# Float switch TS-MPS

Reed-contact equipped
Ready assembled or construction kit (without float pipe) - only in combination with level control TS-NIA

Float switch TS-MPS

## Application

Reed-module equipped float switches are perfectly appropriate for monitoring and controlling of in-tank liquid levels.

They are used as display for messages like empty status signal / full status signal, for controlling of pumps or valves as well as for alarm status signals.

The variety of applications demands individual configuration. Following this need, the float switch TS-MPS is optional available as a construction kit for self-installation.

## Description

- Liquid level probe/sensor, reed-contact equipped
- Float pipe available in a choice of materials, PVC, PP, PVDF or stainless steel
- Up to 5 reed-modules per application
- Float lever, permanent magnet equipped
- Male screw-in thread 11/2“ and 2“
- Spacious connection chamber
- Protection class IP 65

*TIVAL* Sensors magnetic float switches are equipped with special designed reed-modules mounted inside the float pipe.The cable length between the individual reed-modules defines the pitch between the desired liquid levels. Reed-module actuation is provided by a permanent magnet, which is part of the float lever. The lever moves along the float pipe and is the system`s only mobile part.

The *TIVAL* Sensors Level Control TS-NIA is required for liquid level interpretation

## Components

| | |
|---|---|
| Connector head: | including cable clamps, float lever and sealing plug. |
| Reed-module: | MPS 05 |
| Float lever (cylindric): | material PP ø 38 x 60 mm |
| | material PVDF ø 55 x 70 mm |
| | material stainless steel ø 52 x 52 mm |

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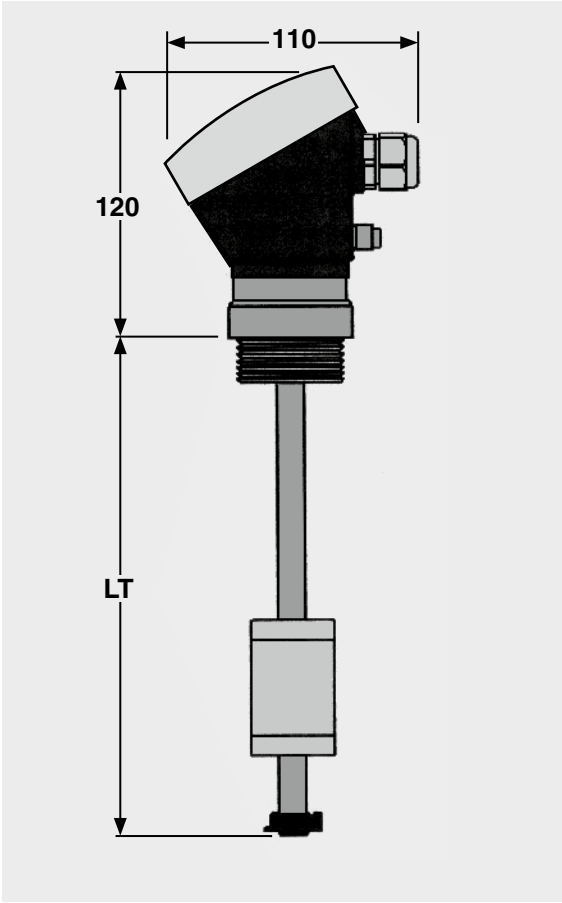
| Technical data | Type: TST-MPS | | | |
|---|---|---|---|---|
| Material float pipe | PVC | PP | PVDF | Stainless steel |
| Material connector head | PBT | PBT | PBT | PBT |
| Medium temperature, max | +60° C | +60° C | +60° C | +60° C |
| Medium density, max (g / cm³) | 0,5 | 0,5 | 0,9 | 0,7 |
| Tank pressure, max ( bar) | 2 | 2 | 3 | 30 |
| Protection class | IP 65 | IP 65 | IP 65 | IP 65 |
| Float pipe diameter (mm) | ø16 x 1,2 | ø16 x 1,8 | ø20 x 1,8 | ø15 x 1 |
| Float pipe length (mm) | min. 100<br>max. 2500 | min. 100<br>max. 2500 | min. 100<br>max. 2500 | min. 100<br>max. 2500 |
| Process connection* | 1 1/2" | 1 1/2" | 1 1/2" | 2" |
| Cable, connection between reed-modules | 1 mm² (rigid) | 1 mm² (rigid) | 1 mm² (rigid) | 1 mm² (rigid) |

* Process connection in different sizes, materials and flange connection upon request.




Level control TS-NIA

## Construction kit

For flexible and individual adaption to variable tank dimensions and liquid levels the float switch TS-MPS is optional available as a construction kit for self-installation. This version is supplied without a float pipe.

Please refer to the following chart for combining the components for your individual application.

## Construction kit

| Type | Part No. |
|---|---|
| Connector head NR 11/2“ (PVC) | 1090105 |
| Reed-module MPS 05 | 1090106 |
| Level control TS-NIA (230 V) | 1090100 |

# Level control TS-NIA

For liquids, must be used with float switch (i.e. TS-MPS)

Level control TS-NIA

Float switch TS-MPS

## Description

- Monitoring and control of 1 to 5 liquid levels
- 3 operating modes: filling, emptying and level monitoring
- Number of reed-modules adjustable to scale
- 5 LEDs for liquid levels display
- Adjustable time delay for compensation of wave motion

The level control TS-NIA must be used with a float switch (i.e. TS-MPS). Number of reed-modules in the float switch has to be equal to the number of liquid levels to be monitored. Float switch and level control are forming a functional unit. If the number of reed-modules set to the control unit marked „MODULES“ differs from the number of the actual installed reed-modules in the float switch, the 5 LEDs (N1 to N5) will conjointly flash after supply voltage is connected. No function will be delivered. After setting the right number of modules to the control unit the proper function will be provided immediately.

