

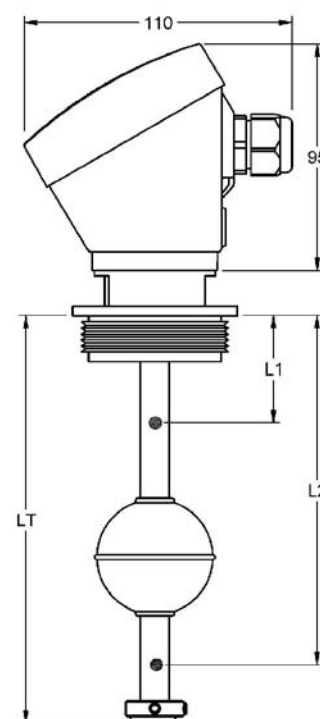
IMNR TB INOX

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 equipped 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: <ul style="list-style-type: none"> · 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)
	Guide tube	SS AISI316 (1.4401), Ø12 mm.
	Length	90..3500 mm.
	Float	FEI601M13 (FEI-1), Ø52x52 mm. SS AISI316 (1.4401). Other options according to table 2.
	Nr. max. of contacts	1..2
	Dist. between contacts	> 40 mm.
	Temperature	-40..+125°C
	Mounting position	Vertical, ±30°
Housing	Material and dimensions	PBT. 64 x 95 x 110 mm
	Protection	IP67
	Temperature	-20..+50 °C
	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



IMNR TB INOX

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

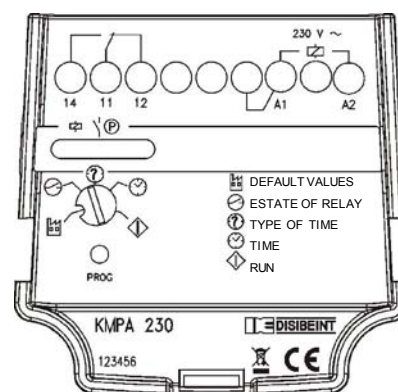
When accessing to this option, the led emits as many flashes as the number of seconds adjusted in the timer, between 0 and 9 seconds. Each time the push-button PROG is pressed, the time value increases in 1 second, except when the value is 9 that moves to 0. If it is pressed longer than 3 seconds, the time value moves to 0.

1s

Run

Normal operation mode.

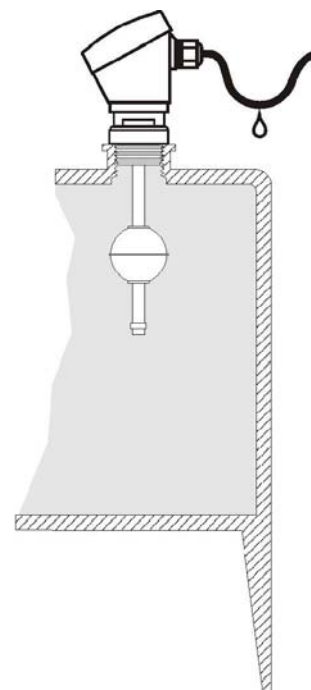
The state of the led matches with the state of the relay contact (led ON = relay ON).

**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 tightened, you can turn the housing 350° 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.



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2 Contacts

Max/Min
level control

State of the
relay contacts









Run



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.

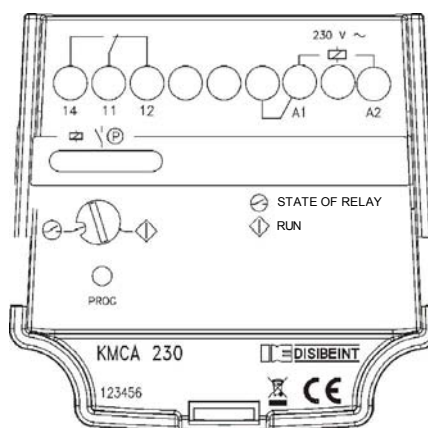
Be sure that the options selector is right positioned. Each time that it is moved to a new option, the  led flashes twice indicating that the option has been correctly reached.

(Relay NO (): led  OFF (emptying); Relay NC (): led  ON (filling). 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.

Normal operation mode.

