

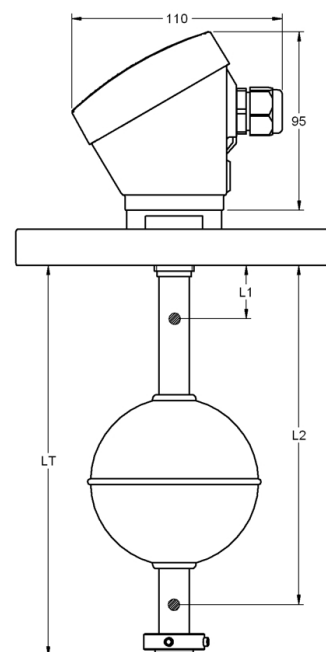
IMNR DBL INOX

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).
	Guided tube	SS AISI316 (1.4401), Ø12 mm.
	Length	90..3500 mm.
	Float	FEI602M13 (FEI-2), Ø95x95 mm. SS AISI316 (1.4401). Other types optionals 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	<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 DBL 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 ⑩ 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 ⑩ turns on. Keep the push-button pressed until the led ⑩ 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 ⑩ OFF; Relay NC (): led ⑩ ON). When accessing to this option, the led ⑩ 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 ⑩ OFF; Undetecting (): led ⑩ OFF; Detecting and undetecting (): led ⑩ flashing). When accessing to this option, the led ⑩ 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



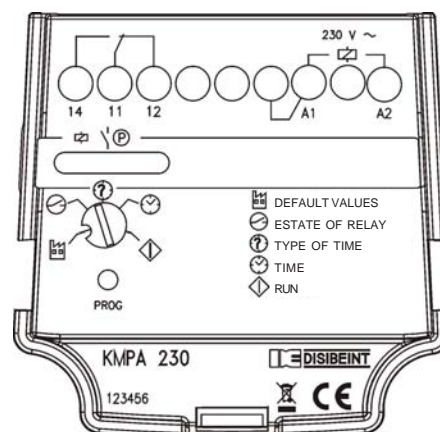
When accessing to this option, the led ⑩ emits as many flashes as the number of seconds adjusted in the timer, between 0 and 9 s. Each time the push-button PROG is pressed, the time value increases in 1 s, except when the value is 9 that moves to 0. If it is pressed longer than 3 s, the time value moves to 0.

Run



Normal operation mode.

The state of the led ⑩ matches with the state of the relay contact (led ON = relay ON).

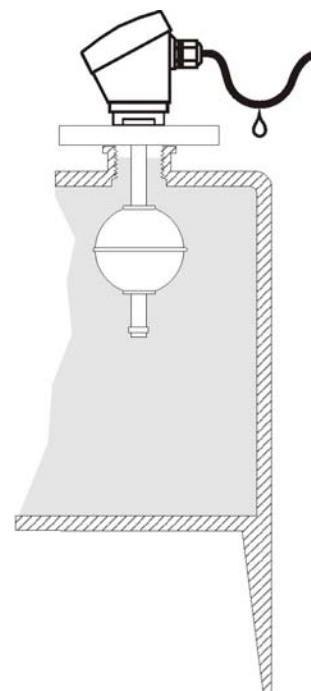


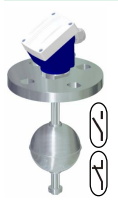
Assembly conditions

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.





2 Electrodes
(Amplifier KMCA)

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 \textcircled{P} led flashes twice indicating that the option has been correctly reached.

State of the
relay contacts



(Relay NO (): led \textcircled{P} OFF; Relay NC (): led \textcircled{P} ON). When accessing to this option, the led \textcircled{P} shows the actual state of the adjustment. Each time the push-button PROG is pressed, it is reversed the state of the relay contacts.

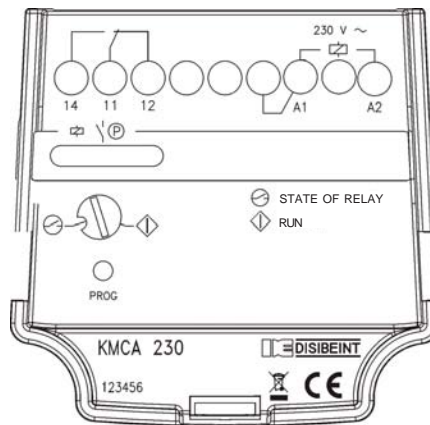
WARNING: This option modifies the state of the relay and this could provoke undesired effects in the case that any device be connected to the contacts of the relay.

Run



Normal operation mode.

The state of the led \textcircled{P} matches with the state of the relay contact (led ON = relay ON).

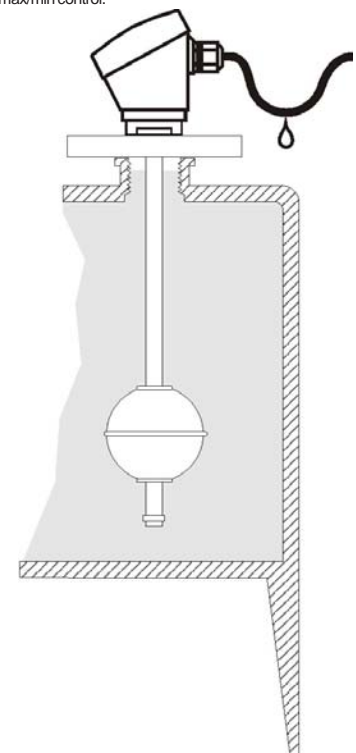


Assembly conditions

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).

Top assembly:
max/min control.