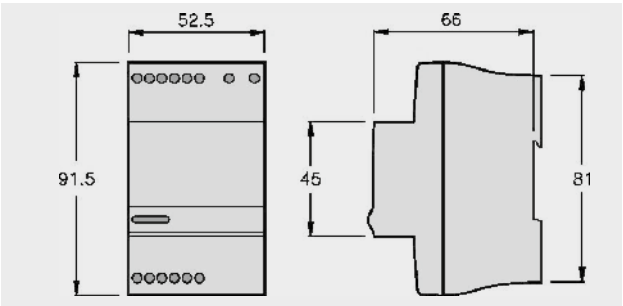
The level control TS-NIA can be comfortably set to one of the three different working modes -filling, emptying and level monitoring- by using a front-mounted turn-knob.

The depictable performance of the level control depends on the selected working mode as well as on the number of reed-modules installed in the float switch.

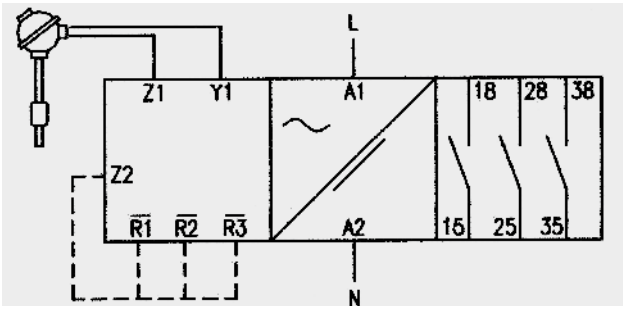
Level monitoring feature, displayed by yellow LEDs, is available independently from the working mode set to the level control.

Important notice: Prior to initial use, the floater must be moved one time fully up and down the float pipe to assure safe level readout!

## Dimensional drawing




Scale drawing TS-NIA




Terminal assignment

| Function | No. of modules | Filling | Emptying | Monitoring |
|---|---|---|---|---|
| Minimum | 1 | | X | |
| Maximum | 1 | X | | |
| Maximum, minimum | 2 | X | X | |
| Max., min., min. - Alarm | 3 | | X | |
| Max., min. max. - Alarm | 3 | X | | |
| Max., min., min. and max. - Alarm | 4 | X | X | |
| Level control | 1 - 5 | | | X |

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## Time delay function

The adjustable time delay function –potentiometer „TIME“- provides the comfort of avoiding any unintentional switching action caused by in-tank wave motion. The time delay is connected to to the particular alarmrelays during function setting to „Filling“ and „Emptying“. If the function setting „LEVEL MONITORING“ is choosen, the adjusted time delay comes across all relais.

The yellow LED assigned to the particular reed-module will flash as long as the adjusted time delay value has expired.

## Inverted relay function

For better application adaption the the TS-NIA provides the option of inverting the function of each of the relais. This option is activated by bridging the output Z2 with the outputs R1, R2 and/or R3.

## Sensor cable specification

A shielded cable must be used.

Total cable resistance has to be less or equal 1.0 Ohm.

The cable lenght to be detected is defined as the cable length between the float switch TS-MPS an the level control TS-NIA.

## Relay outputs

Each relay output is assigned to a single function in addiction to the respectively choosen operating mode and the number of reed-modules installed.

| Function filling | |
|---|---|
| 1 reed-module | relay 1 = pump control |
| 2 reed-modules | relay 2 = pump control |
| 3 reed-modules | relay 2 = pump control; relay 3 = max. alarm |
| 4 reed-modules | relay 1 = min. alarm; relay 2 = pump control; relay 3 = max. alarm |
| 5 reed-modules | relay 1 = min. alarm; relay 2 = pump control; relay 3 = max. alarm |

For use of more than 4 modules, Z2 must be bridged to R1

| Function emptying | |
|---|---|
| 1 reed-module | relay 1 = pump control |
| 2 reed-modules | relay 2 = pump control |
| 3 reed-modules | relay 1 = min. alarm; relay 2 = pump control |
| 4 reed-modules | relay 1 = min. alarm; relay 2 = pump control; relay 3 = max. alarm |
| 5 reed-modules | relay 1 = min. alarm; relay 2 = pump control; relay 3 = max. alarm |

For use of more than 4 modules, Z2 must be bridged to R1

| Function level monitoring | |
|---|---|
| 1 reed-module | relay 2 = middle liquid level |
| 2 reed-modules | relay 1 = min. liquid level; relay 2 = middle liquid level |
| 3 reed-modules | relay 1 = min. liquid level; relay 2 = middle liquid level.; relay 3 = max. liquid level |
| 4 - 5 reed-modules | relay a.m.; display liquid level by built-in LEDs |

| Technical data | Type: TS-NIA |
|---|---|
| Operation voltage | 220 / 230 V AC; others on request |
| Relay (NO) | AC 1 / AC 15: 6 / 3 A (250 V, 50 / 60 Hz) |
| Electrical life span | $30 \times 10^6$ |
| Protection class | IP 20 |
| Storage temperature | -50 ... +85° C |
| Environment temperature | -20 ... +30° C |
| LED display: | green LED: unit engaged<br>red LED (3): relay closed<br>yellow LED (5): liquid level |
| Operating voltage in sensor: | 5 V DC, max. 24 V DC |
| Operating current in sensor: | 1 mA |

Designed and manufactured acc. to 89/366/EEC, 92/31 EEC and 73/23 EEC