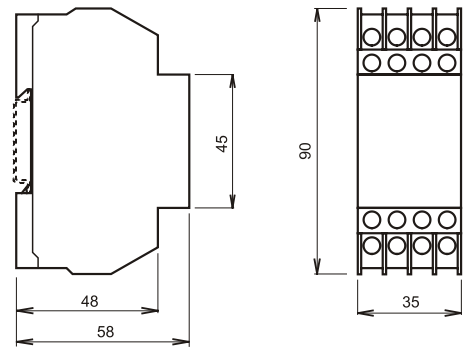


### Features

- for simple level regulation by means of 1 limit sensor and time setting
- fluently adjustable time period from 1 sec to 100 min
- safety voltage supply requirements according to EN 61010
- LED - indication
- mounting on DIN rail 35 mm to cut out 45 mm
- compatible with all types of Dinel 2-state level sensors (with outputs NPN, PNP, "S", NAMUR - here only for safe areas, dead contact)

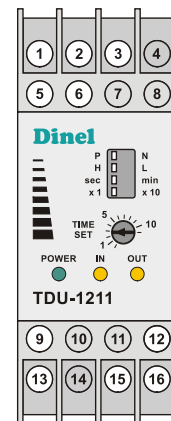
### Dimension drawing



### Technical data

Type	TDU-1211
Nominal supply voltage	230 V / 50 Hz
Allowed supply voltage tolerance	± 10%
Nominal power demand	4 VA
Output voltage sensor supplying	12 V DC
Output voltage tolerance	± 10 %
Maximum output current	60 mA
Output short circuit current	type 300 mA
Max. duration of output short-circuit	unlimited
Contact rating: - max. current	3 A
- max. voltage	250 V
- max. power	500 VA
Input short circuit current	max. 6 mA
Input currents: - to switch on - to switch off - max. power	min. 2 mA max. 1 mA type 1,5 mA
Max. switching frequency at max. load	360 / h
Contact life - number of cycles	min. 10 <sup>5</sup>
Insulating voltage - mains 230 V - output 12 V	4 kV
Ambient temperature	-20°C to + 50 °C
Protection degree: - box - terminals	IP 20 IP 20
Housing material	polycarbonate
Terminal material	CuBe
Max. / recomb. connecting wires cross-section	4 mm <sup>2</sup> / 0,5 ÷ 1 mm <sup>2</sup>
Weight	c. 0,2 kg
230 V supply connection through switch or circuit breaker	
Protection supply 230 V - inner drop - out fuse T 50 mA	
2nd safety class electric installation	
Electrical safety	EN 61010-1
EMC	EN 55022, EN 61000-4-2,-3,-4,-5,6,-11

### Front panels and terminal numbering



#### Funcion of signal LED

##### Green "POWER"

- shines - proper connection to 230 VAC, correct function
- does not shine - failure (short circuit on supply terminals)

##### Orange "IN" - input activation

- shines - current flow on input circuit (on)
- does not shine - no current flow to input circuit (off)

##### Orange "OUT"

- shines - working relay switched on  
- terminals 12, 16 closed
- does not shine - loose of working relay (idle state)  
- terminals 15, 16 closed

## Operating eleme

Switch "**P / N**" - position P - the unit reacts to current flowing to the input terminal (No. 3) - for sensors of PNP type  
 - position N - the unit reacts to current flowing from the input terminal ( No. 3) - for sensors of NPN type, "S", NAMUR or dead contact output

Switch "**H / L**" - position H - time period in actuated during input non-contact to contact crossing  
 - position L - time period is actuated during input contact to non-contact crossing

Switch "**sec / min**" - position - sec - time data on potentiometer scale is in seconds or 10-s of seconds  
 - position - min - time data on potentiometer scale is in seconds or 10-s of minutes

Switch "**x1 / x10**" - position x1 - time data on potentiometer scale is in seconds or minutes  
 - position x10 - time data on potentiometer scale is in 10-s of seconds or 10-s of minutes

## Function description

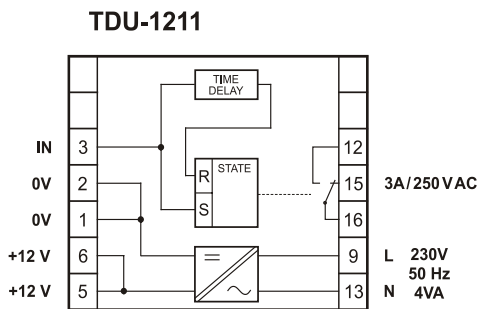
The unit has one input for connection with one working level (or any other 2-state) sensor. By specified state change on unit input (terminal No. 3-IN) the time period starts on for time period from 1 sec to 100 min. Within this time period the input stage is changed (charge-over contact relay) and the contact on terminals No. 12 and 16 is connected (terminals No. 15-16 are disconnected)

