

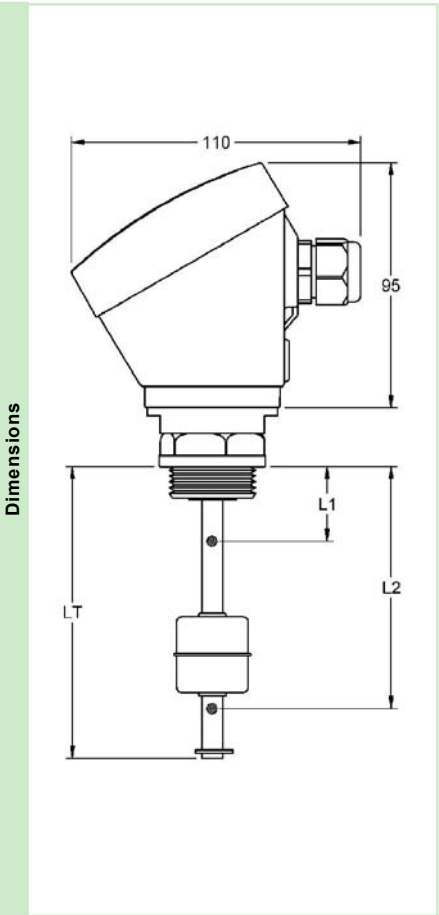
IMNR TBM INOX

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"><li>· With 1 contact: Detection of a only level point (amplifier KMPA). See page 2.</li><li>· With 2 contacts: Detection of max/min levels (amplifier KMCA). See page 3.</li></ul>

Sensor	Process connection	By top screw (See table 1).
	Guided tube	SS AISI316 (1.4401), Ø8 mm.
	Length	100..3500 mm.
	Float	FCI601M09 (FCI-1), Ø29x32 mm. SS AISI316 (1.4401) (See 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.



## IMNR TBM 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.

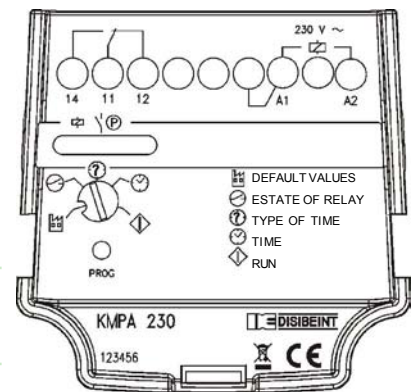
1s

#### Run



Normal operation mode.

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

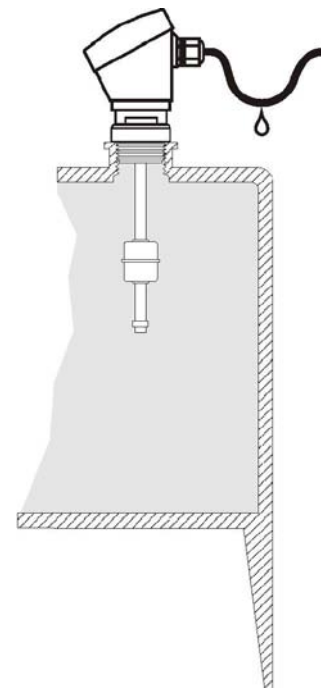


### Assembly conditions

**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.



## IMNR TBM INOX



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.

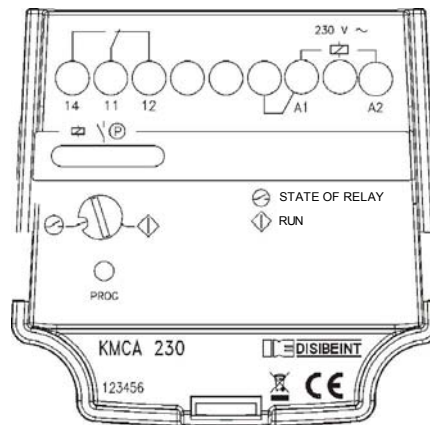
Be sure that the options selector is right positioned. Each time that it is moved to a new option, the  led flashes twice indicating that the option has been correctly reached.

(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).

