DISIBEINT

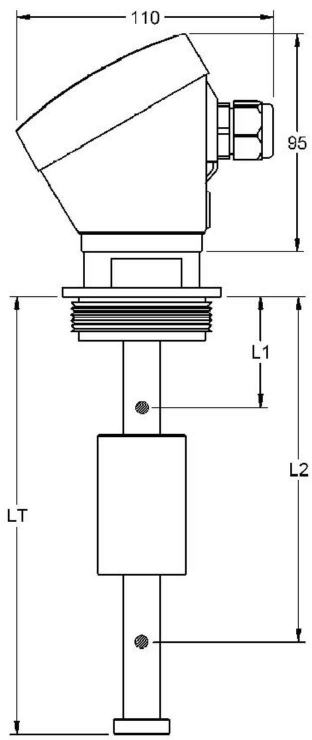
IMNR TB PVDF

MAGNETIC LEVEL SWITCH WITH MANEUVER CONTROL INCORPORATED

Application	Level control for general application in conductive liquids with preferred use in conductive tanks (see other possibilities in page 5).
Operating principle	The sensor uses the own process connection fitting as the common electrode and the rods for detecting the liquid contained into the tank where the level is to be controlled. The detection of that level provokes the action of a relay integrated into the sensor main body. A time can be set to delay the detection in tanks equiped with shakers or with turbulences. In order to adapt easily to the tank characteristics, it can be set the state of the contacts of the relay.
Operating mode	It depends on the number of contacts placed inside: · With 1 contact: Detection of a only level point (amplifier KMPA). See page 2. · With 2 contacts: Detection of max/min levels (amplifier KMCA). See page 3.

Sensor	Process connection	By top screw (see table 1).
	Guied tube	PVDF, Ø 16 mm.
	Length	130..3500 mm.
	Float	**FCPF09M18** (FCP-3), Ø 38x60 mm. PVDF
	Nr. max. of contacts	1..2
	Dist. between contacts	> 40 mm.
	Temperature	-40..+125ºC
	Mounting position	Vertical, ±30º
Housing	Material and dimensions	PBT. 64 x 95 x 110 mm
	Protection	IP67
	Temperature	-20..+50 ºC
	Cable gland	M20 x 1,5 (IP68)
Output	Type	SPDT relay 6A/250VAC
	Response time	· At power on: 800 ms · At liquid detection: 500 ms
	Timing	Adjustable between 0..9 s. It can be set when detecting, undetecting or at whichever of both situations.

Dimensions



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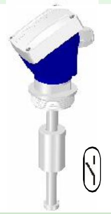


1 Contact

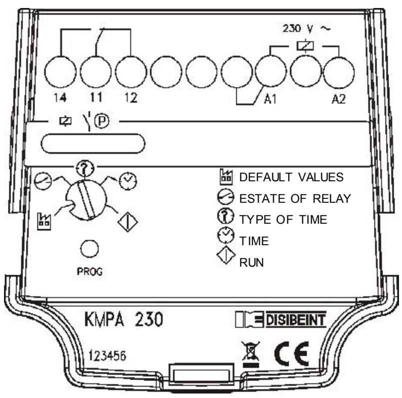
Control 1 level

Start-up and adjustment

Prior to start working with the sensor IMNR, it must be adjusted for getting a right operation. Adjustments can be modified whenever required. It must be taken into account that the behaviour of the device can be different whether the adjustments are done while the electrodes are in touch or not with the liquid.

Be sure that the options selector is right positioned. Each time that it is moved to a new option, the Ⓟ led flashes twice indicating that the option has been correctly reached.

