

Features

- Programmable ranges from 0.1 – 15A AC/DC
- Digitally adjustable, mutually independent current limit points
- High accuracy through innovative microprocessor technology
- AC current monitoring based on RMS measurement
- Adjustable relay delay up to 24.9 seconds per limit point
- Easy to read LCD display
- Password protected programming access

The Model **M410** is used for AC or DC current limit detection. The monitoring ranges of 0.1 to 15 A makes the **M410** suitable for higher current levels than the M200 series.

Independently programmable time delays for relay energisation / deenergisation upon limit detection prevent unwanted responses to transient current variations.

Microprocessor based operation and digital programming ensure quick and precise set-up and adjustment of limit values.

Mode of Operation

The **M410** can be programmed via its front membrane keypad, while its supply voltage is switched on. To prevent unintended changes in the settings, programming is possible only through password access.



After entering the password, the user is prompted through the programming sequence by parameter symbols on the LCD display. Through these steps the current monitoring range, high and low current limit points, and relay delay times up to 24.9 seconds may be programmed.

The **M410** can thus be programmed to operate according to the user's specific application requirements.

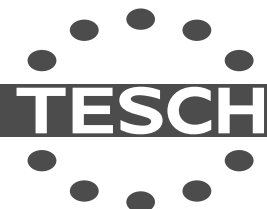
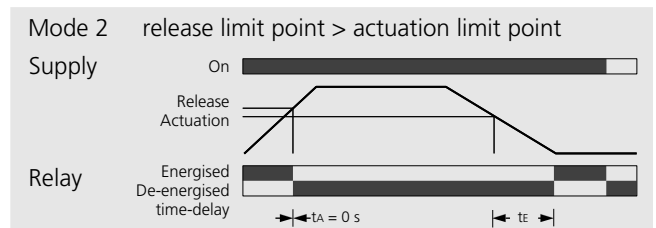
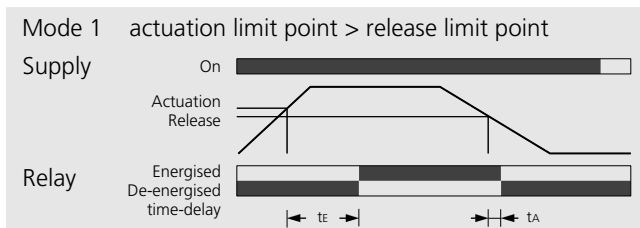
After completing the programming sequence, the settings are stored in the unit's nonvolatile memory, unaffected by power supply interruptions. Because the limit points can be inde-

pendently programmed at any value within the selected monitoring range, the relay energisation point can be higher or lower than the deenergisation point, as illustrated in the diagrams below.

Models and Ordering Data

Contacts	1 change-over contact 1 normally open contact
Measuring range	0.1 - 15AAC/DC
Type M410	Order No.
230 VAC	072 00029
115 VAC	072 00030
24 VAC	072 00031

