COLLAUDO
INSPECTION TEST

201010/304
M-COL 02
09/06

Cliente / Customer	**SPIRAX-SARCO SRL-VIA PER CINISELLO 18-200564 NOVA MILANESE**
Ordine / Order	**543107 DEL 28/09/2010**
Commessa / Job	**772322**
Destinazione / Destination	**DESMET**

LIVELLOSTATO MAGNETICO SERIE	
TOR A	

☒ QUANTITA' **1** ☐ QUANTITY

☒ Controllo visivo e dimensionale	☐ Visual and dimensional check
☒ Controllo generale di funzionamento	☐ Performance check
☒ Controllo generale qualità materiali	☐ Materials quality control check
☐ Prova di pressione idraulica a temperatura ambiente	☐ Hydraulic pressure test at ambient temperature
➢ pressione di progetto bar	➢ project pressure bar
➢ pressione di esercizio bar	➢ operating pressure bar
➢ pressione di prova bar	➢ test pressure bar
➢ manometro matricola N.	➢ manometer S/N N.
☒ Verifica della tensione applicata tra elettrodo e massa	☐ Dielectric test between electrode and ground
➢ per 1 minuto Vca **1500**	➢ 1 minute Vac **1500**
➢ apparecchio matricola N. **496061259**	➢ instrument S/N N. **496061259**
☒ Verifica della resistenza di isolamento	☐ Insulation resistance check
➢ Megger Vcc **500**	➢ Megger Vdc **500**
➢ lettura > **50 MΩ**	➢ reading > **50 MΩ**
➢ apparecchio matricola N. **1514510110694**	➢ instrument S/N N. **1514510110694**

FASCICOLO TECNICO DI RIFERIMENTO / *APPLICABLE TECHNICAL BOOK*		
ATEX	**PED**	**N.A.**
☐ MEC	☐ MEC	☐
☐ SPIN	☐ SPIN	☐
☐ TOR	☐ VISCO/VISCOROL	☐

Principali norme di riferimento/ Main applicable rules:
Direttiva 97/23 (PED), Direttiva 94/9 (ATEX), Norme CEI EN 50014, 50018, ASME.

Matricola / *Serial number*
104917

Allegati / *Attached*

Tag Cliente / *Customer's tags*
LSHL63.6

QUESTO ATTESTATO E' VALIDO PER
THIS CERTIFICATE IS VALID FOR
DESMET BALLESTRA SPA
101654

Data / *Date* **12/10/2010**

Firma / *Signature*
COLIMA S.r.l.

INSTRUCTION MANUAL

LEVEL SWITCH

TOR

REED SWITCH

Type A B PC PP PF

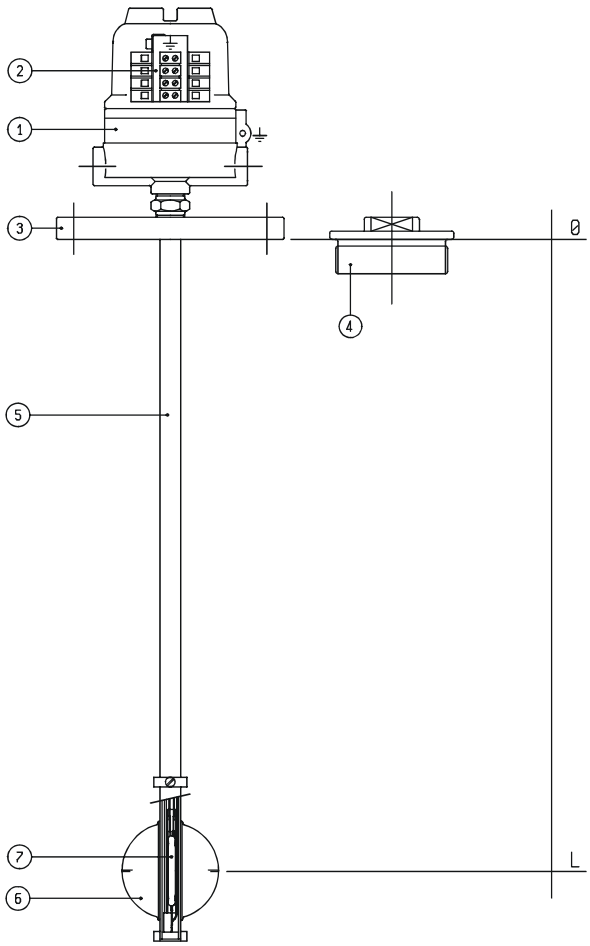
COLIMA S.r.l. Via Mestre, 11 Cernusco sul Naviglio MILANO - ITALIA

Magnetic level switch.
Top mount directly in the tank.
Up to 6 action thresholds.

DESCRIPTION

Level switch formed by:

- Housing (1) with terminal board (2).
- Available Waterproof and E Ex-d version, aluminuim coated with Rilsan or AISI 316
- Flange (3) or thread (4) connection.
- Tube (5), closed at its lower end and pressure safe.
- One or more floats (6).
  Available INOX, BUNA N, PVC, PP, PVDF
- One or more magnetic Reed–switch contacts, fitted inside tube (7).
  Level switch is supplied with preset switching points as requested by customers.
  However field adjustment is always possible.



OPERATION

Level switch is top mount directly in the tank.
Depending on needed thresholds there are one or more floats.
Float slides along tube following liquid level increase or decrease.
Reached preset switching point float magnetically switches Reed-Switch contact.
It is therefore possible to actuate an electrical signal that enables the starting/stopping of pumps, opening/closing of solenoid valves, or activation of alarm systems, as required by modern automation technology.
The size of the fixing systems and floats, and the materials selected depend on the working conditions such as pressure, temperature and type of liquid contained in the tank.

WORKING PARAMETERS

Pressure	**< 100 bar**	INOX
	< 16 bar	BUNA N – PVC – PP - PVDF
Temperature	**– 110 + 200 °C**	INOX
	– 20 + 180 °C	BUNA N
	– 20 + 70 °C	PVC
	– 20 + 105 °C	PP
	– 20 + 130 °C	PVDF
Specific gravity	**> 0,6 Kg/l**	

HOUSINGS

IP67 EN 60529 watertight housings are provided for normal working conditions.

Housings complying with ATEX Directive 94/9/EC are provided for areas subject to explosion hazard. Certificate TÜV 03 ATEX 2015.

CONNECTIONS

TOR level switch is top mount directly in the tank.

Flange connection.
Lowest applicable nominal diameter 50 (2") with nominal pressure related design needs.
Thread connection.
From 1 ½" Gas or NPT.

