

PRODUCT HIGHLIGHTS



- 8 kHz Input Frequency
- Single Limit, Dual Limit, and Limit/Preset Modes
- Internal Totalizing Counter
- Separate Rate and Count Prescaler
- 6 Decimal Point positions
- High Intensity Blue V-F Display
- 6 Digit Rate Display
- 6 Digit Count Display
- Easy English Language Operator Prompts
- 72 mm² Panel - Dust, Water Tight
- 4 Snap-Action Key
- Plug-in Housing (Quick Replacement)
- Easy DIP Switch Set-up
- Reset Key on Panel and Ext'l Resets
- Sinking, Sourcing, TTL Inputs
- Single, Bidirectional, and Quadrature (X1, X2, X4) Inputs
- Relay or Transistor Outputs
- Outputs Latched, Timed, or Deadband Controlled
- Regulated 12 VDC Aux. Power Supply

HIGH SPEED INPUT

The 378 accepts inputs at a maximum frequency of 8 kHz. In addition to its high speed capabilities, a debounce circuit can be enabled to limit the input frequency to 100 Hz.

OPERATING MODES

The 378 is available as a Rate Controller or a Rate/Count Controller. Both the Rate Controller and the Rate/Count Controller versions have an internal Totalizing Counter which will accumulate counts over numerous cycles.

INPUTS/OUTPUTS

Two inputs are available with the 378. These inputs can be set to read Uni- and Bi-directionally. They can also be set to accept Quadrature inputs and can multiply the quadrature signals X1, X2 and X4. 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 operate when the rate passes through the Deadband setting.

SCALE FACTORS

A Prescale value can be set for both the Rate display and the Count Display to allow the operator to view and set frequency and counts using real units of measure. The Prescale value is a multiplier which is applied to the inputs to determine the display and preset values. Both Rate and Count Prescale values can be set from 00.00001 to 99.99999. The 378 also allows setting of the decimal point position for both the Rate and Count displays in any of 6 positions.

Series 378

RATE/COUNT CONTROLLER Single & Dual Output with Scaling



RESETTING THE CONTROLLER

The Controller 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 Rate, Count and Totalizing Displays. In addition, the 378 can be set to either retain its data or reset upon power failure.

OPERATOR PANEL AND HOUSING

The 378 operator panel is dust and water tight and measures a compact 72mm². 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 data value. For operator use, there are 4 snap action keys which allow the operator to easily view Rate, Count, Totalizer, Limits/Preset, Scale Factors, Output Settings, Decimal Point positions, Update Time, Time Base and Display. The 378 can be set to lock out various displays from the operator. One key is dedicated to Resetting the displays. This key can also be locked out.

SET-UP

Set-up of the 378 is accomplished using 16 DIP switches which are located inside the unit. These DIP switches give a visual indication of how the Controller 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.

APPROVALS

See Agency Listing on inside back cover of catalog.

OPERATION

The Series 378 Rate/Count Controller is a ratemeter and a counter that will accept high speed unidirectional, bidirectional, or quadrature input signals, and will activate an output when the predetermined limit and preset values are reached. The unit is available in both Single and Dual Output models, and includes an internal totalizer. The Series 378 comes with a variety of operating modes. The operation of each operating mode is described below.

Rate Controller with High/Low Limits

The Output in the Controller is activated when the frequency passes through its limit. The limit can be set as a High Limit or a Low Limit. In the Dual Output Model, two High Limits or two Low Limits can be independently set. When the limit is passed, the output can be set to latch ON, remain ON for a time period, or remain ON only as long as the frequency remains out of limit (Deadband). See "Outputs".

