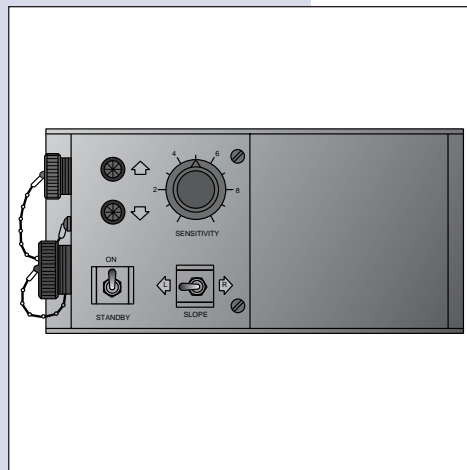




# MCW101C, E Time Proportional Level Controller

## Technical Information



#### DESCRIPTION

The MCW101 Time Proportional Level Controller provides automatic transverse-axis control on paving, curbing and trenching machines. Together with the Q625A or MCQ101 Remote Setpoint Unit it senses the difference between setpoint and actual slope with respect to a gravity reference.

Two modules are housed in the case of the Controller. The slope sensing module electromagnetically measures the deviation between a gravity reference and the equipment it is mounted on. The amplifier module accepts the signal from the sensor and produces a voltage output to drive solenoid valves which, on a typical paving machine, operate lift cylinders to position the tow point of a floated screed. Within the amplifier's proportional band, the percent of time the output is on is proportional to slope error. The MCW101 may be used together with the MCW100 Time Proportional Rotary Position Controller to control both parameters simultaneously.

#### FEATURES

- Proportional output suitable for driving on-off solenoids.
- Accepts remote slope setpoint.
- Dual clockwise/counterclockwise tilt lamps show deviation from setpoint in RUN and STANDBY modes.
- Adjustable deadband varies sensitivity.
- RUN/STANDBY switch permits operator to switch to manual control.
- Rugged aluminum housing.
- 12V<sub>DC</sub> or 24V<sub>DC</sub> supply voltage.
- Reverse polarity and short circuit protected.
- Moisture and corrosion resistant.
- Withstands vibration and shock.

#### ORDERING INFORMATION

Controller	Supply voltage	Type of output	Id. No.
MCW101C1005	12V <sub>DC</sub>	Ground side switching	679852
MCW101C1013	24V <sub>DC</sub>	Ground side switching	679860
MCW101E1003E	12V <sub>DC</sub>	High side switching	730994
MCW101E1011E	24V <sub>DC</sub>	High side switching	725374

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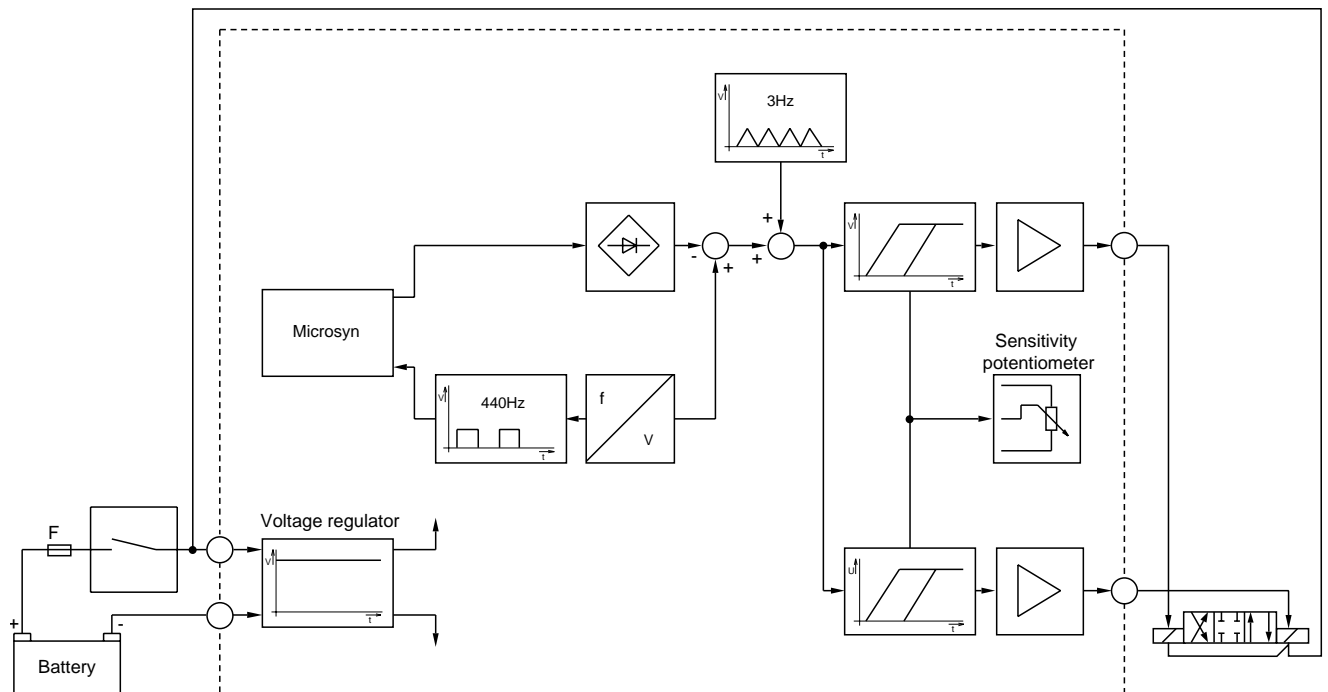
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**TECHNICAL DATA**

