CC701

INSTALLATION MANUAL

COUNTALINE

ELECTRONIC COUNTERS

rhomberg bräsler

guarantee

guarantee

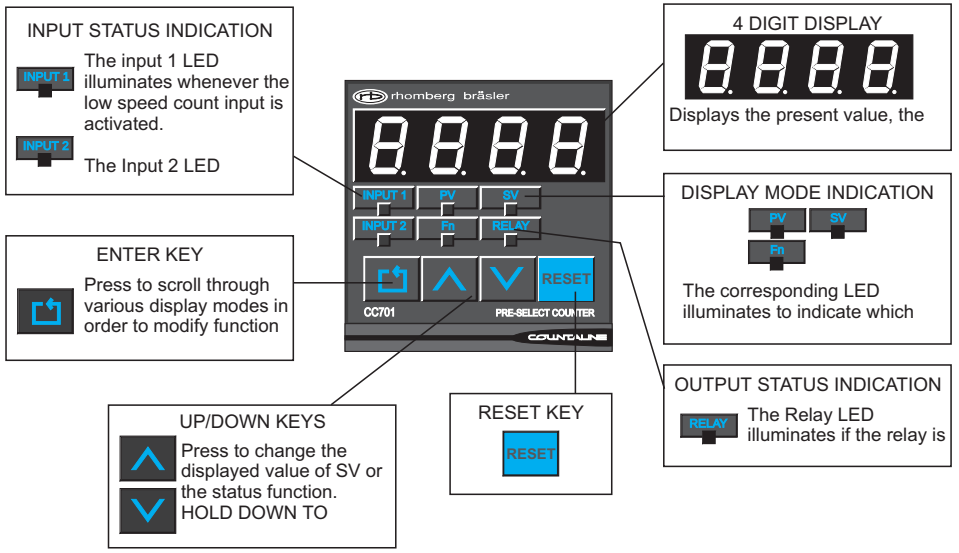
guarantee

12 months

Congratulations on the purchase of this new product. Special care with the design, workmanship and choice of materials has been taken to ensure reliable performance.

Each product is stringently tested twice before leaving our factory. Therefore, our products are guaranteed for a period of 12 (twelve) months from date of purchase. This guarantee is valid for defects arising from failure during operation under specified conditions. Our company does not accept liability for

front panel



contents

introduction

the CC701

The Countaline CC701 is a fully programmable 4-digit preselect counter designed with the latest microcontroller technology. Incorporating many features and input options, the counter is very versatile and easy to use. All programming is guided through by the conspicuous LED display and these user friendly

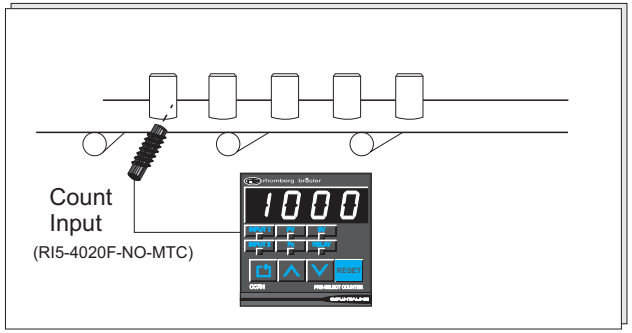


Figure 1 : Simplified Functional Diagram

key features

- 48 x 48 mm panel mount housing format
- Large 4-digit display with leading zero suppression
- User friendly keypad programming
- Selectable ADD, SUBTRACT, or ADD/SUBTRACT count modes
- Separate up and down count inputs in ADD/SUBTRACT mode 1.
- Separate count and count direction inputs in ADD/SUBTRACT mode 2.
- Dividing prescale programmable from 1 to 250.
- Relay hold programmable from 0.1 to 25 seconds in 0.1 second increments.
- High speed count input (500Hz) with selectable positive or negative active edge.
- Independent low speed count input (30Hz)
- Count input overspeed indication
- LED indication of relay output and of both count inputs
- Error message for indication of power supply interruption less than 0.3 second.
- Reset achieved via front panel key pad, via external switch or via NPN sensor.
- DC (NPN/PNP) or Namur sensor compatible high speed input (order option) Sensor leads can be connected directly as the CC701 has an internal sensor power supply.

installation

Panel Cut-out

Cut or punch out a panel as shown in Figure 2. Ideal panel thickness is between one and seven

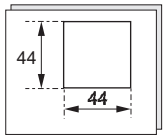


Figure 2 :
Panel Cut-out Dimensions (mm)

Mounting

Refer to Figure 3. Insert the CC701 into the cut-out. Slide the retaining clip (1) over the housing from the rear until the clip presses firmly against the panel.

