

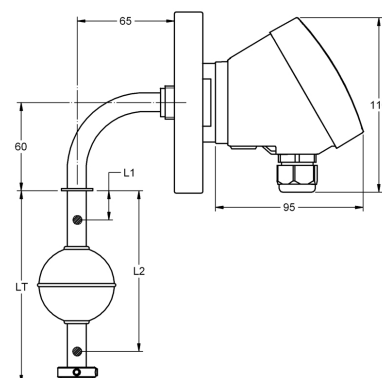
IMNR DBA INOX

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 flange (See table 1, page 5)
	Guided tube	Ø12 mm. SS AISI316 (1.4401)
	Length	100..1000 mm.
	Float	FEI601M13 (FEI-1), Ø52x52 mm. SS AISI316 (1.4401). Other options according to table 2, page 5
	Nº max. of contacts	1..2
	Dist. between contacts	> 40 mm.
	Temperature	-40..+125°C
	Mounting position	Bent in elbow 90°
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	<ul style="list-style-type: none"> • 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 DBA 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 s. Each time the push-button PROG is pressed, the time value increases in 1 s, except when the value is 9 that moves to 0. If it is pressed longer than 3 s, the time value moves to 0.

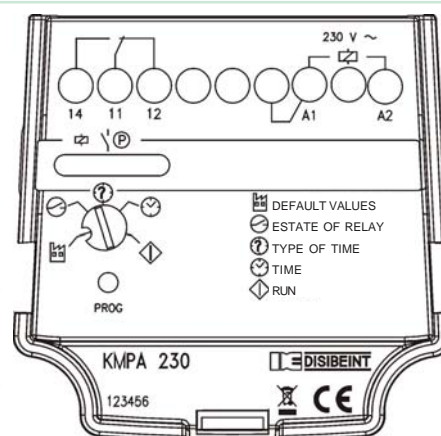
1s

Run



Normal operation mode.

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

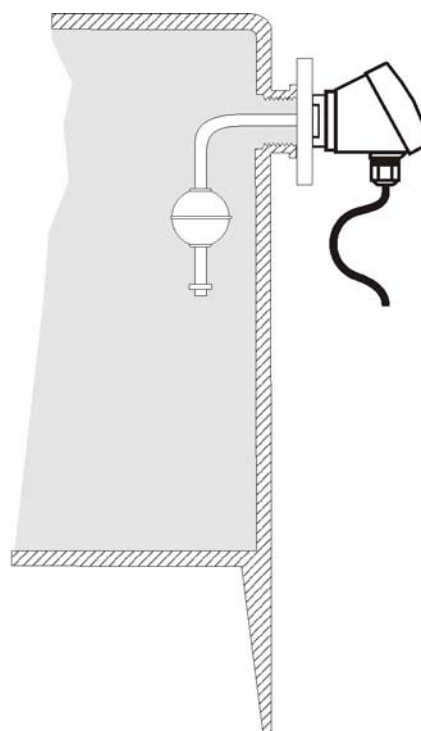


Assembly conditions

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 DBA 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.

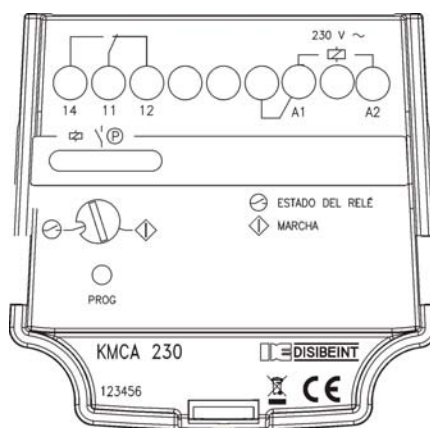
Be sure that the options selector is right positioned. Each time that it is moved to a new option, the  led flashes twice indicating that the option has been correctly reached.

(Relay NO (): led  OFF; 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.

Normal operation mode.

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

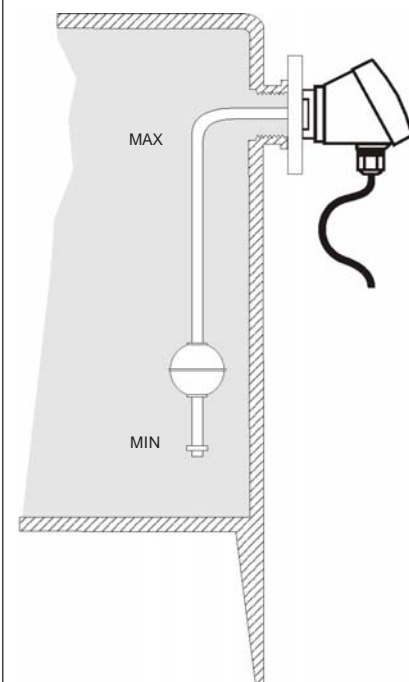


Assembly conditions

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.