Function diagrams



Configuration Description

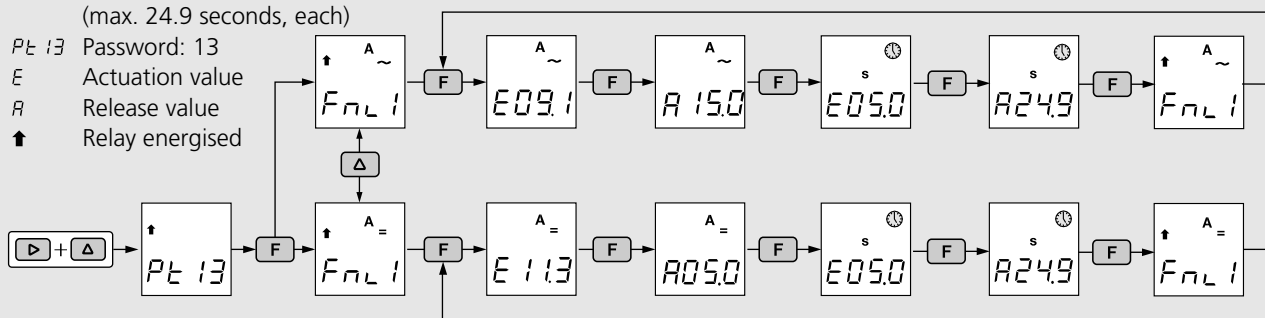
The M410 is programmed by a sequence of operations of its front membrane keys. To put the unit into programming mode, the keys \triangleright + \triangle are pressed simultaneously, upon which $PE00$ appears on the display. The \triangleright key is used to select one of the two numeric digits, causing it to blink. The \triangle key is used to change the value of the blinking digit. The value of a digit can be changed only when it is in the blinking mode. In this way, the password is set to $PE13$, after which programming can proceed by sequentially selecting the parameters, using the F key. After entering the password, the next operation of the F key sets the unit for selection of AC or DC current monitoring, by using the \triangle key. Pressing the F key again enables setting of the current limit point for relay energisation, by adjusting digit values one at a time as described earlier. Similarly, relay de-energisation current limit point, relay energisation time delay, and relay de-energisation time delay may be adjusted by the user.

Display Parameters:

- $F_{NL}^{A\sim}$ Current monitor 0.1 – 15A_{AC}
- $F_{NL}^{A=}$ Current monitor 0.1 – 15A_{DC}
- $E249$ Time delay, relay energise
- $R249$ Time delay, relay de-energise (max. 24.9 seconds, each)
- $PE13$ Password: 13
- E Actuation value
- R Release value
- \uparrow Relay energised

After all programming steps are finished, the M410 reverts to its normal operation mode. Thereafter, to change any parameter, the password must be first entered, the F key repeatedly pressed until the desired parameter step is reached, upon which the digit values are adjusted.

The relay energisation state is indicated by the \uparrow symbol on the LCD display.



Technical Data

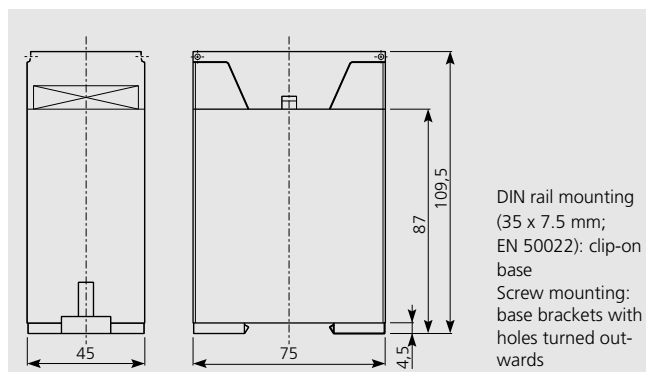
Voltage range	0.8 (0.85/24 V) to 1.1x rated voltage
Frequency range	50/60Hz
Power consumption	Approx. 2 VA
Relay mechanical life	10 ⁷ switching cycles
Current threshold accuracy	± 2%
Timing accuracy	± 0.5% under const. conditions
Temperature influence	< 0.01%/K
Ambient temperature	-5 °C to 60 °C, no condensation
Rated insulation voltage	250 V
Creep and air paths	Group III per VDE 0110; Pollution Level 2

Test voltage	2000 V per VDE 0435
Current measuring range	0.1–15 A _{AC/DC} ; 0.1 A resolution

Protection class	Terminals: IP 20, Enclosure: IP 40 per DIN VDE 0470-1 (11/92)
Connecting terminals	Terminal box with wire protection
Line cross section	Flexible 2.5 mm ² , connecting lead to be stripped up to max. 7 mm
Switching capacity	AC1: 250 V 5 A, DC1: 30 V 4 A

Weight	Approx. 260 g
--------	---------------

Dimensional Diagram (all dimensions in mm)



Circuit Diagram