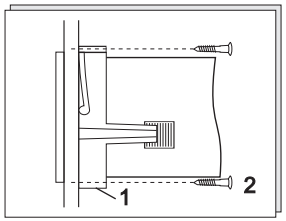
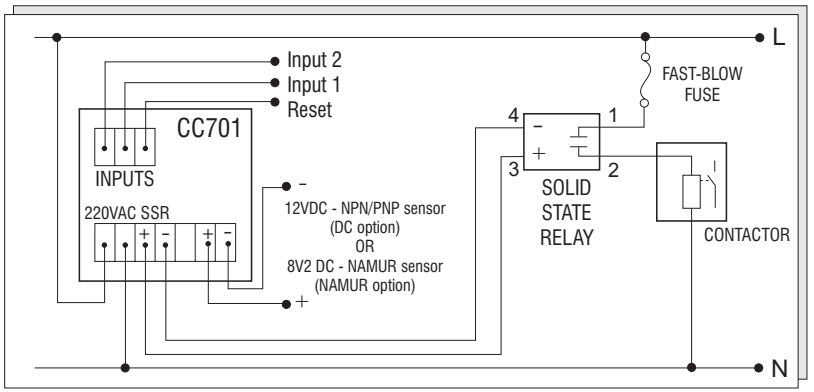


Figure 3 :
Mounting Method

installation

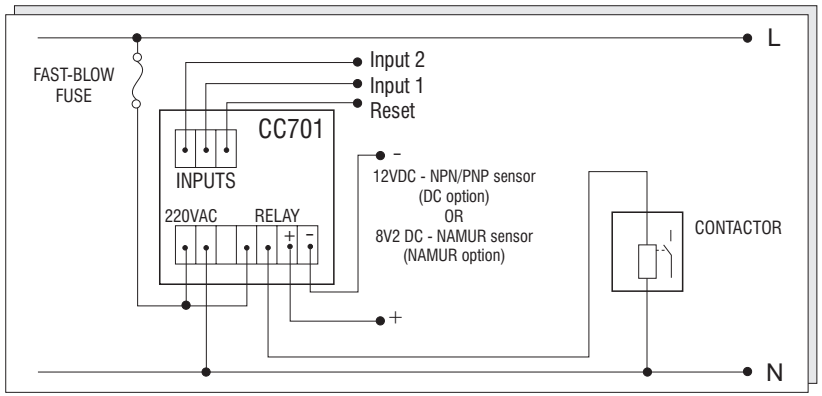
Wiring



Connection example 1:
CC701 with Solid State Relay (SSR) Output

INPUT 1: Low speed input
INPUT 2: High speed input

installation



Connection example 2: CC701 with Relay Output

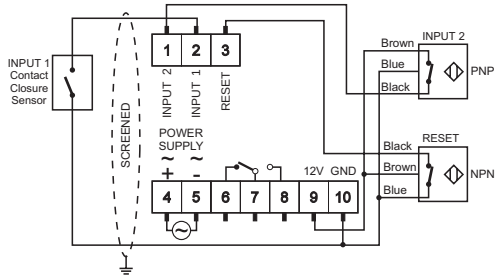
INPUT 1: Low speed input
INPUT 2: High speed input

NOTE: The CC701 is available for DC or Namur sensor input and should therefore be

wiring and input connection

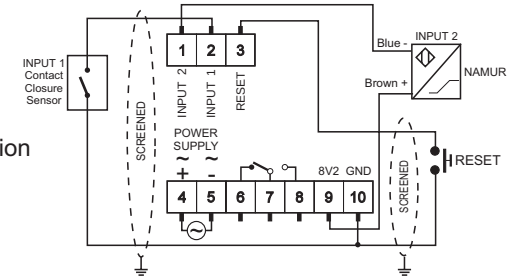
APPLICATION 1

DC OPTION - NPN/PNPsensor connection available on INPUT 2.