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

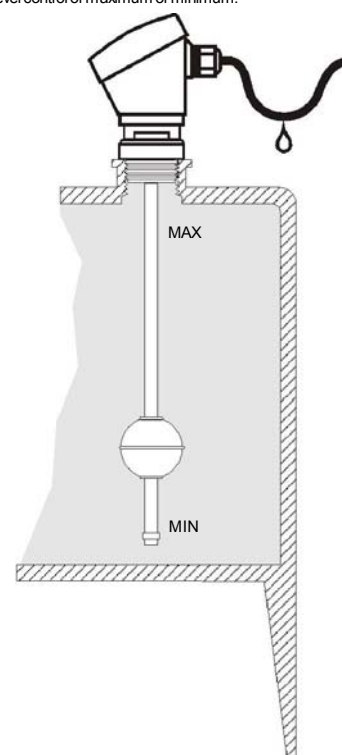


Assembly conditions

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 350° 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.



Model

**IMNR TB INOX 1C**

- 1 Contact
- Amplifier *KMPA*

**IMNR TB INOX 2C**

- 2 Contacts
- Amplifier *KMCA*

Operating diagrams



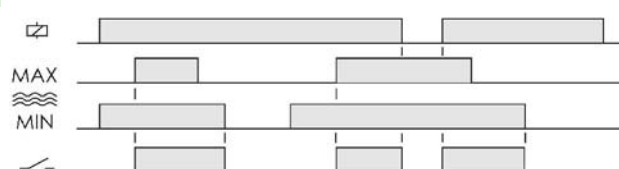
Simulation: Control of maximum level or filling
 Relay contacts: NC
 Timing type: Detecting and undetecting
 Time: Any value greater than 0



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



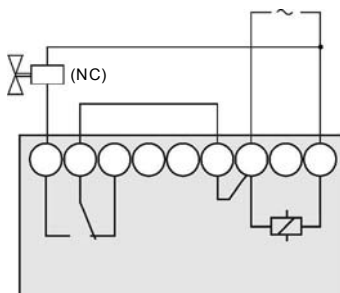
Simulation: Control for filling
 Relay contacts: NC



Simulation: Control for emptying
 Relay contacts: NO

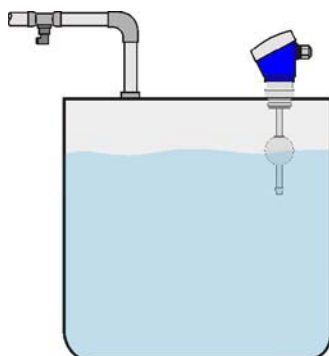
Example of wiring connection

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

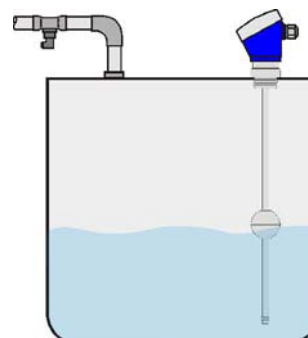


Filling control using a
 sensor with 2 contacts
 and the amplifier KMCA.

Installation examples



Detection of maximum level



Detection of maximum and minimum level

		KMCA	KMPA
Output relay	Resistive load	AC	6 A / 250 V
		DC	0,2 A / 200 V
	Inductive load	AC	6 A / 24 V
		DC	3 A / 250 V
		AC	3 A / 24 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

Dimensions		KMCA / KMPA
	Voltage phase-neutral	300 V
	Overvoltage category	III
	Shocking voltage	4 kV
	Pollution degree	2
	Protection class	IP 20
	Storing temperature	-50..+85°C
	Operating temperature	-20..+50°C
	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	

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

Table 1: Process connection

Thread	1"1/2 G	2" G
Material	SS AISI316 (1.4401)	
e/c (mm)	50	40
E (mm)	15	15
LR (mm)	20	20
LCP (mm)	11	4
<p>It is advisable that the float is narrower than the width of thread</p>		

Table 2: Float

Model	FEI601M13	FEI602M13	FCI602M13
Material	SS AISI316L (1.4404)		
Dimension (mm)	Ø 52x52	Ø 95x95	Ø 44x63
Pressure (kg/cm ²)	30	15	15
Density (g/cm ³)	e > 0,76	e > 0,36	e > 0,75
FS / FH (mm)	12,5 / 39,5	60,8 / 34,2	15,8 / 47,2

Table 3: Protection

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

Ordering code

IMNR TB INOX - ☐ V ☐ P ☐ F ☐ L ☐ C ☐

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	Standard	1
	Protegida	2
	Encapsulada	3
Process connect.	1" 1/2 G	08
	2" G	10
		-
Float	FEI601M13	25
	FEI602M13	29
	FCI602M13	14
Total length (LT)		(mm)
Nr. contacts		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 INOX 048 V1 P08 F14 L500 C2 - L1: 150 L2: 430