INSTALLATION

Level switch is delivered packed and locked.
Before proceed at installation pay attention to disassembly any packing.
Fit in level switch in the tank paying attention to avoid any damage at floats or tube.
Even small deformation can interfere with right device operation.
Also verify that none reason can stop floats run along tube.
If level switch is fitted in a stilling well tube not supplied with, to keep it coaxial must be equipped by centering devices.

Flange mount:
Right set supplied gasket between flanges.
Fix flanges with bolts. Firmly close tightening bolts.

Thread mount:
Set gasket if cylindrical thread.
Tape with PTFE if conical thread.
Firmly close tightening with spanner.

CONTACTS CHARACTERISTICS

Reed- Switch SPDT or SPST contact.

Also available DPDT (two SPDT simultaneous)

Switching capacity	60 VA	30 W
Switching current (I peak)	1 A	
Switching voltage	230 V ~ / 110 V =	

ELECTRIC CONNECTION

Attention!
Always connect protective grounding on terminal boards inside and outside housing.
Supplied contact cables are connected at housing terminal board.
Open housing and connect electric circuit cables at terminal board.

DISASSEMBLY

It is absolutely forbidden disassembly level switch before have been empty any remaining pressure inside tank.
Disconnect electric circuit.
For E Ex-d housings wait at least five minutes before open.
Unscrew housing cover.
Disconnect electric circuit cables from terminal board. Close housing.
Unscrew thread or flange bolts.
Extract level switch from the tank paying attention to avoid any damage at floats or tube.

MAINTENANCE

Instrument doesn't require precautionary maintenance.
However it's recommended to provided time to time a check of liquid fluidity to avoid any suspensions or deposits that can influence wetted parts.
Also check free movability of floats and serviceability of reed switches.
Take necessary precautions if liquid is corrosive.

SPARE PARTS

Components subject to wear or accidentally damage:

- Float (6).
- Reed-switch contact (7).

To order spare parts please to communicate serial number wrote on instrument tag.

DATE	ISSUE	APPROVED
05/07/2006	01	A. Staffini

7A.400-E
Issue 1 - 2009

by spirax sarco

TOR Series - Magnetic level switches

Description

Magnetic-activated level switches for controlling liquid levels in most industrial applications.
Instruments with rigid rod for vertical installation.
Used for full automation of control management, including pressurised tanks, tubs, boilers and for the control of pumps, valves and alarm systems.

Regulations and certifications

Instruments compliant with the European Directive ATEX 94/9/EC.
RINA, Lloyd Register and M.M.I. approved.

Available types

TOR A

Type recommended for most industrial applications. All wetted parts are made totally of stainless steel. Equipped with reed switches, which allow control of up to six switching points with a single instrument. Equipped with a potentiometer transmitter allowing continuous reading of liquid level.

A

TOR B

Type recommended for liquids with low specific weight such as hydrocarbons and mineral oils.
Floats in BUNA N, the other wetted parts are made totally of stainless steel.
Equipped with reed switch contacts, which allow the control of up to six switching points with a single instrument.
Equipped with a potentiometer transmitter allowing the continuous reading of the liquid level.

B

Type TOR A entirely made of stainless steel, with weather-proof housing and thread connection.

TOR PC

Type indicated for corrosive liquids, such as acids and brines, where the use of stainless steel is not recommended.
All wetted parts are made totally of PVC-Polyvinylchloride.
Equipped with reed switch contacts, PC allows the control of up to six switching points with a single instrument.
Equipped with a potentiometer transmitter allowing the continuous reading of the liquid level.

PC

TOR PP

Type indicated for corrosive liquids, such as acids and brines, where the use of stainless steel is not recommended. All wetted parts are made totally of PP-Polypropylene. Equipped with reed switches, wich allow control of up to six switching points with a single instrument. Equipped with a potentiometer transmitter allowing continuous reading of liquid level.

PP

TOR PF

Type indicated for corrosive liquids, such as acids and brines, where the use of stainless steel is not recommended. All wetted parts are made totally of PVDF-Polyvinylidene fluoride. Equipped with reed switch contacts, wich allow control of up to six switching points with a single instrument. Equipped with a potentiometer transmitter allowing continuous reading of liquid level.

PF

TOR CD

Compact type, recommended for applications in hydraulic control units. It can also be used with liquids with low specific weight such as hydrocarbons and mineral oils. Stainless steel or BUNA N floats, the other wetted parts are made of stainless steel. Can be equipped with reed switch contacts, allowing control of up to two switching points with a single instrument. In place of the housing, a three-pin DIN connector with flying plug is used.

CD

Mounting

The TOR series level switches are installed vertically on the top of the tank or externally in a chamber connected to the tank.

Manufacturing characteristics

Materials and sizing are defined in relation to the characteristics of the liquid and the project conditions.

Housings

Protection degree IP67 and IP68 on request.
For general applications in weather-proof execution.
For hazardous areas in explosion-proof execution ATEX Ⓔx II 1/2 G EEx d IIC T6, T5 resp. T4 certified.
Only for TOR CD DIN IP64 connector.
To select the housings, consult technical specifications 7A.401-E.

Electrical equipment

SPST SPDT
DPDT (two simultaneous SPDT contacts)
To select the electrical equipment, consult technical specifications 7A.401-E.

Potentiometer transmitter

Reed switch chain transmitter with divisions reading every 5, 10, 20 mm. Converter for output signal 4÷20 mA,
Available for safe areas or ATEX EEx-i certified approved for plants.
Also available with Hart® protocol.
Can only be used with types A - B - PC - PP - PF.
To select potentiometer transmitter, consult technical specifications 7A.401-E.

Operating principle

One or more magnetic contacts (reed switches) or a reed switch "chain" potentiometer transmitter are placed inside a sealed vertical tube, joined to the locking system.

Contacts

One or more floats, free to slide along the guide tube depending on the liquid level inside the tank, acting magnetically on contacts placed at the operation point, switching their status from NO to NC or vice versa.
Switching points are always field adjustable.

Transmitter

A float, free to slide along the guide tube depending on the liquid level inside the tank, acts magnetically on the transmitter. The level is continuously transmitted.