Operating voltage 12V <sub>DC</sub> :	11V <sub>DC</sub> to 15V <sub>DC</sub>
Operating voltage 24V <sub>DC</sub> :	22V <sub>DC</sub> to 30V <sub>DC</sub>
Maximum supply current:	0,6A (not including output current to the valve)
Maximum voltage droop:	3,5V (3 A load current)
Maximum current output:	3 A
Time proportional output:	f = 3 Hz ± 1 Hz
Minimum pulse width:	t = 37 ms ± 12 ms
Reverse polarity protection:	200V <sub>DC</sub> , maximum
Short circuit protection:	Full, with 0,5Ω maximum resistance

**BLOCK DIAGRAM**

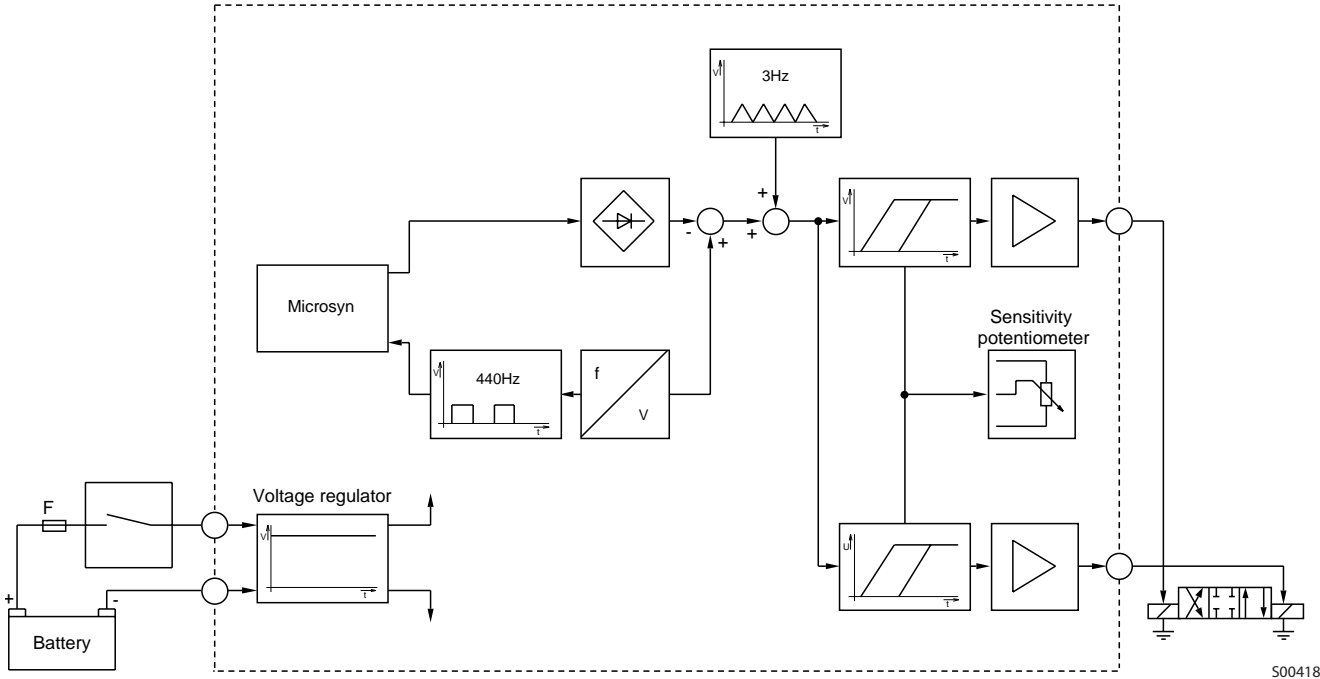
**MCW101C - Ground side switching**



501800

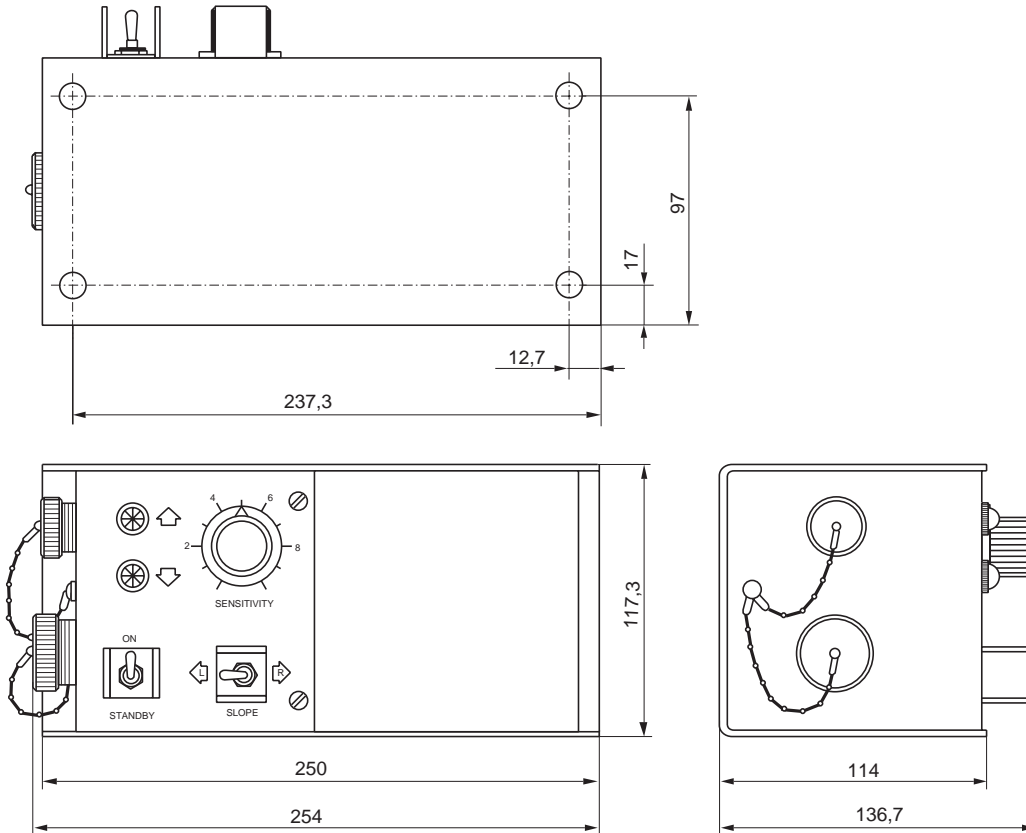
**BLOCK DIAGRAM**

**MCW101E - High side switching**



S00418

**DIMENSIONS**



S00280

**THEORY OF OPERATION**

The MCW101 Time Proportional Slope Controller consists of a slope-sensing transducer and an amplifier. The sensor and amplifier are housed in a single aluminum channel and can be removed easily for repair or replacement. They are connected with a MS-connector.