Default values	The sensor is adjusted by default with values that can be used in a large number of applications. When pressing the push-button PROG the led Ⓟ turns on. Keep the push-button pressed until the led Ⓟ turns off (3 seconds), indicating that the default values have been reset (they are framed with ☐ at the left column).
State of the relay contacts	(Relay NO ( ): led Ⓟ OFF; Relay NC ( ): led Ⓟ ON). When accessing to this option, the led Ⓟ shows the actual state of the adjustment. Each time the push-button PROG is pressed, it is reversed the state of the relay contacts. WARNING: This option modifies the state of the relay and this could provoke undesired effects in the case that any device be connected to the contacts of the relay.
Timing type	(Detecting ( ): led Ⓟ OFF; Undetecting ( ): led Ⓟ OFF; Detecting and undetecting ( ): led Ⓟ flashing). When accessing to this option, the led Ⓟ shows the actual state of the adjustment. Each time the push-button PROG is pressed, it is moved to the next timing type in a cyclic way.
Time (1s)	When accessing to this option, the led Ⓟ emits as many flashes as the number of seconds adjusted in the timer, between 0 and 9 seconds. Each time the push-button PROG is pressed, the time value increases in 1 second, except when the value is 9 that moves to 0. If it is pressed longer than 3 seconds, the time value moves to 0.
Run	Normal operation mode. The state of the led Ⓟ matches with the state of the relay contact (led ON = relay ON).

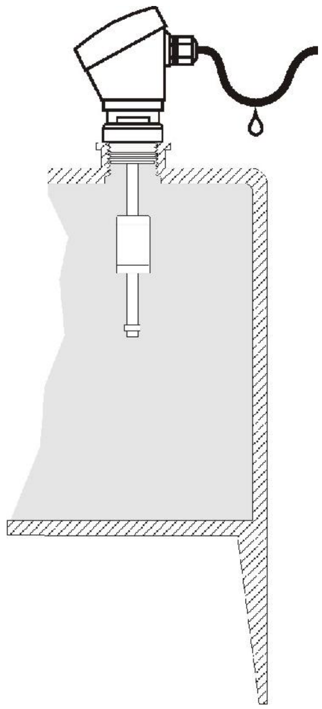


Assembly conditions

Handling: Do not use the housing to screw the sensor into the fitting. Use a tool 40 mm wide at the steel part on the thread. Once tighted, you can turn the housing 350º with your hand until it be placed in the right position.

Electrical connection: Use a cable according with the load the relay will manage. It is convenient that the cable gland completely tight the cable of the electrical connection, and it becomes essential in the event of humidity or when installed outdoor. In these cases, make a loop in the cable to facilitate the removal of accumulated drops (see figure).

Installation at the top side:
Level control of maximum or minimum.



IMNR TB PVDF

2 Contacts

Max/Min level control

Start-up and adjustment

Prior to start working with the sensor IMNR, it must be adjusted for getting a right operation. Adjustments can be modified whenever required. It must be taken into account that the behaviour of the device can be different whether the adjustments are done while the electrodes are in touch or not with the liquid.

Be sure that the options selector is right positioned. Each time that it is moved to a new option, the ℗ led flashes twice indicating that the option has been correctly reached.

State of the relay contacts

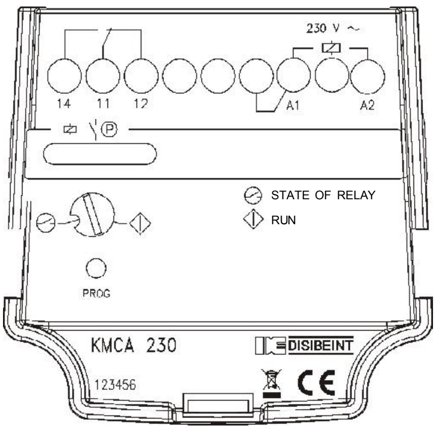
(Relay NO ( ): led ℗ OFF (emptying); Relay NC ( ): led ℗ ON (filling). When accessing to this option, the led è shows the actual state of the adjustment. Each time the push-button PROG is pressed, it is reversed the state of the relay contacts.

WARNING: This option modifies the state of the relay and this could provoke undesired effects in the case that any device be connected to the contacts of the relay.

Run

Normal operation mode.

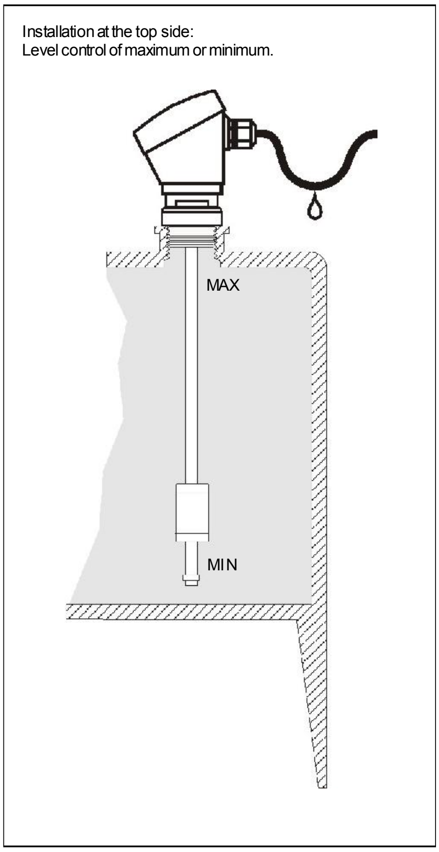
The state of the led ℗ matches with the state of the relay contact (led ON = relay ON).