Length of rod

Minimum length	100 mm
Maximum length	5000 mm

Wetted parts

	Flanged or threaded						Float							
Steel	A105	1	304LSS	2	316LSS	3	316LSS	A	Titanium	B	Monel	C	Hastelloy	D
Plastic	PVC	4	PP	5	PVDF	6	PVC	E	PP	F	PVDF	G	Buna N	H

Float diameters to be used with flanged type

Steel	Ø 44	44	flange ≥ DN 50 - 2" ANSI	Ø 55	55	flange ≥ DN 65 - 2½" ANSI
				Ø 72	72	flange ≥ DN 80 - 3" ANSI
Buna N	Ø 44	44	flange ≥ DN 50 - 2" ANSI	Ø 58	58	flange ≥ DN 65 - 2½" ANSI
Plastic	Ø 70	70	flange ≥ DN 80 - 3" ANSI			

Float diameters to be used with threaded type

Steel	Ø 44	44	thread ≥ G 1½" M (NPT notn applicable)	Ø 55	55	thread ≥ G 2" M (NPT non applicable)
				Ø 72	72	thread ≥ G 3" M
Buna N	Ø 30	30	thread ≥ G 1" M	Ø 58	58	thread ≥ G 2½" M
	Ø 44	44	thread ≥ G 1½" M			
Plastic	Ø 70	70	thread ≥ G 2½" M			

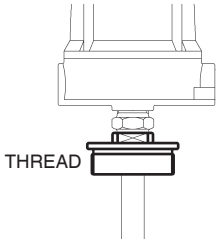
Note: the size of the float is subject to fluid specific gravity; the sizes shown are for standard floats. Other sizes can be made on request.

Process connections

UNI and ANSI flanges FL

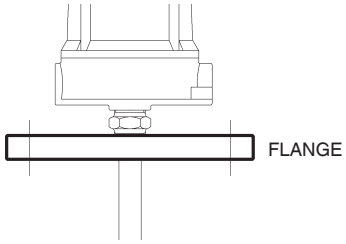
UNI	PN 6	PN 10 / 16		PN 40	PN 64
DN 50	UA	UB		UC	UD
DN 65	UE	UF		UG	UH
DN 80	UI	UL	UM	UN	UO
DN 100	UP	UQ		UR	US
DN 125	UT	UU		UV	UZ

ANSI	150	300	600
2"	AA	AB	AC
2½"	AD	AE	AF
3"	AG	AJ	AH
4"	AI	AL	AM
5"	AN	AO	AP



Threads FI

G	M
1½"	FA
2"	FB
2½"	FC
3"	FD
4"	FE

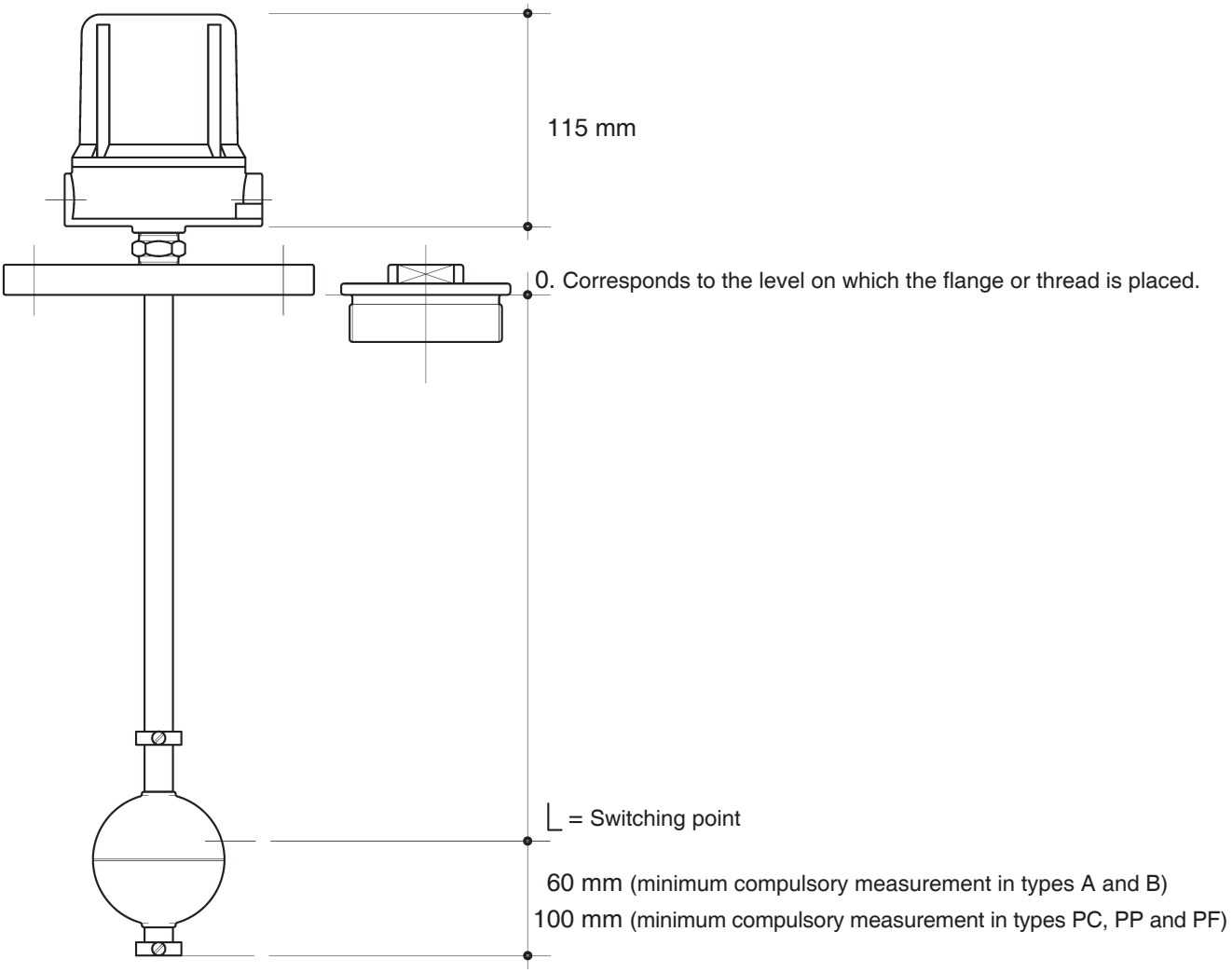


Flanges and threads available in other sizes on request.

Design conditions

TMA - Maximum allowable temperature	Steel		-110 +200°C
	Buna N		-20 +80°C
	Plastic	PVC	-20 +70°C
		PP	-20 +105°C
		PVDF	-20 +130°C
PMA - Maximum allowable pressure	Steel		< 100 bar g
	Buna N		< 16 bar g
	Plastic		< 16 bar g
Fluid specific gravity	Steel and plastic		> 0.8 kg/l
	Buna N / Titanium		> 0.5 kg/l
Differential			fixed 8 mm

Type TOR A with weather-proof housing, steel float and a reed switch contact



How to request and order

Each instrument is identified by an alphanumeric code that defines the manufacturing characteristics.

