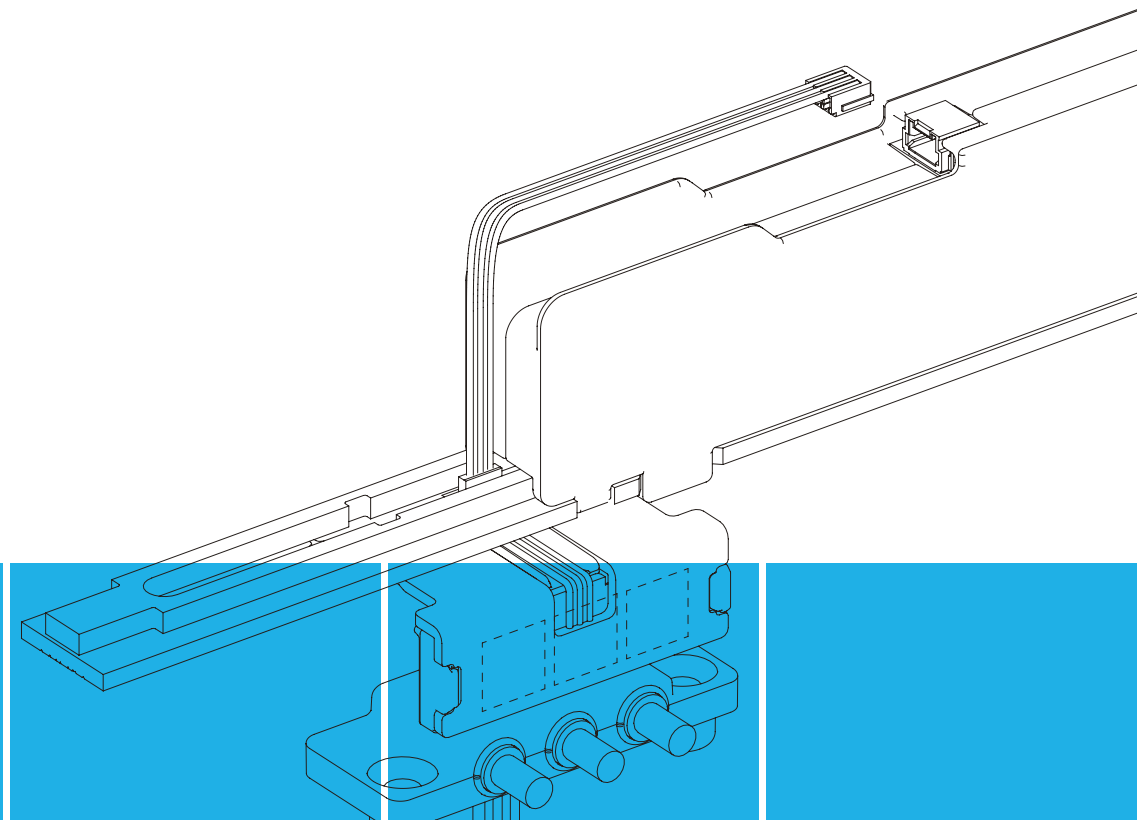


TECHNOLOGY IN MOTION



**MACO  
MULTI**  
E-HARDWARE



E-hardware interfaces

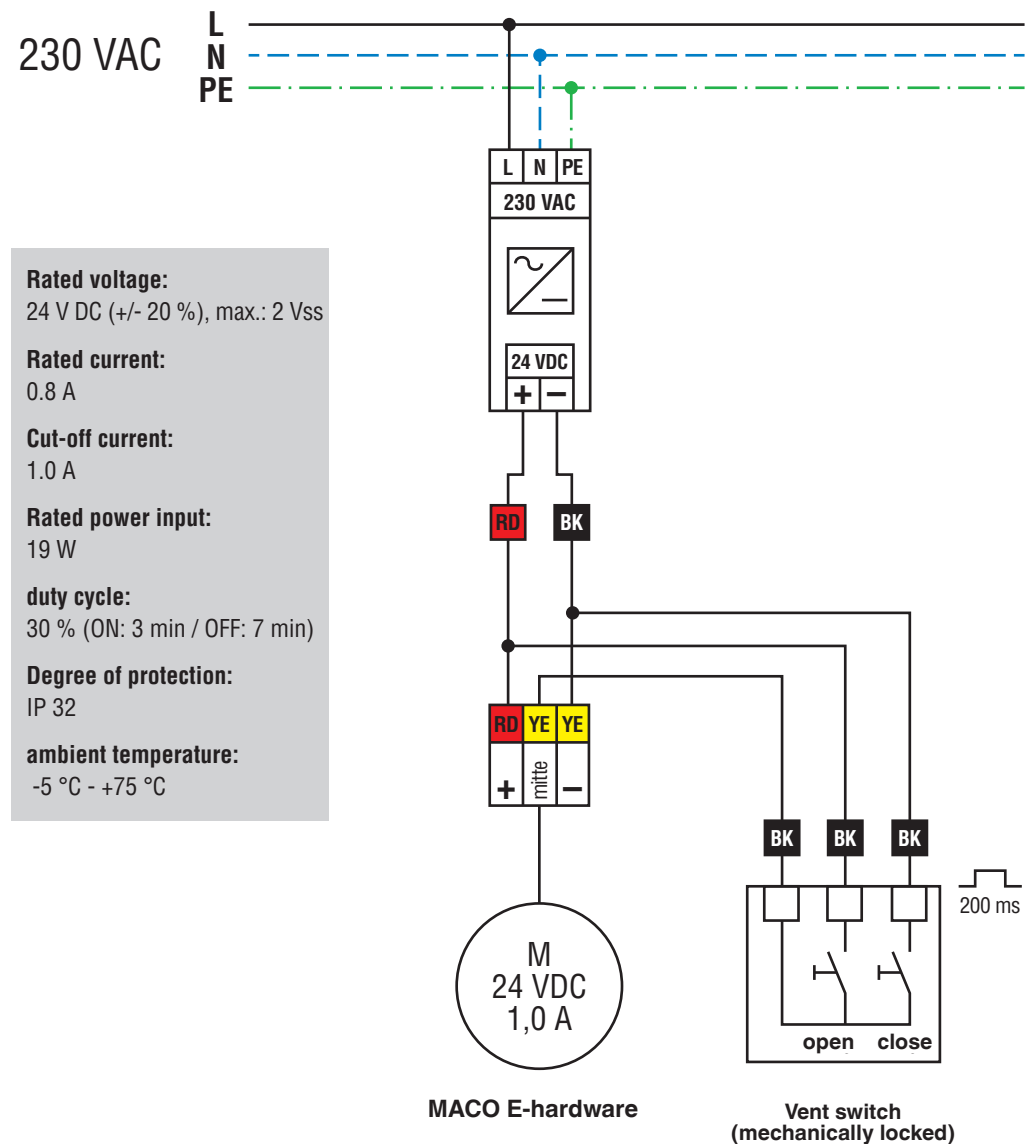
DOCUMENTATION  
WIRING DIAGRAM  
QUESTIONS AND ANSWERS



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## Universal wiring diagram



**Rated voltage:**

24 V DC (+/- 20 %), max.: 2 Vss

**Rated current:**

0.8 A

**Cut-off current:**

1.0 A

**Rated power input:**

19 W

**duty cycle:**

30 % (ON: 3 min / OFF: 7 min)

