC10-CC)
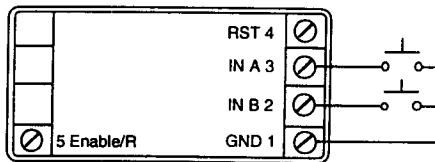
PROGRAM MODE ENABLE (All Models)
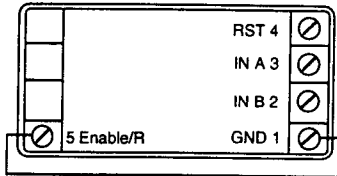
REMOTE RESET (All Models)
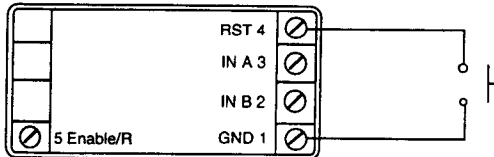
Terminal	Function	Operation
1	Ground	
2	Input B Count Input	Current Source Input (DPC10-CS) Current Sink Input (DPC10-CC)
3	Input A Count Input	Current Source Input (DPC10-CS) Current Sink Input (DPC10-CC)
4	Reset	Connect through Contact Closure to Ground
5	Program Enable	Connect to Ground to Enter Program Mode

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-QT	Quadrature Indicator
DPC10-RM	Ratemeter
DPC10-RT	Ratemeter/Totalizer

OMEGA® ... Your Source for
Process Measurement and Control

TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

PRESSURE/STRAIN FORCE

- ☑ Transducers & Strain Gauges
- ☑ Load Cells & Pressure Gauges
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

FLOW/LEVEL

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

pH/CONDUCTIVITY

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

DATA ACQUISITION

- ☑ Data Acquisition and Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Datalogging Systems
- ☑ Recorders, Printers & Plotters

HEATERS

- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

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