

# Operating instructions 5.94.1

## Electronic LED Preset Counter Type Series 715

### 1. Description

- 5 digit preset counter, 1 preset point, add./subtr.
- bright LED display with 7.5 mm high characters
- count and preset range -19999 to 99999, over- or underflow without count loss up to 1 decade (will be indicated by flashing of the display with 1 Hz frequency)
- programmable as impulse counter, frequency meter or timer
- relay or optocoupler output (refer to ordering code)
- prescaling factor 0.001...9.999
- programming of count functions/operating parameters via the preset keys. During programming the display guides the user with text prompts.
- programmable are:
  - operating mode (output signal at zero or at preset point, with or without automatic reset)
  - decimal point
  - polarity of the inputs (NPN or PNP)
  - input mode and factor
  - output signal to be permanent or timed
  - gate time when programmed as a frequency meter resolution when programmed as a timer (s, min or h)
- supply voltage 230 VAC, 115 VAC or 11...30 VDC

### 2. Inputs

#### 2.1 INP A, INP B

Count inputs; max. count frequency 30 Hz or 10 kHz separately selectable for both inputs via programming switches C and D at the right side of the housing.



Microswitch	INP A		INP B	
	30 Hz	10 kHz	30 Hz	10 kHz
D	ON	OFF		
C			ON	OFF

#### 2.2 Gate

Static input; no counting while this input is activated. If operated as a timer (only h, min and 0.1 min resolutions), the decimal point between the 4th and 5th decade flashes while gate input is not activated (operating indication).

#### 2.3 Reset

Dynamic input; it is connected in parallel to the red reset key and sets the counter to zero (adding mode) or to the preset value (subtracting mode).

#### 2.4 Latch

Static input for display stop. If this input is activated, the current count value will be retained until the latch input will be released again. Counting continues in the background.

#### 2.5 Key

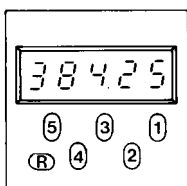
Static keyboard lock input. While this input is activated, all front keys are locked.

### 3. Output

Relay with potentialfree change-over contact or optocoupler with open collector and emitter. When this output is activated, an annunciator (decimal point) will appear on the right of the first decade. For safety circuits the operation of the relay, resp. the optocoupler may be inverted in operating modes 1 and 2 (permanent signal only) by programming 99.99 for duration of output signal. Thus the relay coil will be dead, resp. the optocoupler will be locked when reaching the preset point/zero.

### 4. Programming procedure

- connect to supply voltage
- set microswitch "A" (right side of the housing) to "ON" for a short time. Display will show 1st menu point.



c. select required functions via preset key 1, resp. enter data (prescaling factor, duration of timed signal, gate time) directly via preset keys 1-4.

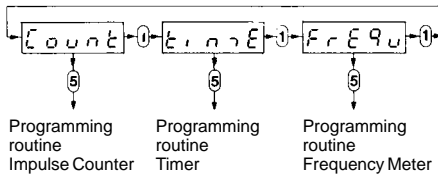
d. press preset key 5 to store selected function/enter data and to change over to next menu point.

e. After programming the last menu point (permanent signal or timed signal) by pressing key 5, the routine will be left if microswitch "A" is set to "OFF". If it is still set to "ON", the programming routine will be passed through once again.

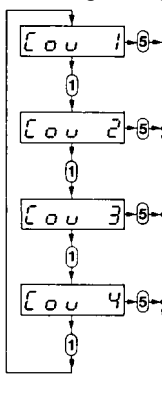
### 5. Menus in detail

#### 5.1 Selection of basic function

After microswitch "A" has been set to "ON" for a short time, one of the basic functions will be displayed:



#### 5.2.1 Programming routine Impulse Counter

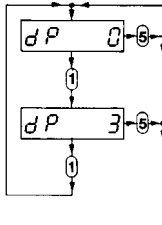


**Operating mode 1:**  
Output signal when count value  $\geq$  preset value  
Reset to zero

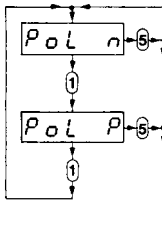
**Operating mode 2:**  
Output signal when count value  $\leq$  zero  
Reset to preset value

**Operating mode 3:**  
Timed signal when count value = preset value and automatic reset to zero.  
Reset to zero.

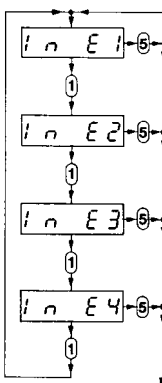
**Operating mode 4:**  
Timed signal when count value = zero and automatic reset to preset value.  
Reset to preset value.



