

Manual DSE-T7



- 8 Digit counter in DIN-housing 144 X 72 mm
- Supply voltage 10 – 35V DC
- 2 Programmable outputs
- In- and outputs optically isolated
- Programmable multiplier
- Power failure protection
- Function “HOLD-RESET”
- Function “SPEED MEASUREMENT”

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LIST OF PARAMETERS

1 INTRODUCTION

1.1 General

The microprocessor controlled counter DSE-T7 contains a counter-input to connect 90° shifted signals with a signal level of 10 – 35V or 5V (5V with or without inverted signals) as well as two outputs. All inputs and outputs are optically isolated.

By programming several parameters the function of the counter can be determined and stored in an EEPROM.

By programming 4 presetvalues it is possible to generate different output-functions. These presetvalues are also stored in an EEPROM.

The programmable power failure protection will ensure that the counter-value is stored in the EEPROM when the supply voltage has been interrupted. At the next start-up the countervalue will be restored.

It is possible to adjust the displayed value to every desired read-out using parameters like the multiplier and the position of the decimal point.

1.2 Important information

- ✓ The DSE-T7 is a high-tech electronic product. To ensure safety and a correct functioning of the product it is important that only qualified specialists will install and operate the DSE-T7.
- ✓ If through a failure or fault the DSE-T7 an endangering of persons or damage to plant is possible, this must be prevented using additional safety measures. These must remain operational in all possible modes of the DSE-T7.
- ✓ Necessary repairs to the DSE-T7 are only to be carried out by the manufacturer.

1.3 *EMC Measures*

To ensure the best possible electromagnetic compatibility, it is recommended to pay attention to shielding and grounding the DSE-T7:

- ✓ Shielding on both sides and with the largest possible contact area.
- ✓ Keep wiring as short as possible.
- ✓ Earth-connections should be short and with the highest possible wiring-diameter.
- ✓ Signal-connections and supply-connections must be separated.

When using the 5V-supply voltage that is generated by the DSE-T7 to supply a 5V-encoder, there is no fully optical isolation between the DSE-T7 and the encoder.

Figure 1 and 2 show the earthing when using 1 or 2 supplies. Figure 3 shows how to use the earthing strip.