Example:

T	B	FL	1	UA	G	A	44	1A	A2	S

- S — Variations (on request, to specify separately)
- A2 — Electric equipment (see specification 7A.401-E)
- 1A — Housing (see specification 7A.401-E)
- 44 — Diameter of float
- A — Float material
- G — Float
- UA — Flange or thread rating
- 1 — Flange or thread material
- FL — Flange or thread
- B — Type
- T — TOR

How to order spare parts

The components subject to possible wear or damage are:

a. Float b. Electrical equipment

The serial number of the instrument, found on the ID nameplate, is necessary for the request.

COLLAUDO
INSPECTION TEST

201011/404
M-COL 02
09/06

Cliente / Customer	**SPIRAX-SARCO SRL-VIA PER CINISELLO 18-20054 NIOVA MILANESE**
Ordine / Order	**543107 DEL 28/09/2010**
Commesse / Jobs	**772321**
Destinazione / Destination	**DESMET**

LIVELLOSTATO MAGNETICO	
MEC D	

☒ QUANTITA' **2** ☐ *QUANTITY*

☒ Controllo visivo e dimensionale	☐ *Visual and dimensional check*
☒ Controllo generale di funzionamento	☐ *Performance check*
☒ Controllo generale qualità materiali	☐ *Materials quality control check*
☐ Prova di pressione idraulica a temperatura ambiente	☐ *Hydraulic pressure test at ambient temperature*
➢ pressione di progetto bar	➢ *project pressure bar*
➢ pressione di esercizio bar	➢ *operating pressure bar*
➢ pressione di prova bar	➢ *test pressure bar*
➢ manometro matricola N.	➢ *manometer S/N N.*
☒ Verifica della tensione applicata tra elettrodo e massa	☐ *Dielectric test between electrode and ground*
➢ per 1 minuto Vca **1500**	➢ *1 minute Vac **1500***
➢ apparecchio matricola N. **496061259**	➢ *instrument S/N N.* ***496061259***
☒ Verifica della resistenza di isolamento	☐ *Insulation resistance check*
➢ Megger Vcc **500**	➢ *Megger Vdc **500***
➢ lettura > **50 MΩ**	➢ *reading > **50 MΩ***
➢ apparecchio matricola N. **1514510110694**	➢ instrument S/N N. **1514510110694**

FASCICOLO TECNICO DI RIFERIMENTO / *APPLICABLE TECHNICAL BOOK*

ATEX	PED	N.A.
☐ MEC	☐ MEC	☐
☐ SPIN	☐ SPIN	☐
☐ TOR	☐ VISCO/VISCOROL	☐

Matricola / *Serial number*
104704÷705

Allegati / *Attached*

Principali norme di riferimento/ Main applicable rules:
Direttiva 97/23 (PED), Direttiva 94/9 (ATEX), Norme CEI EN 50014, 50018, ASME.

Tag Cliente / *Customer's tags*
LSH62.8,LSL62.8

QUESTO ... DESMET BALLESTRA SPA
ORDINE 101654
Spirax Sarco s.r.l. - MILANO - ITALY

Data / *Date* 12/11/2010

Firma / Signature

COLIMA S.r.l.

COLLAUDO
INSPECTION TEST

201011/403
M-COL 02
09/06

Cliente / Customer	**SPIRAX-SARCO SRL-VIA PER CINISELLO 18-20054 NOVA MILANESE**
Ordine / Order	**543107 DEL 28/09/2010**
Commesse / Jobs	**772320**
Destinazione / Destination	**DESMET**

LIVELLOSTATO MAGNETICO	
MEC A	

☒ QUANTITA' **2** ☐ *QUANTITY*

☒ Controllo visivo e dimensionale	☐ *Visual and dimensional check*
☒ Controllo generale di funzionamento	☐ *Performance check*
☒ Controllo generale qualità materiali	☐ *Materials quality control check*
☐ Prova di pressione idraulica a temperatura ambiente	☐ *Hydraulic pressure test at ambient temperature*
➢ pressione di progetto bar	➢ *project pressure bar*
➢ pressione di esercizio bar	➢ *operating pressure bar*
➢ pressione di prova bar	➢ *test pressure bar*
➢ manometro matricola N.	➢ *manometer S/N N.*
☒ Verifica della tensione applicata tra elettrodo e massa	☐ *Dielectric test between electrode and ground*
➢ per 1 minuto Vca **1500**	➢ *1 minute Vac **1500***
➢ apparecchio matricola N. **496061259**	➢ *instrument S/N N.* ***496061259***
☒ Verifica della resistenza di isolamento	☐ *Insulation resistance check*
➢ Megger Vcc **500**	➢ *Megger Vdc **500***
➢ lettura > **50 MΩ**	➢ *reading > **50 MΩ***
➢ apparecchio matricola N. **1514510110694**	➢ instrument S/N N. **1514510110694**

FASCICOLO TECNICO DI RIFERIMENTO / *APPLICABLE TECHNICAL BOOK*

ATEX	PED	N.A.
☐ MEC	☐ MEC	☐
☐ SPIN	☐ SPIN	☐
☐ TOR	☐ VISCO/VISCOROL	☐

Matricola / *Serial number*
104702÷703

Allegati / *Attached*

Principali norme di riferimento/ Main applicable rules:
Direttiva 97/23 (PED), Direttiva 94/9 (ATEX), Norme CEI EN 50014, 50018, ASME.

Tag Cliente / *Customer's tags*
LSH63.1, LSL63.1

QUESTO [illegible]
DESMET BALLESTRA SPA
10165[illegible]

Data / *Date* 12/11/2010

Firma / Signature

COLIMA S.r.l.

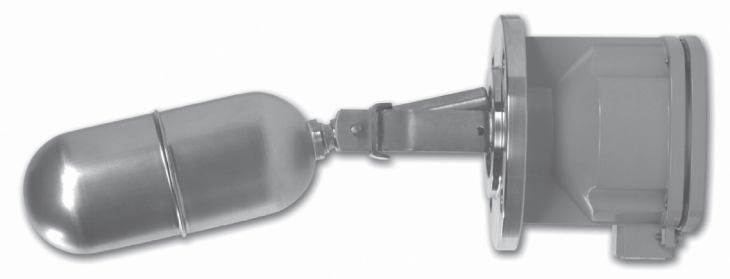
7A.300-E
Issue 1 - 2009

by spirax sarco

MEC Series - Magnetic level switches

Description

Magnetic-activated level switches for controlling liquid levels in most industrial applications. When installed at the foreseen operation point, they work as ON/OFF switches and are used for full automatic management of tanks (including pressurised ones) allowing operations such as starting/stopping of pumps, opening/closing of solenoid valves and activation of alarm systems.
One or more instruments can be used, depending on the number of operation points necessary.