Assembly conditions

Handling: Do not use the housing to screw the sensor into the fitting. Use a tool 40 mm wide at the steel part on the thread. Once tighted, you can turn the housing 350º with your hand until it be placed in the right position.

Electrical connection: Use a cable according with the load the relay will manage. It is convenient that the cable gland completely tight the cable of the electrical connection, and it becomes essential in the event of humidity or when installed outdoor. In these cases, make a loop in the cable to facilitate the removal of accumulated drops (see figure).

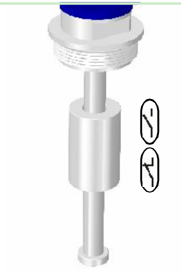


Model

IMNR TB PVDF 1C

· *1 Contact*

· *Amplifier KMPA*

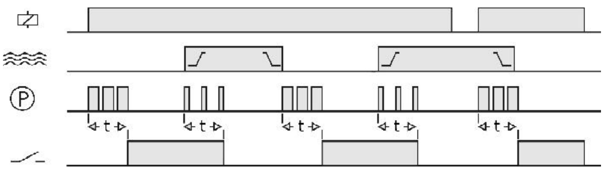


IMNR TB PVDF 2C

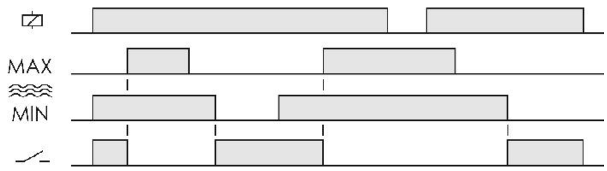
· *2 Contacts*

· *Amplifier KMCA*

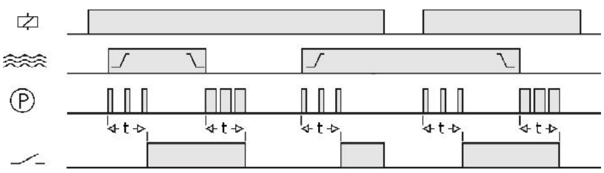
Operating diagrams



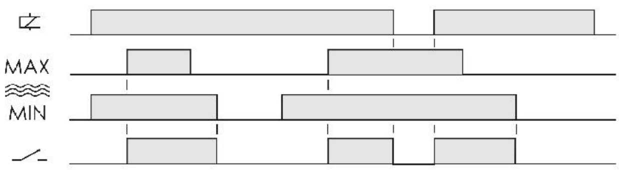
Simulation: Control of maximum level or filling
Relay contacts: NC
Timing type: Detecting and undetecting
Time: Any value greater than 0



Simulation: Control for filling
Relay contacts: NC



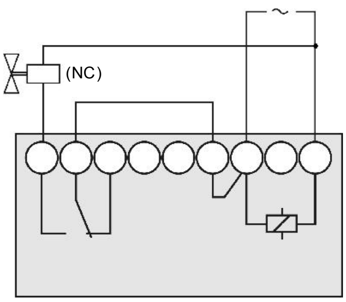
Simulation: Control of minimum level or emptying
Relay contacts: NO
Timing type: Detecting and undetecting
Time: Any value greater than 0



Simulation: Control for emptying
Relay contacts: NO

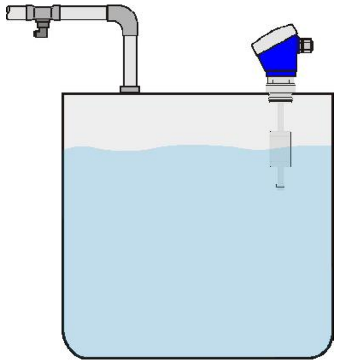
Example of wiring connection

Control of maximum level or filling control using a sensor with 1 contact and the amplifier KMPA.