Figure 1. Single supply voltage

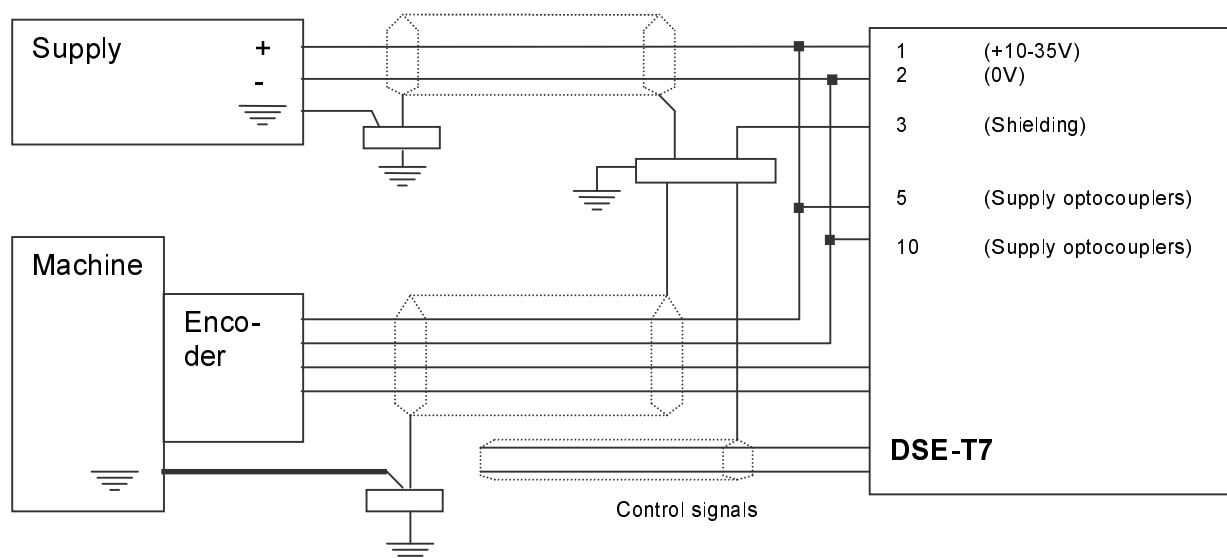


Figure 2. Double supply voltage

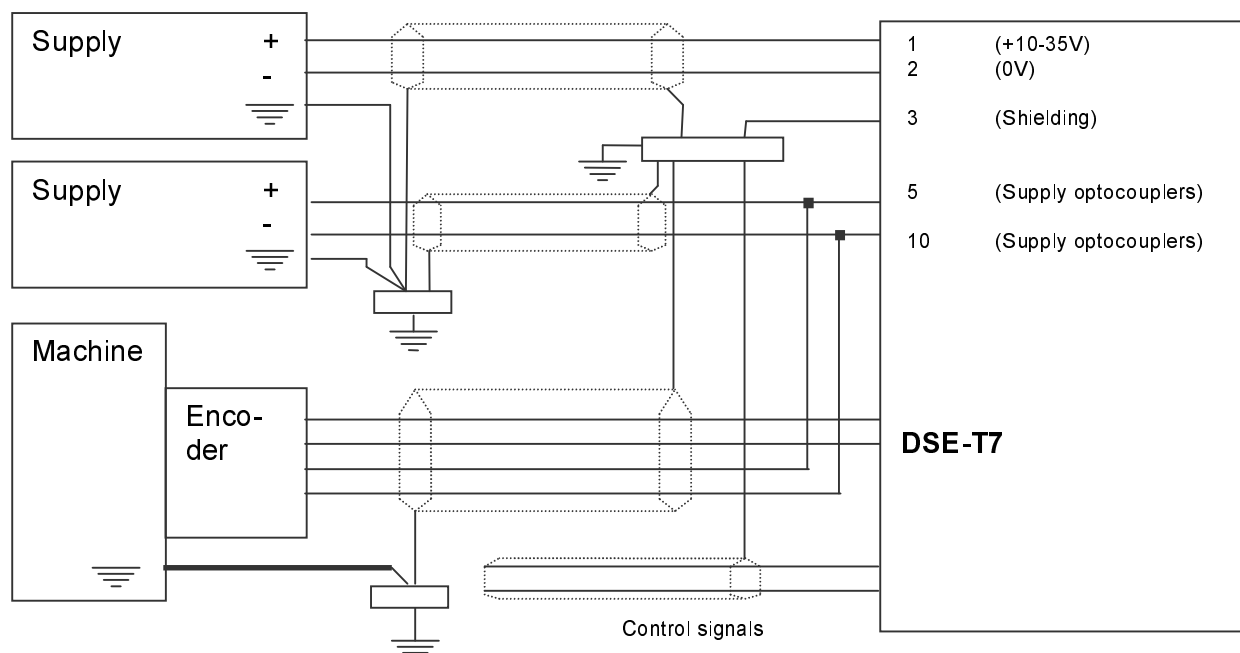
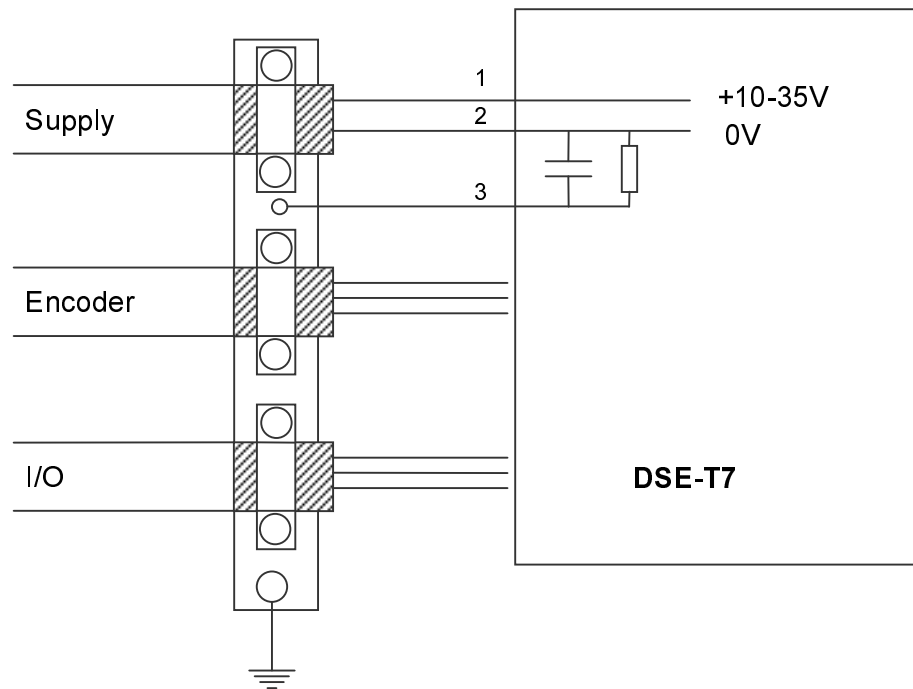


Figure 3. Shielding to earthing strip



2 OPERATION

2.1 Key functions



[P] Key

- activate the programming mode (in combination with other keys)
- terminate the programming mode
- leave edit mode for presets or parameters
- LED burns when edit mode for presets or parameters is active



[+1] Key

- view type number
- increase preset/parameter number
- increase value



[Cursor] Key

- view software version
- activate edit mode
- move one digit to the left in edit mode

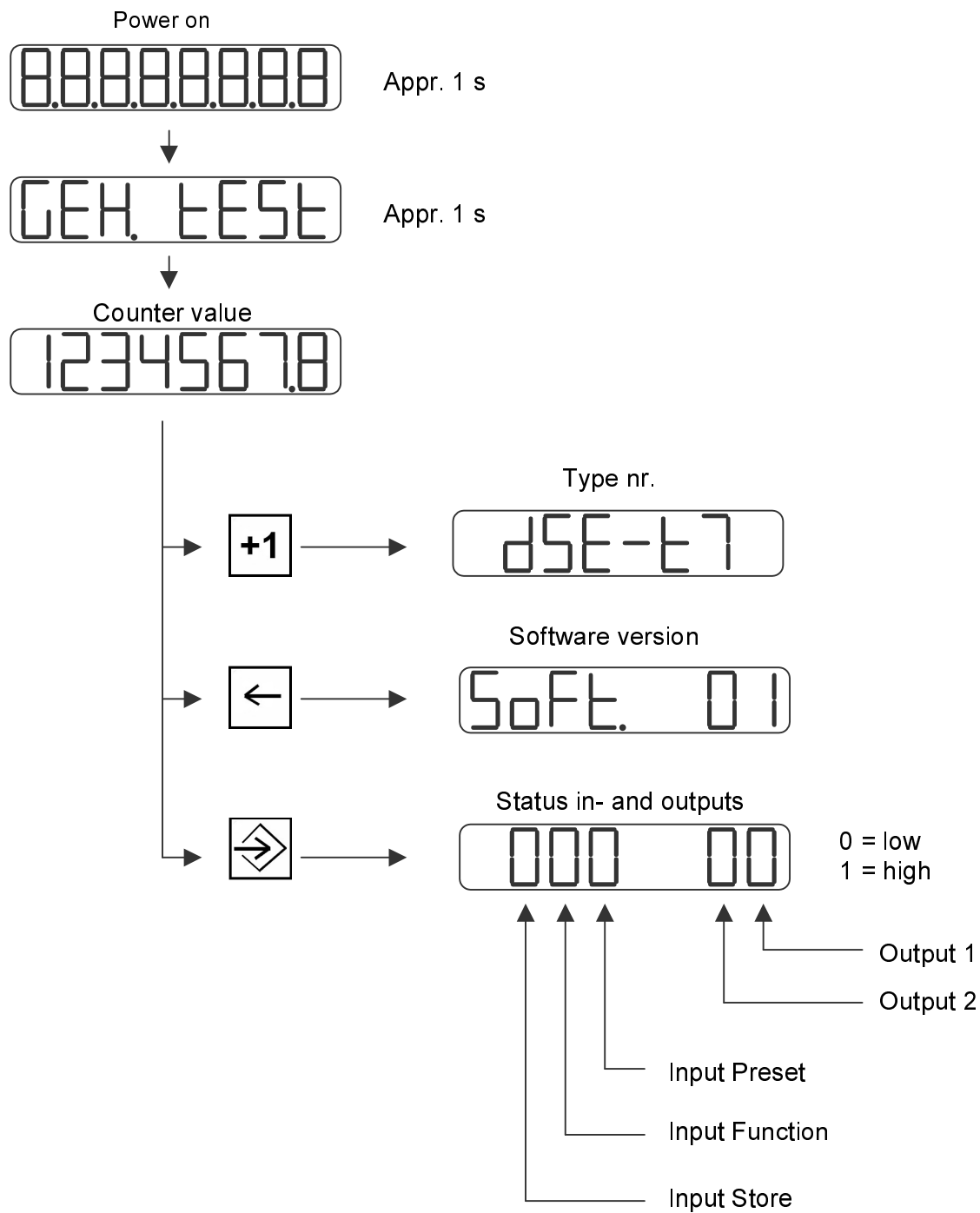


[Enter] Key

- store changes in programming
- view status in- and outputs
- increase preset/parameter number
- clear input (edit mode)