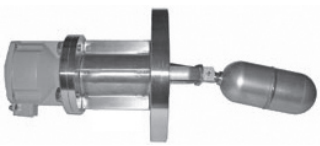
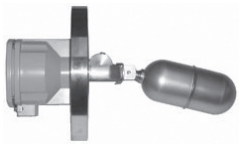


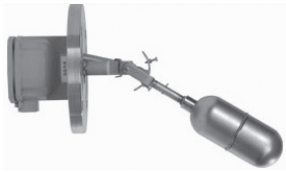
MEC A type
with round flange and
weather-proof housing

Standards and certifications

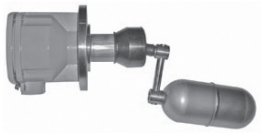
This product fully complies with the requirements of the European Directive ATEX 94/9/EC, PED 97/23/EC.
RINA and M.M.I approved.

Available types

MEC A 	Standard type for general purpose, used in most industrial applications. Horizontal mounting. One operation point. In the picture, the 100% stainless steel versions suitable for low temperatures, for installation in high saline concentration environments and for use in the food industry.	A
MEC AT 	Type with cooling extension, to be used in applications with temperatures from 150°C to 350°C. It can also be assembled in types D, DV, L, S. Horizontal or vertical mounting. One operation point.	AT
MEC CP 	Type suitable for controlling liquid with specific gravity ≥ 0.5 kg/l. Horizontal mounting. Float with counterweight. One operation point.	CP

MEC D 	Type with differential range, adjustable ±40° in two directions. Can be used as a start/stop with a single instrument. Horizontal mounting. The differential increases depending on the length of the stem and there are 7 regulation points, every 15°.	D
MEC DV 	Type with differential range, adjustable in one direction, only 0-40°. Can be used as a start/stop with a single instrument. Vertical mounting. The differential increases depending on the length of the stem and there are 4 regulation points, every 15°.	DV
MEC AV 	Specific type for high vibration with reed switch contact. Frequencies 5÷100 Hz. Horizontal mounting. One operation point.	AV

MEC M



Type equipped with protection bellow to avoid any deposits or inclusions present in the process liquid, eliminating risk of blockage.
It can also be mounted on types D, DV, L and S.
Horizontal mounting.
One operation point.
Stem length depending upon application.

M

MEC O

Type indicated for sunken or difficult to access tanks (high or low level). Vertical mounting on pole in open tanks or in tanks with manhole.
Attention must be paid to the connection rating: float is 120 mm.
One operation point, with field adjustable start/stop function.
Stem length depending upon application.

O

MEC PN

Pneumatic type, suitable in applications where is not allowed electricity.
Stainless steel body with three ways valve.
Horizontal or vertical mounting.
One operation point.

PN

MEC L

Type recommended in applications containing foam, inclusions and viscous fluids, where conditions require that the fulcrum point is not in touch with the process liquid.
Vertical mounting.
One operation point.
Stem length depending upon application.

L

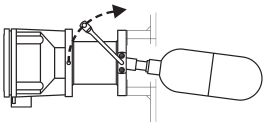
MEC S

Type recommended in applications containing foam, inclusions and viscous fluids, where conditions require that the fulcrum point is not in touch with the process liquid.
Horizontal mounting.
One operation point.
Stem length depending upon application.

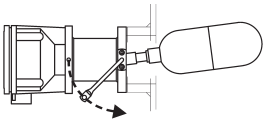
S

MEC T

Type equipped with a device for field verification (operation checking).
Mostly used in the naval industry.
Can also be made in types L and S.
Horizontal and vertical mounting.
One operation point.



Example of manual operation checking, to be carried out in the field



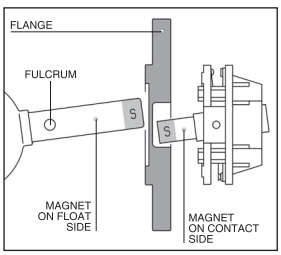
T

MEC MINI

Small dimension type.
Horizontal or vertical mounting.
One operation point.
IP 54 and IP67 protection degree.

MM

Operating principle



Two oscillating magnets on the same axis, one integral with the float and one integral with the electrical equipment, repel each other reciprocally through a non-magnetic material flange. The flange separates the housing, containing the electrical equipment, from the float that is inserted in the tank.
The float automatically follows the level of the liquid, both in rising and in falling conditions.
The switching of the electrical contact is quick and reliable.

Mounting
The MEC series level switches can be installed horizontally or vertically directly in the tank, or externally in a chamber outside the tank.
Square flange is specific for the naval industry.

Manufacturing characteristics
Materials and sizing are defined in relation to the characteristics of the process liquid and the project conditions.

Housing
Protection degree IP67. On request IP68. For general applications in weather-proof execution.
For hazardous areas in explosion-proof execution ATEX ⟨Ex⟩ II 1/2 G EEx d IIC T5 resp. T4 certified.
To select the housings, consult technical specification 7A.301-E.

Electrical equipment
SPDT
DPDT (two simultaneous SPDT contacts)
To select the electrical equipments, consult technical specification 7A.301-E.

Wetted parts

	Flange						Float							
Steel	304SS	1	316SS	2			304SS	A	316SS	B	Monel	C	Hastelloy	D
Plastic	PVC	3	PP	4	PVDF	5	PVC	E	PP	F	PVDF	G		

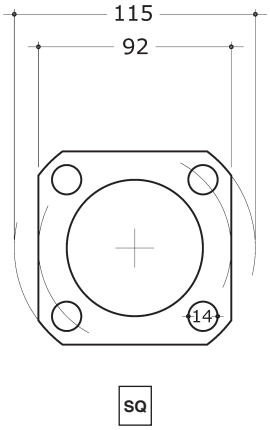
Float diameters

Steel	Ø 48	48	≥ DN 50 - 2" ANSI	Ø 63	63	≥ DN 65 - 2½" ANSI
Plastic	Ø 50	50	≥ DN 50 - 2" ANSI	Ø 60	60	≥ DN 65 - 2½" ANSI

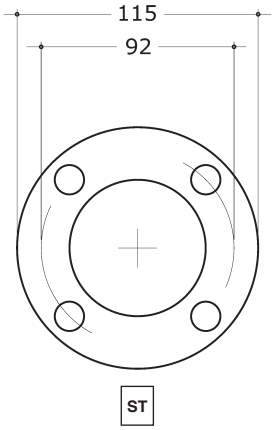
Note: the size of the float is always subject to fluid specific gravity.

