



RM35L●●●MW

Presentation

Level control relays RM35LM33MW and RM35LV14MW control 1 or 2 levels, with a fill or empty function:

Functions	RM35LM33MW	RM35LV14MW
Level 1/Level 2		
Fill/Empty operation		
Detection by resistive probes		
Detection by discrete sensors		
Low/Standard/High sensitivity		

- Function performed
- Function not performed

They feature:

- A sealable cover to help protect the settings
- A control status indicator LED

The relays are designed for clip-on mounting on a \perp rail

Applications

These devices monitor the levels of conductive liquid or non-conductive material. They control the actuation of pumps or valves to regulate levels, help protect submersible pumps against dry running, or help protect tanks from "overflow". They can also be used to control dosing of liquids in mixing processes and help protect heating elements in the event of non-immersion. They have a transparent, hinged cover on their front panel to avoid any accidental alteration of the settings. This cover can be directly sealed.

- Application examples for RM35LM33MW:
 - spring water, town water, industrial water, and sea water
 - metallic salt, acid, or base solutions
 - liquid fertilizers and non-concentrated alcohol (< 40%)
 - liquids in the food processing industry: beer, coffee, etc.
- Application examples for RM35LV14MW:
 - chemically pure water
 - fuels, liquid gases (inflammable)
 - oil, concentrated alcohol (> 40%)
 - ethylene, glycol, paraffin, varnish, and paints

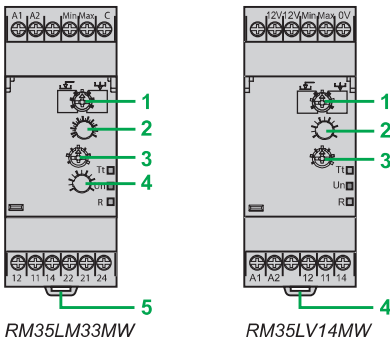
Description

RM35LM33MW

- 1 Configuration: selection of operating mode \perp / \perp and of sensitivity range LS, St, HS
- 2 Sensitivity adjustment potentiometer %
- 3 Switch for selecting the number of levels
- 4 Time delay adjustment potentiometer Tt
- 5 Spring for clip-on mounting on 35 mm/1.38 in. \perp rail

RM35LV14MW

- 2 Configuration: selection of operating mode \perp / \perp and of sensor type PNP, NPN
- 3 Time delay adjustment potentiometer Tt
- 4 Switch for selecting the number of levels
- 5 Spring for clip-on mounting on 35 mm/1.38 in. \perp rail



RM35LM33MW

RM35LV14MW

Tt Yellow LED: indicates timing status

Un Green LED: indicates that supply to the product is on

R Yellow LED: indicates relay output status

Operating principle

Control relays RM35LM and RM35LV are designed to control the levels of:

- Conductive liquid for RM35LM (measures the levels by resistive probes)
- Any other material for RM35LV (controls the levels of conductive liquids)

Function Diagram

- Power supply off
- Power supply on
- Output 11-14, 21-24 open
- Output 11-14, 21-24 closed

The operating principle is based on measurement of the apparent resistance of the liquid between two submerged probes. When this value is less than the threshold setting on the front panel of the device, the relay changes state. To avoid electrolytic phenomena, an AC current runs across the probes.

A selector switch on the front panel allows selection of the required function and the sensitivity range. Control of a single level can be achieved by using the second selector switch. In this case, the Max. level probe stays up in the air and an adjustable time delay avoids any wave effect.

Operating principle

RM35LM33MW

Relay RM35LV measures the levels by means of discrete sensors. These two products activate their output relay when a tank is either emptying or filling.

- A green **Un** LED indicates that the supply is on.
- A yellow **R** LED indicates the state of the output relay.
- A yellow **Tt** LED indicates that timing is in progress.
- The green and yellow LEDs flash to indicate an unacceptable setting position.

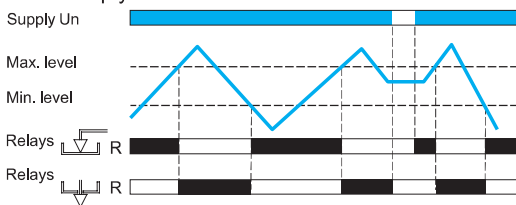
A selector switch on the front panel of these relays allows selection of the required sensitivity range and the empty or fill function. A second switch allows selection of the number of levels (1 or 2) and the type of time delay in the case of level 1 mode.

The position of these configuration switches is taken into account on energization.