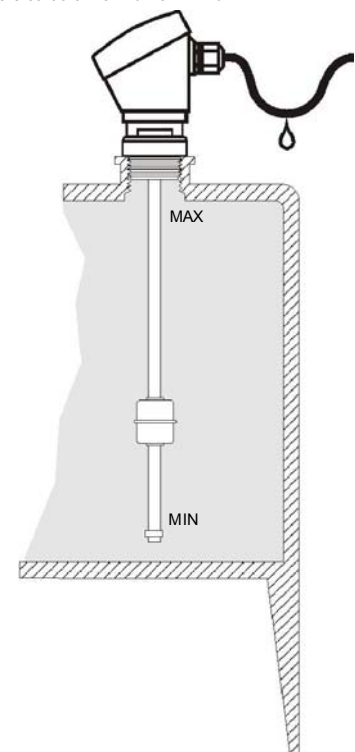


### Assembly conditions

**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 TBM INOX 1C

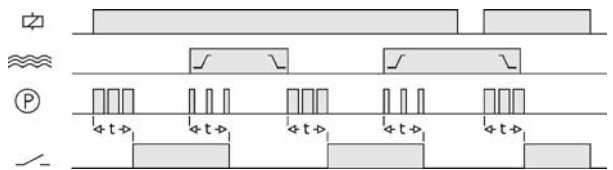
- 1 Contact
- Amplifier *KMPA*



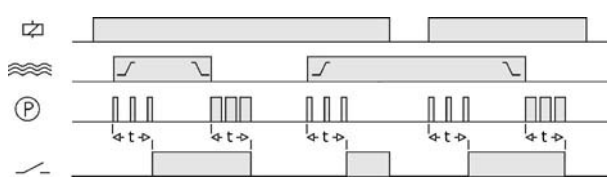
IMNR TBM INOX 2C

- 2 Contacts
- Amplifier *KMCA*

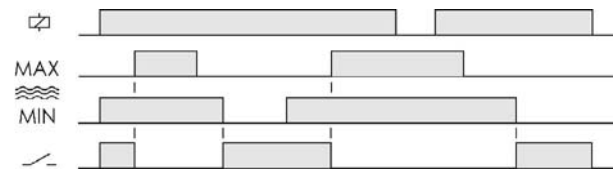
Operating diagrams



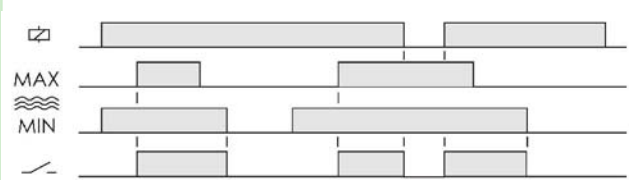
Simulation: Control of maximum level or filling  
Relay contacts: NC  
Timing type: Detecting and undetecting  
Time: Any value greater than 0



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



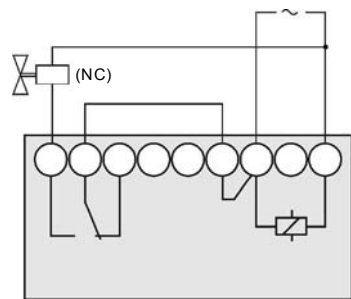
Simulation: Control for filling  
Relay contacts: NC



Simulation: Control for emptying  
Relay contacts: NO

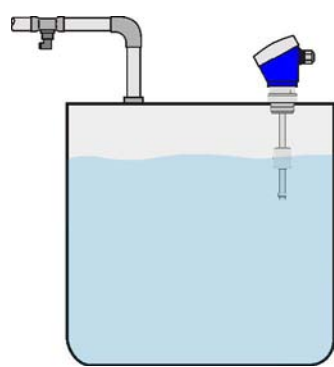
Example of wiring connection

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

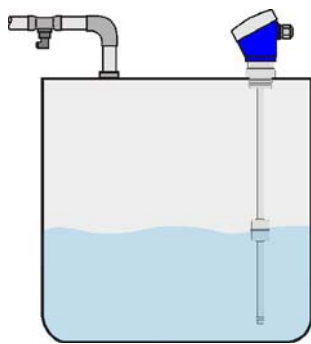


Filling control using a sensor with 2 contacts and the amplifier KMCA.

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 <sup>6</sup> 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

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

Table 1: Process connection

Thread	1" G	1 1/4" G
Material	SS AISI316 (1.4401)	
e/c (mm)	36	46
LR (mm)	19	21
LCP (mm)	15	16

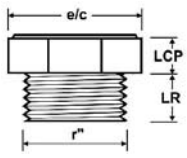


Table 2: Floats

Model	FCI601M09	
Material	SS AISI316L (1.4404)	
Dimension (mm)	Ø 29x32	
Pressure (kg/cm <sup>2</sup> )	15	
Density (g/cm <sup>3</sup> )	e > 0,71	
FS / FH (mm)	9,3 / 22,7	






Table 3: Protection

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

		KMCA / KMPA
Construction dimensions / material data	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	Cyclopol - 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

IMNRTBM 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
	Protected		2
	Insulated		3
Process connect.	1" G		06
	1 1/4" G		07
			-
Float	FCI601M09		13
			-
			-
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).

## Examples:

IMNRTBM INOX 048 V1 P07 F13 L500 C2 - L1: 150 L2: 430