Process connections

Naval industry flange



Colima's standard



UNI and ANSI flanges

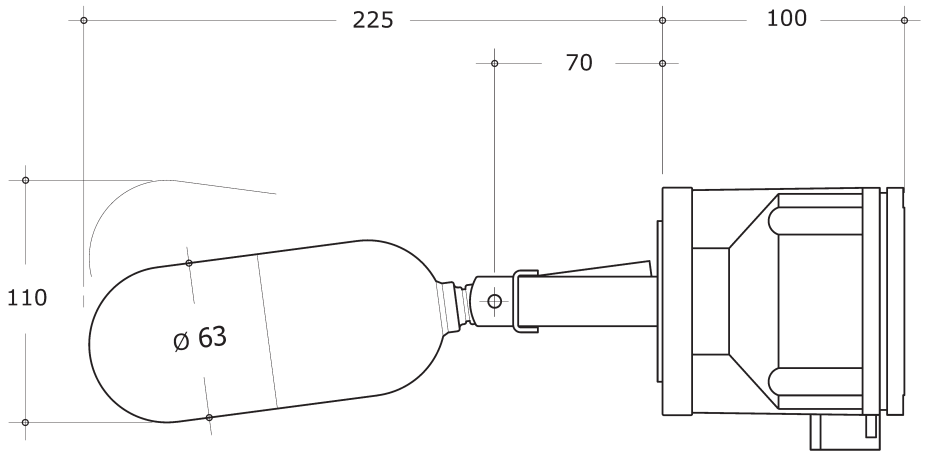
UNI	PN 6	PN 10 / 16		PN 40	PN 64
DN 50	UA	UB		UC	UD
DN 65	UE	UF		UG	UH
DN 80	UI	UL	UM	UN	UO
DN 100	UP	UQ		UR	US

ANSI	150	300	600
2"	AA	AB	AC
2½"	AD	AE	AF
3"	AG	AJ	AH
4"	AI	AL	AM

Flanges in other sizes, on request.

Design conditions

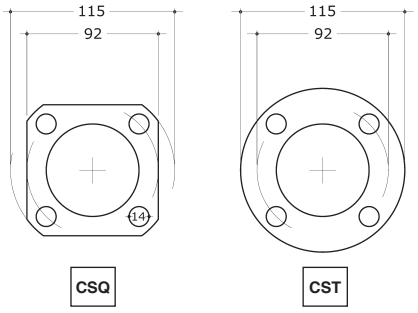
TMA - Maximum allowable temperature	Steel		-20 +150°C
		with cooling extension	-20 +350°C
	Plastic	PVC	-20 +70°C
		PP	-20 +105°C
		PVDF	-20 +130°C
PMA - Maximum allowable pressure	Steel	Colima's flange	< 16 bar g
		flange sized according to rating	< 100 bar g
	Plastic		6 bar g
Fluid specific gravity			≥ 0,8 kg/l
		only CP type	≥ 0.5 kg/l
Differential			fixed 15 mm
		only D and DV types	± 40°

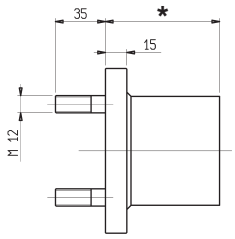


MEC A type with round flange and weather-proof housing

Mounting accessories

Counterflange (on request, also in other sizes)





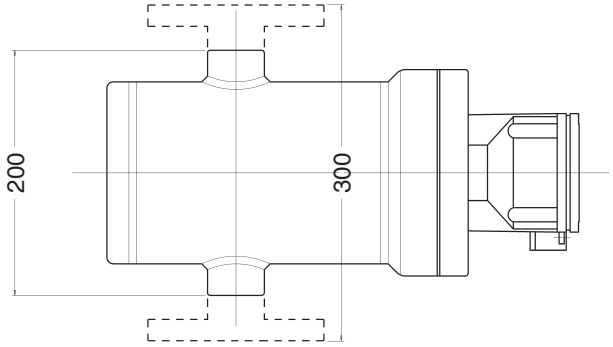
Depth of nippers

*

All types
80 mm

D and DV only
35 mm

Chamber for installation outside the tank



Minimum distance between connections

Flange
300 mm

Output
200 mm

How to request or order

Each instrument is identified by an alphanumeric code describing the manufacturing characteristics.

Example:

M	AT	F	1	UA	G	2	48	1A	A2	S

- Options (on request, to specify)
- Electrical equipment (see specification 7A.301-E)
- Housing (see specification 7A.301-E)
- Float diameter
- Float material
- Float
- Flange rating
- Flange material
- Flange
- Type
- MEC

How to order spare parts

The components subject to possible wear or damage are:

a. Float b. Electrical equipment

The serial number of the instrument, found on the ID nameplate, is necessary for the request.

INSTRUCTION MANUAL

LEVEL SWITCH

MEC D

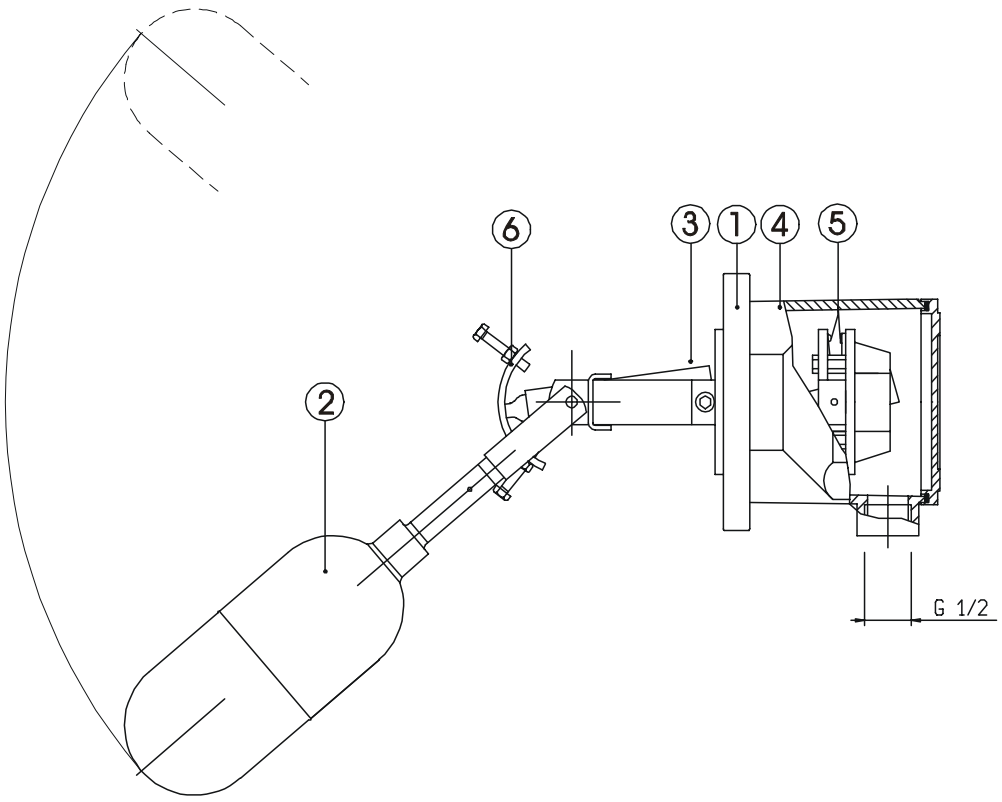
COLIMA S.r.l. Via Verbano, 4 S. Giuliano Milanese MILANO - ITALIA

