

Operating instructions

Electronic LED

Preset Counter

Type Series 715

5.94.1

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

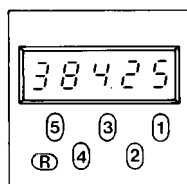
Static keyboard lock input. While this input is activated, all front keys are locked.

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.

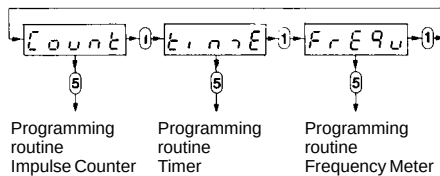
d. press preset key 5 to store selected function/enter data and to change over to next menu point.

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.

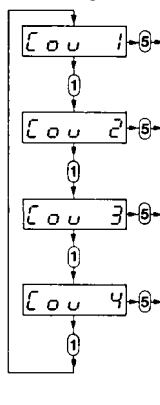
5. Menus in detail

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:

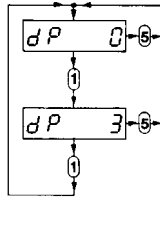
Output signal when count value $\leq$ zero
Reset to preset value

Operating mode 3:

Timed signal when count value = preset value and automatical reset to zero.
Reset to zero.

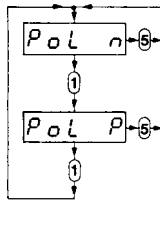
Operating mode 4:

Timed signal when count value = zero and automatical reset to preset value.
Reset to preset value.



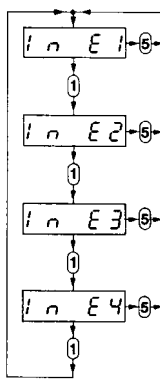
Decimal point:

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:

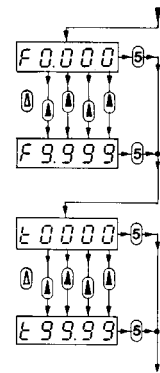
- INP A = count input
INP B = count direction input
- INP A = count input, adding
INP B = count input, subtracting
- Quadrature input
INP A = count input 0°
INP B = count input 90°
- same as E3 but with pulse doubling.
Each pulse edge of INP A will be counted.

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.

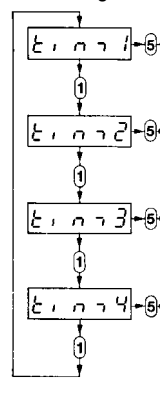
Duration of the output signal:

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 $\leq$ zero or timed signal when count value = zero
Reset to preset value

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

Operating mode 4: Timed signal when count value = zero and automatical 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)

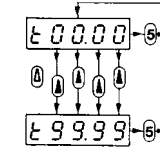
dP0 = no decimal point
dP1 = 0000.0
dP2 = 000.00
dP3 = 00.000

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



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:

Preset value +9XXXX
Preset value -XXXX
Preset value -1XXXX
Preset value +0XXXX

not when programmed as a timer

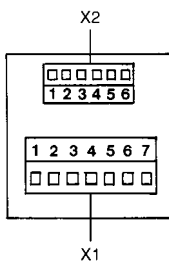
7. Examples for application connections:

Count pulses from contact closure (programmed polarity PNP)

Count pulses from a light barrier

Count pulses from a shaft encoder

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