**Degree of protection:**

IP 32

**ambient temperature:**

-5 °C - +75 °C



## Technical connection information

**Rated voltage:** 24 V DC (+/- 20 %), max.: 2 Vss

**Rated current:** 0.8 A

**Cut-off current:** 1.0 A

**Rated power input:** 19 W

**duty cycle:** 30 % (ON: 3 min / OFF: 7 min)

**Degree of protection:** IP 32

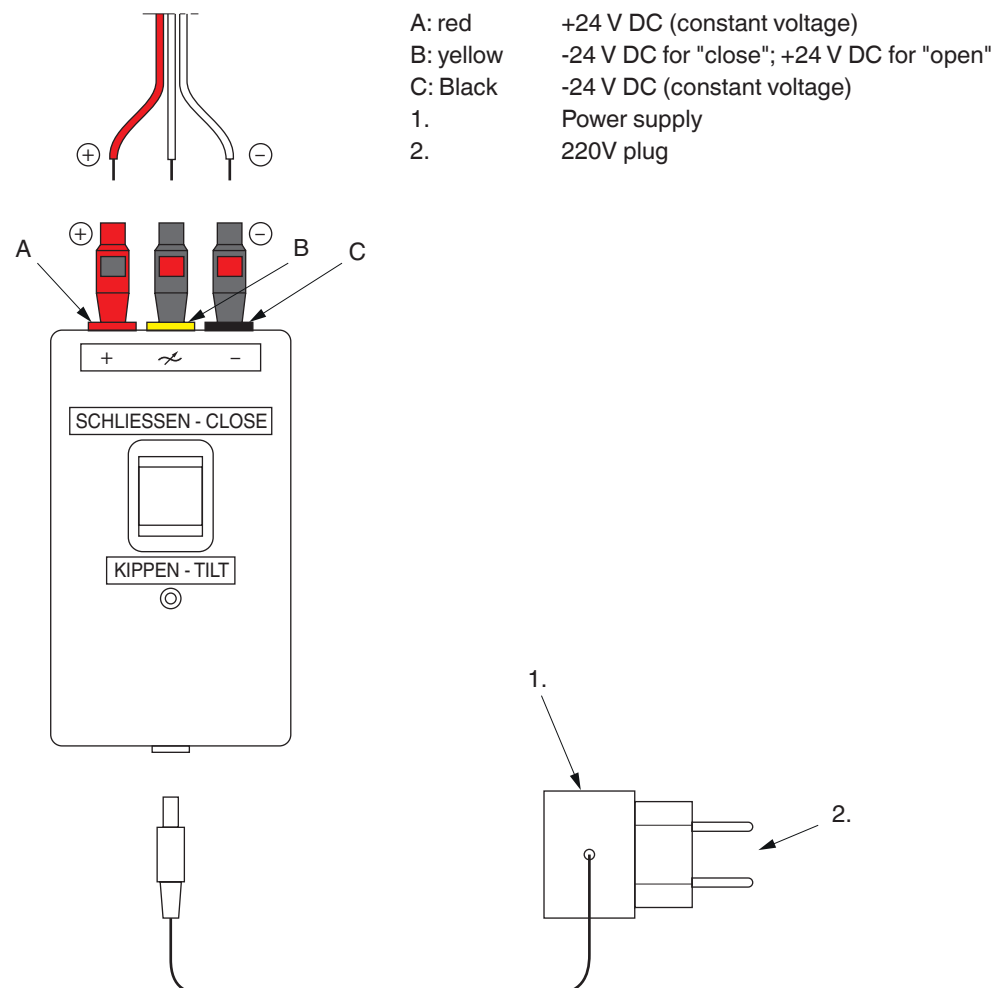
**ambient temperature:** -5 °C - +75 °C

**Closing speed:** <5 mm / s on the main closing edge

**Opening and closing times including neutral travel in motor's rotational position:**

**Open:** approx. 50 s

**Close:** approx. 50 s





## General questions and answers

### **Does E-hardware require a predetermined minimum pulse duration for the motor to respond? Can we quantify?**

The pulse duration is at least 200 ms as indicated on the wiring diagram.

### **The term flank control is mentioned in the interface explanation. What does this mean?**

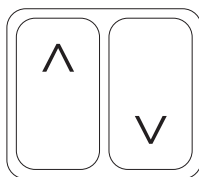
The control is initiated by a signal modification, but is subsequently independent from the further progress of the signal.

*Example: The Maco drive unit is controlled by a brief press of the button, the movement sequence (up to the final position, back to centre) is not affected by subsequent pressure or lack thereof on the button.*

The term flank control also applies when the signal (the press of the button) must be applied to the E-hardware for a particular period, to be recognized as a change. The decisive point is that any subsequent signal progress after a change has been detected no longer affects the controller.

### **Can E-hardware also be operated with a normal OPEN-CLOSE button?**

Yes, there are two options. In the former, the switch is mechanically locked so can both buttons cannot be pressed simultaneously, the second version is described in the next section.



Single button

### **I have used a commercially available 2-way single switch which enables both buttons to be pressed simultaneously for a presentation. Does this represent a risk for the motor or the AC adapter? In this case, must I use a 1 kilo-ohm resistor, in accordance with the circuit?**

Yes here you must ensure that the resistance is provided as shown in the circuit diagram, in order to protect the motor and power supply against short circuit.

### **According to the wiring diagram, earth is connected at the -24 V output of the power supply to protect against ripple (AC voltage on the secondary side of the power supply). Where does this ripple come from?**

See universal wiring diagram!

Cheap switch mode power supplies have a capacitive connection between the primary and secondary sides in order to provide high frequency interference suppression. The high frequencies could otherwise cause radio interference. (For your information: Expensive devices do not need this interference suppression connection). However, this capacitive connection means that relatively high AC voltage can be measured on the secondary side to earth / PE, even up to 230V. This it is not dangerous, because the source is very high resistance, which means that it can only provide very little power, just a few microamperes. For this reason, it is noticeable, but not harmful.