2.2 Display functions

2.2.1 Status functions



2.2.2 Error messages

Error 11

Preset 2 $\leq$ preset 1

Error 12

Hysteresis too big or preset 2 too small
(preset 2 – hysteresis $\leq$ preset 1)

Error 21

Preset 4 $\leq$ preset 3

Error 22

Hysteresis too big or preset 4 too small
(preset 4 – hysteresis $\leq$ preset 3)

GEH. Err

RAM Error (replace DSE-T7)

EEPROM Err

EEPROM Error (replace DSE-T7)

Error 30

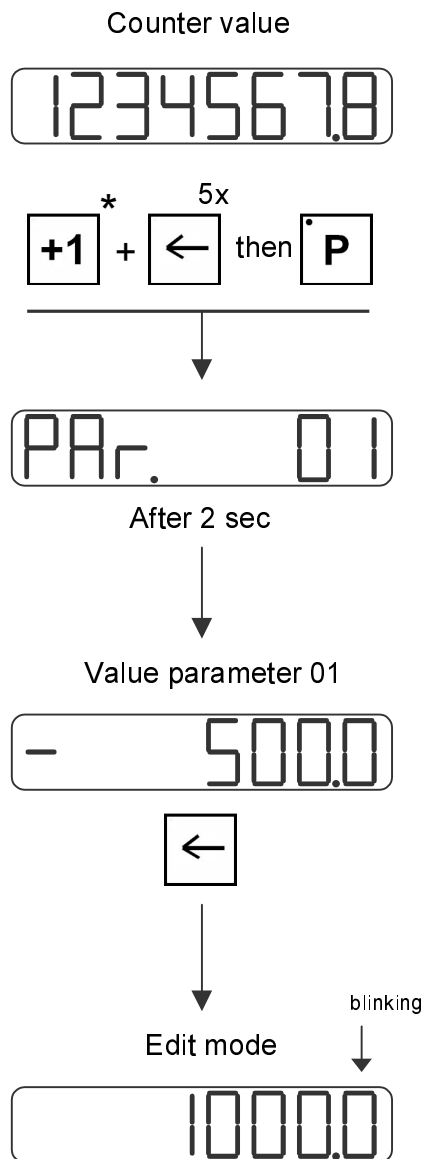
No access to parameters
(see PAR-08)

Error 31

No access to presets
(see PAR-08)

3 PROGRAMMING

3.1 Input parameters



Selecting parameters

- $\boxed{P}$ Leave programming mode
- $\boxed{+1}$ Increase parameter number (+1)
- $\boxed{\rightarrow}$ Increase parameter number (+1)
- $\boxed{\leftarrow}$ Activate edit mode

Changing parameters

- $\boxed{P}$ Leave edit mode (back to selecting)
- $\boxed{\leftarrow}$ Move 1 digit to the left
- $\boxed{+1}$ Increase digit value
- $\boxed{\rightarrow}$ Confirm input
- $\boxed{\leftarrow}^*$ Then $\boxed{\rightarrow}$ Clear input

* keep pressed

3.2 Input presets

Counter value



+1* then **P**

PrESET 1

After 2 sec.

Value preset 1



←

Edit mode

blinking



Selecting presets

P

Leave programming mode

+1

Increase presetnumber (+1)

→

Increase presetnumber (+1)

←

Activate edit mode

Changing parameters

P

Leave edit mode (back to selecting)

←

Move 1 digit to the left

+1

Increase digit value

→

Confirm input

←*

then

→

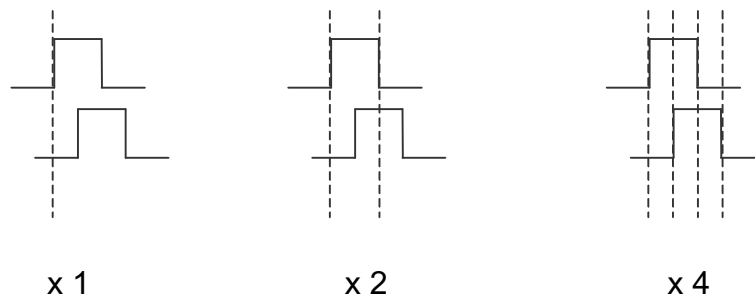
Clear input

* keep pressed

4 FUNCTIONS

4.1 Edge evaluation

Using this function it is possible to count the input signal 1x , 2x or 4x.
(Zie PAR-02).



4.2 Multiplier

If the actual counted impulses are not equal to the desired display value, the display value can be changed using the multiplier (PAR 03).

For example:

600 impulses = 75 mm displacement

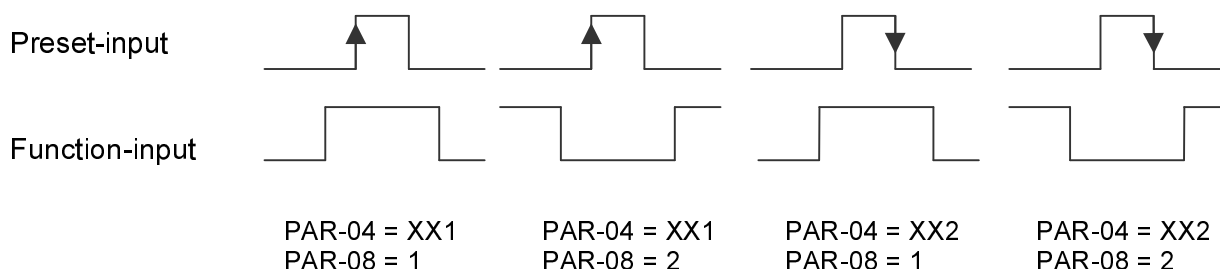
resolution = 0.1 mm

edge evaluation (PAR-02) equal to x2 will give 1200 impulses.

$$\text{multiplier} = 750 / 1200 = \mathbf{0,625}$$

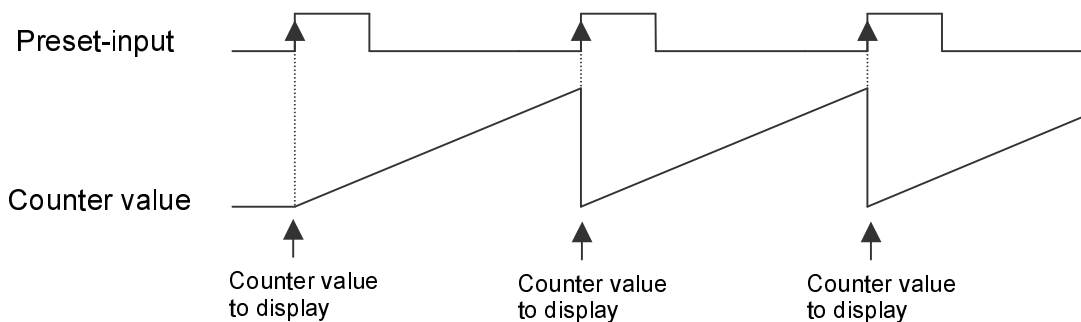
4.3 Preset function

The preset function is used to preset the counter to the programmed value in PAR-01. This is done by a flank (rising or falling) on the preset input (PAR-04). In addition it is also possible to use the function input as the “reference coarse”. The preset function will be activated only with the right signal level of the function input. Presetting the counter is possible in a specific direction or independant of the direction of movement.