- If the configuration switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error.
- If the configuration switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.
- If the configuration switch is returned to the original position selected prior to the last energization, the LEDs return to their normal state.

Control of two levels, empty and fill function

□ Fill/Empty function



■ Empty function

level: 2, function:

- **LS** (Low Sensitivity: 250 Ω...5 kΩ)
- **St** (Standard Sensitivity: 5 kΩ...100 kΩ)
- **HS** (High Sensitivity: 50 kΩ...1 MΩ)

The output relay stays open until the liquid reaches the Max. level probe. As soon as the Max. level is reached, the contact closes and allows emptying of the tank (valve opens, pump starts, etc.). When the level drops below the Min. level, the contact opens to stop the emptying process.

■ Fill function

level: 2, function:

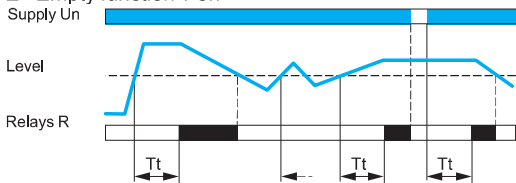
- **LS** (Low Sensitivity: 250 Ω...5 kΩ)
- **St** (Standard Sensitivity: 5 kΩ...100 kΩ)
- **HS** (High Sensitivity: 50 kΩ...1 MΩ)

The output relay stays energized until the liquid reaches the Max. level probe. As soon as the Max. level is reached, the contact opens and the pump stops. When the level drops below the Min. level, the contact closes again and pumping re-starts to raise the level.

Note: When two levels are being controlled, the anti-wave time delay function is not active.

Control of one level, empty function

□ Empty function T on



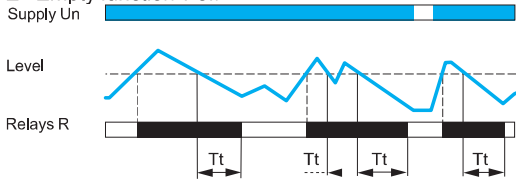
■ Level: 1 - on delay functions:

- **LS** (Low Sensitivity: 250 Ω...5 kΩ)
- **St** (Standard Sensitivity: 5 kΩ...100 kΩ)
- **HS** (High Sensitivity: 50 kΩ...1 MΩ)

When the liquid level rises above the probe for a time greater than the time delay value T_t set on the front panel, the relay is energized and stays energized until the liquid level drops back to the probe.

If the liquid drops back below the set level before the end of the time delay, the relay is not energized.

□ Empty function T off



■ Level: 1 - off delay functions:

- **LS** (Low Sensitivity: 250 Ω...5 kΩ)
- **St** (Standard Sensitivity: 5 kΩ...100 kΩ)
- **HS** (High Sensitivity: 50 kΩ...1 MΩ)

When the liquid level rises above the probe, the relay is energized instantly and stays energized until the liquid again reaches the probe level for a time T_t set on the front panel.

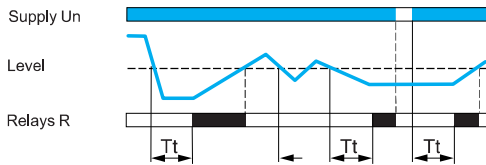
If the liquid drops back below the set level before the end of the time delay period, the relay stays energized.

Operating principle (continued)

RM35LM33MW (continued)

Control of one level, fill function

Fill function T on



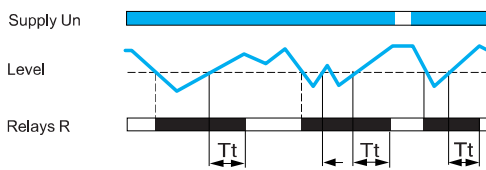
■ Level: 1 - on delay functions:

- LS (Low Sensitivity: 250 Ω...5 kΩ)
- St (Standard Sensitivity: 5 kΩ...100 kΩ)
- HS (High Sensitivity: 50 kΩ...1 MΩ)

When the liquid level drops below the probe for a time greater than the time delay value T_t set on the front panel, the relay is energized and stays energized until the liquid level rises back up to the probe.

If the liquid rises back above the set level before the end of the time delay period, the relay is not energized.

Fill function T off



■ Level: 1 - off delay functions:

- LS (Low Sensitivity: 250 Ω...5 kΩ)
- St (Standard Sensitivity: 5 kΩ...100 kΩ)
- HS (High Sensitivity: 50 kΩ...1 MΩ)

When the liquid level drops below the probe, the relay is energized instantly and stays energized until the liquid level again reaches the probe level and stays above it for a time greater than the time delay period T_t set on the front panel.