## Compatibility to various types of sensor output

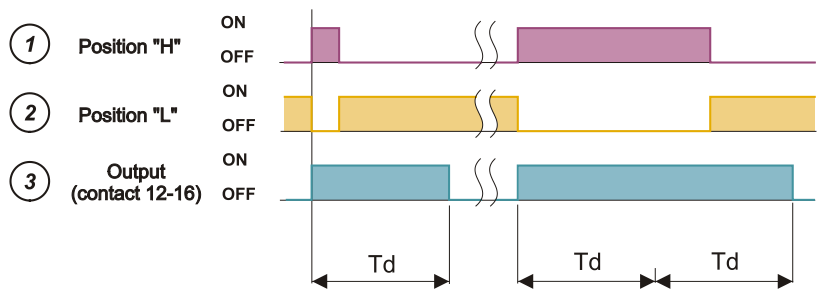
- 3-wire performance- open collector output-type PNP (PO,PC)
- 3-wire performance- open collector output-type NPN (NO,NC)
- 2-wire performance- electronic current switch "S" (SO, SC)
- 2-wire performance- output NAMUR (RO,RC)- only in safe area
- 2-wire performance- any potential free contact

The choice of sensor type is provided by means of switching the top-position switch onto P (PO, PC output sensors) or N position (for other types of sensors).

## Inner block diagram



## Timing diagram

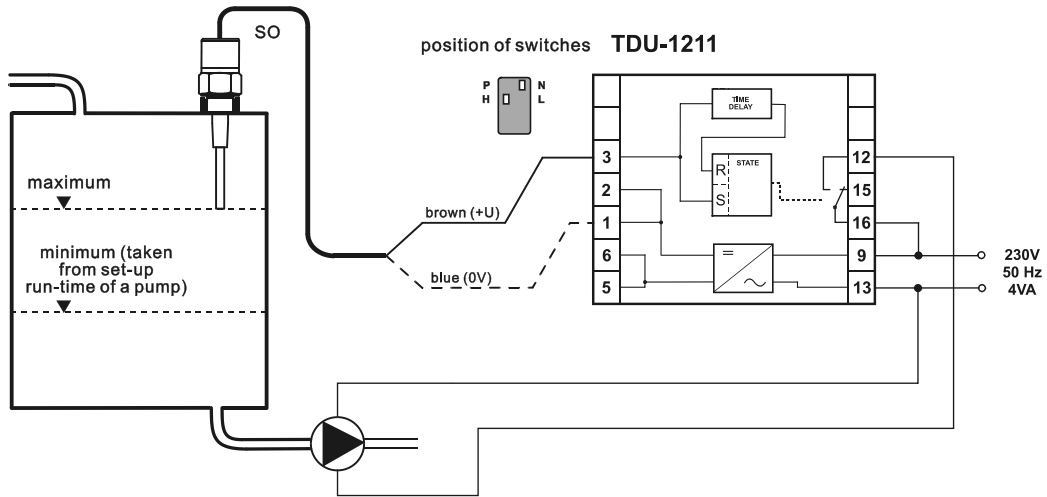


- 1 Timing is triggered by input activation - ON state
- 2 Timing is triggered by input de-activation - OFF state
- 3 The output contact (12-16) is closed within the time  $T_d$  (15-16 is open). If the input is activated at the moment of  $T_d$  time termination, the new  $T_d$  period starts.

### Pump-down regulation

If the medium level gets up to the level defined by level sensor, the input circuit activates, the LED "IN" shines, the output relay (contact 12-16) activates and the signal LED "OUT" shines. At the same time, the action element is activated (the pump, valve, etc.) and the level starts to decrease. The pump activating period is set on by the potentiometer "TIME SET" and switches "sec/min" and "x1/x10". When the set period is over, the relay drops out and the pumping stops. When the level reaches the sensor again, the cycle repeats automatically.

**Attention:** In this case the output sensor "normally open"- NO, PO, SO is used for the max. level. This is to avoid uninterrupted pumping (dry run) at accidental sensor failure. The sensor state (closed) at the max. level state is not identical with the fault sensor state (open).



### Pump - up regulation

If the medium level gets under the level defined by level sensor, the input circuit activates, the LED "IN" shines, the output relay (contact 12 - 16) switches on and the signal LED "OUT" shines. At the same time the action element is activated (the pump, valve, etc.) and the level starts to increase. The pump activating period is set on by potentiometer "TIME SET" and switches "sec/min" and "x/X10". When the set period is over, the relay drops out and the pumping stops. When the level reaches the sensor again the cycle repeats automatically.

**Attention:** In this case the output sensor "normally closed" - NC, PC, SC is used for the min. level. This is to avoid uninterrupted pumping (overflow) at accidental sensor failure. The sensor state (closed) at the min. level state is not identical with the fault sensor state (open).