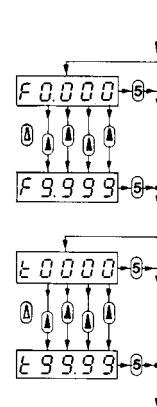
**Decimal point:**  
only optical function!  
dP0 = no decimal point  
dP1 = 0000.0  
dP2 = 000.00  
dP3 = 00.000



**Polarity of the inputs:**  
negative polarity (NPN), switching to 0 V  
positive polarity (PNP), switching to +24 V



**Input modes:**  
E 1: INP A = count input  
INP B = count direction input  
E 2: INP A = count input, adding  
INP B = count input, subtracting  
E 3: Quadrature input  
INP A = count input 0°  
INP B = count input 90°  
E 4: same as E3 but with pulse doubling.  
Each pulse edge of INP A will be counted.



#### Scaling factor:

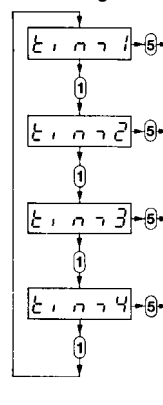
0.001...9.999 to be entered via keys 1-4. Factor 0.000 won't be accepted. Please note: In operating mode 2 and 4 (output signal when count value = zero) the preset value has to be integerly divisible by the factor, otherwise the counter - when reset - will be set to the following integer multiple of the factor.

#### Duration of the output signal:

00.00 = permanent signal in operating modes 1 and 2.  
0.01...99.98 s = timed signal in operating modes 1 to 4.  
99.99 s = permanent signal in operating modes 1 and 2, but with inverted operation of the relay or optocoupler (relay coil will be dead at preset value/zero, optocoupler will be locked).

If microswitch "A" is set to "OFF", the programming routine will be left now and the counter is ready to work. If microswitch "A" is still set to "ON", the programming routine has to be passed through once again.

#### 5.2.2 Programming routine Timer

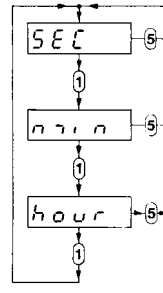


**Operating mode 1:** Permanent signal when count value  $\geq$  preset value or timed signal when count value = preset value.  
Reset to zero

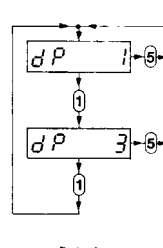
**Operating mode 2:** Permanent signal when count value = zero or timed signal when count value = zero  
Reset to preset value

**Operating mode 3:** Timed signal when count value = preset value and automatic reset to zero.  
Reset to zero

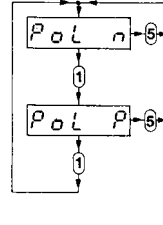
**Operating mode 4:** Timed signal when count value = zero and automatic reset to preset value.  
Reset to preset value



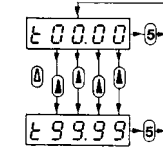
**Unit of time:**  
Timing in s, 0.1 s, 0.01 s or 0.001 s\*  
Timing in min, 0.1 min, 0.01 min or 0.001 min\*  
Timing in h, 0.1 h, 0.01 h or 0.001 h\*  
\*depending on position of decimal point



**Decimal point (resolution)**  
dP0 = no decimal point  
dP1 = 0000.0  
dP2 = 000.00  
dP3 = 00.000



**Polarity of the inputs**  
negative polarity (NPN), switching to 0 V  
positive polarity (PNP), switching to +24 V



**Duration of the output signal:**  
00.00 = permanent signal in operating modes 1 and 2  
0.01... 99.98 s = timed signal in operating modes 1 to 4

- Subject to changes without prior notice -

99.99 = permanent signal in operating modes 1 and 2, but with inverted operation of the relay or optocoupler (relay coil will be dead at preset value/zero, optocoupler will be locked).

If microswitch "A" is set to "OFF", the programming routine will be left now and the counter is ready for operation.

If microswitch "A" is still set to "ON", the programming routine has to be passed through once again.

### 5.2.3 Programming routine Frequency Meter (output is activated when counter value $\geq$ preset value)

**Gate Time** = within this period the incoming pulses will be counted and displayed.  
 Programmable range 0.01 s ... 99.99 s to be entered via keys 1 to 4.  
 00.00 won't be accepted.

**Decimal point:**  
 only optical function.  
 dP0 = no decimal point  
 dP1 = 0000.0  
 dP2 = 000.00  
 dP3 = 00.000

**Polarity of the inputs:**  
 negative polarity (NPN), switching to 0 V  
 positive polarity (PNP), switching to +24 V

**Input modes:**  
**E1:** INP A = count input  
 INP B = count direction input  
**E2:** INP A = count input, adding  
 INP B = count input, subtracting  
**E3:** Quadrature input  
 INP A = count input 0°  
 INP B = count input 90°  
**E4:** same as E3 but with pulse doubling.  
 Each pulse edge of INP A will be counted.

**Scaling factor:**  
 0.001...9.999 to be entered via keys 1-4.  
 Factor 0.000 won't be accepted

**Duration of the output signal:**  
 00.00 = permanent signal in operating modes 1 and 2.  
 0.01...99.98 s = timed signal in operating modes 1 to 4.  
 99.99 s = permanent signal in operating modes 1 and 2, but with inverted operation of the relay or optocoupler (relay coil will be dead at preset value/zero, optocoupler will be locked).