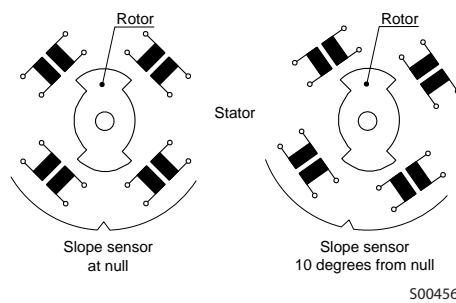
Figure 1 is a representation of the internal construction of the sensor showing the rotor/stator relationships at null and in tipped position. A 440 Hz square wave oscillation from the amplifier is applied to the primary of each of the four coils. The stator position with respect to the rotor (therefore gravity) determines the voltages from the coil secondaries. Opposing coils are wired in series.

The two voltages are demodulated in the amplifier to power a bridge network. A 3 Hz triangular wave is summed with the error signal, defined by the difference between the voltages, to effect the time proportioning. See Figure 2.

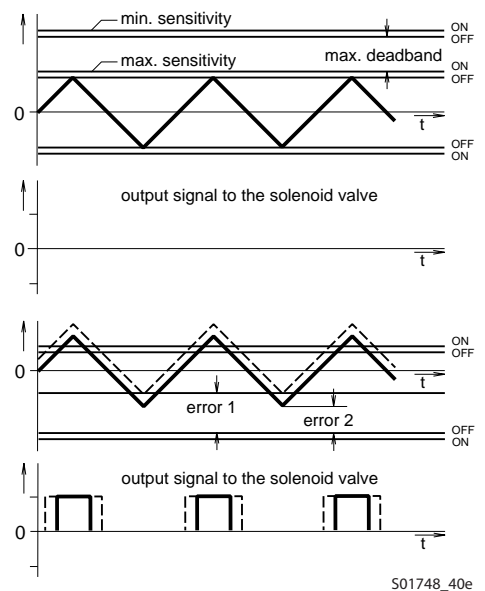
The sum is compared to a reference voltage by two Schmitt triggers, which drive the solenoids. When a Remote Setpoint is used, the difference between the voltages is kept proportional to the commanded slope. The separation between the reference voltages (the deadband) is adjustable through a trim potentiometer in the front panel.

At minimum sensitivity (wide deadband) a 0,4 % slope error signal will fire the triggers. At maximum sensitivity (narrow deadband), both triggers will fire alternately at the peaks of the triangular waves, even when the system is level.

