

376A SERIES



Single/Dual Preset



SINGLE/DUAL
PRESET COUNTER

FEATURES

- 10 kHz Counting Frequency
- Single Preset, Dual Preset, Batch Counting Modes
- Interval Counting Mode with Separate Start
- Count with Inhibit Mode
- Internal Totalizing Counter
- Prescaler 0.00001 to 9.99999
- 6 Decimal Point Positions
- High Intensity Blue V-F Display
- 6 Digit Count Display
- Easy English Language Operator Prompts
- 72mm² Panel - Dust, Water Tight
- 4 Snap-Action Keys
- Plug-in Housing (Quick Replacement)
- Easy DIP Switch Set-up
- Reset Key on Panel and External Resets
- Sinking, Sourcing, TTL Inputs
- Single, Bidirectional, and Quadrature (X1, X2, X4) Counting
- Relay or Transistor Outputs
- Outputs Latched, Timed, or Off at Presets
- Regulated 12 VDC Aux. Power Supply

PRODUCT HIGHLIGHTS

COUNTING MODES

The 376A is available as a Single Preset or a Dual Preset Counter. The Dual Preset Counter can be set as a Batch Counter. Both the Single Preset and the Dual Preset versions have an internal Totalizing Counter which will accumulate counts over numerous cycles. The 376A can be set up for Interval

HIGH SPEED COUNTING

The Single Preset 376A counts at a maximum frequency of 10 kHz. In addition to its high speed capabilities, a debounce circuit can be enabled to limit the count frequency to 100 Hz.

COUNTING MODES

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INPUTS/OUTPUTS

Two count inputs are available with the 376A. These inputs can be set to count Uni- and Bi-directionally. They can also be set to accept Quadrature inputs and can multiply the quadrature signals X1, X2 and X4. Input 2 also operates as the Start input in Interval Mode and as the inhibit input in Count with Inhibit Mode.

These two inputs can be set to accept Current Sinking or Sourcing signals, and there is a High/Low Threshold (Bias) setting allowing the input of TTL level signals.

Two types of outputs are available. The Relay outputs are rated for 10 A at 250 VAC and 30 VDC. The NPN Transistor outputs are current sinking and are rated for 100 mA at 30 VDC. These outputs are field replaceable. Each output can be set to either Latch ON, Remain ON for a Time Delay, or turn OFF at a Preset.

SCALE FACTOR

A Prescale value can be set which allows the operator to view and set counts using real units of measure. The Prescale value is a multiplier which is applied to the count inputs to determine the display and preset values. The Prescale value can be set from 0.00001 to 9.99999. The 376A also allows setting of the decimal point position in any of 6 positions.

RESETTING THE COUNTER

The Counter can be reset using the Reset key on the panel or by using the external Reset Inputs. There are three current sinking external inputs. Each one is dedicated to resetting the Process, Batch and Totalizing Counters. In addition, the 376A can be set to either retain its count or reset upon power failure.

OPERATOR PANEL AND HOUSING

The 376A operator panel is dust and water tight and measures a compact 72 mm². The panel features a high intensity blue vacuum fluorescent display. The display uses 8 digits for its English language operator prompts and 6 digits to display the count value. For operator use, there are 4 snap action keys which allow the operator to easily view Process Count, Batch Count, Totalizer Count, Presets, Scale Factor, Output Settings and Decimal Point position. The 376A can be set to lock out various displays from the operator. One key is dedicated to Resetting the Counter. This key can also be locked out.

SET-UP

Set-up of the 376A is accomplished using 16 DIP switches which are located inside the unit. These DIP switches give a visual indication of how the Counter is set-up, and eliminate the use of complex programming codes. Field replacement of the unit is quick. To replace a unit, remove the old unit from its housing, set the DIP switches in the new unit to the same positions, and plug the new unit in. It's that simple.

AUXILIARY POWER SUPPLY

To power sensor and encoder inputs, a regulated 12 VDC auxiliary power supply is provided. This supply can provide 120 mA of current, and is short circuit protected.

OPERATION

The Series 376A Preset Counter is a predetermined counter that will count high speed uni-directional, bi-directional, or quadrature input signals, and will activate an output when the predetermined preset value is reached. The unit is available in both Single and Dual Preset models, and includes an internal totalizer. Also, the 376A counter will operate as a Batch Counter using the second preset as a Batch Preset. The Series 376A comes with a variety of counting modes. The operation of each counting mode is described below.

COUNT UP FROM ZERO TO A GIVEN PRESET

The Output in the Counter is activated when the Count equals the Preset. In the Dual Preset Model, the Counter counts up from zero and Output 1 is activated when Preset 1 is reached and Output 2 is activated when Preset 2 is reached.