Rate Controller with Split Limits (Dual Output Version)

For the Dual Output Version, Split Limits can be set. In this mode one High Limit and one Low Limit can be set allowing a boundary to be established in which the frequency should remain. When the frequency passes through either of these limits, the appropriate Output in the Controller is activated. When the limit is passed, the output can be set to latch ON, remain ON for a time period, or remain ON only as long as the frequency remains out of limit (Deadband). See "Outputs"

Rate/Count Controller (Dual Output Version)

One Output in the controller is assigned to the Rate Display as a Limit, and the other Output is assigned to the Count Display as a Preset. For the Rate Limit, the Output in the Controller is

activated when the frequency passes through its limit. When the limit is passed, this Rate Output can be set to latch ON, remain ON for a time period, or remain ON only as long as the frequency remains out of limit (Deadband). See "Outputs". For the Count Preset, the Output in the Controller is activated when the count equals the preset. When this Count Output is activated it can either be set to latch ON, or remain ON for a time period. See "Outputs".

Outputs

The Outputs can be set to latch ON, remain ON for a time period or remain ON only as long as the frequency remains out of limit (Deadband). When latched ON, the Output will remain ON until it is reset either through the Reset key on the front panel or through the Reset terminal on the back of the unit. When set ON for a time period, the Output will remain ON for the time value set through the Setup key on the front panel. This value can range from 0.01 sec to 99.98 sec. When set ON for only as long as the frequency remains out of limit, the Output will turn ON when the limit is passed through. It will turn OFF when the frequency is again within the limit. To allow for a band between the turn ON and turn OFF points, a Deadband value can be set through the Setup key on the front panel. The Deadband value determines the number of units within the limit that the frequency must return to, before the output is turned OFF.

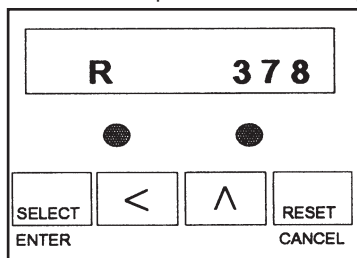
Scale Factor

Prescale values can be set for both the Rate and Count displays to allow viewing and setting the displays using real units of measure. The Prescale value is a multiplier which is applied to the input to determine the display and limits/preset values. The Prescale value can be set from 00.00001 to 99.99999. In addition, the decimal point can be set on the display to any one of 6 positions.

SETTING THE RATE/COUNT CONTROLLER

To set the Controller, 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).

This figure shows the front of panel with the Rate value displayed. Pressing SELECT will scroll through a menu of options. These options are RATE, COUNT, TOTAL, LIMIT 1, LIMIT 2 OR PRESET 2, OUTPUT 1, OUTPUT 2, RATE SF, COUNT SF, RATE DP, COUNT DP, TIMEBASE, UPDATE, DISPLAY. 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 Rate or

Count display. If SELECT is not pressed after a change, RESET will return to the Rate or Count display and the change will not be entered.

Note: Pressing RESET when the RATE, COUNT or TOTAL values are displayed will reset the display and unlatch the output if latched ON.

Selections in addition to Rate are:

Counter - counts accumulated since last Count Reset. C 378

Totalizer - counts accumulated since last Totalizer Reset. 00000378

Limits/Preset - value compared with the actual display value. When the Limit or Preset value is displayed, the LED on the panel will light, indicating which value is displayed. 000500

Output 1/Output 2 - mode setting for outputs. LATCHED

Rate/Count Prescale - this factor will scale the input. The input signal is multiplied by the prescale value to determine the display. 01.00000

Rate/Count Decimal - the number of decimal positions for the Rate or Count display. DP 0

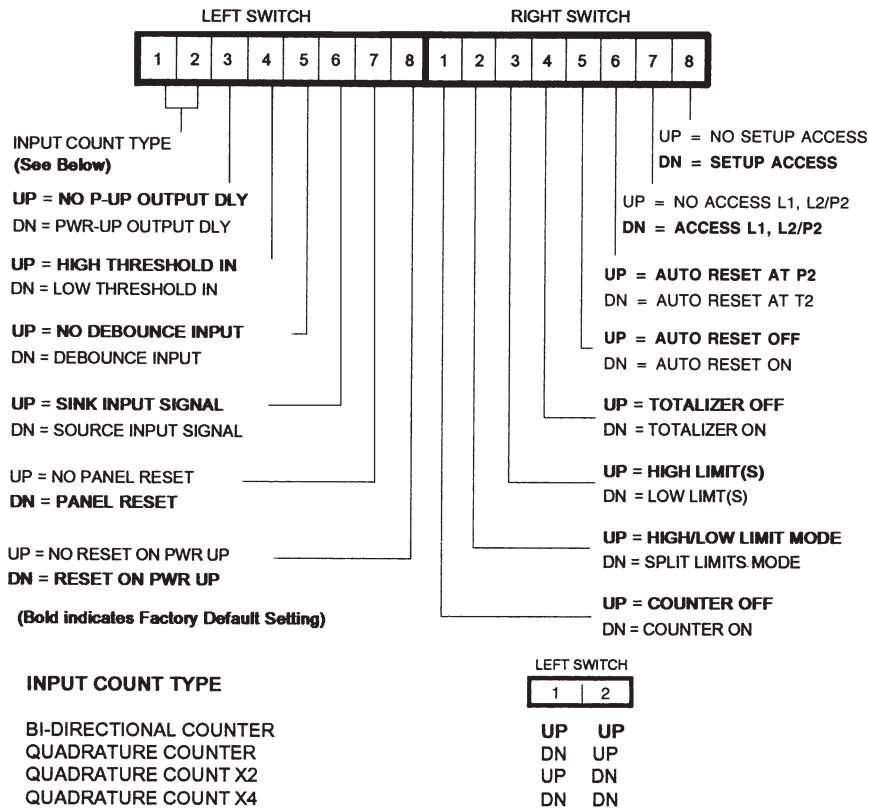
TimeBase - the timebase for the Rate display. PER SEC

Update - The minimum up-date time for Rate calculations. 2 SEC

Display - determines whether the display will remain Fixed or flash between the Rate and Count displays or the Rate and Total displays FIXED

When the Controller's Outputs activate, the LEDs on the panel will flash, indicating which output is activated.

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



SPECIFICATIONS:

SETTINGS (FRONT OF PANEL):

Limits/Presets: 1 to 999,999
 Rate Prescale: 00.00001 to 99.99999
 Count Prescale: 00.00001 to 99.99999
 Timed Outputs: 00.01 to 99.98
 Latched
 Deadband
 Decimal Point Positions: 0 to 6

INPUT MODES:
(SWITCH SELECTABLE)

Bi-Directional
 Quadrature X1
 Quadrature X2
 Quadrature X4
 Magnetic Pickup (ext'l board req'd)

OPERATING FEATURES:
(SWITCH SELECTABLE)

High/Low limit or Split limits
 2 Limits or Limit/Count Preset mode
 Sink or Source Input
 High or Low Threshold (Bias)
 Count Auto Reset at:
 Preset
 After Timed Output
 Totalizer
 Security Lockout:
 Access to Limits/Preset
 Access to OUT1/2, SF, DP, etc.
 Front panel Reset
 Reset on Power Up

MODELS:

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

MAXIMUM INPUT FREQUENCY:

Ratemeter only: 8 kHz
 Ratemeter w/Counter or Totalizer: 5 kHz
 Ratemeter w/Counter and Totalizer: 3 kHz
 (Reduce by 1 kHz when Auto Reset is enabled.)
 Min. Pulse 10 usec. on; 115 usec. off.

PERFORMANCE:

Accuracy: ± 0.03%
 Rate Calculation: 1/tau
 Zero Time: 16.0 sec.

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.
 Magnetic Pickup (ext'l board req'd) -
 Sensitivity: 150 mV peak
 Hysteresis: 100 mV
 Input Impedance: 25 K ohm @ 60 Hz
 Max. Input Voltage: +/- 50 Volts

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

REMOTE RESETS:

Rate, Count, Totalizer
 Min. 15 ms. 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, +/-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 x 4.1 mm
 Blue Vacuum Fluorescent

HOUSING:

Plug in.
 72 mm sq. DIN Plug in. Fully Gasketed. Dust and Water tight.

OPERATING TEMPERATURE:

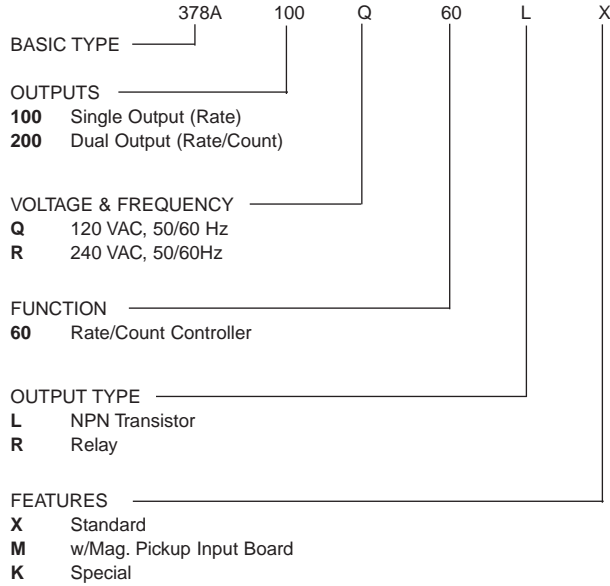
0° F to 140° F

HUMIDITY:

0% to 80% RH
 Non-condensing

SERIES 378 RATE/COUNT CONTROLLER

ORDERING CODE



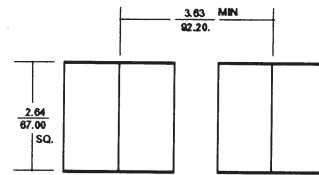
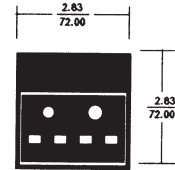
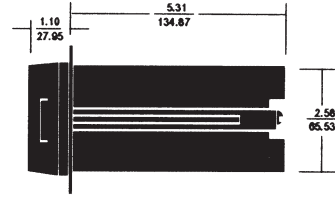
ACCESSORIES

- 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

For prices and further information, consult factory.

DIMENSIONS:

INCHES
MILLIMETERS

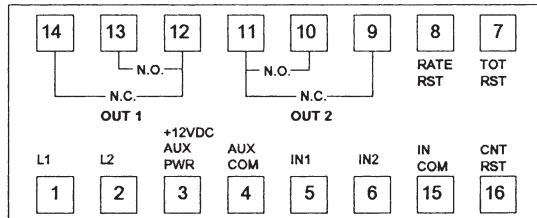


PANEL CUTOUT
SHOWING DISTANCE BETWEEN
ADJACENT CUTOUTS.

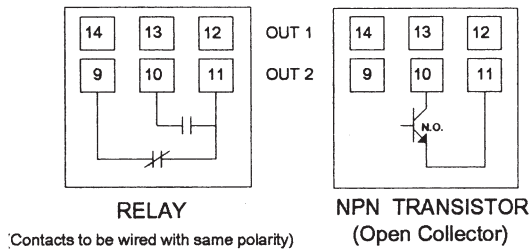
COUNTERS

WIRING

378 TERMINAL WIRING



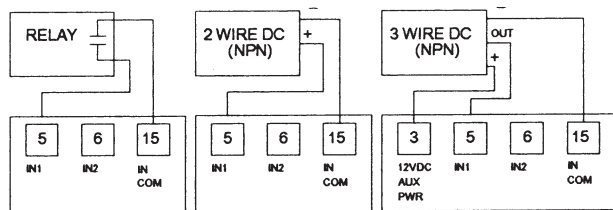
OUTPUT WIRING



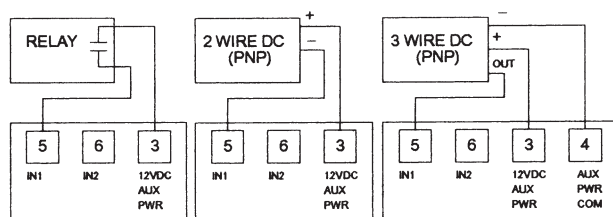
Before starting your design, read the safety statement in the back of the ATC catalog

Concerning safety... ATC makes every effort to build a safe product. We try to state specifications accurately, but every product made will eventually fail, so design our products into equipment so they fail safely.

INPUT WIRING - SINK INPUT SIGNAL



INPUT WIRING - SOURCE INPUT SIGNAL



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