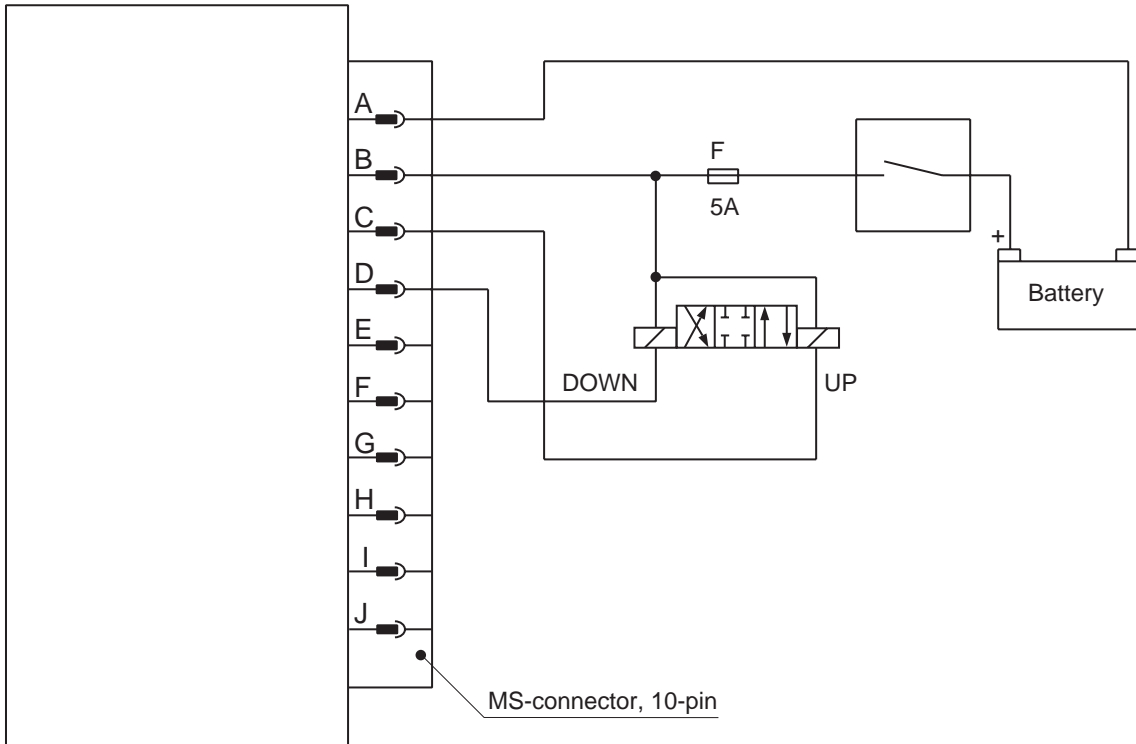
**Figure 1: Rotor-stator relationship**



**Figure 2: Deadband**

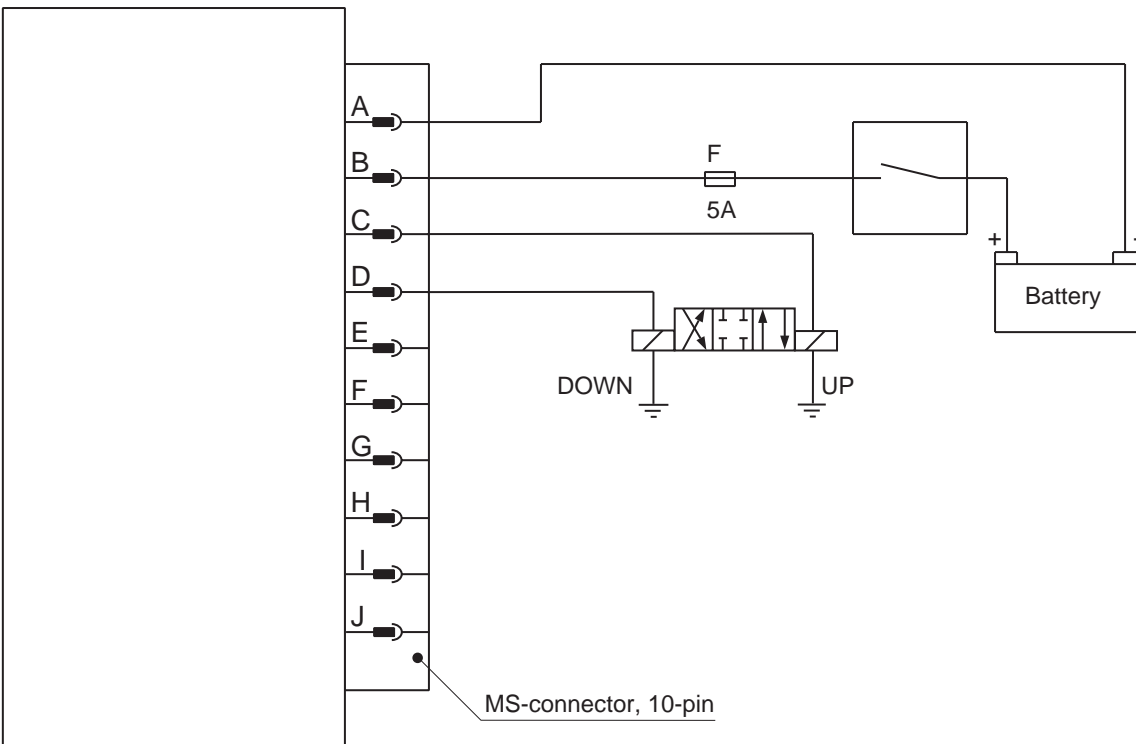


**CONNECTION DIAGRAM MCW101C - Ground side switching**



S00371

**CONNECTION DIAGRAM MCW101E - High side switching**



S00372a



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