Model



IMNR DBL INOX 1C

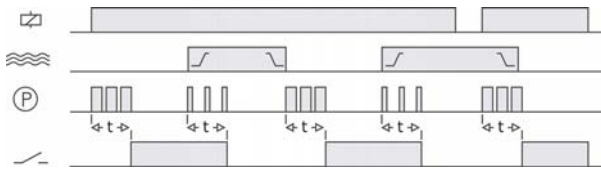
- 1 Contact
- Amplifier *KMPA*



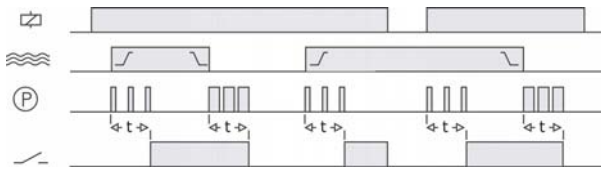
IMNR DBL INOX 2C

- 2 Contacts
- Amplifier *KMCA*

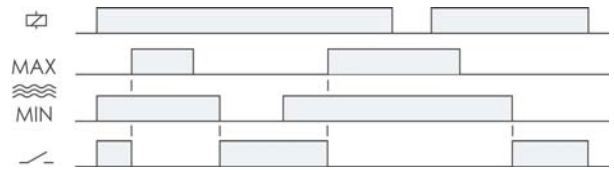
Operating diagrams



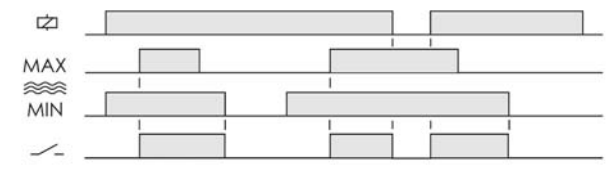
Simulation: Control of maximum level or filling
 Relay contacts: NC
 Timing type: Detecting and undetecting
 Time: Any value greater than 0



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



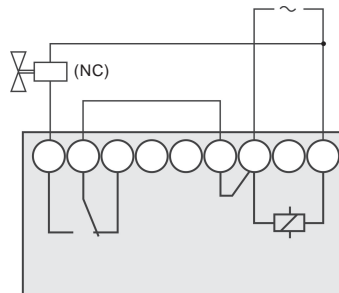
Simulation: Control for filling
 Relay contacts: NC



Simulation: Control for emptying
 Relay contacts: NO

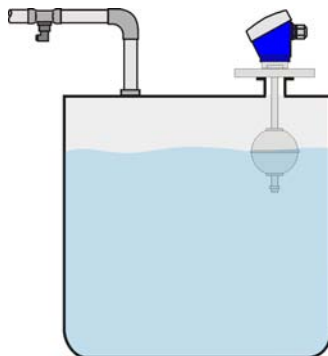
Example of wiring connection

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

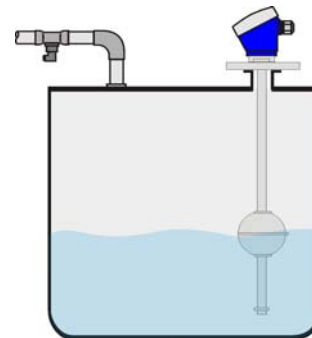


Filling control using a
 sensor with 2 contacts and
 the amplifier KMCA.

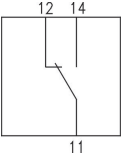
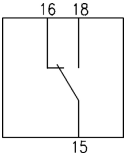
Installation examples



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

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

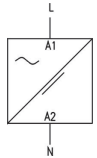
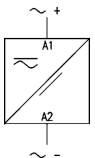
		KMCA / KMPA	
			
Supply voltage	Galvanic insulated	Yes	Yes
	Frequency	50 / 60 Hz	-
	Operating margins	±10...-15%	-
	Positive	-	Terminal A1
	Insulated polarity	-	Yes

Table 1: Process connection

Flange	DN50	DN100
Material	SS AISI316L (1.4404)	
n x t (mm)	4x18	8x18
Ø d (mm)	125	180
D (mm)	165	220
Thickness (LCP) (mm)	18	20

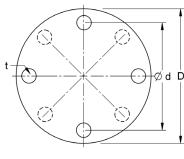


Table 2: Floats

Model	FEI602M13	FEI602M20
Material	SS AISI316L (1.4404)	
Dimension (mm)	Ø 95x95	
Pressure (kg/cm ²)	30	
Density (g/cm ³)	e > 0,36	e > 0,45
FS / FH (mm)	60,8 / 34,2	52,3 / 42,7








Table 3: Protection

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

REFERENCE	VERSION	PROCESS	FLOAT	TOTAL LENGTH	Nº CONTACTS	Nº FLOATS
IMNR DBL INOX	<input type="checkbox"/> V1 Standard	<input type="checkbox"/> P37 DN 50	<input type="checkbox"/> F29 FEI602M13	L 90...3500 mm	<input type="checkbox"/> C1 1 contact	<input type="checkbox"/> N1 1 float
	<input type="checkbox"/> V2 Protected	<input type="checkbox"/> P39 DN 100	<input type="checkbox"/> F31 FEI602M20		<input type="checkbox"/> C2 2 contacts	<input type="checkbox"/> N2 2 floats
	<input type="checkbox"/> V3 Insulated				<input type="checkbox"/> C3 3 contacts	<input type="checkbox"/> N3 3 floats
					<input type="checkbox"/> C4 4 contacts	
					<input type="checkbox"/> C5 5 contacts	

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

Example: IMNR DBL INOX V1 P37 F29 L500 C1 N1 - L1: 150 L2: 430