If microswitch "A" is set to "OFF", the programming routine will be left now and the counter is ready to work.

If microswitch "A" is still set to "ON", the programming routine has to be passed through once again.

## 6. Programming of the Preset Value:

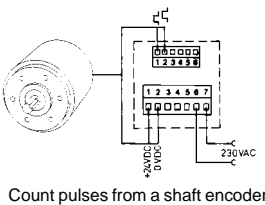
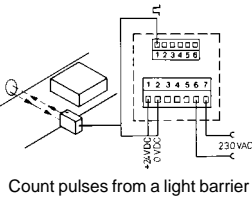
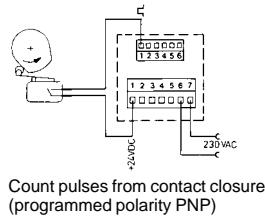
After pressing one of the 5 preset keys, the preset value will be displayed. This value can be changed via the preset keys (one key for each digit).  
 4 seconds after release of the last key pressed the preset value will disappear from the display and the count value will be shown again.

### 6.1 Characteristics of 5th decade:

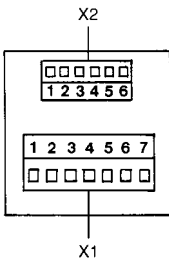
98888 Preset value +9XXXX  
 -8888 Preset value -XXXX  
 78888 Preset value -1XXXX  
 08888 Preset value +0XXXX

not when programmed as a timer

## 7. Examples for application connections:



## 8. Connections



### Plug connection X1

Terminal No.	115/230 VAC version	11...30 VDC version
1	+24 VDC transmitter voltage	—
2	0 VDC (GND)	—
3	Relay output common contact (C) Optocoupler output emitter	
4	Relay output normally open contact (NO)	
5	Relay output normally closed contact (NC) Optocoupler output collector	
6	115 VAC / 230 VAC	+11...30 VDC
7	115 VAC / 230 VAC	0 VDC (GND)

**Please note:** If permanent signal = 99.99 s (inverted operation of relay resp. optocoupler), the connections of terminal 4 and 5 are as follows:

Terminal No.	AC- and DC version
4	Relay output normally closed contact (NC)
5	Relay output normally open contact (NO)

### Plug connection X2

Terminal No.	Designation	Function
1	INP A	count input A
2	INP B	count input B
3	GATE	gate input
4	RESET	reset input
5	LATCH	display stop input
6	KEY	keyboard lock input

## 9. Technical Data

**Supply voltage:**  
 230 VAC, 115 VAC, max. 4 VA  
 or 11...30 VDC, max. 0.1 A

**Display:**  
 5 digit 7 segment red LED display with 7.5 mm high characters

**Polarity of input signals:**  
 programmable, all inputs in common

**Input resistance:**  
 approx. 10 kOhm

**Count frequency:**  
 via DIL switches separately selectable for INP A and INP B  
 30 Hz  
 10 kHz (7.5 kHz in input mode E4)  
 automatical reset 1 kHz without count losses (600 Hz in input mode E4)

**Min. pulse length of the control inputs:**  
 5 ms

**Input sensitivity:**  
 AC supply voltages  
 Log "0": 0...4 VDC  
 Log "1": 12...30 VDC  
 DC supply voltages  $U_b$   
 Log "0": 0...0.2 x  $U_b$   
 Log "1": 0.6 x  $U_b$ ...30 VDC

**Pulse shape:** variable (Schmitt Trigger characteristic)

**Output:** relay with potentialfree change-over contact  
 switching voltage max. 250 VAC / 300 VDC  
 switching current max. 3 A  
 switching current for DC min. 30 mA  
 switching performance max. 50 W for DC  
 max. 2000 VA for AC

or  
 optocoupler with open collector and emitter  
 switching performance: 30 VDC / 15 mA  
 $U_{cesat}$  at  $I_c = 15$  mA: max. 2.0 V  
 $U_{cesat}$  at  $I_c = 5$  mA: max. 0.4 V

**Responding time of output:**  
 relay: approx. 6 ms  
 optocoupler: approx. 1 ms

**Data retention:**  
 min. 10 years or  $10^6$  memory cycles

**Transmitter voltage:**  
 24 VDC -40%/+15%, 80 mA unstabilized for AC-versions

**Noise immunity:**  
 EN 55011 class B and prEN 50082-2

**Ambient temperature:**  
 0...50°C

**Storage temperature:**  
 -25°C...+70°C

**Weight:** approx. 240 g (AC-version with relay)

**Protection:** IP 54 (front)

**Colour of housing:** black

## 10. Ordering Code

6.715.01X.X00

Supply voltage  
 0 = 230 VAC  
 1 = 115 VAC  
 3 = 11...30 VDC

Output  
 0 = relay  
 1 = optocoupler