4.4 Hold-reset function

This function is can be activated through PAR-04. When an edge is detected on the input preset the display-value will be refreshed with the counter-value. At the same time the counter is reset. The display will show the displacement between two rising or falling edges.



Example hold-reset:

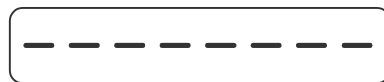
PAR-04 = 101

The hold-reset function is activated; independant from the direction of movement; when a rising edge is detected the counter-value will be shown on the display.

Remark: the preset-value (PAR-01) is added to the counter-value.

4.5 Power failure protection

The power failure protection is activated through PAR-07. When the DSE-T7 is switched off the counter-value is stored in an EEPROM. When storing the value is completed the display will show as shown below. During power-up this value is restored into the counter. If the hold-reset function is activated, power failure protection is deactivated.



4.6 Function input

This input can be programmed with different functions using PAR-08.

Function 1

Signal “Course” (enable) for use with the preset function. (PAR-08 = 1 or 2).

Function 2

Signal “lock programming mode” for parameters and / or presets. The programming mode can only be accessed when the input is high. PAR-08 = 3 or 4.

Function 3

Signal “lock counter input”.

Pulses on the counter input are not added to the counter value, unless the signal on the input has the right level. (PAR-08 = 5 or 6).

4.7 Store function

Depending on the programming of PAR-05 the displayed value is not changing for as long as the store input is active. The store input has no function when PAR-04 = 1xx.

4.8 Speed measurement

It is possible to use the DSE-T7 as a speed indicator. The required measuring time is programmed in PAR-12.

Measuring time 0,001 ... 9,999 sec

Display value = $F_{in} \times FL \times m \times MT$

F_{in} = input frequency (Hz)

FL = edge evaluation (x1, x2 of x4)

M = multiplicator

MT = measuring time in seconds

When the speed indicator function is active, PAR-01, PAR-05 and PAR-07 have no function.

PAR-04: 10^0 and 10^1 have no function.

5 OUTPUTS

5.1 Output programmed as cam

Output 1 : Preset 1 and 2 (see table 1)

Output 2 : Preset 3 and 4 (see table 2)

Table 1

PAR-09	OUTPUT 1 HIGH IN CASE:
X1	counter $\geq$ preset 1 and $<$ preset 2
X2	counter $<$ preset 1 and $\geq$ preset 2
X3	counter $\geq$ preset 1
X4	counter $<$ preset 1

Table 2

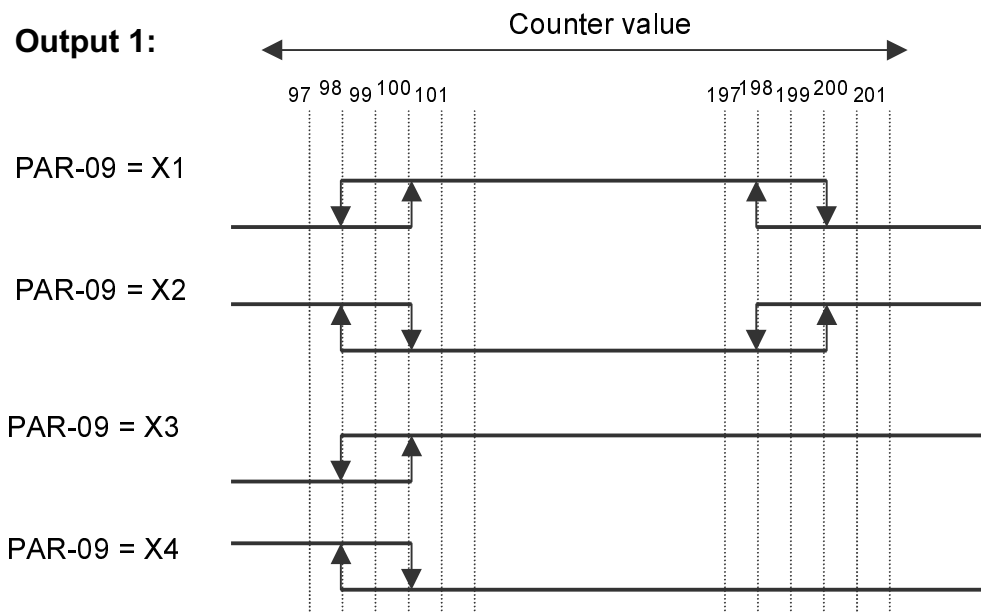
PAR-09	OUTPUT 2 HIGH IN CASE:
1x	counter $\geq$ preset 3 and $<$ preset 4
2x	counter $<$ preset 3 and $\geq$ preset 4
3x	counter $\geq$ preset 3
4x	counter $<$ preset 3