APPLICATION 2

NAMUR OPTION - Namur sensor connection available on Input 2.



set-up procedure

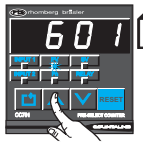
❒ STEP 1: Apply power to the CC701

On power-up, the previous set-up values are retrieved from non-volotile (back-up) memory and the last PV value is displayed

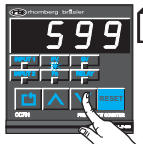
PV is displayed

❒ STEP 2: Select the required Set Value

1 Press the ENTER key once to display SV.
NOTE: The SV LED illuminates. If setting of SV is not



2 Press the UP key to increase SV to the



3 Press the DOWN key to decrease SV to the

NOTE:
Repeatedly depress the UP or DOWN keys to increase values by single units.

set-up procedure

❒ STEP 3: Select Function 1 (Count Mode)

See "Detailed Function Description" for description of functions and operation.

set count mode

1 Press the ENTER key from SV display mode. The Fn LED will illuminate. If setting of function

2 Press the UP or DOWN key

Add Mode

Add/Subtract Mode 2 (differential)

3 Select the required count mode using the

Subtract Mode

Add/Subtract Mode 2 (count direction)

set-up procedure

STEP 4: Select Function 2 (Active Edge)

set active edge

1 Press the ENTER key from Fn1 display mode. The Fn LED will illuminate. If setting

2 Press the UP or DOWN key once to display the status of Fn2.

Positive Active Edge

Negative Active Edge

3 Select the required active edge using the

NOTE: This programmed function is only available

set-up procedure

STEP 5: Select Function 3 (Relay Hold Time)

set relay hold time

1 Press the ENTER key from Fn2 display mode. The Fn LED will illuminate. If setting

2 Press the UP or DOWN key once to display the status of Fn3.

3 Select the required Relay hold time using

NOTE:
- If this value is set to zero, the relay remains
- energised until the counter is reset. Divide the displayed

set-up procedure

STEP 6: Select Function 4 (Prescale)

set prescale

1 Press the ENTER key from Fn3 display mode. The Fn LED will illuminate. If setting

2 Press the UP or DOWN key once to display the status of Fn4.

3 Select the required prescale value using

NOTE: Only the high speed input is divided by the selected prescale value. (PV only shows the

set-up procedure

STEP 7: Return to PV

return to PV

1 Press the ENTER key from Fn4 display mode. The PV LED will illuminate.

2 Your CC701 Pre-select counter is now ready to function as programmed.

Count Inputs

❒ Low speed count input (Input 1)

The low speed input is suitable for frequencies up to 30Hz. Should the input frequency exceed 30Hz an error message is displayed by continuously illuminating the decimal points.
This input can be activated by either an NPN sensor or a switch and it is designed to ignore contact bounce from mechanical switches. When in ADD mode, the low speed input increments the displayed count value. When in

❒ High speed input (Input 2)

The high speed input is suitable for frequencies up to 500Hz. Should the input frequency exceed the maximum frequency, an error message is displayed by continuously illuminating the decimal points. This input can be activated by either an NPN or PNP sensor (i.e. DC option), or a Namur sensor (i.e. Namur option). When in ADD or ADD/SUBTRACT mode 1, the high speed input increments the displayed count value. When in SUB mode, the high speed input decrements the displayed count value. Incrementing or decrementing can be set to occur on

❒ Low and high speed count inputs (Input 1and Input 2)

In the ADD/SUBTRACT mode 2, the count direction of the high speed input is determined by the active state of the low speed input. The high speed input increments the displayed count value when the low speed input is held high, and decrements when it is held low. All the decimal points on the display illuminate if the maximum frequency of either input is exceeded. The counter has a built in

Present Value

The present value (PV) displays the present count value and is indicated by the PV LED. This value is always displayed on power-up.