If the liquid drops back down to below the set level before the end of the time delay period, the relay stays energized.

RM35LV14MW

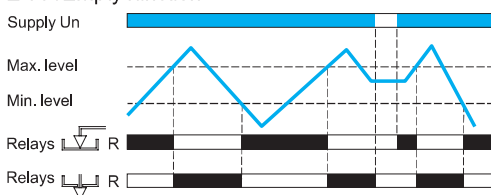
A selector switch on the front panel allows selection of the function (empty or fill) and the type of sensor. A second switch allows selection of the number of levels (1 or 2) and the type of time delay in the case of 1 level mode.

The position of these configuration switches is taken into account on energization.

- If the configuration switch is set to an unacceptable position, the product detects a fault, the output relay stays open, and the LEDs flash to signal the position error.
- If the configuration switch position is changed while the device is operating, all the LEDs flash, but the product continues to operate normally with the function selected at the time of energization preceding the change of position.
- If the configuration switch is returned to the original position selected prior to the last energization, the LEDs return to their normal state.

Control of two levels

Fill/Empty function



■ Empty function

Level: 2

The output relay stays open until the material reaches the Max. probe level. As soon as the Max. level is reached, the contact closes and allows emptying of the tank (valve opens, pump starts, etc.). When the level drops below the Min. probe level, the contact opens to stop the emptying process.

■ Fill function

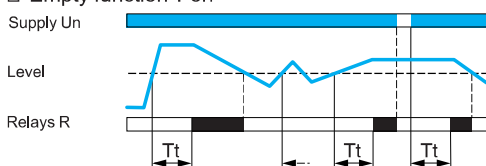
Level: 2

The output relay stays energized until the material reaches the Max. probe. As soon as the Max. level is reached, the contact opens and the pump stops. When the level drops below the Min. probe level, the contact closes again and pumping re-starts to raise the level.

Note: When two levels are being controlled, the anti-wave time delay function is not active.

Control of one level, empty function

Empty function T on

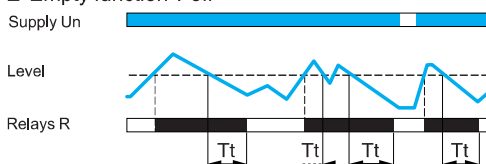


■ Level: 1 - on delay

When the material level rises above the probe for a time greater than the time delay value T_t set on the front panel, the relay is energized and stays energized until the material level drops back to the probe.

If the level rises above the probe before the end of time delay period, the relay is not energized.

Empty function T off



■ Level: 1 - off delay

When the material level rises above the probe, the relay is energized instantly and stays energized until the material level again reaches the probe and stays below it for a time greater than the time delay value T_t set on the front panel.

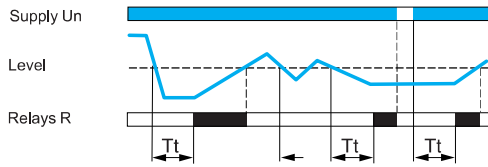
If the level drops back to below the probe before the end of time delay period, the relay stays energized.

Operating principle (continued)

RM35LV14MW (continued)

Control of one level, fill function

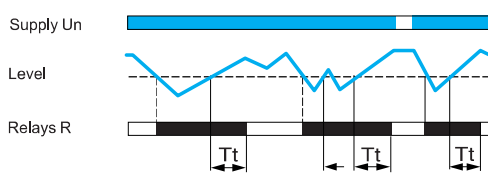
□ Fill function T on



■ Level: 1 - on delay

When the material level drops below the probe for a time greater than the time delay value Tt set on the front panel, the relay is energized and stays energized until the material level again reaches the probe.
If the level rises above the probe before the end of time delay period, the relay is not energized.

□ Fill function T off



■ Level: 1 - off delay

When the material level drops below the probe, the relay is energized instantly and stays energized until the material level again reaches the probe and stays above it for a time greater than the time delay period Tt set on the front panel.
If the level drops back down to below the probe before the end of the time delay period, the relay stays energized.

References



Function	Supply voltage	Output	Reference	Weight
	V			kg/lb
Detection by resistive probes (see page 68)	24...240 ~	2 CO 5 A	RM35LM33MW	0.130/ 0.287
Detection by discrete sensors	24...240 ~	1 CO 5 A	RM35LV14MW	0.130/ 0.287