5.1.1 Example

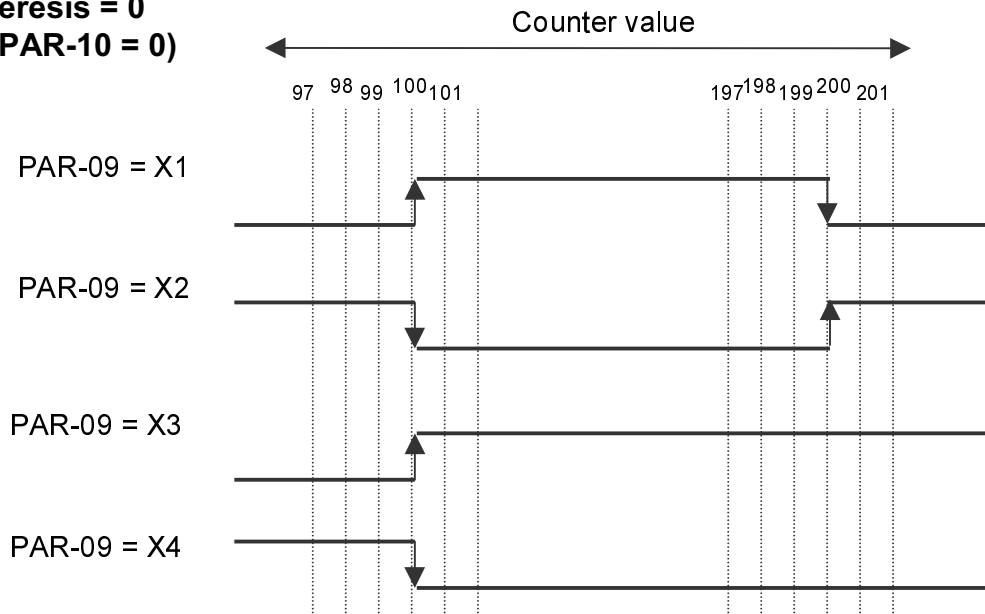
Preset 1 = 100 (start)

Preset 2 = 200 (end)

PAR-10 = 2 (hysteresis)



**Output 1, hys-
teresis = 0
(PAR-10 = 0)**



5.2 Output programmed as pulse

Output 1 : Preset 1 (see table 3)

Output 2 : Preset 3 (see table 4)

Table 3

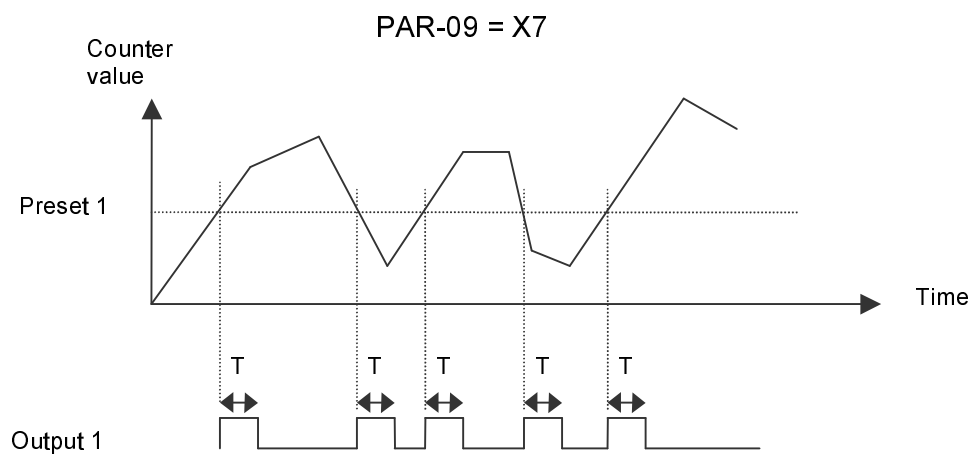
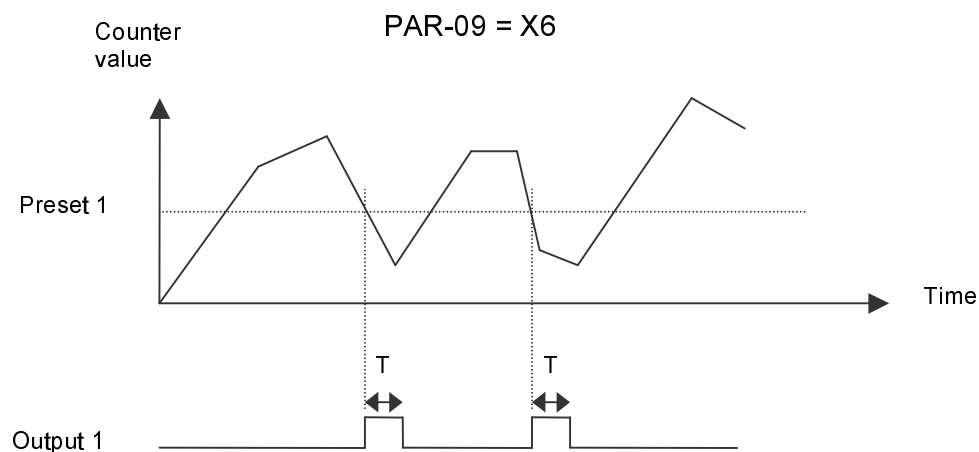
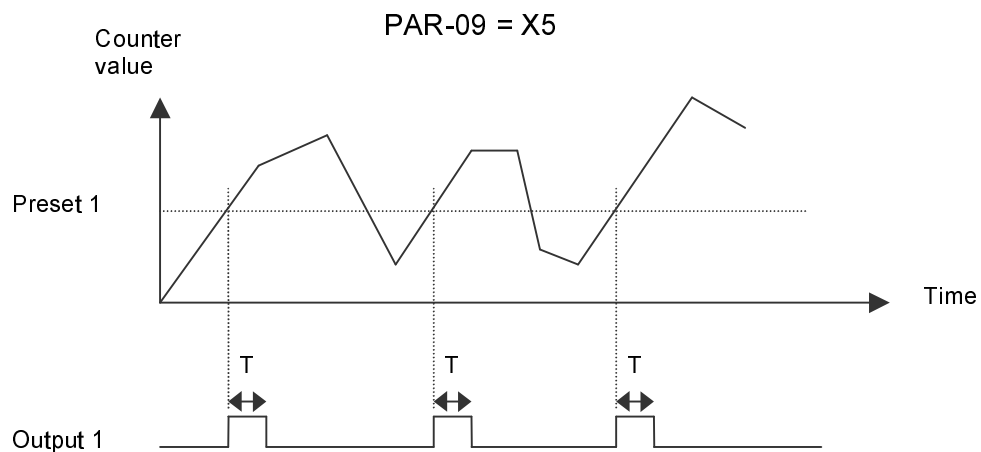
PAR-09	OUTPUT 1 WILL GENERATE A PULS IN CASE:
X5	counter becomes $\geq$ preset 1
X6	counter becomes $\leq$ preset 1
X7	counter becomes $\geq$ preset 1 or counter becomes $\leq$ preset 1

Table 4

PAR-09	OUTPUT 2 WILL GENERATE A PULS IN CASE:
5X	counter becomes $\geq$ preset 3
6X	counter becomes $\leq$ preset 3
7X	counter becomes $\geq$ preset 3 or counter becomes $\leq$ preset 3

5.2.1 Example

Only after the duration of the pulse a new pulse can be triggered. The duration is programmed in PAR-11.