Set Value

The set value (SV) is entered from the keypad and is only displayed when the SV LED illuminates. The set value (SV) can be reset to zero by depressing the reset key pad.

Programmable Functions

All function settings are entered from the front keypad.

❒ Function 1 (Count mode):

ADD mode:
The present value (PV) increments from zero until it equals the set value (SV). At this point the relay energises and the PV resets to zero. The PV increments on each pulse received from the high or low speed input.
SUBTRACT mode:
The present value (PV) decrements the set value (SV) until the PV equals zero. At this point the relay energises and the PV resets to SV. For both the ADD mode and the SUBTRACT mode, either the high speed or the low speed input can be selected, but cannot be used simultaneously.
ADD/SUBTRACT (differential) mode 1:
The PV simultaneously increments, via pulses received from the high speed input, and decrements, via pulses received from the low speed input until the PV equals the SV. At this point the relay energises and the PV resets to zero.

❒ Function 2 (Active Edge):

This function allows for the selection of either a positive or negative active edge on only the high speed count input.

❒ Function 3 (Relay Hold Time):

The time that the relay remains energised is set here. This value must be entered at ten times the desired time. For example, for a relay on time of 5.2 seconds, the value entered must be 52. If this value is set to zero, the relay will remain

❒ Function 4 (Prescaler):

The integer dividing prescaler can be set from 1 up to 250. The prescaler divides the count input pulses by this integer value. Thus the PV only increments or decrements once the prescale number of pulses are received on the count input. For example, if the prescaler is set to 5 and the counter is in ADD mode, the PV only increments after every fifth count input pulse is received. The prescaler can

detailed function description

Control Input

❒ Reset input

The counter is reset by momentarily depressing the reset key pad on the front panel, or by activation of an external switch or NPN sensor, for less than 2 seconds. When in ADD or ADD/SUBTRACT 1 or 2 mode, a reset returns the PV to zero. When in

Input Integrity Indication

❒ Brief Power Failure

The counter stores the PV, SV and all function parameters in non-volatile memory when power supply to the unit is lost. A power failure of duration less than 0.3

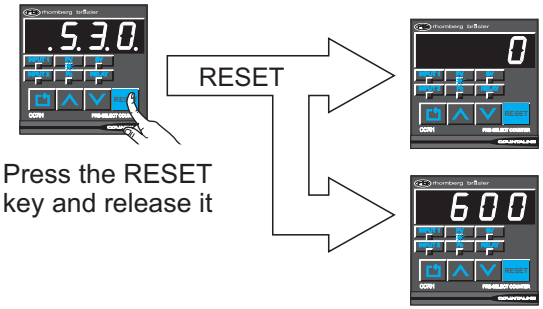
❒ Overflow

If the maximum input frequency is exceeded on either input an error message is displayed by continuously illuminating the decimal points.

In both a brief power failure and an overflow condition the error messages indicate a possible miss count, and can be cleared by depressing the reset button until the decimal points extinguish. The PV value displayed will not be cleared and

detailed function description

Clear error message and reset to zero



Press the RESET key and release it

Count value resets to zero and error message is cleared in ADD or ADD/SUBTRACT1 or 2

Count value resets to SV and error message is cleared in SUBTRACT mode.

Clear error message and retain count value

Press the RESET key until the decimal points

Count value remains while error message is cleared.

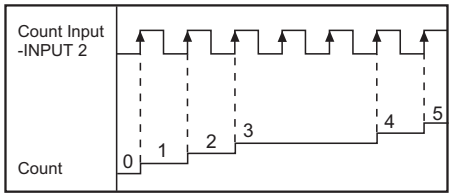
NOTE:
- When all the decimal points are continuously illuminated it indicates an
- overflow error message. All decimal points flashing

error messages

DECIMAL POINT ERROR MESSAGES		
MESSAGE	**CONDITION**	**TO CLEAR**
ALL DECIMAL POINTS ILLUMINATE CONTINUOUSLY	COUNT FREQUENCY EXCEEDED MAXIMUM INPUT FREQUENCY	RESET FOR > 3 SECONDS
ALL DECIMAL POINTS FLASHING	POWER INTERRUPTION LESS THAN 0,3 SECONDS	RESET FOR > 3 SECONDS