Model



IMNR DBA INOX 1C

IMNRI DBA INOX 1C

- 1 Contact
- Amplifier *KMPA*

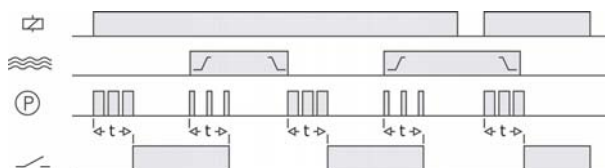


IMNR DBA INOX 2C

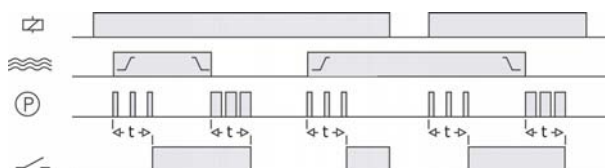
IMNRI DBA INOX 2C

- 2 Contacts
- Amplifier *KMCA*

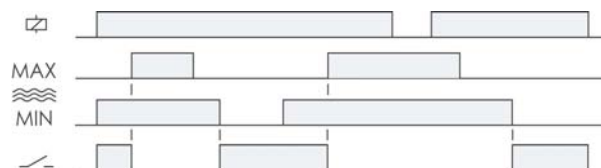
Operating diagrams



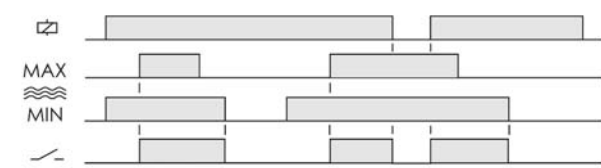
Simulation: Control of maximum level or filling
Relay contacts: NC
Timing type: Detecting and undetecting
Time: Any value greater than 0



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



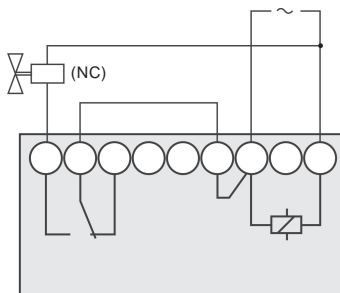
Simulation: Control for filling
Relay contacts: NC



Simulation: Control for emptying
Relay contacts: NO

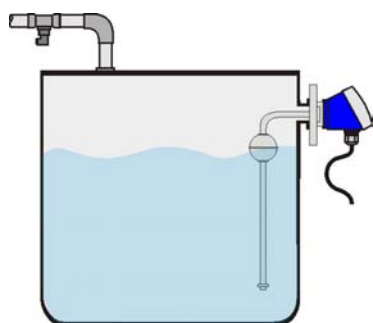
Example of wiring connection

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

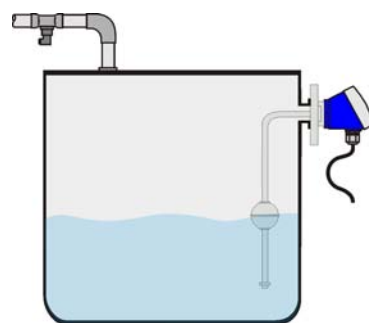


Filling control using a sensor with 2 contacts and the amplifier KMCA.

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

Constructive and environmental 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..+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

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

Table 1: Process connection

Flange	DN25	DN32	DN40	DN50	DN100
Material	SS AISI316 (1.4401)				
n x t (mm)	4x14		4x18		8x18
Ø d (mm)	85	100	110	125	180
D (mm)	115	140	150	165	220
Thickness (LCP)(mm)		18			20

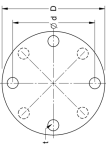


Table 2: Floats

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




Table 3: Protection

Insulated	Filled with epoxy resin
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Ordering code

IMNR DBA INOX - ☐ V ☐ P ☐ F ☐ L ☐ C ☐

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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 DBA INOX 048 V3 P36 F14 L500 C2 - L1: 150 L2: 430