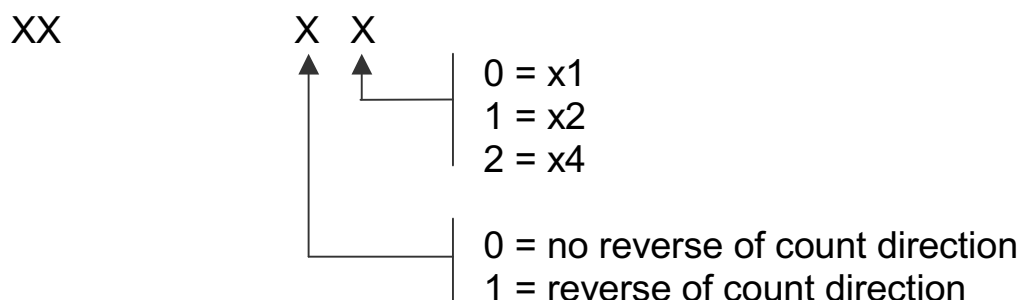


APPENDIX A: PARAMETERS

PAR-01 PRESET VALUE

XXXXXXXX -9999999 ... +99999999
(no function if PAR-04 = 2XX)

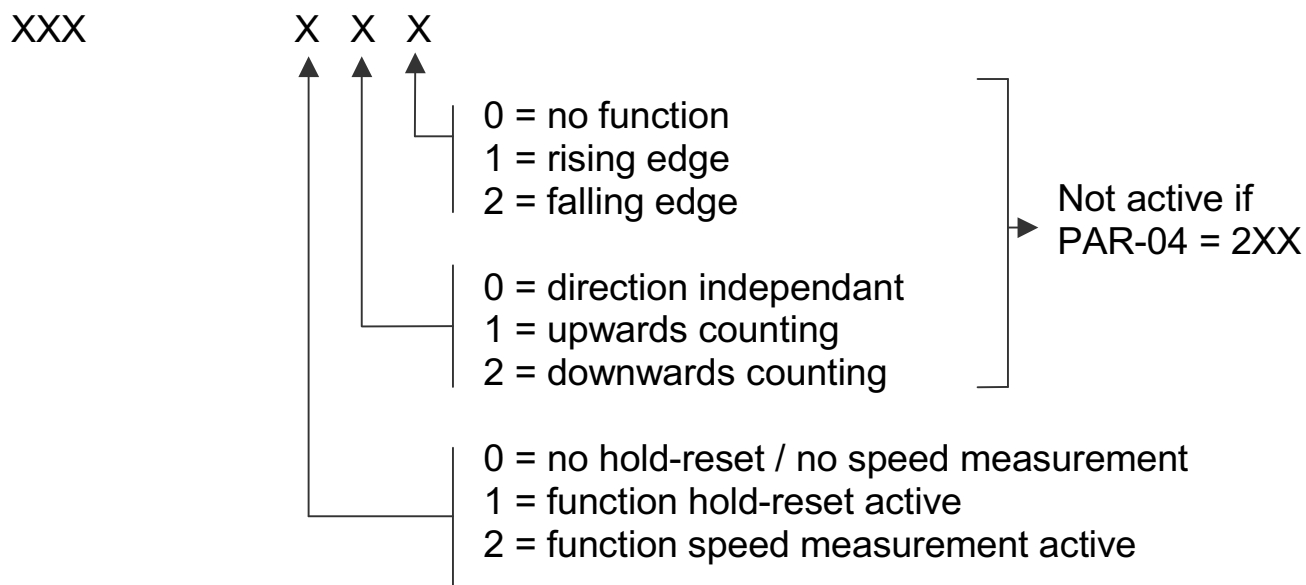
PAR-02 EDGE EVALUATION AND COUNT DIRECTION



PAR-03 MULTIPLICATOR

XXXXXXXX 0.000001 – 9.999999
(input 0 = x1)

PAR-04 PRESET FUNCTION



APPENDIX A: PARAMETERS

PAR-05 STORE

X 0 = no function
1 = high active 
2 = low active 

(no function if PAR-04 = 1XX or 2XX)

PAR-06 DECIMAL POINT

X 0 = no decimal point
 1 = X.X
 2 = X.XX
 3 = X.XXX
 4 = X.XXXX
 5 = X.XXXXXX
 6 = X.XXXXXXX

PAR-07 POWER FAILURE PROTECTION

X 0 = not active
 1 = counter value protected against power failure

(no function if PAR-04 = 1XX or 2XX)

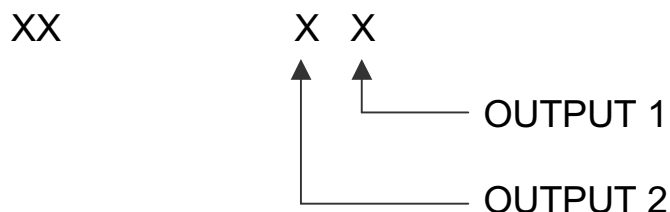
PAR-08 FUNCTION INPUT

X

- 0 = no function
- 1 = reference course high active
- 2 = reference course low active
- 3 = lock programming mode parameters if function-input = low
- 4 = lock programming mode parameters and presets if function-input = low
- 5 = lock count input if function input = high
- 6 = lock count input if function input = low

APPENDIX A: PARAMETERS

PAR-09 OUTPUT 1 AND 2



0 = no function

1 = cam 

2 = cam 

3 = counter value $\geq$ preset

4 = counter value $<$ preset

5 = pulse if counter value becomes $\geq$ preset

6 = pulse if counter value becomes $\leq$ preset

7 = both the functions 5 and 6

PAR-10 HYSTERESIS OUTPUT 1 AND 2 (IF PAR-09 = 1..4)

XXXXXXX 0 – 9999999
(input 0 = no hysteresis)