**Could a solution be found for the Somfy interface?**

Somfy is planning for quarter 1/2015 a similar solution as EnOcean (potential-free contacts which are controlled by the I/O Homecontrol), but this will not be a bidirectional solution. Maco E-hardware can thereby be controlled, but give no feedback on its position.

**If we use KNX or LON for the control signals, but have no Aumüller control panel available, is it also possible to connect to our interface? Is our interface schematic sufficient?**

In this case the connection is made with an additional power supply. In doing so, a potential-free actuator must be used, which switches the MACO E-hardware according to the wiring diagram. Again, this is not a bi-directional solution, the E-hardware can merely be driven, but give no feedback on its position.

**In general, the following drive positions can be reported:**

(but only with Aumüller control panel and KNX connection):

*Window was tilted by motor,  
Window was closed by motor,  
possibly also window was manually placed in turn-only position.*

In any case, there is no feedback on where the window actually is, if it was tilted or closed manually. The reason for this is that the drive always travels back to the zero position and there are no continuous magnets on the hardware and no detection. Only the last position actuated by the motor can be reported.



## External Interface Provider

### Aumüller

Single solution with Maco power supply and wireless module, multiple solutions by Aumüller ventilation control, optional sensors (rain, wind, CO<sup>2</sup>) possible.



Detailed information, specifications, products, data sheets, schematics, etc. directly from the manufacturer ▲  
(<http://www.aumueller-gmbh.de>)

### EnOcean

Wireless solution by Ratio® Venetian blinds actuator in conjunction with various EnOcean wireless switches.



Detailed information, specifications, products, data sheets, schematics, etc. directly from the manufacturer ▲  
(<https://www.enocean.com/de/home>)

### Rademacher

Combined hardware / software solution for home automation with E-hardware control, among other things.



Detailed information, specifications, products, data sheets, schematics, etc. directly from the manufacturer ▲  
([www.rademacher.de](http://www.rademacher.de))



## Custom solutions

### Example barrier-free design - clap sensor

Low-cost kits available at electrical engineering stores. The acoustic input signal (1x clap) is used as a switch for the E-hardware. Using the potentiometer, the sensitivity is matched to the spatial conditions.

### Indicator light with an LED display

The operation of the E-hardware is indicated by the LED display. For this purpose, the 3-pin 6 m long connecting cable is interrupted at any point and the printed circuit board with 3-pin terminal is wired in between.

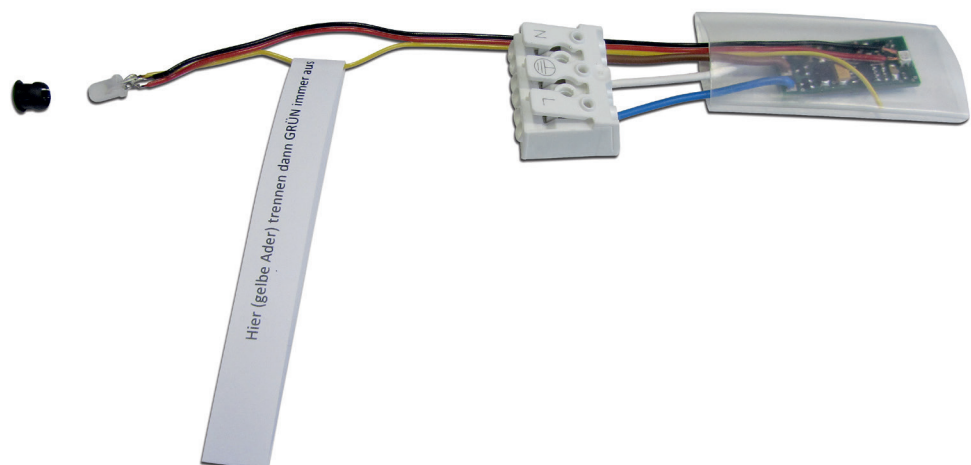
#### 2 colour LED

**Green** = connection to the drive OK if it is installed in front of the contact transition, this is also checked

**Red** = drive in motion > please do not actuate manually

The green LED can be a nuisance in the house, because it is permanently lit up. Therefore, the information is provided to disconnect the yellow wire if it is desired to permanently disable the green LED.

In principle, it must only be ensured that the centre wire of the 6 m cable is connected to the centre terminal (white wire).



TECHNOLOGY IN MOTION



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