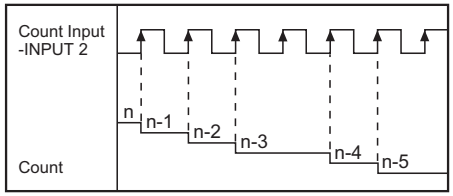
operational diagrams

Add Mode



NOTE: PRESCALE = 1

Subtract Mode

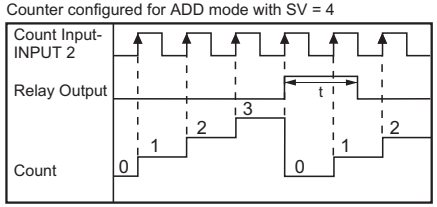


NOTE: n = SET VALUE (SV)
PRESCALE = 1

operational diagrams

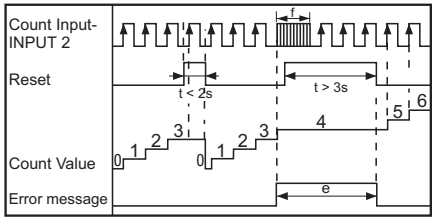
Relay Output

Counter configured for ADD mode with SV = 4



NOTE: t = Relay hold time

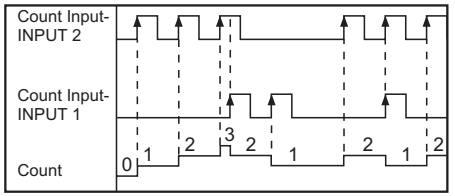
Reset



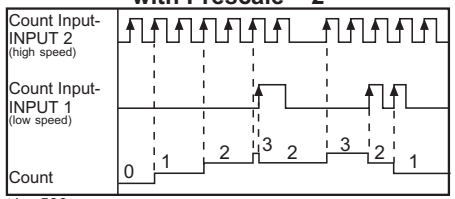
NOTE: f = overspeed on input of greater than 500Hz
e = error message indication
(all decimal points illuminate continuously)

operational diagrams

Add/Subtract Mode 1



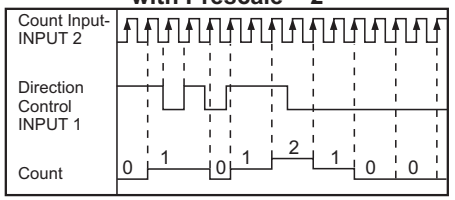
Add/Subtract Mode 1 with Prescale = 2



t1 = 500ms

NOTE: In ADD/SUBTRACT 1 mode the Prescale function can only be used on the high speed (INPUT 2) count input.

Add/Subtract Mode 2 with Prescale = 2



specifications

❒ Input Specifications

	HIGH SPEED INPUT	SLOW SPEED INPUT	RESET INPUT
NAMUR option	NAMUR sensor DIN 19234	Potential free contact or NPN sensor (open collector type)	Potential free contact or NPN sensor (open collector type)
DC option	NPN or PNP sensor (open collector type)		
Maximum input frequency	500Hz	30 Hz	500Hz
Minimum pulse width	1 millisecond	16.7 ms	1 millisecond
Active pulse edge	Positive or Negative (programmable on Function 2, Fn2)	Positive or Negative (programmable on Function 2, Fn2)	Negative: holds count value Positive (if low for < 2 sec): resets count value and clears error messages Positive (if low for > 3 sec): clears error message but not count value

specifications

❒ General Specifications

Power Supply Tolerance	±15%
Power Consumption	<3VA
Operating Temperature	0-55°C
Protection Class (Front Panel)	IP54
Protection Class (Rear)	IP30

❒ Output Specifications

Relay option	250 VAC, 8a, SPDT

SSR Drive option 10mA at 6V

❒ Sensor Interface

Internal sensor power supply
NAMUR sensor option: 8.2V DC / 10mA
NPN or PNP sensor (i.e. DC option): 12V DC / 30mA
Maximum NPN sensor saturation voltage: 2V DC (high speed count input)
2.5V DC (low speed count input)
Maximum PNP sensor saturation voltage: 2V DC (high speed count input)