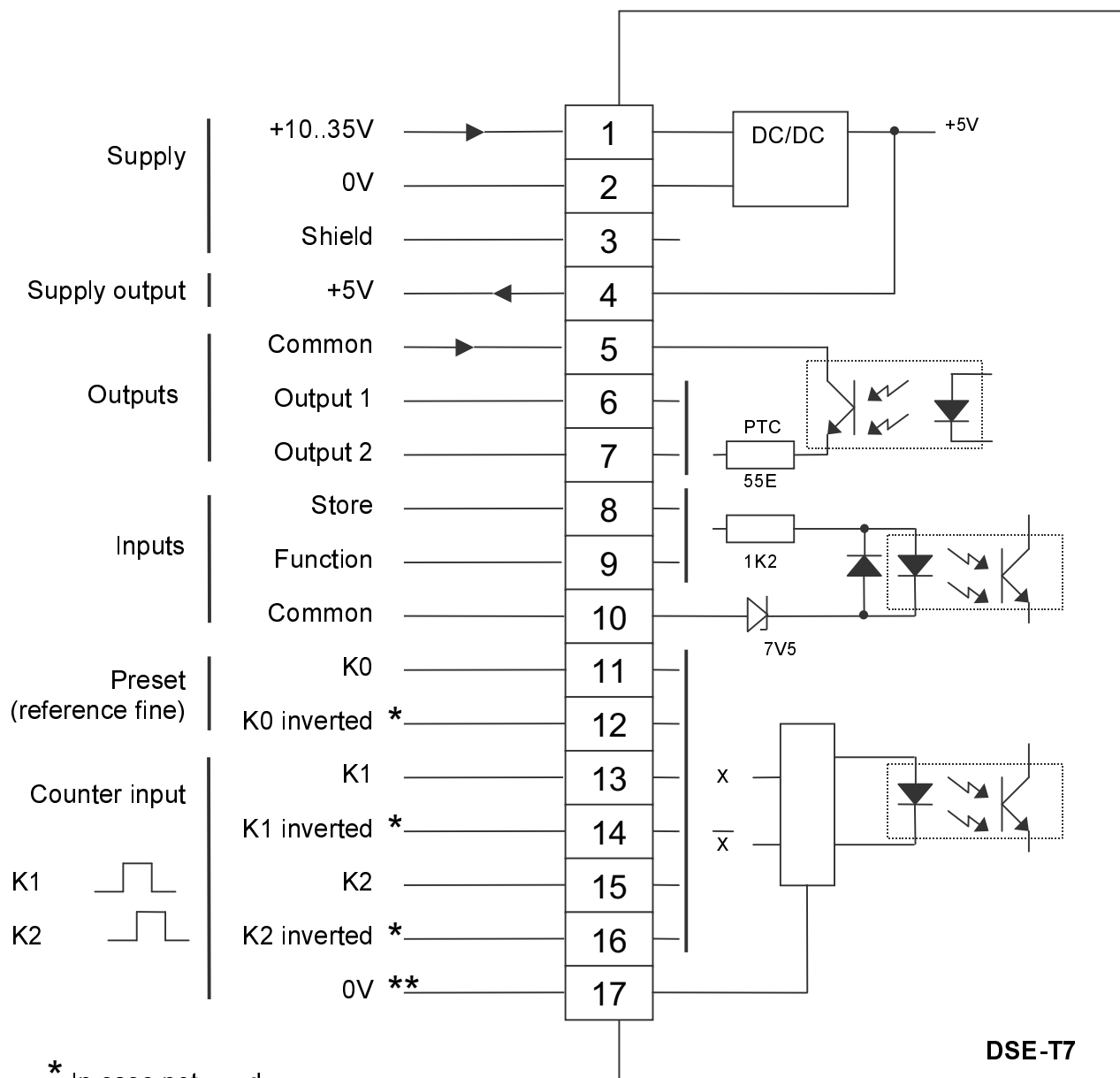
PAR-11 DURATION PULSE OUTPUT 1 AND 2 (IF PAR-09 = 5..7)

XXX 0.01 – 1.99 seconds
(input in 0,01 second)

PAR-12 MEASURING TIME SPEED MEASUREMENT (IF PAR-04 = 2XX)

XXXX 0.001 – 9.999 seconds
(input 0 = 1 second)

APPENDIX B: CONNECTIONS



* In case not used:

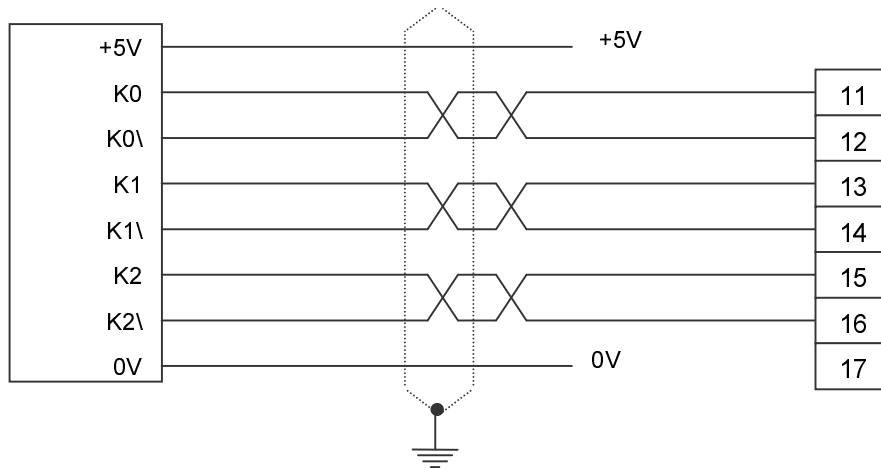
At 5V signal level connect with the 0V of encoder.
At 10 – 35V signal level: do not connect!

** At 10 – 35V signal level connect with the 0V of encoder.

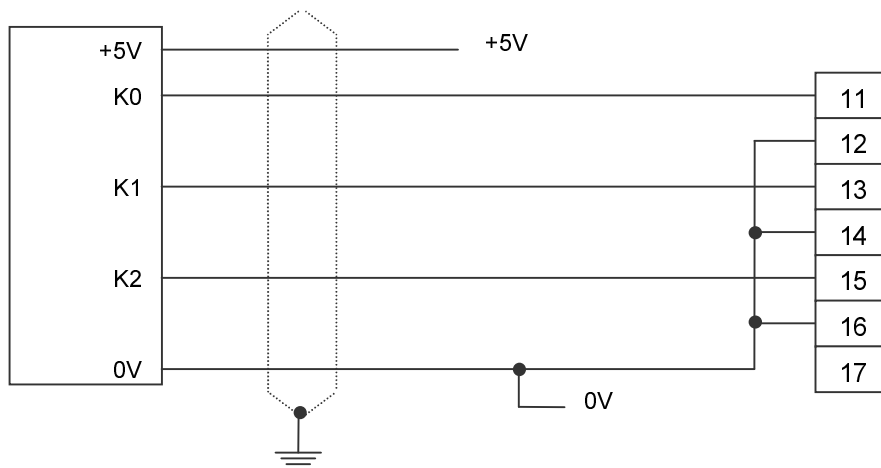
It is possible to use different signal levels for K0 and K1/K2. For example: encoder signals with a level of 5V with inverted signals and a preset signal (K0) of 24V.