COUNT DOWN FROM A PRESET TO ZERO

When Reset is pressed, the Counter is set to the Preset Value. When the Count Value equals

zero, the Output is activated. In the Dual Preset Model, the Counter counts down from the High Preset value and activates one Output when it reaches the Low Preset Value; the other Output is activated when the Counter counts down from the Low Preset Value and reaches zero.

INTERVAL MODE

In this mode, the Counter will not begin counting until Input 2 is turned ON, indicating a Start Signal. Once the Start Signal is received, the Output will turn ON and the Counter will count. The Out-put will then turn OFF at the preset or zero. The Start Signal must be activated each time the process is reset, even when the Counter is set to Auto Reset

BATCH MODE - DUAL PRESET MODELS ONLY

In the Batch Mode, Input 1 is the Count input and will turn ON at Preset 1. Each time Output 1 turns ON, the Batch Counter will record a count. When the Batch Counter value equals the value in Preset 2, Output 2 will turn ON. The Batch Mode must be Manually Reset (unless T2 is set to 00.00 (.5 w/AR) for Auto Reset).

TIMED OUTPUTS

The Outputs can be delayed before turning OFF by setting time delay values for each output. Once the Preset is reached, a time delay, according to the time value set, will occur before the outputs turn OFF. This value can range from 0.00 sec (OFF at Preset) to 99.99 sec (Latched ON). In addition, the outputs can also be set to turn OFF upon reaching the preset for the other output in the Dual Preset Model.

SCALE FACTOR

A Prescale value can be set to allow viewing and setting counts using real units of measure. The Prescale value is a multiplier which is applied to the count in-put(s) to determine the count display and preset values. The Prescale value can be set from 0.00001 to 9.99999. In addition, the decimal point can be set on the display to any one of 6 positions.

SPECIFICATIONS**SETTINGS (FRONT OF PANEL):**

Presets: 1 to 999,999
Scale Factor: 0.00001 to 9.99999
Timed Outputs: 00.01 to 99.98 sec.
Latched
Off at Preset
Decimal Position: 0 to 6

COUNT INPUT MODES:

(SWITCH SELECTABLE)
Bi-Directional
Quadrature X1
Quadrature X2
Quadrature X4
Count with Inhibit
Interval with Start Input

OPERATING FEATURES:

(SWITCH SELECTABLE)
Count Up or Count Down
Count/Go or Count/Stop
Sink or Source Count Input
High or Low Threshold (Bias)
Auto Reset at:
High preset (Count Up)
Zero (Count Down)
After Timed Output
Totalizer
Dual Preset/Batch mode
Security lockout:
Access to Presets
Access to T1, T2, SF, DP
Front panel Reset
Reset on Power Up

MODELS:

Single and Dual Preset with either NPN (Solid State) or Relay Outputs.

MAXIMUM COUNTING FREQUENCY:

10 kHz - Count Up Mode
9 kHz - Count Down Mode
(Reduce by 3 kHz when Totalizing Counter is enabled.)
(Reduce by 2 kHz when Auto Reset is enabled.)
Min. pulse 10 usec. on; 90 usec. off.

COUNT INPUTS:

Sink - 9.4K ohm pull up
Max. current = 1.25 ma
Source - 4.7K ohm pull down
Max. voltage = 30 VDC, @ 7 ma.
High Bias: ViL = 5.5 V Max.
ViH = 7.5 V Min.
Low Bias: ViL = 1.5 V Max.
ViH = 3.75 V Min.

Debounce - reduces count Input 1 to 100 Hz (Input 2 no debounce.)

Interval start requires 15 msec. minimum pulse. (Can be momentary or sustained.)

REMOTE RESETS:

Count, Batch, Totalizer
Min. 15 msec. pulse
Pulled to 5V via 8K ohm res.
Active Low. ViL = 0.5V Max.
Max. current = .625 mA.

OUTPUT - SOLID STATE:

Current Sinking
I sink = 100 mA Max.
VoL = 1.0 VDC Max.
Max. Voltage = 30 VDC

OUTPUT - RELAY:

Life - 100 million operations (no load).
Contact Rating - 10 amp @
30 VDC or 250 VAC, 1/4 HP

DC SUPPLY:

12 VDC Regulated, $\pm 4\%$
Max. current = 120 ma

MEMORY:

Non Volatile EEPROM
230,000 Power Losses min.
10 Year Retention

POWER:

120 VAC : 95 - 132 VAC
240 VAC : 190 - 264 VAC
50 / 60 Hz
Max. Power = 8 VA

DISPLAY:

8 Digit, 14 Segment
5 mm \times 4.1 mm
Blue Vacuum Fluorescent

HOUSING:

Plug in, 72mm² DIN
Fully Gasketed, Dust and Watertight.

TERMINALS:

16 screw terminals located accessible from rear.

OPERATING TEMPERATURE:

0° F to 140° F

HUMIDITY:

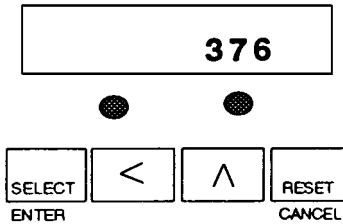
0% to 80% RH
Non-condensing

SETTING THE COUNTER

To set the Counter, there are four push-button keys located on the front of the unit. These buttons are provided to allow the user to select, change and save various values. These key operations are dependent on the DIP Switch settings of the unit (see below).

In addition to the normal counting modes of the unit, the 376A has the capability of operating as a Batch Counter and a Totalizer Counter. When these modes are activated, the functions of the Counter change accordingly. Pressing the RESET key, with the Count, Batch, or Totalizer value displayed, will reset that value.

This figure shows the front of panel with the Process Count value displayed. Pressing SELECT will scroll through a menu of options. After one of



these options is displayed for a second, the value for this option is automatically displayed. Once the option value is displayed, pressing the < key will move one digit to the left and the ^ key will increment the value by one. Then the SELECT key must be pressed to save the new value. Pressing RESET will return to the Process Count display. If

SELECT is not pressed after a change, RESET will return to the count display and the change will not be entered.

Selections in addition to Process Count are:

Totalizer - counts accumulated since last Totalizer Reset. When the total counts exceed 99,999,999 the Totalizer will blink. Pressing RESET will scroll through the actual value, pressing RESET a final time will reset the value to zero.

00000376

Batch - number of cycles elapsed in Batch Mode.

B 1

Preset 1/Preset 2 - value compared with the actual count. When the Preset Value is displayed, the Preset LED on the panel will light, indicating which preset is displayed.

000500

Prescale - this factor will scale the input counts. The count signal is multiplied by the prescale value to determine the count display. The prescale value can range from 0.00001 to 9.99999. Note: If the prescale value is greater than 1, the out put will energize when the count value passes the preset value.

1.00000

Output 1/Output 2 - time delay setting for outputs.

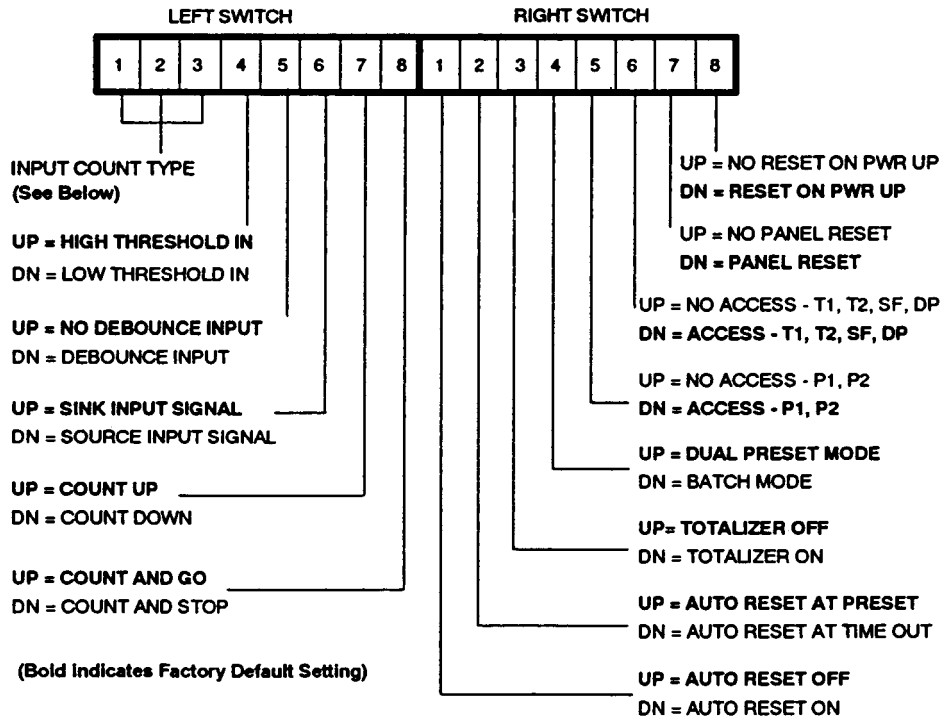
LATCHED

Decimal - the number of decimal positions for the display.

DP 0

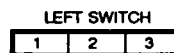
When the Counter reaches its Presets, the Outputs will activate and the LEDs on the panel will flash, indicating which output is activated.

DIP SWITCH SETUP-To set up the Counter for operation, a series of DIP switches located inside the unit must be set.



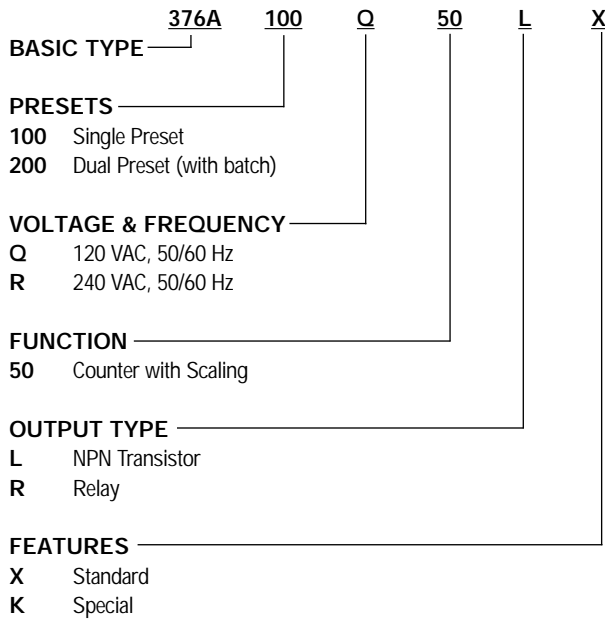
INPUT COUNT TYPE

BI-DIRECTIONAL COUNTER
 QUADRATURE COUNTER
 QUADRATURE COUNT X2
 QUADRATURE COUNT X4
 COUNT WITH INHIBIT
 INTERVAL MODE (COUNTER WITH START SWITCH INPUT)



UP UP UP
 DN UP UP
 UP DN UP
 DN DN UP
 UP UP DN
 DN UP DN

ORDERING CODES



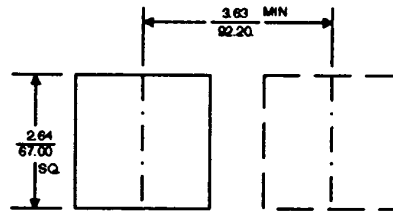
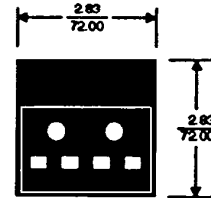
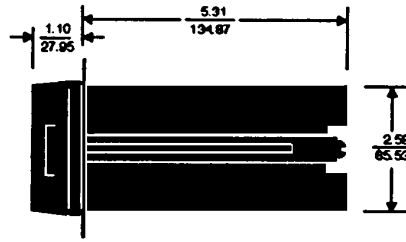
ACCESSORIES

- 0353-260-27-00: Surface mounting bracket kit
- 0305-265-61-70: Retrofit kit
- 0376-320-01-00: Retrofit kit
- 0376-260-13-00: Magnetic Pickup Input Board
- 0376-260-14-00: Millisecond timer conversion Board

For prices and further information, consult factory.

DIMENSIONS

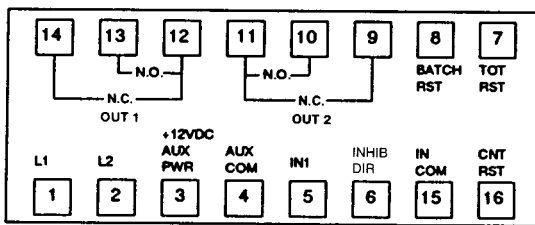
INCHES
MILLIMETERS



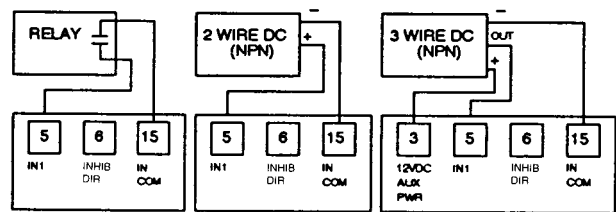
PANEL CUTOUT
SHOWING DISTANCE BETWEEN
ADJACENT CUTOUTS.

WIRING

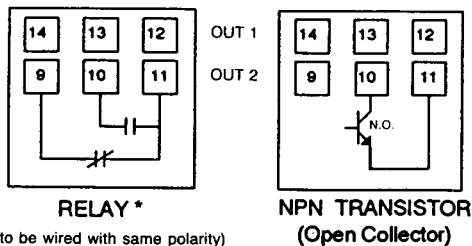
376 TERMINAL WIRING



COUNT INPUT WIRING - SINK INPUT SIGNAL



OUTPUT WIRING



* (Contacts to be wired with same polarity)

COUNT INPUT WIRING - SOURCE INPUT SIGNAL