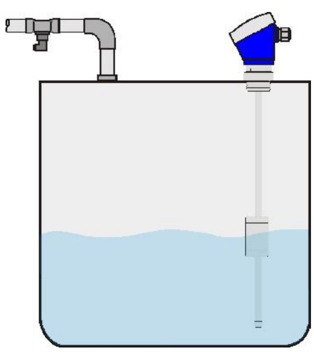


Filling control using a sensor with 2 contacts and the amplifier KMCA.

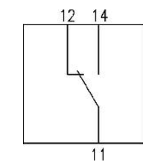
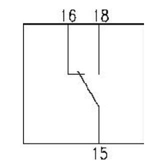
Installation examples



Detection of maximum level



Detection of maximum and minimum level

Output relay		KMCA	KMPA
			
Resistive load	AC	6 A / 250 V	
	DC	0,2 A / 200 V 6 A / 24 V	
Inductive load	AC	3 A / 250 V	
	DC	3 A / 24 V	
Mechanical life		> 30 x 10^6 operations	
Max. mechanical operations		72.000 operations / hour	
Electrical life at full load		360 operations / hour	
Contact material		AgNi 0.15	
Maximum voltage		400 VAC	
Operating voltage		400 VAC	
Volt. between changeovers		1000 VAC	
Voltage between contacts		1000 VAC	
Voltage coil/contact		4000 VAC	
Distance coil/contact		8 mm	
Isolation resistance		> 10^4 MΩ	

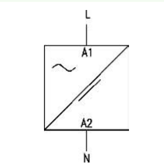
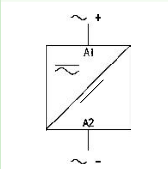
Supply voltage	KMCA / KMPA	
		
Galvanic isolement	Yes	Yes
Frequency	50 / 60 Hz	-
Operating margins	±10..-15%	-
Positive	-	Terminal A1
Protected polarity	-	Yes

Table 1: Process connection

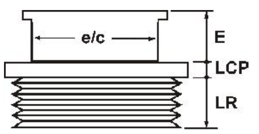
Thread	**2" G**	
Material	PVDF	
e/c (mm)	64	
LR (mm)	26	
LCP (mm)	17	

Table 2: Floats

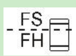
Model	**FCPF09M18**
Material	PVDF
Dimension (mm)	Ø 38x60
Pressure (kg/cm²)	2
Density (g/cm³)	e > 0,71
FS / FH (mm)	17,4 / 9,9
	

Table 3: Protection

Standard	Normal construction, without any internal filling.
Protected	Filled with anticondensation gel.
Insulated	Filled with epoxy resine, flexible.

Constructive and enviromanetal data	KMCA / KMPA
Voltage phase-neutral	300 V
Overvoltage category	III
Shocking voltage	4 kV
Pollution degree	2
Protection class	IP 20
Storing temperature	-50..+85ºC
Operating temperature	-20..+50ºC
Humidity	30..85% HR
Housing	Cycoloy - Light Grey
Socket	Lexan - Light Grey
Leds window	Lexan - Transparent
Buttons and terminal blocks	Technyl - Dark Blue
Terminals	Nickled brass
Norms	Designed and manufactured under EEC standards. Directive for electromagnetic compatibility 2004/108/EEC. Directive for low voltage 2006/95/EEC. Plastics: UL 91 V0

Ordering code

IMNR TB PVDF - ☐ V☐ P☐ F☐ L☐ C☐

		Code
Supply	24 VAC	024
	48 VAC	048
	110..125 VAC	110
	220..240 VAC	230
	15..70 VAC/DC	901
	60..240 VAC/DC	902
Version (V)	Standard	1
	Protected	2
	Insulated	3
Process connect. (P)	2" G	10
		-
		-
Float (F)	FCPF09M18	60
		-
		-
Total length (LT) (L)		(mm)
Nr contacts (C)		1-2

To compose the reference, select an option from each of the boxes To manufacture the sensor must specify the height of each of the contacts L1/L2 (see dimensions on page 1).

Example:
IMNR TB PVDF 048 **V**1 **P**10 **F**60 **L**500 **C**2 - **L1:** 150 **L2:** 430