Magnetic level switch.
Side mount directly in the tank.
One action threshold.

DESCRIPTION

Level switch formed by:

- Housing (4). Available Waterproof and E Ex-d version.
- Contact (5).
- Connection (1). Square or round flange.
- Float (2) with magnetic cartridge (3).
- Adjustable differential (6).



Size of fixing system and float, and the materials selected depend on the working conditions such as pressure, temperature and type of liquid contained in the tank.

OPERATION

Level switch is side mount directly in the tank.

s secured to the tank by means of a flange. This supports a float with a pre-set pivoting axis. The float is integral with a sealed cartridge that contains a magnet.

The housing, which is fixed to the outside of the flange, contains an electrical device with an oscillating magnet connected to the contacts.

The magnets are placed on the same axis. Since the adjacent ends have the same polarity, they repel each other to take up a preset position.

The float works according to the thrust provided by the liquid in the tank.

The contacts switch quickly and reliably.

It is therefore possible to actuate an electrical signal that enables the starting/stopping of pumps, opening/closing of solenoid valves, or activation of alarm systems, as required by modern automation technology.

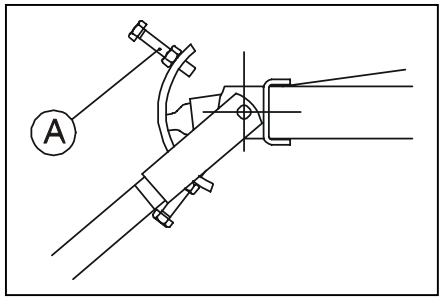
WORKING PARAMETERS

Pressure_____	**< 16 bar**	standard flange
	< 100 bar	sized flange
Temperature_____	**– 110 + 300 °C**	
Specific gravity_____	**> 0,6 Kg/l**	

DIFFERENTIAL

Width_____ **+ / – 40°**

Peg every 7,30°
To ad just differential set limit screws (A)
into needed position.



HOUSINGS

IP67 EN 60529 watertight housings are provided for normal working conditions.

Housings complying with ATEX Directive 94/9/EC are provided for areas subject to explosion hazard. Certificate TÜV 03 ATEX 2016.

CONNECTIONS

MEC A level switch is side mount directly in the tank.

Flange connection.
Lowest applicable nominal diameter 50 (2") with nominal pressure related to design needs.

INSTALLATION

Before proceed at installation pay attention to disassembly any packing.
Fit in level switch in the tank paying attention to avoid any damage at float.
Any deformation can interfere with right device operation.
Also verify that none reason can stop float work.
Right place supplied gasket between flanges.
Fix flanges with bolts.
Firmly close tightening bolts.

CONTACTS CHARACTERISTICS

Standard execution	Ag CdO+Au open air contact

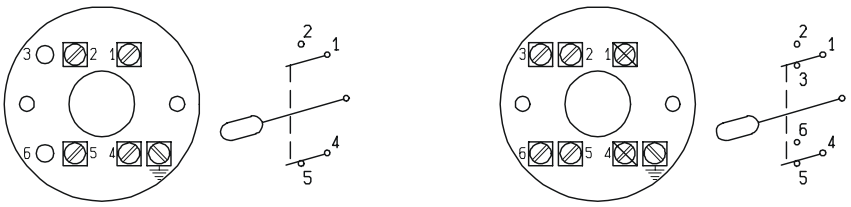
	3 A 230 V~ 1 A 24 V=
Special execution	SPDT microswitch sealed by inert gas
	SPDT microswitch with gold-plated contacts

Also available DPDT (two SPDT simultaneous)

ELECTRIC CONNECTION

Open housing and connect electric circuit cables at terminal board.
Attention!
Always connect protective grounding on terminal boards set inside and outside housing.

See diagram to connect SPDT o DPDT.



DISASSEMBLY

It is absolutely forbidden disassembly level switch before have been empty any remaining pressure inside tank. Disconnect electric circuit. For E Ex-d housings wait

at least five minutes before open. Open housing. Disconnect electric circuit cables. Close housing. Unscrew flange bolts. Extract level switch from the tank paying attention to avoid any damage at float.

MAINTENANCE

Instrument doesn't require precautionary maintenance.
However its recommended to provided time to time a check of liquid fluidity to avoid any suspensions or deposits that can influence wetted parts.
Also check free movability of float and serviceability of contact.
Take necessary precautions if liquid is corrosive.

SPARE PARTS

Components subject to wear or accidentally damage:

- Float (2).
- Contact (5).

To order spare parts please to communicate serial number wrote on instrument tag.

DATE	ISSUE	APPROVED
29/07/2004	00	A. Staffini

ИНСТРУКЦИИ ПО ЭКСПЛУАТАЦИИ И ТЕХОБСЛУЖИВАНИЮ

РЕЛЕ УРОВНЯ

MEC A

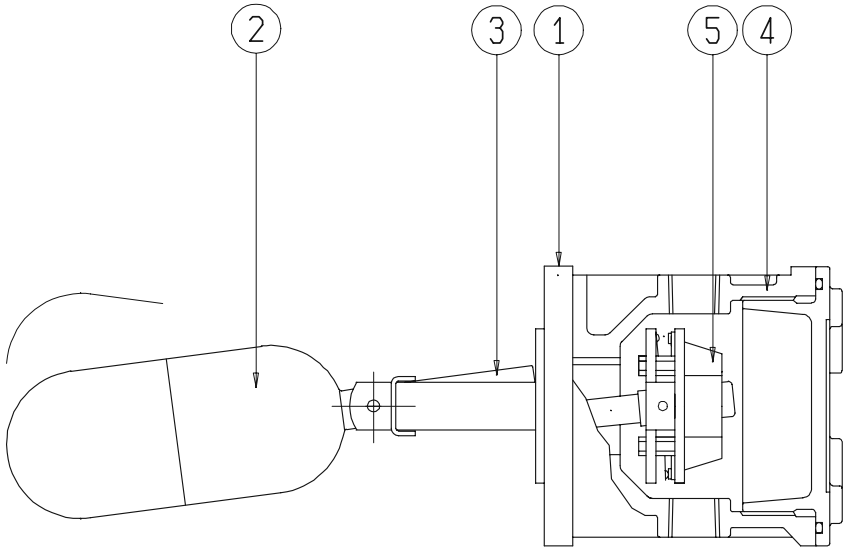
COLIMA S.r.l. Via Mestre, 11 Cernusco sul Naviglio MILANO - ITALIA

Магнитное реле уровня.
Устройство для бокового монтажа непосредственно в баке.
Одна точка срабатывания.

ОПИСАНИЕ

Реле уровня включает:

- Отводной корпус (4). Выпускается в герметичном варианте или варианте E Ex-d.
- Группа контактов (5), содержащаяся в корпусе.
- Система подсоединения к баку (1) с квадратным или круглым фланцем.
- Поплавок (2) с магнитным патроном (3).



Расчет системы крепления, поплавка и выбор используемых материалов зависят от условий эксплуатации, т. е. давления, температуры и типологии содержащейся в баке технологической жидкости.

ПРИНЦИП ФУНКЦИОНИРОВАНИЯ

Реле уровня устанавливается непосредственно в бак. Крепление выполняется фланцем, поддерживающим качающийся поплавок, жестко соединенный с герметичным патроном с магнитом. В отводном корпусе, прикрепленном снаружи к фланцу, размещается электрическое оснащение с качающимся магнитом, подключенным к системе контактов. Магниты расположены на одной оси. Ввиду того, что их соседние концы имеют одинаковую полярность, при взаимном отталкивании они устанавливаются в обязательном порядке. Поплавок при наличии или отсутствии толкающего усилия содержащейся в баке жидкости определяет этот порядок.

Переключение состояния контактов осуществляется быстро и надежно.

Это создает возможность управления электрическим сигналом, который при соответствующем управлении позволяет выполнять операции, например, пуск/остановка насосов, открытие/закрытие электроклапанов, подключение систем аварийной сигнализации.

ПРЕДЕЛЫ ПРИМЕНЕНИЯ

Давление _____	**< 16 бар** со стандартным фанцем
	< 100 бар с расчетным фланцем
Температура _____	**– 40 + 150 °C**
Удельный вес жидкости _____	**> 0,6 кг/л**

ТИПОЛОГИЯ КОРПУСА

Для обычного применения корпус имеет герметичное исполнение с классом защиты IP67 EN 60529.
Имеет одно резьбовое отверстие и клеммы заземления (внутри и снаружи).

Для мест с опасностью взрыва корпус соответствует Директиве ATEX 94/9/CE. Сертификат TÜV 03 ATEX 2016.
Имеет два резьбовых отверстия и клеммы заземления (внутри и снаружи).

ПОДСОЕДИНЕНИЕ К БАКУ

Прибор устанавливается горизонтально непосредственно в бак.
Крепление – фланцевое, с минимальным применимым номинальным диаметром 50 (2")
и номинальным давлением, приведенным к расчетным потребностям.

МОНТАЖ

Проверьте наличие входящей в комплект прокладки.
Введите реле уровня в бак через отверстие, внимательно следя за тем, чтобы не повредить поплавок.
Установите входящую в комплект прокладку и закрепите фланец прибора на баке болтами.
Выполните соответствующую затяжку.
Проверьте, что поплавок может свободно перемещаться внутри бака.

ХАРАКТЕРИСТИКИ КОНТАКТА

Стандартное исполнение	Контакты из Ag CdO+Au с размыканием в воздухе 3 A 230 В~ 1 A 24 В=
Особое исполнение	Микровыключатель SPDT, загерметизированный в инертном газе Микровыключатель SPDT с позолоченными контактами

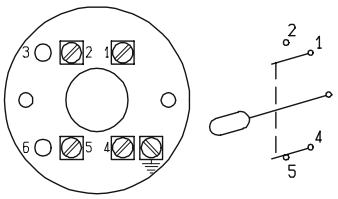
Выпускается также в варианте DPDT (два синхронных SPDT)

ЭЛЕКТРИЧЕСКОЕ ПОДКЛЮЧЕНИЕ

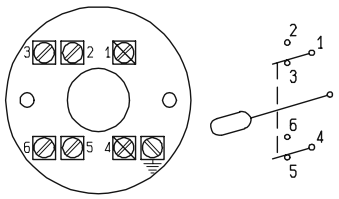
Откройте корпус и выполните электрическое подключение к группе контактов.

Внимание!
Всегда выполняйте подключение заземления, используя клеммы, предусмотренные внутри и снаружи отводного корпуса.

См. схему подключения SPDT или DPDT.



SPDT



DPDT

ДЕМОНТАЖ

Перед снятием убедитесь, что прибор отсоединен ото всех подключений к электроцепи, и проверьте, что бак не находится под давлением.
Для взрывозащищенных корпусов после отключения напряжения перед открытием подождите по меньшей мере 5 минут.
Откройте корпус и отсоедините соединительные электрокабели.
Закройте корпус.
Отвинтите крепежные болты фланца.
Снимите реле уровня, следя за тем, чтобы при извлечении не повредить поплавок.

ТЕХОБСЛУЖИВАНИЕ

Обычно устройство не требует профилактического техобслуживания.
В зависимости от критичности назначения устройства при образовании в технологической жидкости осадков или при наличии покрывающих суспензий и других факторов, нарушающих текучесть технологической жидкости, необходимо предусмотреть соответствующий контроль и профилактику для поддержания системы в чистоте для предупреждения помех для действия поплавка.

ЗАПЧАСТИ

Единственными компонентами, подверженными износу или повреждению, являются:
- Поплавок (2).
- Группа контактов (5).

Для заказа необходимо сообщать серийный номер, указанный на идентификационной табличке
прибора.

ДАТА	ВЫДАЧА	УТВЕРДИЛ
20/04/2007	00	A. Staffini