APPENDIX B: CONNECTIONS

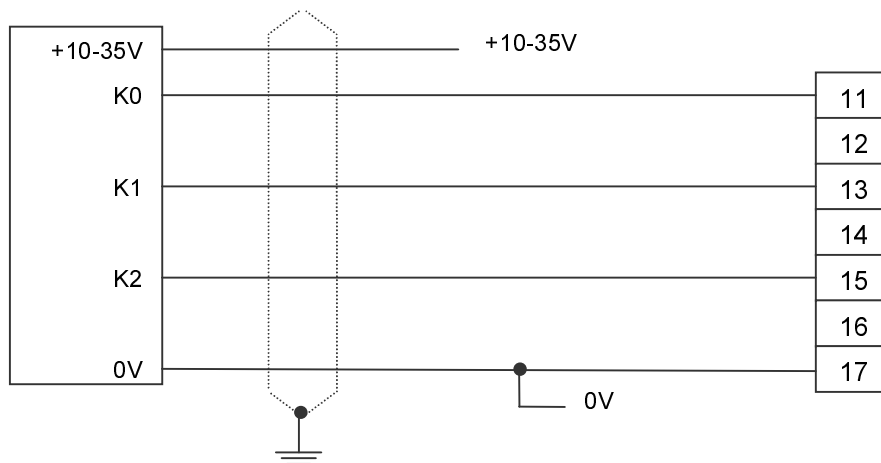
Figuur 4 Signal level 5V (with inverted signals)



Figuur 5 Signal level 5V (no inverted signals)



Figuur 6 Signal level 10 – 35V

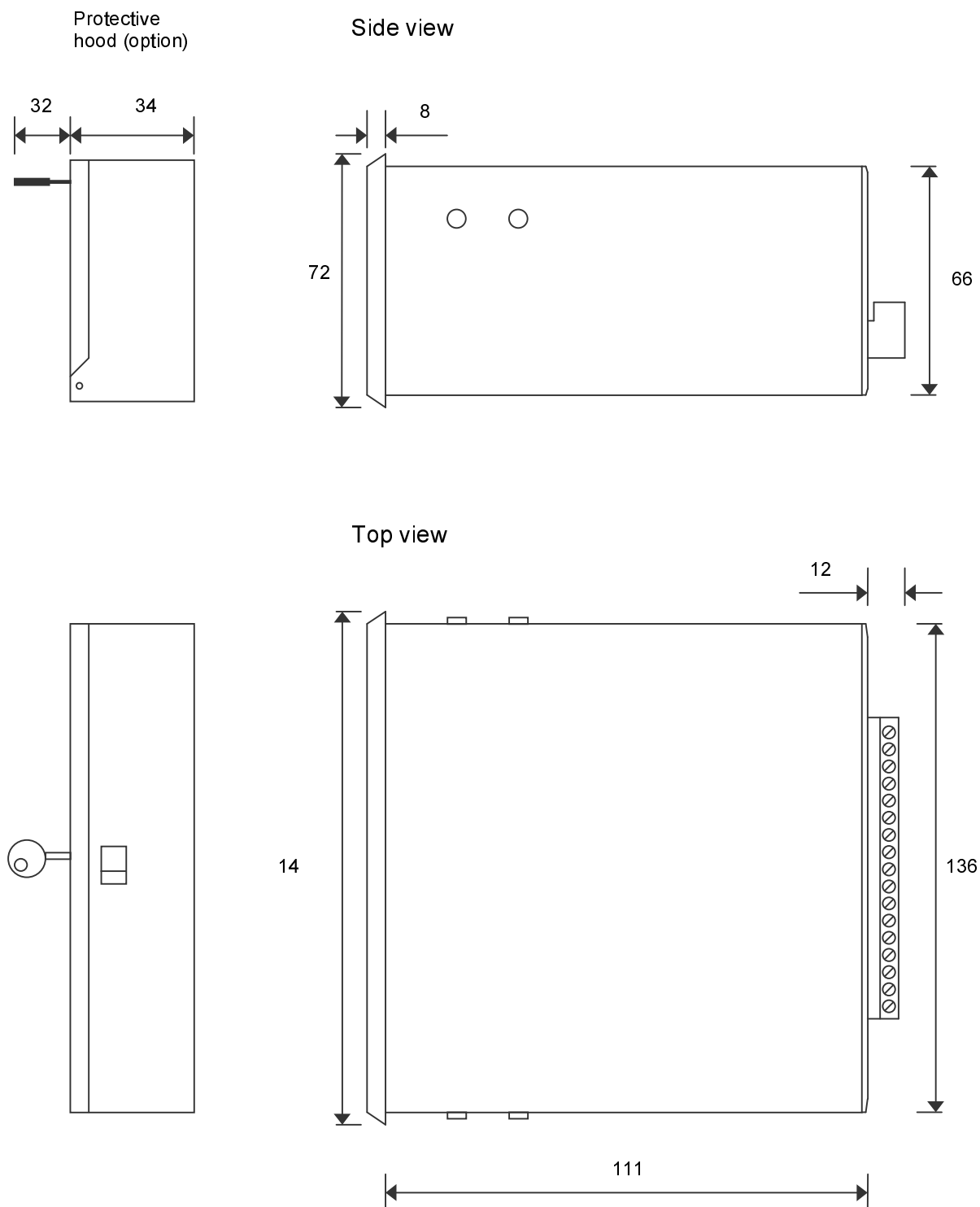


APPENDIX C: TECHNICAL DATA

- Supply voltage	10...35V DC (power failure protection not active) 16...35V DC (power failure protection active)
current consumption	< 150mA (without load)
output	5V max. 350mA
- Count input	optically isolated
signal level	low (5V): 0...+0.8V high (5V): +2.8V...+5V low (24V): 0...+5V high (24V): +10V...+35V
input resistance	appr. 3K Ohm at 24V appr. 0,35K Ohm at 5V
input frequency	max. 150 KHZ
impulswidth K0	min. 2µs
- Store, func. input	optically isolated
	low: 0...+5V high: +10V...+35V
input resistance	appr. 1,8K Ohm at 24V
- Output 1 and 2	optically isolated, NPN transistor, open emitter with PTC
I _{max}	50mA
Supply voltage	35V max.
Output voltage	supply voltage -3.50V (at 50mA) -2V (at 20mA)
- Count range	99999999...-99999999
- Cycle time	1ms
- Data memeory	EEPROM
- Display	8 digit 7-segment LED
height	14 mm
- Temperature range	0...50°C
- Weight	< 0.5 kg
- Protection	front IP50, using the protection hood IP54 rear IP20

APPENDIX D: SIZES

Sizes in mm.



APPENDIX E: LIST OF PARAMETERS

Date:

Serial number:

Preset number	Value
1	
2	
3	
4	
Parameter number	Value
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

APPENDIX E: LIST OF PARAMETERS

Date:

Serial number:

Preset number	Value
1	
2	
3	
4	
Parameter number	Value
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	



Distributor: